

U.S. Department of Education
Washington, D.C. 20202-5335



**APPLICATION FOR GRANTS
UNDER THE**

2015 Enhanced Assessment Grant (EAG)

CFDA # 84.368A

PR/Award # S368A150019

Grants.gov Tracking#: GRANT11950906

OMB No. , Expiration Date:

Closing Date: Jun 29, 2015

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This application was generated using the PDF functionality. The PDF functionality automatically numbers the pages in this application. Some pages/sections of this application may contain 2 sets of page numbers, one set created by the applicant and the other set created by e-Application's PDF functionality. Page numbers created by the e-Application PDF functionality will be preceded by the letter e (for example, e1, e2, e3, etc.).

Application for Federal Assistance SF-424

* 1. Type of Submission: <input type="checkbox"/> Preapplication <input checked="" type="checkbox"/> Application <input type="checkbox"/> Changed/Corrected Application	* 2. Type of Application: <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision	* If Revision, select appropriate letter(s): <input type="text"/> * Other (Specify): <input type="text"/>
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* 3. Date Received: <input type="text" value="06/29/2015"/>	4. Applicant Identifier: <input type="text"/>
--	--

5a. Federal Entity Identifier: <input type="text"/>	5b. Federal Award Identifier: <input type="text"/>
--	---

State Use Only:

6. Date Received by State: <input type="text"/>	7. State Application Identifier: <input type="text"/>
---	---

8. APPLICANT INFORMATION:

* a. Legal Name:

* b. Employer/Taxpayer Identification Number (EIN/TIN): <input type="text" value="38-60000134"/>	* c. Organizational DUNS: <input type="text" value="8053366410000"/>
---	---

d. Address:

* Street1:	<input type="text" value="P.O. Box 30008"/>
Street2:	<input type="text"/>
* City:	<input type="text" value="Lansing"/>
County/Parish:	<input type="text"/>
* State:	<input type="text" value="MI: Michigan"/>
Province:	<input type="text"/>
* Country:	<input type="text" value="USA: UNITED STATES"/>
* Zip / Postal Code:	<input type="text" value="48909-7508"/>

e. Organizational Unit:

Department Name: <input type="text"/>	Division Name: <input type="text" value="Accountability Business Servic"/>
--	---

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: <input type="text" value="Mr."/>	* First Name: <input type="text" value="Andrew"/>
Middle Name: <input type="text"/>	
* Last Name: <input type="text" value="Middlestead"/>	
Suffix: <input type="text"/>	
Title: <input type="text" value="Office Director"/>	

Organizational Affiliation:

* Telephone Number: <input type="text" value="517-241-2694"/>	Fax Number: <input type="text"/>
---	----------------------------------

* Email:

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

A: State Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

U.S. Department of Education

11. Catalog of Federal Domestic Assistance Number:

84.368

CFDA Title:

Grants for Enhanced Assessment Instruments

*** 12. Funding Opportunity Number:**

ED-GRANTS-042815-002

* Title:

Office of Elementary and Secondary Education (OESE): Enhanced Assessment Instruments Grants Program: Enhanced Assessment Instruments CFDA Number 84.368A;

13. Competition Identification Number:

84-368A2015-1

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment

Delete Attachment

View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Dynamic, Interactive, Formative, Assessment, Tasks, and End-of-Unit, Tests, for, Measuring, Challenging, Concepts, and Skills, of, Diverse, Middle, School, Students, .

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

Application for Federal Assistance SF-424**16. Congressional Districts Of:*** a. Applicant * b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

17. Proposed Project:* a. Start Date: * b. End Date: **18. Estimated Funding (\$):**

* a. Federal	<input type="text" value="4,476,512.00"/>
* b. Applicant	<input type="text" value="0.00"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="4,476,512.00"/>

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?** a. This application was made available to the State under the Executive Order 12372 Process for review on b. Program is subject to E.O. 12372 but has not been selected by the State for review. c. Program is not covered by E.O. 12372.*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)** Yes No

If "Yes", provide explanation and attach

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

 ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:Prefix: * First Name: Middle Name: * Last Name: Suffix: * Title: * Telephone Number: Fax Number: * Email: * Signature of Authorized Representative: * Date Signed:

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
19. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL <input type="text" value="Michael Flanagan"/>	TITLE <input type="text" value="State Superintendent"/>
APPLICANT ORGANIZATION <input type="text" value="Michigan Department of Education"/>	DATE SUBMITTED <input type="text" value="06/29/2015"/>

Standard Form 424B (Rev. 7-97) Back

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

Approved by OMB
0348-0046

1. * Type of Federal Action: <input type="checkbox"/> a. contract <input checked="" type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance	2. * Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input checked="" type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	3. * Report Type: <input checked="" type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change
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4. Name and Address of Reporting Entity:
 Prime SubAwardee

* Name: Michigan Department of Education

* Street 1: P.O. Box 30008 Street 2: _____

* City: Lansing State: MI: Michigan Zip: 48909

Congressional District, if known: _____

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

6. * Federal Department/Agency: n/a	7. * Federal Program Name/Description: Grants for Enhanced Assessment Instruments
	CFDA Number, if applicable: 84.368

8. Federal Action Number, if known: _____	9. Award Amount, if known: \$. _____
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10. a. Name and Address of Lobbying Registrant:

Prefix _____ * First Name n/a Middle Name _____

* Last Name n/a Suffix _____

* Street 1 _____ Street 2 _____

* City _____ State _____ Zip _____

b. Individual Performing Services (including address if different from No. 10a)

Prefix _____ * First Name n/a Middle Name _____

* Last Name n/a Suffix _____

* Street 1 _____ Street 2 _____

* City _____ State _____ Zip _____

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

* Signature: Michael Flanagan

* Name: Prefix Mr. * First Name Michael Middle Name P.
* Last Name Flanagan Suffix _____

Title: State Superintendent Telephone No.: 517-373-2313 Date: 06/29/2015

Federal Use Only: Authorized for Local Reproduction Standard Form - LLL (Rev. 7-97)

NOTICE TO ALL APPLICANTS

OMB Number: 1894-0005
Expiration Date: 03/31/2017

The purpose of this enclosure is to inform you about a new provision in the Department of Education's General Education Provisions Act (GEPA) that applies to applicants for new grant awards under Department programs. This provision is Section 427 of GEPA, enacted as part of the Improving America's Schools Act of 1994 (Public Law (P.L.) 103-382).

To Whom Does This Provision Apply?

Section 427 of GEPA affects applicants for new grant awards under this program. **ALL APPLICANTS FOR NEW AWARDS MUST INCLUDE INFORMATION IN THEIR APPLICATIONS TO ADDRESS THIS NEW PROVISION IN ORDER TO RECEIVE FUNDING UNDER THIS PROGRAM.**

(If this program is a State-formula grant program, a State needs to provide this description only for projects or activities that it carries out with funds reserved for State-level uses. In addition, local school districts or other eligible applicants that apply to the State for funding need to provide this description in their applications to the State for funding. The State would be responsible for ensuring that the school district or other local entity has submitted a sufficient section 427 statement as described below.)

What Does This Provision Require?

Section 427 requires each applicant for funds (other than an individual person) to include in its application a description of the steps the applicant proposes to take to ensure equitable access to, and participation in, its Federally-assisted program for students, teachers, and other program beneficiaries with special needs. This provision allows applicants discretion in developing the required description. The statute highlights six types of barriers that can impede equitable access or participation: gender, race, national origin, color, disability, or age. Based on local circumstances, you should determine whether these or other barriers may prevent your students, teachers, etc. from such access or participation in, the Federally-funded project or activity. The description in your application of steps to be taken to overcome these barriers need not be lengthy; you may provide a clear and succinct description of how you plan to address those barriers that are applicable to your circumstances. In addition, the information may be provided in a single narrative, or, if appropriate, may

be discussed in connection with related topics in the application.

Section 427 is not intended to duplicate the requirements of civil rights statutes, but rather to ensure that, in designing their projects, applicants for Federal funds address equity concerns that may affect the ability of certain potential beneficiaries to fully participate in the project and to achieve to high standards. Consistent with program requirements and its approved application, an applicant may use the Federal funds awarded to it to eliminate barriers it identifies.

What are Examples of How an Applicant Might Satisfy the Requirement of This Provision?

The following examples may help illustrate how an applicant may comply with Section 427.

(1) An applicant that proposes to carry out an adult literacy project serving, among others, adults with limited English proficiency, might describe in its application how it intends to distribute a brochure about the proposed project to such potential participants in their native language.

(2) An applicant that proposes to develop instructional materials for classroom use might describe how it will make the materials available on audio tape or in braille for students who are blind.

(3) An applicant that proposes to carry out a model science program for secondary students and is concerned that girls may be less likely than boys to enroll in the course, might indicate how it intends to conduct "outreach" efforts to girls, to encourage their enrollment.

(4) An applicant that proposes a project to increase school safety might describe the special efforts it will take to address concern of lesbian, gay, bisexual, and transgender students, and efforts to reach out to and involve the families of LGBT students.

We recognize that many applicants may already be implementing effective steps to ensure equity of access and participation in their grant programs, and we appreciate your cooperation in responding to the requirements of this provision.

Estimated Burden Statement for GEPA Requirements

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. Public reporting burden for this collection of information is estimated to average 1.5 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is required to obtain or retain benefit (Public Law 103-382). Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Department of Education, 400 Maryland Ave., SW, Washington, DC 20210-4537 or email ICDocketMgr@ed.gov and reference the OMB Control Number. 1894-0005.

Optional - You may attach 1 file to this page.

GEPA_statement.pdf

Add Attachment

Delete Attachment

View Attachment

GEPA (General Education Provisions Act)
**Dynamic Interactive Formative Assessment Tasks and End-of-Unit
Tests for Measuring Challenging Concepts and Skills of Diverse
Middle School Students**

The Michigan Department of Education (MDE) believes that barriers to equitable access to or participation in activities undertaken with funds from this program (title noted above) are being addressed through practices and strategies implemented to ensure equity in all programs. The Michigan State Board of Education has adopted *Vision and Principles for Universal Education* – an over-arching set of guidelines to ensure that all educational opportunities are readily available and easily accessible to all children and families.

For the activities and partners associated with this Grant, the following potential barriers and related solutions to equal access are presented:

- Any participant in this grant, and programmatic intervention, training, meeting, or program administrations with a need for special accommodation due to health status, language barrier, visual or hearing impairment, other physical disability, or age will be assisted through reasonable accommodation and meeting sites being held in publicly accessible buildings. MDE has included resources for translation services to provide materials in numerous languages other than English.
- Any published reports, training, plans or materials will be made available through a variety of means to meet the access needs of constituents. Materials will be available via the MDE, and W or website, by request through written mail, or by calling a main phone number.

Historically, Michigan has been sensitive to equity needs and has responded with practices as listed below.

- Through the programs administered by MDE, there exist a variety of assurances, in different forms and at numerous levels, which guarantee equitable access for all participants, and other key stake holders in the state, which apply to all state and federal programs.
- All participants submitted to the MDE will contain a statement assuring the applicant/contractors will take steps to provide equitable access to, all participation in this grant addressing special needs of participants to overcome barriers based on gender, race, color, national origin, limited English proficiency, disability, and age.
- MDE has worked to ensure the most diverse pool of candidates for employment or contracted services are considered.
- The MDE website at www.michigan.gov/mde has been established to ensure that barriers to equitable participation resulting from geographic isolation are overcome.

CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

If any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions. Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

* APPLICANT'S ORGANIZATION Michigan Department of Education		
* PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE		
Prefix: Mr.	* First Name: Michael	Middle Name: P.
* Last Name: Flanagan	Suffix:	
* Title: State Superintendent		
* SIGNATURE: Michael Flanagan	* DATE: 06/29/2015	

Abstract

The abstract narrative must not exceed one page and should use language that will be understood by a range of audiences. For all projects, include the project title (if applicable), goals, expected outcomes and contributions for research, policy, practice, etc. Include population to be served, as appropriate. For research applications, also include the following:

- Theoretical and conceptual background of the study (i.e., prior research that this investigation builds upon and that provides a compelling rationale for this study)
- Research issues, hypotheses and questions being addressed
- Study design including a brief description of the sample including sample size, methods, principals dependent, independent, and control variables, and the approach to data analysis.

[Note: For a non-electronic submission, include the name and address of your organization and the name, phone number and e-mail address of the contact person for this project.]

You may now Close the Form

You have attached 1 file to this page, no more files may be added. To add a different file, you must first delete the existing file.

* Attachment:

Abstract

Michigan (lead), Wisconsin, Maryland, New Jersey, Nevada, and the Wisconsin Center for Education Research at the University of Wisconsin–Madison (managing partner), propose to develop an operational set of performance-based, technology-interactive, formative assessment tasks, end-of-unit assessment modules, and related teacher tools aligned to the Next Generation Science Standards (NGSS) and the Framework of K–12 Science Education. Activate Learning Curriculum and the WIDA Consortium (in kind partners), will join the lead and supporting states and managing partner in this project. The project will work with districts using NGSS aligned curriculum *Investigating and Questioning our World through Science & Technology* (IQWST) to control for opportunity to learn. The tasks and assessments will use a multi-semiotic performance- and progression-based assessment methodology called ONPAR that measures challenging science knowledge and abilities of widely diverse students including English learners, students with learning disabilities, and mainstream students. This proposal will address two absolute priorities, *Collaboration* and *Use of Multiple Measures of Student Academic Achievement*, two competitive preferences, *Implementing Internationally Benchmarked College- and Career-ready Standards and Assessments* and *Leveraging Technology to Support Instructional Practice and Professional Development*, and invitational priorities, *Developing Innovative Item Types* and *Leveraging Technology to Support Personalized Learning and to Improve Assessment Tools*.

The goal of the project is to improve the assessment of challenging science learning for all middle-school students. Six objectives address this goal: **Objective 1.** Produce 12 technologically interactive, technically defensible, end-of-unit performance diagnostic assessments using 36 extended tasks (Outcomes: documentation of ECD methods to develop test modules and tasks within modules; successful classroom pilots with selected tasks and refinement of tasks, and successful field testing of modules with analyses of data). **Objective 2.** Produce 35–40 additional classroom-embedded extended performance assessment tasks designed for on-demand teacher

use as they teach the 12 IQWST science units (Outcomes: documentation of ECD methods to develop classroom-embedded interactive tasks; successful classroom tryouts and refinement of tasks; successful piloting of classroom-embedded tasks and data analyses; observation, and post-task surveys and interviews with teachers to investigate the effectiveness of the learning tasks).

Objective 3. Produce individualized diagnostic student- and classroom-level reports generated immediately after students complete the tasks and tests (Outcome: successful development and programming of scoring algorithms for measuring status and processes of intended knowledge and skills). **Objective 4.** Produce and evaluate associated materials and related PD for teachers to support and inform task use, interpretation, and differentiated learning based on individualized results (Outcomes: development of task-specific teacher interpretative materials; 3-day face-to-face PD institutes and PD modules; development of a community-of-practice website with resources and chat space for participants; ongoing webexes to discuss the tasks and formative assessment; and surveys to evaluate the PD institute and online PD). **Objective 5.** Investigate the relationships between traditional and innovative item types that measure similar content and depth (Outcomes: identify ONPAR performance- and IQWST traditional-items that measure similar content; analyses of ONPAR-IQWST item dyads by type and group). **Objective 6.** Investigate two types of multiple-measure aggregation schemes using ONPAR tasks and tests at the classroom- and state-level (Outcomes: design multiple aggregation weighting schemes; conduct preliminary and final analyses of weighting schemes and methods).

Approximately 60 teachers will take part in external reviews of task and teacher materials and in bias reviews. Further, about 400 students and six teachers (assuming about 67 students per teacher) will take part in the three pilot tests, and approximately 3000 students and 60 teachers will participate in the field tests for a grand total of about 126 educators and 3400 students participating. Activate Learning is committed to recruiting geographically and demographically stratified sites for all data collections, including Chicago, Baltimore, Los Angeles, and Palm Beach and districts in lead and supporting states (MI, MD, NJ, NV and WI).

Project Narrative File(s)

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**Dynamic Interactive Formative Assessment Tasks and End-of-Unit Tests for Measuring
Challenging Concepts and Skills of Diverse Middle School Students**

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Dynamic Interactive Formative Assessment Tasks and End-of-Unit Tests for Measuring Challenging Concepts and Skills of Diverse Middle School Students

Michigan (lead), Wisconsin, Maryland, New Jersey, Nevada, and the Wisconsin Center for Education Research (WCER) at the University of Wisconsin–Madison (UW) as managing partner, propose to develop an operational set of performance-based, technology-interactive, formative assessment tasks, end-of-unit assessment modules, and related teacher tools aligned to the Next Generation Science Standards (NGSS) and the Framework of K–12 Science Education (hereafter, The Framework). Activate Learning Curriculum and the WIDA Consortium (in kind partners), will join the lead and supporting states and managing partner (WCER) in this project. This proposal will address two absolute priorities, *Collaboration and Use of Multiple Measures of Student Academic Achievement*, as well as the two competitive preferences, *Implementing Internationally Benchmarked College- and Career-ready Standards and Assessments* and *Leveraging Technology to Support Instructional Practice and Professional Development*. In addition, the project will address the invitational priorities, *Developing Innovative Item Types* and *Leveraging Technology to Support Personalized Learning and to Improve Assessment Tools*.

The tasks and assessments will use a progression-based and empirically-proven methodology called ONPAR. ONPAR's multi-semiotic methodology measures challenging science knowledge and abilities of widely diverse students, including English learners (ELs), those with learning and other disabilities, and literate, high performing native English speakers with no individualized education program (IEP). The sophisticated scoring algorithms underlying the tasks and modules will support differentiated learning by providing immediate, real-time diagnostic reports to students and their teachers and generating classroom-level reports for teachers about how and where their students may struggle. Associated materials and teacher professional development (PD) will provide detailed information to teachers about learning progressions and target middle school NGSS associated with all tasks, score interpretation guidance, and exemplar learning activities for students demonstrating different learning profiles. In addition, assessment activities geared to improving academic English language skills will be developed for each task and made

available to teachers. Rubrics associated with these activities will differentially evaluate student progress within their targeted zones of language achievement. All project tasks and materials will align with and act as exemplars of internationally benchmarked college- and career-ready standards and be broadly accessible to the diverse population of middle school students in U.S. schools.

In total, approximately 75 extended, performance assessment tasks, including learning-embedded tasks and tasks for the end-of-unit tests, along with their attendant tools and resources, will be developed, researched, and ready for operational use across 12 spiraled middle school science units. A series of technical studies associated with the tasks and tests will be conducted, and evaluations, educator feasibility, usefulness, and viability data associated with the test and assessment materials will be collected and analyzed. While the materials will not be associated with any one learning approach, the project will be conducted within the context of students learning one science curriculum—Activate Learning’s Investigating and Questioning our World through Science and Technology (IQWST)—so student opportunity-to-learn can be held as constant as possible. This will allow researchers to more clearly determine when assessment results are more likely a factor of the ONPAR instruments and materials, as compared to broad curricular differences.

Goals, Objectives, and Outcomes

The goal is to improve the assessment of challenging science learning for all middle-school students. We have six objectives with associated outcomes.

Objective 1. Produce 12 technologically interactive, technically defensible, end-of-unit performance diagnostic module assessments using 36 extended tasks (approximately three per unit) covering earth-, life-, physical-science, and chemistry, that use innovative item types, span Grades 6–8, are aligned to the NGSS, and are ready for operational use. **Outcomes:**

- documentation of evidence centered design methods to develop modules, tasks within modules, and items within tasks,
- successful classroom pilots with selected tasks, and refinement of tasks as warranted, and
- successful field testing of end-of-unit modules, with psychometric and statistical analyses of data.

Objective 2. Produce approximately 35–40 additional technology-based classroom-embedded extended performance assessment tasks that measure the same constructs as the module tasks, are designed for on-demand teacher use as they teach the 12 middle school science units, use innovative item types, have been empirically validated, and are ready for classroom use. **Outcomes:**

- documentation of evidence centered design methods to develop classroom-embedded interactive tasks and items within tasks,
- successful classroom tryouts with selected tasks, and refinement of tasks as warranted,
- successful piloting of classroom-embedded tasks and data analyses, and
- post-task interviews with teachers to probe the effectiveness of the learning tasks.

Objective 3. Produce individualized diagnostic student- and classroom-level reports generated immediately after students complete the tests and tasks. **Outcomes:**

- successful development and programming of scoring algorithms for measuring status and processes of intended knowledge and skills within and across items.

Objective 4. Produce and evaluate associated materials and related PD for the teachers to support implementation of tasks and additional formative assessment techniques and inform the interpretation and differentiated learning based on individualized results from the tasks and tests. **Outcomes:**

- development of task-specific teacher interpretative guides and 12 end-of-unit guides,
- development of a 3-day face-to-face PD institute and 12 online PD modules where teachers can preview the tasks and modules on their own,
- development of a community-of-practice space on the project website with resources, regular ongoing webexes with project staff to discuss tasks, and an online chat space for participants,
- development and implementation of teacher surveys to evaluate the institute and online products, and
- analysis of data.

Objective 5. Investigate the relationships between traditional and innovative item types that measure similar content or skills. **Outcomes:**

- science experts and staff identify ONPAR innovative items that measure similar content as IQWST traditional multiple-choice and constructed response items, and
- analyses of ONPAR-IQWST item dyads by type and group.

Objective 6. Investigate two types of multiple-measure aggregation schemes using the ONPAR end-of-unit modules. This will include studying the usefulness and validation of aggregating data at the (a) end-of-unit classroom-based level, combining scores from ONPAR module tests associated with a particular unit with relevant IQWST end-of-unit test counterparts, and (b) state accountability level, aggregating scores from the end-of-unit ONPAR tests with the end-of-year state test science results.

Outcomes:

- design multiple aggregation weighting schemes for both classroom and state purposes,
- conduct preliminary analyses of weighting schemes and methods and adjust as needed, and
- conduct analyses with final methods and weighting schemes.

A. Need for Project

Magnitude and Severity of Problem Addressed

Across the United States, the newly adopted college and career readiness standards have set forth rigorous educational goals for all students. In science, the NGSS promote the three dimensions of deep science learning: disciplinary core ideas, cross cutting concepts, and scientific practices, which includes development of increased conceptual understanding and critical thinking, as well as participation in challenging and authentic real-world behaviors as a critical and valued route to learning. Adopting curriculum that mirrors the key foci and spirit of NGSS is just the first step in promoting this type of learning and readiness, however. For all students to meet the rigor of the new standards, a variety of other resources are needed, such as newly-crafted, flexible accessible instructional resources, including aligned formative assessment tools, practices and materials to monitor ongoing learning, support for teachers and

students alike, and provide effective differential information and targeted activities so students can continue to make progress toward the standards. Further, PD programs that both prepare teachers for the instructional shifts associated with this type of challenging curriculum and build their capacity to properly assess today's diverse students as they learn are also necessary.

Magnitude of Need for the Activities

Research shows that the most effective districts and schools use student assessment data on an ongoing basis to inform and guide plans for student growth; these districts also train teachers to thoughtfully interpret and use those data to plan for targeted future instruction (Datnow, Park, & Wohlstetter, 2007; Pellegrino, Wilson, Koenig, & Beatty, 2014). However, most teachers don't know how to collect or make inferences from classroom evidence in order to inform instructional decisions for their students. As such, they need to understand how to collect data from ongoing classroom interactions that are part of learning, and access to effective formative assessment materials that can collect effective diagnostic data while they teach (Pellegrino et al., 2014; Morrison, 2009). It is also essential that teachers understand how to use tools often provided, such as learning maps. Two articles stress the importance of helping teachers effectively use these maps (Furtak & Heredia, 2014; Furtak, Morrison, & Kroog, 2014).

This need is compounded for today's diverse students for whom there exist pronounced achievement gaps in all content areas. For example, on the most recent (2011) National Assessment of Educational Progress (NAEP) science assessment at Grade 8, the average scale score for the national sample of students identified as ELs was 48 points lower than that of students who were not ELs. Similarly, the average 2011 NAEP science scale score for 8th-graders classified as having a disability was 31 points lower than that of students without disabilities (2011 Nation's Report Card, Science). The magnitude of these gaps illustrates both the severity of the problem and the relevance of the project. A key issue is that a large portion of these students express their knowledge in ways that are nonstandard. This is almost certainly due in part to the test accessibility issues, but also seems to be due to their creative ways of compensating for challenges they face (Kopriva & Wright, in press; Schleppegrell, 2004). Equipped with formative assessment resources and the PD needed to hear how these students interpret instruction and

express their abilities, teachers can identify students' learning needs so they can respond effectively. Further, student-friendly formative assessment resources can help students understand their own learning progress and learning needs and take charge of their own pathway to college and career readiness.

Nature and Magnitude of Gaps Addressed

The proposed project is well positioned to address these needs. It will use the proven ONPAR methodology to produce the performance-based and interactive, diagnostic end-of-unit tests and learning tasks teachers will use during instruction. Novel techniques using multi-semiotic screen designs will present the problems and questions, and a wide variety of innovative item types will be automatically scored using sophisticated algorithms. Interpretive student and classroom score reports will be immediately available and will provide individual, targeted understandings of student performance. The ONPAR approach has been found to be effective to measure challenging skills and concepts for diverse students, and associated tools will provide activities and guidance for differential instruction of these learners. By focusing on timely classroom assessment aimed at rigorous standards, this project will accelerate the iterative interplay between enhanced teaching and learning to improve the ability for all students to participate competitively in challenging middle school coursework.

B. Significance

The proposed project has the potential to provide highly relevant, timely, and useful information and strategies to the assessment and science education fields. For years, science, measurement, and cognitive scientists have argued that the deep learning that prepares students for college and careers involves exposure at all grade levels to activities explicitly designed to elicit complex reasoning and metacognitive skills (e.g., NGSS, Appendix C, 2013; Duschl, Schweingruber, & Shouse, 2007; National Research Council, 2005). For students to learn effectively, these experts argue, ongoing classroom assessment reflecting the range of cognitive principles need to be seamlessly integrated into learning activities so teachers and students can track true progress over time (Pellegrino, Wilson, Koenig, & Beatty, 2014; Pellegrino, Chudowsky, & Glaser, 2001).

Some evidence indicates that ongoing formative assessments, progress monitoring, and formal embedded classroom assessments such as the instruments proposed in this project may be positively related to student achievement (Faria et al., 2012). Models of such classroom-embedded formative assessment tasks—and assistance in building and using them—have developed in the past few years (American Association for the Advancement of Science [AAAS], 2007; Black & Wiliam, 2009, 2004; Mislevy, Steinberg, & Almond, 2003; Pellegrino et al., 2014; Quellmalz & Haertel, 2004; Quellmalz et al., 2008; Wilson, 2004). However, exemplar tasks presented in static environments tend to carry a heavy linguistic load even as they refer to concepts and reasoning that can be demonstrated in multiple ways (e.g., AAAS, 2007; Hansen & Zapata-Rivera, 2010; Mislevy & Haertel, in press;). Further, technology-rich environments tend to require text-based constructed or selected-response even though the problem presentation and development of the assessment tasks is depicted multi-semiotically (Fife, Graf, & Ohls, 2011; NCES, 2011, 2012; Quellmalz & Silbergitt, 2010).

By focusing on using computer capabilities of animation, stimuli manipulation, and interactivity, as well as novel response screens, in order to present problems and harvest student responses, the ONPAR methodology reflects the varied ways students learn and reason in deep-learning science classrooms where the concepts and implications of the three dimensions are interwoven. In addition, this approach addresses access needs of students who face challenges with the language or literacy components of assessments because it simultaneously uses multiple stimuli to convey meaning. This is accomplished by presenting questions in virtual “real time,” using text as only one tool in an arsenal of semiotic ways of meaning-making. It also uses a wide variety of item types aligned to the ways learning tasks are presented in the classroom and how students might show or explain what they know.

These techniques are especially appropriate for considering challenging, cognitively complex, science questions and assessment scenarios that simulate authentic problems where students are allowed to progressively make choices and experience the consequences, respond to further stimuli, and demonstrate their solutions in a broader set of ways. These kinds of tasks, as well as the procedures used by the project to build, and score conceptual understandings as well as processes, represent significant advances in the

critical areas of inclusive, complex, performance-based, and authentic formative science assessment at the middle school level—undoubtedly an area in which a great deal more capacity is needed.

Contribution to the advancement of theory, knowledge, and practices in three fields. Within educational measurement the standard argument for common inferences has been made on procedural grounds: common content in tasks and a common approach for synthesizing and summarizing tasks and response data over tasks. The latter part of this argument required standardized conditions of observation. However, based on developments in instructional and cognitive psychology, evidentiary reasoning, and statistical modeling, we can now develop, implement, and test an alternative conceptual argument for common inferences. Rather than requiring standardized conditions of observation, the conceptual argument can be built on evidencing appropriate relationships among target inferences, the knowledge and skills of interest, necessary observations, the properties of tasks designed to elicit the observations, and situations where students interact with assessment requests. This approach suggests that data leading to common inferences may be collected under alternate conditions for different types of problems and solution requirements in a given assessment, for different students within an assessment system at a point in time, and by changes in conditions over time. However, the response opportunities to allow this flexibility must be present in the tasks and tests. The theoretical framework for this project draws on work in educational measurement, science learning and assessment, semiotics, and linguistics pertaining to the ways students comprehend and derive meaning from various semiotic representations.

The theoretical framework in measurement for accomplishing the defensible variation of task presentation conditions or novel response spaces is Mislevy and colleagues' (2003) evidence centered design. While this approach has generally been used to build principled items of the same type that can be interchanged in tests (i.e., Quellmalz et al., 2006, 2008) or design tests using the inference-based approach as a starting point (for instance, see the new AP science frameworks), some researchers have used this argument as a starting point to include variable testing approaches for special populations within testing systems (i.e., Elliott & Thurlow, 2005; Kopriva et al., 2001, 2006). It has been used less often to demand a principled way to adapt the assessment of performance-driven learning, often a necessary

vehicle to teaching more complex and challenging subject matter and skills. To date it does not appear that there has been a comprehensive evaluation of how different types of items supposedly measuring the same construct targets affect inferences over measurement purposes, or over students, yet it stands to reason that evidence centered design, properly implemented, can be the foundational basis for projects such as the one we propose.

The second conceptual foundation is based on science learning and assessment. Since the 1980s, best practices for K–12 science teaching and learning have evolved in accordance with various standards-based reform movements (Lederman & Abell, 2014). These best practices recently underwent significant shifts due to The Framework (2012) and resultant *NGSS* (2013). The conceptual shifts include teaching science as the nexus of key science concepts (core ideas), the ways in which scientists work (practices), and ideas that bridge disciplinary boundaries within the sciences (crosscutting concepts). This “three-dimensional” learning eschews memorization of facts in favor of providing students with opportunities to understand how science knowledge is generated and apply it while carrying out “real-world” science practices (e.g. developing models, designing and carrying out investigations, and arguing from data). Previous standards documents individually addressed these dimensions, giving students a fragmented understanding of scientific pursuits and few opportunities to carry out the practices. The Framework also emphasizes that for deep, connected learning, students focus on fewer core ideas critical for college, career, and citizenship. To support students in building these understandings, the *NGSS* coherently organizes a small set of performance expectations for students that span grade bands and increase in sophistication over time. Thus, *NGSS*-aligned science teaching provides students the time necessary to engage in core ideas through multiple practices while making crosscutting concepts apparent. In contrast, attempting to address the number and breadth of standards in previous documents required more superficial learning experiences (*NGSS*, Appendix A, 2013). In considering how to properly assess science learning, experts recognize the need for coherent instructional systems that rest on aligned standards, curricula, and assessments (Pellegrino et al., 2014; Duschl et al., 2007; Tucker, 2004). They argue that greater alignment and content-measurement coherence can be realized when assessments

emulate students' firsthand activities in the classroom and are designed to provide information about students' conceptual, reasoning, and performance skills as evidenced over items. Classroom or "internal assessments" are used as an integral part of classroom instruction and include teacher-student interactions, observations, and end-of-unit tests. They also include student products Pellegrino (2013) and Ruiz-Primo and others (2002) refer to as "immediate assessments" that result directly from instructional activities, and "close assessments" that are closely tied to the learning experiences but not part of it. This project argues that using interactive student-task stimuli methods to evaluate the skills and conceptual sophistication of students is superior when direct demonstration of their strategies and understanding is possible.

The third foundation rests on literature from the fields of linguistics and semiotics regarding how students comprehend meaning. Within linguistics, researchers posit that discipline-specific academic registers may make it difficult for students to access content (Schleppegrell, 2004). Linguistic analyses that focus on the materials and interactions used in science education establish that language is central to learning science but other semiotic modalities also play canonical roles in conveying meaning (Lemke, 1990). Students who struggle with academic registers have benefitted from systematic approaches using alternative semiotic representations, along with efforts to promote communication using innovative means of interaction (Echevarria, Vogt, & Short, 2007; Wright, 2015).

Semiotic research is focused on how different signs are used to convey meaning. Research in classrooms has shown that communication in educational contexts is inherently multimodal and relies upon visual, mathematical, and actional modalities for the expression of complex ideas (Kress, Jewitt, Ogborn, & Tsatsarelis, 2001; Lemke, 1991; O'Halloran, 2004). Investigations in science classrooms have shown that the patterned use of multiple modalities has become so established that the ways in which different signs are used are canonical. For example, science relies upon models (e.g., solar system, food chains, etc.) to express how the natural world operates in patterned ways. The array of non-linguistic signs and their conventionalized usages are powerful ways of communicating and representing concepts in classroom contexts. Drawing from linguistics (Saussure, 1983) and semiotic theory (Barthes, 1983; Kress, Jewitt, Ogborn, & Tsatsarelis, 2001; Kress & van Leeuwen, 2001, Peirce, 1931–1958), ONPAR

capitalizes on the affordances of different semiotic signs to create a grammar of task and item design that allows test developers to successfully communicate with test takers in novel ways. From a theoretical perspective, ONPAR strategically uses a variety of semiotic signs to capitalize on each sign's potentiality to best communicate with the diversity of test takers. The systematic usage of different signs within the assessment context results in the creation of a grammar of item design, which includes what signs are used and how (e.g., static visuals, movement, international symbols or other symbol systems such as in mathematics; interactional sequences, animations and simulations; access to native and non-native language via written text or sound), what support features are needed, how individual screens are laid out, how items unfold across screens, what types of interactive opportunities are needed for continuous engagement to achieve cohesion and coherence, and what tools test takers need to convey meaning. Successful communication with test takers is rooted in an understanding of different semiotic signs' potentialities and constraints, as well as profiles of diverse test takers and how the signs' potentialities and constraints interact with different diverse test takers' strengths and needs. Creating a consistent grammar of item design provides students the potential to access and create meaning within the assessment.

Potential for generalizing from the findings of the proposed project. The results of this project have the potential to yield several generalizable findings. First, the ONPAR formative assessment methods developed and researched have the potential to be applied to other content areas. Because these assessment methods aim to measure cognitively complex disciplinary knowledge and practices, they may translate (with relevant adaptations) to other content areas that also aim to measure challenging new college and career readiness standards (e.g., mathematics). Findings from this project will inform future work in other content areas.

Second, the assessment methods researched and developed here are likely to be generalizable in that they can be applied to meet needs of diverse students in other assessment contexts. The prior research grants that led to the ONPAR methodology investigated specifically how the measurement of challenging concepts and reasoning can be captured for diverse students (Kopriva et al., 2009, 2011, 2013; 2014, in press; submitted). This project will extend this work to study how the classroom learning tasks and end-

of-unit tests developed using the ONPAR methods are accessible for these students. Other publishers may, in turn, take up these methods to create accessible assessments that better communicate with a broad range of students.

Third, the field of formative assessment is in flux and in need of successful examples of how to use assessment methods to guide the teaching and learning process. The project proposes to design assessment tasks that ask questions about and track diagnostic underpinnings of more challenging concepts and skills, using research-based learning progressions. Well-crafted assessment opportunities that have specific multi-source characteristics can gather evidence pointing the way to future instruction (see Bell & Cowie, 2001; Black & Wiliam, 2009, 2004; Heritage, Jones, & White, 2010).

Finally, the PD program developed alongside the formative assessment tasks will help the field better understand the kinds of supports needed for teachers to better support diverse students. These types of performance tasks are used in the classroom and will complement such PD as The Next Generation Science Exemplar Learning System for Science Educators. The foundational underpinnings associated with ONPAR's formative assessment work and the PD approach proposed here are based in much of the same classroom assessment and cognitive science literature and findings used to undergird the summative ONPAR approach.

Extent to which the proposed project involves the development of new strategies. The project will leverage previous work using the performance-based ONPAR methodology initially developed in three federally-funded experimental projects that investigated how to improve summative items measuring challenging knowledge and abilities for elementary and middle school ELs and non-ELs in science classes (Kopriva et al., 2009; Kopriva & Wright, submitted), elementary and middle school students with and without learning disabilities in mathematics classes (Kopriva et al., 2011), and ELs, students with learning disabilities, and native English speakers with no IEPs in high school Biology and Chemistry classes (Kopriva et al., 2013). Findings demonstrated that the methods significantly closed the gaps between how focal students performed on the ONPAR tests versus tests using traditional items measuring the same content and depth of cognitive demand, and also kept the control groups interested

and performing better on the performance items but with much smaller differences between the two test types. In total, 156 cognitive labs were conducted during these grants and a summary of these findings can be found in Kopriva & Wright (in press). Currently, an ONPAR grant is beginning to research how these methods might be adapted to the classroom arenas. The project proposed here will build on this latest research grant, extending the development of diagnostic-effective tasks and more sophisticated scoring algorithms as well as developing useful teacher materials and PD.

C. Project Design

In this proposal, the first absolute priority, *Collaboration*, is met by state partners working with a university and a curriculum organization to develop research-grounded and empirically-based products measuring challenging content and skills learning of all students. The second absolute priority, *Use of Multiple Measures of Student Academic Achievement*, is addressed by including multiple item types in all tasks and tests, and researching how to combine assessment scores using traditional formats with those from the proposed standardized performance-based products. The first competitive priority, *Implementing Internationally Benchmarked College- and Career-ready Standards and Assessments*, is met by using industry-recognized evidence centered design methods to develop the proposed products to be firmly aligned with The Framework and NGSS. The second competitive priority, *Leveraging Technology to Support Instructional Practice and Professional Development*, is met by, first, developing the performance-based tasks and modules with electronic scoring algorithms to produce individualized student and teacher reports. The reports differentially interpret student performance relative to the relevant learning progressions, identify misconceptions or lack of skills, and present guidance about further instruction based on the individualized reports. Second, a blended model of presenting PD and the development of a breadth of teacher materials covering different topics supports teachers in learning the multiple semiotic ways of assessing students, and encourages them to build capacity to formatively assess their students using techniques shown in the tasks, discussed during PD, and/or available on the website. The face-to-face PD institute will provide extended learning time with teachers, and the online PD

modules, webex meetings, resources on the community of practice website, and chat space will also support and provide ongoing resources for participants. The two invitational priorities, *Developing Innovative Item Types* and *Leveraging Technology to Support Personalized Learning and to Improve Assessment Tools*, are met by using the empirically-supported ONPAR innovative item design, item response space methodology, and novel scoring techniques to improve assessment tools and products, while also delivering individualized student and teacher reports geared to differentially targeting future instruction for relevant students.

This proposal will focus on six objectives associated with the primary goal of improving the assessment of challenging science learning for all middle-school students. All products, tools, and materials will be empirically investigated by working with districts and schools that use the IQWST curriculum, a middle school science curriculum aligned with the three dimensions of NGSS and The Framework. For this project, the publisher of the IQWST curriculum—Activate Learning—has committed to identifying participating districts, schools, and teachers. The chief academic officer, one of the PIs of the grant that wrote the IQWST curriculum and former University of Michigan professor, also serves on the project leadership team. To determine accessibility of the tasks and module tests for students, all qualitative and quantitative student data will be analyzed by student group: native English speakers with no IEPs, lower and higher English proficiency ELs, students with learning disabilities, and other students with disabilities that teachers think might benefit from an alternative form of assessment. Also data from students from lower and higher supplemental educational service schools (as defined by percentage of free and reduced-price lunch participants), and struggling and good native English speaker readers with no IEPs, will be investigated.

Objectives 1-3: Development of tasks, module tests, scoring, and reporting. This project will build approximately 75 technology-based, extended performance-based tasks, collecting technically-defensible validity, reliability, and fairness data to support their use both in the end-of-unit tests and as classroom-embedded stand-alone tasks teachers can use while they are teaching. All ONPAR assessments will use multiple measures to collect data about students' knowledge and abilities, including different

innovative item types as well as multiple- or dichotomous-choice item types. The tasks and end-of-unit tests will measure focal knowledge and abilities within the curriculum of IQWST's 12 science units, and as aligned with NGSS (see Table 1).

The extended classroom learning tasks will use the empirically-proven ONPAR assessment methodology, include 7–12 items each (yielding 20–30 score points), and provide specific diagnostic feedback about content and processes. The tasks for the end-of-unit assessment are expected to be shorter so they can be completed within a class period. Approximately half of the extended tasks will be created to fit NGSS task specifications specially designed for this project within each of the 12 units. The other half will mirror similar specifications and task and item targets, but within different contexts relevant to each unit and most likely with additional or adapted items. The focus of the classroom-embedded learning tasks and the end-of-unit tasks will differ in that the former will collect smaller grain building block data while the latter will be looking for trends over as well as within tasks. The extended task design allows for adequate breadth of content coverage per task while also providing rich contexts of shared interactive stimuli and targeted diagnostic data.

Table 1: The 12 IQWST and Project Units

Life Science	Physical Science	Earth Science	Introduction to Chemistry
Where Have All the Creatures Gone?	Can I Believe My Eyes?	How Does Water Shape Our World?	How Can I Smell Things from a Distance?
What's Going On Inside of Me?	Why Do Some Things Stop While Others Keep Going	What Makes the Weather Change?	How Can I Make New Stuff From Old Stuff?
Why Do Organisms Look The Way They Do?	How Will It Move?	How Is the Earth Changing?	How Does Food Provide My Body with Energy?

The item writers will use established research-based learning progressions to design tasks to pinpoint how well students understand, reason and demonstrate focal knowledge and abilities, as well as to capture process data and provide insight about why and how students may misunderstand or struggle to use effective skills. A few tasks will use immediate feedback screens while students take the formative assessment. We plan this feedback to be interactive, indicating to students whether their response is correct or insufficient, and, if insufficient, asking more pointed questions and/or suggesting a skill or piece of knowledge to consider. Students will be able to change their response(s) based on this feedback, and both responses will be tracked.

Programmers will build sophisticated scoring rubrics that prior ONPAR research has shown to function well. These algorithms will undergird the tasks and modules to provide immediate results. In both classroom tasks and end-of-unit assessments, detailed student reports provide both numerical results by subsection of the tasks and individualized diagnostic interpretations of what different scoring patterns may suggest, for instance apparent misconceptions, process skills that appear to be weak or misguided, or areas where students seem to understand more deeply. Teachers will also receive classroom reports detailing how and where students are collectively doing well or having trouble. Student and classroom reports will be supported with teacher materials explaining the relevant learning progressions, suggesting further activities to use with different student profiles, and giving other guidance aimed at successfully differentiating future instruction.

ONPAR methodology. The ONPAR methodology was built to create dynamic and interactive technology-based tasks that measure challenging concepts and reasoning in science and mathematics for a wide range of students in elementary, middle school, and high school. To communicate authentic, rich contexts and questions, ONPAR uses multi-semiotic methods and stacked, integrative techniques to clearly convey meaning about problems that embrace the fullness of inquiry-based performance while also facilitating meaning for students with different communication strengths and challenges. Innovative item types then measure knowledge and abilities in ways consistent with and aligned to the more

cognitively complex targets arising from the innovative problem and question environments. Four aspects of the ONPAR methodology are significant.

First, in individual research labs and larger experimental clinical trials (Kopriva et al., 2009, 2011, 2013, and 2014 submitted; Kopriva & Wright, in press) researchers have learned how to design item and task scenarios that use multiple stimuli to convey meaning without crowding computer screens or cognitively overwhelming students. The methodology uses an engaging environment punctuated by the purposeful unfolding of the problem “story,” continuous interaction among students, stimuli and queries, and various seamless supports that complement each other and add richness to the task without compromising the integrity of the item targets. **Attachment I** shows a brief example of how typical problems unfold in an animation. In order to engage and deepen the students’ connection with the problem “story,” it is not unusual for scenarios to puncture the problem development with brief interactive questions or ask students to, for instance, propose and view the effects of simulated possibilities. To maintain precision in what the items intend to measure, task questions are presented in full sentences of written English text with oral English and native language translations. Animated and static visuals, symbols, and/or halo rollovers support non-target language without cueing responses. Each screen that uses some multi-semiotic stimuli to convey meaning includes a text box (opened by clicking), which provides in academic English text the full meaning of what is occurring on screen for those who prefer or want to confirm their understanding via this communication mode.

Second, the methodology has developed and empirically validated a broad set of innovative item types deliberately designed so students can engage with interactive, multi-semiotic performance settings to demonstrate and explain their knowledge and skills with multi-step, thoughtful, and provocative problems in ways that do not rely on traditional item formats. Concurrently, IT software engineer researchers have been working with ONPAR response spaces to build sophisticated scoring algorithms that do not depend on hotspots (where specific element must fit into a specific pre-assigned spot on the screen). These advances allow the ONPAR response spaces to automatically score much more fluid responses. From the wide range of innovative item types, see **Attachment II** for sample screenshots from

different grades and content areas. While the questions associated with the exemplar item types may or may not be especially complex, they are representative of the innovative item types that researchers have developed and tested.

Third, the methodology values being able to ferret out and measure depth of knowledge and skills with relatively high probability of certainty (i.e., minimize the effects of guessing and other irrelevant reasons students might respond correctly). Figure 1, for example, shows a compact ONPAR elementary science item that measures if students understand the effects of light and gravity on plant roots and shoots. On one screen the item requires students to correctly pair and place pictures of roots and shoots in three different situations within a carefully designed response environment. Triangulation of student responses strengthens the test's ability to correctly gauge the students' depth of knowledge, minimizes the impact of guessing, and suggests where they might have difficulties.

Figure 1: Roots and Shoots

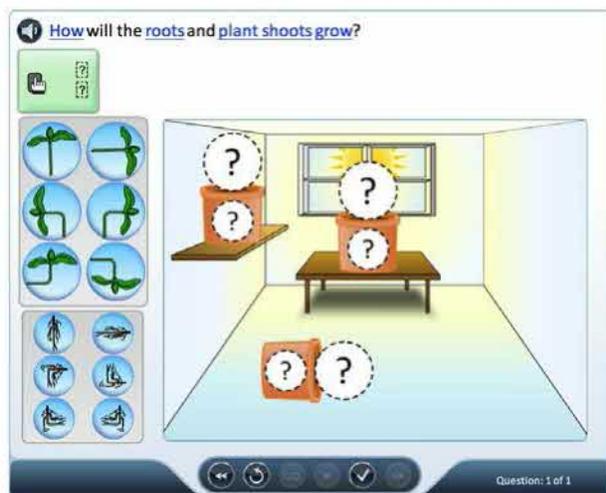


Figure 2: Input Output

IN	OUT
1	-3
2	?
7	9
?	13

The formative tasks proposed will gather a mix of diagnostic building-block data as well as data about students' mastery of challenging concepts, concept formation, and reasoning skills. This will allow test and task users to point to how, where, and why the students may struggle. The tasks will *also* collect process information. This involves how they move between screens, respond within screens, and build and demonstrate their response, including how they complete multistep problems. This generates insight

into differences in student processes not apparently related to group or ability status. Figure 2 depicts one of a few related screens on a middle school math task where algorithms track how students complete the table, how and when they complete the function “rule,” and if and how these sequences are similar or different on the different screens. Process information gleaned from tasks like this can show how students problem solve and provide information to teachers about preferences or skill concerns so further instruction for the students can be most efficiently targeted.

Fourth, as noted, this multi-faceted approach has been found to be valid and effective for conveying meaning about complex content and cognitive abilities over several experimental and qualitative studies. It is also been found to be valid, effective, and accessible for conveying meaning about challenging content and skills to and from a wide variety of students. These include students with high content and high literacy abilities, as well as those who struggle with the language of traditional assessments, such as struggling readers, ELs, students with learning disabilities, other students with speech and language and attention-deficit problems, and students in at-risk schooling (Kopriva and others, 2009; 2011, 2013, in press, and submitted). The results have been remarkable, demonstrating that a large number of students who struggle showing what they know on tests with typical item formats can and are learning complex skills and subject matter. Using innovative presentation and response formats, the ONPAR methodology seems to improve the measurement capabilities for diverse students unable to access typical standardized tests. At the same time, the studies have shown that the methodology not only does *not* disadvantage students who do well on traditional language-based tests but facilitates the broader measurement of students’ challenging concepts and skills. The researchers argue that making challenging assessment questions accessible to most students, in classroom tasks and tests such as those proposed here, should encourage and improve the active teaching of more complex concepts and abilities to these populations, not limiting them to learning primarily basic knowledge and skills.

Objective 4: Development and Evaluation of Task Related Materials and PD. Teacher materials will consist of interpretive guides for all extended classroom learning task and materials for the 12 end-of-unit tests. Guides will include a description of the learning progression set within the standard’s context

and its relevance for the tasks, how the report interpretations fit into these progressions for individual students, and differential learning activities for different patterns of item scores in the task.

The learning task assessment guides will be produced with the following format: (1) background on standards assessed in each task and related learning progressions, along with recommendations on when to implement the task instructionally, (2) screenshots of each task with explanations of the graphics and animations and notes on how the tasks convey meaning so teachers will feel comfortable with the novel presentations and response formats, (3) interpretive guidance relative to the differential patterns of scores within the tasks that were part of the individualized student reports, and 4) specific science activities aimed at addressing students with different score patterns, and academic language development activities associated with task targets to support language development.

The end-of-unit teacher guide will focus more on the “gestalt” of the unit and target standards, as well as how each test task contributes to the meaning in the end-of-unit test. The materials will also provide more information about informal formative assessment techniques teachers can use on an ongoing basis (e.g., guiding questions for individual and group use and why and how these might be appropriate for various purposes). The guide will include a broader set of academic language development activities associated with the science targets to provide exemplars to both science and language teachers regarding how to support academic language skills within the contexts of the specific science targets.

To encourage and support teachers to more fully understand and use the assessment tasks and what they say about the learning of their students, the educators will participate in a blended model of PD including a PD institute, and a community of practice website with resources, online PD modules, and online project meetings and chats. These activities are discussed in the services section of this proposal.

The teacher materials, PD activities, and meetings will be evaluated through short surveys asking teachers to rate their quality; usage data will be collected on the online PD modules to determine how often teachers use individual materials; and attendance in district webex meetings will be collected. This information will be used to refine the materials and activities, and to gauge effectiveness of materials and tools in supporting teachers.

Objectives 5 and 6: Multiple Measures Mini-study and Aggregation Schemes. Multiple item type measures will be used in all ONPAR assessments, including a range of innovative item types and some multiple- or dichotomous-choice item types. The studies identified in Objectives 5 and 6 will lay validity groundwork for building defensible tests using multiple measures and for multiple test measures aggregation arguments if and as the assessment products completed for this grant are used in that capacity. By studying the relationships between the items using traditional item types and the ONPAR items or tasks for each of the identified groups, results can inform the role of item type and how they might interact with target content/processes/dimensions of NGSS, and the role of item type in measuring targets with certain content and cognitive specifications. Further, the study results can add to the discussion of how to improve item selection in tests, including computer adaptive tests, when criteria for making decisions include not only item difficulty but student profiles, cognitive and content complexity of the item or task targets, how item type affects the interaction between student profiles and content/cognitive complexity. Findings can also inform the weighting of item types that measure certain targets or otherwise influence how aggregation schemes may be built to fairly improve the measurement of all students. Studying aggregation schemes at both the classroom and state accountability levels should help inform how teachers, schools, and districts can interpret data collected from multiple types of item measures to make sound differential instructional decisions for their students, and if and how aggregating end-of-unit scores from performance-based ONPAR type tests can enhance results from the state tests where most of the data are collected using traditional item types.

Development Procedures

See Attachment III for the timeline outlining the flow of the task and end-of-unit test development, materials and PD development and implementation, and research activities over the 4-year project. Once the grant is awarded, project leadership will review and finalize project design and components and undertake hiring staff. We anticipate in-person partner leadership meetings twice in Years 1 and 2, and once in Years 3 and 4. Each year, we will conduct one in-person and one webex with the technical advisory committee (TAC); additional consultations with TAC members will be as needed. The external

evaluation will consist of formative data collection and analyses each year, with results presented to leadership in order to refine or readjust schedules or activities. A summative evaluation report will be presented to the partners at the end of the project period. The evaluator and a member of the TAC will be given access to all segments of the project.

To produce the tasks and final end-of-unit tests, project staff will identify assessment targets for the 12 project units in light of the IQWST curriculum, NGSS standards, and available learning progression maps. The task and module development team will consist of science education, assessment, educational linguistics, and IT staff, with guidance from external content and formative assessment educators, partner staff, and consultants. As unit targets are finalized, staff will outline module assessment targets and their task targets, valued points in each unit where individual classroom learning assessment tasks might be useful for the teachers, and the assessment targets for those tasks.

The project will use evidence centered design procedures (Mislevy et al., 2003) to develop the tasks. This begins with designing construct validation arguments and documenting the target content and construct alignment links among the NGSS, intended test and task targets, and the tasks and tests developed in this project. We will develop the extended tasks for the end-of-unit tests and learning tasks in three cycles. For each, task writers, using conceptual targets identified previously, will specify target evidence at the module and task levels and then explore how to convey meaning within and across task item designs to produce tasks that meet the stated claims of the intended targets. Following these guidelines, comprehensive storyboards for end-of-unit field-test module tasks and learning tasks will be constructed, along with detailed scoring rubrics involving both content and process, and aligned with the learning progressions and consistent with with task building. Storyboards will lay out the design and specifications of what and how the problems unfold on the main screens, rollovers associated with text, visuals or symbols, with contextual and response space tools on the relevant screens, and with instructional pop ups as relevant. For all screen particulars, writers will specify directions for developing the movement-based elements such as simulations, animations and interactive sequences, or elements such as other visual stimuli, symbology, or sound. Text, audio, visual, or response stimuli from earlier

screens will carry forward onto later screens as relevant so students have what they need on the current screens. Screens have a standardized organization to keep students focused on the focal content rather than the screen layout. Standardizing aspects include a dashboard with directional controls; oral, translation, and screen text buttons; pop-up instructions or animated help icons that demonstrate how the functions of the response screens operate; a standard screen organization (color coded or placement specific) where new, previous screen, and response spaces and response tools are located; and standard pacing lengths and speeds, palletes, type fonts, and cohesive visual “look,” “feel,” and styles. The balance of focal and facilitative elements on the screens is critical: the focal aspects present the problems, questions, and response environments, while the facilitative aspects retain the coherence of the task. Researchers have spent extensive time learning how to concurrently introduce multiple semiotic devices so students can “hear” what the screen is saying in multiple ways while at the same time not being confused and overstimulated.

As the storyboards are completed, designers, software programmers, and engineers will mock up the screens and animate or otherwise produce programming language to allow all the pieces on each screen within a task to coalesce. Audio files of the oral item questions will be developed in English and at least three other languages. Engineers will also develop comprehensive scoring algorithms to reflect the detailed rubrics and provide data to students and teachers immediately as students complete the assessments. Regular internal reviews will maintain the integrity of all parts of the tasks and scoring and the warrants and claims. Short interactive tutorials, available throughout the project, will introduce students to various elements on the screens, how they work, and why they are there.

To determine if the tasks function as intended, we will conduct small pilots within each cycle, reviews by the external educator early and late in each task development cycle, and external bias reviews once during each cycle. Data will help us refine tasks and assemble modules for field testing.

Concurrently, the associated teacher materials and PD will be designed, developed, and evaluated by external educators within the first cycle and then refined and adapted to address the tasks and modules in later cycles. Student and classroom interpretative reports of scoring algorithms for both the learning tasks

and the end-of-unit modules will be developed within each cycle and vetted for use in field tests. Materials will include interpretative task and module criteria and explanations from associated learning progressions, as well as conceptual science-based and pedagogical resources. They will also include relevant instructional activities related to different scoring profiles and designed to inform differential instruction.

Data Collection and Analysis

To produce assessments that are operational we need to perform a series of industry standard reviews, data collections, and psychometric and statistical analyses. We also will evaluate science assessment teacher materials, PD associated with the science tasks, and the relational study among item types. We will use the validation study focusing on different aggregation schemes at the classroom and state accountability levels to investigate if aggregation schemes improve how well aggregated and unaggregated student scores compare with an independent measure of teacher ratings of students' knowledge and skills of target topics.

Task and test module data collection and analyses. We will follow standard methods for making operational tests to document the technical quality of the ONPAR end-of-unit assessments and learning tasks. This includes using evidence centered design for the tasks, internal reviews, IT programming, external reviews of selected tasks by science teachers, external bias reviews, small pilots from different geographical regions and districts with scores and feedback from teachers about student and teacher reactions, revising tasks based on the reviews and pilots, and assembling tasks into end-of-unit modules for field testing.

There will be four rounds of field tests: one for each cycle of task development and one for tasks needing revision. We will field test the tasks and evaluate the effectiveness of the materials and PD. Participating field test sites will be stratified geographically, by supplemental educational services, and by urban/suburban/rural (sensitive to diversity over race and ethnic groups, including ELs and students with learning disabilities). We will select final sites from the districts currently using IQWST. During field testing, we will collect data from IQWST items and tests, as well as related student, school, and state

science test data, and teacher rating data documenting their students' knowledge and skills based on classroom observation. Teacher and IT training will be completed after schools and teachers agree to participate in the field tests, teachers and students will receive log-in instructions, and field testing will be conducted online within a rolling testing windows as agreed upon with schools/districts. A help desk will be available. Student reports will be available to students and teachers immediately after students complete the tests. Classroom reports for the teachers will be available after the data are available, although the operational assessments will be able to deliver these data immediately after classrooms complete testing.

We anticipate that approximately 30 teachers will review task and teacher materials during development, and about 30 educators will participate in three bias reviews (10 educators/ review) prior to field testing. Further, approximately 400 students and six teachers will take part in piloting, and about 3,000 students and 60 teachers will participate in field testing for a grand total of about 126 educators and 3,400 students participating in the project. Locations for piloting will likely be in Wisconsin and Maryland. Locations for field tests will be stratified geographically and demographically. In preliminary discussions with Activate Learning and Chicago, Baltimore, Los Angeles and Palm Beach, Florida district personnel, it is expected that these districts as well as ones in participating states (Michigan, Maryland, Nevada, New Jersey, and Wisconsin) will take part.

Field test data will be cleaned and placed in usable datasets. For the ONPAR tasks the 2-parameter item response methodology will equate, scale, and analyze the information functions, and then psychometric analyses of these data, such as difficulty and discrimination parameters and reliability tests, will take place. We anticipate conducting hierarchical linear modeling (and possibly other statistical analyses) to determine the impact of district, school, and teacher on the results.

In the mini-study regression analyses, pairs of ONPAR innovative item types and IQWST traditional items measuring similar content will be compared to investigate the relationships between these formats for different student groups and science content. District and school effects will also be studied. Further, the ONPAR and IQWST end-of-unit scores will be differentially weighted to study aggregation schemes

for improving classroom-level measurement, and the ONPAR test module scores will be differentially weighted with the state science test scores to investigate how classroom end-of-unit scores might provide value adjusting student state scores for accountability purposes. Evaluation data from the teacher materials and the PD activities will be coded and analyzed as well to document the effectiveness of these project components. The task usability and interview data from participating teachers will be analyzed also to determine the feasibility and viability of the classroom learning ONPAR tasks that are available for teachers to use as they teach the relevant units. After preliminary analyses are completed, final tasks will be placed into operational end-of-unit tests, and the teacher materials, PD, and website resources will be refined as necessary and packaged for operational use to support the task and tests.

Evaluation of task/module teacher materials, and PD. We will administer detailed surveys to teachers following each PD institute to examine how prepared teachers feel to implement the assessment tasks and modules, and to examine what other institute information was useful. A second survey after field testing will query participants about the quality of the teacher materials and the extent to which they felt that the face-to-face institute, website, online PD, and webexes supported the implementation of the tasks and modules and added to their formative repertoire. We will interview a few teachers from different districts to obtain additional qualitative information. The surveys and interviews will ask teachers to rate quality, identify materials and resources that were useful or not and why, and provide evidence of how they used or were planning to use formative suggestions discussed in the materials or various PD and chat space interactions. Usage data will be collected on the online modules to determine how often teachers use individual materials; attendance in district webex meetings will also be collected. We will code and analyze the data to examine the effectiveness of the various materials, tools, and PD components in supporting teachers to implement the tasks and modules.

Mini study of item type relationships. This study will use regressions to inspect relationships between different item types measuring similar content or skills, using one of the item scores, group, grade, school, and other student demographics as independent variables, and one of the item scores as the dependent variable. We are interested in how a traditional item type relates to item types found in the

ONPAR tasks. Potential item dyads will first be inspected by intended item targets to determine which dyads can be studied. The students' IQWST and ONPAR item data will be collected during field testing, and the school and student data will be collected during the same semester. To evaluate the discrimination of items within the item dyads, researchers will also examine the item discrimination parameters from the 2-parameter IRT analyses completed after field testing. Results will be completed by group.

Studying multiple measures aggregation schemes. A pair of validation studies will investigate different multiple measures aggregation schemes at the classroom and state accountability levels. One study will examine if aggregation schemes between select IQWST and ONPAR end-of-unit tests at the classroom level can improve how well student scores from differently-weighted aggregation schemes compare to scores from an independent measure. The other study will inspect how well aggregation schemes of student scores on the state test and scores on the ONPAR end-of-unit tests compare when weights from the state and end-of-unit tests are varied. The independent measure proposed here is the teacher rating approach validated by Trends in International Mathematics and Science Study researchers. This approach has been found to be effective in successfully differentiating mid-grain content topic knowledge and abilities with regularity, and will be used here for teachers to rate their students' knowledge and skill levels on identified topics based on observation of their classroom work throughout the year. The ONPAR and IQWST data will be collected during field testing, and the state data will be collected from participating districts the same year as the field testing occurs. Methods and differential weighting schemes will be discussed with the TAC and a preliminary analyses of the techniques and schemes conducted. After adjustments, if any, the analyses will focus on improvement between the aggregation scores and the comparison measure, and also on if there are group differences associated with the aggregation schemes. We anticipate that sample sizes by group and cell will be sufficient so that generalizability claims can be made.

Dissemination

We plan several streams of dissemination. First, we will hire science-education staff active in science reform who have like-minded networks and who are interested in writing white papers throughout the

project and presenting at professional conferences. Along with the key personnel from measurement and educational linguistics, this brings together a suite of staff that value writing early and often during the project, including compiling findings and drafting articles, and who value disseminating results to their respective professional research and applied settings. Second, partnership with Activate Learning and WIDA offer rich opportunities for dissemination. Activate Learning is active in highlighting classroom assessments in alignment with the curricular aspects of three dimensions in NGSS and The Framework at professional educator meetings, through networking with companies and clients, and while connecting with districts and schools nationwide. We have access to WIDA's network communications and meetings, and therefore can engage WIDA's member states and its content, assessment, and EL staff. Third, the project website will include white papers, project information, materials, updates, and associated resources. We will build and maintain a listserv and connections on social media. Fourth, we plan for two rollout meetings with WIDA and the Council of Great City Schools, with which we share ongoing work and results.

D. Project Services

The project proposes to provide services through a blended model of PD including face-to-face meetings prior to using the learning tasks and field testing, and online meetings while tasks are being used. Research indicates that effective PD is *ongoing* and *sustained* over time (Wei, et al., 2009), and, as such, the PD will be offered over several months totaling 40-50 hours of instruction and support. The PD will include both group and individual learning opportunities; teachers opting to obtain seat hours (graduate credit) will also complete a reflection activity. Through the PD program teachers will:

- *participate in a 3-day face-to-face PD institute to prepare them to use project materials (approximately 24 hours)*. Teachers need foundational knowledge about new teaching strategies, ideally through hands-on experience (Roy, 2005). The project PD institute will consist of (1) hands-on learning related to the relevant NGSS covered in each task and end-of-unit assessment, (2) trying out formative assessment techniques for diverse learners, (3) hands-on interaction with ONPAR tasks,

(4) guidance on reading and using the differential student and teacher classroom score reports, and (5) re-teaching and enhancement strategies, including guidance on academic language development associated with the assessment tasks. The PD institute will be led by an experienced member of the project staff; after cycle 1 field testing, past participants will also be asked to participate as mentors.

- *utilize online PD modules (approximately 6 hours)*. Online PD modules will provide a synopsis of the NGSS covered, examples of tasks with guidance on how to interact with them, related formative assessment techniques, scoring information, and suggestions for re-teaching and enhancement. The modules, hosted on the project website, will be available for viewing on-demand.
 - *Attend online coaching meetings during implementation and download additional science and formative assessment resources (approximately 10 hours)*. Studies indicate that coaching supports teachers as they develop a new practice (Batt, 2010; Knight & Cornett, 2009; Stephens et al., 2007). As such, the project will host regular webex meetings so participants can meet with a mentor to discuss how to align formative techniques to deep science learning. The meetings will focus on teacher use of ONPAR materials, troubleshooting, and answering questions. The website will also have an ongoing chat space where educators can post articles, resources, questions, or concerns. Project staff will respond to inquiries from the chat space.
 - *Reflection Activity (option for those obtaining seat hours; approximately 5-8 hours)*. Teachers will write a final paper on formative assessment techniques with diverse students to reflect on their experience with the project and what they have learned from it as a culminating activity. Participants will be encouraged to post their papers on the project website; teachers who write reflection papers during early cycles of field testing will be invited to present at webex meetings in subsequent cycles.
- Providing foundational knowledge and ongoing support through the PD services will help ensure that teachers have a deeper understanding of the standards, materials, formative assessment techniques, and gain better insight into how to best work with diverse learners to support their unique learning needs.

E. Personnel

Andrew Middlestead, Michigan Department of Education (MDE), serves as the Director of the Office of Standards and Assessment and oversees the development, design, administration, and reporting of all statewide student assessments. He will oversee personnel at MDE who coordinate grant activities.

Dr. Rebecca Kopriva, UW, PI, is a measurement specialist who will oversee all aspects of the project's development, research, data collection, and data, devoting 25% of her time per year to the project. Dr. Kopriva has served as PI on many federally-funded grant projects of similar size and scope, including the four prior ONPAR projects. In addition, Dr. Kopriva is a tireless advocate for assessment reform to improve the measurement of challenging knowledge and abilities, and doing so for all students. A former state assessment director overseeing innovative classroom as well as summative testing, she has authored many articles, chapters, and books.

Laura J. Wright, UW, co-PI and Project Manager, will devote 80% time managing day-to-day aspects, including task and PD development, recruitment, and communication among staff and partners. Dr. Wright is an educational linguist and qualitative expert. She has worked for more than 10 years on federally-funded science and language education grants as a researcher and project manager, including four ONPAR grants.

Kathryn Drago, UW, will be the lead science task writer, devoting 100% of her time to the project. She is ABD in science education where she worked with primary writers of NGSS and science reform curriculum materials, and she currently works as the lead science writer on the ONPAR formative assessment project. Her deep knowledge of NGSS has translated into building creative, defensible ONPAR tasks, as has her middle school science teaching experience and research methods expertise.

ONPAR project personnel will also consist of a full-time science assessment task developer and a full-time science education specialist with experience identifying activity resources and developing and implementing the PD. We will also hire a full-time researcher with background in qualitative and quantitative research methods, one graduate student with teaching experience, and a quantitative expert in psychometrics and statistics. We will contract with WCER Technical Services, which has extensive experience working with the ONPAR projects, to design, engineer, and program the ONPAR tasks,

Activate Learning's staff will participate in the project, in kind. **LeeAnn Sutherland, PhD**, chief academic officer at Activate Learning, will serve as a member of the leadership and TAC. Dr. Sutherland was a PI on the NSF grant that developed the IQWST curriculum. Activate Learning staff will cover recruiting and participate in developing materials and services. **WIDA** staff will participate in kind as well, advising on the development of PD materials, plans and services, and operational test development.

The **TAC** consists of experts with a high degree of experience in the disciplines informing this project's conceptual and operational underpinnings. Once per year, members will meet and participate in a webex, with additional communication as relevant. Besides Dr. Sutherland, the members are Dr. Jim Pellegrino (UIC), cognitive-science expert and a primary writer of NGSS; Dr. Amelia Gotwals (MSU), science education expert and on the NGSS development committee; Dr. Steve Sireci (UM-Amherst), statistician and psychometrician; and Dr. Martha Thurlow (NCEO), expert on matters related to students with disabilities.

Dr. Phoebe Winter will be the external evaluator. She is a former Vice President at Pacific Metrics Corporation, was a state statistician, a technical expert with a national organization, and a nationally recognized expert in educational measurement research and development. Her work focuses on improving educational assessment and accountability programs, especially their validation efforts.

F. Resources

As lead state, Michigan, will act as fiscal agent for this proposal, using the staff resources within the state's education agency to ensure that reporting and fiscal requirements are met. The MDE Director of Standards and Assessment will oversee two part-time employees; one employee will serve as a subject matter expert on assessment and the other will coordinate financial and reporting activities. The PI, co-PI, project manager, lead science task writer, and IT staff are housed within the managing partner, WCER, and have access to the resources of WCER at UW. WCER is one of the nation's oldest and most highly esteemed university-based education research and development centers, with annual outside funding exceeding \$40 million. Much of the research work at WCER focuses on improving teaching, learning, and assessment, and it is home to centers for research on the improvement of mathematics and science education from kindergarten through postsecondary levels, and the strategic management of human

education. A part of the School of Education, WCER projects are supported by WCER's business and other grant administration services; technical services; and communication and dissemination services. The Business Office provides projects with budgeting, forecasting, accounting, and financial management. Technical Services provides multimedia services, custom software development, and computer support for more than 600 networked computer systems. Data warehousing and network operations are supported by more than 60 servers. This provides WCER with the capability to manage data sets containing sensitive student and school information.

The project team will benefit from a partnership with Activate Learning, the publisher of the IQWST curriculum for middle school. Activate Learning is being successfully enacted in 25 states and more than 50 school districts. IQWST tends to be the curriculum of choice in districts that emphasize students' deep learning of core science concepts and engaging students in the work of scientists as they read, write, and do science in every lesson. The developers of IQWST had lead roles in developing The Framework and the NGSS, initiatives. The tenets that undergird The Framework and NGSS are those on which IQWST's design and pedagogies and practices are based. Activate Learning's close ties to and deep understanding of The Framework and NGSS, and its experience operationalizing the kinds of lessons within which the ONPAR tasks will be used, are vital to the success of this grant.

The team will also benefit from close proximity and collaboration with WIDA, a 36-state consortium housed in WCER. Foundational resources developed by WIDA include the English language proficiency assessment ACCESS for ELLs®, Spanish Language Arts Standards, and a thriving PD department. WIDA currently employs more than 100 staff, providing assistance, training, and support to improve EL language and content educational outcomes. WIDA staff will provide in-kind consultation regarding test development, PD, and EL expertise, and the marketing reach of WIDA Consortium's 36 states and hundreds of districts makes it a valuable and welcome partner.

The budget outlined in this proposal is adequate to support the objectives of the project. We believe the costs of building the novel multi-semiotic classroom tasks and modules proposed here are inexpensive relative to the return on quality and depth of information about the students' mastery of science

knowledge and abilities, and on the diagnostic value of providing specific, individualized feedback to the broadest set of diverse students possible. Further, by producing standardized performance tasks that take advantage of tech-based innovative advances for conveying meaning, are technologically-delivered, auto-scored and immediately available individualized interpretative reports, the products are cost beneficial compared to hand-on tasks, hand-scored responses, and costs associated with transferring results into reporting structures. Finally, the accessibility of the products and the depth of information that can be obtained about learning for these students makes this project particularly significant and noteworthy.

G. Management Plan

Management Team

Core ONPAR project staff will comprise four teams: (1) partner leadership, (2) test development, (3) associated teacher materials and PD, (4) research, data collection and analysis. The leadership team will be responsible for overall management of the project and consists of Rebecca Kopriva, Laura Wright, Andrew Middlestead, LeeAnn Sutherland, and Tim Boals (Executive Director, WIDA). The test development team will comprise the science task developers and IT; the materials and PD team includes the science curriculum specialist and a graduate student; and the research team comprises a researcher, statistician, and graduate student (see Table 2).

Table 2. Positions, Responsibilities, Reporting Structure, Effort, and Funding Source(s)

Position	Responsibility	Reports to	FTE	Funded by
MDE grant coordinator (1)	Report to the federal grant officer; direct financial matters	State assessment director	.75	Grant/state
MDE finance coordinator (1)	Report to the federal grant officer; direct financial matters	State assessment director	.25	Grant/state
PI (1)	Supervise overall project; oversee evaluation, research, dissemination	WCER Director	.30	Grant/WCER
Co-PI/ project manager (1)	Plan and coordinate activities; assist with their oversight and execution	PI	.8	Grant/WCER

Position	Responsibility	Reports to	FTE	Funded by
Assessment task developers (2)	Develop assessment tasks/modules; coordinate with IT on design and programming; develop score reports; write position papers	Co-PI/project manager	2.0	Grant
Science education specialist (1)	Develop teacher guides and PD materials; deliver PD	Co-PI/project manager	1.0	Grant
IT staff	Design, engineer, and program functionality and scoring of tasks and modules; conduct functional reviews	WCER IT Director, PI		Grant
Researcher (1)	Design/oversee research instruments; coordinate pilot and field tests with Activate Learning; oversee research activities; conduct analyses; participate in dissemination	PI	1.0	Grant
Quantitative expert	Design and conduct psychometric and statistical analyses; write results	PI		Grant
Graduate research assistant (1)	Help coordinate and implement PD; assist with research activities, analysis, dissemination	Science curriculum specialist; Researcher/PI	1.0	Grant

Goal, Objectives, Tasks, and Milestones

The goal is to improve the assessment of challenging science learning for all middle-school students. Attachment III contains the timeline detailing the activities we will undertake to achieve this goal and the six objectives associated with it. Table 3 (pp. 39, 40) ties objectives to tasks, milestones, and staff.

Ensuring Continuous Improvement

To ensure continuous improvement in operation of the project, we will hold face-to-face partner leadership meetings every other quarter at UW; the external evaluator will provide informal formative feedback to the PI and co-PI twice each year and yearly formal reports to all partners. Leadership will meet once or twice weekly, with regular calls or webexes with partners as needed. A yearly in-person and yearly webex TAC meeting will provide the opportunity to review project activities and milestones and receive feedback from experts, who will also advise on design and project implementation. Leadership will meet with the internal teams they lead weekly or biweekly, and task developers will meet monthly with the PI and co-PI. Project staff will use WCER's virtual "Sharepoint" site, a web-based collaborative environment to facilitate distributed work, track and report activities, and monitor project status. Task developers and IT will use "Basecamp" to organize, follow, and document progress. Assessment materials and project data will be stored on WCER's secure server, which is also accessible virtually.

Continuous improvement will also be managed through feedback from external stakeholders through the iterative research and development cycles. Staff will receive informal feedback at multiple points from experts and end users, and feedback from formal task and bias reviews from science educators and those specializing in diverse student groups. These critiques, along with the analysis of pilot results, will serve as the basis for final refinement of materials. The PI and co-PI, in collaboration with the partner leadership team, will monitor this cycle at regular meetings. Additionally, project leadership will seek input through individual advising sessions and regular meetings from the TAC on any issues that arise.

Ensuring High Quality Products and Services

Several mechanisms will ensure high quality products and services. Assessment development will use the evidence centered design approach to ensure strong alignment between standards and assessment construct targets. During each cycle prior to and in preparation for finalizing items and modules for field testing, we will conduct iterative internal reviews, external educator reviews, bias reviews, analyses of pilot data, quality control of scoring algorithms, reporting, interface with other tasks in the modules, and IT testing for bugs and adaptability to various technology platforms and with internal UW servers.

Associated materials and tools, including task and module teacher guides, follow-up activities, the PD plan and implementation, webexes, online PD modules, institute materials, resources and website chat space, will follow similar procedures with an initial drafting stage, internal reviews, piloting, evaluation, revision, and final sign off. WIDA's in-house educator resource staff will advise on graphics and formatting and review final products. Design for PD services will be drafted and revised with input from partner organizations. Results of evaluation surveys administered at each stage of implementation and post assessment interviews will inform refinements to subsequent services and materials.

H. Project Evaluation

The project evaluation will consist of regular formative feedback and summative end-of-year written reports in Years 1-3 with a project summative report in Year 4. Formative feedback to the PI and co-PI will occur in months 4 and 8 of each year. In Year 1 the formative feedback and end-of-year reports will focus on reviewing the final project design, unit, task, and item targets as relevant, evaluation of timely task development and scoring and reporting designs, and a review of the designs for the initial aggregation schemes. In Year 2 a review of the pilot implementation and external task reviews, and the processes staff use to evaluate tasks based on results from these sources, an evaluation of ongoing task development, review of the selection of ONPAR/IQWST item dyads, analysis design and any results to-date, review of the field test implementation and subsequent data analyses and revision strategies, and a review of educator results from their PD and associated materials evaluations will occur. Evaluation in Year 3 will continue to focus on task development as well as reviews of pilot, external task reviews, and teacher materials/PD evaluations, field test implementation and analyses, and qualitative and quantitative results to-date from the field test, aggregation and task type studies. In Year 4 the evaluation will focus mostly on results and interpretations of findings. To complete the formative and summative evaluations the evaluator will review process documents associated with each project objective, including implementation procedures as well as designs for data collection and analyses, conduct focus group interviews with staff, and review write-ups of findings and the analytic procedures used.

I. Strategy to Scale

The strategy for continuing to bring the ONPAR formative science products to scale beyond the grant is twofold. First, after maintenance costs of current products, we plan to reinvest most of the money from the sale of the science products to extend the suite of formative assessments and PD activities to other middle school units and to upper elementary units. Second, the remainder of the money will be used to extend marketing of the current products to increase sales.

Table 3. Tasks and Milestones

Objective	Activities	Milestones	Staff
Objective 1: Produce 12 technologically interactive end-of- unit performance diagnostic assessment modules	Create prototype tasks	Prototypes complete	Task developers
	Recruit schools/ districts	Recruitment complete	Activate Learning
	Try out prototypes	Tryouts complete	Researcher
	Finalize assessment tasks	Modules finalized	Leadership team
	Assemble assessment modules	Assessment modules assembled	IT staff
	Recruit for field test cycles	Recruitment complete	Activate learning
	Field test assessment modules	Field testing completed	Researcher
Objective 2: Produce classroom- embedded performance assessment tasks	Draft prototype classroom tasks	Prototypes complete	IT staff/ task developers
	Recruit schools/districts	Recruitment complete	Activate Learning
	Pilot prototype tasks	Pilots completed	Researcher
	Finalize tasks	Tasks finalized	Leadership team

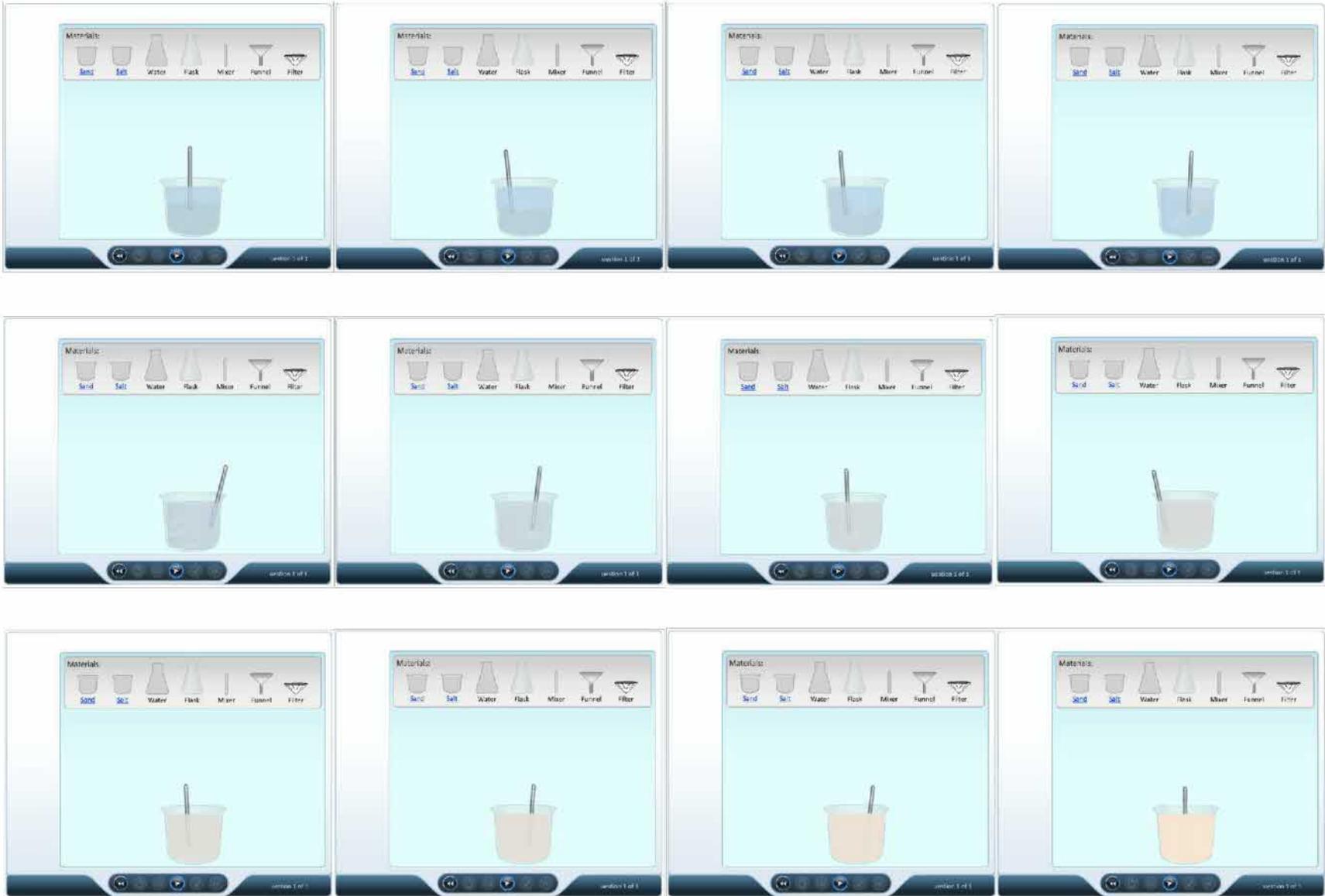
Objective	Tasks	Milestones	Staff
Objective 3: Produce individual diagnostic student/classroom reports.	Create score report template	Report template created	Task developers
	Draft scoring narratives	Narratives drafted	Task developers
	Pilot score reports	Tryouts complete	Researcher
	Finalize score reports	Score reports finalized	Leadership team
Objective 4: Produce/evaluate associated materials and related PD	Draft teacher guides	Teacher guides drafted	Science education specialist
	Pilot teacher guides	Pilots conducted	Researcher
	Finalize teacher guides	Teacher guides finalized	Leadership team
	Schedule/plan PD institute	PD institute planned	Science education specialist
	Conduct PD institute	PD institute complete	Science education specialist
	Evaluate PD institute	Evaluation complete	Researcher
	Draft online PD modules	PD module drafts complete	Science education specialist
	Pilot online PD modules	PD modules pilot complete	Researcher
	Evaluate online PD	Evaluation survey complete	Researcher
	Finalize online PD modules	PD modules finalized	Leadership team

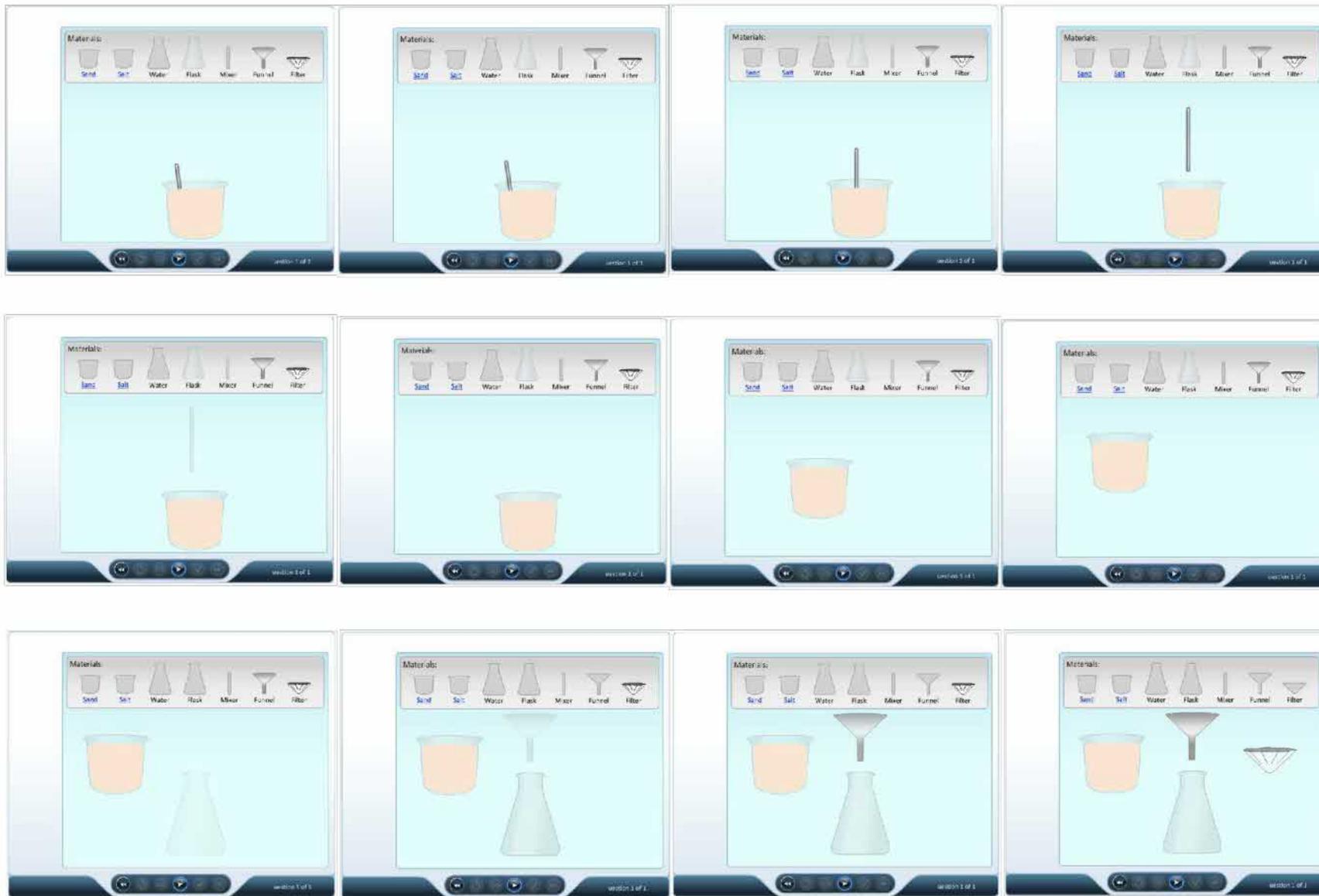
Objective	Tasks	Milestones	Staff
	Meet with districts	Meetings held	Co-PI, Activate Learning, ONPAR staff
Objective 5. Investigate relationships between item types	Identify items dyads	Item dyads identified	Task developers
	Collect field test data	Field test data collected	Researcher
	Conduct regression analyses	Regression analyses conducted	Statistician
Objective 6: Investigate two types of multiple measures aggregation schemes using ONPAR end-of-unit formative test scores	Design multiple measures aggregation schemes	Multiple measures aggregation schemes identified	PI and statistician (TAC)
	Design analysis schemes	Method designed to analyze schemes	PI and statistician (TAC)
	Collect teacher rating data	Teacher ratings collected	Researcher
	Collect state science test data	State science test data collected	Co-PI
	Run preliminary analyses	Preliminary analyses run	PI and statistician (TAC)
	Write results	Results written	Statistician

Attachment I: ONPAR Animation Screenshots for 1 task

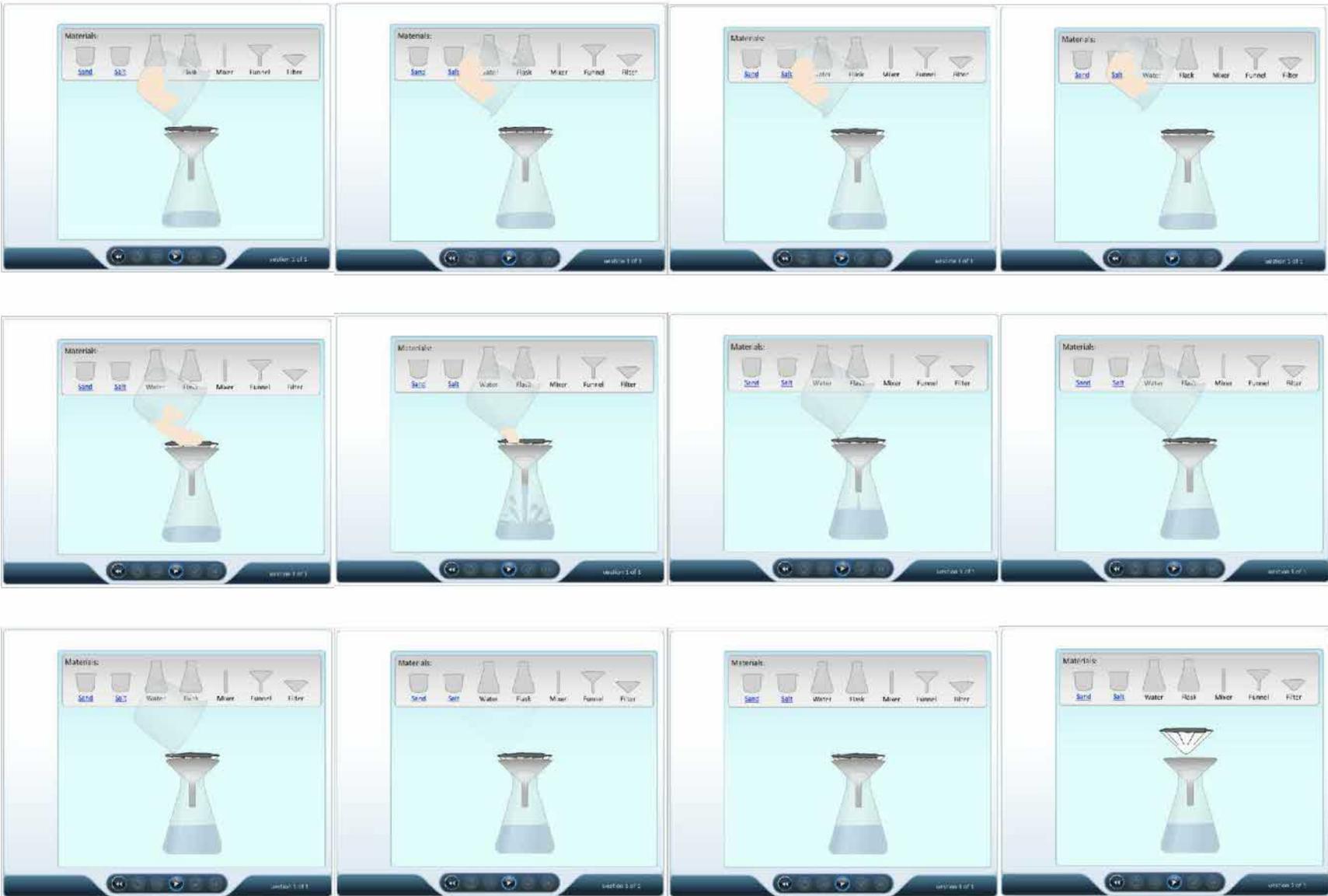
Substance Separation













Attachment II. Screenshots of Selected ONPAR Item Type Response Spaces

Open Response Space

Show how you got your answer for 25 shapes.

Number of shapes	Perimeter
1 shape	6 cm
2 shapes	10 cm
3 shapes	14 cm
4 shapes	18 cm
8 shapes	cm
25 shapes	cm

Make a shape with a perimeter of 14 centimeters.

Make a shape that can fold into the prism.

Open Response Space

Set up an experiment to test how cart weight affects time down the ramp.

ENGLISH TRANSLATE Screen Test

Set up an experiment to test how cart weight affects time down the ramp.

ENGLISH TRANSLATE Screen Test

Draw the Lewis structures for H₂O, CO₂ and CH₄.

H C O

H ₂ O	CO ₂	CH ₄
?	?	?

Question: 1 of 1 Scene: 2 of 3

Draw the Lewis structures for H₂O, CO₂ and CH₄.

H C O

H ₂ O	CO ₂	CH ₄
$\begin{array}{c} \text{H} - \text{O} - \text{H} \\ \\ \cdot\cdot \end{array}$	$\begin{array}{c} \cdot\cdot \\ \text{O} = \text{C} = \text{O} \\ \cdot\cdot \end{array}$	$\begin{array}{c} \text{H} \\ \\ \text{H} - \text{C} - \text{H} \\ \\ \text{H} \end{array}$

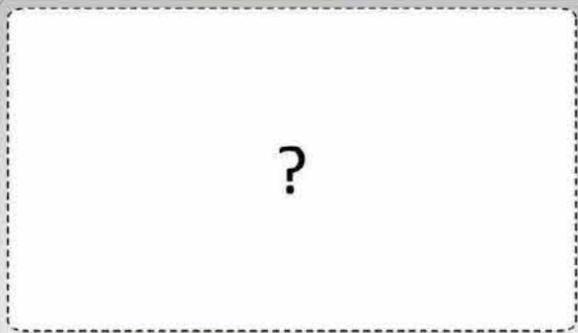
Question: 1 of 1 Scene: 2 of 3

Open Response Space

Show how to estimate the number of marbles in the jar.

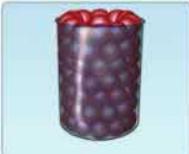


?

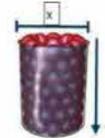


Question: 1 of 1

Show how to estimate the number of marbles in the jar.



Count the number of marbles on the top of the jar, then multiply by the amount of rows of marbles in the jar.



Question: 1 of 1

Show how to estimate the number of marbles in the jar.



12 marbles per layer



6 layers



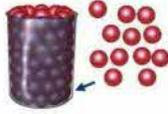
$12 \times 6 = 72$

Question: 1 of 1

Show how to estimate the number of marbles in the jar.



12 marbles on the bottom row



there are about 7 rows in the jar



$12 \times 7 = 84$ marbles

Question: 1 of 1

Open Performance

Make 500.0 mL of a 1.50 M NaOH solution.

Notes

Question: 1 of 1 Scene: 2 of 4 Screen Text English

Make 500.0 mL of a 1.50 M NaOH solution.

Notes

Water	Fill up to	100 mL
NaOH Solid	Add	22 g
1.00 M NaOH	Add	100 mL
3.50 M NaOH	Add	175 mL
NaOH Solid	Add	15 g

Question: 1 of 1 Scene: 2 of 4 Screen Text English

Make 500.0 mL of a 1.50 M NaOH solution.

Notes

2.75 M NaOH	Add	273 mL
Water	Fill up to	500 mL

Question: 1 of 1 Scene: 2 of 4 Screen Text English

Make 500.0 mL of a 1.50 M NaOH solution.

Notes

1.00 M NaOH	Add	25 mL
0.500 M NaOH	Add	25 mL
3.50 M NaOH	Add	50 mL
2.75 M NaOH	Add	15 mL
NaOH Solid	Add	2 g
0.500 M NaOH	Add	10 mL
3.50 M NaOH	Add	5 mL
NaOH Solid	Add	3 g
1.00 M NaOH	Add	10 mL
0.500 M NaOH	Add	5 mL
Water	Fill up to	475 mL

Question: 1 of 1 Scene: 2 of 4 Screen Text English

Causal Chain

Why did the balloon rise?



because **heat**

causes

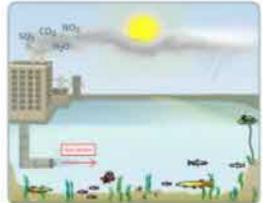
causes

therefore

density mass
molecule motion molecule size
temperature volume
to decrease to increase
air balloon
is greater than is less than

Question: 1 of 1

How does the power plant affect the lake ecosystem?



algae O₂ air
acid water O₂ water
CO₂ air
CO₂ water
air
water

No Change
Increases
Decreases

causes

causes

causes

causes

Question: 1 of 1

Statement Frame

Summarize why the balls take different times to fall.

ball	time (seconds)
A	8
B	16
C	24
D	21
E	26
F	
G	
H	

parachute bigger
parachute smaller
parachute same size
ball higher
ball lower
ball same height

If ? and ? , then ?
and
If ? and ? , then ?

more time
less time

Question: 1 of 1

Explain your answer.

salt
sand
water
filter
absorbs
does not absorb
dissolves in
does not dissolve in
floats in
sinks in

Because
? ? ?
and
? ? ?

Question: 1 of 1

Explain your answer.

? causes fish to increase because
?
? causes fish to decrease because
?

increases decreases
and eats

Question: 1 of 1

Open frame construction

(students construct their own statement frame design and then populate)

The screenshot shows a software interface for a science question. At the top, the question is "Why does the water remain green?". Below the question is a central workspace with a large dashed box containing a question mark. To the left of this workspace is a vertical toolbar with buttons for "light", "energy", "indicator", "carbon dioxide", "oxygen", "water", "released by", "absorbed by", "plant", and "animal". To the right is a horizontal toolbar with buttons for "more oxygen", "more carbon dioxide", and "oxygen = carbon dioxide". In the background, there is an illustration of a test tube with green liquid, a light bulb, and a calendar. At the bottom, the interface shows "Question: 1 of 1", "Scene: 5 of 5", and a "Screen Text" button.

The screenshot shows a software interface for a biology question. At the top, the question is "Complete the diagram to summarize the process of protein synthesis.". The main area is titled "Protein Synthesis" and contains a diagram. The diagram starts with a DNA sequence: "DNA C G G T A G G T C A T C". Below this are two rows of question marks representing mRNA and tRNA. Arrows indicate the flow of information from DNA to mRNA and then to tRNA. A large dashed box with a question mark is positioned below the tRNA, and arrows point from it to two more question marks at the bottom, representing the final products of protein synthesis. On the left side, there is a vertical toolbar with buttons for "amino acid", "nucleotide", "protein", "folding", "transcription", "translation", "DNA", "mRNA", "rRNA", and "tRNA". At the bottom, the interface shows "Question: 01 of 01", "Scene: 3 of 3", and a "Screen Text" button.

Construct a Model

Show that the key conducts electricity.

Screen Text

Testing for Conductivity

Question 1 of 1

Show the energy exchange between roaches and grass.

Screen Text

Build a model

Question 1 of 1

Make a Bohr model of a helium atom.

Particles

Orbits

Scene: 02 of 02

2

Use the amino acid differences to make a cladogram for the bacteria.

Cladogram

		Position		
	Bacteria	11	52	79
Given		W	E	K
New		V	P	R
		V	E	R
		W	E	R
		V	E	R

Scene: 01 of 01

Thank you

Open Drag and Drop

Compare and contrast photosynthesis and respiration.

In animal cells

In plant cells

uses carbon dioxide

produces carbon dioxide

uses oxygen

produces oxygen

uses water

produces water

makes glucose

breaks down glucose

needs light

does not need light

Photosynthesis

Respiration

Question: 1 of 1 Scene: 2 of 2

Compare and contrast photosynthesis and respiration.

In animal cells

In plant cells

uses carbon dioxide

produces carbon dioxide

uses oxygen

produces oxygen

uses water

produces water

makes glucose

breaks down glucose

needs light

does not need light

$C_6H_{12}O_6$

Photosynthesis

Respiration

Question: 1 of 1 Scene: 2 of 2

What are ALL possible genotypes for the missing parent?

RR Rr rr

LL Ll ll

TT Tt tt

Missing parent's genotypes

?

Color

R = red

r = yellow

Leaves

L = smooth

l = rough

Thorns

T = thorns

t = no thorns

Question: 1 of 1 Scene: 5 of 5

Set up an experiment to test how the different temperatures affect the 3 reactions.

Cu and HNO₃

Sb and Br₂

H₂O and K

5°C

15°C

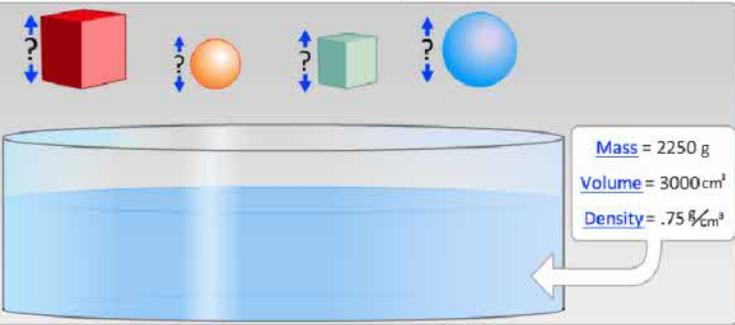
25°C

Question: 1 of 1 Scene: 3 of 3

Object Manipulation

What happens to the objects?

Object	Mass	Volume	Density	Solid?
	22 g	125 cm ³	.176 g/cm ³	hollow
	24 g	27 cm ³	.89 g/cm ³	hollow
	18 g	27 cm ³	.67 g/cm ³	solid
	45 g	125 cm ³	.36 g/cm ³	solid

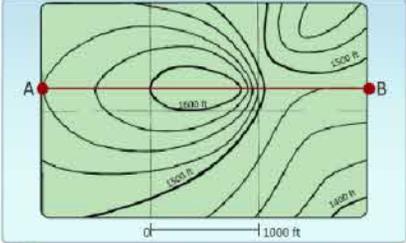
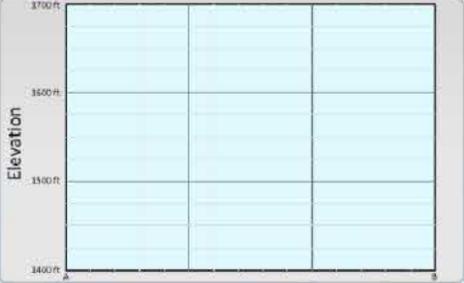


Mass = 2250 g
Volume = 3000 cm³
Density = .75 g/cm³

Question: 1 of 1

Line Draw

Draw the profile of the path from A to B.

Elevation

3700 ft
3500 ft
3400 ft

Question: 1 of 1

Attachment III: Project Extended Timeline

Years	2015-2016				2016-2017				2017-2018				2018-2019			
Quarters	F	W	Sp	Su												
Objectives 1-3 (develop 75 module tasks)																
Finalize design of development and implementation	█															
Identify learning progressions for 12 units	█															
Identify valued foci for each task for all units		█														
Set up 3 cycles of task development		█														
Set up pilot seasons for tasks, contact districts/schools		█														
Task development cycle 1 begins		█														
Internal reviews and task development continues			█													
Cycle 1 task development continues			█													
IT begin programming of tasks			█													
Identify schools/teachers for participating in pilots			█													
Task development cycle 2 begins				█												
IT programming of cycle 1 tasks continues				█												
Finalize fall pilot sites in participating classrooms				█												
External educator and bias reviews for cycle 1 tasks				█												
Pilots of tasks begin				█												

Years	2015-2016				2016-2017				2017-2018				2018-2019			
Quarters	F	W	Sp	Su												
Cycle 2 task development continues																
IT programming continues																
Refining cycle 1 tasks from reviews and pilots																
Finalize winter pilot sites in participating classrooms																
Identify participation in spring 2017 field-testing																
Pilots continue																
Analyses of pilot data																
IT programming continues																
Task development cycle 3 begins																
Finalize late spring field-test sites																
Field-testing of cycle 1 task modules																
Task development cycle 3 continues																
IT programming continues																
Analyses of pilot data completed																
Cleaning cycle 1 field-test data																
Analyze module data from field-test results																

Years	2015-2016				2016-2017				2017-2018				2018-2019			
Quarters	F	W	Sp	Su												
IT programming continues																
External educator and bias reviews for cycle 2 tasks																
Finalize cycle 2 tasks based on pilots, reviews																
Finalize participation in Winter 2018 field-testing																
Collect feasibility, usability classroom task data																
Field-testing of cycle 2 task modules																
IT programming continues																
Teacher interviews to evaluate modules and tasks																
Cleaning cycle 2 field-test data																
Analyze field-test results																
Complete programming for cycle 3 tasks																
Identify participation in fall 2018 field-testing																
Pilots as necessary																
Collect feasibility, usability classroom task data																
External educator and bias reviews for cycle 3 tasks																
Finalize cycle 3 tasks based on pilots, reviews																

Years	2015-2016				2016-2017				2017-2018				2018-2019			
Quarters	F	W	Sp	Su												
Finalize cycle 3 fall field-test sites																
Cleaning and analyses of modules																
Field-tested tasks revised as possible																
Field-testing of cycle 3 task modules																
Collect feasibility, usability classroom task data																
Continue analyses of modules																
Teacher interviews to evaluate modules and tasks																
Finalize participation in Winter 2018 field-testing																
Field-testing of any revised tasks																
Collect feasibility, usability classroom task data																
Cleaning and analyses of field-test data																
Write up of results																
Finalize end-of-unit test for operational use																
Objective 4 (associated materials and teacher PD)																
Arrange IT resources and educator training dates																
Develop associated materials and PD																

Years	2015-2016				2016-2017				2017-2018				2018-2019			
Quarters	F	W	Sp	Su												
PD summer institutes																
Educator training																
Arrange IT resources and educator training dates																
Continue to develop teacher materials																
Develop PD materials for late spring field-testing																
Arrange IT resources and educator training dates																
Educator training																
Evaluate teacher materials and PD from cycle 1																
PD summer institutes																
Complete teacher materials, refine PD as needed																
Educator training																
Evaluate teacher materials and PD from cycle 2																
PD summer institutes																
Arrange IT resources and educator training dates																
Educator training																
Evaluate teacher materials and PD from cycle 3																

Years	2015-2016				2016-2017				2017-2018				2018-2019			
Quarters	F	W	Sp	Su												
Evaluate teacher materials and PD as needed																
Analyses of teacher materials																
Write-ups of teacher materials and PD																
PD summer institutes																
Finalize teaching materials and PD for operational use																
Objectives 5-6 (multiple measure studies)																
Develop aggregation schemes (classroom/state level)																
Educators identify dyad sets of ONPAR/IQWST items																
Collect data (IQWST, cycle 1 ONPAR modules/tasks)																
Educators identify dyad sets of ONPAR/IQWST items																
Preliminary analyses aggregation schemes																
Analyses of mini-study data from cycle 1																
Collect data (IQWST, cycle 2 ONPAR modules/tasks)																
Adjusted analyses of aggregation schemes																
Analyses of mini-study data from cycle 2																
Educators identify dyad sets of ONPAR/IQWST items																

Years	2015-2016				2016-2017				2017-2018				2018-2019			
Quarters	F	W	Sp	Su												
Continue analyses of mini-study																
Continue analyses of aggregation schemes																
Collect data (IQWST, cycle 3 ONPAR modules/tasks)																
Continue analyses of mini-study																
Continue analyses of aggregation schemes																
Project management, partner and TAC meetings																
Grant awarded by October 2015																
Partner leadership meeting																
Hiring																
Partner meetings																
TAC meetings																
Preliminary presentations at professional conferences																
Dissemination																

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Part 6

Letters of Commitment and Support

Michigan Department of Education, *Lead State*

Wisconsin Center for Education Research, UW-Madison, *Managing Partner*.

Activate Learning, *Collaborating Organization*

WIDA Consortium, *Collaborating Organization*

Maryland State Department of Education, *Supporting State*

Nevada Department of Education, *Supporting State*.

New Jersey Department of Education, *Supporting State*

Wisconsin Department of Public Instruction, *Supporting State*

Mariana Castro, WIDA, *Project Advisor*

Amelia Gotwals, *Technical Advisory Committee*

Jim Pellegrino, *Technical Advisory Committee*

Ed Roeber, *Project Advisor*

Stephen Sireci, *Technical Advisory Committee*

Martha Thurlow, *Technical Advisory Committee*

Phoebe Winter, *Project Evaluator*

Curriculum Vitae

Andrew Middlestead, MDE, *Director, Office of Standards and Assessment*

Rebecca Kopriva, WCER, *Principal Investigator*

Laura Wright, WCER, *Co-Principal Investigator*

Kathryn Drago, WCER, *Science Task Developer*

Bob Glover, WCER, *Director of IT Services*

LeeAnn Sutherland, Activate Learning, *Technical Advisory Committee*

Heather Milo, Activate Learning, *Science Curriculum and PD Consultant*

Mariana Castro, WIDA, *Project Advisor*

Amelia Gotwals, *Technical Advisory Committee*

Jim Pellegrino, *Technical Advisory Committee*

Ed Roeber, *Project Advisor*

Stephen Sireci, *Technical Advisory Committee*

Martha Thurlow, *Technical Advisory Committee*

Phoebe Winter, *Project Evaluator*



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF EDUCATION
LANSING

MICHAEL P. FLANAGAN
STATE SUPERINTENDENT

June 26, 2015

Monique Chism, Ph.D.
Office of State Support
U.S. Department of Education
Washington, D.C. 20202-0170

Dear Dr. Chism:

This letter is to express the Michigan Department of Education's (MDE) commitment as the lead state to collaborate with the Wisconsin Center for Education Research (WCER) at the University of Wisconsin–Madison (UW), in partnership with Activate Learning Curriculum and the World-Class Instructional Design and Assessment (WIDA) Consortium on the Enhanced Assessment Grant Project titled Dynamic Interactive Formative Assessment Tasks and End-of-Unit Tests for Measuring Challenging Concepts of Skills of Diverse Middle School Students. We are very excited about this proposal because of the large and linguistically diverse population of its K-12 student population. This work will continue to build on Michigan's current career- and college-ready instruction initiatives and move educators towards better usage of technology for classroom assessments.

As the lead, MDE has the capacity, expertise, and commitment to lead the implementation of this project. We understand that the federal grant funds will:

- Produce technologically interactive end-of-unit performance diagnostic module assessments in Grades 6-8 that cover earth-, life-, physical-science, and chemistry using innovative item types which are aligned to new science standards in states.
- Produce additional technology-based classroom-embedded extended performance assessment tasks that measure the same constructs as the module tasks, are designed for on-demand teacher use as they teach middle school science units, use innovative item types, have been empirically validated, and are ready for classroom use.
- Produce individualized diagnostic student- and classroom-level reports generated immediately after students complete the tests and tasks.

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- Produce and evaluate associated materials and related professional development for the teachers to support implementation of tasks and additional formative assessment techniques and inform the interpretation and differentiated learning based on individualized results from the tasks and tests.
- Investigate the relationships between traditional and innovative item types that measure similar content or skills.
- Investigate two types of multiple-measure aggregation schemes using the end-of-unit modules.

The WIDA Consortium and WCER have an impressive foundation in focusing on the needs of English learners (ELs) and other special student populations. Their ability to establish working partnerships for other collaborative partnerships with states, districts, and educators sets them apart from other organizations.

Michigan is actively exploring new science standards that better prepare students for careers and college in science and other related fields. In doing so Michigan recognizes the importance of focusing on the learning and assessment needs of all students, particularly those historically under-represented.

Through the grant MDE plans to hire a project coordinator who will work collaboratively with WCER staff to lead, oversee, and manage all grant activities. The coordinator will ensure that all required activities are completed, grants and contracts are established in a timely fashion, evaluation and performance activities are conducted, and stakeholder agencies are working in tandem at the state, between states, and at local levels to support the achievement of the project goals and objectives.

Michigan looks forward to the opportunity to work with WIDA and WCER as the lead state on this proposed formative science assessment project. We look forward to being a part of innovation that has the potential to significantly impact students' learning of science content.

Sincerely,

(b)(6)

Venessa A. Keesler, Ph.D.
Deputy Superintendent, Accountability Services
Michigan Department of Education

STATE BOARD OF EDUCATION

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**Wisconsin Center for
Education Research**
UNIVERSITY OF WISCONSIN-MADISON

June 26, 2015
Michigan Department of Education
PO Box 30008
Lansing, MI 48909

To Whom It May Concern:

This letter is to express the Wisconsin Center for Education Research's (WCER) commitment to serve as managing partner for the EAG grant entitled *Dynamic Interactive Science Formative Assessment Tasks and Modules for Measuring Challenging Concepts and Skills of Diverse Students* for which the Michigan Department of Education is lead. WCER is a center within the University of Wisconsin-Madison which is a state agency. WCER houses staff who will serve as the PI and Co-PI on this grant, Dr. Rebecca Kopriva and Dr. Laura Wright. As the managing partner, WCER will oversee the work that is undertaken to accomplish the goals and objectives of the proposed project, if funded.

We understand that the goal of this project is to improve the assessment of challenging science learning for *all* middle-school students. The project will develop approximately 75 extended, performance assessment tasks, including learning-embedded tasks and tasks for the end-of-unit tests using the ONPAR assessment methodology, along with their attendant tools and resources. In addition, a series of technical studies associated with the tasks and tests will be conducted, and evaluations, associated with the test and assessment materials will be collected and analyzed.

WCER commits to serving as the managing partner for the duration of the grant period, which we anticipate to be four years. WCER looks forward to the opportunity to work with the proposed formative assessment project and being part of this collaborative effort to create innovative accessible formative science assessments that will provide meaningful guidance and support for teachers who need accurate knowledge of *all* students' science content knowledge.

Sincerely,

(b)(6)

Tim Boals, PhD
WCER
Executive Director, WIDA



44 Amogerone Crossway Unit 7862,
Greenwich, CT 06836

6/23/15

Dear Drs. Kopriva and Wright:

This letter is to express Activate Learning's commitment to partnering in the Enhanced Assessment Grant Project entitled *Dynamic Interactive Science Formative Assessment Tasks and Modules for Measuring Challenging Concepts and Skills of Diverse Students*. We are very excited about this proposal because innovative, accessible science formative assessments based on the Framework for K-12 Science Education and aligned to the Next Generation Science Standards (NGSS) are needed for all students.

We believe these technology-enhanced formative assessments will complement the existing research-based IQWST science curriculum we publish. Formative assessment resources are needed for both teachers and students to monitor ongoing learning within the classroom. Past research conducted by your team has shown a great deal of promise in using this innovative assessment methodology to measure *all* students' understanding of rigorous topics.

We commit to participating in the project in the following ways:

- Recruiting all districts to take part in the project's pilot and field-testing. It is understood these districts will be geographically and demographically diverse, and that they will be using the IQWST curriculum.
- Working with the project to provide NGSS science expertise and how this expertise translates into aligned curriculum for middle school students.
- Providing advice about PD and IT matters as relevant.

We understand that the funds for this project will be provided solely by the grant and will not require additional funds from Activate Learning.

Activate Learning looks forward to the opportunity to work with the proposed ONPAR formative assessment project and being part of this collaborative effort to create innovative accessible formative science assessments that will provide meaningful guidance and support for teachers who need accurate knowledge of *all* students' science content knowledge.

Sincerely,

Tom Pence

Tom Pence

Executive Vice President, Sales and Marketing

Activate Learning



June 25, 2015

Dr. Rebecca Kopriva, Principal Investigator
Wisconsin Center for Education Research
University of Wisconsin-Madison
1025 West Johnson Street, Suite 785
Madison, Wisconsin
53706

Dear Dr. Kopriva:

The WIDA Consortium is delighted to partner with you in undertaking the *Dynamic Interactive Science Formative Assessment Tasks and Modules for Measuring Challenging Concepts and Skills of Diverse Students* project, if funded by the Enhanced Assessment Grant program through the U.S. Department of Education. As our ongoing close collaborations as colleagues within the Wisconsin Center for Education Research attest, we believe this project's goal of applying the ONPAR methodology to the classroom has high potential to make an important contribution to the field.

The goal of the proposed project, to improve the assessment of challenging science learning for all middle-school students, is an important and timely one. We are confident that the proposed project's end products and findings will help to inform assessment, instruction, and policy to improve academic outcomes for ELs, particularly given promising research results on the previous ONPAR investigations.

As a project partner, the WIDA Consortium commits to providing infrastructure and expertise on issues related to English language proficiency and formative assessment. Our staff of stellar professionals has broad and deep expertise in all issues related to the academic achievement of ELs, including and especially English language proficiency (ELP) standards and assessments, ELP and content standards alignment, academic language and professional development.

We appreciate the opportunity to continue partnering in our shared research endeavors related to valid academic content-area assessment for ELs, as part of WIDA's mission to provide high-quality, empirically based interventions such as this one with proven success for ELs. We look forward to contributing our expertise and resources on the proposed grant.

Sincerely,

(b)(6)



Timothy J. Boals,
Ph.D. Executive
Director WIDA
Consortium (608)
263-4326
tjboals@wisc.edu



June 25, 2015.

Dr. Rebecca Kopriva, Principal Investigator
Wisconsin Center for Education Research
University of Wisconsin-Madison
1025 West Johnson Street, Suite 785
Madison, Wisconsin 53706

Dear Drs. Kopriva and Wright:

This letter is to express the Maryland State Department of Education's (MSDE) support of the Enhanced Assessment Grant Project entitled *Dynamic Interactive Science Formative Assessment Tasks and Modules for Measuring Challenging Concepts and Skills of Diverse Students*. We are very excited about this proposal because innovative, accessible science formative assessments based on the Framework for K-12 Science Education and aligned to the Next Generation Science Standards (NGSS) are needed for our diverse students.

Research is clear that formative assessment is a key support in ensuring students' college and career readiness. Formative assessment is needed for both teachers and students to monitor ongoing learning within the classroom. Furthermore, the research conducted by previous ONPAR projects has shown a great deal of promise in using this innovative assessment methodology to measure not only EL and other students who struggle with the language of traditional assessments, but *all* students. Formative science assessments designed with the ONPAR methodology that are valid and reliable for the broad range of diverse Maryland students will be a critical component in preparing all of our students to meet NGSS.

We understand that the federal grant funds will be used to:

- Develop technology and innovative item types to create formative science assessment modules and tasks in Grades 6-8.
- Ensure an enhanced link to NGSS
- Include all students, including ELs and students who struggle with the language of traditional assessments
- Develop a more engaging test-taking experience for all students
- Reduce the test administration burden required compared to the current paper-based assessment by providing automatically scored performance tasks

The MSDE and representatives from school systems in the state recognize the need for better, more innovative science formative assessments and look forward to working with the ONPAR project to develop these science formative assessments.

We understand that the funds for this project will be provided solely by the grant and will not require additional funds from Maryland. We also understand that the formative assessments designed by this project will be available for use by schools within Maryland and that they need not use the

Investigating & Questioning our World Through Science & Technology (IQWST) curriculum from Activate Learning in order for the assessments to be useful for instructional purposes. Maryland looks forward to the opportunity to work with the proposed ONPAR formative assessment project and being part of this collaborative effort to create innovative accessible formative science assessments that will provide meaningful guidance and support for teachers who need accurate knowledge of *all* students' science content knowledge.

Sincerely,

(b)(6)

A rectangular box with a black border, used to redact the signature of the sender. The text "(b)(6)" is written in the top-left corner of the box.

Ilhye Yoon
Title III/ELL Specialist
Division of Curriculum, Assessment and Accountability
Maryland State Department of Education

BRIAN SANDOVAL
Governor

STATE OF NEVADA

SOUTHERN NEVADA OFFICE
9890 S. Maryland Parkway, Suite 221

DALE A.R. ERQUIAGA
Superintendent of Public Instruction



Las Vegas, Nevada 89183
(702) 486-6458
Fax: (702)486-6450
http://www.doe.nv.gov/Educator_Licensure

DEPARTMENT OF EDUCATION
700 E. Fifth Street
Carson City, Nevada 89701-5096
(775) 687 - 9200 · Fax: (775) 687 - 9101
<http://www.doe.nv.gov>

June 24, 2015

Laura Wright, PhD
Associate Director, Content Assessment and Learning
Wisconsin Center for Education Research

Rebecca Kopriva, PhD
Senior Scientist
Wisconsin Center for Education Research
University of Wisconsin-Madison
1025 W Johnson St. MD 1263
Madison, WI 53706-1706

Dear Dr. Kopriva and Dr. Wright,

This letter is to express the Nevada Department of Education's support of the Enhanced Assessment Grant Project entitled *Dynamic Interactive Science Formative Assessment Tasks and Modules for Measuring Challenging Concepts and Skills of Diverse Students*. We are very excited about this proposal because innovative, accessible science formative assessments based on the Framework for K-12 Science Education and aligned to the Next Generation Science Standards (NGSS) are needed for Nevada's diverse students.

Research is clear that formative assessment is a key support in ensuring students' college and career readiness. Formative assessment is needed for both teachers and students to monitor ongoing learning within the classroom. The research conducted by previous ONPAR projects has shown a great deal of promise in using this innovative assessment methodology to measure not only English Learners (EL) and other students who struggle with the language of traditional assessments, but *all* students. Formative science assessments designed with the ONPAR methodology that are valid and reliable for the broad range of diverse Nevada students will be a critical component in preparing all of our students to meet the NGSS.

We understand that the federal grant funds will be used to:

- Develop technology and innovative item types to create formative science assessment modules and tasks in Grades 6-8

- Ensure an enhanced link to NGSS
- Include all students, including ELs and students who struggle with the language of traditional assessments
- Develop a more engaging test-taking experience for all students
- Reduce the test administration burden required compared to the current paper-based assessment by providing automatically scored performance tasks

The Nevada Department of Education and representatives from school districts in the state recognize the need for better, more innovative science formative assessments and look forward to working with the ONPAR project to develop these science formative assessments.

We understand that the funds for this project will be provided solely by the grant and will not require additional funds from Nevada. We also understand that the formative assessments designed by this project will be available for use by schools in other LEAs within Nevada and that they need not use the IQWST curriculum from Activate Learning in order for the assessments to be useful for instructional purposes.

Nevada looks forward to the opportunity to work with the proposed ONPAR formative assessment project and being part of this collaborative effort to create innovative accessible formative science assessments that will provide meaningful guidance and support for teachers who need accurate knowledge of *all* students' science content knowledge.

Sincerely,

(b)(6)

A rectangular box with a black border, used to redact the signature of Steve Canavero. The text "(b)(6)" is written in the top-left corner of the box.

Steve Canavero
Deputy Superintendent for Student Achievement

SC:ms



State of New Jersey

DEPARTMENT OF EDUCATION

PO Box 500

TRENTON, NJ 08625-0500

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DAVID C. HESPE
Commissioner

June 24, 2015

Dr. Rebecca Kopriva and
Dr. Laura Wright
Wisconsin Center for Education Research
1025 W. Johnson Street
Madison, WI 53706

Dear Drs. Kopriva and Wright:

This letter is to express the New Jersey Department of Education's (NJDOE) support of the Enhanced Assessment Grant Project entitled *Dynamic Interactive Science Formative Assessment Tasks and Modules for Measuring Challenging Concepts and Skills of Diverse Students*. As a member of the 36-state, non-profit WIDA Consortium, New Jersey is very excited about this proposal because innovative, accessible science formative assessments based on the Framework for K-12 Science Education and aligned to the Next Generation Science Standards (NGSS) are needed for our SEA's diverse students.

Research is clear that formative assessment is a key support in ensuring students' college and career readiness. Formative assessment is needed for both teachers and students to monitor ongoing learning within the classroom. Furthermore, the research conducted by previous ONPAR projects has shown a great deal of promise in using this innovative assessment methodology to measure not only EL and other students who struggle with the language of traditional assessments, but *all* students. Formative science assessments designed with the ONPAR methodology that are valid and reliable for the broad range of diverse New Jersey students will be a critical component in preparing all of our students to meet NGSS.

We understand that the federal grant funds will be used to:

- Develop technology and innovative item types to create formative science assessment modules and tasks in Grades 6-8;
- Ensure an enhanced link to NGSS;
- Include all students, including ELs and students who struggle with the language of traditional assessment;
- Develop a more engaging test-taking experience for all students, and
- Reduce the test administration burden required compared to the current paper-based assessment by providing automatically scored performance tasks.

The NJDOE and representatives from school districts in the state recognize the need for better, more innovative science formative assessments and look forward to working with the ONPAR project to develop these science formative assessments. The NJDOE understands that the funds for this project will be provided solely by the grant and will not require additional funds from New Jersey. We also understand that the formative assessments designed by this project will be available for use by schools in other LEAs within New Jersey and that they need not use the IQWST curriculum from Activate Learning in order for the assessments to be useful for instructional purposes.

As indicated by submission of the annual WIDA Consortium Memorandum of Understanding, which outlines the terms and conditions of states' participation in the Consortium, New Jersey is committed to collaborating on the "research, design and opportunities for English language learners in pre-kindergarten through grade twelve." The NJDOE looks forward to the opportunity to work with the proposed ONPAR formative assessment project and being part of this collaborative effort to create innovative accessible formative science assessments that will benefit students in 36 states by providing meaningful guidance and support for teachers who need accurate knowledge of *all* students' science content knowledge.

Sincerely,

(b)(6)

Karen L. Campbell, Director
Office of Supplemental Educational Programs

KLC\U:\Ken\2015\WIDA\Letters of Support\NJ letter of support for ONPAR 6-22-15 (2).docx

c: Susan Martz
Jeffrey Hauger
Kenneth Bond

June 23, 2015

Drs. Rebecca Kopriva and Laura Wright
Wisconsin Center for Education Research
University of Wisconsin-Madison
1025 West Johnson Street
Madison, Wisconsin 53706

Dear Drs. Kopriva and Wright:

This letter is to express the Wisconsin Department of Public Instruction's support of the Enhanced Assessment Grant Project entitled *Dynamic Interactive Science Formative Assessment Tasks and Modules for Measuring Challenging Concepts and Skills of Diverse Students*. We are very excited about this proposal because innovative, accessible science formative assessments based on the Framework for K-12 Science Education and aligned to the Next Generation Science Standards (NGSS) are needed for our state's diverse students. While we have not adopted these standards as a state, several of our largest and most diverse districts are moving ahead with these standards and are in desperate need of instructional supports such as assessment materials.

Research is clear that formative assessment is a key support in ensuring students' college and career readiness. Formative assessment is needed for both teachers and students to monitor ongoing learning within the classroom. Furthermore, the research conducted by previous ONPAR projects has shown significant promise in using this innovative assessment methodology to measure not only EL and other students who struggle with the language of traditional assessments, but *all* students. Formative science assessments designed with the ONPAR methodology that are valid and reliable for the broad range of diverse Wisconsin students will be an important component in preparing all of our students to meet college and career ready standards in science.

We understand that the federal grant funds will be used to:

- Develop technology and innovative item types to create formative science assessment modules and tasks in Grades 6-8.
- Ensure an enhanced link to contemporary, research-based science practice
- Include all students, including ELs and students who struggle with the language of traditional assessments
- Develop a more engaging test-taking experience for all students
- Reduce the test administration burden required compared to the current paper-based assessment by providing automatically scored performance tasks

The Wisconsin Department of Public Instruction and representatives from school districts in the state recognize the need for better, more innovative science formative assessments and look forward to working with the ONPAR project to develop these science formative assessments. We understand that the funds for this project will be provided solely by the grant and will not require additional funds from Wisconsin. We also understand that the formative assessments

designed by this project will be available for use by schools in other LEAs within Wisconsin and that they need not use the IQWST curriculum from Activate Learning in order for the assessments to be useful for instructional purposes.

Wisconsin looks forward to the opportunity to work with the proposed ONPAR formative assessment project and being part of this collaborative effort to create innovative, accessible formative science assessments that will provide meaningful guidance and support for teachers who need accurate knowledge of *all* students' science content knowledge.

(b)(6)

Kevin Anderson, Consultant
Science Education



World-Class Instructional Design and Assessment
Wisconsin Center for Education Research (WCER)
University of Wisconsin-Madison
1025 West Johnson Street, MD #23
Madison, WI 53706

University of Wisconsin-Madison
1025 West Johnson Street, Rm 1263
Madison, WI 53706-1706

Dear Drs. Kopriva and Wright,

I enthusiastically submit this letter of commitment for your proposed Enhanced Assessment Grant initiative, *Dynamic-Interactive Formative Assessment Tasks and End-of-Unit Modules for Measuring Challenging Concepts and Skills of Diverse Middle School Students*.

I believe that my interests in educational equity, cognitive science, professional development, and curriculum and instruction of English language learners will be useful to your project. In particular, I look forward to advising your project to help ensure that the assessment tasks and related materials will be effective for a wide range of teachers and students.

I will be available for advising and evaluation activities throughout the duration of the project. I look forward to working with you on this valuable effort to expand the learning opportunities for diverse students in science.

Sincerely,

(b)(6)

Mariana Castro, PhD
Director of Academic language and literacy initiatives

866.276.7735 • www.wida.us • info@wida.us

MICHIGAN STATE
UNIVERSITY

June 25, 2015

Dr. Rebecca Kopriva
Principal Investigator
Wisconsin Center for Education Research
School of Education
University of Wisconsin-Madison
1025 West Johnson Street, Suite 785
Madison, Wisconsin 53706

Dear Dr. Kopriva:

I look forward to serving as the expert science consultant for the proposed *Dynamic Interactive Formative Assessment Tasks and End-of-Unit Tests for Measuring Challenging Concepts and Skills of Diverse Middle School Students*, if funded by the U.S. Department of Education Enhanced Assessment Grant (EAG) program. The project will develop approximately 75 extended, performance assessment tasks, including learning-embedded tasks and tasks for the end-of-unit tests, along with their attendant tools and resources. A series of technical studies associated with the tasks and tests will be conducted, and evaluations, associated with the test and assessment materials will be collected and analyzed. The project's multi-faceted focus on effective, valid, and rigorous classroom formative assessment practices and an innovative professional development program to support teaching and learning will yield products and results with great potential to improve academic outcomes for all students.



Department of Teacher Education

325 Erickson Hall
East Lansing, MI
48824

517/355--8531

I understand that my commitment entails attending one or two in-person or virtual meetings per year and consulting (mainly via WebEx, email, and phone) with project staff and TAC members regarding topic selection for ONPAR formative tasks and the selection of learning progressions. I will also iteratively review tasks as they are being developed for content and standards alignment, provide input on the design and structure of the professional development program, and review the PD modules and associated materials. I will also be available to consult with TAC members as needed. I believe that my expertise in learning progressions for science and assessment development positions me well to provide feedback on your project.

Thank you for the opportunity to participate as the expert science consultant on this endeavor. I look forward to working together on this timely and important project to develop accessible assessments for all students.

Sincerely,

(b)(6)

Amelia Gotwals, Ph.D.

Gotwals@msu.edu

June 24, 2015

Dr. Rebecca Kopriva
University of Wisconsin-Madison
1025 West Johnson Street
Room 1263
Madison, WI 53706-1706

Dear Drs. Kopriva and Wright,

I enthusiastically submit this letter of commitment to serve on your Technical Advisory Committee for your proposed Enhanced Assessment Grant initiative, *Dynamic-Interactive Formative Assessment Tasks and End-of-Unit Modules for Measuring Challenging Concepts and Skills of Diverse Middle School Students*.

I believe that my experience in investigating the use of dynamic representations to help all students, including students from cultural and language minority backgrounds, learn complex and important science will be useful to your project. In particular, I look forward to advising your project to ensure that the science content, pedagogy, and the use of interactive multimedia will be effective for a wide range of students.

I will be able to attend an in-person TAC meeting each year as well as one webex per year. In addition, I will be available for advising and evaluation activities throughout the duration of the project. I look forward to working with you and your colleagues at the University of Wisconsin-Madison in this valuable effort to expand the learning opportunities in science for diverse students.

Respectfully yours,

(b)(6)

James W. Pellegrino
Liberal Arts and Sciences Distinguished Professor
Distinguished Professor of Education
Co-director, *Learning Sciences Research Institute*



June 25, 2015

Dr. Rebecca Kopriva
Principal Investigator
Wisconsin Center for Education Research
School of Education
University of Wisconsin-Madison
1025 West Johnson Street, Suite 785
Madison, Wisconsin 53706

Dear Rebecca:

Thank you for inviting me to participate as a project advisor for the proposal to the U.S. Department of Education for the Enhanced Assessment Grant application titled *Dynamic Interactive Formative Assessment Tasks and End-of-Unit Tests for Measuring Concepts and Skills of Diverse Middle School Students*. The project's goal of applying the ONPAR methodology to building innovative classroom assessments has substantial potential to make an important contribution to the field of measurement. Specifically, by developing and investigating the validity, utility, and feasibility of the proposed middle-school classroom assessment prototypes and associated materials, this project will permit educators to assess academic performance of *all* students, including English language learners (ELLs) and students with disabilities in a manner that reduces the interference of unnecessary language, and thus encourages higher levels of academic performance. The results of your work will continue to inform assessment and instructional policies and practices of participating states, thus leading to improved academic outcomes for these students.

I understand that my commitment to serve as a project advisor entails attendance at one in-person meeting and one virtual meeting each year, over the course of the project period, during which I will provide expert guidance on formative assessment and policy to the project leadership team and staff.

Thank you for the opportunity to participate as part of the project. I look forward to working together with you and the others on this timely and important project for states.

Sincerely,

(b)(6)

Edward Roeber,
Assessment Director
Michigan Assessment Consortium

1001 Centennial Way, Suite 300, Lansing, MI 48917

michiganassessmentconsortium.org



Sireci Psychometric Services, Inc.

13 Gaugh Street
Easthampton, MA 01027, USA
(413)203-1217

June 25, 2015

University of Wisconsin-Madison
1025 West Johnson Street, Rm 1263
Madison, WI 53706-1706

Dear Drs. Kopriva and Wright,

I enthusiastically submit this letter of commitment to serve on your Technical Advisory Committee for your proposed Enhanced Assessment Grant initiative, *Dynamic-Interactive Formative Assessment Tasks and End-of-Unit Modules for Measuring Challenging Concepts and Skills of Diverse Middle School Students*.

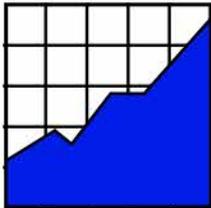
I believe that my experience in investigating issues of validity, cross-lingual assessment, standard setting, and computer-based testing will be useful to your project. In particular, I look forward to advising your project to ensure that the assessment design will be effective for a wide range of students.

I will be able to attend your one in-person TAC meeting per year and one webex per year. In addition, I will be available for advising and evaluation activities throughout the duration of the project. I look forward to working with you and the University of Wisconsin-Madison in this valuable effort to expand the learning opportunities for diverse students in science.

Sincerely,

(b)(6)

Stephen G. Sireci, Ph.D.
President



**NATIONAL
CENTER ON
EDUCATIONAL
OUTCOMES**

In collaboration with:

Council of Chief State School Officers (CCSSO)

National Association of State Directors of Special Education (NASDSE)

Supported by:

U.S. Office of Special Education Programs

June 22, 2015

Dr. Rebecca Kopriva and Dr. Laura Wright
University of Wisconsin-Madison
1025 West Johnson Street, Rm 1263
Madison, WI 53706-1706

Dear Drs. Kopriva and Wright:

I enthusiastically submit this letter of commitment to serve on your Technical Advisory Committee for your proposed Enhanced Assessment Grant initiative, *Dynamic-Interactive Formative Assessment Tasks and End-of-Unit Modules for Measuring Challenging Concepts and Skills of Diverse Middle School Students*.

I believe that my experience working in assessment and decision making, learning disabilities, effective classroom instruction, and integration of students with disabilities in general education settings will be useful to your project. In particular, I look forward to advising your project to ensure that the assessments and the use of interactive multimedia will be effective for a wide range of students.

I will be able to attend your one in-person TAC meeting per year and one webex per year. In addition, I will be available for advising and evaluation activities throughout the duration of the project. I look forward to working with you and the University of Wisconsin-Madison in this valuable effort to expand the learning opportunities for diverse students in science.

Sincerely,

(b)(6)

Martha L. Thurlow, Ph.D.
Director and Senior Research Associate

June 25, 2015

Dr. Rebecca Kopriva, Principal Investigator
Wisconsin Center for Education Research
University of Wisconsin-Madison
1025 West Johnson Street, Suite 785
Madison, Wisconsin 53706

Dear Dr. Kopriva and Dr. Wright:

I look forward to participating as the external evaluator for the proposed grant, *Dynamic Interactive Science Formative Assessment Tasks and Modules for Measuring Challenging Concepts and Skills of Diverse Students* project, if funded by the Enhanced Assessment Grant program through the U.S. Department of Education.

The goal of the proposed project, to improve the assessment of challenging science learning for all middle-school students, is an important and timely one. Specifically, by developing and investigating the validity, utility, and feasibility of the proposed middle-school science classroom assessment prototypes and associated materials, this project will yield results that will help to inform assessment, instruction, and policy to improve academic outcomes for ELs.

I understand that my commitment to serve as the project evaluator will consist of regular formative feedback and summative end-of-year written reports in Years 1-3 with a project summative report in Year 4, and formative feedback to the PI and co-PI two times each year over the course of the four-year project period. I will provide expert evaluation to the project leadership team and staff intended to inform the grant's implementation and end products.

Thank you for the opportunity to participate as part of the project evaluation. I look forward to working together on this timely and important assessment project.

Sincerely,

(b)(6)

Phoebe C. Winter

Andrew J. Middlestead

(b)(6)

OBJECTIVE: To apply my interest and knowledge in education, curriculum, assessment, and measurement to a position to lead in policy and operations development to create student assessment systems and nurture business to successfully measure student ability and to prepare all students for career and college readiness.

EDUCATION: **MASTER OF ARTS**
Michigan State University, College of Education
Major: Measurement & Quantitative Methods

BACHELOR OF SCIENCE
Michigan State University, College of Social Science
Major: Psychology
Specialization: Health & Humanities

**RELATED
COURSEWORK:**

- Quantitative Methods in Education Research I & II (CEP 932-933)
- Psychometric Theory I (CEP 921)
- Educational Inquiry (CEP 930)
- Instrument Construction (CEP 920)
- Motivation & Learning (CEP 910)
- Item Response Theory (CEP 923)
- Elementary & Middle School Administration (EAD 852A)
- Psych Development Learning Diff. & Commonalities (CEP 801)
- Learning in School & Other Settings (CEP 800)
- Adolescent Development
- Data Analysis & Psychological Research
- Psychological Measurement

**SYSTEMS
ABILITY:**

- Microsoft Office – (Word, Excel, PowerPoint, Access)
- Microsoft SQL Server 2008
- SAS
- SPSS
- Online Assessment Item Authoring & Banking Systems

**WORK
EXPERIENCE:**

Mar. 2014 – Present

**Director, Office of Standards & Assessment, Michigan
Department of Education (MDE)**

- Serve as Assessment Director for the State of Michigan
- Direct a cohesive assessment office of 30 assessment experts for six different state-wide assessment programs
- Provide leadership and mentoring for a management team covering areas of test development, administration/scoring/reporting, and test composition and design services.
- Serve as contract compliance lead for all assessment contracts for the state of Michigan, including lead in RFP development.

Jan. 2011 – Present

**Michigan State Lead & Co-Chair, Item Development Work
Group, Smarter Balanced Assessment Consortium**

- Represent the State of Michigan as a governing state in the consortia.
- Facilitate a work group of item development experts from around the nation in creating a rich robust item bank of items for the 25-state consortium
- Provide policy and procedure input to consortium test development
- Facilitate bi-monthly work group webinars
- Lead in contract management of consortia contracts

Sep. 2009 – Mar. 2014

**Test Development Manager, Office of Standards &
Assessment, Michigan Department of Education (MDE)**

- Manage a cohesive test development team of 8 full-time consultants for six different state-wide assessment programs. Including 3-8 & 11 summative assessments, English Language Learners assessments, Assessments for students with disabilities, and interim assessments.
- Provides directions and leadership for all test development processes. Such as Item Writer Training, Item Content/Bias/Sensitivity Review, Item Statistic Review, Test Blueprint and Form development
- Act as contract manager for Michigan item development contract. This includes frequent collaboration with vendors.
- Oversees quality control of item writing for selected-response, constructed-response, and technology-enhanced item types.

- Coordinates with other offices within MDE (Curriculum Office, Superintendents Office, Office of Special Education, Teacher Preparation Office)

Dec. 2006 – Sep. 2009

Education Research Consultant, Office of Career and Technical Education (CTE), Michigan Department of Education (MDE)

- Calculate CTE Core Performance Indicators for federal reports
- Coordinate the annual CTE Follow-Up Survey
- Monitor seven grants
- Chair data issue committee
- Coordinate with other offices within MDE

Jan. 2003 – Dec. 2006

Research Assistant, Promoting Rigorous Outcomes in Math and Science Education (PROM/SE) project, College of Education, Michigan State University

- Collaborated in the planning and implementation of education research
- Performed data analysis using statistical software
- Managed data collection from various research instruments
- Developed methods to create tailored data reports
- Supervised student employees

May 2000 – Dec. 2002

Research Assistant, U.S. National Research Center for Third International Math and Science Study (TIMSS), College of Education, Michigan State University

- Coordinate survey feedback and input
- Archive old material to a Web based database system
- Create data tables and reports
- Developed methods to create tailored data reports
- Supervised student employees

PERSONAL DEVELOPMENT:

- Fellow – Education Policy Fellowship Program (2011-12)
- Photographer – Part-Time Photography Business
- Boy Scouts – achieved Eagle Scout

REFERENCES:

- Additional available upon request

Rebecca Kopriva

(b)(6)

Professional Experience

- 2007-present** Senior Research Scientist, Director of the Institute of Innovative Assessment, Wisconsin Center for Educational Research, School of Education, University of Wisconsin Madison.
- 2000-2006** Research Professor, Founder and Director, Center for the study of Assessment Validity and Evaluation, University of Maryland College Park
- 2000-2006** Affiliated Professor, Measurement, Statistics & Evaluation, and Counseling & Personnel Services, University of Maryland College Park
- 1998-2000** Independent Consultant
- 1995-1997** Director, Student Assessment, Delaware Dept. of Public Instruction, Dover, DE
- 1993-1995** Coordinator of Research, Statistics Faculty, California State University Fresno
- 1992-1995** Associate Professor, California State University Fresno
- 1989-1992** Assistant Professor, California State University Fresno

Recent Federal Grants

- 2014-2017 *Technology-interactive Classroom-embedded Modules for Measuring Challenging Math and Science Skills of ELs.* Rebecca Kopriva, PI, USED, Institute for Education Science. Award amount: \$1,599,765.
- 2009-2012 *Assessing REAL Science on a Large-Scale Assessment: The Promise of Computer-Interactive Items for High School Students with Language Challenges.* Rebecca Kopriva, PI, USED, Office of Elementary and Secondary. Award amount: \$1,961,563.
- 2007-2010 *Obtaining Necessary Parity through Academic Rigor (ONPAR) in Mathematics.* Rebecca Kopriva, PI. USED, Office of Elementary and Secondary. Award amount: approximately \$1,700,000.
- 2006-2010 *Developing Structured Task Design Models To Assess Middle School Science in Context: Making Comparable Inferences about Embedded Tasks Across a Diverse Population,* Rebecca Kopriva, PI. National Science Foundation. Award amount: a) \$1,695,168.00; b) \$2,033,149.
- 2006-2009 *Obtaining Necessary Parity through Academic Rigor (ONPAR) in Science.* Rebecca Kopriva, PI. USED, Office of Elementary and Secondary. Award amount: approximately \$1,899,000.
- 2003-2005 *Taxonomy for Testing English Language Learners,* Rebecca Kopriva, PI. USED, Office of Elementary and Secondary. Award amount: \$1,547,971/
- 2001-2005 *Valid Assessment for English Language Learners,* Rebecca Kopriva, PI, Robert Mislevy, Co-PI. Grant awarded by U.S. Department of Education, Office of

Educational Research and Improvement, Grant No. R305T010846-03. Award amount: \$1,979,219.00.

1996-1999. *Identifying Effective Accommodations Students with Disabilities*. Rebecca Kopriva, PI. Grant awarded by U.S. Department of Education, Office of Educational Research and Improvement to the Delaware State Department of Public Instruction.

Educational History

Institution	Major	Degree and Year
University of California Irvine	Studio Art	B.A., 1979
Colorado State University	Counseling	M.S., 1986
University of Northern Colorado	Applied Statistics	Ph.D., 1989

Recent Publications, selected

- Kopriva, R.J., Wright, L. Triscari, R. (2015 submitted). Examining a multisemiotic approach to measuring challenging content for English learners and others: Results from the ONPAR elementary and middle school science study. Submitted.
- Kopriva, R.J. & Wright, L. (2015, in press). Score Processes in Assessing Academic Content of Non-native Speakers. In (J. Pellegrino and K. Ercikan (eds). *Validation of Score Meaning in the Next Generation of Assessments*.
- Kopriva, R.J., Thurlow, M.L., Perie, M., Lazarus, S. S. & Clark, A. (2014, in press). Test takers and the validity of score interpretations. In *Educational Psychologist*.
- Kopriva, R.J. (2014, in press). Second-generation challenges for continuing to improve how to make content assessments accessible for ELLs. *Applied Measurement in Education*.
- Thurlow, M.L. & Kopriva, R.J. (2014, in press). Advancing accessibility and accommodations in content assessments for students with disabilities and English language learners, *Review of Research in Education*.
- Kopriva, R. J. & Carr, T.G. (2014, submitted). Erasing the gap for low English ELs: Introducing dynamic computer-based methodology for assessing challenging science that works by conveying meaning through interactive media. Manuscript submitted for publication.
- Shaw, J.M., Abedi, J., & Kopriva, R.J. (2014, submitted for Special Issue of *Educational Assessment*). The Future of Content Assessment for English Language Learners. Manuscript submitted for publication.
- Kopriva, R.J., Gabel, D., Merow, K. and Carr, T.G. (in preparation). How technology and multi-semiotic methods work together to successfully assess complex mathematics for students with literacy and attention challenges in grades 4 and 7.
- Kopriva, R.J. and Albers, C. (2013). Considerations for Testing Special Needs Students. In *APA Handbook of Testing and Assessment in Psychology* (In K. F. Geisinger). APA Books. Washington D.C.

- Cawthon, S., Leppo, R., Carr, T.G., & Kopriva, R.J. (2013). Towards accessible assessments: The promises and limitations of test item adaptations for students with disabilities and English language learners. *Educational Assessment*, 18:73–98.
- Thurlow, M. & Kopriva, R.J. (in preparation for Invited Volume of *Review of Research in Education*). Advancing Accessibility and Accommodations in Content Assessments for Students with Disabilities and English Language Learners.
- Kopriva, R. J., & Sexton, U. (2011). Using appropriate assessment processes: How to get accurate information about the academic content knowledge and skills of English language learners. In M. del Rosario Bastera, E. Trumbull, & G. Solano-Flores (Eds.), *Cultural validity in assessment*. New York, NY: Routledge Publishers.
- Kopriva, R.J. (2011). Useful Intervention Points for the Assessment of ELLs: How are we doing? What is needed now? In *Association of Test Directors Proceedings on ELLs and School Policy*. ATD Press, Washington D.C.
- Kopriva, R.J. (2010). Where Are We and Where Could We Go Next? Summary and Next Steps. In *Evaluating the Comparability of Scores from Achievement Test Variations* (P.Winter, Ed). Council of Chief State School Officers Press; Washington D.C.
- Kopriva, R.J. (2010). Using Appropriate Assessment Approaches: How to Get Good Information about the Academic Knowledge and Skills of English Learners. In M. del Rosario (Charo) Bastera, G. Solano-Flores, & E. Trumbull, (Editors), *Assessment, Language, and Culture: A Guide for Teachers*, Routledge Taylor and Francis, NY, NY.
- Kopriva, R.J. and Lara, J. (2009). Looking back and looking forward: Inclusion of all students in U.S.'s National Assessment of Educational Progress over the last 40 years and recommendations for the 21st century. In, *Celebrating the 50th Anniversary of NAEP*. USED Press, Washington, D.C.
- Kopriva, R.J. (2009). So, Where Are We Going? In (P. Winter, Ed) *Test Score Comparability and Validity: Preparing for the Future of Assessment*. Washington, D.C., Council of Chief State School Officers Press.
- Kopriva, R.J. (2008). *Improving Testing for English Language Learners: A Comprehensive Approach to Designing, Building, Implementing, and Interpreting Better Academic Assessments*. New York, NY. Routledge Publishers.
- Kopriva, R.J. (2008). Considering test designs that provide useful data from *wrong* answers: Utilizing learning progressions and other data about student learning to inform instructionally informative large-scale assessments. *Harvard Education Letter*, pp. 2-5 Cambridge, MA.
- Kopriva R.J., Emick, J., Hildago-Delgado, C.P., and Cameron, C. (2007). Do proper accommodation assignments make a difference? Examining the impact of improved decision-making on scores for ELLs. *Educational Measurement: Issues and Practices*, pp 21-40.
- Kopriva, R.J. and Koran, J. (2007). Addressing the importance of systematically matching student needs and test accommodations. In L. Cook and C. Cahahan (Editors). *Large Scale Assessment and Accommodations: What Works?* (pp. 145-167) Council of Exceptional Children Press, Washington, D.C.

- Kopriva, R.J. (2005). *Selection Taxonomy for English Language Learner Accommodations (STELLA) Decision-Making System: Systems Logic and Computerized Program*. University of Maryland, College Park, MD.
- Kopriva, R.J. Wiley, D.E., and Chen, C.S., (2009). Can optimal testing conditions erase the validity gap for lower English proficient ELLs and poor readers? Sobering findings from a recent study. Undergoing revision.
- Lara, J., Ferrara, S., Calliope, M., Sewell, D., Winter, P., and Kopriva R. (2007). The English language development assessment (ELDA). In J. Abedi (Ed.), *English Language Proficiency Assessment in the Nation: Current Status and Future Practice*. (pp. 47-62). University of California Davis Press, Davis, CA.
- Winter, P. Kopriva, R.J., Chen, C.S., and Emick, J. (2006). Exploring individual and item factors that affect assessment validity for diverse learners: Results from a large-scale cognitive lab. *Learning and Individual Differences*. Vol 16, No. 4, pp. 267-276.

Presentations at Professional Meetings, selected

- 2009 Policy and reality: Making academic assessments work for English learners. Invited presentation at the annual meeting of the National Council on Measurement in Education, San Diego CA
- 2009 What happens when large-scale items actually use the computer's capabilities? Exploring issues and redefining challenges. Presentation at the annual meeting of the National Council on Measurement in Education, San Diego CA. With J. Bauman and D. Gabel.
- 2009 It's about time: Matching English learners and the ways they take tests by using an online tool to properly address individual needs. Presentation at the annual meeting of the National Council on Measurement in Education, San Diego CA. With T.G. Carr.
- 2009 Building comparable computer-based science items for English learners: Results and Insights. Presentation at the annual CCSSO National Conference on Student Assessment. Los Angeles, CA. With T.G. Carr, C. Cameron.
- 2009 Comparability methodology: Past and future. Presentation at the annual CCSSO National Conference on Student Assessment. Los Angeles, CA.
- 2008 Where are we REALLY at with building comparable items for ELs and students with disabilities? Invited presentation at the National Council of Measurement in Education Annual Meeting, NY, NY.
- 2008 The limits of DIF: Why this item evaluation tool is flawed for LD students, hearing impaired, and English learners. Presentation at the National Council of Measurement in Education Annual Meeting, NY, NY.
- 2008 Testing for the future: Addressing the needs of low literacy English learners by moving beyond the use of common item types in large-scale testing. Presentation at the American Education Research Association Annual Meeting, NY, NY.
- 2007 The validity of large-scale assessment scores for ELLs under optimal testing conditions: Does validity vary by language proficiency? Presentation at the American Education Research Association Annual Meeting, Chicago, IL. With J. Emick.

- 2007 Comparing standard and enhanced access items for diverse students: Item analyses in six grades and four subjects. Presentation at the CCSSO Large Scale Assessment Conference, Nashville, TN. With C. Cameron.
- 2006 Teacher and multi-source computerized approaches for making individualized test accommodation decisions for English language learners. Presentation at the National Council of Measurement in Education, San Francisco, Ca. With J. Koran, J. Emick, J.R. Monroe and D. Garavaglia.
- 2006 Teacher evaluation of a computerized system for making individualized test accommodation recommendations. Presentation at the American Education Research Association, San Francisco, Ca. With J. Koran, M. Cho, and J. Emick.
- 2006 Building accessible tests: Developing access-based items and associated materials. Invited presentation at the American Association of the Advancement of Science, Washington, D.C.

LAURA J. WRIGHT

(b)(6)

EDUCATION

Ph.D., Linguistics

Concentration in sociolinguistics

Georgetown University, Washington, DC

US Department of State Foreign Language Area Studies (FLAS) Fellow: Turkish

Dissertation: Doing, talking and writing science: A discourse analysis of the
resemiotization of laboratory activities in a middle school science class

M.A., Linguistics

Concentration in TESOL

Northeastern Illinois University, Chicago, IL

Thesis: Sarcasm: An invitation to realign

B.A., International Ministries

Moody Bible Institute, Chicago, IL

PROFESSIONAL EXPERIENCE

UNIVERSITY OF WISCONSIN-MADISON, Madison, WI

Project Director, 2014-present

CENTER FOR APPLIED LINGUISTICS, Washington, DC

Educational Linguist, 2008–2014

THE GEORGE WASHINGTON UNIVERSITY, Washington, DC

Assistant Research Professor, 2008–2012

Courses taught: Language and Education, Ethnography of Speaking.

GEORGETOWN UNIVERSITY, Washington, DC

Adjunct Instructor, 2008

Course taught: Language and Multimedia.

THE GEORGE WASHINGTON UNIVERSITY, Washington, DC

Research Assistant, 2005–2008

MARYMOUNT UNIVERSITY, Arlington, VA

Adjunct Instructor, 2004–2005

Courses taught: Principles of Language, Perspectives on Language Acquisition.

LANGUAGE ANALYSIS SYSTEMS, Herndon, VA

Onomastics Consultant, 2002–2005

NORTHEASTERN ILLINOIS UNIVERSITY, Chicago, IL
ESL Teaching Assistant and Writing Tutor, 1999–2000
Courses taught: ESL Writing III, ESL Listening and Speaking.

INTERFAITH REFUGEE AND IMMIGRATION MINISTRIES, Chicago, IL
ESL Instructor, 1996–1999

EDUCATIONAL SERVICES INTERNATIONAL, Alhambra, CA
EFL Teacher & Central Administrator, Liceul Teoretic Octavian Goga, Miercurea Ciuc,
Romania, 1994–1996

PROJECTS (SELECTED)

**TECHNOLOGY-INTERACTIVE, CLASSROOM-EMBEDDED MODULES FOR MEASURING
CHALLENGING MATH AND SCIENCE SKILLS OF ENGLISH LEARNERS (ELs)**

U.S. DEPARTMENT OF EDUCATION
Project Director, 2014–present

NATIONAL CLEARINGHOUSE FOR ENGLISH LANGUAGE ACQUISITION (NCELA)
US DEPARTMENT OF EDUCATION
Senior Research Associate, 2013–2014

**WIDA ASSESSMENT SERVICES SUPPORTING ELs THROUGH TECHNOLOGY SYSTEMS
(ASSETS)**
US DEPARTMENT OF EDUCATION
Senior Research Associate, 2012–2014.

PROJECT FIREBIRDS ARE STEM TEACHERS (FAST) CAPACITY
NATIONAL SCIENCE FOUNDATION
Project Director, 2012–2014

**ARGUMENTATION AND ACHIEVEMENT IN MIDDLE SCHOOL SCIENCE: AN ANALYSIS OF
A VIDEO DATABASE**
NATIONAL SCIENCE FOUNDATION
Co-Principal Investigator, 2010–2013

VOCABULARY INSTRUCTION AND ASSESSMENT FOR SPANISH SPEAKERS (VIAS),
NATIONAL INSTITUTE OF CHILD HEALTH & HUMAN DEVELOPMENT
Research Associate, 2010–2013

**OBTAINING NECESSARY PARITY THROUGH ACADEMIC RIGOR (ONPAR) MATH &
SCIENCE**
US DEPARTMENT OF EDUCATION
Research Associate, 2008–2012

**SCALING UP CURRICULUM FOR ACHIEVEMENT, LEARNING AND EQUITY PROJECT
(SCALE-UP),**

NATIONAL SCIENCE FOUNDATION

Research Assistant, 2005–2008

PUBLICATIONS (SELECTED)

- Boals, T., Blair, A., Cranley, E., Kenyon, D., Wilmes, C., and Wright, L. (in press). Transformation in K-12 English language proficiency assessment: Changing contexts, changing constructs. *Review of Research in Education*.
- Wiley, T. & Wright, L.J. (in press). How has the concept of academic language been defined (*and by whom*) and interpreted (*and by whom*)? How can educators draw on this work in ways that enable linguistically and culturally diverse students to develop language and literacy for academic purposes across content areas? In G. Valdés, K. Menken, & M. Castro (Eds), *Common Core and ELLs/emergent bilinguals: A guide for all educators*. Philadelphia: Caslon Publishing.
- Wright, L.J. (in press). Inquire to acquire: A discourse analysis of bilingual students' development of science literacy. In Molle, D., Sato, E., Boals, T., & Hedgspeth, C. (Eds), *Multilingual learners and academic literacies: Sociocultural contexts of literacy development in adolescents*. New York: Routledge.
- Adger, C. & Wright, L. (in press). Discourse in educational settings. In D. Schiffrin, D. Tannen, & H. E. Hamilton (Eds.), *The Handbook of Discourse Analysis*. Malden, MA: Blackwell.
- Wright, L. & Duguay, A.. (2013). *Developing academic literacy in the content areas*. (Hot Topics in ELL Education). Washington, DC: Center for Applied Linguistics.
- Kenyon, D., Merow, K. Wright, L., & Gabel, D. (2012). The ASSETS Consortium English language proficiency assessment framework: Annual summative and on-demand screener. Washington, DC: Center for Applied Linguistics.
- Wright, L. J., Kuipers, J., & Viechnicki, G. B. (2011). Argumentation and the negotiation of scientific authority in classrooms. In M. Pollock & B. A. U. Levinson (Eds.), *Companion to the anthropology of education*. Malden, MA: Wiley-Blackwell.
- Logan-Terry, A., & Wright, L. J. (2010). Making thinking visible: An analysis of English language learners' interactions with access-based science assessment items. *AccELerate!*, 2(4), 11–14.
- Wright, L. J. (2010). Considerations for developing and implementing translations of standardized K–12 assessments. In P. Winter (Ed.), *Evaluating the comparability of scores from achievement test variations* (pp. 189–206). Washington, DC: Council of Chief State School Officers.
- Kuipers, J., Viechnicki, G. B., Massoud, L. A., & Wright, L. J. (2009). Science, culture and equity in curriculum: An ethnographic approach to the study of a highly-rated curriculum unit. In K. Bruna & K. Gomez (Eds.), *Talking Science, Writing Science* (pp. 241–268). Mahwah, NJ: Erlbaum.
- Wright, L. J. (2008). Learning by doing: The objectification of knowledge across semiotic modalities. *Linguistics and Education*, 19, 225–243.

- Wright, L. J. (2008). Writing science and objectification: Selecting, organizing, and decontextualizing knowledge. *Linguistics and Education*, 19, 265–293.
- Wright, L. J. (2008). *Doing, talking and writing science: A discourse analysis of the resemiotization of laboratory activities in a middle school science class* (doctoral dissertation, Georgetown University, Washington, DC).
- Wright, L. J. (2004). Non-verbal navigational tools of conversation. *University of Pennsylvania Working Papers in Linguistics*, 10(1), 231–236.

INVITED PRESENTATIONS

- Wright, L.J.. (2014). *Academically Speaking*. Presentation for National Professional Development Grantees' meeting. July, 2014, Albany, NY.
- Wright, L.J. & Tabaku, L. (2013). *Developing Academic Literacy with English Learners in Grades 6-12*. Webinar presented for Mid-Atlantic Equity Center. April, 2013.
- Wright, L.J.. (2012). *Academic Literacy as Social Practice*. Presentation for World Class Instruction Design and Assessment Sociocultural Contexts of Academic Literacy Development for Adolescent English Learners October, 2012, Madison, WI.
- Wright, L.J.. (2012). *Inquire to Acquire: Science as a catalyst for English language learning*. Presentation for The National Science Resource Center's 2012 Leadership Development Forum, March, 2012, Indianapolis, IN.
- Wright, L.J.. (2011). *ONPAR Science: Next generation testing for English learners*. Presentation for the Colorado Department of Education Academy on Language, Culture, and Equity, April, 2011, Denver, CO.
- Wright, L.J.. (2010). *Linguistics and education: Discourse analysis meets argumentation*. Presentation for Masters in Language and Communication Program panel on Language and Education, Georgetown University, February, 2010, Washington, DC.
- Wright, L.J.. (2008) *The discourse of science tests*. Presentation for ANTH 162: Ethnographic Analysis of Speaking (Kuipers), The George Washington University, November, 2008, Washington, DC.
- Wright, L. J.. (2008). *Discourse analysis in the field of education*. Presentation for Masters in Language and Communication Program panel on Language and Education, Georgetown University, February, 2008, Washington, DC.

PRESENTATIONS (SELECTED)

- Wright, L.J. & Kenyon, D.M. (2014). *Empirically-based Language Learning Progressions and their Implications for Assessment*. Paper presented at American Association of Education Research, April, 2014, Philadelphia, PA.
- Wright, L. J. (2014). *Academic Conversations*. Paper presented at the National Professional Development Meeting, March 2014, Washington, DC.
- Wright, L. J. (2014). *The Importance of Academic Language in the New Standards*. Paper presented at the US Department of Education Charter Schools Program Replication and Expansion Directors' Meeting, March, 2014, Washington, DC.

EDUCATION

ABD. Educational Studies: Science Education, University of Michigan,
Dissertation Title: Contextualization in Middle School Science Curriculum, Enactment, and Student Learning

Dissertation chair: Joe Krajcik

M.A. Educational Studies: Research Methods, University of Michigan, *December 2009*

M.S. Cancer Biology, Stanford University, *January 2006*

B.S. Biochemistry, Spanish minor, University of Maryland, Baltimore County, *May 2001, cum laude*

RESEARCH EXPERIENCE

Research Associate, 2015-present

University of Wisconsin-Madison, Wisconsin Center for Education Research

- Lead developer for middle school formative science assessment tasks aligned to Next Generation Science Standards.

Principal Investigator: Rebecca Kopriva

Researcher Investigating Inquiry-based Middle School Science Curricula, 2012-2014

East Carolina University

- Investigated the adoption and adaptation of the Investigating and Questioning our World Through Science and Technology (IQWST) curriculum at a rural charter school.

Developer of Inquiry-based Middle-School Science Curricula, 2006-2011

University of Michigan, Center for Highly Interactive Classrooms, Curricula, and Computing in Education (HICE), Investigating and Questioning our World through Science and Technology (IQWST) curriculum

- Developed teacher and student curricular materials and student assessments for an 8th grade chemistry inquiry-based unit through five design cycles

Principal Investigator: Joseph Krajcik

Cancer Immunology Laboratory Researcher, 2001-2004

Stanford University, Bone Marrow Transplant group

- Investigated the use of specific subsets of bone marrow cells to cure hematological cancers in mouse models

Principal Investigator: Robert Negrin

SCHOLARLY PUBLICATIONS

Levy, B. L. M., Thomas, E. T., **Drago, K.**, & Rex, L. A. (2013). Examining studies of inquiry-based learning in three fields of education: Sparking generative conversation. *Journal of Teacher Education*, 64(5), 387-408.

Krajcik, J. S., Sutherland, L. M., **Drago, K.**, & Merritt, J. (2011) The promise and value of learning progression research. In Bernholt, S., Neumann, K. & Nentwig, P. (Eds.), *Making it Tangible - Learning Outcomes in Science Education*. Münster: Waxmann.

Drago, K., Shwartz, Y., Dalpe, S., Eklund, J., Rogat, A., & Krajcik, J. S. (2011) How do I get the energy to do things?. In Krajcik, J. S., Reiser, B. J., Sutherland, L. M., & Fortus, D. (Eds.), *Investigating and Questioning our World through Science and Technology*. NY: Sangari Global Education.

Edinger, M., Hoffmann, P., Ermann, J., **Drago, K.**, Fathman, C. G., Strober, S., & Negrin, R. S. (2003) CD4+CD25+ regulatory T cells preserve graft-versus-tumor activity while inhibiting graft-versus-host disease after bone marrow transplantation. *Nature Medicine*, 9(9), 1144-50.

SCHOLARLY PRESENTATIONS

- Drago, K.** (2013, April). Learning progressions as tools for evaluation: Assessment of contextualizing instruction in a project-based chemistry curriculum. Paper presented at the NARST Annual International Conference, Rio Grande, Puerto Rico.
- Drago, K.** (2012, March). Middle-schoolers' science learning measured by close and proximal assessments based on the Framework for K-12 Science Education: Implications for standards-based accountability and teacher performance evaluations. Poster presented at the NARST Annual International Conference, Indianapolis, IN.
- Krajcik, J., Sutherland, L., Choi, S., **Drago, K.**, & Merritt, J. (2012, March) The effects of coherent curriculum on middle school students' understanding of key chemistry ideas. Paper presented at the NARST Annual International Conference, Indianapolis, IN.
- Krajcik, J., **Drago, K.**, Sutherland, L., & Merritt, J. (2011, March). The promise and value of learning progression research. Paper presented at the 5th IPN-York Symposium: Making it Tangible – Learning Outcomes in Science in Education, Kiel, Germany.
- Drago, K.** (2011, April). Middle-schoolers' learning about photosynthesis and cellular respiration: A mixed methods study. Paper presented at the National Association for Research in Science Teaching Annual Conference, Orlando, FL.
- Drago, K.** (2011, March). Middle-schoolers' learning about photosynthesis and cellular respiration. Presented at the GSCO Student Research Conference, Ann Arbor, MI.
- Merritt, J., **Drago, K.**, Sutherland, L., & Krajcik, J. (2010, March). Curriculum coherence: A three year study of middle school students understanding of chemical concepts. Paper presented at the National Association for Research in Science Teaching Annual Conference, Philadelphia, PA.
- Drago, K.** (2009, April). The Co-construction of inquiry in the science classroom by curriculum designers and teachers, Paper presented at the American Educational Research Association Annual Meeting, San Diego, CA.
- Drago, K.** (2008, March) The role of contextualization in students' science learning. Talk presented at the School of Education Graduate Student Research Symposium, Ann Arbor, MI.
- Drago, K.**, Shwartz, Y., & Krajcik, J. (2007, July) Driving question development: A joint effort between curriculum designers and students. Poster presented at the CCMS Knowledge Sharing Institute 2007, Washington D.C.

IN-SERVICE TEACHER EDUCATOR EXPERIENCE

Professional Development Facilitator, 2012-2013

East Carolina University

- Designed and provided professional development for rural middle school teachers enacting the Investigating and Questioning our World through Science and Technology (IQWST) curriculum for the first time

Teach For America-Detroit Corps Program Manager and Designer, 2010-2012

University of Michigan

Performance Assessment/EPortfolio Manager, 2011-2012

- Developed and managed the ePortfolio assessment environment for over 100 corps members

- Facilitated workshops and created handbooks, webpages, and instructional sequences supporting corps members, field instructors, seminar instructors, ePortfolio graders, and ePortfolio coaches in using the ePortfolio
- Coordinated assignment articulation, support, submission, and grading Design Team Member, 2010-2011.
- Created science specific program outcomes for corps members

Project Manager: Kendra Hearn

Professional Development Facilitator, 2006-2009

University of Michigan, Investigating and Questioning our World through Science and Technology (IQWST)

- Designed and conducted workshops to introduce in-service teachers to the activities and pedagogies of the 8th grade IQWST chemistry unit

UNIVERSITY TEACHING EXPERIENCE

High School Teacher Candidate Supervisor, 2014

East Carolina University, Internship in Science Education (SCIE 4324), Undergraduate face-to-face course

- Observed enactments of three teacher candidates at their internship placements
- Provided timely, targeted feedback to teacher candidates regarding professionalism, classroom management, science content knowledge, and reform-based science teaching practices

Middle School Science Methods Instructor, 2013

East Carolina University, Teaching Science in the Middle Grades (SCIE 4319), Undergraduate asynchronous distance education and face-to-face methods courses

- Guided teacher candidates during practicum experience that included development, rehearsal, revision, and enactment of an inquiry-based 5E unit plan
- Prepared teacher candidates for their edTPA certification tasks by engaging them in critical analysis of how standards, meaningful scientific phenomena, evidence-based explanations, academic language, and student characteristics should inform their teaching practice
- Supported teacher candidates in becoming reform leaders through use of the disciplinary core ideas, science practices, and crosscutting concepts of the Next Generation Science Standards

Life and Environmental Science Methods Instructor, 2013

East Carolina University, Life and Environmental Science Methods (SCIE 3604), Undergraduate asynchronous distance education methods course

- Engaged middle and high-school teacher candidates in improving their life/environmental science content knowledge through inquiry investigations of topics such as geologic timeline, evolution, structure/function relationships, biodiversity, sustaining organisms/ecosystems, renewable/non-renewable resources, and climate change

- Supported teacher candidates in improving their science pedagogy through investigating misconceptions, the Next Generation Science Standards, 5E lesson planning, and online synchronous peer teaching events

Secondary Science Methods Instructor, 2012-2014

East Carolina University, Introduction to Teaching in the High School Science Classroom (SCIE 3323), Undergraduate face-to-face methods course

- Engaged teacher candidates in their first experiences with classroom management, investigation into equitable teaching practices, 5E lesson planning, teaching rehearsals, and reflection on practice
- Guided teacher candidates during practicum experience that included multiple focused classroom observations, interviewing high school students, enacting individual lessons, and reflection upon teaching and assessment quality

Elementary Science Methods Instructor, 2012-2013

East Carolina University, Teaching Science in the Elementary School (SCIE 3216), Undergraduate face-to-face methods course

- Engaged teacher candidates in activities highlighting key elementary science content while introducing modern learning theory, 5E lesson planning, teaching rehearsals, and reflection on practice
- Guided teacher candidates during practicum experience that included observing a practicum teacher, interviewing elementary students, enacting individual and group lessons, and reflection upon teaching and assessment quality

SECONDARY SCIENCE TEACHING EXPERIENCE

Science Course Designer and Instructor, 2005-

2007 Duke University, Talent Identification

Program Cancer biology, 2006-2007; Genetics, 2005

- Developed and taught 3-week summer science courses providing the equivalent of a semester of university level instruction to talented and gifted high school students

High School Science Teacher, 2004-2006

Delaware Valley Charter High School, Philadelphia, PA

- Twelfth-grade physics and earth science teacher; lead science teacher; twelfth-grade lead teacher, 2005-2006
- Biology, physics, and earth science teacher for all grades, 2004-2005

PROFESSIONAL TRAINING

edTPA Local Evaluator Update

East Carolina University, College of Education

- Reviewed new scoring procedures and graded sample artifacts for the teacher performance assessment portfolio for licensure of science teachers

Distance Education Professional Learning Community Participant

East Carolina University, College of Education

- Participated in sessions introducing best practices and technologies for distance education classes

Tegrity Training

East Carolina University

- Learned how to capture lectures and add them to Blackboard for distance

education classes

Using the Learning Center as Your e-Textbook with Pre-Service Teachers

National Science Teachers Association

- Learned how to compile NSTA resources to supplement or replace textbooks in science education courses

NVivo Consultancy

QSR International

- Practiced advanced features of nVivo qualitative analysis software specific to my research

GRANTS

GCRT Grant, 2012

East Carolina University, MSITE Executive Advisory Council

- Received funding for research related scientific probes for use with the IQWST curricula (\$2,900)

Start Up Grant, 2012

East Carolina University, Division of Research and Graduate Studies

- Received funding for the first three years of research at ECU (\$36,570)

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

National Science Teachers Association, 2013-2014

North Carolina Science Leadership Association, 2012-2014

North Carolina Science Teachers Association, 2012-2014

NARST, 2007-present

American Educational Research Association, 2007-2014

American Association for the Advancement of Science, 2007-present

SERVICE TO PROFESSIONAL ORGANIZATIONS

NARST

Outstanding Paper Award Committee member, 2013-present

Graduate student forum co-organizer, 2010-2013

Graduate student forum panelist, 2009-2010

Membership and Election Committee member, 2008-2009, 2010-present

Conference proposal reviewer, 2008-present

International Society of the Learning Sciences

Conference proposal reviewer, 2011

American Educational Research Association

Conference proposal reviewer, 2008

Robert Glover

(b)(6)

Solution Architect/Director Technical Services

Mr. Glover is an information technology strategist and manager with over 20 years of experience in providing innovative technology solutions. Converts research or business requirements into an architecture and design that becomes the blueprint for technology solutions; motivates and guides developers to take ownership of their portion of the technology architecture; and continuously reinforces best practices that result in the delivery of high quality and novel technology solutions.

Career Highlights

- Defined the design and constructed a longitudinal student information database implemented on a relational database system for the SCALE project (System Wide Change for All Learners and Educators) encompassing data from Los Angeles Unified School District, Denver Public School District, Madison School District, and Providence RI School District
- Defined the design and constructed a longitudinal student information relational database and a secure web based report delivery for the Value Added Research Center's student value added reporting applications
- Initiated and implemented WCER's transition from VB6 to a Microsoft.NET C# environment that utilizes state of the art technology
- Collaborated with the WCER Business Office and the School Of Education Dean's Office to create the WCER personnel/proposal funding management system and the financial reporting tool that accesses data from disparate data sources including UW Shared Financial System and the PayData system managed by the Engineering School
- Provided substantive input to external projects including the design of a value added reporting system for the New York City School District, Chicago Public School District, and Milwaukee Public School System utilizing the University Wisconsin High Throughput Computing (CONDOR) system hosted within the Computer Sciences Department
- Participated in University Wisconsin -Madison campus wide policy setting groups including the Madison Information Security Team and Guidelines for the Use of Personal Equipment and Services To Conduct University Sponsored Activities, and School of Education IT Policy Advisory Committee
- Designed and implemented for Pacific Gas and Electric an web based invoicing and payment system that supported secure online delivery and payment of customer utility bills
- Designed and implemented a data warehouse for American Family Insurance that supported underwriting and actuarial decision making and data mining of policy holder loss experiences and agent performance that accessed data from numerous legacy mainframe systems and the delivery of real time ad hoc reports.

Career History

November 2003 to Present: Wisconsin Center for Education Research, University of Wisconsin - Madison

Director Technical Services (Current Title): Manage the Technical Services staff of WCER to ensure effective and responsive delivery of information technology services to multiple research centers housed within the School of Education. Responsibilities include management of technical support (help desk), technology purchases, software development (web and client server), and graphics design (web and print). Additional responsibilities include the design, implementation, and management of the information technology infrastructure for multiple centers within the School of Education. Involvement includes technology selection, configuration and administration of networks and servers, development and implementation of security, database design and administration, web server administration, and desktop and web application design frameworks based primarily on C# and Microsoft .NET framework. Support and participate through direct effort the research initiatives of principal investigators internal and external to the School of Education. Additional responsibilities include definition and implementation of software development best practices and software life cycle management

October 2001 to June 2003: CUNA Mutual Insurance Agency, Madison WI

Business Systems Consultant: Lead Developer for a CRM system for the use of CUNA Mutual independent sales representatives utilizing Siebel 7.04 eFins application. Main project responsibilities included design and implementation of systems to clean and load data feeds of credit union and member information from legacy systems utilizing web services written in VB.NET, Java2, WIN32 API, XML, XSL, and MQ Series. Other duties included system security and user interface customization.

April 2000 to January 2001: Utility.COM, Emeryville, CA

Senior Programmer/Analyst: Lead developer for a web based invoicing system for electric and gas utilities and a high volume data transfer system to support a web based electric and gas utility signups, invoicing, and payments. Project utilized COM objects developed in Visual C++ (ATL), XML, stored procedures and triggers running on Oracle Si, Java2, and the Vitria Messaging environment.

March 1997 to April 2000: American Family Insurance, Madison WI

Senior Database Developer: Design, implement and manage a data warehouse that supported underwriting and actuarial decision making and data mining. Data sources included Customer Billing, Agent Quality Management, Inforce Policies, and Casualty Risk Management. Project involved migrating data from legacy mainframe systems (DB2 and ADATABASE) to AIX UDB running on a 25 node IBM Symmetric Parallel Processing system. Project required extensive data modeling, complex SQL queries, and data cleaning strategies. Responsibilities also included development of user interfaces using Business Objects and Crystal Reports.

April 1994 to February 1997: Heurikon Corporation, Madison WI.

Lead Operating System Developer/Integrator: Design, implemented the integration of Wind River Systems real time operating system VxWorks with custom designed hardware used primarily in telecommunication

applications. Additional responsibilities included project management and implementation of hardware based monitors developed in CPU specific assembly language and microcode.

January 1998 to Present: Consultant, Sterling Software Solutions, Madison WI.

Provide consulting services to insurance and power utility companies. Clients included American Family Insurance, Sentry Insurance, and Alberta Canada Power and Light. Provide design and implement decision support and data mining applications including databases, data cleaning and loading, and reporting interfaces.

**Publications and
Education**

Publications

Christopher Thom, Robert Glover, Jeffery Watson: *Information Technology Considerations Center For Educator Compensation Reform*, <http://www.cecr.ed.gov/guides/itConsiderations.pdf>

Education

Bachelor Science Chemistry/Biochemistry, Wake Forest University, Winston-Salem NC - May 1977
Masters Business Administration, Edgewood College (Cumulative GPA 4.00/4.00; Graduation date August 2011)

References

Excellent professional and personal references will be provided upon request.

Dr. LeeAnn M. Sutherland

(b)(6)

Education

Doctorate (Ph.D., 2002). The University of Michigan, Ann Arbor; Educational Studies; Literacy, Language and Culture (Adolescent Content Area Literacy)
Master in the Art of Teaching: Reading (M.A.T., 1991). Aquinas College, Grand Rapids MI
Added both elementary education and reading endorsements to teacher certification
Bachelor of Arts: English/Sociology (B. A., 1979, cum laude). Alma College, Alma MI.
State of Michigan secondary teacher certification

Graduate and Professional Experience

Chief Academic Officer, Activate Learning, Greenwich, CT. (January 2013-present)
(Publisher of IQWST, science curriculum developed while full-time at UM)
Research Scientist, Center for Highly Interactive Classrooms, Curricula & Computing in Education (hi-ce), University of Michigan (2003-present).
Faculty affiliate, Center for Curriculum Materials in Science (CCMS).
Post Doctoral Research Fellow, hi-ce, University of Michigan (2002-03).
Graduate Student Research Assistant—University of Michigan (1996-2002)

- PIs: Ronald Marx, Phyllis Blumenfeld, Joseph Krajcik, Elizabeth Moje.
- PI: Pamela A. Moss
- Supervisor of ELA teacher interns. Director: Dr. Frederick Goodman.

Instructor, *A Taste of College*, Services for Students with Disabilities at UM (1997, 1998, 1999).
Lecturer II, *Writing Practicum*, English Composition Board, UM School of Literature, Science, and the Arts (1991-1996). Tutor training for UM Athletic Department (1994-1997).
Academic Skills Specialist, Multicultural Services Dept., Aquinas College, Grand Rapids, MI.
Career Education Instructor—Godwin Heights Public Schools, Wyoming MI; Middle School and High School Guidance Departments.
High School English Teacher—Montabella Community Schools, Edmore MI; Alma High School, Alma MI.

Related Grants

Center on the Use of Emerging Technologies to Improve Literacy Achievement for Students with Disabilities in Middle School (CET). U.S. Department of Education, Office of Special Education Programs, Technology and Media Services for Individuals with Disabilities. Collaborative grant, University of Michigan subcontract from CAST, **LeeAnn Sutherland, PI**. Lead PIs: David Rose, CAST, Ted Hasselbring, Vanderbilt. Awarded 2012-2017.

Collaborative Research: Universal Design of Middle and High School Science Curricula, **PI: LeeAnn Sutherland**, Co-PI Joe Krajcik. (Also David Rose, PI at the Center for Applied Special Technology [CAST]; Jackie Miller, PI, Education Development Center [EDC]. National Science Foundation DRL-0730260 (2007-2011, 2011-2012).

Collaborative Research: Developing the Next Generation of Middle School Science Materials -- Investigating and Questioning Our World Through Science and Technology. Original PIs: Joseph Krajcik and Brian Reiser (Northwestern); **Co-PIs: LeeAnn Sutherland** and David Fortus (Weizmann Institute of Science, Israel). **Sutherland PI** as of Krajcik's move from University of Michigan to Michigan State University, Fall 2011. National Science Foundation ESI 0101780 and DRL 0439352- (2001-2004, 2004-2010, 2010-2012).

Publications (Selected)

- Fortus, D., Sutherland, L. M., Reiser, B. J., & Krajcik, J. S. (in press). Assessing the role of curriculum coherence in student learning about energy. *Journal of Research in Science Teaching*.
- Daley, S. G., Hillaire, G., & Sutherland, L. M. (2014). Beyond performance data: Improving student help seeking by collecting and displaying influential data in an online middle-school science curriculum. *British Journal of Educational Technology*, n/a-n/a. doi: 10.1111/bjet.12221
- Shin, N., Sutherland, L. M., and Rappolt-Schlichtmann, G. (under review). Technology-Enhanced Universal Design of Learning Materials For All Students. *Educational Technology Research & Development*.
- Reiser, B. J., Brody, L., Novak, M., Sutherland, L. M. Tipton, K. (in press). Asking Questions and Defining Problems, in Schwarz, C. V., Passmore, C., & Reiser, B. J., (eds). *Moving Beyond "Knowing" Science to Making Sense of the World: Bringing Next Generation Science and Engineering Practices into our K-12 Classrooms*.
- Krajcik, J. S., Reiser, B. J., Sutherland, L. M. & Fortus, D., (2013) IQWST: Investigating and questioning our world through science and technology. 2nd Edition. Middle School Science Curriculum Materials. Greenwich, CT: Sangari Active Science.
- Krajcik, J. S., Reiser, B. J., Sutherland, L. M. & Fortus, D., (2011) IQWST: Investigating and questioning our world through science and technology. Middle School Science Curriculum Materials. Sangari Active Science: USA.
- Shin, N., Sutherland, L, Norris, C., & Soloway, E. (2011). "Effects of game technology on elementary student learning in mathematics". *British Journal of Educational Technology*.
- Krajcik, J.S. & Sutherland, L.M (2010) Supporting Students in Developing Literacy in Science. *Science*. American Association for the Advancement of Science. 456-459, vol 328, April 23, 2010.
- Sutherland, L.M, Shin, N., & Krajcik, J.S. (2010). *Exploring the Relationship between 21st Century Competencies and Core Science Content*. Paper commissioned by the National Academies, National Research Council, Washington, DC.
- http://www7.nationalacademies.org/dbasse/Research_on_21st_Century_Competencies.html
- Stevens, S.Y., Sutherland, L.M. & Krajcik, J.S. (2009). *The Big Ideas of Nanoscale Science and Engineering*. Arlington, VA: NSTA Press
- Sutherland, L. M. (2008). Reading in Science: Developing High-Quality Student Text and Supporting Effective Teacher Enactment. *Elementary School Journal*. 162-180.

- Schwartz, Y, Weizmann, A., Fortus, D., Sutherland, L., Merritt, J, & Krajcik, J. (June, 2008). Classroom discussions and their role in inquiry-based learning environments. *Science Teacher*.
- Sutherland, L. M., Botzakis, S., Moje, E. B., & Alvermann, D. E. (2008). Drawing on Youth Cultures in Content Learning and Literacy. In Lapp, D, Flood, J., Farnan, N. (Eds.), *Content Area reading and Learning: Instructional Strategies* (3rd ed), Needham Heights, MA: Allyn & Bacon.
- Sutherland, L.M., McNeill, K.L., Krajcik, J.S. & Colson, K. (2006). Supporting students in creating scientific explanations. In Douglas, R., Klentschy, M., & Worth, K. (Eds.), *Linking Science & Literacy in the K-8 Classroom* (pp. 163-181). Arlington, VA: NSTA Press.
- Sutherland, L.M., Meriweather, A., Rucker, S., Sarratt, P., Hines-Hale, Y., Moje, E.B, & Krajcik, J. (2006). “More emphasis” on scientific explanation: Developing conceptual understanding while developing scientific literacy. In R. E. Yager (Ed.) *Exemplary Science in Grades 5-8: Standards-Based Success Stories* (pp. 99-114). Arlington, VA: NSTA Press.
- Sutherland, L. M. (2005) Black adolescent girls’ use of literacy to negotiate boundaries of ascribed identity. *Journal of Literacy Research*, 37:3, pp. 365-406.
- Moje, E. B., Peek-Brown, D., Sutherland, L. M., Marx, R. W., Blumenfeld, P., Krajcik, J. (2004). Explaining explanations: Developing scientific literacy in middle-school project-based science reforms. In D. Strickland & D. E. Alvermann, (Eds.), *Bridging the Gap: Improving Literacy Learning for Preadolescent and Adolescent Learners in Grades 4-12* (pp. 227-251). New York: Teachers College Press.

Professional Papers and Presentations

- Sutherland, L. M. (August, 2014). *Connecting Science and Literacy with NGSS & Common Core: Middle School*. NSTA Virtual Conference.
- Peek-Brown, D., Stevens, S. Y., Sutherland, L., Choi, S., Shin, N., & Krajcik, J. (June, 2014). *Characterizing Teachers’ Support of Modeling Practices in Science Classrooms*. International Conference of the Learning Sciences, Boulder: CO.
- Sutherland, L. M. & Peek-Brown, D. (December, 2013). *Research-Based, Standards-Aligned Instruction: IQWST Middle School Science Curriculum*. Invited presentation for the National Academy of Sciences conference on Literacy for Science in the Common Core ELA Standards and The Next Generation Science Standards, Washington, D.C.
- Fortus, D. L., Sutherland, L. M., Reiser, B. J., Krajcik, J. S. (April, 2013). Assessing the Role of Curriculum Coherence in Student Learning about Energy. Paper presented at the National Association for Research in Science Teaching annual international conference, Rio Grande: Puerto Rico.
- Krajcik, J., Choi, S., Shin, N., & Sutherland, L. M. (June, 2012). *Improving Middle School Students’ Understanding of Core Science Ideas Using Coherent Curriculum*. Paper to be presented at the International Conferences of the Learning Sciences, Sydney, Australia.
- McCall, K. L., Sutherland, L.M., Shin, N. (2012) Investigating students’ patterns of use of supports in an electronic science inquiry unit. Poster presented at the Conference of the National Association for Research in Science Teaching. Indianapolis, IN.

- Shin, N. & Sutherland, L. M. (November, 2011). Technology-Enhanced Environment for Diverse Learners in Science, Paper presented at NTNU-HU-SNU Joint Symposium on Science Education, Taipei, Taiwan.
- Sutherland, L. M., Shin, N., Rappolt-Schlichtmann, G., Rose, D., Krajcik, J. S. (April, 2011). *Integrating Science, Literacy, Technology and Universal Design to Enhance Inquiry-Based Science Learning in Grades 6-8*. Symposium presented at the Annual Meeting of the American Educational Research Association. New Orleans, LA.
- Sutherland, L. M. & Krajcik, J. S. (April, 2011). *Science and Literacy as Integrated Disciplines in Inquiry Curriculum Design*. Paper presented at the Annual Meeting of the American Educational Research Association. New Orleans, LA.
- Shin, N., Sutherland, L. M. & McCall, K. L. (April, 2011) *Design-Based Research of Features in Inquiry-Based Science Materials*. Paper presented at the Annual Meeting of the American Educational Research Association. New Orleans, LA.
- McCall, K. L., Shin, N. & Sutherland, L. M. (April, 2011) *Investigating the Role of Video to Support Student Understanding of the Nature of Scientific Work*. Paper presented at the Conference of the National Association for Research in Science Teaching. Orlando, FL.
- Rose, D., Sutherland, L.M. & Miller J. (December, 2010). *Digital Curricula in Secondary Science: Developing UDL Materials, Envisioning UDL Classrooms*. Invited Session for NSF DRK-12 Annual Meeting, Washington, D.C.
- Sutherland, L.M. (June, 2010). *Examining middle school students' use of digital, multimedia-enhanced chemistry materials*. Paper presented at ISTE, Denver, CO. Research Paper Set with Rappolt-Schlichtmann, G., ISTE Enhancing Early Science Education through Universal Design for Learning: Two Technology Based Implementations
- McCall, K. L., Shin, N., & Sutherland, L. M. (March, 2010). *Evaluating the potential effects of scaffolding features on student learning of science*. Poster presented at the Annual Meeting of the National Association of Research on Science Teaching, Philadelphia, PA.
- Sutherland, L. M, Shin, N., & McCall, K. L. (March, 2010). *Integrating science, literacy, technology and universal design for learning to enhance middle school students' inquiry-based science learning*. Paper presented at the Annual Meeting of the National Association of Research on Science Teaching, Philadelphia, PA.
- Krajcik, J.S., Sutherland, L.M., Smith, S., Reiser, B., & Fortus, D. (March, 2010). *Comparing Student Achievement across Time in Contexts Using a Coherent Inquiry Curriculum Versus Those Using Traditional Curricula*. Paper presented at the Annual Meeting of the National Association of Research on Science Teaching, Philadelphia, PA.
- Merritt, J.D., Drago, K., Krajcik, J. S. & Sutherland, L.M. (March, 2010). *Curriculum Coherence: A Three Year Study of Middle School Students Understanding of Chemical Concepts*. Paper presented at the Annual Meeting of the National Association of Research on Science Teaching, Philadelphia, PA.
- Falk, A. H. & Sutherland, L.M. (March, 2010). *Opportunities for Science Teacher Learning Through Approximations of Whole-Class Discussions*. Paper presented at the Annual Meeting of the National Association of Research on Science Teaching, Philadelphia, PA.
- Sutherland, L.M., & Krajcik, J. S., (February, 2010). *Exploring the Relationship between 21st Century Competencies and Core Science Content*. Invited presentation for National Academies Planning Meeting on 21st Century Competencies. Washington, DC.
- Krajcik, J.S., & Sutherland, L.M. (2009). *IQWST Materials: Meeting the Challenges of the 21st Century*. Paper presented at the NRC Workshop on Exploring the Intersection between

Science Education and the Development of 21st Century Skills. Available:
http://www7.nationalacademies.org/bose/21st_Century_Skills_Workshop_Homepage.html.

http://www7.nationalacademies.org/dbasse/Research_on_21st_Century_Compencies.html

Krajcik, J.S., Fogleman, J. , Sutherland, L., Finn, L.(2008) *Professional Development That Supports Reform: Helping Teachers Understand and Use Reform-Rich Materials*. Poster presented at the Annual Meeting of the American Educational Research Association, New York: NY.

Sutherland, L.M., Moje, E.B., Cleveland, T. & Heitzman, M. (April 2006). *Incorporating literacy learning strategies in an urban middle school chemistry curriculum: Teachers' successes and dilemmas*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.

Blumenfeld, P. C., Krajcik, J. S., Kam, R., Kempler, T. M., Sutherland, L. M., Geier, R. (April 2005) *Opportunity to Learn in PBL for Middle School Science: Predicting Urban Student Achievement and Motivation*. Paper presented at the Annual Meeting of the American Educational Research Association, Montreal.

Workshops

Sutherland, L. M. (Repeated 2013-present). Connecting the Next Generation Science Standards and the Common Core State Standards for Science. (Several state and national conferences, as well as individual school districts in WI, MO, NY, TX, MA, SC, FL, MI, IL).

Sutherland, L. M. & Peek-Brown, D. (Ongoing September-December 2012) Literacy to Support Content Learning: Engaging as a School Community. Detroit, MI. Detroit School of Arts.

Krajcik, J.S. & Sutherland, L.M. (March, 2010). *Gaps Between the Standards and the Curriculum: Which Gaps Need Bridging and How?* Research Dissemination Conference of the Annual meeting of the National Science Teachers Association. Philadelphia, PA.

Sutherland, L. M. & Krajcik, J. S. (December, 2009) A Successful Professional Development Model for Preparing Teachers to use Reform-Based Curriculum Effectively. DRK-12 workshop for the Washington, D.C.: National Science Foundation

Memberships in Professional Organizations

American Educational Research Association (AERA), International Society of the Learning Sciences (ISLS), National Association for Research in Science Teaching (NARST), Association for Supervision and Curriculum Development (ASCD), Learning Disabilities Association of America (LDA), National Reading Conference (NRC), International Reading Association (IRA).

HEATHER MILO

OBJECTIVE

Science curriculum and instruction specialist looking for opportunities to engage learners in reflective dialogue centered on student thinking and the scientific practices, concepts, and language of the Next Generation Science Standards.

ACADEMIC PREPARATION

M.S.	2013-2015	University of Wisconsin - Madison	Madison, WI	<ul style="list-style-type: none">Curriculum & Instruction: Science EducationAcademic Interests: student sense-making, model-based inquiry, classroom discourse practices, teacher education, and science curriculum development.
B.S.	2004-2008	University of Wisconsin - Madison	Madison, WI	<ul style="list-style-type: none">Secondary Education: BiologyHarvey Meyerhoff Excellence Award for Leadership, Scholarship and Service, 2007

GRADUATE APPOINTMENTS

Wisconsin Center for Education Research (WCER) Science Education Project Assistant	2014-present	University of Wisconsin – Madison, WCER	Madison, WI	<ul style="list-style-type: none">Collaborate with Co-Principal Investigator, Dr. Leema Berland, on the National Science Foundation funded project, “Supporting scientific practices in elementary and middle school classrooms.” Explore the development of dialogic patterns that support and inhibit students’ ability to make sense of phenomena through explanatory models.Identify specific teacher and student discourse practices that linguistically position students as sense-makers, and that attend to and advance each other’s scientific ideas.
Education Portfolio & Career Services (EPCS) Consultant and Liason	2013-2015	University of Wisconsin – Madison, EPCS	Madison, WI	<ul style="list-style-type: none">Foster professional identity development through ongoing critical self-reflection and collaborative dialogue designed to raise critical awareness of their implicit values and assumptions about teaching and learning.Proceduralize assessment protocol to gather qualitative and quantitative feedback data from surveys, job fairs, e-portfolio, and workshops in order to evaluate office services, calculate job placement, and re-design future data gathering procedures.

TEACHING AND RELATED EXPERIENCE

Science Education Consultant	2015-present	Activate Learning	Nation-wide	<ul style="list-style-type: none">Develop middle school science curriculum using 4 design principles built on coherence: learning goal coherence; intraunit coherence between content learning goals, scientific practices, and curricular activities; interunit coherence between disciplines; and coherence between science literacy and general literacy skills.Conduct professional development that examines the 3 dimensions of NGSS and models instructional strategies that position students as science sense-makers.
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H.A.T.O.M.K.I.N.S@G.M.A.I.L.C.O.M

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PR/Award # S368A150019

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Summer Cooking Camp Coordinator	2014	Atlanta Botanical Garden (ABG)	Atlanta, GA	<ul style="list-style-type: none"> ▪ Budgeted grant funds to plan, coordinate, and implement a two-week long summer nutritional program with 16 middle school children who lacked access to fresh local foods. Practiced gardening and cooking techniques that could be replicated at home. ▪ Collaborated with the Afterschool All-Stars Program, Atlanta Public Schools, Georgia State University’s Dept. of Nutrition, the ABG chef, the ABG horticulturist, and two middle schools to recruit students, provide transportation to and from the garden, collect assessment data, plan a menu and healthy eating goals, integrate gardening techniques, and coordinate GSU nutrition internship experiences.
Middle School Science Teacher (Grades 6-8)	2012-2013	The Epstein School	Atlanta, GA	<ul style="list-style-type: none"> ▪ Collaborated weekly with three science teachers, two support staff, and principal to develop essential questions, assessment methods, and learning plans for 6th, 7th, and 8th grade science courses using Understanding by Design (UbD) framework. ▪ Restructured 15 science units to align with the cross-cutting concepts, disciplinary core ideas, and scientific practices outlined in the Next Generation Science Standards. ▪ Designed and implemented curricula for three five-week-long health & sex education programs in grades 6-8 and evaluated programs via discussion and survey feedback.
Lead Middle School Science Teacher (Grades 6-8)	2009-2012	Sophia Academy	Atlanta, GA	<ul style="list-style-type: none"> ▪ Ordered, inventoried, and facilitated the integration of three inquiry science units into each K-8 grade and met with teachers every trimester to evaluate progress. ▪ Prepared individualized accommodations and modifications for all middle school students based on psychological evaluation and annual testing data. ▪ Organized monthly professional development sessions on formative assessment strategies using technology such as iPads, flipcharts, and student response systems. ▪ Designed and implemented middle school study skills curriculum to provide our special needs population with strategies for organization and note-taking using interactive science notebooks.
JHU’s Center for Talented Youth (CTY) Summer Teacher Assistant	2007-2008	Johns Hopkins’ University CTY	Los Angeles, CA; Loudenville, NY	<ul style="list-style-type: none"> ▪ Co-taught “Introduction to Biomedical Sciences,” and “Fast-Paced High School Biology” two three-week courses for 8th-10th graders interested in pursuing higher education opportunities in medical and/or biotechnology fields.
Nutrition Educator	2007	Amigos de las Americas	Oaxaca, MEX	<ul style="list-style-type: none"> ▪ Fundraised \$4200 to travel to an underdeveloped Oaxacan community and reduced malnutrition by planting 30+ personal gardens and one community garden of locally-grown amaranth and taught weekly cooking and English classes.

TEACHING LICENSURE

Georgia Biology [FLD 750] grades 6-12; Clear Renewable, valid 3/2013 – 7/2017
 Science (Broad Field) [FLD 748] grades 6-12; Clear Renewable, valid 3/2015 – 7/2017

MARIANA CASTRO

(b)(6)

SUMMARY

National leader in the education of emergent bilinguals with experience in standards-based curriculum, instruction and assessment. Passionate and committed to equitable education of all children with a focus on English Language Learners and Emergent Bilinguals.

EXPERIENCE

- 2014-Present **Director of Academic Language and Literacy Initiatives, WIDA at Wisconsin Center for Education Research**
- Development of English and Spanish Language Development Standards for pre-K-12 grade
 - Research on issues related to language development, bilingualism and instruction and assessment
 - Consultation, technical expertise, and participation in national panels and initiatives related to second language development and bilingualism representing WIDA
- 2013-2014 **Director of Teaching and Learning, WIDA at Wisconsin Center of Education Research**
- Directed professional development activities, educator resources and professional development programs across and beyond the WIDA Consortium
 - Consulted and provided technical assistance to assessment development and research
 - Presented at national conferences and events
- 2006-2013 **Coordinator of Professional Development, WIDA at Wisconsin Center of Education Research**
- Directed professional development activities, educator resources and professional development programs across and beyond the WIDA Consortium
 - Consulted and provided technical assistance to assessment development and research
 - Presented at national conferences and events
- 2006-2013 **Coordinator of Professional Development, WIDA at Wisconsin Center of Education Research**
- Managed and coordinated professional development opportunities for the WIDA Consortium
 - Managed, trained and supervised consultants and outreach specialist that deliver professional development across our Consortium
 - Provided technical support to State Educational Agencies, administrators and teachers across the fifteen states in the Consortium.
 - Presented at local, regional, and national professional conferences

- 2005-2015 **Adjunct Faculty, *Edgewood College***
- Developed and delivered courses in ESL methodology, assessment, and language development for ESL, bilingual, science and mathematics teachers
 - Guest lectured for Elementary and Secondary Education courses
- Summer 2012 **Adjunct Faculty, *Whitewater***
- Delivered courses on assessment and ESL methodology
- 2003-2006 **Program Support Teacher, *Madison Metropolitan School District***
- Coordinated bilingual programs in 4 elementary schools and 2 middle schools
 - Developed and delivered professional development on second language acquisition, working with ELLs and bilingual methodology
 - Developed and trained ELS and Bilingual Education summer teachers
 - Consulted on School Improvement Plans and Special Education Identification
 - Participated in the Equity Team for the Division of ESL and Student Services
- 2000-2003 **Science, ESL and Bilingual Education Teacher, *Madison Metropolitan School District***
- Developed and taught courses: Newcomer Science, ESL Biology, Chemistry in the Community, Latino American Language and Culture
 - Participated as a member of the School Improvement Team, Professional Learning Communities Initiative, and Equity Team
- 2000-2002 **Adjunct Faculty, *Madison Area Technical College (AKA Madison College)***
- Developed and taught courses for adults in conversational Spanish
- Summer 1999, 2000 and 2001 **Biology and Chemistry Instructor, *PEOPLE Program, UW Madison***
- Designed, developed and delivered enrichment and preparatory courses for minority students entering high school
- 1994-2000 **Bilingual Resource Specialist, *Madison Metropolitan School District***
- Provided linguistic and academic support to English Language Learners in general education and ESL classes
 - Provided small group and individual instruction to students
 - Served as liaison for families and the Latino Community
 - Translated and interpreted in daily and legal documentation, IEP meetings and parent-teacher conferences
 - Taught Spanish Classes to general education teachers
- 1992-2000 **After-School Spanish Teacher, *Madison Metropolitan School District***

- Planned, designed and taught Enrichment Spanish courses to elementary school children as an after-school program
- Planned, designed and taught conversational Spanish to middle school teachers

- 1991-1994 **Special Education Assistant, *Madison Metropolitan School District***
- Provided support to students with severe cognitive and physical disabilities, autism and Down syndrome at elementary school level
 - Worked with students in classroom and during Physical and Occupational Therapy
- 1990-1991 **Child Care Practitioner, *Safe Heaven, Madison, WI***
- Developed curriculum and worked with 2 and 3 year old children
- 1988-1990 **Teacher of English as a Foreign language, *Centro Cultural de Lenguas Modernas***
- Developed curriculum and taught English as a foreign language to 3-4 years old children and adults

EDUCATION

- 2015 **PhD in Education, Curriculum and Instruction with an emphasis in Teacher Education *UW Madison***
- 2003 **Master of Science in Education, Curriculum and Instruction with an emphasis on ESL and Bilingual Education *UW Whitewater***
- 2000 **Bachelor in Science, Education *UW Madison***
- 1997 **Bachelor in Science, Chemistry *UW Madison***

CERTIFICATES AND LICENSES

- Wisconsin **Chemistry Licensure (610) – NCATE Accredited**
- Wisconsin **Bilingual Secondary Licensure (028) – NCATE Accredited**
- Wisconsin **Bilingual Elementary License (044) – NCATE Accredited**
- Wisconsin **English as a Second Language License (395) – NCATE Accredited**

PUBLICATIONS

- Mc, Donald, R., Boals, T., Castro, M. Cook, H. G., Lundberg, T. and White, P. (2015). *Formative language assessment for English learners: A Four-Step Process*. Portsmouth: Heinemann
- Valdés, G., Menken, K. and Castro, M. (2015). *Common core, bilingual and English language learners: A resource for educators*. Philadelphia: Caslon Publishing
- Mancilla, L., Boals, T. and Castro, M. (2014). De aquí y de allá: Latino borderland identities. In C. A. Grant & E. Zwiier (2014). *Intersectionality and urban education: Identities, policies, spaces, and power*. Charlotte: Information Age Publishing
- Castro, M. and Mancilla, L. (2014). El baile del lenguaje en la educación bilingüe. In *Soleado-Promising Practices from the Field*, 7(3).
- Castro, M. and Mancilla, L. (2013). Las normas del desarrollo del español académico: Preparando la tierra para una nueva cosecha. In *Soleado-Promising Practices from the Field*, 6(2).
- Castro, M., Ibarra-Johnson, S., Mancilla, L., & Venegas, P. (2013, April-May). El continuo lingüístico del español: A Systemic Functional Linguistics Approach to Examining the Academic Spanish Development of Emergent Bilingual Students. Paper presented at the 2013 American Educational Research Association Annual Conference, San Francisco, CA.
- Castro, M. (2010). Coaching and Mentoring in Practice. In C. J. Casteel & K. G. Ballantyne. (Eds.) (2010) *Professional development in action: Improving teaching for English learners*. Washington, DC: National Clearinghouse for English Language Acquisition. Available at http://www.ncele.gwu.edu/files/uploads/3/PD_in_Action.pdf

CONTRIBUTIONS TO THE FIELD

Contributor to and co-authored the following publications:

- WIDA English Language Development Standards, 2.5-5.5 Years © 2014. Board of Regents of the University of Wisconsin System, on behalf of the WIDA Consortium - www.wida.us.
- WIDA Spanish Language Development Standards, K-12 © 2013. Board of Regents of the University of Wisconsin System, on behalf of the WIDA Consortium - www.wida.us.
- Council of Chief State School Officers. (2012). Framework for English Language Proficiency Development Standards corresponding to the Common Core State Standards and the Next Generation Science Standards. Washington, DC: CCSO
- WIDA English Language Development Standards, K-12 © 2012. Board of Regents of the University of Wisconsin System, on behalf of the WIDA Consortium - www.wida.us.

CONFERENCE PRESENTATIONS

- 2015 *Language Policy Implications of the Common Core State Standards for ELLs/Emergent Bilinguals*, Toronto, Canada, May, 2015
- 2014 *Transforming the Problem-Based Notion of Academic Language to a Resource-Based Perspective*, 2014 American Educational Research Association Annual Meeting, Philadelphia, PA, April 2014
2013. Castro, M., Ibarra-Johnson, S., Mancilla, L. . Pedagogía con respeto: Construyendo junto con nuestros estudiantes una educación basada en estándares, La Cosecha Conference, Albuquerque, NM.

LANGUAGES

English, Spanish and French

AWARDS

2005-2006 Aristo Scholar, Teacher Recognition at Madison Metropolitan School District
1998-2000 Morgridge Grant Recipient

MEMBERSHIPS

American Educational Research Association (AERA)
American Association for Applied Linguistics (AAAL)
Association for Supervision and Curriculum Development (ASCD)
National Association for Bilingual Educators (NABE)
National Association for Multicultural Education (NAME)
State Collaboratives on Assessment and Student Standards (SCASS)
TESOL International Association (TESOL)

AMELIA WENK GOTWALS, PH.D.

Michigan State University
325 Erickson Hall
620 Farm Lane East Lansing, MI 48824
gotwals@msu.edu

EDUCATION

Ph.D., Educational Studies, University of Michigan, 2006

M.S., Ecology and Evolutionary Biology, University of Michigan, 2005

M.S. Science Education, University of Michigan, 2004

B.A. Biology, Brown University, Providence, R.I., 1998

PROFESSIONAL EXPERIENCE

2014-present: Associate Professor of Science Education, Department of Teacher Education, College of Education, Michigan State University, East Lansing, MI

2006-2014: Assistant Professor of Science Education, Department of Teacher Education, College of Education, Michigan State University, East Lansing, MI

2001-2006: Research Assistant, NSF- Funded Project BioKIDS: Kids Inquiry of Diverse Species, School of Education, University of Michigan, Ann Arbor, MI

1999-2001: Middle School and High School Science and Biology Teacher, The Pingry School, Martinsville, NJ.

1998-1999: Middle School Science Teacher, West Nottingham Academy, Colora, MD.

SELECTED PUBLICATIONS

Gotwals, A.W. & Anderson, C.W. (in press). Learning progressions. *Encyclopedia of Science Education*. New York, NY: Springer Press.

Gotwals, A.W., & Birmingham, D. (in press). Eliciting, identifying, interpreting and responding to students' ideas: Teacher candidates' growth in formative assessment practices. *Research in Science Education*.

Gotwals, A.W., Kintz, T., Cisterna, D. & Lane, J. (accepted). Distinguishing observable formative assessment practices: A synthesis of the literature. *Educational Assessment Journal*.

Gotwals, A.W., Cisterna, D., Ezzo, D. Philhower, J. & Roeber, E. (accepted). Testing hypotheses about teaching: A practice progressions approach to formative assessment.

Educational Assessment Journal.

- Hokayem, H., Gotwals, A.W., & Weinburg, M. (2014). A method for developing a learning progression for systemic reasoning. In Berlin, D.F. & White, A.L. (Eds). *Initiatives in Mathematics and Science Education with Global Implications*. Columbus, OH: International Consortium for Research in Science and Mathematics Education.
- Gotwals, A.W., & Songer, N.B. (2013). Validity evidence for learning progression-based assessment items that fuse core disciplinary ideas and science practices. *Journal of Research in Science Teaching*. 50, 597-626.
- Gotwals, A.W., Hokayem, H., Song, T., & Songer, N.B. (2013). The role of disciplinary core ideas and practices in the complexity of large-scale assessment items. *Electronic Journal of Science Education*. 17, 1-25.
- Songer, N.B., & Gotwals, A.W. (2012). Guiding explanation construction by children at the entry points of learning progressions. *Journal for Research in Science Teaching*, 49, 141-165.
- Alonzo, A. C., & Gotwals, A. W. (Eds.). (2012) *Learning progressions in science: Current challenges and future directions*. Rotterdam, The Netherlands: Sense Publishers.
- Gotwals, A. W. (2012). Learning progressions for multiple purposes: Challenges in using learning progressions. In A.C. Alonzo & A.W. Gotwals (Eds). *Learning progressions in science: Current challenges and future directions* (pp. 461-475). Rotterdam, The Netherlands: Sense Publishers.
- Gotwals, A.W., Songer, N.B., & Bullard, L. (2012). Assessing students' progressing abilities to construct scientific explanations. In A. C. Alonzo & A. W. Gotwals (Eds.) *Learning progressions in Science* (pp. 183-210). The Netherlands: Sense Publishing.
- Gotwals, A.W., & Songer, N.B. (2010). Reasoning up and down a food chain: Using an assessment framework to investigate students' middle knowledge. *Science Education*. 94, 259-281.
- Hokayem, H., & Gotwals, A. W. (2010). Investigating the nature of evidence 6th grade students use in constructing scientific explanations in biodiversity. In Gomez, K, Lyons, L., & Radinsky, J. (Eds.) *Learning in the disciplines: Proceedings of the 9th International Conference of the Learning Sciences (ICLS 2010)* (pp. 435-437). Chicago, IL.: International Society of the Learning Sciences.
- Songer, N. B., Kelcey, B., & Gotwals, A.W. (2009). How and when does complex reasoning occur? Empirically driven development of a learning progression focused on complex reasoning in biodiversity. *Journal of Research in Science Teaching*. 46, 610-6

RECENT SELECTED PRESENTATIONS

- Gotwals, A.W., Hokayem, H. & Wright, T. (2014, April). Argumentation at the start of school: Characterizing the entry points into a learning progression for argumentation. Paper presented at the annual meeting of the National Association of Research in Science Teaching, Pittsburgh, PA.
- Bennett, S. & Gotwals, A.W. (2014, April). Evidence-based explanation skills of non-science majors at a community college. Paper presented at the annual meeting of the American Educational Research Association, Philadelphia, PA.
- Frasier, A., Bennett, S. Cisterna, D. & Gotwals, A.W. (2014, April). Policy Churn and the micro- level implementation of a statewide professional development program. Paper

- presented at the annual meeting of the American Educational Research Association, Philadelphia, PA.
- Gotwals, A.W., Cisterna, D. & Ezzo, D. (2014, April). FAST: Formative Assessment for Science Teachers. Presentation at the annual meeting of the National Science Teacher Association, Boston, MA.
- Gotwals, A.W., Cisterna, D.A., Ezzo, D., Kintz, T., Lane, J., & Roeber, E. (2013, April). *Formative assessment practice progressions: Lessons from the Formative Assessment for Michigan Educators Project*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.
- Gotwals, A.W., & Ezzo, D. (2013, April). *The role of science in supporting critical collegiality in a mixed-content professional learning community*. Paper presented at the annual meeting of the National Association of Research in Science Teaching, Rio Mar, Puerto Rico.
- Cisterna, D., & Gotwals, A.W. (2013, April). *Science teachers learning to formatively assess in a community-based professional development*. Paper presented at the annual meeting of the National Association of Research in Science Teaching, Rio Mar, Puerto Rico.
- Hokayem, H., & Gotwals, A.W. (2013, April). A learning progression for early elementary students' ecological systemic reasoning. Paper presented at the annual meeting of the National Association of Research in Science Teaching, Rio Mar, Puerto Rico.
- Gotwals, A.W. (2013, April). Next generation assessment. In Sato, T. (Chair), *The next generation of science education research: The importance of collaboration and interdisciplinary research agendas*. Symposium conducted at the annual meeting of the National Association of Research in Science Teaching, Rio Mar, Puerto Rico.
- Gotwals, A.W. (2012, April). Formative assessment practices in the classroom. In A.W. Gotwals (Chair), *The impact of a statewide professional development model for formative assessment*. Related paper set presented at the annual meeting of the American Educational Research Association, Vancouver, BC, Canada.
- Gotwals, A.W., & Birmingham, D. (2012, March). *Eliciting, identifying, interpreting and responding to students' ideas: Teacher candidates' growth in formative assessment practices*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.
- Hokayem, H., & Gotwals, A.W. (2012, March). *Learning progression for students' reasoning about food webs at lower elementary*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Indianapolis, IN.

GRANTS

LPF-CMP2 Innovation Grant, CREATE for STEM Institute, Michigan State University
 August 2013-August 2014 (co-PI)
SOLID Start: Designing Curriculum to Promote Science, Oral language, and Literacy Development from the Start of School
 \$100,000

Michigan Department of Education
 August 2010-August 2014 (PI)
FAME: Formative Assessment for Michigan Educators

\$699,764

The National Science Foundation
Learning Progressions in Science
(LeaPS) August 2008-August 2011 (PI)
\$99,998

The National Science Foundation
Deep Think: Thinking Deeply about Biodiversity through Inquiry
August 2006-August 2010 (co-PI)
\$3 Million (MSU sub-contract, \$208,607).

The Spencer Foundation
Spencer Dissertation
Fellowship 2005-2006
\$30,000

RECENT NATIONAL PROFESSIONAL SERVICE

2013: Michigan State Network of Educators for Smarter Balanced Digital Library, Michigan Department of Education

2013-present: Publication Advisory Committee, National Association of Research in Science Teaching

2013: Planning committee and co-leader of breakout session for Next Generation of Science Standards (NGSS) rollout, Michigan Department of Education and CREATE for STEM Institute

2009-2013: Expert Reviewer, STEM Scopes Assessment Team, Rice University. 2012-present: Editorial Board Member, *Journal of Research in Science Teaching*

2012-present: Michigan representative for the Council of Chief State School Officers, State Collaborative on Assessment and Student Standards (SCASS), Formative Assessment for Students and Teachers (FAST).

2012: Advisory Board for the Science Cognitively Based Assessment of, for, and as Learning (CBAL) group, Educational Testing Service.

2011: Committee member for feedback on National Research Council's *Framework for Science Education*, National Association of Research in Science Teaching.

JAMES WILLIAM PELLEGRINO

Present Position

Liberal Arts & Sciences Distinguished Professor
Distinguished Professor of Education
University of Illinois at Chicago
Chicago, IL 60607

Office Address

Learning Sciences Research Institute (M/C 057)
1240 W. Harrison Street
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Chicago, IL 60601
(312) 413-2320

Education

Colgate University: Bachelor of Arts; Major: Psychology; 1965-1969
Univ of Colorado: Master of Arts; Experimental & Quantitative Psychology; 1969-1970
Univ of Colorado: Doctor of Philosophy; Experimental & Quantitative Psych; 1971-1973

Professional Experience

2001-	Liberal Arts and Sciences Distinguished Professor & Distinguished Professor of Education, Co-Director, Learning Sciences Research Institute, University of Illinois at Chicago
1992-1998	Dean, Peabody College of Education and Human Development, Vanderbilt University
1989-2001	Frank W. Mayborn Professor of Cognitive Studies, Peabody College, Vanderbilt University
1987-1989	Chairman, Department of Education, University of California at Santa Barbara
1979-1989	Associate Professor and Professor of Education and Psychology, University of California at Santa Barbara
1973-1979	Assistant and Associate Professor in the Department of Psychology and Research Associate in the Learning Research and Development Center, University of Pittsburgh

Selected Publications

A learning sciences perspective on the design and use of assessments in education. In K. Sawyer (Ed.), *Cambridge Handbook of Research in the Learning Sciences* (pp. 233-252), Cambridge, England: Cambridge University Press, 2014.

Assessment as a positive influence on 21st century teaching and learning: A systems approach to progress. *Psicología Educativa* 20, 1-13, 2014.

Developing assessments for the Next Generation Science Standards (with M. Wilson, J. Koenig, & A. Beatty). Washington, DC: National Academies Press, 2014.

Proficiency in science: Assessment challenges and opportunities. *Science*, 340, 320-323, 2013

Assessment of science learning: Living in interesting times. *Journal of Research in Science Teaching*, 49(6), 831-841, 2012.

The design of an assessment system for the race to the top: A learning sciences perspective on issues of growth and measurement. In Bernholt, S., Neumann, K. & Nentwig, P. (Eds.). *Making it Tangible - Learning Outcomes in Science Education* (pp. 87-117). Münster: Waxmann, 2012.

Concept Inventories as Aids for Instruction: A Validity Framework with Examples of Application (with L. DiBello, K. James. N. Jorion, & L. Schroeder). In *Proceedings of 2011 International Research in Engineering Education Symposium* (pp. 698-706). Madrid, Spain, 2011.

A Technology for Assessing Multiple Source Comprehension: An Essential Skill of the 21st Century (with S. Goldman, K. Lawless, J. Braasch, F. Manning, & K. Gomez). In M. Mayrath, J. Clarke-Midura, & D. H. Robinson (Eds.). *Technology-based assessments for 21st Century skills: Theoretical and practical implications from modern research* (pp. 173-210). Charlotte, NC: Information Age Publishing, 2011.

Perspectives on the integration of technology and assessment (with E. Quellmalz). *Journal of Research on Technology in Education*, 2011, 43(2), 119-134.

The Challenges of Conceptualizing What Low Achievers Know and Assessing that Knowledge. In M. Perie (Ed.). *Teaching and Assessing Low-Achieving Students with Disabilities: A Guide to Alternate Assessments Based on Modified Achievement Standards* (pp. 67-109). Baltimore, MD: Brookes Publishing, 2010.

Perspectives on technology and testing (with E. Quellmalz). *Science*, 2009, 323, 75-79.

Educating Future Engineers: Who, What, and How (with S. Sheppard & B. Olds, Eds.). Special Issue of the *Journal of Engineering Education*, July 2008.

From cognitive theory to instructional practice: Technology and the evolution of *Anchored Instruction* (with S. Brophy). In D. Ifenthaler, J. M. Spector, & P. Pirnay-Dummer (Eds.), *Understanding models for learning and instruction: Essays in honor of Norbert Seel* (pp. 277-303). New York: Springer, 2008.

Technology and formative assessment (with J. Brown & S. Hinze). In T. Good (Ed.), *21st Century Education. Vol 2. Technology* (pp. 245-255). Thousand Oaks, CA: Sage. 2008.

Teacher education and technology: Initial results from the "What Works and Why" project (with S. Goldman, M. Bertenthal, & K. Lawless). In L. Smolin, K. Lawless, & N. Burbules (Eds.), *Information and communication technologies: Considerations of current practice for teachers and teacher educators*. New York: Blackwell, 2007.

Beyond rhetoric: Realities and complexities of integrating assessment into teaching and learning (with S. Goldman). In C. Dwyer (Ed). *The future of assessment: Shaping teaching and learning* (pp. 7-52). Mahwah, NJ: Erlbaum, 2007.

A validity framework for evaluating the technical quality of alternate assessments (with S. Marion). *Educational Measurement: Issues and Practice*, Winter 2006, 47-57.

Educational assessment: Towards better alignment between theory and practice (with D. Hickey). In L. Verschaffel, F. Dochy, M. Boekaerts, & S. Vosniadou (Eds.). *Instructional psychology: Past, present and future trends. Sixteen essays in honour of Erik De Corte (Advances in Learning and Instruction Series)* (pp 169-189). Oxford: Elsevier, 2006.

Instructionally supportive accountability tests in science: A viable assessment option? (with J. Popham, T. Keller, B. Moulding, & P. Sandifer). *Measurement: Interdisciplinary Research and Perspectives*, 2005, 3(3), 121-187.

Theory, level, and function: Three dimensions for understanding transfer and student assessment (with D. T. Hickey). In J. P. Mestre (Ed.). *Transfer of learning from a modern multidisciplinary perspective* (pp. 251-293). Greenwich, CO: Information Age Publishing, 2005.

Learning and Instruction: A SERP Research Agenda (with S. Donovan). Washington, DC: National Academy Press, 2004.

Designs for research on technology and assessment: Conflicting or complementary agendas? In B. Means & G. Haertel (Eds.), *Using Technology Evaluation to Enhance Student Learning* (pp. 49-56). New York: Teachers College Press, 2004.

Complex learning environments: Connecting learning theory, instructional design, and technology. In N. J. Seel & S. Dijkstra (Eds.). *Curriculum, plans, and processes in instructional design: International perspectives* (pp. 25-48). Mahwah, NJ: Erlbaum Associates, 2004.

The foundations of assessment (with N. Chudowsky). *Measurement: Interdisciplinary Research and Perspectives*, 2003, Vol 1, No. 2, 103-148.

Connecting learning theory and instruction: Principles, practices and possibilities. In F. Achtenhagen & E. John (Eds.), *Milestones of vocational education and training. Vol. 1. The teaching-learning perspective.* (pp. 17-42). Bielefeld: Bertelsmann, 2003.

Connecting learning theory and instructional practice: Leveraging some powerful affordances of technology (with the Cognition and Technology Group at Vanderbilt). In H. O'Neill & R. Perez (Eds.), *Technology applications in education: A learning view* (pp. 173-209). Mahwah, NJ: Erlbaum, 2002.

Understanding how students learn and inferring what they know: Implications for the design of curriculum, instruction and assessment. In M. J. Smith (Ed.), *NSF K-12 Mathematics and Science Curriculum and Implementation Centers Conference Proceedings* (pp. 76-92). Washington, DC.: National Science Foundation and American Geological Institute, 2002.

Knowing What Students Know: The Science and Design of Educational Assessment (with N. Chudowsky & R. Glaser). Washington, DC: National Academy Press, 2001.

The motivational and academic consequences of elementary mathematics environments: Do constructivist innovations and reforms make a difference? (with D. Hickey & A. Moore). *American Educational Research Journal*, 2001, 38, 611-652.

Adventures in anchored instruction: Lessons from beyond the ivory tower (with the Cognition and Technology Group at Vanderbilt). In R. Glaser (Ed.), *Advances in instructional psychology: Vol 5. Educational design and cognitive science* (pp. 35-99). Mahwah, NJ: Erlbaum, 2000.

Addressing the two disciplines problem: Linking theories of cognition and learning with assessment and instructional practice (with G. Baxter & R. Glaser). In A. Iran-Nejad & P. D. Pearson (Eds.), *Review of research in education* (pp. 309-355). Washington, DC: AERA, 1999.

Grading The Nation's Report Card: Evaluating NAEP and Transforming the Assessment of Educational Progress (with L. Jones & K. Mitchell). Washington, DC: National Academy Press, 1999.

How People Learn: Bridging Research and Practice (with S. Donovan & J. Bransford). Washington, DC: National Academy Press, 1999.

The Jasper Project: Lessons in curriculum, instruction, assessment and professional development (with the Cognition and Technology Group at Vanderbilt). Mahwah, NJ: Erlbaum, 1997.

Looking at technology in context: A framework for understanding technology and education (with the Cognition and Technology Group at Vanderbilt). In D. Berliner & R. Calfee (Eds.) *The handbook of educational psychology* (pp. 807-840). New York: Simon and Schuster Macmillan Publishing, 1996.

The Jasper series: A generative approach to improving mathematical thinking (with the Cognition and Technology Group at Vanderbilt). In K. Sheingold, L. Roberts, & S. Malcom (Eds.), *This Year in Science Series 1991: Technology for Teaching and Learning* (pp. 108-140), Washington, DC: American Association for the Advancement of Science.

Synergistic Activities

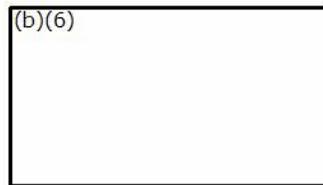
- National Academy of Sciences/National Research Council Committee on the Evaluation of the National and State Assessments of Educational Progress (Committee Chair);
- National Academy of Sciences/National Research Council Committee on Cognitive Science Foundations of Assessment (Committee Co-chair);
- National Academy of Sciences/National Research Council Committee on Learning Research and Educational Practice (Committee Co-chair);
- National Academy of Sciences/National Research Council Committee on Strategic Education Research Partnerships: Panel on Learning and Instruction (Committee Chair);
- National Academy of Sciences/National Research Council Committee on Deeper Learning and 21st Century Skills (Committee Chair);
- National Academy of Sciences/National Research Council Committee on Developing Assessments of Science Proficiency in K12 (Committee Co-chair);
- National Academy of Sciences/National Research Council Board on Testing and Assessment (Board Member)
- Co-developer with other members of the Cognition and Technology Group at Vanderbilt of "*The Adventures of Jasper Woodbury*" a multimedia mathematical problem solving series (educational product for K-12).

Collaborators (last 48 mo.)

Susan Goldman (UIC), Kimberly Lawless (UIC), Tom Moher (UIC), Donald Wink (UIC), Lou DiBello (UIC), Kim Gomez (UCLA), Joe Krajcik (Michigan State), Mark Reckase (Michigan State), Jeanne Pemberton (Arizona), Bob Chang (NU), Jim Minstrell (FACET Innovations), Angela DeBarger (SRI), Neil Heffernan (WPI), Jodi Davenport (WestEd).

VITA

EDWARD D. ROEBER



Academic History

University of Michigan	1966	A.B. Psychology
University of Michigan	1967	A.M. Educational Psychology (Measurement and Evaluation)
University of Michigan	1970	Ph.D. Measurement and Evaluation

Recent Work Experience

8/12 - Assessment Director, Michigan Assessment Consortium, Lansing, MI
1/10 - Managing Partner, Assessment Solutions Group
1/11-8/14. Senior Assessment Policy Advisor, Wisconsin Center for Education Research/WIDA, University of Wisconsin, Madison, WI
8/12 -8/14 Consultant, Michigan State University Formative Assessment for Michigan Educators Research Project, East Lansing, MI
9/07-9/12 Adjunct Professor, Counseling, Education Psychology and Special Education; Teacher Education, Michigan State University College of Education, East Lansing, MI
11/03-9/07 Senior Executive Director, Office of Assessment & Accountability, Michigan Department of Education
7/98-11/03 Vice-President, External Relations, Measured Progress, Dover, NH.
4/91-7/98 Director, Student Assessment Programs, Council of Chief State School Officers, Washington, D.C.
3/76-4/91 Supervisor, Michigan Educational Assessment Program, Michigan Department of Education, Lansing, Michigan
7/72-3/76 Coordinator, Test Development, Michigan Educational Assessment Program, Michigan Department of Education, Lansing, Michigan
5/69-6/72 Consultant, Exercise Development, National Assessment of Educational Progress/Education Commission of the States, Ann Arbor, MI and Denver, CO.

Selected Consultation (Since 1993)

1993 National Assessment Governing Board. Developed guidelines for the administration of NAEP below the state level.
Co-authored paper on the impact of reporting the state NAEP program

1994 Chair, External Review Committee, Florida Accountability Commission (1994-1995)
Member, Michigan English Language Arts Framework Advisory Committee
Member, Technical Advisory Committee, Michigan Department of Education (1994-98)
National Evaluation Consultant, Massachusetts Assessment Advisory Committee (1994-95)

- 1995 Chair, External Review Committee, Illinois State Board of Education
- Member, RFP National Advisory Committee, Kentucky Department of Education (1995-96)
- 1996 Member, Technical Advisory Committee, Missouri Department of Education (1996-1998 and 2003-Present)
- Chairman, Oregon Content and Performance Standards Review Team, Oregon Department of Education
- 1997 Consultant, Minnesota Department of Education (1997-98)
- Consultant, Alaska Department of Education (1997-98)
- Consultant, Pinckney Community Schools (1999-2001) Helped develop district's comprehensive assessments.
- 2002 Michigan Accreditation National Expert Panel (2002-2003)
- MEAP External Review (2002)
- 2003 Education Commission of the States, Developed concept papers on accountability.
- USED Blue Ribbon Schools Reviewer (2003 to 2012)
- 2004 Nevada Special Education Technical Advisory Committee (2004-2005)
- 2005 Ontario Provincial Department of Education Advisor on RFP development (2005).
- 2006 National Assessment Governing Board, Wrote Paper on the Motivation of Twelfth Grade Students for the NAEP
- Idaho Technical Advisory Committee (2006 to 2012)
- Review of the Performance of the Utica (MI) Community Schools
- 2007 Panel Member, Washington Office of Superintendent of Public Instruction, Assessing English Language Learners (2007)
- Member, RFP Review and Selection Committee, National Board of Professional Teaching Standards
- 2008 Bermuda Technical Advisory Committee (2008-2009)
- Member, Technical Work Group, National Clearinghouse for English Language Acquisition (2008-2010)
- 2009 Contractor to the Idaho State Department of Education for the ISAT-Alt alternate assessment program (2009-2010)

- 2010 Senior Partner, Assessment Solutions Group (2010 to present)
Assist the MS Department of Education to revise its RFP for the alternate assessment program, and assist in the conduct of competitive bidding on the project.
- 2011 Dynamic Learning Maps Technical Advisory Committee
- 2011 Consultant, Wisconsin Center for Education Research/WIDA, University of Wisconsin, Madison, WI (2011-2012)
- 2014 Member, Quality of English Language Proficiency Assessments (2014-Present)
Member, Idaho Technical Advisory Committee (2014-Present)
- 2015 External Consultant, Indiana State Board of Education

Selected Publications (Since 1991)

- Roeber, Edward D. (1991) "A Guide to Developing and Administering Performance Assessments in Large-Scale Assessment Programs."
- Fisher, Thomas H. and E. Roeber. (1991) "Educational Standard-Setting at the State Level." Paper written for the National Assessment Governing Board.
- Roeber, Edward D. (1992) "Designing the Comprehensive Assessment System: Top Down or Bottom Up?"
- Biance, Michael and E. Roeber. (1997) "A Policymaker's Guide to Standards-Based Accountability System," Denver, CO: Education Commission of the States.
- Roeber, Edward D. (1998) "Standards and Educational Reform." A chapter written for a book on education policy edited by Greg Cizek.
- Roeber, Edward and M. Mastie. (2000) *Steps in the Right Direction: Using and Reporting Assessment Results*. Dover, NH: Advanced Systems in Measurement & Evaluation.
- Roeber, Edward. (2000) "Developing Coordinated Assessment Systems." Compact, March 2000. Education Commission of the States.
- Roeber, Edward and K. Warlick. (2001) "Challenge and Change of IDEA '97." State Education Standard, Autumn 2001. National Association of State Boards of Education.
- Roeber, Edward. (2002). "Setting Standards on Alternate Assessments for Students with Disabilities." Monograph 41. Minneapolis, MN: National Center on Educational Outcomes, University of Minnesota.
- Roeber, Edward. (2003) "Assessment Models for No Child Left Behind." Issue Brief on Accountability, Denver, CO: Education Commission of the States.

- Roeber, Edward. (2003) "Appropriate Inclusion Of Students with Disabilities In State Accountability Systems." Issue Brief on Accountability, Denver, CO: Education Commission of the States.
- Rabinowitz, S., E. Roeber, C. Schroeder, and J. Sheinker. (2006) "Creating Aligned Standards and Assessment Systems." Washington, DC: Council of Chief State School Officers.
- Roeber, Edward D. (2006) "The History of the National Conference on Large-Scale Assessment Conference." Washington, DC: Council of Chief State School Officers.
- Roeber, Edward and J. Olsen. (2007) "History of the State Collaboratives on Assessment and Student Standards." Washington, DC: Council of Chief State School Officers.
- Topol, Barry, J. Olsen, and E. Roeber. (2010) "The Cost of New High Quality Assessments: A Comprehensive Analysis of the Potential Costs for Future State Assessments." Stanford Center for Opportunity Policy in Education.
- Roeber, Edward. (2011) "Educator Evaluation – Models, Parameters, Issues and Implementation." East Lansing, MI: Michigan Education Association.
- Roeber, Edward. (2012) "Interim Benchmark Assessment – A Typology."
- Topol, Barry, J. Olsen, E. Roeber, and P. Hennon. (2012) "Getting to Higher-Quality Assessments: Evaluating Costs, Benefits, and Investment Strategies." Stanford Center for Opportunity Policy in Education.
- McMannus, S., & Roeber, E. (2013). Is there a role for formalized tools in formative assessment? Paper presented at the 2013 American Educational Research Association Annual Meeting, San Francisco, CA. April 2013.
- Gotwals, A.W., D. Cisterna, D. Ezzo, T. Kintz, J. Lane, and E. Roeber. Formative-Assessment Practice Progressions: Lessons Learned from the Formative Assessment for Michigan Educators Project. Paper presented at the 2013 American Educational Research Association Annual Meeting, San Francisco, CA. April 2013.
- McMannus, S., & Roeber, E. (2013). Resolved: Formalized assessments cannot be considered 'formative assessment.' Paper presented at the 2013 CCSSO National Conference on Student Assessment, National Harbor, MD. June 2013.
- Gotwals, Amelia, et al. Testing Hypotheses about Teaching: A Practice Progressions Approach to Formative Assessment. Educational Assessment (Draft Paper).

Selected Presentations (Since 1993)

- 1996 U.S. Senate, Education and Labor Committee, Testimony on Title I (IASA)
Kentucky State Board of Education
Louisiana State Board of Education
- 2007 Presenter on Assessment, Michigan Association for Supervision and Curriculum
Development, Curriculum Leaders Institute (2007-Present)
- 2008 Oregon State Board of Education

- 2009 Webinar on assessment in the arts for NASDAE
- 2010 CCSSO Meeting on the Costs of Using Innovative Assessment Models
NRC BOTTA Meeting on the Costs of Using Innovative Approaches to Assessment
- 2015 Presentation to the Indiana State Board of Education

STEPHEN G. SIRECI, PhD

College of Education—Center for Educational Assessment

University of Massachusetts

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Education

Ph.D. in Psychology (Psychometrics), Fordham University, Bronx, NY

Master of Arts in Psychology, Loyola College, Baltimore, MD

Bachelor of Arts in Psychology, Loyola College, Baltimore, MD

Professional Experience

September, 1995 to Present:

Professor, School of Education, University of Massachusetts Amherst

Director, Center for Educational Assessment, University of Massachusetts Amherst

Adjunct Associate Professor, Psychology Department (11/02), University of Massachusetts Amherst

June, 1992 to August, 1995:

Senior Psychometrician, American Council on Education, Washington, D.C.

August, 1990 to July, 1992:

Psychometrician, American Institute of Certified Public Accountants, New York, NY

June, 1990 to August, 1990:

Predoctoral Fellow, Educational Testing Service, Princeton, NJ

May, 1989 to June, 1990:

Research Supervisor of Testing, Newark Board of Education, Newark, NJ

(Promoted from Senior Research Assistant in January, 1990).

Selected National Commissions, Blue-Ribbon Panels, and Advisory Committees

2010-present	Florida Alternate Assessment Technical Advisory Committee
2004-present	Puerto Rico Technical Advisory Committee (Chair, since 2010)
2004-present	Texas Technical Advisory Committee
2005-2011	National Center on Educational Outcomes, Research-to-Practice Panel
2006-2011	National Alternate Assessment Center, Expert Panel
2006-2010	Psychometric Oversight Committee, American Institute of CPAs
2006-2009	Assessing multiple sources reading comprehension, Advisory Board
2007-2009	Massachusetts Teacher Educator Licensure Pass Rate Study Group
2004-2009	Designing Accessible Reading Assessments Technical Advisory Committee
2004-2009	Partnership for Accessible Reading Assessment Technical Advisory Committee
2003-2009	Graduate Management Admissions Council Technical Advisory Committee
2003-2009	Federation of State Boards of Physical Therapy Technical Advisory Committee
2004-2008	New Hampshire Assessment Technical Advisory Committee
2004-2008	New Hampshire Enhanced Assessment Initiative Tech. Advisory Committee
2005-2007	National Board of Professional Teaching Standards Assessment Certification Advisory Panel (Chair), resumed 2013-present
2003-2007	Senior Scientist, The Gallup Organization
2003-2006	Montana Comprehensive Assessment System Technical Advisory Committee

Selected National Commissions, Blue-Ribbon Panels, and Advisory Committees (continued)

2003-2006	Graduate Records Exam Technical Advisory Committee
2005-2006	Technical Adequacy of Assessments for Alternate Student Populations, WestEd
2002-2004	National Assessment of Educational Progress Quality Assurance Panel
2002-2003	Maine Comprehensive Assessment System Technical Advisory Committee
2003	Committee on Diagnostic Methodology (The College Board)
2001-2002	College Board's Blue Ribbon Panel on the Flagging of Test Scores
2001-2002	Commission on Instructionally Supportive Assessment
2001-2002	Massachusetts Comprehensive Assessment System Blue Ribbon Panel

Recent Awards/Honors

Outstanding Teacher Award, School of Education, University of Massachusetts, 2002-2003.
Chancellor's Award, University of Massachusetts Amherst, 2007
Fellow, Div. of Evaluation, Measurement, and Statistics, American Psychological Association, 2007.
Fellow, American Educational Research Association, 2009
Outstanding Accomplishments in Research and Creative Activity, UMass Amherst, 2009
Thomas Donlon Award for Distinguished Mentoring (Northeastern Educ. Research Assoc.), 2010
Samuel F. Conti Faculty Fellowship Award, University of Massachusetts Amherst, 2012

Consulting

Currently or formerly consulted with a wide variety of national testing organizations, local boards of education, professional licensure organizations, federal government agencies, and other educational research or service organizations since 1987. Current and former clients include the American Institute of Certified Public Accountants, Association of American Medical Colleges, the College Board, Educational Testing Service, Federation of State Medical Boards, the Gallup Organization, the Graduate Management Admissions Council, Microsoft, National Academy of Sciences, Newark (NJ) Board of Education, Novell, and Westfield Public Schools.

Selected Publications

- Allalouf, A., Hambleton, R. K., & Sireci, S. G. (1999). Identifying the sources of differential item functioning in translated verbal items. *Journal of Educational Measurement*, 36, 185-198.
- Chakwera, E., Khembo, D., & Sireci, S. G. (2004). High-stakes testing in the warm heart of Africa: The challenges and successes of the Malawi National Examinations Board. *Education Policy Analysis Archives*, 12(29) (see <http://epaa.asu.edu/epaa/v12n29/>).
- Chulu, B. W., & Sireci, S. G. (2011). Importance of equating high-stakes educational measurements. *International Journal of Testing*, 11, 38-52.
- Hambleton, R. K., Sireci, S. G., & Smith, Z. (2009). Evaluating NAEP achievement levels in the context of international assessments. *Applied Measurement in Education*, 22, 376-393.
- Hauger, J. B., & Sireci, S. G. (2008). Detecting differential item functioning across examinees tested in their dominant language and examinees tested in a second language. *International Journal of Testing*, 8, 237-250.
- Huff, K. L., & Sireci, S. G. (2001). Validity issues in computer-based testing. *Educational Measurement: Issues and Practice*, 20 (3), 16-25.
- Karantonis, A., & Sireci, S. G. (2006). The bookmark standard setting method: A literature review. *Educational Measurement: Issues and Practice*, 25 (1), 4-12.

Selected Publications (continued)

- Li, X., & Sireci, S. G. (2013). A new method for analyzing content validity data using multidimensional scaling. *Educational & Psychological Measurement*, 73, 365-385.

- Martone, A., & Sireci, S. G. (2009). Evaluating alignment between curriculum, assessments, and instruction, *Review of Educational Research* 4, 1332-1361.
- Militello, M., Schweid, J., & Sireci, S. G. (2010). Formative assessment systems: evaluating the fit between school districts' needs and assessment systems' characteristics, *Educational Assessment, Evaluation, and Accountability*, 29-52.
- O'Neil, T., Sireci, S. G., & Huff, K. F. (2004). Evaluating the consistency of test content across two successive administrations of a state-mandated science assessment. *Educational Assessment*, 9, 129-151.
- Pitoniak, M. J., Sireci, S. G., & Luecht, R. M. (2002). A multitrait-multimethod validity investigation of scores from a professional licensure exam. *Educational and Psychological Measurement*, 62, 498-516.
- Randall, J., Sireci, S. G., Li, X., & Kaira, L. (2013). Evaluating the comparability of paper- and computer-based science tests across sex and SES subgroups. *Educational Measurement: Issues and Practice*, 31(4), 2-12.
- Sireci, S. G. (1997). Problems and issues in linking tests across languages. *Educational Measurement: Issues and Practice*, 16(1), 12-19.
- Sireci, S. G. (1998). Gathering and analyzing content validity data. *Educational Assessment*, 5, 299-321.
- Sireci, S. G. (1998). The construct of content validity. *Social Indicators Research*, 45, 83-117.
- Sireci, S. G. (2005). Unlabeling the disabled: A perspective on flagging scores from accommodated test administrations. *Educational Researcher*, 34(1), 3-12.
- Sireci, S. G. (2007). On validity theory and test validation. *Educational Researcher*, 36(8), 477-481.
- Sireci, S. G. (2008). Are educational tests inherently evil? In D. A. Henningfeld (Ed.). *At issue: Standardized testing* (pp. 10-16). Detroit: Thompson Gale.
- Sireci, S. G. (2009). Packing and unpacking sources of validity evidence: History repeats itself again. In R. Lissitz (Ed.), *The Concept of Validity: Revisions, New Directions and Applications* (pp. 19-37). Charlotte, NC: Information Age Publishing Inc.
- Sireci, S. G. (2013). Agreeing on validity arguments. *Journal of Educational Measurement*, 50, 99-104.
- Sireci, S. G. (2013). Trafność symulacyjnych gier jako narzędzi oceny. *Personel Plus*, 08(69), 8-11. [Validating simulation games as assessment tools. Published in Polish.]
- Sireci, S. G., & Allalouf, A. (2003). Appraising item equivalence across multiple languages and cultures. *Language Testing*, 20, 148-166.
- Sireci, S. G. & Berberoglu, G. (2000). Using bilingual respondents to evaluate translated-adapted items. *Applied Measurement in Education*, 35 (2), 229-259.
- Sireci, S. G., & Clauser, B. E. (2001). Issues to be considered in setting standards on computerized-adaptive tests. In C.J. Cizek (Ed.), *Standard setting: Concepts, methods, and perspectives*. (pp. 355-369). Mahwah, NJ: Lawrence Erlbaum.
- Sireci, S. G., & Faulkner-Bond (2014). Validity evidence based on test content. *Psicothema*, 26, 100-107. doi: 10.7334/psicothema2013.256.
- Sireci, S. G., & Forte, E., (2012). Informing in the information age: How to communicate measurement concepts to education policy makers. *Educational Measurement: Issues and Practice*, 31(2), 27-32.
- Sireci, S. G. & Geisinger, K. F. (1992). Analyzing test content using cluster analysis and multidimensional scaling. *Applied Psychological Measurement*, 16, 17-31.
- Sireci, S. G., & Geisinger K. F. (1995). Using subject matter experts to assess content representation: An MDS analysis. *Applied Psychological Measurement*, 19, 241-255.

- Sireci, S.G., & Green, P.C. (2000). Legal and psychometric criteria for evaluating teacher certification tests. *Educational Measurement: Issues and Practice*, 19(1), 22-31, 34.
- Sireci, S. G., Han, K. T., & Wells, C. S. (2008). Methods for evaluating the validity of test scores for English language learners. *Educational Assessment*, 13, 108-131.
- Sireci, S. G., Harter, J., Yang, Y., & Bhola, D. (2003). Evaluating the equivalence of an employee attitude survey across languages, cultures, and administration formats. *International Journal of Testing*, 3, 129-150.
- Sireci, S. G., Hauger, J. B, Wells, C. S., Shea, C., & Zenisky, A. L. (2009). Evaluation of the standard setting on the 2005 grade 12 National Assessment of Educational Progress mathematics test. *Applied Measurement in Education*, 22, 339-358.
- Sireci, S. G., & Parker, P. (2006). Validity on trial: Psychometric and legal conceptualizations of validity. *Educational Measurement: Issues and Practice*, 25(3), 27-34.
- Sireci, S. G., & Pitoniak, M. J. (2007). Assessment accommodations: What have we learned from research? In C. C. Laitusis & L. Cook (Eds.) *Large scale assessment and accommodations: What works?* (pp. 53-65). Arlington: Council for Exceptional Children.
- Sireci, S. G., & Rios, J. (2013). Decisions that make a difference in detecting differential item functioning. *Educational Research and Evaluation*, 19, 170-187.
- Sireci, S. G., Scarpati, S., & Li, S. (2005). Test accommodations for students with disabilities: An analysis of the interaction hypothesis. *Review of Educational Research*, 75, 457-490.
- Sireci, S. G., & Talento-Miller, E. (2006). Evaluating the predictive validity of Graduate Management Admissions Test Scores. *Educational and Psychological Measurement*, 66, 305-317.
- Sireci, S. G., Thissen, D., & Wainer, H. (1991). On the reliability of testlet-based tests. *Journal of Educational Measurement*, 28, 237-247.
- Sireci, S. G., Yang, Y., Harter, J., & Ehrlic, E. (2006). Evaluating guidelines for test adaptations: A methodological analysis of translation quality. *Journal of Cross-Cultural Psychology*, 37, 557- 567.
- Sireci, S. G., Zanetti, M. L., & Berger, J. B. (2003). Recent and anticipated changes in postsecondary admissions: A survey of New England colleges and universities. *Review of Higher Education*, 26, 323-342.
- Wainer, H., Sireci, S. G., & Thissen, D. (1991). Differential testlet functioning: Definitions and detection. *Journal of Educational Measurement*, 28, 197-219.
- Wells, C. S., Baldwin, S., Hambleton, R. K., Sireci, S. G., Karantonis, A. & Jirka, S. (2009). Evaluating score equity assessment for state NAEP. *Applied Measurement in Education*, 22, 394-408.
- Ying, L., & Sireci, S. G. (2007). Validity issues in test speededness. *Educational Measurement: Issues and Practice*, 26(4), 29-37.
- Zenisky, A. L., Hambleton, R. K., & Sireci, S. G. (2009). Evaluating the utility of NAEP reporting practices. *Applied Measurement in Education*, 22, 359-375.

Selected Professional Service

Member, Board of Directors, National Council on Measurement in Education, April 2006-April 2009 President, Northeastern Educational Research Association, 2006-2007 (Past-President

2007-2008).

Co-editor, *International Journal of Testing*, September 2008- June 2013

Co-editor, *Journal of Applied Testing Technology*, December 2000—

May 2008 Editorial Board, *Applied Measurement in Education*, since

January 1996 Editorial Board, *Psicothema*, since November 2000

Editorial Board, *International Journal of Testing*, since January 2002—September

2008 Editorial Board, *Educational and Psychological Measurement*, since

December 2004 Editorial Board, *European Journal of Psychological Assessment*,
since 2005

Editorial Board, *Educational Measurement: Issues and Practice*, 5/2000—12/2003, 2009-

present Board of Directors, Northeastern Educational Research Association, 1996-1999

VITA
Martha L. Thurlow

SUMMARY OF RELATED EXPERIENCE

Dr. Thurlow has spent 25 years conducting research and technical assistance on the inclusion of all students, including students with disabilities and English learners, in appropriate instruction and assessments, and in policies that support successful progress through school for college and career readiness. Her areas of focus have been participation criteria, accommodations policies and practices, universal design of assessments, and the development of new assessment systems.

PRESENT POSITION

Director, National Center on Educational Outcomes (1999-present)
Senior Research Associate, Department of Educational Psychology (1999-present)
Senior Research Associate, Institute on Community Integration (1999-present)

EDUCATION

Ph.D., University of Minnesota, Minneapolis, MN; Educational Psychology; Special Education. Dissertation: A longitudinal study of instructional ecology and student responding for students with and without learning disabilities, 1993.
M.A., University of Minnesota, Minneapolis, MN; Educational Psychology; Special Education (Mental Retardation), 1971.
B.A., University of Minnesota, Minneapolis, MN; Psychology, 1968.

SELECTED PUBLICATIONS/PRESENTATIONS

Thurlow is an author of 17 books, one test bank, 2 instructor's manuals, and more than 50 book chapters. Among her recent books and chapters are:

Thurlow, M.L., & Quenemoen, R.F. (in press). Alternate assessments for students with disabilities. In C. Wells & M. Faulkner-Bond (Eds.), *Educational measurement: From foundations to future*. New York: Guilford.

Thurlow, M.L., & Kopriva, R.J. (in press). Advancing accessibility and accommodations in content assessments for students with disabilities and English learners. *Review of Research in Education*.

Thurlow, M.L. (in press). How should we evaluate whether special education works? In B. Bateman, J.W. Lloyd, & M. Tankersley (Eds.), *Enduring issues in special education: Personal perspectives* (pp. 323-339). New York: Routledge.

Thurlow, M.L. (2014). Instructional and assessment accommodations in the 21st century. In L. Florian (Ed.), *The Sage handbook of special education* (2nd ed. pp. 597-631). Thousand Oaks, CA: Sage.

Thurlow, M.L., Lazarus, S.S., & Christensen, L.L. (2013). Accommodations for assessment. In B. Cook & M. Tankersley (Eds.), *Effective practices in special education* (pp. 311-327). Iowa City: Pearson.

Shriner, J.G., & Thurlow, M.L. (2012). Curriculum-based measurement, progress monitoring and state assessments. In C.A.Espin, K.L. McMaster, S. Rose, & M.M. Wayman (Eds.), *A measure of success: The influence of curriculum-based measurement on education* (pp. 247-258). Minneapolis, MN: University of Minnesota Press.

Banerjee, M., & Thurlow, M. (2012). Using data to find common ground between secondary and postsecondary accommodations for students with disabilities. In C. Secolsky (Ed.), *Handbook on measurement, assessment, and evaluation in higher education*.

Thurlow, M.L., Quenemoen, R.F., & Lazarus, S.S. (2012). Leadership for student performance in an era of accountability. In J. Crockett, B. Billingsley, & M. Boscardin (Eds.), *The handbook of leadership & administration for special education* (pp. 3-16). London: Routledge.

Thurlow, M.L., & Quenemoen, R.F. (2011). Standards-based reform and students with disabilities. In J.M. Kauffman & D.P. Hallahan (Eds.), *Handbook of special education* (pp. 134-146).. New York: Routledge.

Thurlow, M.L. (2010). Large scale assessment and accountability for students with special needs. In E. Baker, P. Peterson, & B. McGaw (Eds.), *International encyclopedia of education* (3rd ed.) (pp. 752-758). Oxford: Elsevier.

Thurlow has been an author of more than 175 articles in refereed journals and numerous articles in other outlets. Among these are:

Thurlow, M.L. (in press). Accommodation for challenge, diversity and variance in human characteristics. *Journal of Negro Education*.

Thurlow, M.L., Wu, Y.C., Lazarus, S.S., & Ysseldyke, J.E. (in press). Special education – Non-special education achievement gap in math: Effects of reporting methods, analytical techniques, and reclassification. *Exceptionality*.

Thurlow, M.L. (2014). Dispelling misperceptions: Shifting focus from whether standards-based reforms result in better outcomes to how they can result in better outcomes! A response to Ryndak et al. *Research and Practice for Persons with Severe Disabilities*, 39(2), 154-155.

- Thurlow, M.L. (2014). Common core for all – Reaching the potential for students with disabilities. *Social Policy Report*, 28(2), 18-20.
- Thurlow, M.L., & Lazarus, S.S. (2013). Leading special education as it transitions to next-generation assessments (Introduction to the special issue). *Journal of Special Education Leadership*, 26(1), 5-8.
- Thurlow, M.L., Lazarus, S.S., Hodgson, J.R. (2012). Leading the way to appropriate selection, implementation, and evaluation of the read-aloud accommodation. *Journal of Special Education Leadership*, 25(2), 72-80.
- Johnstone, C.J., & Thurlow, M. (2012). Statewide testing of reading: What are we testing and how might it affect students with disabilities? *The Journal of Special Education*, 46(1), 17-25.
- Lazarus, S.S., Cormier, D.C., & Thurlow, M.L. (2011). States' accommodations policies and development of alternate assessments based on modified achievement standards: A discriminant analysis. *Remedial and Special Education*, 32(4), 301-308. (Online version available March, 2010).
- Thurlow, M.L. (2010). Steps toward creating fully accessible reading assessments. *Applied Measurement in Education*. 23(2), 121-131.

Thurlow has been an author of more than 175 reports from federally funded projects and other sources. Some of these reports are:

- Lazarus, S., Thurlow, M., Christensen, L., & Shyyan, V. (2014). *Successfully transitioning from the AA-MAS to the general assessment* (Policy Directions 22) Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.
- Thurlow, M. L., Liu, K. K., Ward, J. M., & Christensen, L. L. (2013). *Assessment principles and guidelines for ELLs with disabilities*. Minneapolis, MN: University of Minnesota, Improving the Validity of Assessment Results for English Language Learners with Disabilities (IVARED).
- Liu, K.K., Goldstone, L.S., Thurlow, M.L., Ward, J.M., Hatten, J., & Christensen, L.L. (2013). *Voices from the field: Making state assessment decisions for English language learners with disabilities*. Minneapolis, MN: University of Minnesota, Improving the Validity of Assessment Results for English Language Learners with Disabilities (IVARED).
- Christensen, L. L., Albus, D. A., Liu, K. K., Thurlow, M. L., & Kincaid, A. (2013). *Accommodations for students with disabilities on state English language proficiency assessments: A review of 2011 state policies*. Minneapolis, MN: University of

Minnesota, Improving the Validity of Assessment Results for English Language Learners with Disabilities (IVARED).

Lazarus, S. S., Thurlow, M. L., Rieke, R., Halpin, D., & Dillon, T. (2012). *Using cognitive labs to evaluate student experiences with the read aloud accommodation in math* (Technical Report 67). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Hodgson, J. R., Lazarus, S. S., Price, L. M., Altman, J. R., & Thurlow, M. L. (2012). *Test administrators' perspectives on the use of the read aloud accommodation in math on state tests for accountability* (Technical Report 66). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Rogers, C.M., Christian, E.M., & Thurlow, M.L. (2012). *A summary of the research on the effects of test accommodations: 2009-2010* (Technical Report 65). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Thurlow has made presentations at more than 200 international, national, regional, state, and local conferences. Some of these reports are:

Thurlow, M.L. (2014). (Moderator). *NCME symposium on growth models for special populations*. National Council on Measurement in Education, Philadelphia, PA.

Thurlow, M.L. (Discussant), Stevenson, Z (Chair), Russell, M., Chia, M., & Reavis, T. (2013, April). Inclusion of students with disabilities and English learners in the administrations of the Race to the Top assessments: Technical issues and accommodations. National Council on Measurement in Education, San Francisco.

Liu, K.K., Thurlow, M.L., Goldstone, L., & Christensen, L.L. (2013, April). Enhancing state assessment validity for English language learners with disabilities. American Educational Research Association, San Francisco.

SELECTED PROFESSIONAL ACTIVITIES

Editorial Activities – Selected Examples

Assessment for Intervention, 2010-

Journal of Disability Policy Studies, 2008-

Journal of Special Education, 1999-

Exceptional Children, 1988-91, 1993-95, 2003-2006; 1995-2003 (Co-editor)

Technical Advisory Committees – Selected Examples

SMARTER Balanced Assessment Consortium Technical Advisory Committee, 2010-

CCSSO-NGA Common Core Standards Validation Committee, 2009-2010

Technical Advisory Panel on Uniform National Rules for NAEP Testing of Students with Disabilities, 2009

National Center for Learning Disabilities Growth Model Task Force, 2009
U.S. Department of Education Growth Peer Review Panel, 2007, 2008
NAEP Full Population Estimates Workgroup, 2007

Professional Affiliations – Selected Examples

American Educational Research Association
Council for Exceptional Children (2009-2012 Chair of Honors Committee)
National Council on Measurement in Education (2014 Chair of Diversity and Testing Committee)

Funded Projects – Selected Examples

Accessible Reading Assessments (2004-2009, extension to 2010)
National Alternate Assessment Center Subcontract (2005-2009, extension to 2010)
Universally Designed Assessments (2005-2006, completed for Thompson)
Technology Assisted Reading Assessments Subcontract (2006-2011)
Minnesota Accommodations Training (2007-2008)
Multi-State GSEG (2007-2010, extension to 2011)
Alabama GSEG (2008-2010)
Accommodations Monitoring (2008-2009)
Minnesota Accommodations Evaluation (2009-2010)
GSEG to Support Alabama (2010-2011)
Improving the Validity of Assessment Results for ELLs with Disabilities (2011-2013)
Disability Advisory Panel for SMARTER Balanced Assessment Consortium (2011-2012)
Smarter Balanced Assessment Consortium (2013-2014)

PHOEBE C. WINTER

(b)(6)

EDUCATION

Ph.D. Psychology: Measurement, Evaluation, and Applied Statistics, Columbia University, NY

M.A., M.Ed. Psychology: Measurement, Evaluation, and Applied Statistics, Columbia University, NY

B.A. Psychology, magna cum laude, Clemson University, Clemson, SC

PROFESSIONAL EXPERIENCE

INDEPENDENT CONSULTANT (CURRENT)

Consulting projects include

- Serving on state and national technical advisory committees for large-scale assessment programs.
- Providing advice on task and test development, automated and hand scoring, and establishing and evaluating score/inference validity for research projects in online assessment.
- Working with groups of state education staff members and researchers to develop an innovative online assessment of English language proficiency.

PACIFIC METRICS CORPORATION, MONTEREY, CA (2009–2014)

EXECUTIVE VICE PRESIDENT FOR EDUCATION POLICY

- Sat on the Executive Team and oversaw the work of the Research Department.
- Monitored and interpreted federal and state policy, national trends, and innovations in assessment and accountability.
- Designed and implemented research and development strategies and projects to improve the quality of assessments and enhance the validity of results.
- Advised Pacific Metrics' clients on the implications of federal legislation and policies related to assessment and accountability.
- Served as a consultant and advisor regarding federal policy on large-scale assessment; served on state technical advisory committees and as an advisor to national research projects.
- Advised Pacific Metrics' Executive Team and Directors on national assessment decisions, issues, needs, and upcoming changes in the external environment.
- Developed and delivered presentations to state department of education staff, federal education staff, researchers, and other stakeholders.

CONSULTANT IN EDUCATIONAL ASSESSMENT DESIGN AND POLICY, STATISTICAL ANALYSIS, AND EDUCATIONAL RESEARCH AND EVALUATION (1994–2009)

Consulting projects included

- Coordinating CCSSO's state consortium on Technical Issues in Large-Scale Assessment (TILSA).
- Serving on state and national technical advisory committees.
- Working with the U.S. Department of Education as a peer reviewer for state assessment and accountability and as a technical consultant.
- Designing and developing state and district level assessments.
- Working on university-based research projects and conducting analyses of assessment data.
- Reviewing and developing proposals and requests for proposals for large-scale assessment programs.
- Conducting and developing program evaluations.

CENTER FOR THE STUDY OF ASSESSMENT VALIDITY AND EVALUATION, COLLEGE OF EDUCATION, UNIVERSITY OF MARYLAND (2002–2004)

RESEARCH DIRECTOR

- Directed research projects in large-scale assessment and evaluation focusing on accessibility and validity, including design and instrument development, and managed all aspects of project implementation, from development of proposals to analysis and reporting of results.
- Coordinated the dissemination of results and wrote and edited articles and papers related to Center studies.

COUNCIL OF CHIEF STATE SCHOOL OFFICERS, STATE EDUCATION ASSESSMENT CENTER (1995–2002)

PROJECT DIRECTOR

- Worked with national experts, state department of education staff, and U.S. Department of Education staff to address technical and policy issues associated with the use of large-scale assessment.
- Directed two consortia in the State Collaborative on Assessment and Student Standards: Technical Issues in Large-Scale Assessment and Comprehensive Assessment Systems for Title I.
- Served as author for the 2005 NAEP Mathematics Test and Item Specifications.

VIRGINIA DEPARTMENT OF EDUCATION, DIVISION OF RESEARCH, EVALUATION, AND STUDENT TESTING (1991–1994)

PRINCIPAL, QUANTITATIVE ANALYSIS

- Worked on the development and implementation of Virginia's assessment programs; responsibilities included designing, coordinating, and conducting statistical analyses of assessment data; coordinating the revision of the assessment program; designing and carrying out assessment-related research; training readers in Virginia's six-domain writing scoring model; managing the technical and financial aspects of contracts; preparing reports and making presentations describing the results of complex psychometric procedures for lay and technical audiences.
- Assisted with the design and implementation of Virginia's educational accountability system. Served on departmental teams, providing both technical and policy advice on student assessment and served as Virginia's representative to national organizations.

SOUTH CAROLINA DEPARTMENT OF EDUCATION, OFFICE OF RESEARCH (1983-1991)

EDUCATION PROGRAM SPECIALIST

- In the Teacher Assessment Unit, coordinated the development and implementation of a pre-service teacher assessment program; responsibilities included coordinating all aspects of test development; planning and conducting psychometric analyses of test data; developing publicity materials; coordinating contractual services and budgets; training readers in a holistic writing scoring process; making presentations to legislative and State Board of Education committees.
- Worked on other teacher assessment projects, including the development of teacher licensure tests and the development of in-service teacher evaluation programs.
- In the Student Assessment Unit, designed new student assessment programs and implemented existing programs. Responsibilities included coordinating the development of mathematics and early childhood assessment programs; assisting in the development of language arts assessments; training readers in a holistic writing scoring process; working with schools in the development of innovative forms of assessment; designing and implementing psychometric analyses; advising department staff on assessment-related policy; preparing and presenting reports for lay and technical audiences.

PUBLICATIONS, PRESENTATIONS, AND PAPERS

- Almond, P., Tindal, G., Kopriva, R., Winter, P.C., Linn, R. (1998). LEP, special education, and large-scale assessment – Can we find a one size fits all approach that works? Presentation at the annual National Conference on Large-Scale Assessment, Colorado Springs, Colorado.
- Almond, P., Winter, P., Cameto, R., Russell, M., Sato, E., Clarke-Midura, J., Torres, C., Haertel, G., Dolan, R., Beddow, P., & Lazarus, S. (2010). Technology-enabled and universally designed assessment: Considering access in measuring the achievement of students with disabilities—foundation for research. *Journal of Technology, Learning, and Assessment*, 10(5).
- Barton, K. E., & Winter, P.C. (2011). Alternative formats – a review of the literature. In Winter, P.C. (Ed.). Evaluating the comparability of results from educational achievement test variations. Washington, DC: Council of Chief State School Officers.
- Barton, K. E., & Winter, P.C. (2011). Evaluating the comparability of scores from an alternative format. In Winter, P.C. (Ed.). Evaluating the comparability of results from educational achievement test variations. Washington, DC: Council of Chief State School Officers.
- Bayless, D., Carlson, D., Lunsford, J., Ryan, J.M., Winter, P.C., & Ross, G. (1997). Measuring adequate school progress. Presentation at the annual National Conference on Large-Scale Assessment, Colorado Springs, Colorado.
- Bilsky, L.H., Blachman, S., Chi, C., Mui, A., & Winter, P. (1986). Comprehension strategies in math problems and story contexts. *Cognition and Instruction*, 3(2), 109-126.
- Bruce, W., DeVito, P., Fabrizio, L., Forte, E., MacQuarrie, D., Roeber, E., & Winter, P. (June, 2009). Overview of the practical and technical issues in large-scale assessment programs: Assessment boot camp. Presentation at the annual National Conference on Student Assessment, Los Angeles.
- Burger, D., Hill, R., Rozelle, J., Winter, P.C., & Redfield, D. (1997). Perspectives on state and local efforts to implement standards-aligned assessments in the service of student learning. Presentation at the annual National Conference on Large-Scale Assessment, Colorado Springs, Colorado.
- Chen, C., & Winter, P.C. (June, 2004). Planning and Conducting Cognitive Laboratories for Developing Large-Scale Assessments. Presentation at the annual National Conference on Large-Scale Assessment, Boston.
- Crane, E., & Winter, P.C. (2006). *Setting coherent performance standards*. Washington: Council of Chief State School Officers.
- Erpenbach, W.J., Carlson, D., La Marca, P.M., Winter, P.C. (Eds.). (2002). *Incorporating multiple measures of student performance into state accountability systems -- A compendium of resources*. Washington: Council of Chief State School Officers.
- Hamm, D.W. & Winter, P.C. (1984). Education Entrance Examination in South Carolina. Paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois.
- Hansche, L., Stubits, T., & Winter, P.C. (1998). *Using existing assessments for measuring student achievement: Guidelines and state resources*. Washington, DC: Council of Chief State School Officers.
- Hartley, L.C., Helsley, T., & Winter, P.C. (1984). The scoring process. Paper presented at the annual meeting of the American Educational Research Association, Chicago, Illinois.
- Horm-Wingerd, D.M., Winter, P.C., & Plofchan, P. (2000). *Primary level assessment for IASA Title I: A call for discussion*. Washington, DC: Council of Chief State School Officers.
- Kahl, S., Viator, K., & Winter, P.C. (1998). From content standards to assessments. Presentation at the National Conference on Large-Scale Assessment, Colorado Springs, Colorado.

- Kopriva, R.J., Samuelsen, K., Wiley, D.E., & Winter, P.C., (April, 2003). Evidentiary logic in the assessment of diverse learners. Paper presented at the annual meeting of the National Council on Measurement in Education, Chicago.
- Kopriva, R.J., Wiley, D.E., & Winter, P.C., (April, 2004). Rethinking the role of individual differences in educational assessment. Paper presented at the annual meeting of the National Council on Measurement in Education, San Diego.
- Kopriva, R. J., Winter, P. C., (June, 2006). Validating developmental assessments: Evaluation of an English language proficiency test. Presentation at the National Conference on Large-Scale Assessment, San Francisco.
- La Marca, P.M., Redfield, D., & Winter, P.C. (2000). *State standards and state assessment systems: A guide to alignment*. Washington: Council of Chief State School Officers.
- Lara, J., Ferrara, S., Calliope, M., Sewell, D., Winter, P., Kopriva, R., Bunch, M., & Jodersma, K. (2007). The English Language Development Assessment (ELDA). In Abedi, J. *English language proficiency assessment in the nation: Current status and future practice*. Davis, CA: University of California.
- Linton, D.L., Winter, P.C., & Liu, J.M. (1985). An exploratory analysis of factors related to performance on a teacher observation instrument. Paper presented at the annual meeting of the Eastern Educational Research Association, Virginia Beach, Virginia.
- Lottridge, S.L., Mugan, L., Winter, P.C. (2013). The AS Decision Matrix: Using Program Stakes and Item Type to Make Informed Decisions about Automated Scoring Implementations. Pacific Metrics.
http://www.pacificmetrics.com/white-papers/ASDecisionMatrix_WhitePaper_Final.pdf
- Malagon, M.H., Rosenberg, M.B., & Winter, P.C. (2006). Developing aligned performance level descriptors for the English Language Development Assessment K-2 inventories. In Council of Chief State School Officers, *Aligning assessment to guide the learning of all students*. Washington, DC: Council of Chief State School Officers.
- Moon, T. R., Loyd, B.H., Hughes, K., & Winter, P. (1996). Scoring and training issues involved in large-scale performance assessments. Paper presented at the annual meeting of the American Educational Research Association, New York.
- Moon, T. R., Loyd, B.H., Hughes, K., & Winter, P. (1996). Using generalizability theory to estimate score reliability of large-scale writing performance assessment. Paper presented at the annual meeting of the American Educational Research Association, New York.
- National Assessment Governing Board (2005, draft). *2005 NAEP mathematics assessment and item specifications*. Winter, P.C., specifications author. Washington, DC: National Assessment Governing Board.
- Olson, J., Winter, P.C., Gattis, K., Crovo, M., & Martin, W. (2001). The NAEP mathematics assessment consensus framework: An update for the states and nation. Presentation at the annual National Conference on Large-Scale Assessment, Houston, Texas.
- Ross, G.A., Walkup, H., Winter, P.C., Hambleton, R.K., & Redfield, D. (1998). Developing performance standards for large-scale assessments. Presentation at the annual National Conference on Large-Scale Assessment, Colorado Springs, Colorado.
- Ryan, J.M., Carlson, D., Winter, P.C., Gribbons, B., & Matoes, J. (1998). Using multiple measures to determine student performance levels: Some technical issues. Presentation at the annual National Conference on Large-Scale Assessment, Colorado Springs, Colorado.
- Wiley, D.E., Kopriva, R.J., & Winter, P.C., (April, 2004). Modeling the person/task interaction space. Paper presented at the annual meeting of the National Council on Measurement in Education, San Diego.

- Winter, P.C., Wood, S.W., Lottridge, S.M., Hughes, T.B., & Walker, T.E. (June, 2013). What do we Get from CR and TE Items? Findings from the study The Utility of Online Mathematics Constructed-Response Items: Maintaining Important Mathematics in State Assessments and Providing Appropriate Access to Students. Presentation at the annual National Conference on Student Assessment, National Harbor, MD.
- Winter, P.C., Burkhardt, A., Freidhoff, J.R., Stimson, R.J., & Leslie, S.C. (2013). Astonishing Impact: An Introduction to Five Computer-based Assessment Issues. Michigan Virtual University Research Institute. http://media.mivu.org/institute/pdf/astonishing_impact.pdf
- Winter, P.C. (2011). Building on what we know -- Some next steps in assessing English language proficiency. *AcELerate*, 3, 9-11.
- Winter, P.C. (Ed.) (2010). *Evaluating the comparability of results from educational achievement test variations*. Washington, DC: Council of Chief State School Officers.
- Winter, P.C. (2010). Introduction. In Winter, P.C. (Ed.). *Evaluating the comparability of results from educational achievement test variations*. Washington, DC: Council of Chief State School Officers.
- Winter, P.C., Lottridge, S., Kramer, L., Sireci, S., & Kopriva, R. (June, 2009). Comparability of test scores: what's new, what's next. Presentation at the annual National Conference on Student Assessment, Los Angeles.
- Winter, P.C. (April, 2009). Comparing apples to apples: Challenges and approaches to establishing the comparability of test variations. Paper presented at the annual meeting of the National Council on Measurement in Education, San Diego.
- Winter, P.C. (2008). Evaluating the Comparability of Results of Test Variations: Alternative Formats and Modified Assessments. Presentation at the National Conference on Measurement in Education, Orlando.
- Winter, P.C. (2004). Validity studies for the English Language Development Assessment. Presentation at the annual National Conference on Large-Scale Assessment, Boston.
- Winter, P.C. (2003). Construct validity: What are we really measuring? Presentation at the annual National Conference on Large-Scale Assessment, San Diego.
- Winter, P.C. (2001). *Combining information from multiple measures of student achievement for school-level decision-making: An overview of issues and approaches*. Washington, DC: Council of Chief State School Officers.
- Winter, P.C. (1999). Assessment and accountability requirements of Title I: Accounting for the learning of all students. Paper presented at the annual meeting of the American Educational Research Association, Montreal.
- Winter, P.C. (1996). *Implementing the adequate yearly progress provisions of Title I in the Improving America's Schools Act of 1994*. Washington: Council of Chief State School Officers.
- Winter, P.C. (1990). Horizontal equating using item response theory: The effects of distribution shape. Unpublished doctoral dissertation, Columbia University.
- Winter, P.C. (1989). Regulation of home schooling parents in South Carolina: The state's perspective. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.
- Winter, P. C., Kopriva, R. J., Chen, C., and Emick, J. E. (2006). Exploring individual and item factors that affect assessment validity for diverse learners: Results from a large-scale cognitive lab. *Learning and Individual Differences*, 16, 267-276.
- Winter, P.C., Kopriva, R.J., Chen, C., & Wiley, D.E. (April, 2004). Exploring Student and item factors that affect assessment validity: Results from a large-scale cognitive lab. Paper presented at the annual meeting of the National Council on Measurement in Education, San Diego.

- Winter, P.C. & Linton, D.L. (1985). An investigation of student teacher performance over time on the Assessments of Performance in Teaching. Paper presented at the annual meeting of the Eastern Educational Research Association, Virginia Beach.
- Winter, P.C. & Thomas, M.K. (1989). *The South Carolina Education Entrance Examination guide*. Atlanta, GA: Educational Testing Service.
- Wise, L.L., Zhang, L., Winter, P., Taylor, L., & Becker, D.E. (2006). Vertical alignment of grade-level expectations for student achievement: Report of a pilot study. In Council of Chief State School Officers, *Aligning assessment to guide the learning of all students*. Washington, DC: Council of Chief State School Officers.
- Zhang, L., Chou, F., Miller, E., Winter, P.C., & Dunbar, S. (2001). Has educational reform narrowed the test score gap between minority and majority students? Presentation at the annual National Conference on Large-

PROFESSIONAL SERVICE

- American Educational Research Association: Proposal reviewer, Divisions D and L, ongoing
- American Educational Research Association: Division D Secretary-Elect, 2014
- American Educational Research Association: Division D Mentoring Committee, 2012-2014; Chair, 2013
- American Educational Research Association: Division D Significant Contributions to Educational Measurement and Research Methodology Committee, 2008-2010; Chair, 2009–2010
- National Council on Measurement in Education, Outreach and Partnerships Committee, 2008–2011; Chair, 2008–2010
- National Conference on Student (formerly Large Scale) Assessment: Planning Committee, 1994–2009
- Manuscript reviewer, Educational Measurement: Issues and Practices, ongoing
- Manuscript reviewer, Educational Assessment, ongoing
- AEL/Edvantia Editorial Review Board, 2003–2006
- Virginia Educational Research Association: President, 1998–1999; Executive Board, 1999–2002

References

- AAAS Science Assessment. (2007). *Project 2061 science assessment website* [Test item database]. Retrieved from <http://assessment.aaas.org/>
- Abedi, J., Courtney, M., Mirocha, J., Leon, S., & Goldberg, J. (2005). *Language accommodations for English language learners in large-scale assessments: Bilingual dictionaries and linguistic modification* (CSE Tech. Rep. No. 666). Los Angeles: University of California, National Center for Research on Evaluation, Standards, and Student Testing.
- Barthes, R. (1983). *The Fashion System*. (trans. Matthew Ward & Richard Howard). London: Jonathan Cape.
- Batt, E. G. (2010). Cognitive coaching: A critical phase in professional development to implement Sheltered instruction. *Teaching and Teacher Education*, 26 (2010), 997-1005.
- Bell, B. & Cowie, B. (2001) *Formative assessment in science education*. The Netherlands: Kluwer Academic Press.
- Black, P., & Wiliam, D. (2004). The formative purpose: Assessment must first promote learning. In M. Wilson (Ed.), *Towards coherence between classroom assessment and accountability* (103rd Yearbook of the National Society for the Study of Education, Part II) (pp. 20–50). Chicago, IL: University of Chicago Press.
- Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*. 21(1) 5–31.
- Datnow, A., Park, V., Wohlstetter, P. (2007). *Achieving with Data: How High-Performing School Systems Use Data to Improve Instruction for Elementary Students*. Los Angeles: University of Southern California Center for Educational Governance.
- Duschl, R., Schweingruber, H., & Shouse, A. (Eds.). (2007). *Taking science to school: Learning and teaching science in grades K–8*. Washington, DC: National Academies Press.
- Echevarria, J., Vogt, M. E., & Short, D. (2007). *Making content comprehensible for English learners: The*

- SIOP model* (3rd ed.). Boston, MA: Pearson Allyn & Bacon.
- Elliott, J. L., & Thurlow, M. L. (2000). *Improving test performance of students with disabilities in district and state assessments*. Thousand Oaks, CA: Corwin Press.
- Faria, A.-M., Heppen, J., Li, Y., Stachel, S., Jones, W., Sawyer, K., ...Palacios, M. (2012). *The use of interim assessment data in urban schools: Links among data use practices and student achievement*. Abstract. Washington, DC: American Institutes for Research and Council of the Great City Schools.
- Fife, J. H., Graf, E. A., & Ohls, S. (2011). *Constructed Response Mathematics Task Study*. ETS Research Report. Report Number RR-11-35. Retrieved from <http://www.ets.org/research/topics/cbal/publications/>.
- Hansen, E., & Zapata-Rivera, D. (2010, May). *Designing Assessment-for-Learning (AfL) systems for diverse students: A game-based AfL for learning middle school mathematics*. Paper presented at the National Council on Measurement in Education, Denver, CO.
- Heritage, M., Jones, B., & White, E. S. (2010). *Supporting teachers' use of formative assessment evidence*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver, CO. Retrieved from <http://www.cse.ucla.edu/products/>.
- Knight, J. & Cornett, J. (2009). *Studying the impact of instructional coaching*. Lawrence, KS: Kansas Coaching Project for the Center on Research on Learning.
- Kopriva, R.J., Wright, L. Triscari, R. (2015 submitted). *Examining a multisemiotic approach to measuring challenging content for English learners and others: Results from the ONPAR elementary and middle school science study*. Submitted.
- Kopriva, R.J. & Wright, L. (2015, in press). *Score Processes in Assessing Academic Content of Non-native Speakers*. In J. Pellegrino and K. Ercikan (Eds). *Validation of Score Meaning in the Next Generation of Assessments*
- Kopriva, R.J. (2001). *Issues and possibilities in on-line assessment technology for racial, language and*

cultural minority students and students with disabilities. Invited presentation to the U.S. Department of Education's Conference on On-line Student Assessment: The Future of State Testing, Washington D.C.

Kopriva, R. J., Carr, T. G., Gabel, D., & Cameron, C. (2011). *Improving the validity of mathematics results for students with learning disabilities in reading and other SWDs who struggle with language and literacy: Findings from the ONPAR elementary and middle school mathematics experimental study*. Retrieved from <http://www.onpar.us/research/reports.html>.

Kopriva, R. J., Gabel, D., & Cameron, C. (2009). *Overview of results from the ONPAR elementary and middle school science experimental study with ELs and non-ELs: A promising new approach for measuring complex content knowledge of English learners with lower proficiency levels*. Retrieved from <http://www.onpar.us/research/reports.html>.

Kopriva, R. J., Winter, P. C., Triscari, R., Carr, T. G., Cameron, C., & Gabel, D. (2013). *Assessing the knowledge, skills, and abilities of ELs, selected SWDs and controls on challenging high school science content: Results from randomized trials of ONPAR and technology-enhanced traditional end-of-course biology and chemistry tests*. Retrieved from <http://www.onpar.us/research/reports.html>.

Koran, J. Emick, J. Monroe, J.R. & Garavaglia, D. (2006). Teacher and multi-source computer-based approach for making individualized test accommodation decisions for English language learners. Presentation at the National Council of Measurement in Education, San Francisco, CA.

Kress, G., Jewitt, C., Ogborn, J., & Tsatsarelis, C. (2001). *Multimodal teaching and learning: The rhetorics of the science classroom*. London, New York: Continuum Publishers.

Kress, G. & van Leeuwen, T. (2001). *Multimodal discourse: The modes and media of contemporary communication*. New York: Oxford University Press.

Kress, G. & van Leeuwen, T. (2006). *Reading Images: The grammar of visual design*. London: Routledge.

Lederman, N.G., & Abell, S.K. (Eds.). (2014). Handbook of research on science education (Vol. II). New

- York, NY: Routledge.
- Lemke, J. (1990). *Talking science: Language, learning, and values*. Norwood, NJ: Ablex.
- Mislevy, R., & Haertel, G. (in press). *Implications of evidence-centered design for educational testing* (Technical Report 17). Menlo Park, CA: SRI International.
- Mislevy, R. J., Steinberg, L. S., & Almond, R. G. (2003). On the structure of educational assessments. *Measurements: Interdisciplinary Research and Perspectives*, 1(1), 3–62.
- Mislevy, R. J. (1994). Evidence and inference in educational assessment. *Psychometrika*, 58, 79–85.
- Morrison, J. (2009). Why teachers must be data experts. *Educational Leadership* 66(4).
- National Center for Education Statistics (2012). *The Nation's Report Card: Science in Action: Hands-On and Interactive Computer Tasks From the 2009 Science Assessment* (NCES 2012–468). Washington, DC: Institute of Education Sciences, U.S. Department of Education.
- National Center for Education Statistics. (2011). *The Nation's Report Card: Mathematics 2011* (NCES 2012–458). Washington, DC: Institute of Education Sciences, U.S. Department of Education.
- NGSS Lead States. (2013). *Next Generation Science Standards: For States, By States*. Washington, DC: The National Academies Press.
- National Research Council (U.S.) Donovan, S., Bransford, J., & National Research Council (U.S.). (2005). *How students learn*. Washington, D.C: National Academies Press.
- National Research Council. (2012). *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Committee on a Conceptual Framework for New K-12 Science Education Standards. Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
- O'Halloran, K.L. (2004). *Multimodal discourse analysis: systemic functional perspectives*. London: Continuum.
- Pellegrino, J.W. (2013). Proficiency in science: Assessment challenges and opportunities. *Science*, 340(6130), 320-323.

- Pellegrino, J., Chudowsky, N., & Glaser, R. (2001). *Knowing what students know: The science and design of educational assessment*. Washington, DC: National Academy Press.
- Pellegrino, J. Wilson, M. Koenig, J.A. & Beatty, A.S. (2014). *Developing Assessments for the Next Generation Science Standards*. Washington, DC: National Academies Press.
- Peirce, C.S. (1931-58): *Collected Writings* (8 Vols.). (Ed. Charles Hartshorne, Paul Weiss & Arthur W Burks). Cambridge, MA: Harvard University Press.
- Quellmalz, E. S., De Barger, A. H., Haertel, G., Schank, P., Buckley, B., Gobert, J., . . . Ayala, C. (2008). Exploring the role of technology-based simulations in science assessment: The Calipers Project. In J. E. Coffrey, R. Douglas, & C. Stearns (Eds.), *Assessing science learning: Perspectives*. Arlington, VA: NSTA Press.
- Quellmalz, E. S., & Haertel, G. (2004, May). *Technology supports for state science assessment systems*. Paper commissioned by the National Research Council Committee on Test Design for K–12 Science Achievement.
- Quellmalz, E. S., & Silberglitt, M. D. (2010, May). *Opportunities and challenges of designing technology-based learning-centered assessments for diverse students*. Paper presented at annual meeting of the American Educational Research Association, Denver, CO.
- Roy, P. (2005). High quality professional development for the visual arts. In B. B. Rushlow (Ed.), *The changing roles of arts leadership* (pp. 63-78). Reston, VA: National Art Education Association.
- Ruiz-Primo, M. A., Shavelson, R. J., Hamilton, L. & Klein, S. (2002). On the evaluation of systemic education reform: Searching for instructional sensitivity. *Journal of Research in Science Teaching*, 39(5), 369-393.
- Saussure, Ferdinand de ([1916] 1983): *Course in General Linguistics* (trans. Roy Harris). London: Duckworth.
- Schleppegrell, M. J. (2004). *The language of schooling: A functional linguistics perspective*. Mahwah, NJ: Erlbaum.

- Stephens, D., Morgan, D., Donnelly, A., DeFord, D., Young, J. Seaman, M., et al. (2007). The South Carolina Reading Initiative: NCTE's Reading Initiative as a statewide staff development project. Urbana, IL: National Council of Teachers of English.
- Thompson, S. J., Johnstone, C. J., & Thurlow, M. L. (2002). *Universal design applied to large scale assessments*. (Synthesis Report 44). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes. Retrieved 6/14/2015, from the World Wide Web:
<http://education.umn.edu/NCEO/OnlinePubs/Synthesis44.htm>
- Wei, R.C., Darling-Hammond, L., Andree, A., Richardson, N., & Orphos, S. (2009). Professional learning in the learning profession: A Status Report on Teacher Development in the United States and Abroad, National Staff Development Council.
- Wilson, M., & Draney, K.. (2004). Some Links Between Large-Scale and Classroom Assessments: The Case of the BEAR Assessment System. *Yearbook of the National Society for the Study of Education*, 103, 132–154.
- Wright, L.J. (2015). Inquire to acquire: A discourse analysis of bilingual students' development of science literacy. In Molle, D., Sato, E., Boals, T., & Hedgspeth, C. (Eds), *Multilingual learners and academic literacies: Sociocultural contexts of literacy development in adolescents*. New York: Routledge.
- Wright, L. J., & Kopriva, R. J. (2009). Using cognitive labs to refine technology-enhanced assessment tasks and ensure their accessibility: Insights from data collected to inform ONPAR elementary and middle school science task development. Madison, WI: Institute for Innovative Assessment, University of Wisconsin-Madison. Retrieved from
<http://iassessment.wceruw.org/research/researchpapers/onpar>.

COPY

INDIRECT COST RATE AGREEMENT
STATE EDUCATION AGENCY

Organization

Michigan Department of Education
P.O. Box 30008
Lansing, MI 48909

Date: SEP 30 2014

Agreement No: 2014-159

Filing Reference: Replaces previous
Agreement No. 2013-162

Dated: 9/30/2013

The approved indirect cost rates herein are for use on grants, contracts, and other agreements with the Federal Government. The rates are subject to the conditions included in Section II of this Agreement and issued by the U.S. Department of Education pursuant to the authority in Attachment A of Office of Management and Budget Circular A-87.

Section I - Rates and Bases

<u>Type</u>	<u>From</u>	<u>To</u>	<u>Rate</u>	<u>Base</u>	<u>Applicable To</u>
Fixed	10/01/2014	09/30/2015	8.1%	MTDC	APwR

Distribution Base:

MTDC Modified Total Direct Cost - Total direct costs excluding equipment, capital expenditures, participant support costs, pass-through funds and the portion of each subaward (subcontract or subgrant) above \$25,000 (each award; each year).

Applicable To:

APwR The rates herein are applicable to All Programs including those that require a restricted rate per 34 CFR 75.563 and 34 CFR 76.563.

Treatment of Fringe Benefits:

Fringe benefits applicable to direct salaries and wages are treated as direct costs. Pursuant to OMB Circular A-87-Attachment B Paragraph 8.d.(3), unused leave costs for all employees will be allocated as an indirect cost except for those employee salaries designated as a direct cost for the restricted rate calculation.

Capitalization Policy: Items of equipment are capitalized and depreciated if the initial acquisition cost is equal to or greater than \$5,000.

Section II – Particulars

Limitations: Application of the rates contained in this Agreement is subject to all statutory or administrative limitations on the use of funds, and payments of costs hereunder are subject to the availability of appropriations applicable to a given grant or contract. Acceptance of the rates agreed to herein is predicated on the following conditions: (A) that no costs other than those incurred by the Organization were included in the indirect cost pools as finally accepted, and that such costs are legal obligations of the Organization and allowable under the governing cost principles; (B) the same costs that have been treated as indirect costs are not claimed as direct costs; (C) that similar types of information which are provided by the Organization, and which were used as a basis for acceptance of rates agreed to herein, are not subsequently found to be materially incomplete or inaccurate; and (D) that similar types of costs have been accorded consistent accounting treatment.

Accounting Changes: The rates contained in this agreement are based on the organizational structure and the accounting systems in effect at the time the proposal was submitted. Changes in organizational structure or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rates in this agreement, require the prior approval of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowance.

Provisional/Final/Predetermined Rates: A proposal to establish a final rate must be submitted. The awarding office should be notified if the final rate is different from the provisional rate so that appropriate adjustments to billings and charges may be made. Predetermined rates are not subject to adjustment.

Fixed Rate: The negotiated fixed rate is based on an estimate of the costs that will be incurred during the period to which the rate applies. When the actual costs for such period have been determined, an adjustment will be made to a subsequent rate calculation to compensate for the difference between the costs used to establish the fixed rate and the actual costs.

Notification to Other Federal Agencies: Copies of this document may be provided to other Federal agencies as a means of notifying them of the agreement contained herein.

Audit: All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based may be compensated for in a subsequent negotiation.

Reimbursement Ceilings/Limitations on Rates: Awards that include ceiling provisions and statutory/regulatory requirements on indirect cost rates or reimbursement amounts are subject to the stipulations in the grant or contract agreements. If a ceiling is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.

Budget Narrative File(s)

* **Mandatory Budget Narrative Filename:**

To add more Budget Narrative attachments, please use the attachment buttons below.

**Dynamic, Interactive Formative Assessment Tasks and End-of-Unit Tests for Measuring
Challenging Concepts and Skills of Diverse Middle School Students**

Budget Narrative

**The summary activities of the Lead State Grant Coordinator and Fiscal Specialist (key personnel)
for the Michigan Department of Education**

Lead State Grant Coordinator TBD (LSGC) – (Years 1-4, not to exceed 75%FTE) will be responsible for reviewing data, planning and implementation of the grant program in Michigan, and ensuring that state and federal legislative requirements and guidelines are followed, including the use of funds. The LSGC will utilize large scale assessment experience with K-12 students to coordinate all data collection, review and handling procedures specific to the pilot rollout in order to obtain high-quality data and information for research and administrative purposes. The LSGC will follow project management methodology (PMM) and State of Michigan regulations for handling sensitive data to coordinate data access to program participants and contractors. The LSGC will work closely with contract and finance staff to establish and update Memoranda of Understanding regarding network security as needed and to provide oversight of program coordination with the fiscal specialist, participants, and contractors.

Fiscal Specialist TBD - (Years 1-4, not to exceed 25% FTE) will be responsible for developing all contracts and MOUs for the grant program, oversee procurement; receive, review, and process all quarterly invoices over the course of the grant and develop annual financial reports. Also any reporting from the sub-recipients will be reviewed and routed for approval through this position. The fiscal specialist will also supervise ongoing monitoring of fiscal management and programmatic review. Any/all audits conducted with the federal/state agencies will be coordinated through this position.

**Michigan Department of Education
4 Year Summary (10/1/2015-9/30/2019)**

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	TOTAL
	<u>10/15-09/16</u>	<u>10/16-09/17</u>	<u>10/17-09/18</u>	<u>10/18-09/19</u>	<u>BUDGET</u>
1. PERSONNEL - SALARY AND FRINGES					
SME	\$ 64,861	\$ 66,158	\$ 67,481	\$ 68,831	\$ 267,330
SME Fringes	\$ 44,448	\$ 45,337	\$ 46,244	\$ 47,169	\$ 183,198
Fiscal	\$ 18,796	\$ 19,172	\$ 19,555	\$ 19,946	\$ 77,469
Fiscal Fringes	\$ 12,532	\$ 12,782	\$ 13,038	\$ 13,299	\$ 51,651
TOTAL SALARIES AND WAGES	\$ 140,637	\$ 143,449	\$ 146,318	\$ 149,245	\$ 579,649
SALARY	\$ 83,657	\$ 85,330	\$ 87,036	\$ 88,777	\$ 344,800
FRINGES	\$ 56,980	\$ 58,120	\$ 59,282	\$ 60,468	\$ 234,850
2. TRAVEL					
Domestic	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 7,200
TOTAL TRAVEL	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 7,200
3. OTHER DIRECT COSTS					
CSS&M	\$ 2,617	\$ 2,670	\$ 2,723	\$ 2,778	\$ 10,788
Rent	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 4,000
TOTAL OTHER DIRECT CHARGES	\$ 3,617	\$ 3,670	\$ 3,723	\$ 3,778	\$ 14,788
TOTAL DIRECT COSTS	\$ 146,054	\$ 148,919	\$ 151,841	\$ 154,822	\$ 601,636
4. INDIRECT COSTS					
Federal Indirect Cost Rate (8.1%)	\$ 11,830	\$ 12,062	\$ 12,299	\$ 12,541	\$ 48,733
Contractual Indirect	\$ 2,025	\$ 2,025	\$ 2,025	\$ 2,025	\$ 8,100
TOTAL INDIRECT COSTS	\$ 13,855	\$ 14,087	\$ 14,324	\$ 14,566	\$ 56,833
TOTAL DIRECT & INDIRECT	\$ 159,909	\$ 163,006	\$ 166,166	\$ 169,388	\$ 658,469

1. PERSONNEL

The following staff will be funded through this proposal to the grant. Position descriptions for grant-funded staff positions are in the appendices. Year 1 includes the %FTE times the yearly salary and fringe benefits. Years 2, 3, and 4 have a 2% increase.

	Annual	Fringe	%FTE	total Yr 1
TBD SME	86,481	59,264	75%	109,309
TBD Fiscal	75,184	50,127	25%	31,328
Total Salary and Fringe				140,637

2. TRAVEL

Travel assumes 1 trip per year for the one principal employee assuming the DAS

maximum per trip allowance of \$1,800/trip.

3. OTHER DIRECT COSTS

CSS&M is inclusive of supplies, telecommunication, postage, printing, IT support, services and materials.

4. INDIRECT COSTS

Rent is applied using the MDE standard rate of \$4,000 per FTE. This is applied against the total FTE's associated % with this grant budget.

The Michigan indirect cost rate agreement is currently 8.1 percent. The indirect costs cover general operating expenses for the Michigan Department of Management and Budget and the Michigan Department of Education offices that include the following services: accounting, terminal leave, budget office, communications, human resources, office of audits, and the information technology network.

WISCONSIN CENTER FOR EDUCATION RESEARCH

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4 Year Summary (10/1/2015 - 9/30/2019)

	<u>YEAR 1</u> <u>10/15 - 9/16</u>	<u>YEAR 2</u> <u>10/16 - 9/17</u>	<u>YEAR 3</u> <u>10/17 - 9/18</u>	<u>YEAR 4</u> <u>10/18 - 9/19</u>	<u>TOTAL</u> <u>BUDGET</u>
SENIOR PERSONNEL					
Kopriva, Rebecca, PI	\$46,770	\$48,348	\$49,979	\$51,664	\$196,761
Wright, Laura	\$88,000	\$90,970	\$94,038	\$97,209	\$370,217
OTHER PERSONNEL					
Post-doc Researcher	\$32,010	\$66,224	\$62,275	\$70,858	\$231,367
Drago, Kathryn	\$78,375	\$81,020	\$83,752	\$86,576	\$329,723
Science Task Developer	\$75,625	\$78,177	\$80,815	\$0	\$234,617
Science Ed Specialist	\$0	\$78,177	\$80,815	\$83,539	\$242,531
Graduate Students	\$23,326	\$24,123	\$24,946	\$25,796	\$98,191
TOTAL SALARIES AND WAGES	\$344,106	\$467,038	\$476,619	\$415,642	\$1,703,406
TRAVEL					
Domestic	\$15,040	\$18,238	\$18,238	\$18,238	\$69,754
TOTAL TRAVEL					
OTHER DIRECT COSTS					
Materials and supplies	\$5,600	\$2,100	\$600	\$600	\$8,900
Consultant services	\$30,000	\$50,720	\$60,000	\$80,000	\$220,720
Teacher/school stipends	\$0	\$8,000	\$41,000	\$0	\$49,000
IT Services	\$130,667	\$130,667	\$130,667	\$20,300	\$412,301
Tuition Remission	\$12,000	\$12,000	\$12,000	\$12,000	\$48,000
TOTAL OTHER DIRECT COSTS	\$178,267	\$203,487	\$244,267	\$112,900	\$738,922
TOTAL DIRECT COSTS	\$537,413	\$688,763	\$739,124	\$546,780	\$2,512,086
INDIRECT COSTS					
WCER 0.23	\$120,845	\$155,655	\$167,239	\$122,999	\$566,738
UW 0.30	\$157,624	\$203,029	\$218,137	\$160,434	\$739,224
TOTAL INDIRECT COSTS	\$278,469	\$358,684	\$385,376	\$283,433	\$1,305,967
TOTAL DIRECT & INDIRECT	\$815,882	\$1,047,447	\$1,124,500	\$830,213	\$3,818,053

WISCONSIN CENTER FOR EDUCATION RESEARCH

YEAR 1 (10/1/2015 - 9/30/2016)

<u>SENIOR PERSONNEL</u>	<u>% OF EFFORT</u>	<u>AMOUNT</u>	<u>FRINGE</u>	<u>TOTAL</u>
Kopriva, Rebecca, PI Base Salary \$136,057	25% 12 months	\$34,014	\$12,755	\$46,770
Wright, Laura Base Salary \$80,000	80% 12 months	\$64,000	\$24,000	\$88,000
<u>OTHER PERSONNEL</u>				
Postdoc Researcher Base Salary \$55,000	50% 12 months	\$27,500	\$4,510	\$32,010
Drago, Kathryn Base Salary \$57,000	1 @ 100% 12 months	\$57,000	\$21,375	\$78,375
Science Task Developer Base Salary \$55,000	1 @ 100% 12 months	\$55,000	\$20,625	\$75,625
Science Ed Specialist Base Salary \$55,000	0% 12 months	\$0	\$	\$0
Graduate Student Base Salary \$37,502	1 @ .50% 12 months	\$18,751	\$4,575	\$23,326
TOTAL SALARIES AND WAGES		\$256,265	\$87,841	\$344,106

TRAVEL

1. Domestic

0 Trip(s) 3 overnights - Travel to Domestic Conference

Air Fare	\$424	
Lodging	\$675	
Registration	\$300	
Meals	\$200	
Total	<u>\$1,599</u> /Trip	\$0

6 trips 3 overnights - Madison

Air Fare	\$424	
Lodging	\$675	
Meals	\$200	
Total	<u>\$1,299</u> /Trip	\$7,794

2 trips 3 overnights - SEA

Airfare	\$700	
Lodging	\$675	
Meals	\$200	
Total	<u>\$1,575</u> /Trip	\$3,150

4 trips 2 overnights - Advisory Board

Air Fare	\$424	
Lodging	\$450	
Meals	\$150	
Total	<u>\$1,024</u> /Trip	\$4,096

Total Domestic \$15,040

TOTAL TRAVEL

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\$15,040

OTHER DIRECT COSTS

MATERIALS AND SUPPLIES

CONSULTANT SERVICES				
Evaluator				\$10,000
Gotwals				\$4,000
Advisory Board	\$4,000 X 4			\$16,000
Educator honorarium				\$
TOTAL CONSULTANT SERVICES				\$30,000
OTHER				
School Stipends				\$0
IT Services				\$130,667
Tuition Remission				\$12,000
TOTAL OTHER				\$142,667
TOTAL OTHER DIRECT COSTS				\$178,267
TOTAL DIRECT COSTS				\$537,413
INDIRECT COSTS (53%)				
WCER	0.23	X	\$525,413	\$120,845
UW	0.30	X	\$525,413	\$157,624
TOTAL INDIRECT COSTS				\$278,469
TOTAL DIRECT AND INDIRECT COSTS				\$815,882

WISCONSIN CENTER FOR EDUCATION RESEARCH

YEAR 2 (10/1/2016 - 9/30/2017)

<u>SENIOR PERSONNEL</u>	<u>% OF EFFORT</u>	<u>AMOUNT</u>	<u>FRINGE</u>	<u>TOTAL</u>
Kopriva, Rebecca, PI Base Salary \$140,139	25% 12 months	\$35,035	\$13,313	\$48,348
Wright, Laura Base Salary \$82,400	80% 12 months	\$65,920	\$25,050	\$90,970
<u>OTHER PERSONNEL</u>				
Post-doc Researcher Base Salary \$56,650	100% 12 months	\$56,650	\$9,574	\$66,224
Drago, Kathryn Base Salary \$58,710	1 @ 100% 12 months	\$58,710	\$22,310	\$81,020
Science Task Developer Base Salary \$56,650	1 @ 100% 12 months	\$56,650	\$21,527	\$78,177
Science Ed Specialist Base Salary \$56,650	100% 12 months	\$56,650	\$21,527	\$78,177
Graduate Student Base Salary \$38,627	1 @ .50% 12 months	\$19,314	\$4,809	\$24,123
TOTAL SALARIES AND WAGES		\$348,928	\$118,110	\$467,038

TRAVEL

1. Domestic

2 Trip(s) 3 overnights - Travel to Domestic Conference

Air Fare	\$424		
Lodging	\$675		
Registration	\$300		
Meals	\$200		
Total	<u>\$1,599</u> /Trip		\$3,198

6 trips 3 overnights - Madison

Air Fare	\$424		
Lodging	\$675		
Meals	\$200		
Total	<u>\$1,299</u> /Trip		\$7,794

2 trips 3 overnights - SEA

Airfare	\$700		
Lodging	\$675		
Meals	\$200		
Total	<u>\$1,575</u> /Trip		\$3,150

4 trips 2 overnights - Advisory Board

Air Fare	\$424		
Lodging	\$450		
Meals	\$150		
Total	<u>\$1,024</u> /Trip		\$4,096

Total Domestic \$18,238

TOTAL TRAVEL

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\$18,238

OTHER DIRECT COSTS

MATERIALS AND SUPPLIES

CONSULTANT SERVICES				
Statistician				\$20,000
Evaluator				\$10,000
Gotwals				\$4,000
Advisory Board	\$4,000	X 4		\$16,000
Educator honorarium				\$720
TOTAL CONSULTANT SERVICES				\$50,720
OTHER				
School Stipends				\$8,000
IT Services				\$130,667
Tuition Remission				\$12,000
TOTAL OTHER				\$150,667
TOTAL OTHER DIRECT COSTS				\$203,487
TOTAL DIRECT COSTS				\$688,763
INDIRECT COSTS (53%)				
WCER	0.23	X	\$676,763	\$155,655
UW	0.30	X	\$676,763	\$203,029
TOTAL INDIRECT COSTS				\$358,684
TOTAL DIRECT AND INDIRECT COSTS				\$1,047,447

WISCONSIN CENTER FOR EDUCATION RESEARCH

YEAR 3 (10/1/2017 - 9/30/2018)

<u>SENIOR PERSONNEL</u>	<u>% OF EFFORT</u>	<u>AMOUNT</u>	<u>FRINGE</u>	<u>TOTAL</u>
Kopriva, Rebecca, PI Base Salary \$144,343	25% 12 months	\$36,086	\$13,893	\$49,979
Wright, Laura Base Salary \$84,872	80% 12 months	\$67,898	\$26,141	\$94,038
<u>OTHER PERSONNEL</u>				
Post-doc Researcher Base Salary \$58,350	100% 12 months	\$53,045	\$9,230	\$62,275
Drago, Kathryn Base Salary \$60,471	1 @ 100% 12 months	\$60,471	\$23,281	\$83,752
Science Task Developer Base Salary \$58,350	1 @ 100% 12 months	\$58,350	\$22,465	\$80,815
Science Ed Specialist Base Salary \$58,350	100% 12 months	\$58,350	\$22,465	\$80,815
Graduate Students Base Salary \$39,786	1 @ 50% 12 months	\$19,893	\$5,053	\$24,946
TOTAL SALARIES AND WAGES		\$354,092	\$122,527	\$476,619
TRAVEL				
1. Domestic				
2 Trip(s) 3 overnights - Travel to Domestic Conference				
Air Fare		\$424		
Lodging		\$675		
Registration		\$300		
Meals		\$200		
Total		\$1,599		\$3,198
6 trips 3 overnights - Madison				
Air Fare		\$424		
Lodging		\$675		
Meals		\$200		
Total		\$1,299		\$7,794
2 trips 3 overnights - SEA				
Airfare		\$700		
Lodging		\$675		
Meals		\$200		
Total		\$1,575		\$3,150
4 trips 2 overnights - Advisory Board				
Air Fare		\$424		
Lodging		\$450		
Meals		\$150		
Total		\$1,024		\$4,096
Total Domestic				\$18,238
TOTAL TRAVEL				\$18,238

OTHER DIRECT COSTS
MATERIALS AND SUPPLIES

CONSULTANT SERVICES				
Evaluator				\$10,000
Statistician				\$30,000
Gotwals				\$4,000
Advisory Board	\$4,000	X 4		\$16,000
Educator honorarium				\$
TOTAL CONSULTANT SERVICES				\$60,000
OTHER				
School Stipends				\$41,000
IT Services				\$130,667
Tuition Remission				\$12,000
TOTAL OTHER				\$183,667
TOTAL OTHER DIRECT COSTS				\$244,267
TOTAL DIRECT COSTS				\$739,124
INDIRECT COSTS (53%)				
WCER	0.23	X	\$727,124	\$167,239
UW	0.30	X	\$727,124	\$218,137
TOTAL INDIRECT COSTS				\$385,376
TOTAL DIRECT AND INDIRECT COSTS				\$1,124,500

WISCONSIN CENTER FOR EDUCATION RESEARCH

YEAR 4 (10/1/2018 - 9/30/2019)

<u>SENIOR PERSONNEL</u>	<u>% OF EFFORT</u>	<u>AMOUNT</u>	<u>FRINGE</u>	<u>TOTAL</u>
Kopriva, Rebecca, PI Base Salary \$148,673	25% 12 months	\$37,168	\$14,496	\$51,664
Wright, Laura Base Salary \$87,418	80% 12 months	\$69,934	\$27,274	\$97,209
<u>OTHER PERSONNEL</u>				
Post-doc Researcher Base Salary \$60,100	100% 12 months	\$60,100	\$10,758	\$70,858
Drago, Kathryn Base Salary \$62,285	1 @ 100% 12 months	\$62,285	\$24,291	\$86,576
Science Ed Specialist Base Salary \$60,100	100% 12 months	\$60,100	\$23,439	\$83,539
Graduate Students Base Salary \$40,979	1 @ 50% 12 months	\$20,490	\$5,307	\$25,796
TOTAL SALARIES AND WAGES		\$310,077	\$105,565	\$415,642

TRAVEL

1. Domestic

2 Trip(s) 3 overnights - Travel to Domestic Conference

Air Fare	\$424	
Lodging	\$675	
Registration	\$300	
Meals	\$200	
Total	\$1,599 /Trip	\$3,198

6 trips 3 overnights - Madison

Air Fare	\$424	
Lodging	\$675	
Meals	\$200	
Total	\$1,299 /Trip	\$7,794

2 trips 3 overnights - SEA

Airfare	\$700	
Lodging	\$675	
Meals	\$200	
Total	\$1,575 /Trip	\$3,150

4 trips 2 overnights - Advisory Board

Air Fare	\$424	
Lodging	\$450	
Meals	\$150	
Total	\$1,024 /Trip	\$4,096

Total Domestic \$18,238

TOTAL TRAVEL \$18,238

OTHER DIRECT COSTS

MATERIALS AND SUPPLIES

Research Materials	PR/Award # S368A150019	\$500
Copying Services	Page e189	\$100
TOTAL MATERIALS AND SUPPLIES		\$600

CONSULTANT SERVICES				
Evaluator				\$20,000
Statistician				\$40,000
Gotwals				\$4,000
Advisory Board	\$4,000	X 4		\$16,000
Educator honorarium				\$
TOTAL CONSULTANT SERVICES				\$80,000
OTHER				
School Stipends				\$
IT Services				\$20,300
Tuition Remission				\$12,000
TOTAL OTHER				\$32,300
TOTAL OTHER DIRECT COSTS				\$112,900
TOTAL DIRECT COSTS				\$546,780
INDIRECT COSTS (53%)				
WCER	0.23	X	\$534,780	\$122,999
UW	0.30	X	\$534,780	\$160,434
TOTAL INDIRECT COSTS				\$283,433
TOTAL DIRECT AND INDIRECT COSTS				\$830,213

Wisconsin Center for Education Research at the University of Wisconsin – Madison

Dynamic, Interactive Formative Assessment Tasks and End-of-Unit Tests for Measuring Challenging Concepts and Skills of Diverse Middle School Students

Budget Narrative

PERSONNEL

All persons who work regularly for the Center are placed on the University of Wisconsin payroll in accordance with established University procedures. Titles and stipends are regulated and approved by Center management, the Dean of the School of Education, Madison Campus and University Central Administration. Salaries for professional staff are based on current salaries. Merit increments are calculated each year at 3% effective July 1st for professional staff. Rebecca Kopriva is the PI on the grant and will oversee the activities and otherwise manage the project personnel associated with the project. Laura Wright is the Co-PI and project manager and will oversee the day-to-day activities associated with the project.

Rebecca Kopriva, PI (Years 1 - 4 - 25%) Over the course of the grant, Dr. Kopriva will lead and guide the conceptual, implementation, and research work of all the partners so that each partner's expertise blends with and contributes to the realization of the project goals. Additionally, she will oversee the measurement development aspects of the project, including the conceptualization of tests, tasks and items, the scoring strategies within and across tasks and items, the review of tests, task, and items, and the scoring programs. She will also oversee the development of research related materials, the quantitative analyses of the data collected from the pilot studies, field tests, task type and aggregation studies, questionnaires and interviews, as well as the interpretation of research findings. She will lead the partner leadership team composed of key personnel from Michigan and the University of Wisconsin, and the partners Activate Learning and the WIDA Consortium. Working with staff at the partner institutions, Dr. Kopriva will oversee the development of dissemination materials and be responsible for communicating with the fiscal agent, Michigan, and the EAG project directors as requested. Dr. Kopriva's time will be spent for the duration of the grant overseeing the project activities as discussed above. Dr. Kopriva's time will be charged to the project.

Laura Wright, Co-PI and Project Manager (Years 1 -4- 80%) As Co-PI Dr. Wright will help Dr. Kopriva oversee the project and will be in charge of the qualitative portions of the project. As project manager be the ongoing project liaison with partners at all relevant points in the project, and will oversee, manage and work with the internal staff on a day to day basis. This includes participating educators and consultants in order to ensure that the task development, materials development, pilot and field tests, qualitative and quantitative studies, and data retrieval are being completed in a high quality and timely manner. Dr. Wright will manage the writing of the reports and dissemination materials.

Kathryn Drago (Years 1 – 4 – 100%) Kathryn Drago will be the lead science task writer and will develop tasks and oversee the science drafts developed by the other writer and by IT. She will work with the project manager, Activate Learning, the expert consultants, and educator advisor/reviewers to identify and design end-of-unit targets for task development as well as task and item topics within IQWST units; identify and oversee the applicable learning progression

maps; construct the tasks, complete scoring schemes, develop the student and classroom interpretive reports, and oversee others work in these tasks,; and take part in internal reviews. She will also oversee the revisions of the tasks based on external reviews, interviews, and pilot and field test findings; be available to work with qualitative and quantitative researchers as relevant; help interpret findings from the testing and studies; and is responsible for overseeing the packaging of the final tasks and tests for operational use. Ms. Drago will also complete white papers and article drafts, help to write up results, and make presentations at her professional conferences.

Science Task Developer (Years 1 – 3 – 100%). This developer will work with Ms. Drago and IT to complete all tasks. This includes helping to identify applicable unit learning progression maps; construct the tasks and complete scoring schemes, and take part in internal reviews. She will also oversee help with the revisions of the tasks based on external reviews, interviews, and pilot and field test findings; be available to work with qualitative and quantitative researchers as relevant; help interpret findings from the testing and studies, and help package final products. This person will also complete white papers and article drafts, write up results, and make presentations at this person's professional conferences.

Post-doc Researcher (Year 1, 50%, Years 2-4, 100%). The post-doc researcher will be responsible for coordinating the external reviews, quantitative and qualitative data collections, drafting all survey questionnaires and protocols, identifying and delivering requests for district, school and student data that will be used as part of the project, and working with Activate Learning and the science education specialist to finalize data collectons at the school sites. Working with the graduate student and the science education specialist the researcher will staff or otherwise oversee the various data collections, and be in charge of coding and otherwise analyzing the qualitative data, including completing basic quantitative analyses. This person will be available to work with the statistician to help complete data sets from the piloting, field tests, and item types and aggregation studies, and help interpret the data, and complete white papers and article drafts as relevant, write-up qualitative results, and make presentations at this person's professional conferences.

Science Education Specialist (Year 2-4, 100%). The science education specialist will be responsible for developing all the teacher materials, activities, tools and the PD programs, including designing, populating, and maintaining the project website and chat space, designing and developing the online PD modules, and overseeing the webexes, with relevant help from the partners and the graduate student. Working with the researcher and graduate student, this person will oversee the data collections from the PD programs, webexes, the chat space, and teacher's use and evaluation of the materials, activities, and tools available to them during the quantitative data collections and on an ongoing basis through their interactions with the website, webexes and during PD. The specialist will also be responsible for revising the materials, PD, and other tools, activities based on the relevant data collections and packaging the materials, activities, tools, and the PD program for operational use, and complete white papers, and draft and present findings at conferences.

Graduate Student (Years 1 – 4 – 50% of 1 FTE). The graduate student will work with the researcher and the science specialist, as well as the task developers as time permits, to complete

the tasks identified under these staff, and otherwise help complete the grant activities.

FRINGE BENEFITS

Fringe benefit rates vary by employee classification. Classifications and rates are established by the University. In recent years, fringe benefit rates have increased consistently on an annual basis and are increased slightly following June 30 each year.

TRAVEL

All reimbursements for transportation, lodging, meals, and related costs are included in this category. Travel expense reimbursements are made on the basis of actual and reasonable expenditures. Payments are governed by Wisconsin State Statutes and the University of Wisconsin System Travel Regulations. Travel estimates are based on past Center accounting experience, allowable travel expenses based on the University and State of Wisconsin travel regulations, and travel quotes from Fox World Travel.

Travel to Madison:

6 trips, 3 overnights

Years 1 -4: air - \$424; lodging - \$675; meals - \$200 = \$1,299 x 6 trips = \$7,794/year

In years 1-4 Kathryn Drago, who lives in Alabama, will go to Madison to work with the IT staff and/or PI or co-PI at WCER and to go to the yearly TAC meeting for a total of 3 times each year.

The other developer, who will be hired, will most likely live around DC (which is where the ONPAR task and test development work is situated for this and other work) and will also travel 3 times to Madison to work with IT and grant principles in years 1-3. For year 4, the science education specialist will accompany Ms. Drago 3 times to work with IT and PI and co-PI to finalize teacher products for operational use, and to attend the TAC meeting.

Travel to SEA:

2 trips, 3 overnights

Years 1 -4: air - \$700; lodging - \$675; meals - \$200 = \$1,575 x 2 trips = \$3,150/per year

These trips are for the PI and Co-PI to meet with lead state representatives in years 1 and 4. In years 2 and 3 the researcher and science education specialist will go to Michigan to finalize details related to district participation in the various phases of the projects and oversee selected testing sites.

Advisory Board Travel:

4 trips, 2 overnights

Years 1 - 4: air - \$424; lodging - \$450; meals - \$150 = \$1,024 x 4 trips = \$4,096/per year

The four members of the TAC advisory board will convene in Madison each year for 4 years to discuss technical, instructional and programmatic issues pertinent to the grant.

Travel to Domestic Conference:

2 trips, 3 overnights

Years 2 - 4: air - \$424; lodging - \$675; meals - \$200; registration - \$300 = \$1,599 x 2 trips = \$3,198/year

Two of the staff each year, beginning in year 2, will present findings about the project at a

science conference and the AERA conference.

OTHER

1. Materials and supplies

Research Materials: Funds have been budgeted for miscellaneous research materials and publications. Year 1 = \$1000; Years 2 to 4, \$500 per year.

Four laptops at \$1500 each are budgeted to be used by the task writer, researcher, the science education specialist, and the graduate student. The task writer needs the computer because all tasks that are being created are technology-based, all documentation related to the tasks are created and stored in secure electronic folders, progress monitoring of the tasks that are being created between item writers and IT staff, with project manager and PI oversight is completed using an electronic software program, and educator reviews and revisions will all be done online. Regular communication and in-person meetings between task writers is expected which necessitates at least one person traveling (neither will live in Madison). The researcher is in charge of conducting all focal groups, external educator and bias reviews, working with Activate Learning to recruit and train educators and observe pilot and select field-testing sites. Some of this work will be done electronically, some will be done in-person across the country, with the researcher overseeing the logging of usage and related evaluation data. The scope of work for the science education specialist includes designing and populating the teacher and PD website for participants and conducting regular PD in-person institutes around the country, and working with educators to pilot the draft products before final implementation, and logging in revisions with documentation related to all changes. The graduate student will be working with both the researcher and the science education specialist, particularly in conducting training, overseeing implementation and recording qualitative data about these series of events at the various IQWST sites across the country.

Copying Services – Minimal funds have been budgeted for copying services. Years 1-4 = \$100

3. Consultants

Amelia Gotwalls, the science task consultant, will be paid up to \$4000 each year for years 1-4 to advise the task developers about learning progressions, help in designing tasks, NGSS alignment with task drafts, scoring algorithms and report interpretations, and final task and test revisions. She will also participate in the TAC meetings as relevant.

The statistician/psychometrician will be paid \$20,000 in Year 2, \$30,000 in Year 3, and \$40,000 in Year 4, to complete the quantitative analyses.

Phoebe Winter, the external evaluator, will be paid \$10,000 in Years 1-3, and \$20,000 in Year 4 to complete the formative and summative evaluations and reports, participate in the TAC meetings and meet with partner leadership.

The four external technical advisory committee (TAC) members, Joe Krajcik, Steve Sireci, and Martha Thurlow, will each be paid \$4000/year for 4 years.

Teacher/school stipends

School educators will participate in the project in several different ways. In Year 2 a small number of educators will review selected materials and receive an educator honorarium totaling \$720. Further, in Year 2 \$8000 will be spent for stipends for teachers to continue to review materials, participate during the summer in a PD institute, to participate in fall and winter pilots and in the spring field testing. In Year 3 \$41,000 has been allocated for teacher and school stipends to participate in the pilot test, summer PD institutes, and the next three field tests.

IT Services

The IT staff at WCER will be paid a total of \$412,301 from Years 1-4 to design and implement the web-based tasks, pilot and fieldtesting modules, and final end-of-unit tests. These items may include, depending on design, static images, hovers, dynamic graphing, dynamic placing of objects, open ended free text answers, and various related student aids. The responses to these items will be programmatically scored by the application, and reports will be programmed to be available to students and teachers after testing. Additionally, there will be an administrator portion that will allow management of student rosters and tracking of student results. The student results will be stored in a database for later retrieval.

Tuition Remission

\$12,000 per year for Years 1-4 has been allocated for the graduate student's tuition remission.

INDIRECT COSTS

Modified Total Direct Cost (MTDC) is used as the base for overhead calculations. The MDTC base includes all direct charges. The University negotiates with DH&HS Region 5 to establish indirect cost rates. The 53% rate in this proposal is the approved rate effective April 27, 2015.

**U.S. DEPARTMENT OF EDUCATION
BUDGET INFORMATION
NON-CONSTRUCTION PROGRAMS**

OMB Number: 1894-0008
Expiration Date: 04/30/2014

Name of Institution/Organization

Michigan Department of Education

Applicants requesting funding for only one year should complete the column under "Project Year 1." Applicants requesting funding for multi-year grants should complete all applicable columns. Please read all instructions before completing form.

**SECTION A - BUDGET SUMMARY
U.S. DEPARTMENT OF EDUCATION FUNDS**

Budget Categories	Project Year 1 (a)	Project Year 2 (b)	Project Year 3 (c)	Project Year 4 (d)	Project Year 5 (e)	Total (f)
1. Personnel	83,657.00	85,330.00	87,036.00	88,777.00	0.00	344,800.00
2. Fringe Benefits	56,980.00	58,120.00	59,282.00	60,468.00	0.00	234,850.00
3. Travel	1,800.00	1,800.00	1,800.00	1,800.00	0.00	7,200.00
4. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
5. Supplies	0.00	0.00	0.00	0.00	0.00	0.00
6. Contractual	815,882.00	1,047,447.00	1,124,500.00	830,213.00	0.00	3,818,042.00
7. Construction	0.00	0.00	0.00	0.00	0.00	0.00
8. Other	3,617.00	3,670.00	3,723.00	3,778.00	0.00	14,788.00
9. Total Direct Costs (lines 1-8)	961,936.00	1,196,367.00	1,276,341.00	985,036.00	0.00	4,419,680.00
10. Indirect Costs*	13,855.00	14,087.00	14,324.00	14,566.00	0.00	56,832.00
11. Training Stipends	0.00	0.00	0.00	0.00	0.00	0.00
12. Total Costs (lines 9-11)	975,791.00	1,210,454.00	1,290,665.00	999,602.00	0.00	4,476,512.00

***Indirect Cost Information (To Be Completed by Your Business Office):**

If you are requesting reimbursement for indirect costs on line 10, please answer the following questions:

(1) Do you have an Indirect Cost Rate Agreement approved by the Federal government? Yes No

(2) If yes, please provide the following information:

Period Covered by the Indirect Cost Rate Agreement: From: 10/01/2014 To: 09/30/2015 (mm/dd/yyyy)

Approving Federal agency: ED Other (please specify):

The Indirect Cost Rate is 8.10 %.

(3) For Restricted Rate Programs (check one) -- Are you using a restricted indirect cost rate that:

Is included in your approved Indirect Cost Rate Agreement? or, Complies with 34 CFR 76.564(c)(2)? The Restricted Indirect Cost Rate is %.

Name of Institution/Organization Michigan Department of Education	Applicants requesting funding for only one year should complete the column under "Project Year 1." Applicants requesting funding for multi-year grants should complete all applicable columns. Please read all instructions before completing form.	
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**SECTION B - BUDGET SUMMARY
NON-FEDERAL FUNDS**

Budget Categories	Project Year 1 (a)	Project Year 2 (b)	Project Year 3 (c)	Project Year 4 (d)	Project Year 5 (e)	Total (f)
1. Personnel	0.00					0.00
2. Fringe Benefits	0.00					0.00
3. Travel	0.00					0.00
4. Equipment	0.00					0.00
5. Supplies	0.00					0.00
6. Contractual	0.00					0.00
7. Construction	0.00					0.00
8. Other	0.00					0.00
9. Total Direct Costs (lines 1-8)	0.00					0.00
10. Indirect Costs	0.00					0.00
11. Training Stipends	0.00					0.00
12. Total Costs (lines 9-11)	0.00					0.00

SECTION C - BUDGET NARRATIVE (see instructions)

U.S. DEPARTMENT OF EDUCATION
SUPPLEMENTAL INFORMATION
FOR THE SF-424

OMB Number: 1894-0007
Expiration Date: 07/31/2014

1. Project Director:

Prefix:	First Name:	Middle Name:	Last Name:	Suffix:
Ms.	Rebecca		Kopriva	

Address:

Street1:	21 Florida Ave.
Street2:	
City:	Berkeley
County:	
State:	CA: California
Zip Code:	94707
Country:	USA: UNITED STATES

Phone Number (give area code)	Fax Number (give area code)
202 744 2808	

Email Address:

rkopriva@wisc.edu

2. Novice Applicant:

Are you a novice applicant as defined in the regulations in 34 CFR 75.225 (and included in the definitions page in the attached instructions)?

Yes No Not applicable to this program

3. Human Subjects Research:

a. Are any research activities involving human subjects planned at any time during the proposed project Period?

Yes No

b. Are ALL the research activities proposed designated to be exempt from the regulations?

Yes Provide Exemption(s) #:

No Provide Assurance #, if available:

c. If applicable, please attach your "Exempt Research" or "Nonexempt Research" narrative to this form as indicated in the definitions page in the attached instructions.

<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
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