Amplify Desmos Math

Grades K–5

Program Guide

About Amplify

Amplify is dedicated to collaborating with educators to create learning experiences that are rigorous and riveting for all students. Amplify creates K–12 core and supplemental curriculum, assessment, and intervention programs for today's students.

A pioneer in K–12 education since 2000, Amplify is leading the way in next-generation curriculum and assessment. All of our programs provide teachers with powerful tools that help them understand and respond to the needs of every student.

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Welcome to Amplify Desmos Math!

Amplify Desmos Math is a curiosity-driven program that supports teachers in building a classroom of students who see themselves as math people and gain lifelong math proficiency.

Through a structured approach to problem-based learning, we help teachers create a collaborative math community with students at its center. The program pairs problems students are eager to solve with clear, easy-to-follow instructional guidance that leaves space for teacher creativity. Teachers build on students' curiosity to develop lasting grade-level understanding.

This Program Guide is, as its name suggests, your guide to using Amplify Desmos Math in the classroom. In the pages that follow, you'll find information about our pedagogical philosophy, the research behind our approach, and program components and features. We've also included a section on navigating digital and print program resources to help you find your way around the curriculum.

We're thrilled to have you on this journey with us, and we're here to help. Whether you have a pedagogical question or need technical support, our team can be reached anytime via:

Live chat: Click the orange icon while logged in to chat with our customer support team.

Phone: Call our toll-free number: **(800) 823-1969**.

Online: Visit **amplify.com/request-support** and fill out the form with as much detail as possible about your question, and a member of our team will be in touch.

—The Amplify Desmos Math team

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Our philosophy

As we developed Amplify Desmos Math, we asked ourselves: *How can we support teachers in creating a collaborative classroom of learners excited about math?*

With that question in mind, we built the program around four core tenets:

1 Math that motivates

Picture a classroom where students are so eagerly engaged in a lesson, they wish it wouldn't end. The room is buzzing with the sounds of natural curiosity. This is what an Amplify Desmos Math classroom looks and sounds like. This is math that motivates.

Our curriculum supports social classrooms, invites mathematical creativity, and evokes wonder, empowering students to see themselves and their classmates as having interesting mathematical ideas.

2 A structured approach to problem-based learning

Problem-based learning asks students to make sense of and think strategically about mathematically interesting problems. This approach allows students' ideas to take center stage, so they are active and engaged in their learning process. Teachers are able to hear and respond to student thinking in real time, guiding and differentiating instruction right in the moment.

The Teacher Edition provides guidance for teachers to anticipate and monitor strategies students may use, select and sequence students' ideas, and orchestrate productive discussions to help students make connections between their own ideas and those of their classmates.

Proficiency Progression

Lessons are designed around what we call the Proficiency Progression, a model that systematically builds on students' curiosity to develop lasting grade-level understanding.

1. Activate students' prior knowledge and curiosity
2. Generate new ideas through collaboration
3. Refine ideas using facilitation tools
4. Guide to grade-level understanding
5. Practice, reinforce, remediate, and extend for lasting understanding

Learn more on page 68

3 Access to grade-level math for every student, every day

Tasks in each lesson are thoughtfully sequenced so that all students can engage with the math each day without any roadblocks. Every lesson includes suggestions for accessibility and differentiation to support, strengthen, and stretch student understanding.

We also provide additional resources that integrate seamlessly with core instruction, including a suite of assessments, tailored practice resources that adjust to student learning, and other intervention solutions. Cohesive differentiation and intervention resources support and challenge students on their path toward deeper understanding of the learning goals, ensuring that all students can gain or stretch beyond grade-level math.

4 Student thinking is valuable and can be made evident.

Students first take an active role in developing their own ideas, then synthesize those ideas as a class. To guide the learning process, students see each other's thinking, engage in conversations, and connect to each other by using math to make sense of the world. This collaboration fuels classroom conversations and a shared understanding of math.

Responsive Feedback™ shows students what their ideas mean in context and offers opportunities for students to learn from each other's answers. This feedback encourages students to explore different strategies and make sense of a variety of responses, so that student ideas drive the learning process.

A powerful suite of math resources

Amplify Desmos Math combines the best of problem-based lessons, intervention, personalized practice, and assessments into a coherent and engaging experience for both students and teachers.

Screening and progress monitoring

mCLASS® Assessments, along with daily formative checks, measure what students know and how they think. The asset-based assessment system provides teachers with targeted, actionable insights, linked to core instruction and intervention resources.

Core instruction

Amplify Desmos Math lessons provide a structured approach to problem-based learning, helping teachers create a collaborative math community with students at its center. Each lesson systematically builds on students' curiosity to develop lasting grade-level understandings for all students.

Differentiation and intervention

Boost™ Personalized Learning activities help students access grade-level math through engaging, independent digital practice. Responsive Feedback™ adjusts to students' work, providing item-level adaptivity to further support their learning.

Integrated resources like Mini-Lessons, Fluency Practice, and Math Adventures provide targeted intervention on a specific concept or skill connected to the daily lesson. Extensions are also available to stretch students' understanding.

Course and unit structure

Course

Note: The number of lessons varies from unit to unit in each grade. There are eight units in grade 2. See pages 12–17 for the full program scope and sequence.

Unit

Note: The number of sub-units per unit and lessons within each sub-unit varies. This depiction shows the general structure of a unit. See the course Table of Contents in the print Teacher Edition for more details.

*A brief but powerful mCLASS Beginning-of-Year Screener is provided when mCLASS Benchmark is not included.

A indicates program assessments

Lesson structure

Grades K–1

Warm-Up

Every Amplify Desmos Math lesson begins with a whole-class Warm-Up, an invitational Instructional Routine intended to provide a social moment at the start of the lesson in which every student has an opportunity to contribute. Some Warm-Ups build fluency or highlight a strategy that may be helpful in the current lesson. Other Warm-Ups act as an invitation into the math of the lesson. The Warm-Up for the first lesson of each unit introduces the Unit Story for the Unit.

Activities

Each lesson includes one or two activities. These activities are the heart of each lesson. Students notice, wonder, explore, calculate, predict, measure, explain their thinking, use math to settle disputes, create challenges for their classmates, and more.

Guidance is provided to help teachers launch, monitor, and connect student thinking over the course of the activity. There are also suggestions for pacing, facilitation moves, discussion questions, examples of early student thinking, and ideas for early finishers, as well as opportunities to build and develop the math community in the classroom.

Grades 2–5

Centers

Centers are engaging, hands-on, 15-minute games for students in grades K–5 to play collaboratively to strengthen their understanding of key skills and concepts. In grades K–1, students have Daily Center Time built into every lesson.

Synthesis & Show What You Know

Teachers ensure that students end the lesson with accurate and enduring understandings of the math goal through a synthesis of student ideas, explicit instruction, and reflection.

A short Show What You Know assessment allows students to show what they know about the learning goals of the lesson and reveal what they are still learning.

Practice

Daily practice problems for the day's lesson are included both online and in the print Student Edition, including fluency, test practice, and spiral review.

Lesson Practice 2.03

Lesson Summary

You can represent an equal-sharing situation with a division equation. The dividend and numerator represent the amount being shared, and the divisor and denominator represent the number of shares.

5 liters of water are shared by 6 people. How many liters of water does each person receive?

what is being shared

$5 \div 6 = \frac{5}{6}$ — how much each person receives (size of 1 group)

number of equal shares

1 Jada cuts an 11-inch strip of paper into 5 equal parts. Write an equation to represent the length of each part in inches.

2 Han shared 7 liters of water equally among his 6 dogs. Write an equation to represent the amount of water each dog received in liters.

Unit 2 Lesson 3 99 Lesson Practice

Lesson Practice 2.03 Name _____ Date _____

3 Determine whether each equation represents the given story problem. Place a check mark in the correct column.

		Yes	No
Priya is making blueberry pancakes for her family. She makes 10 pancakes using 3 cups of frozen blueberries. What is the amount of blueberries in each pancake?	$3 \div 10 = \frac{3}{10}$		
Shawn uses 8 ounces of tomato sauce for a homemade spaghetti sauce recipe. The spaghetti sauce makes 5 servings. How many ounces of tomato sauce are in each serving?	$5 \div 8 = \frac{5}{8}$		
2 liters of apple juice is shared equally among 8 people. How many liters of juice does each person get?	$8 \div 2 = 4$		
Clare uses 7 cups of paint equally on 3 of her paintings. How much paint is used on each painting?	$7 \div 3 = \frac{7}{3}$		

4 Diego has 10 feet of ribbon that he cuts into 6 pieces. Which equation represents the length of each piece of ribbon in feet?

(A) $6 \div 10 = \frac{6}{10}$ (B) $6 \div 10 = \frac{10}{6}$

(C) $10 \div 6 = \frac{6}{10}$ (D) $10 \div 6 = \frac{10}{6}$

Unit 2 Lesson 3 100 Lesson Practice

Practice problems in grades K–1 are only available in print.

Scope and sequence

Kindergarten

Suggested instructional days: **137**

UNIT 1

Math in Our World

18 instructional days
3 assessment days

21 days total

UNIT 2

Numbers 1–10

22 instructional days
4 assessment days

26 days total

UNIT 3

Flat Shapes All Around Us

16 instructional days
2 assessment days

18 days total

UNIT 4

Understanding Addition and Subtraction

20 instructional days
3 assessment days

23 days total

UNIT 5

Make and Break Apart Numbers Within 10

15 instructional days
3 assessment days

18 days total

UNIT 6

Numbers 0–20

11 instructional days
2 assessment days

13 days total

UNIT 7

Solid Shapes All Around Us

16 instructional days
2 assessment days

18 days total

Grade 1

Suggested instructional days: **154**

UNIT 1

Adding, Subtracting, and Working With Data

15 instructional days
4 assessment days

19 days total

UNIT 2

Addition and Subtraction Story Problems

20 instructional days
5 assessment days

25 days total

UNIT 3

Adding and Subtracting Within 20

20 instructional days
5 assessment days

25 days total

UNIT 4

Numbers to 99

22 instructional days
5 assessment days

27 days total

UNIT 5

Adding Within 100

14 instructional days
4 assessment days

18 days total

UNIT 6

Measuring Lengths of Up to 120 Length Units

15 instructional days
4 assessment days

19 days total

UNIT 7

Geometry and Time

17 instructional days
4 assessment days

21 days total

Grade 2

Suggested instructional days: **155**

UNIT 1

Working with Data and Solving Comparison Problems

16 instructional days
4 assessment days

20 days total

UNIT 2

Adding and Subtracting Within 100

22 instructional days
5 assessment days

27 days total

UNIT 3

Measuring Length

15 instructional days
4 assessment days

19 days total

UNIT 4

Addition and Subtraction on the Number Line

13 instructional days
3 assessment days

16 days total

UNIT 5

Numbers to 1,000

12 instructional days
3 assessment days

15 days total

UNIT 6

Geometry and Time

15 instructional days
4 assessment days

19 days total

UNIT 7

Adding and Subtracting Within 1,000

19 instructional days
4 assessment days

23 days total

UNIT 8

Equal Groups

13 instructional days
3 assessment days

16 days total

Grade 3

Suggested instructional days: **152**

UNIT 1

Introducing Multiplication

18 instructional days
4 assessment days

22 days total

UNIT 2

Area and Multiplication

13 instructional days
4 assessment days

17 days total

UNIT 3

Wrapping Up Addition and Subtraction Within 1,000

22 instructional days
5 assessment days

27 days total

UNIT 4

Relating Multiplication to Division

20 instructional days
5 assessment days

25 days total

UNIT 5

Fractions as Numbers

17 instructional days
5 assessment days

22 days total

UNIT 6

Measuring Length, Time, Liquid Volume, and Weight

17 instructional days
5 assessment days

22 days total

UNIT 7

Two-Dimensional Shapes and Perimeter

13 instructional days
4 assessment days

17 days total

Grade 4

Suggested instructional days: **148**

UNIT 1

Factors and Multiples

11 instructional days
3 assessment days

14 days total

UNIT 2

Fraction Equivalence and Comparison

15 instructional days
4 assessment days

19 days total

UNIT 3

Extending Operations to Fractions

16 instructional days
4 assessment days

20 days total

UNIT 4

From Hundredths to Hundred Thousands

21 instructional days
5 assessment days

26 days total

UNIT 5

Multiplicative Comparison and Measurement

17 instructional days
4 assessment days

21 days total

UNIT 6

Multiplying and Dividing Multi-Digit Numbers

22 instructional days
4 assessment days

26 days total

UNIT 7

Angles and Properties of Shapes

18 instructional days
4 assessment days

22 days total

Grade 5

Suggested instructional days: **145**

UNIT 1

Volume

14 instructional days
4 assessment days

18 days total

UNIT 2

Fractions as Quotients and Fraction Multiplication

15 instructional days
4 assessment days

19 days total

UNIT 3

Multiplying and Dividing Fractions

15 instructional days
3 assessment days

18 days total

UNIT 4

Multiplication and Division With Multi-Digit Numbers

18 instructional days
4 assessment days

22 days total

UNIT 5

Place Value Patterns and Decimal Operations

24 instructional days
5 assessment days

29 days total

UNIT 6

More Decimal and Fraction Operations

19 instructional days
4 assessment days

23 days total

UNIT 7

Geometry and Patterns

12 instructional days
4 assessment days

16 days total

Print for every lesson with engaging digital experiences

The program thoughtfully combines conceptual understanding, procedural fluency, and application, motivating students with interesting problems they are eager to solve.

Whether in print or digital form, engaging interactions enable students and teachers to openly exchange ideas.

Each lesson includes student print materials, interactive teacher Presentation Screens, and digital resources for practice and differentiation. Some lessons also use manipulatives or provide options for students to use devices individually or in pairs. Device recommendations for student use are age-appropriate, with more frequent usage in middle and high school.

In the grade 4 lesson, Ronnie the Roly Poly, students help a roly poly reach a strawberry by representing equivalent fractions with multiplication expressions. They immediately see whether or not their responses were correct as the roly poly moves toward the strawberry.

Developing problem-solvers who persevere

Multiple ways to solve a problem

There are often multiple ways of solving a problem. By hearing a variety of strategies, students see that their ideas are valuable and feel empowered to participate.

Productive struggle

When given time to reach into their strategy toolboxes and play out their thinking, students can persevere in making sense of problems and getting to a correct answer.

Flexible, confident problem solvers

Computational fluency helps students tackle challenges with ease and adaptability. Our curriculum weaves fluency into everyday learning with plenty of practice opportunities. Students become versatile problem solvers ready to apply their skills in any situation.

Program components

For students

- Student Edition (two-volume)
- Digital access to lesson resources and practice
  - Interactive Student Screens
  - Responsive Feedback
  - Collaboration tools
  - Boost Personalized Learning
- Additional Practice

Student materials are available in Spanish.

Manipulative kits

Manipulative kits are specific to each grade, K–5, and include materials for a class of 24 students. An add-on kit with materials for an additional five students is also available for purchase for larger class sizes.

See page 23 for a full list of components included in the hands-on manipulative kits.

Centers kits

Centers kits are available for easy grab-and-go use that include all printed materials needed, organized and pre-packaged by Center and Center stage.

For teachers

- Teacher Edition (two-volume*)
- Digital access to planning and instruction resources
  - Presentation Screens
  - Facilitation and progress monitoring tools
  - Assessment and reporting suite, including mCLASS Assessments
- Assessment and Lesson Resources
- Centers Resources
- Intervention and Extension Resources
- Math Language Development Resources
- Additional Practice

*In grades K–2, the Teacher Edition is in four volumes: Volumes 1a, 1b, 2a. and 2b.

Manipulatives

Hands-on manipulatives in the math classroom are essential tools for discovery and understanding key math concepts. They create a tactile experience to help students conceptualize information, allowing them to build mental models.

Our approach to manipulatives in Amplify Desmos Math provides:

- A space where students can use any manipulative they want to explore and play to better understand a concept.
- A way for teachers to see how students are understanding a concept through the use of manipulatives.
- Specific manipulatives for specific moments.

Lessons in Amplify Desmos Math thoughtfully integrate the use of manipulatives where appropriate to enhance students' understanding of key math concepts. Our approach aligns with the 2013 position statement issued by the National Council of Supervisors of Mathematics (NCSM): "[I]n order to develop every student's mathematical proficiency, leaders and teachers must systematically integrate the use of concrete and virtual manipulatives into classroom instruction at all grade levels".[1]

The contents of Amplify Desmos Math manipulative kits include materials that can be used to illustrate math concepts, "whether made specifically for mathematics (e.g., connecting cubes) or for other purposes."[2]

The kits contain materials for a class of 24 students, with an add-on kit for larger class sizes also available.

1 NCSM. (2013). Improving student achievement in mathematics using manipulatives in classroom instruction [Position paper].

2 V. de W., J. A., Karp, K. S., Bay-Williams, J. M., & Wray, J. A. (2022). *Elementary and middle school mathematics: Teaching developmentally*. Pearson.

Component	GK	G1	G2	G3	G4	G5
4-inch clock			✓			
6-inch protractor					✓	✓
Algebra tiles						
Base ten cubes					✓	✓
Base ten flats				✓	✓	✓
Base ten rods		✓	✓	✓	✓	✓
Base ten units		✓		✓	✓	✓
Bucket balance				✓		
Clear plastic straws	✓					
Clock		✓	✓			
Compass						
Dot cubes		✓				
Double ten frames		✓	✓			
Five frames	✓					
Foam number cubes			✓	✓	✓	
Geoblocks	✓	✓				
Geoboards				✓		
Geosolids	✓	✓				
Gram weights				✓		
Inch color tiles			✓	✓	✓	
Number cards	✓	✓	✓	✓	✓	✓
Paper clips						
Pattern blocks	✓	✓		✓	✓	
Patty paper						
Place value mat		✓				
Play dough	✓					
Ruler			✓	✓	✓	
Snap cubes	✓	✓	✓	✓	✓	✓
Tape measure			✓			
Ten frames	✓	✓	✓			
Two-color counters	✓	✓	✓	✓	✓	✓

The research behind our approach

Amplify Desmos Math is designed to foster a collaborative environment that promotes student engagement and results in increased learning opportunities. Without this careful curriculum design, the work in math classrooms tends to be passive—a reality educators know all too well. As a result, students are disengaged from classroom activities, and from learning in general.[1] Many of these students also come to believe that math is not for them.[2]

To reverse these kinds of outcomes in the classroom, it's important to create a student-centered classroom, where students are genuinely engaged in learning and can picture themselves as capable of doing math. In 2014, the National Council of Teachers of Mathematics set forth guiding principles for teaching mathematics based on their research. These practices[3] include teaching and learning, access and achievement for all students, curriculum, tools and technology, and assessment. Below we describe each of these principles and how they have guided the design of Amplify Desmos Math.

1 See Fredricks, J. A., Parr, A., Amemiya, J. L., & Wang, M.T. (2019). What matters for urban adolescents' engagement and disengagement in school: A mixed methods study. *Journal of Adolescence Research*, 34, 491–527.; Juvenon, J. (2007). Reforming middle schools: Focus on continuity, social connectedness and engagement. *Educational Psychologist, 42*(4),197–220.; Roeser, R. W., Peck, S. C., & Nasir, N. (2006). Identity and self processes in school learning, achievement and well-being. In P. Alexander & P. H. Winne (Eds), *Handbook of educational psychology* (2nd ed.). (pp. 391–424).: Lawrence Erlbaum.

2 See Binning, K. R., Wang, M. T., & Amemiya, J. L. (2019). Persistence mindset among adolescents: Who benefits from the message that academic struggles are normal and temporary? *Journal of Youth and Adolescence*, *48*, 269–286.; Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*, 246–263

3 National Council of Teachers of Mathematics. (2014). Principles to Action, Executive Summary.

Teaching and learning

An excellent mathematics program requires teaching that engages students in learning through individual and collaborative experiences that promote their ability to make sense of mathematical ideas and reason mathematically.

We embedded the structures laid out by Peg Smith and Mary K. Stein's *5 Practices for Orchestrating Productive Classroom Discourse* into Amplify Desmos Math lessons to ensure that teachers could effectively engage students in meaningful and productive mathematics conversation. Additionally, Amplify Desmos Math relies on collaboration and lots of hands-on, curiosity-driven learning to help students dive into problems on their own and develop skills in expressing their perspectives. Lessons often include collaborative use of manipulatives, movement around the classroom, and other social features designed to support students in seeing each other's brilliant ideas.

Pairs | 10 min

Activity 2 Organizing Cooking Tools

Purpose: Students order cube towers and number cards to connect quantities and written numerals with the count sequence.

Presentation Screens 4-6

Lesson 17 Activity 2

Materials

Manipulative Kit:

- Ensure each pair has connecting cube towers from Activity 1 and one set of number cards (1–10).

1 Launch

4 **Play** the animation.

5 **Display** a set of student-created cube towers and number cards that are out of order.

Note: Each pair's cube towers and number cards should be kept in a set so that they can be used in the next lesson.

Distribute the number cards and cube towers created in Activity 1.

Say, "It is helpful to organize cooking tools in a way that helps the chefs see how many. Organize your cube towers and numbers in a way that makes sense to you. Explain to your partner how you organized them."

2 Monitor

While students complete the activity, refer to the Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What ideas do you have about organizing the cube towers and number cards? What could you do first?"
- Ask, "Will you start with organizing the cube towers or number cards, or both?"

3 Connect

6 MLR **MLR7:** This Connect is structured using the *MLR7: Compare and Connect* routine.

Invite pairs to share their strategies for putting the cube towers in order. Select and sequence their responses in the order shown in Rows 2 and 3 in the *Differentiation* table.

Use the Think-Pair-Share routine. Ask:

- "What is the same about how each pair organized the cooking tools?"
- "What is different about how each pair organized the cooking tools?"

ML/EL **Multilingual/English Learners** Provide sentence frames, such as "___ is the same/different because . . ."

Say (if not yet mentioned during discussion), "They both put the numbers and groups in order, but 1 pair compared how many were in each cube tower and the other pair thought about the numbers we say when we count."

Key Takeaway: Say, "We can say that these numbers are in *order*. Numbers are in order when they are organized to match how we count."

227A Unit 2 Numbers 1–10

In this kindergarten lesson, students have a choice in how they approach problems in different ways and explain their thinking to a partner.

Access and achievement for all students

An excellent mathematics program requires that all students have access to a high-quality mathematics curriculum, effective teaching and learning, high expectations, and the support and resources needed to maximize their learning potential. This commitment reflects a broader push within the educational community to ensure that every student has the opportunity to thrive as a learner and practitioner of mathematics.[1]

The differentiation of Amplify Desmos Math extends beyond academic differences to encompass variations in student motivation, interests, and identity. Understanding and addressing these aspects are essential for creating inclusive learning environments where all students feel valued and empowered to succeed.[2] We incorporated Universal Design for Learning guidelines (Engagement, Representation, Action & Expression) into each lesson and developed a platform that is intuitive and easy-to-use for all learners. To support multilingual/English learners, Amplify Desmos Math incorporates research-based Mathematical Language Routines (MLRs) by providing language modality strategies like sentence frames where appropriate, both in the teacher language provided for each task and in the differentiation support section found throughout the program.

1 Fredricks, J. A., Parr, A., Amemiya, J. L., & Wang, M.T. (2019). What matters for urban adolescents' engagement and disengagement in school: a mixed methods study. *Journal of Adolescence Research*, 34, 491–527.; Juvenon, J. (2007). Reforming middle schools: focus on continuity, social connectedness and engagement. *Educational Psychologist*, 42(4),197–220.; Roeser, R. W., Peck, S. C.,& Nasir, N. (2006). Identity and self processes in school learning, achievement and well-being. In P. Alexander & P. H. Winne (Eds), *Handbook of educational psychology*. 2nd edn. (pp. 391–424). Mahwah, NJ: Lawrence Erlbaum.

2 Binning, K. R., Wang, M. T., & Amemiya, J. L. (2019). Persistence mindset among adolescents: Who benefits from the message that academic struggles are normal and temporary? *Journal of Youth and Adolescence*, 48, 269–286.; Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and intervention. *Child Development*, 78, 246–263.

Curriculum

An excellent mathematics program includes a curriculum that develops important mathematics along coherent learning progressions and develops connections among areas of mathematical study and between mathematics and the real world.

The Amplify Desmos Math curriculum is based on the same scope and sequence as Illustrative Mathematics'® IM K–12 Math™, which is highly rated for its focus, coherence, and rigor.* Materials in Amplify Desmos Math assess and give all students extensive work with grade-level content to meet the full intent of grade-level standards. Assessments are aligned to grade-level standards, including all quizzes and end-of-unit assessments. Lessons give students meaningful experiences with grade-level content and additionally include practice problems that serve to reinforce understanding of grade-level concepts. All Amplify Desmos Math lessons can be copied, edited, and customized by teachers. Regarding coherence, the materials address the major clusters of the grade, have supporting content connected to major work, make connections between clusters and domains, and have content from prior and future grades connected to grade-level work.

Additionally, each course addresses each aspect of **rigor** in mathematics. Lessons develop students' **conceptual understanding** by inviting them into familiar or accessible contexts and asking them for their own ideas before presenting more formal mathematics. **Procedural fluency** is embedded throughout activities and in daily lesson practice. Several structures in the curriculum further highlight procedural fluency development, including:

- Repeated challenges, where students engage in a series of challenges on the same topic.
- Challenge Creators, where students challenge themselves and their classmates to a question they create.

Students also have opportunities to **apply** what they've learned to new mathematical or real-world contexts. Concepts are often introduced in context and most units end by inviting students to apply their learning.

*Specific EdReports ratings and details can be found at https://edreports.org/reports/overview/open-up-resources-6-8-math-2017.

Students can show their thinking in open-ended text responses like the one shown in this example.

1 See Roy, A., et al (2013). Teaching to address diverse learning needs: Development and validation of a differentiated instruction scale. *International Journal of Inclusive Education*, *17* (11), 1186–1204; Tomlinson, C.A. (2014); *The differentiated classroom: Responding to the needs of all learners* (2nd ed.). Association for Supervision and Curriculum Development; and Lindner, K.-T., & Schwab, S. (2020). Differentiation and individualisation in inclusive education: A systematic review and narrative synthesis. *International Journal of Inclusive Education*, 1–21.

Tools and technology

An excellent mathematics program integrates the use of mathematical tools and technology, in tandem with physical materials, as essential resources to help students learn and make sense of mathematical ideas, reason mathematically, and communicate their mathematical thinking.

Multiple studies on the use of feedback in education have shown that rich feedback provided during the instructional cycle is most effective in teaching students new skills. This type of feedback not only shows whether a student's answer is right or wrong, but also helps students understand the specific mistakes they made, see the math in those mistakes, realize why they made those mistakes, and know what they can do to avoid making the same mistakes in the future.[1]

Digital activities and Presentation Screens in Amplify Desmos Math incorporate an interactive **Responsive Feedback™** feature that shows students the meaning of their own thinking, providing students with the kind of information that is proven to help students most. Lessons allow students to input different variables in a problem so that they can see how correct and incorrect answers impact a solution. The playful nature of the lessons allows students to explore their mathematical thinking with autonomy and discover why certain answers are incorrect or correct.

The grade 3 Puppy Pile lesson allows students to use bar graphs to explore how different scales and quantities of animals impact the data representation.

For example, in the Grade 3 Puppy Pile lesson, students extend their understanding of scaled picture graphs to scaled bar graphs. As students represent data on scaled bar graphs and compare the graphs, they consider how the same data can look different when represented on graphs with different scales. This mathematical understanding is strengthened as individual items build into the accurate bar graph for a student to compare against their response. Students are able to adjust the scale of the graphs and visually see the impact of the different scales.

The student digital platform is highly interactive and allows students to respond in a variety of ways. Students show their understanding through digital interactions, discussion, open-ended text responses, sketches, and digital manipulatives. When appropriate, teachers can allow students to see others' responses to spark discussion. Digital tools for teachers are available for classroom use every day, while student devices are recommended for an age-appropriate number of lessons.

Assessment

An excellent mathematics program ensures that assessment is an integral part of instruction, provides evidence of proficiency with important mathematics content and practices, includes a variety of strategies and data sources, and informs feedback to students, instructional decisions, and program improvement.

Research shows that the most effective forms of assessment are designed intentionally to support student learning. These assessments are integrated into the learning experience, provide immediate knowledge of student performance, and give students prompt feedback about their performance. Amplify Desmos Math provides many ways for educators to understand what their students know and provide the support needed for students to progress in the math learning journeys.

Name _____ Date _____

End-of-Unit Assessment Unit 4.2

1 Select *all* fractions that are equivalent to $\frac{3}{12}$.

A. $\frac{1}{4}$ B. $\frac{2}{8}$
C. $\frac{2}{11}$ D. $\frac{4}{1}$
E. $\frac{5}{20}$

2 Select *all* fractions that are *greater* than $\frac{1}{2}$, but *less* than 1.

A. $\frac{4}{5}$ B. $\frac{1}{3}$
C. $\frac{5}{4}$ D. $\frac{4}{7}$
E. $\frac{5}{10}$

3 Use the symbol <, >, or = to make the statement true.

$\frac{3}{5}$ ___ $\frac{7}{12}$

4 Write an equivalent fraction with the given denominator.

$\frac{1}{2} = \frac{\quad}{12}$

Form A 42

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Name _____ Date _____

End-of-Unit Assessment (continued) Unit 4.2

5 Write 2 different fractions that are equivalent to $\frac{4}{6}$.

Show or explain your thinking.

answer: _____

6 Priya says that $\frac{3}{5}$ and $\frac{6}{10}$ are not equivalent because there are twice as many parts in $\frac{6}{10}$. Do you agree with Priya? Write *yes* or *no*. Explain your thinking.

7 Order the fractions from *least* to *greatest*.

$\frac{7}{4}$ $\frac{7}{12}$ $\frac{3}{8}$ $\frac{13}{6}$ $\frac{1}{4}$

Least Greatest

Form A 43

Benchmark and progress monitoring assessments in the program are powered by integrated mCLASS® Assessments. These assessments measure students' knowledge and provide teachers with targeted, actionable insights based on assessment results. mCLASS Assessments provide instructional recommendations that are linked to core instruction and supplemental practice and intervention resources, ensuring that each assessment contributes to improving students' mathematical understanding. This connection between assessment and instruction results in an impactful assessment system that aids Multi-Tiered Systems of Support (MTSS) in the classroom and ultimately helps students learn.

Amplify Desmos Math also includes unit- and lesson-level assessments and additional knowledge checks that keep teachers apprised of what their students know, available in both print and digital formats. When administered through the Amplify Desmos Math digital platform, educators are able to see a student's approach to solving math problems in real time, giving educators an opportunity to provide immediate feedback that students can use as they learn new skills. Built-in teacher supports help teachers use students' partial or unfinished learning to have productive conversations in the classroom, spurring occasion for group learning, which studies show optimize math learning in the classroom.[1]

1 National Academies of Sciences, Engineering, and Medicine. (1993). *Measuring what counts: A conceptual guide for mathematics assessment*. Washington, DC: The National Academies Press.

Guided by expert advisors, partners, and educators

Amplify Desmos Math embodies the convergence of groundbreaking research and development efforts in K–12 mathematics instruction. The acquisition of Desmos Classroom by Amplify Education in 2022 brought together two distinct, yet complementary, curriculum efforts based on Illustrative Mathematics'® IM K–12 Math™.

A dedicated team at Amplify, with nearly 2,000 combined years of classroom teaching and school leadership experience, thoughtfully created Amplify Desmos Math with teachers and students in mind. This team includes curriculum developers, interaction developers, copy editors, graph specialists, digital innovation specialists, standards and customization specialists, production editors, and many more.

Amplify Desmos Math also brings together industry-leading curriculum development and instructional technology experts who understand the needs of K–12 teachers and learners and are dedicated to rigorous mathematics instruction.

Program advisors and contributors

Jason Zimba, Ph.D.

A leader in mathematics education, Jason was a founding partner of Student Achievement Partners, an author of the Publishers' Criteria for Mathematics, and a catalyst in countless initiatives to improve math education nationwide. He is now Chief Academic Officer at Amplify.

Dan Meyer, Ph.D.

A longtime advocate for better math instruction, Dan served as Chief Academic Officer at Desmos, making digital math tools more accessible and engaging for students. In 2024, Dan was awarded the prestigious Ross Taylor/Glenn Gilbert National Leadership Award by the National Council of Supervisors of Mathematics for transforming the way educators and students experience mathematics. He continues to shape the future of math technology as Vice President of User Growth at Amplify.

Kristin Gray

Passionate about the value of curiosity in the classroom, Kristin received the Presidential Award for Excellence in Mathematics and Science Teaching. Beyond her role as a teacher and coach, she has influenced math education at scale as former Director of K–5 Curriculum at Illustrative Mathematics and current Executive Director of Math at Amplify.

Phil Daro

Dedicated to rigorous mathematics instruction, Phil received the Walter Denham Award from the California Mathematics Council and the Ross Taylor/Glenn Gilbert National Leadership Award from the National Council of Supervisors of Mathematics. He is a long-time member of the NAEP Validity Studies panel.

Fawn Nguyen

With over 30 years of classroom experience, Fawn is renowned for her teaching methods in the area of problem-solving. She has shared her knowledge at countless conferences and workshops nationwide. She now leverages her expertise as a math specialist at Amplify.

Patrick Callahan, Ph.D.

A research mathematician passionate about using assessment to understand student thinking, Patrick co-founded Math ANEX, now a part of Amplify. He has served as statewide co-director of the California Mathematics Project and Senior Research Scientist at WestEd. He is Vice President of Assessment at Amplify.

John W. Staley, Ph.D.

A longtime educator and past president of NCSM, John has worked to improve school systems and prepare students for the future. He has also served as chair of the U.S. National Commission on Mathematics Instruction and board member for Student Achievement Partners.

Partner organizations

ENGLISH LEARNERS SUCCESS FORUM

Math is a language that needs to be developed. Our work with **English Learners Success Forum (ELSF)** supports the development of all students' language skills with thoughtful integration of strategies and best practices for multilingual and English learners. **elsuccessforum.org**

(Note: ELSF does not rate or endorse materials. ELSF encourages all selection of materials to go through a robust adoption process using EL-inclusive criteria.)

math for love

Multiplication By Heart and other fluency decks by **Math for Love** have been included in Amplify Desmos Math to inspire a love of mathematics in students and to foster a deep understanding of math concepts through problem-solving, play, and inquiry. **mathforlove.com**

desmos studio PBC

Our close collaboration with **Desmos Studio**—which sets the standard for calculators and digital tools for exploring mathematics—enables us to build accessible and delightful activities in Desmos Classroom, Amplify's teaching and learning platform. **desmos.com**

Classroom advisors

Chris Shore
Secondary Curriculum and Instruction Coordinator
Professional learning, intervention, usability, and secondary mathematics

Michelle Douglas Meyer
District Math Facilitator
Early childhood mathematics

JoAnna Chocooj
Retired teacher
Early childhood mathematics

Leila Sales
Children's Book Author, Publisher, and Consultant
Elementary Unit Stories

Educator advisors

- Vicky Alvarez, Teacher
- Wendy Baty, Consultant & Retired Teacher
- Daniel Bautista, Teacher
- Melodie Blackwood, Consultant
- Jed Butler, Teacher
- Beverly Campbell, Elementary Teacher on Special Assignment
- Joaquin Castillo, Instructional Coach
- Leslie Ceballos, Assistant Principal
- Christina Corradino, Teacher on Special Assignment
- Jamie Dropik, Teacher
- Simon Eisenberg, Lead teacher
- Krista Fosmire, Teacher
- Duane Habecker, Mathematics coordinator
- Allison Krasnow, Assistant Principal
- Jeffrey Linder, Math Specialist
- Chandra T. Phillips, Principal
- Lori Robinson, Retired Executive Director
- Ileana Santigao, Teacher
- Morgan Saxby, Teacher
- Lisa Stoll, Retired Teacher
- Natara Warren, Teacher & instructional coach
- Chris Weber, Principal
- Kelly Young, Teacher

VOLUME:
204
96+108

Navigating the program

In the pages that follow, you'll find helpful tips and wayfinding for navigating Amplify Desmos Math. We recommend reading these pages alongside the program's print materials and digital experience to fully appreciate and understand the components in context.

You'll read about navigating program features including:

- Navigating the print program
- Navigating the digital program

Navigating the print program

Unit & Sub-Unit Resources

Each unit includes a range of resources designed to support teachers in thinking through the progression of mathematics that students will engage with over the course of the unit. These resources can support teachers in their unit planning, as well as choices they make in response to students' thinking, strengths, and needs that arise over the course of the unit.

Unit at a Glance

Unit Investigation Filling Containers
Launch the unit with this engaging mathematical task!

Math in Action (Optional)
End the unit with reflecting on the math students learned in the unit and how it applies to their world!

Assess and Respond — Unit Investigation — Sub-Unit 1

A **Pre-Unit Check** — Learn more about your students' understanding of foundational concepts and skills that will support them in Sub-Unit 1.

1 **Investigate: Filling Containers** — **Which container has the greatest capacity?** — Apply measurement concepts to determine the relative capacities of containers.

2 **Which Is Largest?** — **Defining Volume** — Explore volume by building and comparing figures with standard unit cubes.

3 **Cube Figures** — **Developing Strategies to Determine Volume** — Describe the layered structure of a rectangular prism and develop strategies to determine the volumes of rectangular prisms.

Assess and Respond — Sub-Unit 3

7 **Packing the Barge** — **Measuring Volume With Different Units** — Explain how different-sized units affect the measurement of the volume of an object.

8 **Shipping Out Trash** — **Applying Volume Concepts to Solve Problems** — Determine the volumes of rectangular prisms with standard units of measure by using the formulas $V = l \times w \times h$ and $V = B \times h$.

A **Quiz: Sub-Unit 2** — Learn about your students' understanding of the concepts and skills so far in this unit.

9 **Putting It Together** — **Determining Volume of Figures Made of Prisms** — Build and determine the volumes of figures composed of rectangular prisms in which unit cubes are visible.

Assess and Respond

14 **Lesson Learned** — **Solving Real-World Problems Involving Volume** — Determine the volume of a figure composed of rectangular prisms when given clues about the figure's attributes.

A **End-of-Unit Assessment** — Learn about your students' understanding of the concepts and skills in the unit. There are two forms of the End-of-Unit Assessment: Forms A and B.

Unit 1 1B Unit at a Glance

All lessons can be taught using the Student Edition while the teacher projects Presentation Screens.

We recommend students use devices to interact with some lessons, as indicated with

Pacing: 18 days | **Short on time?** See pacing considerations below.

Pre-Unit Check: 20 min — **Sub-Unit Quizzes:** 20 min each
14 Lessons: 60 min each — **End-of-Unit Assessment:** 45 min

Assess and Respond — Sub-Unit 2

4 **Stacking Garbage** — **Using the Structure of Rectangular Prisms to Determine Volume** — Use and explain the layered structure of a rectangular prism to determine volumes of rectangular prisms.

A **Quiz: Sub-Unit 1** — Learn about your students' understanding of the concepts and skills so far in this unit.

5 **Partial Prisms** — **Using Multiplication to Calculate Volume** — Determine the volumes of partially filled or completely packed rectangular prisms and represent the volumes with different multiplication expressions.

6 **Volume of Rectangular Prisms** — **Generalizing How to Determine the Volume of Any Rectangular Prism** — Determine the volume of a rectangular prism without unit cubes and generalize how to determine the volume of any rectangular prism.

10 **Figures Made of Prisms** — **Determining Volume of Figures in Different Ways** — Determine the volumes of figures composed of rectangular prisms, in which unit cubes are visible, using different strategies.

11 **Where Are the Prisms?** — **Determining Volume Using Edge Lengths** — Represent and determine the volume of a figure composed of rectangular prisms in which unit cubes are not shown.

12 **What's the Edge Length?** — **Determining Volume When Edge Lengths Are Unknown** — Represent and determine the volume of a figure composed of rectangular prisms in which unit cubes are not shown and some needed edge lengths are unknown.

13 **Express Yourself** — **Representing the Volume of a Figure in Different Ways** — Explain how different expressions represent the volume of a figure composed of rectangular prisms.

Pacing Considerations

mCLASS Screener (Beginning-of-Year): If you administer this assessment before engaging in Unit 1 instruction, you may use the results of the Beginning-of-Year in place of the Pre-Unit Check.

End-of-Unit Assessment: This assessment can be given on the same day as the Pre-Unit Check for the next unit.

Lesson 1: This lesson can be omitted. It is an exploration that helps students engage in the unit, but is not essential for meeting required standards. If omitted, read and discuss the Unit Story prior to Lesson 2.

Lessons 2 and 3: These lessons can be condensed into 1 lesson.

Unit 1 1C Unit at a Glance

Every unit has a **Unit at a Glance** page which shows teachers everything they need to know to get started planning out their upcoming unit.

We recommend students use **devices** to interact with most lessons. These lessons can be taught using the Student Edition while the teacher projects the screens.

Teachers are provided with thoughtful **pacing considerations** for how they can adjust the pacing of the unit as needed without compromising unit learning goals.

Unit Overview pages

Teachers will find a comprehensive set of resources for each unit, including an overview of the math of the unit, a visual summary of the Unit at a Glance, a preview of each of the unit assessments, and unit guidance for differentiation, Centers, accessibility, language development, materials, technology, and connections to future learning. Each Unit Overview also includes a professional development activity, a formative Pre-Unit Check that teachers can use to assess students' readiness for unit topics, and a Unit Story that provides an engaging narrative to frame students' explorations throughout the unit.

Table of contents

The **Sub-Unit Overview** clearly shows the goals and student-facing essential questions for the sub-unit.

Depending on the goals of the sub-unit, the **Math That Matters Most** page illustrates for teachers the most important progressions of either strategies, skills, or language that happen during the sub-unit.

This page lists all the **Centers** newly introduced in **Activities** in the sub-unit. For each new Center, it shows teachers a list of all the materials needed for repeated use. It also lists the Centers recommended for use beyond the lesson.

The **Summary** page clearly illustrates what students learned in the sub-unit, which aids teachers as they provide opportunities for practice and assessment of sub-unit topics.

Sub-Unit Overview pages

The lessons within each unit are grouped into sub-units that address a related group of concepts. Each sub-unit starts and ends with pages that focus on the key ideas of the sub-unit.

Lesson Supports

Throughout this Teacher Edition, lesson guidance for teachers is organized clearly and consistently so that they have all of the information they need at their fingertips.

Lesson modality shows teachers how they should plan to have students engage in the lesson.

Unit 1
Lesson
3

This lesson uses print Student Edition pages and digital Teacher Presentation Screens.

Cube Figures

Developing Strategies to Determine Volume

Let's explore the structure of rectangular prisms.

Focus and Coherence

- **Today's Goals**
  1. **Language Goal:** Describe the attributes and layered structure of a rectangular prism. **(Writing, Speaking, and Listening)**
  2. **Goal:** Develop strategies to determine the volumes of rectangular prisms.

  Students compose and decompose rectangular prisms with unit cubes, developing language to describe the layered structure. They use the layered structure to develop more efficient strategies to determine volume and to consider what makes 2 prisms different.

Prior Learning

In Grades 1 and 2, students built and described the attributes of rectangular prisms. In Lesson 2, students counted the unit cubes making up a solid figure to measure its volume.

Future Learning

In Lesson 4, students will determine the volumes of rectangular prisms represented as two-dimensional prisms. They will see that any face of the prism can be considered 1 layer and that each layer is identical.

Vocabulary

Review Vocabulary

rectangular prism
unit cubes
volume

Rigor and Balance

- Students continue to build their **conceptual understanding** of volume by examining the structures of rectangular prisms and using the structure to develop strategies to determine volume.

I can be all of me in math class.
When do you do math outside of school?

Support students in building their ***mathematical identity*** by asking them to reflect on this question as they complete this lesson.

Unit 1 Lesson 3 11A Cube Figures

In the **Focus and Coherence** section, teachers will find the goals and language goals for the lesson. There is also information on prior learning that has built to the math in this lesson, as well as future learning that this lesson is helping build to.

The **Rigor and Balance** section explains how students develop conceptual understanding, procedural fluency, and application in this lesson.

Lesson Overview

This introductory page orients teachers to the topic, standards, and key learning goals of the lesson, including any new vocabulary terms that will be introduced.

The **time frame** and suggested **student grouping** is listed for each part of the lesson.

The screen icon is used to show which **Presentation Screens** or **Digital Student Screens** align to each instructional moment.

The **Prep Checklist** lists all materials students will need for the lesson.

Examples of what **students might say** in response to the Warm-Up prompt are provided to help teachers prepare to facilitate the conversation.

Lesson at a Glance

The Lesson at a Glance page describes the purpose of the Warm-Up, Activities, Synthesis, and Show What You Know. Teachers will find suggested timing for each part of the lesson, as well as guidance on whether students should work individually, in pairs, in small groups, or with the whole class.

The page also lists which Student Edition pages, Presentation Screens, or Digital Student Screens can be used with each part of the lesson, as well as any hands-on materials that may be needed.

Warm-Up

Every Amplify Desmos Math lesson begins with a whole-class Warm-Up, an invitational Instructional Routine intended to provide a social moment at the start of the lesson in which every student has an opportunity to contribute. Some Warm-Ups build fluency or highlight a strategy that may be helpful in the current lesson. Other Warm-Ups act as an invitation into the math of the lesson. The Warm-Up for the first lesson of each unit introduces the Unit Story for the unit.

The **Purpose** of each activity is highlighted here, as well as suggestions for the **student grouping**, **time frame,** and **screen pacing** for the activity.

Teachers are provided with thoughtful **Short on time?** suggestions for how they can adjust the pacing of the lesson as needed without compromising lesson goals.

Each lesson notes the corresponding **Teacher Presentation Screens** or related **Student Edition** pages also available to support the lesson.

For every activity, teachers will see the **corresponding student digital screens** or **Student Edition pages**, based on the recommended lesson modality.

Small Groups | 35 min

Activity 1 The Climbing Wall

Purpose: Students determine the volume of a solid figure composed of rectangular prisms where some edge lengths are unknown, recognizing that they may need to use parallel edges to determine unknown edge lengths.

Presentation Screens 3–6 | Lesson 12 Activity 1

Materials
Classroom materials:
- Provide students with access to colored pencils or highlighters (as needed).

Short on time? Consider discussing Problem 3 as a class.

1 Launch

3 **Read aloud** the first part of the introduction from the Student Edition.

Use the Think-Pair-Share routine. Ask, "Do you have all of the information you need to determine the volume of this climbing wall? Why or why not?"

Arrange students in groups of 3.

4 **Read aloud** the second part of the introduction and Problems 1–3 from the Student Edition.

Say. "Solve Problems 1 and 2 with your group of 3. Then make a new group to discuss Problem 3".

A **Accessibility: Visual-spatial processing** Provide access to colored pencils or highlighters for students to use to annotate the figure by showing the decomposition.

2 Monitor

After students have completed **Problem 1**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .
- Ask, "What information is given in the image that you will need to determine the volume of the solid figure?"
- Ask, "What information do you still need to determine the volumes of the rectangular prisms in the solid figure? How could you use the discussion from the Warm-Up to help you determine the missing information?"

3 Connect

5 **Invite students to share** their thinking for Problem 1, including how they used their strategy to determine the volume and how they determined any unknown edge lengths.

Record students' thinking by annotating the images.

Ask. "How do you know when you need to add or subtract to determine an unknown edge length?"

6 **Key Takeaway:** Say, "Sometimes you need to add or subtract when using parallel edges to determine the lengths of unlabeled edges."

Unit 1 Lesson 12 | 68–69 | Activity 1

Student Edition

Unit 1 Lesson 12 — **What's the Edge Length?**

Warm-Up — eyes on teacher

Activity 1 — **The Climbing Wall**

The Joyful Green Climbing Group used recyclable goods to make a three-dimensional climbing wall for Joyful Green Elementary.

Here are 3 different strategies you could use to determine the volume of the climbing wall.

Strategy A	Strategy B	Strategy C

Unit 1 Lesson 12 | 68 | Warm-Up | Activity 1

Activity 1 — **The Climbing Wall (continued)**

1 Your group will be assigned 1 strategy. Use the assigned strategy to determine the volume of the figure in cubic feet.

Show your thinking.

Sample work shown.

top prism: 2 × 2 × 2 = 8
bottom prism: 7 × 2 × 5 = 70
volume: 8 + 70 = 78

answer: 78 cubic feet

2 Write 1 expression or equation to represent how you determined the volume of the climbing wall. Sample response shown.

(2 × 2 × 2) + (7 × 2 × 5) = 78

3 Discuss Oral activity: No writing expected.

Join a new group so that each member worked with a different strategy in Problem 1.
- How is your work in Problem 1 similar? Different?
- How are your expressions or equations in Problem 2 similar? Different?

Synthesis — eyes on teacher

Unit 1 Lesson 12 | 69 | Activity 1

3-6 Presentation Screens

D **Differentiation | Teacher Moves**

Look for students who . . .	For example . . .	Provide support . . .
Almost there Decompose the figure and use only labeled edge lengths to determine the volume.	(7 × 7 × 2) + (7 × 7 × 5) = 343, so 343 cubic feet	**Support** Ask, "By decomposing the figure in this way, how many separate prisms have you made that can be detached from each other?" Point to 1 unknown edge length and ask, "How long is this edge? How do you know?"
Decompose the figure and determine needed edge lengths based on their decomposition strategy.	(2 × 2 × 2) + (7 × 2 × 5) = 78, so 78 cubic feet	**Stretch** Ask, "Which strategy would require you to determine the fewest number of unknown edge lengths? How do you know?"

Unit 1 Lesson 12 | 69A | Activity 1

In the **Launch**, **Monitor**, **Connect** guidance, teachers will find ways to help students get started, suggested facilitation moves, and discussion questions.

The **Key Takeaway** is called out to highlight the learning goal of the activity and provide teachers with an example of how to frame the big idea of the activity for students.

The guidance for every activity includes a D **Differentiation Teacher Moves** table to support teachers in meeting the needs of all students during the activity. This table can help teachers anticipate the ways students may approach the activity, and provides prompts that they can use during the lesson to **Support**, **Strengthen**, and **Stretch** individual students in their thinking.

Activities

Each lesson includes one or two activities. These activities are the heart of each lesson. Students notice, wonder, explore, calculate, predict, measure, explain their thinking, settle disputes, create challenges for their classmates, and more.

Guidance is provided to help teachers Launch, Monitor, and Connect students' thinking over the course of each activity. Teachers will also find suggestions for pacing, facilitation moves, discussion questions, examples of early student thinking, and ideas for students who may enjoy a challenge, as well as opportunities to build and develop the math community in their classroom.

Each **Lesson Practice** begins with a **Summary** of the big ideas in the lesson, often including a worked example. Students can highlight parts of the summary or share it with a caregiver or classmate.

Lessons conclude with an opportunity for students to reflect on the main learning goals and "**show what they know**," either in print or digitally. This is a great way for both students and teachers to get a formative check for understanding.

A **Practice Problem Item Analysis** table breaks down the problems by type, Depth of Knowledge (DOK), and corresponding standards.

Synthesis

The Synthesis is an opportunity for the teacher and students to pull all the learning of the lesson together into a lesson takeaway. Students engage in a facilitated discussion to consolidate and refine their ideas about the learning goals, and the teacher synthesizes students' learning.

Lesson Practice

Daily practice problems for the day's lesson are included in the print Student Edition, including Fluency, Test Practice, and Spiral Review.

Support provides guidance for how to work with students who could benefit from targeted intervention.

Strengthen lists resources for students to reinforce their understanding of the concepts.

Stretch lists challeng opportunities for stuc who are ready to exte their learning.

D Differentiation Use after Lesson 12

Lesson Goal: Determine the volume of a figure composed of rectangular prisms when some edge lengths are unknown.

Support

Provide targeted intervention for students by using these resources.

If student response shows: the use of given edge lengths to determine the volumes of rectangular prisms

Respond:

- **Mini-Lesson |** 15 min
  Determining Unknown Edge Lengths of a Figure (ML 1.12)

Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If student response shows: the use of an incorrect value for a missing edge length but a correct method for determining the volume of a figure composed of rectangular prisms

Respond:

- **Center |** 15 min
  Capture Squares, Stage 7

Stretch

Challenge students and extend their learning with these resources.

If student response shows: the use of a correct value for a missing edge length and a correct method for determining a volume of 144 cubic inches

Respond:

- **Sub-Unit 3 Extension Activities |** 15 min

- **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Support, Strengthen, and Stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding.

Additional Activities

Lesson Practice
Additional Practice
Fluency Practice
Math Adventures
Item Bank

Professional Learning

Who participated in math class today? What assumptions are you making about those who did not participate? How could you leverage each of your students' ideas to support them in being seen and heard in tomorrow's math class?

Unit 1 Lesson 12 72A Differentiation

Mini-Lessons provide targeted intervention to students who need additional support or need more time. Ideal for small-group or whole-class instruction, as well as independent learning.

Professional Learning callouts feature questions and prompts designed to help teachers reflect on how students' thinking developed over the course of the lesson.

Differentiation

A comprehensive set of differentiation suggestions and resources are provided for teachers to use as needed after each lesson. This includes Mini-Lessons for Supporting, Centers for Strengthening, and Extension activities for Stretching students' understanding of the lesson goal.

Digital resources designed to Support, Strengthen, and Stretch student learning include Boost Personalized Learning, Fluency Practice, and Math Adventures.

Unit 1 | Quiz: Sub-Unit 1

Assess and Respond

Quiz: Sub-Unit 1

Independent | 20 min

Item Analysis

Problem(s)	Concept or skill	DOK
1	Comparing the volumes of figures	2
2	Determining the volume of a rectangular prism showing unit cubes	2
Up Next . . . (preparation for Les		
3*	Knowing relativ	

Assessment Resources

Assessment Resource PDF

Quiz: Sub-Unit 1

Quiz: Sub-Unit 1 (continued)

Digital

Differentiation (Quiz: Sub-Unit 1)

Sub-Unit Goal(s)	Problem(s)	Respond to Student Thinking
Describe and determine the volume of a rectangular prism using its layered structure.	1	Support • Mini-Lesson: *Comparing Volume* (ML 1.02) • Teacher Move: Have students review the problem and then provide additional opportunities for students to compare the volumes of prisms.
	2	Support • Mini-Lesson: *Using the Structure of Rectangular Prisms to Determine Volume* (ML 1.04) • Teacher Move: Have students review the problem by determining the volume of the top layer and then counting the number of layers.
Up Next . . . (preparation for Lesson 7)		
Determine the volume of a rectangular prism using the formulas $V = l \times w \times h$ and $V = B \times h$.	3	Support • Mini-Lesson: *Estimating and Measuring Objects in Inches* (Grade 2 ML 3.08) • Teacher Move: Plan to use base-ten units and unit cubes in Lesson 7 to demonstrate the relative sizes of standard measurement units.

Unit 1 258 Assess and Respond

An **Item Analysis** is provided to show what concepts and skills are assessed in each problem.

A **Differentiation** table suggests specific teacher moves and resources to support students' understanding based on their responses to assessment problems.

Assess and Respond

Each unit typically includes one or two Sub-Unit Quizzes. Quizzes are designed for students to show what they know and can do based on what they have learned so far in the unit. Each unit includes Assess and Respond guidance for the Pre-Unit Check, Sub-Unit Quizzes, and End-of-Unit Assessment.

Navigating the digital program

Unit Landing Page

4.1 Unit Overview

Factors and Multiples

Explore patterns and identify multiples, factor pairs, and prime and composite numbers.

Let us know what you thought about this lesson by filling out this survey.

Unit at a Glance

Sub-Unit 1: Patterns, Factors, and Multiples (Lessons 1–8)

- Generate and extend shape and number patterns.
- Determine whether a number is prime or composite.
- Relate the side lengths and area of a rectangle to factors and multiples.

Sub-Unit 2: Using Factors and Multiples (Lessons 9–12)

- Apply multiplication fluency within 100 and the relationship between multiplication and division to identify factor pairs and multiples.

Standards

Addressing MP1 MP2 MP3 MP6 MP7 MP8 4.NBT.B.6 4.OA.A 4.OA.A.3 4.OA.B 4.OA.B.4 4.OA.C 4.OA.C.5

Vocabulary

- common multiple
- composite number
- multiple
- prime number

On the Unit Landing Page for each unit, you'll find Unit-at-a-Glance information, including sub-unit descriptions and learning goals, vocabulary found in the unit, and standards addressed in the unit (where applicable).

The Unit Landing Page also includes a variety of paper resources available for that unit. Those resources include:

- A printable PDF of the Teacher Edition and Student Edition pages for the entire unit (the Teacher Edition pages include assessment answer keys).
- A caregiver resource for teachers to share with families about the math in the unit and how to support learning at home.
- Student goals and glossary of vocabulary in the unit
- Routine Facilitation Guides for the routines found in the unit
- Activity Sheets and Cards for lessons in the unit that call for additional resources not included in the Student Edition
- Additional Practice, Mini-Lessons, Extensions, and Math Language Development Resources for the unit
- Optional Math in Action activities
- Unit assessments

Lesson Landing Page

Like the print Lesson Overview, the Lesson Landing page has helpful information for planning and facilitating the lesson.

A. Differentiation Beyond the Lesson
The Differentiation Beyond the Lesson tab provides guidance and differentiation resources after each lesson for students in three categories: Support, Strengthen, and Stretch.

B. At a Glance
The At a Glance button will pull up a preview of the lesson Warm-Up, lesson activities, Synthesis, and Show What You Know. You'll find suggested timing for each part of the lesson, as well as guidance on whether students should work individually, in pairs, or with the whole class. The Focus and Coherence and Rigor and Balance information for the lesson is also found here.

C. Practice Problems
Every Amplify Desmos Math lesson includes a digital Practice Problems set, which you and students can access via the Lesson Landing Page.

D. Lesson prep
In the gray box on the Lesson Landing Page, you'll find the goals for that lesson, any materials needed for the lesson, vocabulary found in that lesson, and standards addressed in the lesson.

E. Lesson Thumbnails
Teacher Presentation Screens enhance lessons and are for the teacher to project. Lessons where student devices are suggested have Student Activity Screens.

F. Paper resources
Paper resources for each lesson include print Teacher Edition pages, print Student Edition pages, and the lesson Show What You Know printable PDF.

Student Screens

For some lessons, Student Activity Screens make the lesson highly interactive for students working on devices individually or in pairs or small groups. You can preview by clicking Activity Screens from the lesson landing page.

To make planning and teaching seamless, tips for instruction are available in both the print Teacher Edition and digitally at point of use. At the bottom of Activity Screens, the teacher will see suggestions for facilitation to support great classroom conversations:

- **Teacher Moves:** Suggestions for pacing, facilitation moves, discussion questions, examples of early student thinking, and ideas for early finishers, as well as opportunities to build and develop the math community in your classroom.
- **Sample responses:** One or more examples of a possible student response to the problem.
- **Student supports:** Facilitation suggestions to support students with disabilities and multilingual students.

Assign

Getting your students started with a digital lesson is a breeze. To have your students try one of these program preview lessons, simply generate and share a single-session code by clicking the arrow next to @Assign. If you have individual classes set up, getting students online is even quicker!

Pause

Pause allows you to stop the lesson and gather student attention—whether for a brief announcement or a class discussion.

Keep an activity paused for as long (or as briefly) as you want. When you're ready for students to continue, press the Pause button again to resume the activity.

With Pause activated, students can see their current screen but cannot interact with the activity at all.

Pacing

Pacing allows you to lead students through part of an activity one screen or one section at a time. To activate, click the Pacing icon. Then select the screen (or screens) you'd like to gather your students on. They'll automatically go to that location in the activity, and the navigation outside of that range will temporarily be disabled.

Once Pacing is activated, you'll see clear indicators for what screens your students may access. You can edit or extend that range, or even disable pacing, with a single click.

Hide screens

Are you running out of time in class? Or do you want to refine an activity to better suit your students' needs? You can hide screens from students by clicking the Menu (three vertical dots) on the screen's thumbnail. This allows for non-sequential teacher pacing.

Notice that the screens automatically renumber themselves when one is hidden. Change your mind? Simply click Unhide and students will be able to access the screen again.

Teacher supports and facilitation tools

Teacher Dashboard

The powerful Teacher Dashboard helps teachers play an active role as discussion facilitators, monitoring student work in real time, choosing moments to share and discuss, and synthesizing learning. Teachers get insight into student thinking in real time, meaning they can select student work to display and discuss quickly and easily, and ask better questions to guide more productive discussions.

To teach a lesson with students on devices, click the Dashboard link next to your single-session code or class name to launch your Teacher Dashboard with facilitation tools.

The Teacher Dashboard has four tabs at the top. In addition to these views, the Teacher Dashboard also has facilitation tools, including the Class Conversation Toolkit and Written Feedback.

Snapshots

Peg Smith and Mary Kay Stein's *5 Practices for Orchestrating Productive Mathematics Discussions* offers a clear and useful framework for facilitating class discussions around student thinking. We added a Snapshot tool to make it even easier to select and sequence student work for those discussions. Try your hand at selecting and sequencing student work for discussion during your next Amplify Desmos Math lesson.

Snapshot student screens

To select a response for discussion, simply click the camera icon.

Then, in the Snapshots View, you can organize your snapshots into albums. Each album can hold up to four snapshots.

Present your albums to facilitate class discussions. Consider entering a title or question, or simply share your discussion prompt aloud! (**Note:** The teacher must present the album of snapshots to students in order for the album to show on student devices.)

Snapshot in Teacher View

To select a response for discussion in the Teacher View, click the response's checkbox to bring up the snapshots and the Feedback sidebar.

You can select up to four pieces of work and present them to students right from the Teacher View, or save them as an album in Snapshots.

Dashboard summary view

When you open a dashboard, you will first see the Summary View. Here you will see a row for each student in the activity session, along with a quick overview of where they are in the activity, a symbol to let you know more about their work on that screen, and a triangle indicator in the corner if you've sent the student feedback on that screen.

You can click on any of these boxes to see the current state of the student's screen. You might use a student screen as a jumping-off point for a class discussion and modify the screen together with the class. Any changes you make will not change the work for the student.

Here is what the symbols on this page mean:

Dash: There is no required input for this screen, but students still need to look at it.

Check: Everything on this screen is correct.

Cross: Something on this screen is incorrect.

Warning: Something on this screen isn't merely incorrect but indicates the student may have misunderstood the question itself—intervene ASAP!

Dot: This screen requires teacher interpretation.

You might also see a triangle indicator in the corner. Here's what they mean:

Teal triangle: You sent feedback to the student on that screen, but the student has not yet seen the feedback.

Gray triangle: You sent feedback to the student on that screen and the student has seen the feedback.

Teacher View

In the dashboard, you can use the Teacher View to answer questions like:

- How did all my students answer this question?
- What answers were most common?

If the screen has some components that can be correct or incorrect, you can check the Show Correctness checkbox in the upper-right corner of the screen. This will add icons to pieces of work showing if they're correct or incorrect.

You can also leave written feedback and create and present albums of snapshots from the Teacher View by selecting the student response checkboxes.

9+3

Math that motivates

Research shows that only 47% of students in the United States feel like they often or always work on interesting problems in math class.[1] Amplify Desmos Math taps into students' natural curiosity with interesting problems they are eager to solve, leading to lifelong mathematical confidence.

Our student-centered approach ensures learning mathematics isn't done in isolation. Students are connected to each other's thinking and ideas, developing an understanding that they can use math to understand the world around them.

In the pages that follow, you'll find information on program features that help motivate students, including the following:

- Unit Stories
- Centers
- Math identity and community
- Responsive Feedback
- Delightful digital activities and tools

1 YouthTruth. (2024). Making Sense of Learning Math Insights from the Student Experience. https://youthtruth.org/wp-content/uploads/2024/05/Making-Sense-of-Learning-Math_2023.pdf.

Unit Stories

Amplify Desmos Math lessons are designed to promote student engagement and inquiry by inviting students to build upon their prior knowledge and lived experiences while learning and formalizing new math concepts. The program is intentionally designed to put student ideas at the center by inviting a variety of ideas and approaches.

Every unit in grades K–5 contains a Unit Story, which is a brief fiction story with real-world context that connects to the math of the unit and introduces characters that students will get to know as they engage in the unit. Teachers read the story aloud from their Teacher Edition at the beginning of each unit, while projecting illustrations for students from the story, found in the Teacher Presentation Screens.

In just minutes, students get to know the characters, setting, and plot of the story, all of which they will encounter again throughout the unit. Across the unit, the Unit Story context and characters are used at appropriate points to inspire and engage students in the math, as well as in reflections about how math is a part of their everyday lives.

Grade 2, Unit 1: In *A New Class Pet*, Mr. Roy's class is getting a pet. He has asked the class to decide which animal they should get. The students have narrowed their choices to two candidates: a goldfish and a guinea pig. When a vote is taken, they find someone has written "millipede" on the ballot. By the end of the story, Benita convinces her classmates that a millipede would be the best class pet.

Later in Grade 2, Unit 1, students help help Benita build a bridge for the millipede to make it to its favorite food – leaves – by finding pairs that make 10.

Research has proven that children's literature in math class helps students to mathematize their world. Reading with a math lens provides students with the opportunity to ask questions about, and make connections between, math and their lives.
This approach:

- Encourages students to see math in their world and see themselves in the math.
- Provides natural avenues for students to share their thinking.
- Inspires students to pursue math ideas outside of math class.

Amplify Desmos Math Unit Stories provide authentic contexts for the math in the unit that capture student interest, increase engagement, provide entry points for students, and provide intrinsic motivation for students to want to learn math.

Hintz, A. & Smith, A. T. (2022). *Mathematizing children's literature: Sparking connections, joy and wonder through read-alouds and discussion*. Routledge.

Centers

Game-based Centers strengthen student engagement and reinforce key skills and concepts.

Centers are engaging, hands-on games for students to play collaboratively to strengthen their understanding of key skills and concepts.

Centers are designed so that students engage in them with minimal teacher direction and support. Each Center has multiple stages so that students return to the same Center game repeatedly within and across grade levels, with the content of the Center growing in complexity to align with grade-level standards in a scaffolded manner.

And we've made prepping for and facilitating Centers a breeze with Amplify Desmos Math Centers Kits. Centers Kits are available for easy grab-and-go use that include all printed materials needed, organized and pre-packaged by Center and Center stage.

Centers kits are available for easy grab-and-go use that include all printed materials needed, organized and pre- packaged by Center and Center stage.

Daily Center Time (Grades K–1)

The last 15 minutes of the daily lesson is always Center Time. Depending on where the lesson falls in the learning trajectory, students will either:

- Be introduced together to a new Center.
- Engage in Center Choice Time, choosing previously introduced Centers to revisit.

Centers as Activities

New Centers are strategically introduced to the whole class as one of the Lesson Activities.

- Students return to these Centers in future Center Choice Times.
- Teachers can also engage students in Centers as a Differentiation activity.

Differentiation

Each lesson lists specific Centers that teachers can use with small groups to strengthen their understanding of key learning goals.

- Students usually have previously been introduced to at least an earlier stage of these Centers.
- Teachers can also use Centers after Assessment points.

The materials required to utilize Centers are included in program materials.

- Work mats and instruction cards are included in the Centers Resource book.
- The required manipulatives are included in the Manipulative Kit.

Cover Up

Students take turns generating numbers and placing counters on a board. The first partner to fill a row, column, or diagonal wins.

GRADE 1
- Stage 1 Add 1 or 2
- Stage 2 Subtract 1 or 2
- Stage 3 Make 10
- Stage 4 Doubles
- Stage 5 Near Doubles
- Stage 6 Add 7, 8, or 9
- Stage 7 Add or Subtract 10
- Stage 8 Add Within 100 Without Composing
- Stage 9 Add Within 100 With Composing

GRADE 2
- Stage 10 Add Within 1,000 Without Composing

GRADES 2, 3
- Stage 11 Add Within 1,000 With Composing

GRADE 3
- Stage 12 Factors 1–5 and 10
- Stage 13 Factors 1–9

GRADE 4
- Stage 14 Two-Digit Factors

CENTER Directions

Cover Up

Stage 12

Let's multiply using factors of 1–5 and 10.

Pairs

You'll need . . .
- 2 base-ten units
- two-color counters
- Gameboard A or B
- Recording Sheet

Set-up
- Choose a Gameboard.
- Choose who will use red counters and who will use yellow counters.

How to Play

1. **Player A:**
   - Place each cube on a number in the gray row. Each cube can be on a different number, or both cubes can be on the same number. Multiply the numbers.
   - Cover the product of the two numbers with a counter.
   - Record the multiplication expression and product.
2. **Player B:**
   - Move one of the cubes. Multiply the numbers.
   - If the product is not already covered with a counter, cover it.
   - Record the multiplication expression and product.
3. Take turns moving one cube at a time. Record each multiplication expression and product, even if you were unable to cover the product.

How to Win
- The first player to cover 5 squares in a row wins.

Cover Up 67

Cover Up

40	2	3	
6	20	8	
100	15	2	
12	9	16	
4	1	50	

1	2	3	4

68 Cover Up

Math identity and community

Amplify Desmos Math lessons are structured to elicit all students' powerful math ideas. The Math Identity and Community feature supports teachers in helping students build confidence in their own mathematical thinking, develop skills to work with and learn from others when doing math, and learn how math is an interwoven part of their broader community.

- **Math identity** is how students see themselves in relation to learning about and engaging with math.
- **Math community** is both the supportive learning environment of the math classroom as well as how math is a part of students' larger communities.

Each classroom is a unique combination of students, teachers, and school cultures. Teachers will find brief prompts integrated throughout the lessons that they can use to provide opportunities for all students to mathematize their world. This is especially important for students who may not see themselves as belonging in math or may not see math as belonging in their lives.

Teachers can use the suggested prompts to broaden students' ideas about what it means to be good at math, highlight the value of each student's contributions, and to celebrate math class as a place for coming together to think in flexible, creative, and interesting ways. These habits of mind can help students engage with math joyfully and successfully both in and outside of math class.

Here are some examples of the Math Identity and Community supports embedded in each lesson:

I can be all of me in math class.

You will work with partners every day in math class. What do you want your partners to know about you?

Support students in building their ***mathematical identity*** by asking them to reflect on this question as they complete this lesson.

We are a math community.

What does good listening look like and sound like in a math community?

Support students in building their ***mathematical community*** by asking them to reflect on this question as they complete this lesson.

I am a doer of math.

What math strengths did you use today?

Support students in building their ***mathematical identity*** by asking them to reflect on this question as they complete this lesson.

We are a math community.

How do you tell someone that you disagree with their math solution or answer?

Support students in building their ***mathematical community*** by asking them to reflect on this question as they complete this lesson.

Responsive Feedback

Harness the power of digital math and graphing tools to show students the meaning of their thinking in context.

Responsive Feedback in Amplify Desmos Math digital activities responds to student thinking by showing the mathematical meaning behind it, sparking their thinking and questioning. This motivates and engages students in the learning process.

The playful nature of this immediate feedback allows students to explore their mathematical thinking without embarrassment and discover why certain answers are incorrect or correct. This unique kind of feedback:

- Provides immediate information to students through visualization tools like tables, graphs, images, and animations.
- Visualizes student responses to show the meaning of their thinking.
- Allows students to adjust different inputs and variables to see what changes.
- Reveals peer responses after a student has submitted their work, fueling classroom conversations.
- Motivates students to persevere in ways simple “right” and “wrong” feedback does not.

Responsive Feedback isn’t limited to lessons where students are on devices. Presentation Screens have embedded Responsive Feedback moments for teachers to project, and the suggested Teacher Moves in the Teacher Edition provide guidance on how to provide Responsive Feedback for students using print.

In the Kindergarten lesson Harry Explores the Ocean, students receive immediate feedback on whether their addition expression equals five through an animation of a starfish collecting seashells.

In the grade 3 lesson: 2, 5, or 10?, teachers use interactive bar graphs on a Presentation Screen to help students consider how the same data is represented on graphs with three different scales—2, 5, and 10.

In the grade 4 lesson Getting in Order, students compare and order sets of fractions from least to greatest to control the locations of flippers in a pinball game. When the fractions are in order, a ball will fall through all of the flippers and roll to the star.

Delightful digital activities and tools

Visual and dynamic interactions pique student interest and invite all students to engage in the mathematics.

In Amplify Desmos Math, embedded interactions and animations allow students to test predictions, get feedback, share ideas, and connect representations.

Engaging interactions

The digital interactions included in lesson activities are designed to elicit student thinking in a way that feels fun and inviting. As students play and explore math concepts, teachers can highlight the ideas that students share, connect those ideas to other students' ideas, and build on their thinking through productive class discussion.

With Challenge Creator, students are able to create their own challenges for their classmates to solve. When students create a challenge and solve it, it gets added to the digital class gallery, where they can then select other students' challenges to solve.

Social, collaborative experiences

Digital tools allow students to interact with each other's ideas in a variety of ways. Students can use the "Share With Class" button to exchange ideas with each other directly on an activity screen. Activities like Challenge Creator and Polygraph offer fun ways for students to play with the math together. Whether working solo or in tandem on devices, students are never alone as they work through activities.

Teacher Presentation Screens

All lessons benefit from the power of digital math. Teachers display Presentation Screens that help them guide and facilitate student learning that include Responsive Feedback and important animations and interactions.

Student Screens

Some lessons are designed to be taught with students on devices, interacting with Student Activity Screens and one another. Aligned Student Edition pages are also available for notetaking and offline learning.

Check out the Technology page at the beginning of every unit to learn which lessons are recommended to be taught with students using devices.

Interactive digital resources supporting differentiation and practice are available for every lesson, including Lesson Practice, Fluency Practice, Math Adventures, and more.

Digital facilitation tools

A suite of digital facilitation tools for lessons that are recommended to have students using devices. These tools foster collaborative classrooms and help teachers share their students' thinking, including:

- Snapshot and share student work to whole class.
- Monitor student progress.
- Pace the number of screens available for students to explore.
- Sync all students to the same screen.
- Pause student screens.
- Anonymize student names

See pages 44–53 for more information.

Technology

Dynamic, digital interactions are integral to Amplify Desmos Math. Powerful digital tools, such as the teacher dashboard, enable teachers to effectively facilitate rich math discussions.

A Powerful Digital Experience

Visualize the Mathematics
(Lesson 2)

Students use multiple representations of mathematical concepts and skills in order to make connections, understand structure, and find patterns.

Receive Responsive Feedback
(Lesson 16)

Students are free to explore mathematics in interactive ways. When they try new ideas, they receive real-time responsive feedback so they can refine their thinking and move learning forward.

Collaborate With Classmates
(Lesson 12)

Students have opportunities to view, appreciate, and respond to the mathematical thinking of their classmates and work together in problem solving.

Digital Lessons in This Unit

Digital Lessons are recommended to be taught with students on devices for a dynamic learning experience. Aligned Student Edition pages are also available for notetaking and off-device learning when needed.

Lesson		Why digital?
2	Panda Patterns	Students use responsive feedback to build their conceptual understanding of addition patterns.
12	Dynamic Decompositions	Students receive responsive feedback to make generalizations about when it's necessary to decompose units to subtract.
16	Close Catch	Students explore interactive number lines and receive interpretive feedback as they analyze the closest ten to given numbers.

Unit 3 Wrapping Up Addition and Subtraction Within 1,000 241J

2
3

A structured approach to problem-based learning

A structured approach to problem-based learning provides teachers with clear step-by-step moves to build systematically from students' prior knowledge to grade-level learning. It combines conceptual understanding, procedural fluency, and application, motivating students with problems they are eager to solve while supporting teachers in guiding grade-level outcomes.

This approach helps teachers make the transition to planning and teaching problem-based lessons, monitoring student progress, and differentiating instruction based on real-time data.

In the pages that follow, you'll learn more about the individual facets of the program that make this curriculum as easy as possible for teachers, and as easy as possible for every student to be an active and engaged participant in their own learning. We do this with:

- Proficiency Progression
- Lesson design
- Instructional routines
- Professional development

Proficiency Progression

Student-centered learning you can guide with confidence

Problem-based learning asks students to make sense of and think strategically about mathematically interesting problems. This approach allows students' ideas to take center stage, so they are active and engaged in their learning process. Teachers are able to hear and respond to student thinking in real time, guiding and differentiating instruction right in the moment.

Moving from "I do, We do, You do" to "You do, We do, I do"

Lessons begin by activating student's prior knowledge and curiosity, inviting them to explore the math, collaborate, and refine their thinking. By focusing on developing student thinking first, teachers can better connect ideas, guide learning, and synthesize learning objectives.

Proficiency Progression

A model that steps out problem-based learning

1. Activate students' prior knowledge and curiosity.
2. Generate new ideas through collaboration.
3. Refine ideas using facilitation tools.
4. Guide to grade-level understanding.
5. Practice, reinforce, remediate, and extend for lasting understanding.

Differentiation recommendations help teachers guide their students to grade-level understanding. Learn more on page 78.

Students using print will arrive at similar answers.

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Predict that the machine will make any rectangle with an area that is an even number.	***The machine will make rectangles that are even numbers.***	**Support** Ask, "If the rectangles have areas that are even numbers, what are some possible side lengths?"
Predict that the machine will make any rectangle with an area that can be determined by skip counting by the side length.	***The machine will make other areas with side lengths that can be counted up by 8.***	**Strengthen** Ask, "What is another way you could determine the areas made by the machine?"
Predict that the machine will make any rectangle with an area that is a multiple of the side length.	***The machine will make rectangles with an area that is a multiple of 8 because that is the side length.***	**Stretch** Ask, "If the area is a multiple of the side length, what could you say about the side lengths in terms of the area?"

Lesson 5 Building Rectangles 30–31

Daily Warm-Ups include low-floor, high ceiling tasks that invite a variety of strategies and approaches.

Key Takeaways highlight the learning goal of the activity and provide teachers with an example of how to frame the big idea of the activity for students.

Key Takeaway: Say, "The space between the lines on bar graphs can represent different amounts. This amount is called the **scale**. The second graph is a **scaled bar graph** because it has a scale other than 1."

Lesson Practice reinforces students' understanding of the day's concept, in addition to other Support, Strengthen, and Stretch activities.

Lesson design

Amplify Desmos Math lessons are designed to provide collaborative learning experiences.

Amplify Desmos Math is designed with a structured approach to problem-based learning that systematically builds on students' curiosity. Students are first invited to explore problems that create an intellectual need for new mathematical ideas. Then the teacher builds on strategies used by students and connects their ideas to the learning goals of the lesson.

Every lesson activity is organized into a Launch, Monitor, Connect format, enabling teachers to set students up for success with each task.

Launch

The launch is a short, whole-class conversation that creates a need or excitement, provides clarity, or helps students connect to their prior knowledge or personal experience, which ensures that everyone has access to the upcoming work. Considerations for launching include:

- Try to keep it short. Set students up to get started with a clear and catchy invitation to the math.
- Wait to model a specific way to solve. Leave space for a variety of different student approaches at the outset.
- Pair up. Encourage small groups of students to talk through their thinking as they work.

Monitor

As students work individually, in pairs, or in groups, teachers explore student thinking, ask questions, and provide support to help move the conversations closer to the intended math learning goal. Considerations for monitoring include:

- Look for students' strategies and check in with students as they work.
- Ask questions to learn what students are thinking. The suggested differentiation moves can be used to support, strengthen, and stretch their ideas.
- Use the Differentiation Teacher Moves to help you select and sequence student ideas to highlight when connecting.

Connect

Teachers connect students' ideas to the key learning goals of the lesson, facilitating class discussions that help students synthesize and solidify the big ideas. Considerations for connecting include:

- Save a few minutes at the end of each lesson activity to bring students back together to discuss.
- It's OK to start the class discussion before all students have finished the activity.
- Center discussions on students' ideas by displaying one or more of their responses and connecting the responses to the Key Takeaway of the activity.

Instructional routines

Classroom consistency frees up attention to focus on teaching and learning

Using instructional routines regularly creates consistency in the classroom, freeing up time for teachers so that they can attend to student thinking and communicate what is important in the class. Instead of focusing on the directions of an activity, students can focus on making sense of and communicating about the math.

Each instructional routine included in an Amplify Desmos Math lesson creates opportunities for conversations and supports meaningful discussion. Implementing these routines can be a practical tool for establishing a classroom learning community that values student thinking.

At the beginning of the school year, teachers are supported in setting up a productive math learning community. Instructional routines and math language routines are extensively included in the first lessons of each school year, along with additional support and scaffolding for introducing and engaging in the routines.

Here are some examples:

- The Notice and Wonder routine encourages students to engage with content by observing and discussing what they notice and wonder about a new concept. This approach provides a low-pressure way for students to activate their knowledge.
- The Stronger and Clearer Each Time routine communicates the importance of feedback and creates an opportunity for students to learn from each other as they construct and refine their viable arguments.

Point-of-use facilitation guidance for instructional routines is always one click away in the digital platform. Teachers are encouraged to use this guidance as they establish and maintain their productive classroom communities.

Instructional routines embedded in Amplify Desmos Math

Instructional routines can be found throughout each lesson in the Teacher Edition and digital Presentation Screens. Math Language Routines (MLRs) are used within lessons to highlight student-developed language and ideas, cultivate conversation, support mathematical sense-making, and promote meta-cognition. Here is a list of the instructional routines used in the Amplify Desmos Math curriculum:

- Choral Count
- Estimation Exploration
- Gallery Tour
- How Many Do You See?
- Mix and Mingle
- Notice and Wonder
- Number Talk
- Stories and Questions (Kindergarten only)
- True or False?
- Think-Pair-Share
- What Do You Know About ___?
- Which One Doesn't Belong?
- MLR1: Stronger and Clearer Each Time (MLR1)
- MLR2: Collect and Display
- MLR3: Critique, Correct, Clarify (Grades 2–5 only)
- MLR4: Information Gap (Grades 3–5 only)
- MLR5: Co-Craft Questions
- MLR6: Three Reads
- MLR 7: Compare and Connect
- MLR8: Discussion Supports

Professional development

Embedded, in-the-moment professional development

Unit-level professional development

The Unit Overview for each unit includes a Professional Development page, which lists opportunities for teachers to deepen their understanding of the math in the unit and how to teach it.

Professional Learning

Here is an opportunity to deepen your understanding of the math in this unit and how to teach it.

Spotlight on Structure Recognition

Lesson 6, Activity 1

Activity 1 Quilt Design

Hands-On

Mel's aunt has 24 fabric squares that she wants to use to make a rectangular quilt. You will be given 24 square tiles to represent the fabric squares.

You'll need . . .

1 Use the square tiles to determine all the different ways Mel's aunt could arrange the squares to make a rectangle.
- Use the grid paper on the next page to draw each rectangle.
- Label the side lengths of each rectangle.

2 Record the dimensions of each rectangle you drew as a multiplication expression.

3 Discuss

How do you know you have found all the possible rectangles that have an area of 24 square units?

38 Unit 1 Factors and Multiples

Try This

Put on your student hat and complete Problems 1–3.

Questions for reflection

- Some students may build rectangles by arranging square tiles.
  - How do you think these students will reason about factor pairs?
- Some students may relate side lengths to multiples and areas to factors.
  - How might you support your students in reasoning about the structure of their models and the abstract concepts the models represent?

Other lessons that attend to structure recognition:

- **Lesson 4:** Students use a hundreds chart to recognize patterns with multiples.
- **Lesson 11:** Students write sentences to relate factors and multiples.

Unit Overview Video

Unit Overview videos provide you with an overview of the content and key features of the unit. The videos tell the story of the unit and how the sub-units fit together to create an aligned experience for students. When possible, key interactions, models, and strategies used within the unit are showcased.

Unit Overview

31 Unit 1 Factors and Multiples

Lesson-level professional development

Each Amplify Desmos Math lesson provides a moment of professional learning as an opportunity for teachers to reflect on how well the lesson went. These professional learning moments can relate to principles, instruction, pedagogy, or program content.

Professional development sessions tailored to your needs.

Amplify's professional development team supports both teachers and administrators throughout their entire implementation journey.

Launch

On-site and virtual Launch sessions introduce Amplify programs and support strong implementation.

After learning about the program's foundational principles and key features, you'll practice implementing the program within a collaborative environment.

Strengthen

On-site and virtual Strengthen sessions deepen understanding of the program. Session offerings are targeted and meant to take your practice—and your students' learning—to the next level.

Offered as part of core packages, as well as enhancements, Strengthen sessions are intended to effectively address your students' needs. Examples include:

- Supporting student math discussion.
- Unit-level planning.
- Leveling up with teaching tools.

Coach

On-site and virtual Coach sessions are tailored to elevate instructional practices and meet the unique needs of teachers and/or leaders.

Partner with an Amplify coach who will support you in planning customized sessions leveraging our menu of supports, which can include:

- Lesson-modeling by an Amplify facilitator.
- Classroom observations and debriefs.
- Grade-level planning.

3
2
1
2 + 3/2

Access to grade-level understanding for every student, every day

The Amplify Desmos Math curriculum provides teachers with lessons, strategies, and resources to eliminate barriers and increase access to grade-level content without reducing the mathematical demand of tasks. Our lessons are developed using the Universal Design for Learning (UDL) framework to proactively ensure that all learners can access and participate in meaningful, challenging learning opportunities.

Every activity has multiple entry points to ensure that all students are supported and challenged. Intervention and personalized learning activities are directly connected to the day's content and offer students the individualized supports they need to be successful.

Each lesson and unit contains guidance for teachers on how to identify students who may need support, students who need to keep strengthening their understanding, and students who may be ready to stretch their learning. In addition, teachers are provided with recommendations for resources to use with each group of students.

In the pages that follow, you'll read about how students access grade-level math every day through:

- Differentiation
- Mini-Lessons
- Boost Personalized Learning
- Math Adventures
- Fluency Practice
- Accessibility

Differentiation

Differentiation that enables teachers to support students in catching up while keeping up with grade-level math.

Differentiation in Amplify Desmos Math is organized into three categories:

Support

Provide targeted intervention for students by using these resources.

Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

Stretch

Challenge students and extend their learning with these resources.

Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Use their fingers to find the missing addend.	I can count the amount I know: 1, 2, 3, 4, 5, 6, 7, 8. Then I have 2 fingers left: 9, 10. So, 2 is the number that will make 10.	**Strengthen** Ask, "Where do you see the amount you know in the blocks or in the equation?"
Count on or count back to find the missing addend.	I have 8, so I can count 2 more: 9, 10. or I need 10, so I can count back 2 to get to 8: 9, 8.	**Stretch** Ask, "Why might it be helpful to know pairs that make 10?"
Use a known fact to find the missing addend.	I know 2 + 8 = 10, so I know 8 + 2 = 10. or I know 9 + 1 = 10, so I know 8 + 2 = 10.	

In-lesson Teacher Moves

Within every lesson activity, teachers can use the Differentiation Teacher Moves suggestions to provide in-the-moment instructional support to learners while they are engaged in the work of the lesson/task.

Teachers are provided with clear student actions and understanding to look for, each matched with immediately usable suggestions for how to respond to the student thinking illustrated in each row of the table.

In addition to using these suggestions in the moment as teachers monitor student work, teachers can review the Differentiation table in advance to help them anticipate how students are likely to approach the activity.

Differentiation beyond the lesson

The learning goal of each lesson is broken down for teachers into what it looks like for students to need support in the lesson goal, for students to need to keep strengthening their understanding of the lesson goal, and for students to be ready to stretch their learning.

Teachers are provided with recommendations for resources to use with each group of students.

Support, Strengthen, and Stretch resources include:

- **Mini-Lessons:** 15-minute, small-group direct instruction lessons targeted to a specific concept or skill.
- **Item Banks:** Space for teachers to create practice and assessments by using filters and searching for standards, summative-style items, and more.
- **Boost Personalized Learning:** Engaging independent, digital practice provides access to key concepts of the day's lesson through Responsive Feedback that adjusts to student thinking.
- **Fluency Practice:** Adaptive, personalized practice built out for basic operations and more.
- **Centers:** Lesson-embedded routines and practice for students that are vertically aligned across grade levels.
- **Extensions:** Lesson-embedded Teacher Moves including possible stretch questions and activities for students.
- **Lesson Practice:** Additional practice problems support every lesson.
- **Math Adventures:** Strategy-based math games where students engage with math concepts and practice skills in a fun digital environment.
- **Lesson Summary Support:** Support for students and caregivers that provides efficient explanation of the learning goal with clear examples.

Assess and Respond

At each Assessment point in a unit, teachers have the opportunity to respond to student understanding. For each assessment item, teachers are provided with clear suggestions for how to Support students who are showing they need intervention. Students who are ready to strengthen or stretch their learning based on the assessment can access any of the strengthen or stretch resources aligned to the content of the assessment.

Mini-Lessons

Intervention Mini-Lessons aligned to core instruction

Amplify Desmos Math Mini-Lessons are 15-minute lessons aligned to the most critical topics throughout a unit. Teacher-led Mini-Lessons are used to provide targeted intervention to small groups of students who need additional support or to re-engage students with content that they may need more time on.

Amplify Desmos Math Mini-Lessons are the perfect complement to our problem-based approach, because they provide more explicit instruction opportunities and leverage a consistent instructional routine (Modeled Review, Guided Practice, Check for Understanding).

A minds-on experience to support your students' curiosity and thinking beyond the core lesson

Rather than serving as simple solo drills or worksheets, Mini-Lessons tie directly into critical topics to keep students thinking and exploring the grade-level math they need more time with.

Differentiation where and when it matters most, to help all students access grade-level math

Mini-Lessons are used to address critical prerequisite skills for upcoming lessons or to engage students in grade-level math immediately after a core lesson, when they need more time to think about a concept or skill. Mini-Lessons reinforce the same topics and content students see in core instruction.

Faded worked examples build proficiency

The design of Mini-Lessons is informed by the extensive research around worked examples. In particular, faded worked examples involve fading away the support given in the worked examples as practice goes on and students become more proficient. In essence, the worked examples get less "worked-out" over time.

Studies on the use of faded worked examples have found benefits for problem solving, for both better performance on difficult problems and less time taken to achieve the same level of performance.[1] Students working with faded worked examples have also been shown to have fewer unproductive moments during their practice sessions.[2]

Structure of a Mini-Lesson

Easy as one, two, three:

1 **Modeled review**

Teachers work through an example with students.

2 **Guided practice**

Teachers guide students through faded examples, where scaffolds are heavier early on and are gradually removed.

3 **Check for understanding**

Teachers provide students an opportunity to show what they have learned.

Determining the Volume of Solid Rectangular Prisms | Teacher's Guide | ML 1.06

Goal

Calculate the volume of a rectangular prism using the formula $V = l \times w \times h$.

Standard: NY-5.MD.5b

Materials: highlighters

Modeled Review

Point to Han's example.

Ask:
- "Why did Han cross out one of the edge lengths?"
- "How does the expression Han wrote represent the volume of the prism?"

Reinforce Han's thinking by saying, "Sometimes, problems show more information than you need. To calculate the volume, you only need to identify the length, width, and height of the prism and then multiply."

Model identifying the needed edge lengths to write an expression.

Guided Practice

For each problem, focus students' attention on using the provided prisms to complete the table.

To scaffold students' thinking, **ask:**
- "What do the edge lengths represent?"
- "How does each expression represent the volume of the prism?"

Vocabulary

If needed, share the meaning of the words with students.
associative property of multiplication: The product of three or more numbers remains the same regardless of how the numbers are grouped.
rectangular prism: A solid figure with six faces that are all rectangles.
volume: The amount of space a three-dimensional figure takes up.

1 | Grade 5

Determining the Volume of Solid Rectangular Prisms | Teacher's Guide | ML 1.06

Guided Practice

Suggest students highlight the edge lengths that represent the length, width, and height.

Key Takeaway:
- **Say,** "Volume is measured in cubic units, such as cubic inches. The formula $V = lwh$ can be used to determine the volume of any rectangular prism."

Reflection

Ask:
- "How could you determine whether an expression represents the volume of a rectangular prism?"
- "After today's lesson, what questions do you still have?"

Check: Recommended Next Steps

Almost There	Got it!
If students need more support, consider using Grade 5 Mini-Lesson 1.08: *Using Volume Formulas*.	If students need more practice, have students refer to the prism in the Modeled Review. Ask them what the volume would be if the height was 6 units.

2 | Grade 5

1 Flores, R. and Inan, F. (2014). Examining the impact of adaptively faded worked examples on student learning outcomes. *Journal of Interactive Learning Research*, 467–485.

2 Booth, J. L., McGinn, K. M., Young, L. K., & Barbieri, C. (2015). Simple practice doesn't always make perfect: Evidence from the worked example effect. *Policy Insights from the Behavioral and Brain Sciences 2*(1), 24–32.

Boost Personalized Learning

Digital, responsive practice that provides personalized support students need to access grade-level math every day.

Boost Personalized Learning activities in Amplify Desmos Math target a skill or concept aligned to the day's core lesson, with each student receiving personalized scaffolds based on what they already know.

This powerful technology complements daily learning and provides another layer of support to the in-lesson differentiation and instructional guidance provided by teachers.

Personalized feedback, scaffolds, and supports

Activities adapt to each student's unique needs. Tailored, differentiated support includes:

- **Responsive Feedback** responds to student thinking by showing the mathematical meaning behind their thinking. Student-friendly guidance helps learners get unstuck.
- **Guided Support** provides moments of explicit instruction to summarize key concepts and support sensemaking.
- **Intervention** provides more intensive instruction on key concepts and skills from previous grade-levels that directly build toward grade-level concept and skills.

Tailored to what students think and know

Every time a student demonstrates what they know, we analyze their work to create an accurate and up-to-date picture of how a student thinks.

We've charted how skills and thought processes are linked, influence learning, and connect to mathematical standard mastery. Our model uses this information to provide tailored recommendations for Personalized Learning support for instructional areas that directly build toward grade-level concepts or skills.

Integrated Boost Personalized Learning enables all students to access grade-level math in each activity with tailored supports based on what they already know. Each activity acts in service of core materials and grade-level standards to maximize the opportunities students have to develop a meaningful understanding of math.

- Traditional approaches to personalized learning have often focused on remediation disconnected from grade-level learning, which can leave students behind rather than accelerate their progress.
- Amplify Desmos Math uses an asset-based approach, which provides personalized scaffolds to enable all students to access grade-level math every day.

Math Adventures

Strategy-based digital math games that give students a fun, engaging, and low-stakes way of practicing math skills.

Unlike simple, repetitive math games, students navigate through various levels of Math Adventures in Amplify Desmos Math with supportive feedback along the way.

Math Adventures are perfect for times when teachers need students to be independent after finishing classwork, an assessment, or group work.

Twelve a Dozen

Players use factoring skills and solve order-of-operations puzzles to save the world.

Formula Won

Players race across tracks by picking sets of cards and operations, including integers, mixed numbers, or decimals.

Number Jumper

Students practice addition and subtraction facts by jumping through swamps, caves, forests, pillow forts, and more.

Connect the Blocks

Students develop fluency by composing different combinations of blocks.

Sumaze

Learners explore math concepts independently with immersive puzzles to develop problem-solving skills and mathematical thinking.

Fluency Practice

Freeing up brainpower and working memory for students to do more complex mathematical work.

When basic facts and procedures are second nature, it's easier to figure out how to structure a multi-step word problem, model a solution, or puzzle out systems of equations.

- **Fact Fluency** uses spaced repetition, an evidence-based approach to promoting memory retention, to teach basic facts. We've partnered with Math for Love to iterate on the popular Multiplication by Heart to create Division by Heart and Addition and Subtraction by Heart I & II.
- **Skills Fluency** provides independent, standards-aligned practice of grade-level concepts like rounding, fractions, and decimals to build procedural fluency. These cards are designed for practice after a concept is learned or generalized—supporting daily, meaningful fluency work beyond basic fact recall. (*Available with Boost Math add-on*)

Math language development

The connection between mathematical content, practice, and language is strong—that's why we believe developing mathematical language is critical for all learners.

Our approach to math language development focuses on when, how, and why students use language to make sense of and share their mathematical ideas. Every lesson in Amplify Desmos Math includes opportunities for all students to develop mathematical language as they experience the content, while providing intentional support for multilingual/English Learners. We purposefully progress language development from lesson to lesson and across units by supporting students in making their arguments and explanations stronger, clearer, and more precise. Our systematic approach to the development of math language can be broken down into the following four categories of support:

Vocabulary

Units and lessons start by surfacing students' language for new concepts, then building connections between their language and the new vocabulary for that unit. This honors the language assets that students bring into their learning.

Warm-Up What Do You Know About ___?

Purpose: Students share ideas about the number 15 to honor what they already know about factors, multiples, and prime and composite numbers.

Language goals

Language goals attend to the mathematics students are learning, and are written through the lens of one or more of four language modalities: reading, writing, speaking, and listening.

Today's Goals

1. **Language Goal:** Use the structure of the coordinate grid and directional language to describe and locate points. **(Reading, Writing, Speaking, and Listening)**
2. **Language Goal:** Describe the structure of the coordinate grid. **(Speaking and Listening)**

Math Language Routines (MLR)

Math Language Routines[1] are used within lessons to highlight student-developed language and ideas, cultivate conversation, support mathematical sense-making, and promote meta-cognition. Tips for facilitating MLRs are included when they would be helpful within lessons.

MLR

MLR7: Compare and Connect Invite students to analyze each strategy, compare them, and then connect to their strategy. Consider asking:

- "Who used a strategy similar to Omari's? Ivory's?"
- "Where is the constant difference in each strategy?"
- "Why did different strategies lead to the same outcome?"

Multilingual/English learner support

Supports for multilingual/English learners (ML/ELs) are called out at intentional points within each lesson. These specific, targeted suggestions support ML/ELs with modifications that increase access to a task, or through development of contextual or mathematical language (both of which can be supportive of all learners). ML/EL supports may also be attached to MLRs.

ML/EL

Multilingual/English Learners Encourage students to paraphrase each other's ideas to help them make connections and incorporate vocabulary from the unit. **(Speaking and Listening)**

1 Zwiers, J., Dieckmann, J., Rutherford-Quach, S., Daro, V., Skarin, R., Weiss, S., & Malamut, J. (2017). Principles for the design of mathematics curricula: Promoting language and content development. Retrieved from Stanford University, UL/SCALE website: http://ell.stanford.edu/content/mathematicsresources-additional-resources

Facilitating meaningful conversations

Amplify Desmos Math supports social and collaborative classrooms where students make sense of mathematics by sharing their thinking in pairs or small groups, or with the whole class.

These conversations allow students to connect and share their experiences, strengths, and knowledge, as well as their early thinking. They're encouraged to consider others' perspectives, appreciate different approaches, and see the value in changing one's mind. Throughout each lesson, teachers will find structures and tips to support them in facilitating these meaningful conversations.

Centering personal connections

Teachers are encouraged to consider the experiences of their students and communities, bringing in connections they have to math topics. The Teacher Edition supports teachers in building conversations around the creativity and unique experiences of their students.

In the grade 4 lesson, Create Your Own Problem, students write their own two-step story problems and solve two-step story problems written by their peers. Students use their creativity while engaging deeply in the math.

In the grade 5 lesson, Stacking Garbage, students work together to explore various strategies that can be used to determine the volume of rectangular prisms. Teachers can use prompts in the Teacher Edition to help students connect the activities to their own lives.

Supporting student collaboration

Different groupings are suggested for different lesson phases, including whole-class discussions and pair work. These groupings encourage students to listen to each others' perspectives.

Intentional groupings help students support their partners without simply sharing answers. When students share a device, they can talk through tasks together in ways that inform each other's thinking.

Celebrating different perspectives

Many lesson activities invite students to consider a variety of different responses, including early or unfinished thinking.

In this Warm-Up, students analyze and compare different representations of three-digit numbers. Activities like this help teachers elicit different kinds of student thinking. The Teacher Edition provides suggestions for engaging students in conversation, reinforcing the idea that each student has something valuable to contribute.

Practice makes progress.

When it comes to cementing new learning into long-term understanding, ample practice opportunities are key. Amplify Desmos Math builds practice opportunities into both daily instruction and independent practice.

Lesson Practice

Every lesson in Amplify Desmos Math includes lesson practice in both print and digital* intended to support fluency work and spiral review and prepare students for summative assessment moments.

Additionally, some lessons include repeated practice challenges and Challenge Creators to provide multiple opportunities for practice and to encourage students to engage with mathematics through enriched feedback and collaboration with other students.

*Practice problems are only available in print in grades K–1.

Additional Practice

Available as blackline masters for teachers or as student workbooks, Additional Practice follows the Amplify Desmos Math course structure with two pages of additional problems per lesson with teacher annotations.

These problems further address fluency, spiral review, and a variety of Depth of Knowledge (DOK) questions in lesson learning, supporting differentiated practice based on the needs of students.

Item Bank

With the Item Bank, teachers can create digital screens or assessments from scratch from a bank of items that are appropriately tagged by standard. A seamless item selection and flow also includes the ability to edit individual items.

Teachers can preview items and item sets quickly, then assign the digital practice sets they create as independent work that will show up in students' workstreams in Student Home.

Accessibility

Universal Design for Learning

Each lesson incorporates opportunities for engagement, representation, action, and expression based on the guidelines of Universal Design for Learning (UDL). UDL is a research-based framework designed to ensure meaningful learning experiences for all students.[1]

Multiple Means of Engagement

Individuals are motivated in different ways, at different times, and in different contexts. Lessons provide learners a variety of options to recruit their interest, support sustained effort and persistence, and support self-regulation.

Multiple Means of Representation

Learners make sense of information differently. Amplify Desmos Math includes options for presenting information in multiple ways to support comprehension and understanding of language.

Multiple Means of Action and Expression

Learners differ in how they navigate learning environments and express what they know. Amplify Desmos Math ensures that materials are accessible, support multiple means of students' expression and communication, and scaffold executive functioning.

Support Self-Regulation: Students reflect on their learning.

Present Information in Multiple Ways: Students and teachers can use digital tools, such as text to speech, enlarged font, and dynamic visuals.

Support Multiple Means of Student Expression and Communication: Students can communicate their ideas in multiple ways, including sketching, uploading photos, or recording an audio response.

1 https://udlguidelines.cast.org/

Lesson facilitation supports

Every lesson includes at least one specific suggestion the teacher can use to increase access to the lesson without reducing the mathematical demand of the tasks. These suggestions address the following areas:

- Conceptual Processing
- Visual-Spatial Processing
- Executive Functioning
- Memory and Attention
- Fine Motor Skills

Accessibility tools

Students have the ability to control accessibility tools so that each learning experience is customized to their individual needs. In many instances, these tools can be turned on or off at any point of instruction.

Text to speech: Reads text instructions to students in multiple languages.

Enlarged font: Increases the size of all text on screen.

Braille mode: Includes narration of digital interactions.

Language selection: Toggles between languages.

PLAY
AREA
8
20

Student thinking is valuable and can be made evident.

In Amplify Desmos Math, we believe that all students have something brilliant to offer and that math class is a place where teachers can elicit, celebrate, and build on that brilliance. Students' ideas are what fuel meaningful classroom conversations and drive the learning process.

By starting with what students already know, Amplify Desmos Math helps build a strong foundation for success to guide and support future learning. Teachers are empowered to transform every classroom into an engaged math community that invites, values, and develops student thinking. With explicit guidance on what to look for and how to respond, teachers can effectively support students as they develop their understanding.

In the pages that follow, you'll read about program features that help bring student thinking to life, including the following:

- Assessments
- mCLASS Assessments
- Data and reporting

Assessments

Robust assessments drive learning and inform instruction.

A variety of performance data in Amplify Desmos Math provides evidence of student learning, while helping students bolster their skills and understanding.

Throughout lessons, units, and the entire program, you'll find summative and formative assessments meant to provide insights into students' conceptual understandings. Student learning is never a surprise at the end of a unit—with Amplify Desmos Math, understanding is made continually visible.

Unit-level assessments

Our embedded unit assessments offer key insights into students' conceptual understanding of math. These assessments provide regular, actionable information about how students are thinking about and processing math, with both auto-scoring and in-depth rubrics that help teachers anticipate and respond to students' learning needs.

Pre-Unit Check (grades 1–A1)

Each unit begins with an assessment designed to identify the student skills that will be relevant to the upcoming unit. This check is agnostic to the standards covered in the following unit and serves not as a deficit-based acknowledgment of what students do not know, but rather as an affirmation of the knowledge and skills with which students come in.

End-of-Unit Assessment

Students engage with rigorous grade-level mathematics through a variety of formats and tasks in the End-of-Unit Assessment. A combination of autoscored and rubric-scored items provide deep insights into student thinking. All Amplify Desmos Math End-of-Unit Assessments include two forms.

Sub-Unit Quizzes

With regular Sub-Unit Quizzes, student understanding never comes as an end-of-unit surprise. In these checks, students are assessed on a subset of conceptual understandings from the unit, with rubrics that help illuminate students' current understanding and provide guidance for responding to student thinking.

Sub-Unit Checklists (grades K–1)

These checklists enable teachers to observe key skills and concepts that cannot be assessed on a pencil-and-paper assessment. The checklists outline the supports students need to get where they need to go.

Lesson-level assessments

Amplify Desmos Math lessons are centered around sense-making and in-the-moment feedback. Daily moments of assessment provide valuable evidence of learning for both the teacher and student.

Responsive Feedback™

We harness the power of digital math and graphing tools to show students the meaning of their thinking in context. Teachers have the ability to see and provide in-the-moment feedback as students progress through a lesson. Responsive Feedback motivates students and engages them in the learning process.

Show What You Know

Each lesson has a daily formative assessment focused on one of the key concepts in the lesson. Show What You Know moments are carefully designed to minimize the time students take to complete while maximizing the insight the teacher receives on a daily basis to attend to student needs during the following class. *Show What You Know is optional in grades K–1.*

Beginning in grade 2, all unit-level and lesson-level assessments can be completed digitally.

Name _____ Date _____

Show What You Know 1.05

For Problems 1–4, find the number that makes the equation true.

Show or explain your thinking.

1. 12 + _____ = 15
2. 20 – 9 = _____
3. _____ + 6 = 19
4. 16 – _____ = 9

I can . . .
Find numbers that make addition and subtraction equations true.

27

Name _____ Date _____

Show What You Know 1.11

Identify the mystery number from the table using the following clues:

- **The number is a composite number.**
- **The number is a multiple of 3.**
- **7 is a factor of the number.**

15	7	63	32

_____

I can . . .
Use what I know about factors, multiples, and prime and composite numbers to identify numbers.

31

Show What You Know example pages for grades 2 and 4.

mCLASS Assessments

Benchmark and progress monitoring assessments identify what students know and can do.

Integrated mCLASS® Math Assessments reveal students' math thinking through an asset-based approach. This data provides better insights about what students know, what math assets to leverage, and where students need support.

mCLASS Benchmark

This powerful digital assessment system is whole-class administered for benchmarking three times a year: beginning-of-year (BOY), middle-of-year (MOY), and end-of-year (EOY). The assessments are designed with a focus on analyzing student responses to reveal underlying math thinking, evaluate what students know about grade-level math, and inform instructional decisions. A brief but powerful Beginning-of-Year Screener is available when mCLASS Benchmark is not included.

- Evaluate student performance toward grade-level expectations for growth measure.
- Identify the specific areas of strengths and development needs for each student to inform differentiation in Amplify Desmos Math and Boost Personalized Learning.
- Further target Tier 2 and Tier 3 intervention areas with an adaptive diagnostic module.

mCLASS Progress Monitoring

These Progress Monitoring assessments help teachers chart students' progression between Benchmark assessment windows. For students receiving targeted support, Progress Monitoring informs whether intervention is working or whether adjustments are needed to improve student learning.

As an essential part of a school's MTSS or Response to Intervention (RTI) framework, these assessments can be used to track student progress at the concept level; items contained within a Progress Monitoring tool reflect tightly connected concepts and skills.

Progress Monitoring is designed to be brief and administered frequently to support timely instructional decisions.

Ongoing performance insights

Student learning is never a surprise at the end of a unit—with Amplify Desmos Math, understanding is made continually visible.

Connected to the predictive data of mCLASS Assessments, the robust reporting of Amplify Desmos Math helps teachers plan instruction based on data across summative and formative assessments:

- **Pre-Unit Check:** Each unit begins with an assessment designed to identify the student skills that will be relevant to the upcoming unit. *Available beginning in grade 2.*
- **Sub-Unit Quizzes:** In these quizzes, students are assessed on a subset of conceptual understandings from the unit, with rubrics that help illuminate their current understanding.
- **End-of-Unit Assessment:** Students engage with rigorous grade-level mathematics through a variety of formats and tasks that provide deep insights into student thinking.

Track performance across all activities or for one moment in time.

Provides a comprehensive picture of student performance

Data-driven planning for instruction

Throughout a unit, teachers can depend on insights and recommendations based on most recent data.

Teachers can see data from mCLASS Assessments, Boost Personalized Learning, and core assessments all in one place. Student groups are identified for teachers to automatically:

- Plan instruction around classroom strengths and areas of growth from mCLASS Performance.
- See major trends around classroom performance based on recent assessments.

Start each unit with reliable insights into student learning.

Quickly check student understanding at the start of every unit with **Pre-Unit Checks**.*

Teachers can lean on this data to assess the critical prerequisite skills for the upcoming unit, with suggestions for how to support students in those concepts throughout the unit.

*There are no Pre-Unit Checks in Kindergarten.

Pre-Unit Checks performance is easily found under Core Curriculum.

Daily Checks For Understanding

Each lesson has a daily formative assessment focused on one of the key concepts in the lesson. **Show What You Know*** moments are carefully designed to minimize the time students take to complete while maximizing the insight the teacher receives on a daily basis to attend to student needs during the following class.

Digital Teacher Experience from Grade 5, Unit 2, Lesson 11: Relating Area to Multiplication With Fractions Greater Than 1

Show What You Know from Grade 5, Unit 2, Lesson 11: Relating Area to Multiplication With Fractions Greater Than 1

*Show What You Know is optional in grades K–1, with digital capabilities starting in grade 2.

Teachers can digitally check for student thinking throughout the lesson and the Show What You Know with the **Teacher Dashboard**, with a glanceable Summary View of all student responses.

Teachers can also select each student's name to view their mathematical thinking.

Tracking progress throughout a unit

Throughout each unit, teachers can lean on the data from **Sub-Unit Quizzes** and **End-of-Unit Assessments**.

These digital* and paper-based assessments allow teachers to track growth throughout a unit, and feed into the overall **Assessment & Activity Report** by class.

Name _____ Date _____

End-of-Unit Assessment Unit 5.1

1 Which statement describes the volume of the rectangular prism in cubic units?

A. The volume is 7 cubic units.
B. The volume is less than 12 cubic units.
C. The volume is 12 cubic units.
D. The volume is greater than 12 cubic units.

2 Select *all* the expressions that represent the volume of the rectangular prism.

A. $3 \times 4 \times 5$
B. $(3 + 4) \times 5$
C. $15 + 15 + 15 + 15$
D. $15 \times 15 \times 15 \times 15$
E. 5×12

3 Determine the volume of the figure.

Show or explain your thinking.

answer: _____

Form A 8

*Sub-Unit Quizzes and End-of-Unit Assessments are exclusively paper-based in grades K–1.

Digitally auto-graded questions immediately showcase performance for every assessment.

The **Insights and Recommendations** pop-up analyzes class performance throughout the year to give teachers targeted, individual small group recommendations.

View performance for **Sub-Unit Quizzes** and **Sub-Unit Assessments**.

Digging into growth across standards

Connected to the Assessment & Activity Report, the **Standards Report** helps educators identify students' strengths and areas in need of improvement within their class, and can be a valuable tool for standards-based grading.

The report allows teachers to:

- See class performance against grade-level against expectations over time.
- View when a standard was last assessed and how many items relate to that standard.
- Plan for instruction around grade-level standards that need reteaching.

Actionable next steps for every assessment

At every assessment moment in a unit, teachers have opportunities to respond to student understanding with built-in differentiation support.

In the Teacher Edition, teachers are provided with clear suggestions for how to differentiate instruction with Support, Strengthen, and Stretch recommendations:

Support

Provide targeted intervention for students by using these resources.

Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

Stretch

Challenge students and extend their learning with these resources.

The learning goal of each lesson is broken down for teachers into what it looks like for students who need support in the lesson goal, for students who need to strengthen their understanding of the lesson goal, and for students to be ready to stretch their learning.

Teachers are provided with recommendations for resources to use with each group of students.

Unit 4 | End-of-Unit Assessment

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Additional data on student thinking can be found in Teacher Reporting.

End-of-Unit Assessment

Independent | 45 min

Facilitation: Assign the End-of-Unit Assessment to learn about your students' understanding of concepts and skills in this unit. There are two forms of the End-of-Unit Assessment: Forms A and B.

Item Analysis, Forms A and B

Problem(s)	Concept or skill	Addressed in	DOK
1	Multiplying fluently within 100	Lesson 8	1
2, 3	Interpreting whole number quotients of whole numbers	Lesson 5	2
4	Writing equations with a symbol for the unknown to represent multiplication and division situations	Lesson 6	2
5, 6	Applying properties of operations as strategies to divide within 100	Lesson 18	1
7	Multiplying one-digit whole numbers by multiples of 10 in the range 10–90	Lesson 14	1
8	Applying properties of operations as strategies to multiply within 100	Lesson 12	1
9	Solving two-step story problems using the 4 operations	Lesson 15	2

Assessment Resources

- Student Print Assessments
- Answer Keys

Differentiation Resources

Intervention and Extension Resources includes:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

If students need with concepts o the following re

- Lesson Practi
- Additional Pra
- Item Bank

Unit 4 487A

Assess before, during, and after each unit.

Respond with differentiation to support students.

D Differentiation (End-of-Unit Assessment)

Note: To **strengthen** and **stretch** students' learning, refer to the differentiation resources suggested throughout this unit and in the Unit Overview.

Sub-Unit Goal(s)	Problem(s)	Respond to Student Thinking
Determine the volume of a rectangular prism using the formulas $V = \ell \times w \times h$ and $V = B \times h$.	1	**Support** • **Mini-Lesson:** *Writing Expressions to Determine the Volume of a Figure* (ML 1.13)
	2	**Support** • **Center:** *Can You Build It?*, Stage 2 • **Teacher Move:** Consider revisiting Lesson 3, Activity 1. Have students write as many expressions as they can for the prisms they build.
Determine the volume of a figure composed of rectangular prisms.	3	**Support** • **Mini-Lesson:** *Writing Expressions to Represent the Volume of a Figure* (ML 1.11) • **Teacher Move:** Have students review the problem by annotating a composition or decomposition strategy and sharing with a partner. • **Teacher Move:** Consider revisiting Lesson 11, Activity 1. Have students discuss what is similar and different about each strategy.
Determine the volume of a rectangular prism using the formulas $V = \ell \times w \times h$ and $V = B \times h$.	4	**Support** • **Mini-Lesson:** *Using Volume Formulas* (ML 1.08)
Determine the volume of a figure composed of rectangular prisms.	5, 6	**Support** • **Mini-Lesson:** *Determining the Volumes of Figures Made of Prisms* (ML 1.10)
	7	**Support** • **Mini-Lesson:** *Determining Unknown Edge Lengths of a Figure* (ML 1.12) • **Teacher Move:** Have students review the problem by describing to a partner how they decomposed the figure or removed a piece from the full prism. Then have students write an equation to show their calculation.
	8	**Support** • **Teacher Move:** Have students review the problem by justifying their response to a partner.

Notes

Notes

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