



Amplify Desmos Math 6–8 Review

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Background

For more than 25 years, Nieman Inc. has been a premier educational developer of innovative digital and print products. Our staff brings decades of experience from teaching, publishing, journalism, marketing, and technology. We're in classrooms, tutoring students and consulting teachers through professional development. We've developed programs across the K-12 spectrum, verified correlations for state adoptions, created digital curricula, written and reviewed ELL programs, created assessment banks, and everything in between.

This alignment was performed by a team of math and curriculum review specialists.

To conduct the study, Nieman reviewed all materials supplied by the vendor, Amplify Education, including the Digital Experience and Teacher Guides, Indiana standards alignments, and Professional Development materials, in addition to the completed Indiana Evaluation Tool and written evidence. Nieman advised on a few minor changes to the Evaluation Tool for clarity. Amplify made revisions based on Nieman's suggestions, and we have confirmed the final version of the Evaluation Tool and attached documentation.

Findings

Section I

Overall, coverage of the 2023 Indiana Academic Standards for Math is satisfactory throughout the 6–8 program. Desmos Math 6–8 received Meets Expectations ratings from EdReports, with perfect scores across all three gateways. Desmos Math was derived from the Illustrative Mathematics program.

Each grade of the 6–8 program has at least 85 percent alignment with the Indiana Standards. The grade-level documents Lessons and Indiana Standard provide details on alignments. The documents also demonstrate the program's scope and sequence. The Unit Facilitation Guides and Admin Guides provide more detail about scope and sequence.

- The 6–8 middle school curriculum has an average of 91 percent alignment across grade levels with the 2023 Indiana Academic Standards for Math.
- Grade 6 has a 92 percent alignment with standards. The following standards are not addressed:
 - 6.NS.6 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers from 1 to 100, with a common factor as a multiple of a sum of two whole numbers with no common factor.
The curriculum does not address use of the distributive property to express a sum involving common factors.

The following Grade 6 standard is addressed in another grade: Grade 8 Unit 1 Lessons 11-12.

- ❖ 6.GM.2 Apply the sums of interior angles of triangles and quadrilaterals to solve real-world and mathematical problems.
Real-world problems are not included.
- Grade 7 has a 92 percent alignment with standards. The following standards are not addressed:
 - 7.NS.1 Show on a number line that a number and its opposite have a sum of 0 (are additive inverses). Find and interpret sums of rational numbers in real-world contexts.
Additive inverses are not addressed.
 - 7.DSP.3 Make observations about the degree of visual overlap of two numerical data distributions represented in line plots or box plots. Describe how data, particularly outliers, added to a data set may affect the mean and/or median.
The term “outlier” is not covered.

The following Grade 7 standards are addressed in other grades:

- ❖ Addressed at Grade 6 Unit 7 Lessons 5 and 11
7.NS.2 Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
- ❖ Addressed at Grade 8 Unit 8 Lesson 2
7.NS.6 Apply the inverse relationship between squaring and finding the square root of a perfect square whole number. Find square roots of perfect square whole numbers.
- ❖ Addressed at Grade 8 Unit 8 Lesson 9, Grade 8 Unit 3 Lessons 4–9, Grade 8 Unit 5 Lesson 8
7AF.5 Define slope as vertical change for each unit of horizontal change, and apply that a constant rate of change or constant slope describes a linear function. Identify and describe situations with constant or varying rates of change.
- ❖ Addressed at Grade 8 Unit 3 Lesson 5, Grade 8 Unit Lesson 8, Grade 8 Unit Lesson 11
7.AF.6 Graph a line given its slope and a point on the line. Find the slope of a line given its graph.
- ❖ Addressed at Grade 8 Unit 5 Lesson 11: volume of cylinder (rest of standard addressed at Grade 7)
7.GM.3 Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms.
- Grade 8 has a 90 percent alignment with standards. The following standards are not addressed:
 - 8.GM.2 Solve real-world and other mathematical problems involving volume of cones, spheres, and pyramids and surface area of spheres.
The volume of a pyramid and the surface area of a sphere are not addressed.
 - 8.DSP.5 For events with a large number of outcomes, understand the use of the multiplication counting principle. Develop the multiplication counting principle, and apply it to situations with a large number of outcomes.
Not addressed

The following Grade 8 standard is addressed in other grades:

- ❖ Addressed at Grade 7 Unit 8 Lessons 2–6

8.DSP.3 Represent sample spaces and find probabilities of compound events (independent and dependent) using organized lists, tables, and tree diagrams.

Each grade level builds on concepts from the previous grade. For example, grade 6 geometry lessons on area provide a foundation for grade 7 lessons on scale drawings. The grade 7 scale drawing lessons provide a basis for grade 8 geometry lessons on dilations.

All unit lessons in the 6–8 curriculum provide a balance of opportunities for students to build conceptual understanding and procedural fluency. At least 85 percent provide real-world application skills. Interactive animations help students build conceptual understanding in areas such as transformation and linear equations. Series of screens in digital lessons demonstrate mathematical procedures step by step to provide procedural fluency. Real-world skills include situations familiar to middle school students from their daily lives to industrial applications from the working world. For example, Grade 6 Unit 4 Lesson 1 demonstrates division of fractions by cutting up cookies. Grade 7 Unit 2 Lesson 9 uses gasoline mileage per gallon to demonstrate proportional relationships.

At least 95 percent of lessons include differentiated instruction to make lessons accessible to all students. The curriculum follows Universal Design for Learning (UDL) guidelines. Differentiation is embedded in the lessons, and it also appears in the Teacher Moves tab and the Lesson Guide. For example, a Student Supports tab on the screens in digital lessons provides strategies for differentiating the material for multiple groups. A Challenge Creator provides extension opportunities. In Grade 8 Unit 6 Lesson 6, differentiated instruction strategies in the Student Supports tab for interpreting slope include visual displays, sentence frames, and vocabulary help for English Language Learners. A strategy for students with disabilities involves connecting new problems with prior work. Keyboard shortcuts allow students using adaptive technology to fully participate in the lesson. An extension has students experiment with inputting slopes to make lines of fit.

Many lessons have multiple entry points as well as strategies to help students in need of Tier 2 and Tier 3 intervention. For example, the Teacher Moves tab has teachers move around the room to monitor group or individual student work to identify students who may need extra help. All grades of the Desmos 6–8 feature interactive digital manipulatives that will help students with visual learning styles. The program includes Spanish language instruction and text-to-speech functionality.

Desmo Math 6–8 is web-based and supports the two most recent versions of popular browsers on Windows, Chrome, and Apple devices.

Section II

Desmos Math 6–8 provides multiple opportunities for formal and informal assessment. Toward the middle of each unit is a quiz, and at the end is the End Assessments. These assessments include multiple-choice, select all, short answer, and extended response question types. All of these formal assessments include rubrics and scoring guides. Readiness Checks and Pre-Unit Checks provide informal assessment. Assessments include lists of Common Core content and process standards with which they align.

Formative assessment tools also include a written feedback tool and the Teacher Dashboard, which provides feedback on the class's comprehension. A Cool-Down activity at the end of lessons allows

students to express how well they understood lesson concepts. Other formative assessment tools include homework, projects, common misconceptions, and in-class discussion prompts.

An example of a project is Grade 6 Unit 2 Lesson 14, where students use ratios to create a proposal to reduce school food waste. Another project in Grade 8 Unit 5 Lesson 7 has groups create a poster that analyzes functional representations of the burning of calories. Practice sets at the ends of units can be used for homework. The Teacher Moves tab on a screen in digital lessons highlights key discussion prompts. It also discusses possible misconceptions in a section called Early Student Thinking.

Section III

The Desmos 6–8 math program provides tutorials and webinars as professional development tools to launch the program with teachers. Implementation will also be supported by a Desmos national math coach and a curriculum email support help desk.

Guidance and support for teachers appears at both the unit and lesson level. At the unit level, overview videos describe “big ideas” students are to master for the unit. The videos begin with prior learning expectations. Presentation of the big ideas is next, followed by a preview of related learning in later units. For teachers who prefer print over video, the Admin Guide covers the same information. Other unit-level support includes a Student Goals and Glossary section as well as brief lesson summaries in the unit At a Glance section.

There are also At a Glance sections at the lesson level that summarize key activities in the lesson and provide clear directions for the teacher. Other key resources at the lesson level are the Teacher Moves tabs on digital lessons and Lesson Guides on paper lessons, which include explicit scripts and guidance.

For optional requirements, alignment to STEM standards is at least 60 percent. The program provides opportunities for reflection, authentic problems, and hands-on activities. At the end of each unit is a Reflection and Synthesis section that provides multiple tasks for student reflection. An example of an authentic problem can be found in Grade 7 Unit 8 Lesson 7, where students apply their knowledge of probabilities to analyze weather forecasts. An example of a hands-on activity can be found in Grade 6 Unit 7 Lesson 3, where each student is given a number card to use in an activity concerning ordering positive and negative numbers from least to greatest.