ADVANCEMENT COURSES™
A Wiley Brand

Using Diagnostic Assessments to Differentiate Math Instruction

30 Clock Hours
Why should teachers take our courses?

A Focus on Student Success
Fostering student success in both academics and social-emotional growth is the main focus of all of our courses. Our courses are filled with strategies, techniques, and activities that are directly tied to improving student achievement in the classroom.

Classroom Applicable
We believe that professional development should be directly related to the classroom, so our courses are designed to include valuable resources for the classroom, innovative strategies and perspectives, and activities aimed at developing content teachers can use in the classroom immediately.

Authentic Assessments
As every subject and grade range has its own needs, we have designed our courses to include authentic assessments that mirror the type of work teachers do in the classroom. With case studies, active reading exercises, and time for developing student-facing activities, our courses provide consistent opportunities to express learning in an authentic manner.

Reflective Practice
A key component of all of our courses is time dedicated to reflective practice. Each course includes a journaling component, which prompts the teacher to connect the reading to their practice, experiences, student population, and school community.

Connection to Special Populations
While many professional development courses may tack on a section on special populations at the end, we believe that knowledge of special populations is integral to all subjects and grade ranges. The majority of our courses include direct strategies for working with exceptional students (special needs, English Language learners, at-risk students, and gifted and talented students).

Professional Learning Community
A dedicated online community space allows teachers to interact with course instructors and their peers, sharing resources, exploring new ideas, and connecting with other educators from across the country.
Using Diagnostic Assessments to Differentiate Math Instruction

Course Description

Math teachers face enormous pressure to help their students perform well on state and national exams. However, these cumulative end-of-year assessments do little to help teachers evaluate how students are performing throughout the year and how to help them effectively while they’re still in your classroom. That’s where diagnostic assessments come in. Diagnostic assessments give you the data you need to determine students’ needs and drive instructional practices to improve their learning.

In this course, you will learn a variety of assessment techniques to help you diagnose students’ strengths and weaknesses in the math classroom. The key to differentiating curriculum is having the appropriate data that show you what kind of support students need. Therefore, we’ll explore how to create assessments that yield the right data, plus techniques for implementing the assessments successfully. In addition, you’ll receive tech tools, posters, graphic organizers, and templates that will help you design assessments and differentiate your curriculum.

Using the techniques from this course, you’ll be able to meet the diverse needs of all learners in your classroom to help them achieve their highest potential in math.

Connections to Practice

This course provides the following classroom connections:

- Strategies and techniques to assess students in the math classroom
- Tools such as posters, graphic organizers, and templates to support assessment and differentiation
- Resources to differentiate instruction in the math classroom
- Tools for creating assessments in the math classroom

Course Outcomes

In this course, participants will:

- Examine a variety of assessment tools in the math classroom.
- Select technology tools to assess and differentiate in the math classroom.
- Implement a variety of assessments to determine student strengths and areas for growth in the math classroom.
- Develop strategies for gaining meaningful data from assessments.
- Create successful assessments that will yield valuable data and support differentiation.
Charlotte Danielson Framework for Teaching Alignment

**Domain 1: Planning and Preparation**
1b Demonstrating Knowledge of Students
1c Setting Instructional Outcomes
1d Demonstrating Knowledge of Resources
1f Designing Student Assessments

**Domain 3: Instruction**
3c Engaging Students in Learning
3d Using Assessment in Instruction

**Course Engagement and Resources**

The activities and engagement options for the course have been designed to align with guidelines and considerations of Universal Design for Learning. This course aims to:

- Provide the learner with multiple means of representation.
- Provide the learner with multiple means of action and expression.
- Provide the learner with multiple means of engagement.

Your course facilitator will be available to you to answer questions and provide written feedback on your submitted Checkpoint assignment and Final Project. Additionally, within the Moodle LMS, you will have access to a collection of community resources through which you will be able to further explore course concepts through collaboration with facilitators and peers.

**Materials**

Online reading, viewing, and listening resources will be provided in each module.

**Method of Evaluating Student’s Performance**

<table>
<thead>
<tr>
<th>Assignment Category</th>
<th>Total Point Value</th>
<th>Percentage of total possible points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Checkpoint</td>
<td>10 points</td>
<td>30%</td>
</tr>
<tr>
<td>Participation Assignments: Self-reflection and goal setting, concept practice questions, discussion and reflection forums, and the Module 4 checkpoint activity</td>
<td>10 points</td>
<td>30%</td>
</tr>
<tr>
<td>Assignment Category</td>
<td>Total Point Value</td>
<td>Percentage of total possible points</td>
</tr>
<tr>
<td>---------------------</td>
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<td>------------------------------------</td>
</tr>
<tr>
<td>Final Project</td>
<td>15 points</td>
<td>40%</td>
</tr>
</tbody>
</table>

*Please note that you must receive a percentage of 80% or higher for successful completion of this course. Completion of all activities is required to receive credit.

Assessments

Self-Reflection and Goal Setting

This course will include a self-reflection and goal setting assignment in the first module, in which each learner will articulate what they hope to learn and achieve because of the course. Learners will be guided to reflect briefly upon their intentions for the course and to set one to two specific (SMART) goals for their learning.

Concept Practice

These automatically scored questions will appear in each module and will cover concepts discussed in the module. Immediate feedback will be provided for each question.

Discussions

Discussions will appear in each module and include questions about concepts that appear in the module.

Learners will be expected to post one original response to the prompt and respond to two peers.

Discussions will be evaluated on a pass–fail basis, per the following guidelines for completion:

- Participant satisfactorily shares thoughtful reflections and responds to colleagues in a respectful and engaging way.
- Participant provides an adequate level of detail in entries.
- Examples are satisfactorily helpful and informative and foster discussions or demonstrate substantial reflection.
- Participant’s responses are clear and well written and employ proper APA citation.

Project Checkpoint

Each course will include one project checkpoint activity for submission in Module 2. The checkpoint serves as a framework that supports learners in planning for and managing the development of the final project. Thus, the checkpoint allows learners to create artifacts or components that will later serve in completing the final project.
Learners will receive feedback from the course facilitator on the checkpoint assignment in Module 2.

The checkpoint assignment in Module 2 will be evaluated using the following rubric:

<table>
<thead>
<tr>
<th>Focus Areas</th>
<th>Does Not Meet Expectations (1 point)</th>
<th>Partially Meets Expectations (3 points)</th>
<th>Meets Expectations (4 points)</th>
<th>Exceeds Expectations (5 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of Course Content</td>
<td>Checkpoint relates incomplete or incorrect information about course concepts. The learner provides an unclear reflection upon how he or she will evaluate personal progress toward established course goals.</td>
<td>Checkpoint relates superficial information about course concepts. The learner provides a superficial reflection upon how he or she will evaluate personal progress toward established course goals.</td>
<td>Checkpoint relates clear information about course concepts. The learner provides a satisfactory reflection upon how he or she will evaluate personal progress toward established course goals.</td>
<td>Checkpoint relates detailed and thorough information about course concepts. The learner provides a detailed reflection upon how he or she will evaluate personal progress toward established course goals.</td>
</tr>
<tr>
<td>Alignment of Student Outcomes</td>
<td>Checkpoint activity’s alignment to course learning outcomes is unclear or absent.</td>
<td>Checkpoint activity aligns with 1–2 course learning outcomes.</td>
<td>Checkpoint activity aligns with 2–3 course learning outcomes.</td>
<td>Checkpoint activity aligns with 3–5 course learning outcomes.</td>
</tr>
</tbody>
</table>

**Final Project**

The final project for each course will appear in the final module and will include a prompt that aligns with each category (including the “evaluate” and “create” categories) of Bloom’s taxonomy, building on the concepts from each module.

Final projects will be designed for the learner to create an artifact that demonstrates application and understanding of concepts and skills learned through each module of the course.
The final project will be evaluated using the following rubric:

<table>
<thead>
<tr>
<th>Focus Areas</th>
<th>Does Not Meet Expectations (1 point)</th>
<th>Partially Meets Expectations (3 points)</th>
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<th>Exceeds Expectations (5 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of Course Content</td>
<td>Project relates incomplete or incorrect information about course concepts. The learner provides an unclear reflection upon how they will evaluate personal progress toward established course goals.</td>
<td>Project relates superficial information about course concepts. The learner provides a superficial reflection upon how they will evaluate personal progress toward established course goals.</td>
<td>Project relates clear information about course concepts. The learner provides a satisfactory reflection upon how they will evaluate personal progress toward established course goals.</td>
<td>Project relates detailed and thorough information about course concepts. The learner provides a detailed reflection upon how they will evaluate personal progress toward established course goals.</td>
</tr>
<tr>
<td>Application of Course Content</td>
<td>The project is not clearly aligned with the chosen audience; learner demonstrates no or faulty awareness of the audience’s needs.</td>
<td>Learner makes choices regarding content and methods of presentation that may be unclear or inappropriate in some ways; learner demonstrates some awareness of the chosen audience’s needs.</td>
<td>Learner makes appropriate choices regarding content and methods of presentation; learner demonstrates a clear awareness of the chosen audience’s needs.</td>
<td>Learner chooses and adapts project content and presentation in multiple ways to ensure complete appropriateness for the chosen audience; learner demonstrates exceptional awareness of the audience’s needs.</td>
</tr>
<tr>
<td>Alignment of Student Outcomes</td>
<td>Project’s alignment to course learning outcomes is unclear or absent.</td>
<td>Project aligns with 1–2 course learning outcomes.</td>
<td>Project aligns with 2–3 course learning outcomes.</td>
<td>Project aligns with 3–5 course learning outcomes.</td>
</tr>
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**Course Outline**

**Module 1**

Assessments play such a big part in today’s educational world. Think of all the assessments you give on a daily, weekly, monthly, and yearly basis. What are they? How often do you provide assessments? Educators are constantly assessing their students. Types of assessments include formative, summative, self, and diagnostic. These assessments are valuable tools for the data they provide educators and stakeholders.
The mathematics classroom is filled with a variety of assessments: questions, observations, quizzes, tests, exit tickets, state and national assessments, and more. These assessments provide valuable data for educators! What do teachers do with this data? Using this data to drive instruction is key for success in the math classroom. Knowing how to use data from assessments helps meet the needs of today's learners. Before we explore how to use the data, let's ensure that the types of assessments we assign are valuable and can yield meaningful data in the math classroom. In this module you will explore the various types of assessments in the math classroom and determine on how to use these assessments effectively to gain meaningful data in the math classroom.

**Learning Outcomes**

By the conclusion of this module, you will be able to do the following:

- Evaluate the current role of assessments in your math classroom.
- Examine a variety of assessments in the math classroom.
- Explain the attributes of diagnostic assessments for math instruction.
- Select technology tools to assess learners.
- Determine the validity and reliability of the assessments you provide your learners.

**Agenda**

Review the reading, viewing, and listening resources provided in Module 1, and complete the:

- **Self-Reflection and Goal Setting Activity:** in this discussion forum, you will articulate what you hope to learn/achieve because of the course. Please reflect briefly upon their intentions for the course and to set 1-2 specific (SMART) goals for your learning.
- **Introductory Forum:** in this discussion forum, you will have an opportunity to introduce yourself and meet other learners in the course.
- **Module 1 Content Lesson:** The content lesson serves to introduce and explain the topics and concepts for the module, and their applications in the classroom setting.
- **Module 1 Discussion Forum:** in this discussion forum, you will provide an original response to a question posed about topics in the Module 1 Content Lesson and respond to the original postings of your peers.

**Module 2**

As teachers of mathematics, we constantly strive to bring the best instructional practices and strategies to meet the diverse and ever-changing needs of our learners. Reaching all students may occur through the newest and latest trends in education, creative teaching strategies, exciting and engaging technology apps and sites, or the most up-to-date curriculums available. The world is constantly changing, and as educators we must adapt and help prepare our students for the future.

In the math classroom, teachers have the responsibility of teaching all students the same content, regardless of skill and ability level. Standards are set at the local, state, and national levels, and teachers must adhere to these standards and ensure that their students can meet or exceed them. Educators know that not all students learn the same way or at the same pace. It would make our jobs as teachers much easier if there was a “one size fits all” model to utilize on
a daily basis, but we know that is not the case. Reaching all learners requires a variety of methods and strategies, and educators need resources and tools to help students learn in the most appropriate way for them.

Teachers can meet the needs of all learners in the math classroom and help each student find success by homing in on strategies to work with individual learners through differentiated instruction. Differentiating instruction brings relevant and engaging learning opportunities to each student to enhance their learning in the math classroom. Teachers can differentiate instruction in a variety of ways, such as through content, process, and product. In this lesson you will explore how to meet the needs of all your students in the math classroom through differentiated instruction.

**Learning Outcomes**

By the conclusion of this module, you will be able to do the following:

- Evaluate instructional practices for differentiation in mathematics.
- Appraise ways to meet the needs of all learners.
- Select technology tools to differentiate instruction.
- Explore challenges and benefits of differentiated instruction.

**Agenda**

Review the reading, viewing, and listening resources provided in Module 2, and complete the:

- **Module 2 Content Lesson**: The content lesson serves to introduce and explain the topics and concepts for the module, and their applications in the classroom setting.
- **Module 2 Discussion Forum**: In this discussion forum, you will provide an original response to a question posed about topics in the Module 2 Content Lesson and respond to the original postings of your peers.
- **Module 2 Project Checkpoint**: This checkpoint serves to help you evaluate course concepts and discuss their relationship to your professional goals and the outcomes for the course. To complete this checkpoint, you will be asked to reflect upon how you have planned for and executed the application of course concepts and strategies in your professional environment so far.

**Module 3**

Using data to drive teaching practices is vital for engaging learners of all skill and ability levels and helping students succeed. In this module, we will synthesize assessments and differentiation in the math classroom and formulate a way to drive instructional practices through data in the math classroom. Exploring data through teacher-collected methods such as formative, summative, diagnostic, and student self-assessments, as well as data from state examinations, can help to drive instructional practices and differentiate instruction. You will explore case studies examining data and learn to use this data to differentiate instruction to meet the needs of your students. By the end of this module, you will create a coherent plan to bring data-driven instruction to your mathematics classroom practice to enhance student learning, understanding, and achievement.
Learning Outcomes

By the conclusion of this module, you will be able to do the following:

- Examine data-driven instruction and how it can serve the math classroom.
- Plan differentiated math instruction through data.
- Evaluate student data to meaningfully differentiate instruction.
- Perform an item analysis as a strategy for differentiating instruction.
- Utilize formative, summative, and diagnostic assessment data to differentiate instruction.

Agenda

Review the reading, viewing, and listening resources provided in Module 3, and complete the:

- **Module 3 Content Lesson**: The content lesson serves to introduce and explain the topics and concepts for the module, and their applications in the classroom setting.
- **Module 3 Discussion Forum**: in this discussion forum, you will provide an original response to a question posed about topics in the Module 3 Content Lesson and respond to the original postings of your peers.
- **Final Project**: For the final project in this course, you will construct an activity or resource that you will use to introduce course concepts to an audience of your choice. You will implement the resource with your audience or with a test audience for the purpose of assessing its success.
- **Course Evaluation Survey**

Technology Requirements

Please review the [System Requirements for Moodle](#).

Netiquette Policy

Anyone enrolled in online courses has the right to learn in an environment where all individuals are treated equitably and with respect. Behaviors in the course that interfere with the learning experience are not permitted. Disruptive or disrespectful behaviors may result in dismissal from the course.

To maintain a positive, professional, and supportive online environment for this class, learners should adhere to the following standard guidelines. Everyone is expected to:

- Show respect for the facilitator and for other learners in the class, including use of polite, professional tone, respecting and valuing the privacy of other learners, and expressing differences of opinion in a polite and rational way.
- Maintain an environment of constructive criticism when commenting on the work of other learners by offering feedback that is supportive and helpful in nature.
- Contribute relevant topics and ideas when involved in group discussions or other collaborative activities.
Use appropriate grammar and structure in online communication and refrain from use of all capital letters, as this equates to and can be interpreted as shouting in the online environment.

**Compliance With the Americans with Disabilities Act**

In compliance with Section 504 of the Rehabilitation Act and the Americans With Disabilities Act, participants who have any condition, either permanent or temporary, which might affect their ability to complete this course, are encouraged to reach out to support@advancementcourses.com at the beginning of the course. We will make reasonable academic and accessibility accommodations to the course.

**Academic Integrity**

Honesty is an essential aspect of academic integrity. Individual students are responsible for doing their own work and submitting original assignments as per the course directions. Plagiarism and cheating of any kind will not be tolerated.

*Plagiarize:* “To steal and pass off (the ideas or words of another) as one’s own without crediting the source; presenting as new and original an idea or product derived from an existing source” (*Webster’s new collegiate dictionary*, 1973, p. 870). This includes using information from the Internet without citing the website. Avoid plagiarism by appropriately acknowledging the source of the author’s words and ideas.

*Cheating:* Submitting or presenting an assignment as your own when it was written or created by someone else is not permissible in this class.

**References**


Dyer, K. (2015, April 10). 7 ways to understand if your classroom assessments are working. *NWEA.*

Edutopia. (2008, July 15). *Why is assessment important?*


NCTM. (n.d.). *Using data.*


Yale Poorvu Center. (n.d.). *Blind grading.*
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