

# Dear Teacher,

Welcome to Amplify Desmos Math! We're so excited your school has chosen our program this year. Your hard work plays an essential role in your students' math experience, so we wanted to reach out to introduce ourselves.

We developed this program around the idea that a structured approach to problem-based instruction builds on students' curiosity to develop lasting grade-level understandings for every member of your classroom. Each lesson offers opportunities for you to build on students' understanding, connect their ideas, develop their skill fluency, and empower them to ask questions, explore, and make discoveries. This year, our mission is for your students to learn math — and to love learning math!

Here's what you can expect:

- **Interactive lessons** that blend paper-based and digital learning, including:
  - » Lessons that drive classroom discussions so students can work toward a shared understanding and sense of community.
  - » Responsive Feedback™ that interprets students' responses in context and encourages perseverance and revision.
  - » Easy-to-follow lesson plans tested in classrooms across the country, with clear teaching suggestions, strategies, and Math Language Routines.
- **Lesson practice** to support fluency and help students review previous topics.
- **Recommended differentiation moves** that meet the needs of diverse learners.
- **Diagnostic, formative, and summative assessments** along with lesson-level checks for understanding.
- **A caregiver resource** for each unit that includes explanations of key math concepts and problems to try.

We hope your students enjoy using technology to explore math, working with classmates to solve problems, and learning new and interesting concepts. We also hope you love experiencing it with them!

—The Amplify Desmos Math team



# Unit 1 Introducing Multiplication

Represent and solve problems involving equal groups, including in the contexts of arrays and scaled graphs.

 **Unit Story: My Name Is Harper** In this story, a polar bear named Piho gets the opportunity to see and experience parts of the world from the same perspective as her friend Taka, an Arctic tern.



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Galyna Motizova/Shutterstock.com

## Pre-Unit Check

### Sub-Unit 1 Unit 1: Introducing Multiplication ..... 1R

 <b>1.01</b>	Investigate   Finding Equal Groups	.3A
<b>1.02</b>	Equal Groups   Introducing Multiplication	.5A
<b>1.03</b>	More Equal Groups   Representing Situations With Drawings and Diagrams	12A
<b>1.04</b>	Book Clubs   Making Sense of Multiplication Problems	19A
<b>1.05</b>	Choosing Your Own Strategy   Solving Multiplication Problems	26A
<b>1.06</b>	What's Missing?   Relating Representations to Equations With Unknown Values	33A
<b>1.07</b>	As a Matter of Fact   Building Flexibility, Efficiency, and Accuracy With Multiplication Facts	40A
 <b>Sub-Unit Quiz 1</b>		47A

Building Toward: 3.OA.A.1, MP1, MP2, MP6

3.OA.A.3, 3.OA.A.1, MP2, MP4, MP7, MP8

3.OA.A., MP1, MP2, MP7

3.OA.A.3, 3.OA.A.4, 3.OA.C.7, MP1, MP2, MP7, MP8

3.OA.A.4, 3.OA.A.1, 3.OA.A.3, 3.OA.C.7,

MP2, MP4, MP7, MP8

3.OA.C.7, 3.OA.A.1, 3.OA.A.4, MP2, MP3, MP6, MP7, MP8



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### Sub-Unit 2 Arrays ..... 48

<b>1.08</b>	Searching for Arrays   Finding, Drawing, and Describing Arrays	49A
<b>1.09</b>	Arrays of Flavor   Exploring the Commutative Property of Multiplication	56A
<b>1.10</b>	Organizing Art Supplies   Solving Problems With Arrays	63A
<b>1.11</b>	A Community Reading Event   Different Representations of Multiplication	70A
 <b>Sub-Unit Quiz 2</b>		77A

3.OA.A.1, MP6, MP8

3.OA.B.5, 3.OA.A.1, MP7, MP8

3.OA.A.3, 3.OA.A.1, 3.OA.C.7, MP1, MP2, MP7, MP8

3.OA.A.3, 3.OA.C.7, MP1, MP4, MP7, MP8



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### Sub-Unit 3 Data in Scaled Graphs ..... 78

<b>1.12</b>	Library Surveys   Drawing and Interpreting Picture Graphs and Bar Graphs	79A
<b>1.13</b>	School Surveys   Reading Scaled Picture Graphs	84A
<b>1.14</b>	Which Character Are You?   Creating a Scaled Picture Graph	91A
<b>1.15</b>	Puppy Pile   Representing Data on Scaled Bar Graphs	96A
<b>1.16</b>	2, 5, or 10?   Choosing a Scale	102A
<b>1.17</b>	Raising the Bar   Answering Questions About Scaled Bar Graphs	109A
<b>1.18</b>	Favorite Season   Answering Questions About Scaled Bar Graphs	116A
 <b>End-of-Unit Assessment</b>		122C

Building Toward: 3.MD.B.3, MP2

3.MD.B., MP1, MP2, MP7, MP8

3.MD.B.3, MP2, MP6, MP7

3.MD.B.3, MP3, MP6, MP7

3.MD.B.3, MP3, MP4, MP6, MP7

3.MD.B.3, MP1, MP2, MP6, MP7

3.MD.B.3, MP1, MP7, MP8

# Unit 2 Area and Multiplication

Explore area concepts and relate area to multiplication using rectangles and rectilinear shapes.

 **Unit Story: Cheri's New Home** In this story, Cheri learns about her new home from the house's previous owner, Ms. Sarah.



## Pre-Unit Check

123T

## Sub-Unit 1 Concepts of Area Measurement

124

- 2.01 Investigate | Comparing Rugs ..... 125A  
2.02 Which Covers More Space? | Developing the Concept of Area ..... 127A  
2.03 Tiling Figures | Using Square Tiles to Determine the Areas of Rectangles ..... 132A  
2.04 Area Hunt | Understanding and Estimating With Different-Sized Square Units ..... 139A  
2.05 Rectangles and Arrays | Determining the Areas of Rectangles by Counting Square Units ..... 146A

Building Toward: 3.MD.C.5, MP1, MP3, MP5

3.MD.C.5, MP1, MP3, MP6

3.MD.C.5.B, 3.MD.C.5.A, 3.MD.C.6,

MP2, MP3, MP6, MP7

3.MD.C.6, 3.OA.D, MP2, MP3, MP4

3.MD.C.6, 3.MD.C.5, MP2, MP3, MP6, MP7

## Sub-Unit Quiz 1

153A



## Sub-Unit 2 Relating Area to Multiplication

154

- 2.06 Rectangular Rugs | Relating Multiplication Expressions to Tiled Rectangles ..... 155A  
2.07 Toying With Tiles | Determining the Areas of Rectangles Without a Grid ..... 162A  
2.08 Using a Ruler | Measuring Side Lengths to Determine the Areas of Rectangles ..... 169A  
2.09 Painting and Planting With Cheri | Solving Area Problems With Missing Side Lengths ..... 174A

3.MD.C.7.B, 3.MD.C.7.A, 3.OA.B.5, MP2, MP7

3.MD.C.7.A, 3.MD.C.7.B, 3.OA.B.5, MP1, MP2, MP3, MP7

3.MD.C.7.B, 3.OA.B.5, MP5, MP6, MP7

3.MD.C.7.B, 3.OA.A.3, 3.OA.B.5, MP1, MP4, MP7, MP8

## Sub-Unit Quiz 2

179C



## Sub-Unit 3 Determining Area of Figures Composed of Rectangles

180

- 2.10 A Missing Puzzle Piece | Determining the Areas of Rectilinear Figures ..... 181A  
2.11 Painting Cheri's House | Calculating the Areas of Figures Using Multiplication and Addition ..... 188A  
2.12 What Do We Need to Know? | Determining the Areas of Figures With Unknown Side Lengths ..... 195A  
2.13 Designing a Putting Green | Applying an Understanding of Area to Solve Real-World Problems ..... 201A

3.MD.C.7.D, MP6, MP7

3.MD.C.7.D, 3.OA.C.7, MP1, MP2, MP3, MP7

3.MD.C.7.D, 3.OA.A.3, MP3, MP7

3.MD.C.7.D, 3.MD.C.5, 3.MD.C.6, 3.MD.C.7.B, 3.OA.A.3, MP1, MP4

## End-of-Unit Assessment

206A

# Unit 3 Wrapping Up Addition and Subtraction Within 1,000

Develop fluency with addition and subtraction within 1,000 while using rounding and estimation to determine the reasonableness of answers.

 **Unit Story: The View From up Here** In this story, Max climbs monuments, step by step, to photograph new perspectives.



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## Pre-Unit Check

207V

### Sub-Unit 1 Adding Within 1,000

208

-  **3.01** Investigate | Creating a Photo Gallery ..... 209A  
**3.02** Panda Patterns | Using Addition Patterns to Determine Sums ..... 211A  
**3.03** How Would You Solve It? | Using Different Strategies to Add ..... 218A  
**3.04** Adding Three-Digit Numbers | Using Familiar Strategies to Add ..... 225A  
**3.05** What Is an Algorithm? | Introducing the Expanded Form and Partial Sums Algorithms ..... 232A  
**3.06** Using Fewer Digits | Adding With the Standard Algorithm ..... 239A  
**3.07** Determining Sums of 2 or More Addends | Composing More Than 1 Unit to Add ..... 246A  
**3.08** Adding Strategically | Choosing an Addition Strategy Based on the Numbers to Add ..... 253A

**Building Toward:** 3.NBT.A.2, MP1, MP2, MP4  
3.OA.D.9, 3.NBT.A.2, MP7, MP8  
3.NBT.A.2, MP2, MP5, MP7, MP8  
3.NBT.A.2, MP1, MP3, MP6, MP7  
3.NBT.A.2, MP1, MP2, MP7, MP8  
3.NBT.A.2, MP3, MP6  
3.NBT.A.2, MP6, MP7, MP8  
3.NBT.A.2, MP1, MP5, MP7, MP8

## Sub-Unit Quiz 1

259C

### Sub-Unit 2 Subtracting Within 1,000

260

- 3.09** Subtracting Three-Digit Numbers | Using Different Strategies to Subtract ..... 261A  
**3.10** Subtracting With an Algorithm | Introducing the Expanded Form Subtraction Algorithm ..... 268A  
**3.11** A New Algorithm | Relating the Expanded Form Algorithm to the Standard Algorithm ..... 275A  
**3.12** Dynamic Decompositions | Decomposing a Ten and Hundred to Subtract by Place ..... 282A  
**3.13** Subtracting From Zero? | Decomposing With Zeros Using Subtraction Algorithms ..... 289A  
**3.14** Subtracting Strategically | Choosing a Subtraction Strategy Based on the Numbers ..... 296A

3.NBT.A.2, MP1, MP2, MP5, MP7, MP8  
3.NBT.A.2, MP1, MP6, MP7, MP8  
3.NBT.A.2, MP3, MP5, MP6, MP7  
3.NBT.A.2, MP6, MP7  
3.NBT.A.2, MP3, MP6, MP7, MP8  
3.NBT.A.2, 3.OA.B.5, MP1, MP5, MP7, MP8

## Sub-Unit Quiz 2

303A

### Sub-Unit 3 Rounding Within 1,000

304

- 3.15** Nearest on a Number Line | Preparing for Rounding by Identifying the Nearest Multiple of 100 ..... 305A  
**3.16** Close Catch | Reasoning About the Nearest Ten ..... 312A  
**3.17** What's the Goal? | Rounding to the Nearest Ten and Hundred to Estimate ..... 319A  
**3.18** Mystery Numbers | Determining a Number Based on Its Rounded Value ..... 326A

3.NBT.A.1, MP6, MP7  
3.NBT.A.1, MP7, MP8  
3.NBT.A.1, MP6, MP7  
3.NBT.A.1, MP7, MP8

## Sub-Unit Quiz 3

333A

### Sub-Unit 4 Solving Two-Step Problems

334

- 3.19** Does It Make Sense? | Checking Reasonableness Through Rounding ..... 335A  
**3.20** Rep-re-sent! | Connecting Tape Diagrams and Equations to Situations ..... 342A  
**3.21** Representing Information | Representing Situations With Diagrams and Equations ..... 347A  
**3.22** Through the Lens of Numbers | Solving Two-Step Problems ..... 354A

3.OA.D.8, MP1, MP3, MP5, MP6, MP7  
3.OA.D.8, 3.OA.A.1, MP2, MP3, MP5  
3.OA.D.8, 3.OA.A.1, MP1, MP2, MP4, MP5  
3.OA.D.8, MP2, MP4, MP6

## End-of-Unit Assessment

360A



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# Unit 4 Relating Multiplication to Division

Explore the relationship between multiplication and division to multiply and divide whole numbers within 100.

 **Unit Story: Home Cooking** In this story, Mateo and Amy prepare a surprise birthday meal for their most loyal customer, Mr. Gharbi.



## Pre-Unit Check

361X

### Sub-Unit 1 What Is Division?

362

-  **4.01** Investigate | Packing Up Peppers ..... 363A  
**4.02** Representing Division | Representing Partitive and Quotitive Division Situations ..... 365A  
**4.03** Family Dinner | Interpreting, Representing, and Solving Division Problems ..... 372A  
**4.04** Representing and Solving | Representing and Solving Division Problems ..... 379A

Building Toward: 3.OA.A, MP1, MP2, MP7  
3.OA.A.2, MP2, MP6  
3.OA.A.2, 3.OA.A.3, MP1, MP4, MP7, MP8  
3.OA.A.3, 3.OA.A.2, MP1, MP2, MP7, MP8

## Sub-Unit Quiz 1

385C

### Sub-Unit 2 Relating Multiplication and Division

386

- 4.05** It's Chili in Here! | Recognizing Division as an Unknown-Factor Problem ..... 387A  
**4.06** Division and Multiplication Equations | Using Multiplication and Division to Solve Problems ..... 393A  
**4.07** Relating Quotients to Familiar Products | Using Familiar Facts to Identify Unknown Factors ..... 398A  
**4.08** Patterns in Multiplication | Exploring Patterns in Multiplication Tables ..... 403A

3.OA.B.6, 3.OA.A.2, MP2, MP4, MP7, MP8  
3.OA.A.3, 3.NBT.A.3, 3.OA.A.2, 3.OA.B.6, MP1, MP2, MP3, MP7, MP8  
3.OA.C.7, 3.OA.B.6, MP7, MP8  
3.OA.D.9, 3.OA.C.7, MP7

## Sub-Unit Quiz 2

407C

### Sub-Unit 3 Multiplying Larger Numbers

408

- 4.09** Composing Rectangles | Using Rectangles to Explore the Distributive Property ..... 409A  
**4.10** How Do You Split It? | Making Equal Groups of Rectangles to Determine the Area ..... 416A  
**4.11** Handling Hot Sauce | Multiplying a One-Digit Number by Multiples of 10 ..... 422A  
**4.12** Multiplying Teen Numbers | Multiplying a One-Digit Number by a Teen Number ..... 429A  
**4.13** Problems Around the Farm | Solving Multiplication Problems Involving Teen Numbers ..... 436A  
**4.14** Multiplying Numbers Greater Than 20 | Applying Strategies to Multiply Larger Numbers ..... 441A  
**4.15** Planting Pepper Seeds | Representing and Solving Two-Step Story Problems ..... 447A

3.MD.C.7.C, 3.OA.C.7, MP1, MP2, MP8  
3.MD.C.7.C, 3.OA.C.7, MP2, MP3, MP7  
3.NBT.A.3, MP5, MP7  
3.OA.B.5, 3.OA.A.3, MP2, MP3, MP7  
3.OA.A.3, 3.MD.C.7.C, 3.OA.B.5, MP1, MP2, MP3, MP6  
3.OA.B.5, MP7, MP8  
3.OA.D.8, 3.NBT.A.3, 3.OA.B.5, MP1, MP2, MP3, MP7

## Sub-Unit Quiz 3

451C

### Sub-Unit 4 Dividing Larger Numbers

452

- 4.16** Setting Up the Birthday Party | Division With Greater Numbers ..... 453A  
**4.17** Looking at the Numbers | Choosing Division Strategies ..... 460A  
**4.18** Lots and Lots of Groups | Comparing Representations to Divide ..... 467A  
**4.19** Be Flexible! | Developing Efficient Strategies for Dividing Within 100 ..... 474A  
**4.20** Peppers and Apples, Oh My! | Representing and Solving Problems With All 4 Operations ..... 480A

3.OA.A.3, 3.OA.A.2, MP1, MP5  
3.OA.B.5, 3.OA.A.3, MP1, MP2, MP4, MP7, MP8  
3.OA.B.5, 3.NBT.A.3, 3.OA.A.2, MP1, MP3, MP7  
3.OA.B.5, 3.OA.A.3, MP1, MP7, MP8  
3.OA.D.8, MP1, MP2

## End-of-Unit Assessment

487A



# Unit 5 Fractions as Numbers

Make sense of fractions as numbers and reason about fractions using area and number line diagrams.

 **Unit Story: Coen and Obita** In this story, Coen lives alone until a tiny tailor moves into his home. Eventually, the two become friends and use their trade skills to make each other's lives easier.



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 **Pre-Unit Check**

489T

**Sub-Unit 1** Introduction to Fractions ..... 490

- |   |   |      |  |
|---|---|------|--|
|  <b>5.01</b> | Investigate   Making Parts and Wholes .....                         | 491A | Building Toward: 3.NF.A, 3.NF.A.1, MP1, MP6, MP7 |
| <b>5.02</b>   | What Is a Fraction?   Introduction to Fractions .....               | 493A | 3.NF.A.1, MP3, MP6                               |
| <b>5.03</b>   | One Part Wonder   Introduction to Unit Fractions .....              | 500A | 3.NF.A.1, 3.G.A.2, MP3, MP6, MP7                 |
| <b>5.04</b>   | More Parts, More Wholes   Introduction to Non-Unit Fractions .....  | 506A | 3.NF.A.1, MP7                                    |
| <b>5.05</b>   | What Parts? How Many Parts?   Representing Non-Unit Fractions ..... | 513A | 3.NF.A.1, MP4, MP7, MP8                          |

 **Sub-Unit Quiz 1** ..... 519C



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**Sub-Unit 2** Fractions on the Number Line ..... 520

- |             |   |      |  |
|-------------|---|------|--|
| <b>5.06</b> | To the Number Line   Fractions Less Than 1 on the Number Line .....   | 521A | 3.NF.A.2.A, 3.NF.A.2, MP6, MP7           |
| <b>5.07</b> | Fractions on the Number Line   Representing Fractions Less Than 1 and Greater Than 1 on the Number Line ..... | 526A | 3.NF.A.2.B, 3.NF.A.2, MP6, MP7           |
| <b>5.08</b> | Cat Crossing   Fractions Equal to Whole Numbers .....   | 532A | 3.NF.A.3.C, 3.NF.A.2, 3.NF.A.3, MP7, MP8 |
| <b>5.09</b> | Location, Location, Location   Using the Number Line and Fractions Flexibly .....                             | 539A | 3.NF.A.2, 3.NF.A.3.C, MP7, MP8           |

 **Sub-Unit Quiz 2** ..... 545C



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**Sub-Unit 3** Equivalent Fractions ..... 546

- |             |   |      |  |
|-------------|---|------|--|
| <b>5.10</b> | Obita's Quilts   Identifying Equivalent Fractions .....   | 547A | 3.NF.A.3.A, 3.NF.A.3, 3.NF.A.3.B, MP2, MP6, MP7, MP8           |
| <b>5.11</b> | Generating Equivalent Fractions   Finding Equivalent Fractions Using Diagrams and Fraction Strips ..... | 554A | 3.NF.A.3.B, 3.NF.A.3, 3.NF.A.3.A, 3.OA.B.5, MP2, MP6, MP7, MP8 |
| <b>5.12</b> | Line-Up   Equivalent Fractions on a Number Line .....   | 561A | 3.NF.A.3.A, 3.NF.A.3, 3.NF.A.3.B, MP2, MP4                     |
| <b>5.13</b> | Whole Numbers and Fractions   Expressing Whole Numbers as Fractions .....                               | 567A | 3.NF.A.3.C, 3.NF.A.3, MP7, MP8                                 |
| <b>5.14</b> | A New Denominator   Expressing Whole Numbers as Fractions With a Denominator of 1 .....                 | 574A | 3.NF.A.3.C, 3.NF.A.3, MP1, MP2, MP7, MP8                       |

 **Sub-Unit Quiz 3** ..... 581A



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**Sub-Unit 4** Fraction Comparisons ..... 582

- |             |  |      |                                     |
|-------------|--|------|-------------------------------------|
| <b>5.15</b> | Seams About Right   Comparing Unit Fractions .....                       | 583A | 3.NF.A.3.D, 3.NF.A.3, MP2, MP7, MP8 |
| <b>5.16</b> | Same Number of Parts   Comparing Fractions With the Same Numerator ..... | 589A | 3.NF.A.3.D, 3.NF.A.3, MP7, MP8      |
| <b>5.17</b> | Ruby the Red Panda   Comparing Fractions With the Same Denominator ..... | 596A | 3.NF.A.3.D, 3.NF.A.3, MP7, MP8      |

 **End-of-Unit Assessment** ..... 602C

# Unit 6 Measuring Length, Time, Liquid Volume, and Weight

Students estimate, measure, and solve problems involving length, time, liquid volume, and weight.

 **Unit Story: Just Stick With It, Sasha** In this story, Sasha learns about the patience and responsibility needed to raise a show chicken for a county fair competition.



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## Pre-Unit Check

603T

## Sub-Unit 1 Measurement Data on Line Plots ..... 604

- 6.01 Investigate | Egg-cellent Pick ..... 605A  
6.02 How Long Is It? | Measuring in Halves of an Inch ..... 607A  
6.03 More Precise Measurements | Measuring in Fourths of an Inch ..... 612A  
6.04 Same Lengths, Different Names | Measuring in Halves and Fourths of an Inch ..... 619A  
6.05 The Plot Chickens | Creating Line Plots to Display Length Measurement Data in Half and Quarter Inches ..... 626A  
6.06 Let's Make a Line Plot | Generating and Displaying Measurement Data on a Line Plot ..... 633A

## Sub-Unit Quiz 1 ..... 637C

- 3.MD.B.4, MP1, MP2, MP3  
3.MD.B.4, 3.NF.A.3.C, MP4, MP5, MP6, MP7  
3.MD.B.4, 3.NF.A.3.C, MP2, MP3, MP6  
3.MD.B.4, 3.NF.A.3.B, MP6, MP7  
3.MD.B.4, 3.NF.A.2, MP2, MP7  
3.MD.B.4, 3.NF.A., MP6, MP7, MP8



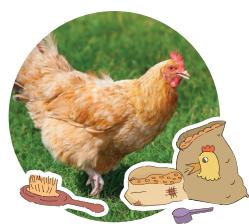
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## Sub-Unit 2 Weight and Liquid Volume ..... 638

- 6.07 Estimating Weight | Estimating Weight in Grams and Kilograms ..... 639A  
6.08 Weight It Out | Measuring Weight in Grams and Kilograms ..... 646A  
6.09 Measuring Liquids | Introducing Liquid Volume ..... 653A  
6.10 How Much Liquid Does It Hold? | Estimating and Measuring Liquid Volume in Liters ..... 660A

- 3.MD.A.2, MP7, MP8  
3.MD.A.2, 3.OA.C.7, 3.NBT.A.2, MP3, MP5, MP7  
3.MD.A.2, MP1  
3.MD.A.2, 3.NF.A.2, 3.OA.C.7, MP3, MP7, MP8

## Sub-Unit Quiz 2 ..... 667A



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## Sub-Unit 3 Problems Involving Time ..... 668

- 6.11 Hands of Time | Telling and Writing Time to the Minute ..... 669A  
6.12 Chicken Time | Representing and Solving Problems Involving Start and End Times ..... 676A  
6.13 The Time in Between | Solving Elapsed-Time Problems ..... 683A  
6.14 All Kinds of Time | Writing and Solving Time Problems ..... 690A

- 3.MD.A.1, MP6, MP7  
3.MD.A.1, MP6, MP7  
3.MD.A.1, MP1, MP2  
3.MD.A.1, MP2, MP3, MP7, MP8

## Sub-Unit Quiz 3 ..... 695C



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## Sub-Unit 4 Measurement Problems in Context ..... 696

- 6.15 Fair Questions | Making Sense of and Representing Measurement Situations ..... 697A  
6.16 Now Weight | Representing and Solving Problems Involving Weight ..... 704A  
6.17 For Good Measure | Solving Problems Using All Four Operations ..... 711A

- 3.MD.A.2, MP2, MP7, MP8  
3.MD.A.2, 3.OA.A.3, 3.OA.B.6, MP2, MP3, MP4, MP7  
3.MD.A.2, 3.MD.A.1, 3.OA.A.3, MP2, MP6, MP7, MP8

## End-of-Unit Assessment ..... 716A

# Unit 7 Two-Dimensional Shapes and Perimeter

Students identify and define attributes of different quadrilaterals, and they explore the perimeter of two-dimensional shapes.

 **Unit Story: Through Piho's Eyes** In this story, a polar bear named Piho gets the opportunity to see and experience parts of the world from the same perspective as her friend Taka, an Arctic tern.



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## Pre-Unit Check ..... 717T

### Sub-Unit 1 Reasoning With Shapes ..... 718

-  **7.01** Investigate | Sorting Shapes ..... 719A  
**7.02** Piho's Shapes | Describing Attributes of Shapes in Different Categories ..... 721A  
**7.03** Rectangles, Squares, and Rhombuses | Identifying Defining Attributes of Rectangles, Squares, and Rhombuses ..... 728A  
**7.04** More Quadrilaterals | Drawing and Categorizing Examples and Non-Examples of Quadrilaterals ..... 735A  
**7.05** Wax Prints | Using Geometric Attributes to Create Wax Prints ..... 742A
-  **Sub-Unit Quiz 1** ..... 747A

**Building Toward:** 3.G.A.1, MP1, MP7

3.G.A.1, MP6, MP7

3.G.A.1, MP3, MP6, MP7

3.G.A.1, MP3, MP6, MP7

3.G.A.1, MP6, MP7



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### Sub-Unit 2 What Is Perimeter? ..... 748

- 7.06** Distance Around Shapes | Developing the Concept of Perimeter ..... 749A  
**7.07** Perimeters of Different Shapes | Exploring Different Shapes With the Same Perimeter ..... 756A  
**7.08** Fencing the Field | Determining the Perimeters of Shapes Given All or Some of the Side Lengths ..... 763A  
**7.09** Solving Perimeter Problems | Solving Real-World and Mathematical Problems Involving Perimeter ..... 770A
-  **Sub-Unit Quiz 2** ..... 777A

3.MD.D.8, MP6, MP7

3.MD.D.8, 3.NBT.A.2, MP3, MP7, MP8

3.MD.D.8, 3.G.A.1, MP1, MP3, MP7

3.MD.D.8, 3.G.A.1, 3.OA.C.7, MP1, MP7, MP8



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### Sub-Unit 3 Expanding on Perimeter ..... 778

- 7.10** In the Real World | Solving Real-World Problems Involving Perimeter and Area of Rectangles ..... 779A  
**7.11** Perimeters and Areas | Exploring Rectangles With the Same Perimeter and Different Areas ..... 786A  
**7.12** Unique Unicorns | Exploring the Perimeter of Rectangles With the Same Area ..... 793A  
**7.13** Designing a Tiny House (Optional) | Applying an Understanding of Area and Perimeter to Solve Real-World Problems ..... 800A
-  **End-of-Unit Assessment** ..... 806A

3.MD.D.8, 3.MD.C.5, 3.MD.C.7, 3.OA.D.8, MP1, MP2, MP3

3.MD.D.8, 3.MD.C.7, 3.OA.C.7, MP3, MP7, MP8

3.MD.D.8, 3.MD.C., 3.OA.C.7, MP7, MP8

3.MD.D.8, 3.MD.C., MP1, MP4, MP7



# A curiosity-driven program that builds students' lifelong math proficiency

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:

## A structured approach to problem-based learning

The program thoughtfully combines conceptual understanding, procedural fluency, and application. Each lesson is designed to tell a story by posing problems that invite a variety of approaches before guiding students to synthesize their understanding of the learning goals.

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.<sup>1</sup>

### 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.

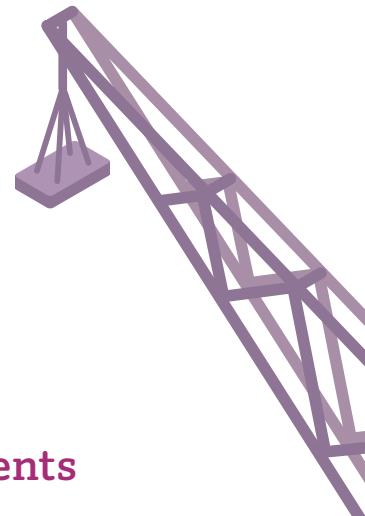
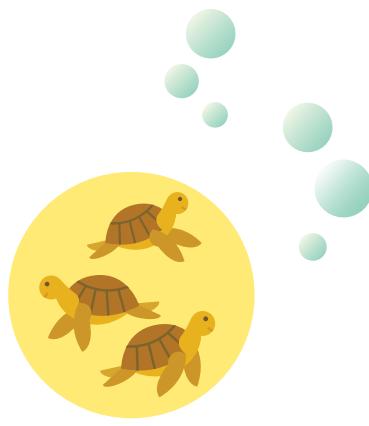
- 1 Activate students' prior knowledge and curiosity
- 2 Generate new ideas through collaboration
- 3 Refine ideas using facilitation tools
- 4 Guide to grade-level understanding
- 5 Practice, reinforce, remediate, and extend for lasting understanding

## 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 students' understanding.

We also provide additional resources that integrate seamlessly with core instruction, including a suite of assessments, tailored practice resources that adjust to students' 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 all students can keep up with or stretch beyond grade-level math.





## Students' thinking is valuable and can be made evident

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

Rather than evaluating ideas as simply right or wrong, Responsive Feedback™ shows students what their ideas mean in context and offers opportunities for students to learn from each other's responses.<sup>2</sup> This feedback encourages students to explore different strategies and make sense of a variety of responses, so that students' ideas drive the learning process.

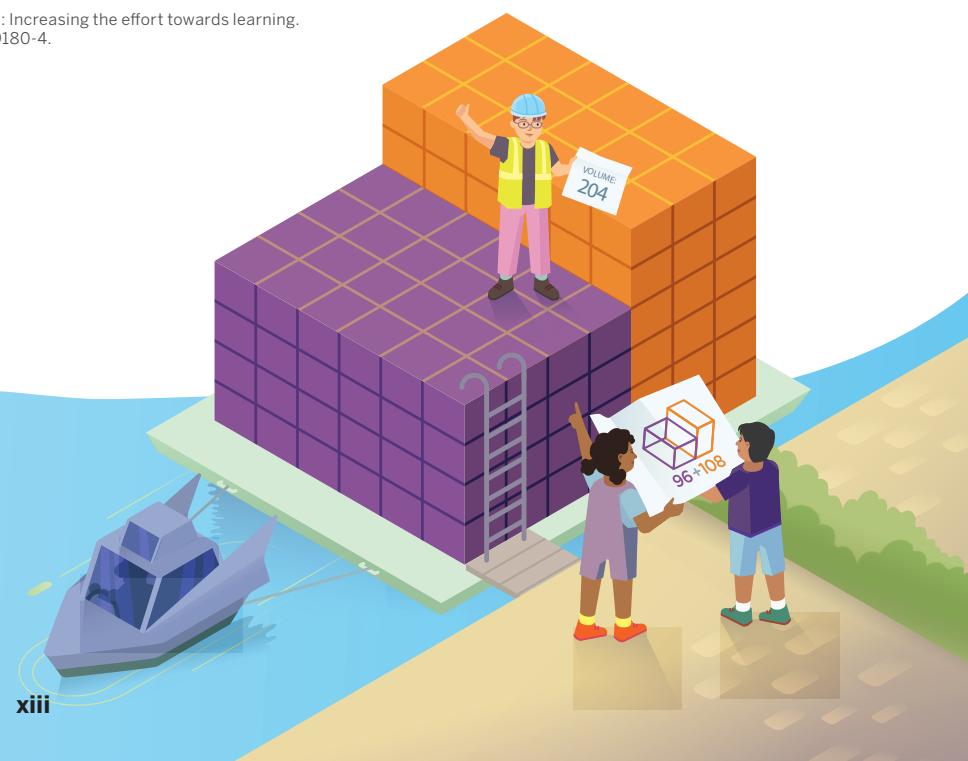
## Math that motivates students

Picture a classroom where students are so eagerly engaged in a lesson, they wish it would not end. It is buzzing with the sounds of natural curiosity. There is an audible groan from students when their screens are paused. This is what an Amplify Desmos Math classroom looks like 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 brilliant mathematical ideas.

<sup>1</sup>Smith, M.S., & Stein, M.K. (2018). *5 practices for orchestrating productive mathematics discussions* (2nd ed.). SAGE Publications.

<sup>2</sup>Chase, C., Chin, D.B., Oppezzo, M., Schwartz, D.L. (2009). Teachable agents and the protégé effect: Increasing the effort towards learning. *Journal of Science Education and Technology* 18, 334–352. <https://doi.org/10.1007/s10956-009-9180-4>.



# Scope and Sequence | Grades K–5

Volume 1				
	Unit 1	Unit 2	Unit 3	Unit 4
Kindergarten 137 days total	Math in Our World  18 instructional days 3 assessment days <b>21 days total</b>	Numbers 1–10  22 instructional days 4 assessment days <b>26 days total</b>	Flat Shapes All Around Us  16 instructional days 2 assessment days <b>18 days total</b>	Understanding Addition and Subtraction  20 instructional days 3 assessment days <b>23 days total</b>
Grade 1 154 days total	Adding, Subtracting, and Working With Data  15 instructional days 4 assessment days <b>19 days total</b>	Addition and Subtraction Story Problems  20 instructional days 5 assessment days <b>25 days total</b>	Adding and Subtracting Within 20  20 instructional days 5 assessment days <b>25 days total</b>	Numbers to 99  22 instructional days 5 assessment days <b>27 days total</b>
Grade 2 155 days total	Working With Data and Solving Comparison Problems  16 instructional days 4 assessment days <b>20 days total</b>	Adding and Subtracting Within 100  22 instructional days 5 assessment days <b>27 days total</b>	Measuring Length  15 instructional days 4 assessment days <b>19 days total</b>	Addition and Subtraction on the Number Line  13 instructional days 3 assessment days <b>16 days total</b>
Grade 3 152 days total	Introducing Multiplication  18 instructional days 4 assessment days <b>22 days total</b>	Area and Multiplication  13 instructional days 4 assessment days <b>17 days total</b>	Wrapping Up Addition and Subtraction Within 1,000  22 instructional days 5 assessment days <b>27 days total</b>	Relating Multiplication to Division  20 instructional days 5 assessment days <b>25 days total</b>
Grade 4 148 days total	Factors and Multiples  11 instructional days 3 assessment days <b>14 days total</b>	Fraction Equivalence and Comparison  15 instructional days 4 assessment days <b>19 days total</b>	Extending Operations to Fractions  16 instructional days 4 assessment days <b>20 days total</b>	From Hundredths to Hundred Thousands  21 instructional days 5 assessment days <b>26 days total</b>
Grade 5 145 days total	Volume  14 instructional days 4 assessment days <b>18 days total</b>	Fractions as Quotients and Fraction Multiplication  15 instructional days 4 assessment days <b>19 days total</b>	Multiplying and Dividing Fractions  15 instructional days 3 assessment days <b>18 days total</b>	Multiplication and Division With Multi-Digit Whole Numbers  18 instructional days 4 assessment days <b>22 days total</b>

## Volume 2

Unit 5	Unit 6	Unit 7	Unit 8
<b>Make and Break Apart Numbers Within 10</b> 15 instructional days 3 assessment days <b>18 days total</b>	<b>Numbers 0–20</b> 11 instructional days 2 assessment days <b>13 days total</b>	<b>Solid Shapes All Around Us</b> 16 instructional days 2 assessment days <b>18 days total</b>	
<b>Adding Within 100</b> 14 instructional days 4 assessment days <b>18 days total</b>	<b>Measuring Lengths of up to 120 Length Units</b> 15 instructional days 4 assessment days <b>19 days total</b>	<b>Geometry and Time</b> 17 instructional days 4 assessment days <b>21 days total</b>	
<b>Numbers to 1,000</b> 12 instructional days 3 assessment days <b>15 days total</b>	<b>Geometry and Time</b> 15 instructional days 4 assessment days <b>19 days total</b>	<b>Adding and Subtracting Within 1,000</b> 19 instructional days 4 assessment days <b>23 days total</b>	<b>Equal Groups</b> 13 instructional days 3 assessment days <b>16 days total</b>
<b>Fractions as Numbers</b> 17 instructional days 5 assessment days <b>22 days total</b>	<b>Measuring Length, Time, Liquid Volume, and Weight</b> 17 instructional days 5 assessment days <b>22 days total</b>	<b>Two-Dimensional Shapes and Perimeter</b> 13 instructional days 4 assessment days <b>17 days total</b>	
<b>Multiplicative Comparison and Measurement</b> 17 instructional days 4 assessment days <b>21 days total</b>	<b>Multiplying and Dividing Multi-Digit Numbers</b> 22 instructional days 4 assessment days <b>26 days total</b>	<b>Angles and Properties of Shapes</b> 18 instructional days 4 assessment days <b>22 days total</b>	
<b>Place Value Patterns and Decimal Operations</b> 24 instructional days 5 assessment days <b>29 days total</b>	<b>More Decimal and Fraction Operations</b> 19 instructional days 4 assessment days <b>23 days total</b>	<b>Geometry and Patterns</b> 12 instructional days 4 assessment days <b>16 days total</b>	

# Program Resources

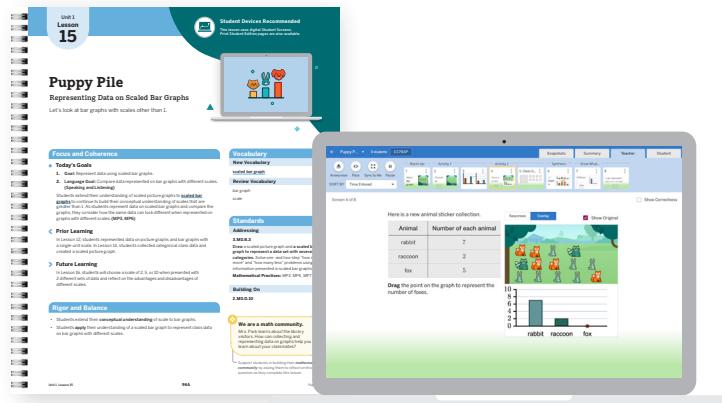
## For Students



- Student Edition (two-volume)
- Digital access to interactive digital student screens, practice, and assessments
- Responsive Feedback™
- Collaboration tools like Challenge Creators and Polygraphs
- Boost Personalized Learning

Student materials available in Spanish

## For Teachers



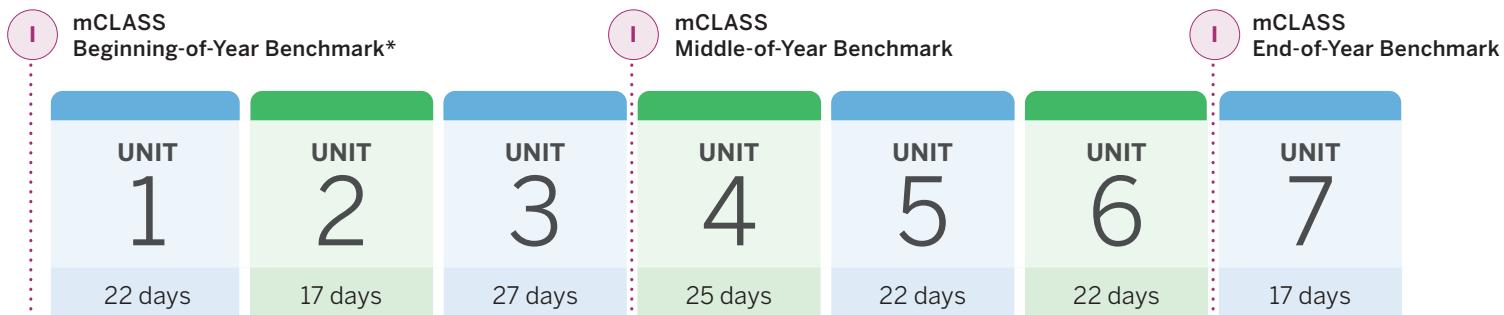
- Teacher Edition (two-volume)
- Digital access to planning and instruction resources including teacher moves in Spanish
- Teacher Presentation Screens
- Facilitation and progress-monitoring tools
- Assessment and reporting suite, including Benchmarks and Progress Monitoring

## Additional Resources

<b>Assessment and Lesson Resources</b> • Unit Assessments • Show What You Know Lesson Assessments • Rubrics and Teacher Answer Keys • Activity PDFs	<b>Intervention and Extension Resources</b> • Mini-Lessons • Extensions	<b>Centers Resources</b> • Centers PDFs • Work Mats, Cards, and Grids
<b>Math Language Development Resources</b> • Graphic Organizers, Frayer Models, Sentence Frames • English/Spanish Cognates, Word Banks, and Glossary • Proficiency-leveled Supports	<b>Additional Practice</b> • Two pages of student practice per lesson • Teacher Answer Keys	<b>Optional: Manipulative Kits and Centers Kits</b> 

# Program Architecture

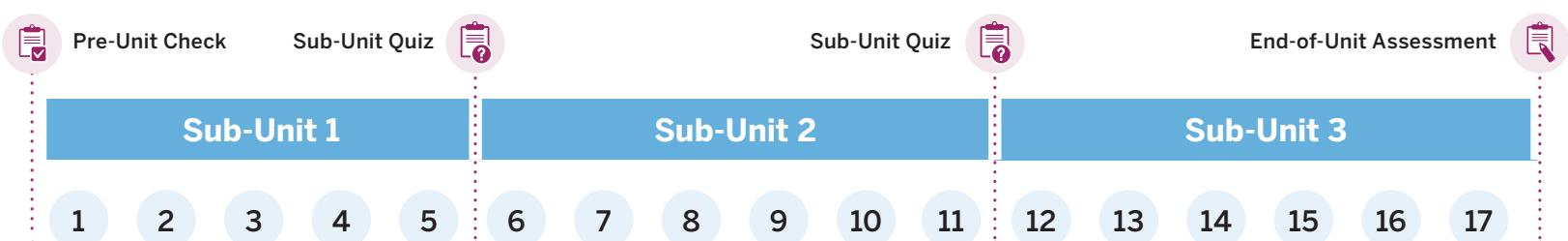
## Course



**Note:** This depiction shows the general structure of a course. The number of lessons varies from unit to unit. See Scope and Sequence pages for the full program scope.

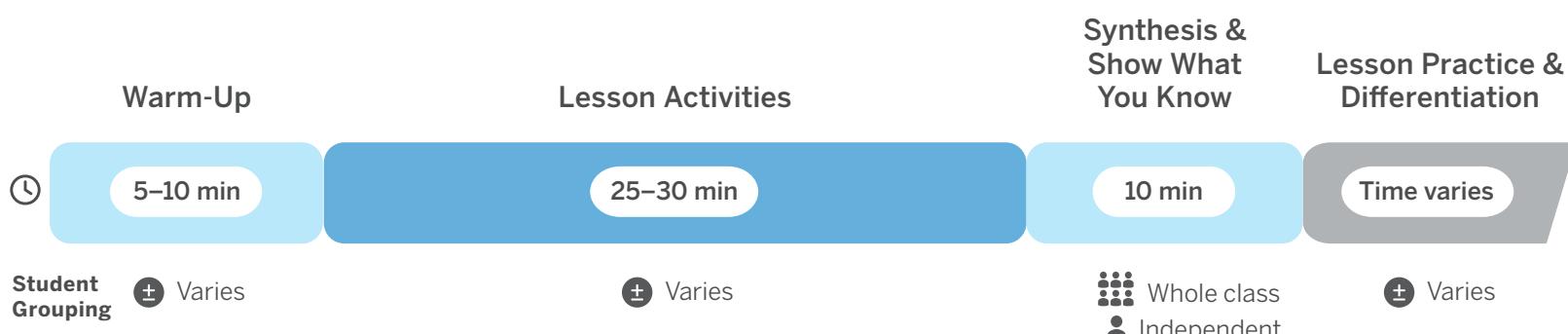
\*A brief but powerful mCLASS Beginning-of-Year Screener is provided when mCLASS Benchmark is not included.

## Unit



**Note:** The number of sub-units, lessons, and quizzes within each unit varies. This depiction shows the general structure of a unit. See the course Table of Contents for more details.

## Lesson



# Navigating This Program



Once you have logged into the digital program, you can launch a guided tour with helpful navigation tips.

## 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**

**Assess and Respond** — **Unit Investigation** — **Sub-Unit 1**

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

**1 Investigate: Filling Containers**  
Filling Containers  
Launch the unit with this engaging mathematical task!

**2 Which Is Largest?**  
Defining Volume  
Which container has the greatest capacity?

**3 Cube Figures**  
Developing Strategies to Determine Volume  
Explore volume by building and comparing figures with standard unit cubes.

**4 Stacking Garbage**  
Using the Structure of Rectangular Prisms to Determine Volume  
Describe the layered structure of a rectangular prism and develop strategies to determine the 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 Prism**  
Determining 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.

**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.

**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.

**11 Where Are the Prisms?**  
Determining Volume Using Edge Lengths  
Determine the volumes of figures 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.

**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.

**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

**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

**Assess and Respond** — **Sub-Unit 2**

**15 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 place in the Pre-Unit Check.

End-of-Unit Check: This assessment can be given on the same day as the End-of-Unit Check for the entire 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**      **Unit at a Glance**      **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.

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

**Sub-Unit 1 Goal:**

- Describe and determine the volume of a rectangular prism using its layered structure.

**Progression of Strategies, Skills, or Language**

Progression	For Example...
Determining volume of three-dimensional figures by counting unit cubes.	The volume is 12 cubic units. There is 1 cube on top, 3 cubes in the next row, and 8 cubes on the bottom arranged in 2 rows. 
Building rectangular prisms and describing the layered structure of a rectangular prism.	There are 6 unit cubes in 1 layer. The cubes are arranged in 2 rows of 3 unit cubes. There are 5 identical layers of 6 unit cubes stacked on top of each other. 
Determining the volume of a rectangular prism by iterating layers of cubes.	The right face of the prism has 20 cubes. There are 6 layers of 20 cubes, so the volume is 120 cubic units. 

**Math That Matters Most**

**Sub-Unit 1:** Describe and determine the volume of a rectangular prism using its layered structure.

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.

**Sub-Unit 1 | Centers in This Sub-Unit**

**Introduced in This Sub-Unit**

Prepare enough materials for the entire class to engage in these Center stages in a Lesson Activity. These materials can be reused with small groups for differentiation.

**Materials**

- (0-5) Centers Resources
- connecting cubes (Manipulatives)
- folders (Classroom materials)

**Can You Build It?**

**Stage 2** Rectangular Prisms

Students build rectangular prisms with given volumes.

**Materials**

- Directions\*, Recording Sheet
- (0-5) Centers Resources
- connecting cubes (Manipulatives)
- folders (Classroom materials)

**Sub-Unit 1 | Sub-Unit Summary**

**Sub-Unit 1 | Summary**

In this sub-unit...

- We defined **volume** as the amount of space a three-dimensional object takes up. It can be measured by packing an object with **unit cubes** so that there are no gaps or overlaps.
- We determined the volumes of three-dimensional figures by counting the number of unit cubes used to build the figures.

The volume is 12 unit cubes:  
• 1 cube on top  
• 3 cubes in the next row  
• 8 cubes in the bottom arranged in 2 rows.

**Additional Centers**

Use the Centers Resources

- \*These Center stages were introduced:
  - Would You Rather? Stage 1
  - Rectangle Rumble, Stage 3

**Notes:**

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.

# Navigating This Program

## 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.

The screenshot shows a sample lesson page from the Teacher Edition. At the top, it says "Unit 1 Lesson 3". Below that is the title "Cube Figures" and the subtitle "Developing Strategies to Determine Volume". A callout box on the right indicates that this lesson uses print Student Edition pages and digital Teacher Presentation Screens. The main content area includes sections for "Focus and Coherence", "Rigor and Balance", and "Standards". The "Focus and Coherence" section contains "Today's Goals" (Language Goal: Describe the attributes and layered structure of a rectangular prism; Goal: Develop strategies to determine the volumes of rectangular prisms) and "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). The "Rigor and Balance" section explains how students develop conceptual understanding, procedural fluency, and application. The "Standards" section lists "5.MD.C.4" (Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units) and "5.MD.C.3" (Also Addressing: Mathematical Practices: MP3, MP6, MP7). A callout box on the right encourages teachers to ask students about their mathematical identity. The page also includes a "Vocabulary" section with terms like "rectangular prism", "unit cubes", and "volume".

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.

Where applicable, the Standards section will list all standards addressed in this lesson, including standards the lesson builds on and standards the lesson builds toward. The **bolded** words indicate which parts of each standard described are covered in the 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.

**Lesson at a Glance** 60 min

**Standards:** 5.MD.C.4, 5.MD.C.3

**Warm-Up** Whole Class | 10 min

Students are introduced to the **What Do You Know About \_\_\_?** routine, providing all students with the opportunity to share what they already know about rectangular prisms. (MP3, MP6)

**Activity 1** Pairs | 15 min

Students build prisms using unit cubes. They describe and compare the structures of different rectangular prisms, recognizing that they can use the structure to determine the volume. Additional Prep Prepare: a blank chart titled *Describing Rectangular Prisms*

**Activity 2** Small Groups | 20 min

Students are introduced to the **Center Can You Build It?** Stage 2, in which they compete to build as many different rectangular prisms possible with a given volume. This prepares students to recognize the layered structure in images of prisms in Lesson 4.

**Synthesis** Whole Class | 10 min

Students review and reflect on whether each individual unit cube must be counted in order to determine volume.

**Show What You Know** Independent | 5 min

Students demonstrate their understanding by selecting true statements about the volume of a rectangular prism.

**Prep Checklist**

This lesson includes:  
Presentation Screens, Student Edition, Show What You Know PDF

Additional required materials:  
Manipulative Kit: connecting cubes, number cards (0–5)  
Classroom materials: folders, chart paper, Describing Rectangular Prisms chart (teacher made), markers

Consider using the Math Language Development Resources scaffolds (as needed).

Unit 1 Lesson 3 113 Lesson at a Glance

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

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

**Whole Class | 10 min**

**Warm-Up What Do You Know About \_\_\_?**

**Purpose:** Students share ideas about rectangular prisms, preparing them to connect the layered structure to strategies for determining a prism's volume.

**1 Launch**  
Use the **What Do You Know About \_\_\_?** routine. Ask, "What do you know about rectangular prisms?" Invite students to share their responses.

**2 Connect**  
Record students' responses as they share. Ensure that students notice the 6 faces of a rectangular prism. Ask, "How are rectangular prisms similar to the figures you built in the previous lesson? How are they different?"

**Students might say ...**

- I know that rectangular prisms are solid shapes.
- I know that rectangular prisms have 6 sides or faces.
- I know that each face of a rectangular prism is a rectangle.

Unit 1 Lesson 3 110 Warm-Up

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.

# Navigating This Program

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.

**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.

**1 Launch**

- Small Groups | 35 min**
- Materials Classroom materials:**
  - Provide students with access to colored pencils or highlighters (as needed).
- Short on time? Consider discussing Problem 3 as a class.**

**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**

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

**Student Edition**

**Unit 1 Lesson 12**

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

**What's the Edge Length?**

Let's write expressions to represent the volume of figures when some edge lengths are unknown.

**Warm-Up**

We are a math community. We believe that learning together helps you learn from teachers and your peers and helps you grow and succeed in your community!

**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**:  
  
 $(2 \times 2 \times 2) + (7 \times 2 \times 5) = 8 + 70 = 78$   
**Strategy B**:  
  
 $(2 \times 2 \times 2) + (7 \times 2 \times 5) = 8 + 70 = 78$   
**Strategy C**:  
  
 $(2 \times 2 \times 2) + (7 \times 2 \times 5) = 8 + 70 = 78$

**Warm-Up Activity 1**

**D Differentiation | Teacher Moves**

**Look for students who ...**

**Almost there**

Decompose the figure and use only labeled edge lengths to determine the volume.

$(7 \times 7 \times 2) + (7 \times 7 \times 5) = 343,$   
so 343 cubic feet

**For example ...**

**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?'"

**Provide support ...**

**Decompose the figure and determine needed edge lengths based on their decomposition strategy.**

$(2 \times 2 \times 2) + (7 \times 2 \times 5) = 8 + 70 = 78,$   
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**

**68–69**

**Activity 1**

**69**

**Presentation Screens**

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.

**Synthesis**

**Lesson Takeaway:** When determining the volume of a solid figure, some edge lengths may need to be determined to calculate the volume in a way that reflects the decomposition strategy.

**Lesson Synthesis**

**Students using print**

**Lesson Practice 112**

**Lesson Practice 112**

**Show What You Know**

**Students using digital**

**Lesson Practice Item Analysis**

**Lesson Practice** **Independent**

Students continue developing their conceptual understanding, fluency, and application of topics from this lesson and previous lessons/units (spiral review). Invite students to refer to the **Lesson Summary** to support them with this practice and their learning throughout the year.

**Students using print**

**Lesson Practice 112**

**Lesson Practice 112**

**Lesson Practice Item Analysis**

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.

## 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.

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

UNIT OVERVIEW	SUB-UNIT OVERVIEW	LESSON OVERVIEW, WARM-UP & ACTIVITIES	SYNTHESIS & SHOW WHAT YOU KNOW	LESSON PRACTICE	DIFFERENTIATION	ASSESS AND RESPOND
<b>Support</b> provides guidance for how to work with students who could benefit from targeted intervention.	<b>Strengthen</b> lists resources for students to reinforce their understanding of the concepts.	<b>Stretch</b> lists challenge opportunities for students who are ready to extend their learning.				
<p><b>D Differentiation</b> Use after Lesson 12</p> <p><b>Lesson Goal:</b> Determine the volume of a figure composed of rectangular prisms when some edge lengths are unknown.</p> <p><b>Support</b> Provides targeted intervention for students by using these resources.  <b>If student response shows:</b> the use of given edge lengths to determine the volumes of rectangular prisms  <b>Respond:</b><ul style="list-style-type: none"><li>• Mini-Lesson   15 min Determining Unknown Edge Lengths of a Figure (ML1.12)</li></ul></p> <p><b>Strengthen</b> Reinforce students' understanding of the concepts assessed by using these resources.  <b>If student response shows:</b> 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  <b>Respond:</b><ul style="list-style-type: none"><li>• Center   15 min Capture Squares, Stage 7</li></ul></p> <p><b>Stretch</b> Challenge students and extend their learning with these resources.  <b>If student response shows:</b> the use of a correct value for a missing edge length and a correct method for determining a volume of 144 cubic inches  <b>Respond:</b><ul style="list-style-type: none"><li>• Sub-Unit 3 Extension Activities   15 min</li></ul></p>						
<b>Mini-Lessons</b> 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.	<b>Professional Learning</b> callouts feature questions and prompts designed to help teachers reflect on how students' thinking developed over the course of the lesson.		<b>Assess and Respond</b>			

## 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**

**Facilitation:** Assign this Sub-Unit Quiz at the end of Sub-Unit 1 to evaluate students' proficiency with the key concepts and skills addressed in this sub-unit. The Up Next problem previews targeted concepts and skills addressed in the next sub-unit.

**Item Analysis**

Problem(s)	Concept or skill	DOK	Standard(s)
1	Comparing the volumes of figures	2	4.MD.A.1, 5.MD.C.3, MP6
2	Determining the volume of a rectangular prism showing unit cubes	2	5.MD.C.3, MP7

**Up Next... (preparation for Lesson 7)**

**3\*** Knowing relative sizes of measurement units within one system including km, m, cm, kg, g, oz, lb, and mL.

**Assessment Resource PDF**

**D Differentiation (Quiz: Sub-Unit 1)**

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
	1	<ul style="list-style-type: none"> <li><b>Support</b> • Mini-Lesson: Comparing Volume (ML 1.02)</li> <li>Teacher Move: Have students review the problem and then provide additional opportunities for students to compare the volumes of prisms.</li> </ul>
	2	<ul style="list-style-type: none"> <li><b>Support</b> • Mini-Lesson: Using the Structure of Rectangular Prisms to Determine Volume (ML 1.04)</li> <li>Teacher Move: Have students review the problem by determining the volume of the top layer and then counting the number of layers.</li> </ul>
	3	<ul style="list-style-type: none"> <li><b>Support</b> • Mini-Lesson: Computing and Measuring Objects in Inches (Grade 2 ML 3.08)</li> <li>Teacher Move: Plan to use base ten units and unit cubes in Lesson 7 to demonstrate the relative sizes of standard measurement units.</li> </ul>

## 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.

# Facilitating Lesson Activities

## Launch, Monitor, Connect

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. This approach is an interpretation of Smith and Stein's 5 Practices for Orchestrating Productive Mathematics Discussions.

### 1 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

- Try to keep it short. Set students up to get started with a clear and catchy invitation to the math.
- Don't model a specific way to solve. Leave space for a variety of different student approaches.
- Pair up. Encourage small groups of students to talk through their thinking as they work.

### 2 Monitor



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

#### Considerations for Monitoring

- 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 table to help select and sequence students' ideas to highlight during the Connect discussion.

### 3 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.

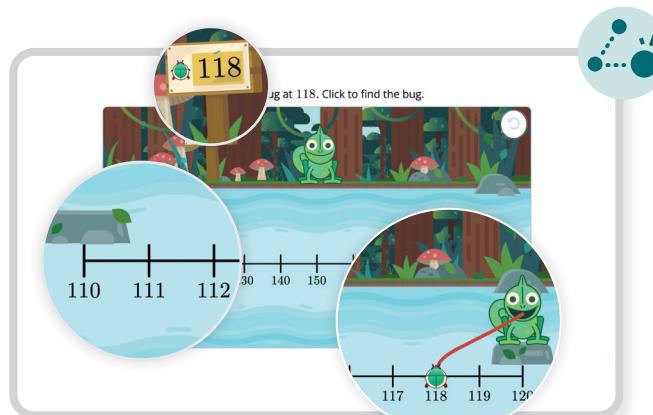
#### Considerations for Connecting

- Save a few minutes at the end of each lesson activity to bring students back together to discuss.
- As soon as you find you're ready to have discussions about common strategies, bring the class back for the connect. Often, this is before all students have finished on work.
- Students will be able to contribute to the discussion and learn from their classmates based on their in-progress work.
- Center discussions on students' ideas by displaying one or more of their responses and connecting the responses to the Key Takeaway of the activity.

**Considerations for Pacing:** Pacing will vary by activity. Teachers can typically plan on spending 1–3 minutes for the Launch and 5–8 minutes for the Connect, and the remainder for the Monitor depending on the suggested length of the activity.

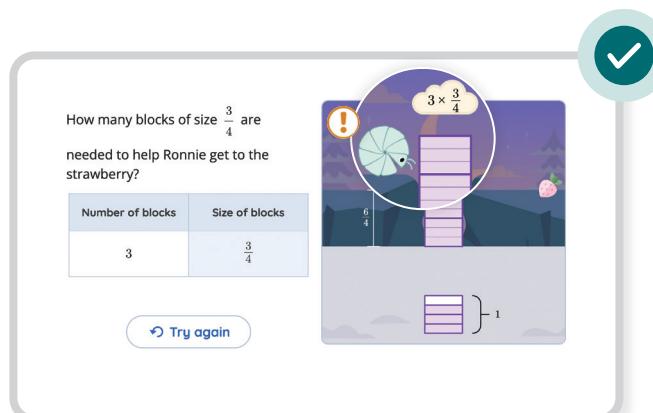
# The Power of Digital

Lessons include visual and dynamic interactions that pique students' interest and invite all students to engage in the mathematics. The embedded interactions and animations allow students to test predictions, get feedback, share ideas, and connect representations.



## Delightful, engaging interactions

The digital interactions included in the lesson activities are designed to elicit students' 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.



## Responsive Feedback™

In Amplify Desmos Math, students are invited to try their thinking out — even if that thinking is still in the “rough draft” phase. As students interact with the digital screens, they see visuals and simulations that respond faithfully to their inputs. This meaningful feedback allows students to experience the joy of causing the animation to react to their mathematical ideas. As a result, students may notice interesting things about both correct and incorrect answers more readily.

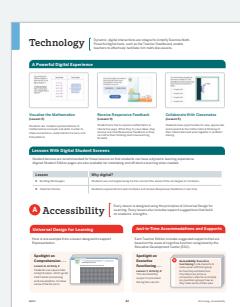


## Social, collaborative experiences

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.

### Digital Lesson Recommendations

Check out the Technology page at the beginning of every unit to learn which lessons are recommended to be taught with students using devices for a dynamic learning experience. Lessons with digital student screens have been carefully selected, and the number of these lessons increases developmentally across grade levels. If needed, aligned Student Edition pages are also available for notetaking and offline learning.



### Presentation Screens

Print lessons also benefit from the power of digital. Teachers display Presentation Screens that include important animations and interactions to help guide and facilitate students' learning.

# Digital Facilitation Tools

Amplify Desmos Math includes 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.

The screenshot shows the Teacher Dashboard interface. At the top, there are tabs for 'Snapshots', 'Summary', 'Teacher', and 'Student'. Below the tabs, there's a navigation bar with 'Warm-Up', 'Activity 1', 'Activity 2', 'Synthesis', and 'Show What You Know'. A dropdown menu 'SORT BY' is set to 'Time Entered'. The main area displays a grid of student work for 'Activity 1'. Each student's work is shown in a box with a small thumbnail and a list of names. A pop-up window titled '4 Students Selected' shows four specific student responses. At the bottom, there are buttons for 'Teacher Moves', 'Sample Responses', and 'Student Supports'.

## Teacher Dashboard

The dashboard gives the teacher insight into students' thinking in real time. Teachers can zoom in on a particular student or view all students' responses at once. This can help to identify students that may need additional support and those who are ready for extensions.

After reviewing students' thinking, teachers can select and display specific ideas or the distribution of responses to invite students into productive, student-centered discussions.

### Snapshot View

Select and sequence students' work to connect mathematical ideas. Teachers can even add their own questions to prompt further thinking.

### Summary View

Monitor students' progress or accuracy for a set of screens. Click into any box to see a specific student's work on that screen.

### Teacher View

Answer questions such as:

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

### Student View

Preview screens for students. For example, the teacher might work through a screen with the class or talk through upcoming screens before students work on their own.

## A powerful conversation toolkit

Pacing, pausing, and sync tools can support teachers as they encourage mathematical discourse and collaborative thinking in their classes.



**Anonymize** swaps out students' names to help them feel more comfortable sharing their ideas. Students' names are replaced by the names of famous mathematicians, with a special emphasis toward mathematicians with diverse backgrounds.



**Pace** allows the teacher to make a certain number of screens available for students to work on.



**Sync to Me** enables the teacher to bring all students to the same screen.



**Pause** stops students from working so that the teacher can gather everyone's attention for discussion.

Activity 1						
	1	2	3	4	5	Class
Audrey Tang	●	✗	✓	—	✓	
Etta Zuber Falconer	●	✓	✓	—	✓	
Moon Duchin	●	✓	✓	—	✓	
Mae Jemison	●	✓	✓	—	✓	
Sylvia Bozeman	●	✓	✓	—	✓	
Eugenia Cheng	●	✓	✓	✓	—	✓
Vi Hart	●	✓	✗	—	✓	

# 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 **embedded suggestions** at the beginning of each lesson 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 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.

## Embedded Suggestions

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?



**We are a math community.**  
What does good listening look like and sound like in a math community?



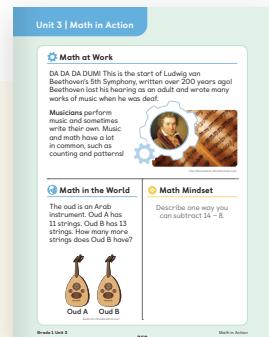
**I am a doer of math.**  
What math strengths did you use today?



**We are a math community.**  
How do you tell someone that you disagree with their math solution or answer?

## Math in Action

Each unit includes a **Math in Action** page that is available in the digital program. This page provides opportunities for students to make connections to the content of the unit and showcases the ways it appears in the world. Math in Action also allows a space for student self-reflection on those connections.



# Bringing Math to Life

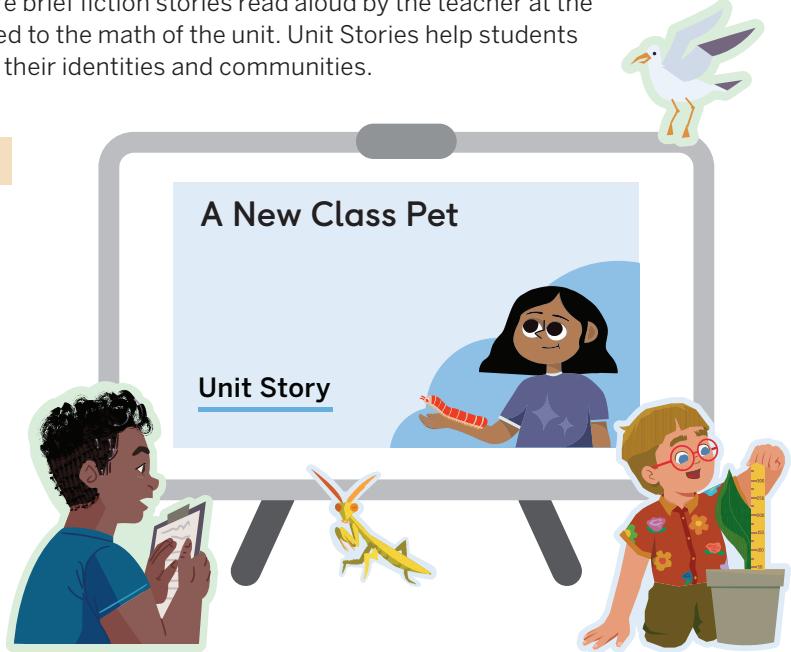
Amplify Desmos Math K–5 has two features specifically designed to increase active engagement in the math classroom.

## Unit Stories

Every unit in Amplify Desmos Math K–5 contains a **Unit Story**. These are brief fiction stories read aloud by the teacher at the beginning of each unit that introduce contexts and characters connected to the math of the unit. Unit Stories help students see themselves and their communities in math and see math as part of their identities and communities.

### How do they work?

- Teachers read the story aloud from their Teacher Edition while presenting illustrations for students.
- Students get to know the characters, setting, and plot of the story, all of which they will encounter again across the unit. Students engage in the **Notice and Wonder** routine throughout the story and discuss how they see math in the story.
- 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 their math identity and community.



## Centers

Centers in Amplify Desmos Math help strengthen students' understanding of key skills and concepts through engaging, hands-on, 15-minute games for students to play collaboratively.

### How do they work?

- Teachers have access to all **Centers** from their grade level as well as all Centers from other grade levels.
- Work Mats and instruction cards are included in the **Centers Resource book** and in the optional **Centers Kit**. Manipulatives are included in the optional **Manipulative Kit**. Centers are designed for students to engage in 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.



### Centers as Activities

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

### Differentiation

Each lesson lists one recommended Center teachers can use with small groups to strengthen their understanding of key learning goals.

- Students were introduced to the Center stage or an earlier stage of the Center in a previous lesson.
- Teachers can also use Centers after Assessments.

# Accessibility

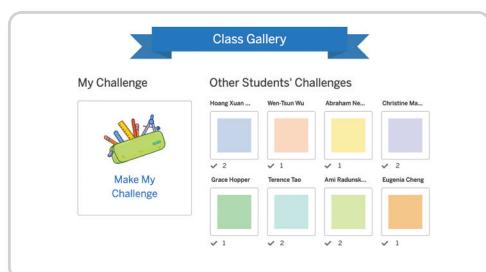
Amplify Desmos Math is built to support all students in accessing and participating in meaningful and challenging learning. This support is incorporated into the curriculum structure, lesson-level guidance, and digital tools.

## 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.<sup>1</sup>

### Multiple Means of Engagement

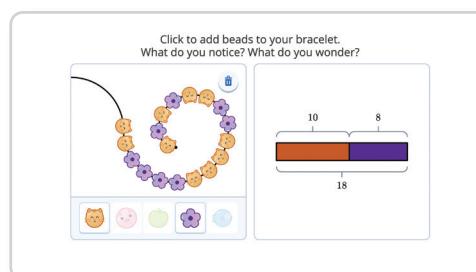
Individuals are each motivated in different ways, at different times, and in different contexts. Lessons are designed to welcome interests and identities, support sustaining effort and persistence, and develop emotional capacity.



**Sustain Effort and Persistence:** Students are invited to build their own challenge for other students to solve, which provides opportunities for choice and autonomy, as well as joy and play.

### Multiple Means of Representation

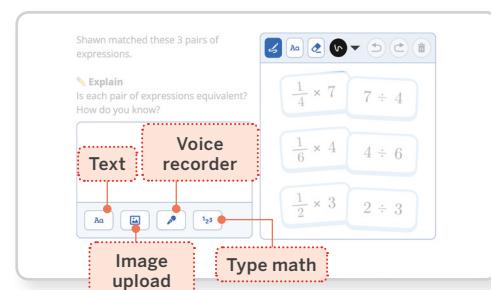
Learners make sense of information differently. Amplify Desmos Math includes options for presenting information in multiple ways to support comprehension and understanding of language.



**Cultivate Multiple Ways of Knowing and Making Meaning:** Classes engage in open-ended discussions about what individual students notice and wonder about mathematical concepts.

### 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 and interactions are accessible, support multiple means of students' expression and communication, and scaffold executive functioning.



**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.

## 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

**A Accessibility: Visual-Spatial Processing:** Guide visualization by demonstrating the connections between the expression and the base-ten blocks. Use annotations, such as arrows and labels, to highlight the connections.

## Accessibility Tools

With their teacher's support, students have the ability to use accessibility tools on their device to customize the learning experience to their individual student needs.

**Text to speech:** Use the screen reader on a student's device to read text instructions to students in multiple languages, including narration of digital interactions.

**Font:** The font used in our elementary program is a large font that has easier-to-read text styling.

**Zoom:** Students can zoom the page using their device zoom options to make the text and images larger.

**Language selection:** Toggles between languages.

<sup>1</sup> <https://udlguidelines.cast.org/>

# Differentiation

Differentiation in Amplify Desmos Math enables teachers to ensure all students have access to grade-level math content. This support is organized for teachers into three categories:

## S Support

Provide targeted intervention for students by using these resources.

## S Strengthen

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

## S Stretch

Challenge students and extend their learning with these resources.

## Differentiation: In-Lesson Teacher Moves

Within every lesson activity, teachers can use the **D Differentiation Teacher Moves** suggestions to provide **in-the-moment instructional support** to learners as they engage in the work of the lesson.

Teachers are provided with clear student actions and understandings 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.

D 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.	<b>Strengthen</b> Ask, "Where do you see the amount you knew 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.	<b>Stretch</b> 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 $8 + 2 = 10$ .	

## Differentiation: Beyond the Lesson

In each lesson, students' understanding of the learning goals is broken down for teachers into three categories: students who need support to understand the learning goals, students who need to continue strengthening their understanding of the learning goals, and students who are ready to stretch their learning.

Each **Support**, **Strengthen**, and **Stretch** resource is designed to take 15 minutes:

- Mini-Lessons:** Targeted intervention for students who need additional support or need more time.
- Centers:** Collaborative hands-on games.
- Extensions:** Small group or independent challenges.



Teachers can also assign digital resources to Support, Strengthen, and Stretch student learning: **Boost Personalized Learning**, **Fluency Practice**, and **Math Adventures**.

- » Amplify Desmos Math includes digital, adaptive practice that provides the personalized support students need to access grade-level math every day.
- » Boost Personalized Learning activities target a skill or concept aligned to the day's core lesson, with each student receiving personalized scaffolds based on what they already know.

**D Differentiation** Use after Lesson 3

Lesson Goal: Write multiplication expressions to represent diagrams and situations involving equal groups.

**Support** Provide targeted intervention for students by using these resources.

If student response shows: a multiplication expression other than  $2 \times 6$  or  $6 \times 2$  or an addition expression

**Respond:**

- Mini-Lesson | 35 min Writing Expressions That Represent Equal-Groups Drawings and Situations

**Strengthen** Reinforce student understanding of the multiplication concept by using these resources.

If student response shows: 2 × 6 and describes 6 groups of 2

**Stretch** Challenge students and extend their learning by using these resources.

If student response shows: 6 × 2 and describes 6 groups of 2

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

Additional Activities

- Fluency Practice
- Additional Practice
- Math Adventures
- Math Bank

Professional Learning

Lesson connecting different representations of multiplication during the card sort support students in developing a deeper understanding of multiplication.

**D Differentiation** Pre-Unit Check

Assess and Respond

Pre-Unit Check

Item Analysis

Sub-Unit Goal(s)

Problem(s)

Support

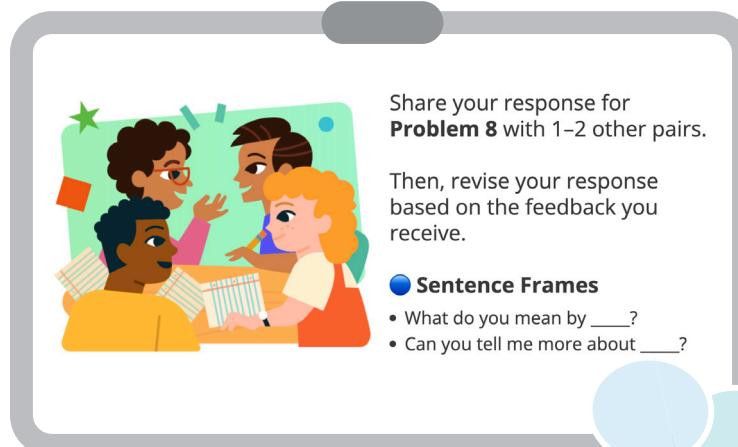
Response

## D Differentiation: Assess and Respond

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

# Instructional Routines

Instructional routines that are used repeatedly create efficiencies for teachers so that they can attend to student thinking and communicate what is important in their classroom. Instead of focusing on the directions of an activity, students can focus on making sense of and communicating about the math.



Share your response for **Problem 8** with 1–2 other pairs.  
Then, revise your response based on the feedback you receive.

**Sentence Frames**

- What do you mean by \_\_\_\_?
- Can you tell me more about \_\_\_\_?



**Here are some examples:**

- The **Which One Doesn't Belong?** routine communicates to students that their ideas have value, that there are many ways to be correct in math, and that they can learn math by sharing their math thinking with each other.
- 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.

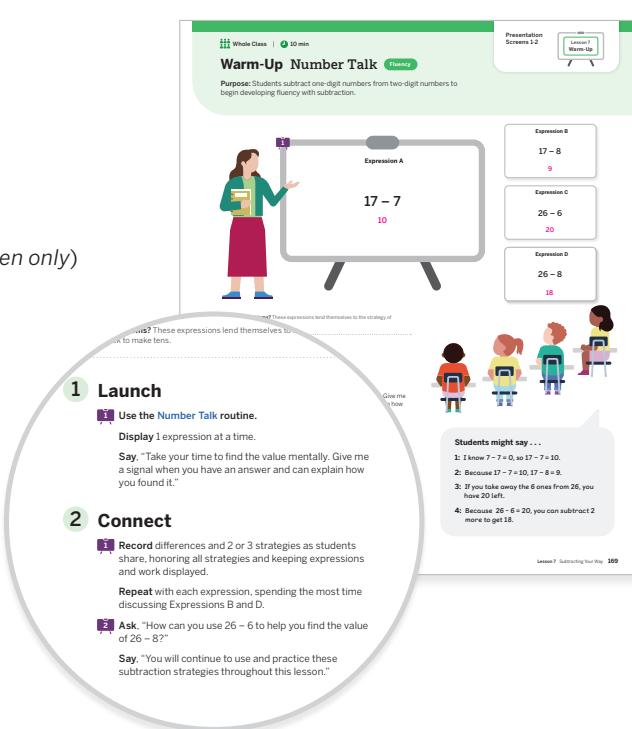
Each instructional routine included in an Amplify Desmos Math lesson creates opportunities for conversations and supports meaningful discussion. Implementing these routines can be a practical tool for establishing a classroom learning community that values students' thinking.

## Instructional Routines Embedded in the Curriculum

Instructional routines can be found throughout each lesson in the Teacher Edition. Here is a list of the instructional routines used in the Amplify Desmos Math curriculum:

- **MLR1:** Stronger and Clearer Each Time
- **MLR2:** Collect and Display
- **MLR3:** Critique, Correct, Clarify (Grades 2–5)
- **MLR4:** Information Gap (Grades 3–5)
- **MLR5:** Co-Craft Questions
- **MLR6:** Three Reads
- **MLR7:** Compare and Connect
- **MLR8:** Discussion Supports
- Choral Count
- Estimation Exploration
- Gallery Tour
- How Many Do You See?
- Mix and Mingle
- Notice and Wonder
- Number Talk
- Stories and Questions (*Kindergarten only*)
- Think-Pair-Share
- True or False?
- What Do You Know About \_\_\_\_?
- Which One Doesn't Belong?

**Fluency** Instructional Routines are used in many lesson warm-ups to help students build fluency skills. Because fluency requires repeated practice, fluency is also embedded in Centers, Lessons, Lesson Practice, and Fluency Practice cards.



**Whole Class | 10 min**  
**Warm-Up Number Talk** Fluency  
Purpose: Students subtract one-digit numbers from two-digit numbers to begin developing fluency with subtraction.

**Launch**  
Use the Number Talk routine.  
Display 1 expression at a time.  
Say, "Take your time to find the value mentally. Give me a signal when you have an answer and can explain how you found it."

**Connect**  
Record differences and 2 or 3 strategies as students share, honoring all strategies and keeping expressions and work displayed.  
Repeat with each expression, spending the most time discussing Expressions B and D.  
Ask, "How can you use  $26 - 6$  to help you find the value of  $26 - 8$ ?"  
Say, "You will continue to use and practice these subtraction strategies throughout this lesson."

**Students might say ...**

- 1: I know  $7 - 7 = 0$ , so  $17 - 7 = 10$ .
- 2: Because  $17 - 7 = 10$ ,  $17 - 8 = 9$ .
- 3: If you take away the 6 ones from 26, you have 20 left.
- 4: Because  $26 - 6 = 20$ , you can subtract 2 more to get 18.

# Math Language Development

At Amplify Desmos Math, we acknowledge that there is a strong interconnection between mathematical content, practices, and language. We believe that developing mathematical language is critical for all learners, while recognizing and supporting the unique needs of Multilingual/English Learners.

Our approach to math language development focuses on when, how, and why students are using 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 throughout the units by cultivating students' language and supporting students in making their arguments and explanations stronger, clearer, and more precise as they progress from lesson to lesson.

Here are four ways we support students with developing mathematical language:

## Vocabulary

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

- Collect the language students use as they share their responses, such as "dollar," "dollar sign (\$)," "100¢," "4 quarters," and "10 dimes."
- Add the language below the images of the dollar bill on the *Quarter and One Dollar Bill* chart. Students may mention bills of different values.



**Key Takeaway:** Say, "A dollar is a unit of money worth 100 cents. When you write dollar amounts, you use the \$ symbol."

## 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 Goal**

1. **Language Goal:** Represent and describe situations involving equal groups. (**Speaking, Listening, and Writing**)

## Math Language Routines (MLR)

**MLR** **Math Language Routines**<sup>1</sup> are used within lessons to do one or more of the following: 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.



### MLR3: Critique, Correct, Clarify

Use the **Think-Pair-Share** routine. Ask:

- *Critique:* "What might Priya be trying to do to calculate the area of this figure? How do you know?" As students share, use the sketch tool to shade the rectangles that overlap.
- *Correct:* "What could you add or change to make Priya's work true?" As students share, record the correct decomposition and equations to match.
- *Clarify:* "What could you add or change to make Priya's work easier to understand?"

## Multilingual/English Learners Support

Supports for **MLR Multilingual/English Learners** are called out at intentional points within each lesson. These suggested supports are specific, targeted actions that are beneficial for Multilingual/English Learners. They often describe a modification to increase access to the task or support with contextual or mathematical language development that can often be supportive of all learners. Multilingual/English Learners supports may also be attached to MLRs.



**Multilingual/English Learners** Encourage students to draw visual models or represent their subtraction problems with manipulatives to help others see what they are explaining.

<sup>1</sup> 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/mathematics-resources-additional-resources>



Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.



Spanish translations of student-facing materials are available both digitally and in print, and can be accessed on each lesson page.

# Program Assessments

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 will 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.

**Amplify Desmos Math Reporting** offers insightful and actionable data to help teachers understand their students' strengths, create grades, and modify instruction.

## Lesson-Level Assessments

Amplify Desmos Math lessons are centered around sense-making and in-the-moment feedback. Daily moments of assessment provide insights into students' understandings of concepts and skills.



### 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 opportunities for students to show their teacher what they understand and what they are still learning.

## 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

Each unit begins with a check to determine students' **proficiency** with **prerequisite skills** that are helpful for success in the upcoming unit. This check serves as an affirmation of the knowledge and skills with which students come into the unit. **Suggestions for supports** students may need as they engage in the unit are provided.



### Sub-Unit Quizzes

In Sub-Unit Quizzes, students are assessed on a subset of **mathematical skills, conceptual understandings, and procedural fluencies** from the unit. Guidance helps illuminate where students are and provides insight into what **supports** they need to get where they need to go.



### End-of-Unit Assessment

Students engage with rigorous grade-level mathematics through a variety of formats and tasks in the End-of-Unit Assessment. These formats, comprising both auto-scored and rubric-scored items, provide deep insight into students' learning of skills and concepts.

\*Performance Tasks are included in Grades 3–5.

## Course-Level Assessments

The asset-based digital **mCLASS Assessments** system measures proficiency, reveals underlying mathematical thinking, and informs instructional support for every learner. The **mCLASS Benchmark** is administered three times a year with mCLASS Progress Monitoring to help track students' math performance between Benchmark assessments. A brief, yet powerful **Beginning-of-Year Screener** is provided when full access to mCLASS is not included. These help target intervention areas and identify specific areas of strength and development to inform differentiation.

# Standards for Mathematical Content

The following correlations show the alignment of Amplify Desmos Math to the Content Standards for Grade 3.

<b>3.OA</b>	<b>Operations and Algebraic Thinking</b>	<b>Lesson(s)</b>
<b>3.OA.A</b>	<b>Represent and solve problems involving multiplication and division.</b>	<b>Unit 1, Lessons 2, 3</b>
3.OA.A.1	Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as $5 \times 7$ .	<b>Unit 1, Lessons 2, 4, 6–10</b> <b>Unit 3, Lessons 20, 21</b>
3.OA.A.2	Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$ .	<b>Unit 4, Lessons 2–6, 16, 18</b>
3.OA.A.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	<b>Unit 1, Lessons 4–6, 10, 11</b> <b>Unit 2, Lessons 9, 12, 13</b> <b>Unit 4, Lessons 3, 4, 6, 12, 13, 16, 17, 19</b> <b>Unit 6, Lessons 16, 17</b>
3.OA.A.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$ , $5 = ? \div 3$ , $6 \times 6 = ?$	<b>Unit 1, Lessons 5–7</b>
<b>3.OA.B</b>	<b>Understand properties of multiplication and the relationship between multiplication and division.</b>	
3.OA.B.5	Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$ , then $15 \times 2 = 30$ , or by $5 \times 2 = 10$ , then $3 \times 10 = 30$ . (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$ , one can find $8 \times 7$ as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ . (Distributive property.)	<b>Unit 1, Lesson 9</b> <b>Unit 2, Lessons 6–9</b> <b>Unit 3, Lesson 14</b> <b>Unit 4, Lessons 12–15, 17–19</b> <b>Unit 5, Lesson 11</b>
3.OA.B.6	Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.	<b>Unit 4, Lessons 5–7</b> <b>Unit 6, Lesson 16</b>
<b>3.OA.C</b>	<b>Multiply and divide within 100.</b>	
3.OA.C.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$ , one knows $40 \div 5 = 8$ ) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	<b>Unit 1, Lessons 5–7, 10, 11</b> <b>Unit 2, Lesson 11</b> <b>Unit 4, Lessons 7–10</b> <b>Unit 6, Lessons 8, 10</b> <b>Unit 7, Lessons 9, 11, 12</b>
<b>3.OA.D</b>	<b>Solve problems involving the four operations, and identify and explain patterns in arithmetic.</b>	<b>Unit 2, Lesson 4</b>
3.OA.D.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	<b>Unit 3, Lessons 19–22</b> <b>Unit 4, Lessons 15, 20</b> <b>Unit 7, Lesson 10</b>

# Standards for Mathematical Content

3.OA.D.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	<b>Unit 3</b> , Lesson 2 <b>Unit 4</b> , Lesson 8
<b>3.NBT</b>	<b>Number and Operations in Base Ten</b>	<b>Lesson(s)</b>
<b>3.NBT.A</b>	<b>Use place value understanding and properties of operations to perform multi-digit arithmetic.</b>	
3.NBT.A.1	Use place value understanding to round whole numbers to the nearest 10 or 100.	<b>Unit 3</b> , Lessons 15–18
3.NBT.A.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	<b>Unit 3</b> , Lessons 2–14 <b>Unit 6</b> , Lesson 8 <b>Unit 7</b> , Lesson 7
3.NBT.A.3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., $9 \times 80, 5 \times 60$ ) using strategies based on place value and properties of operations.	<b>Unit 4</b> , Lessons 6, 11, 15, 18 <b>Unit 7</b> , Lesson 2
<b>3.NF</b>	<b>Number and Operations—Fractions</b>	<b>Lesson(s)</b>
<b>3.NF.1</b>	<b>Develop understanding of fractions as numbers.</b>	
3.NF.A.1	Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into $b$ equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by $a$ parts of size $\frac{1}{b}$ .	<b>Unit 5</b> , Lessons 1–5
3.NF.A.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.	<b>Unit 5</b> , Lessons 6–9 <b>Unit 6</b> , Lessons 5, 10
3.NF.A.2.A	Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into $b$ equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line.	<b>Unit 5</b> , Lesson 6
3.NF.A.2.B	Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off $a$ lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.	<b>Unit 5</b> , Lesson 7
3.NF.A.3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.	<b>Unit 5</b> , Lessons 8, 10–17
3.NF.A.3.A	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	<b>Unit 5</b> , Lessons 10–12
3.NF.A.3.B	Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2} = \frac{2}{4}, \frac{4}{6} = \frac{2}{3}$ . Explain why the fractions are equivalent, e.g., by using a visual fraction model.	<b>Unit 5</b> , Lessons 10–12 <b>Unit 6</b> , Lesson 4
3.NF.A.3.C	Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3 = \frac{3}{1}$ ; recognize that $\frac{6}{1} = 6$ ; locate $\frac{4}{4}$ and 1 at the same point of a number line diagram.	<b>Unit 5</b> , Lessons 8, 9, 13, 14 <b>Unit 6</b> , Lessons 2, 3
3.NF.A.3.D	Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$ , $=$ , or $<$ , and justify the conclusions, e.g., by using a visual fraction model.	<b>Unit 5</b> , Lessons 15–17

<b>3.MD</b>	<b>Measurement and Data</b>	<b>Lesson(s)</b>
<b>3.MD.A</b>	<b>Solve problems involving measurement and estimation.</b>	
3.MD.A.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	<b>Unit 6, Lessons 11–14, 17</b>
3.MD.A.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	<b>Unit 6, Lessons 7–10, 15–17</b>
<b>3.MD.B</b>	<b>Represent and interpret data.</b>	<b>Unit 1, Lesson 13</b>
3.MD.B.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	<b>Unit 1, Lessons 14–18</b>
3.MD.B.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	<b>Unit 6, Lessons 1–6</b>
<b>3.MD.C</b>	<b>Geometric measurement: understand concepts of area and relate area to multiplication and to addition.</b>	<b>Unit 7, Lessons 12, 13</b>
3.MD.C.5	Recognize area as an attribute of plane figures and understand concepts of area measurement.	<b>Unit 2, Lessons 2, 5, 13</b> <b>Unit 7, Lesson 10</b>
3.MD.C.5.A	A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.	<b>Unit 2, Lesson 3</b>
3.MD.C.5.B	A plane figure which can be covered without gaps or overlaps by $n$ unit squares is said to have an area of $n$ square units.	<b>Unit 2, Lesson 3</b>
3.MD.C.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	<b>Unit 2, Lessons 3–5, 13</b>
3.MD.C.7	Relate area to the operations of multiplication and addition.	<b>Unit 7, Lessons 10, 11</b>
3.MD.C.7.A	Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.	<b>Unit 2, Lessons 6–7</b>
3.MD.C.7.B	Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.	<b>Unit 2, Lessons 6–9, 13</b>
3.MD.C.7.C	Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths $a$ and $b + c$ is the sum of $a \times b$ and $a \times c$ . Use area models to represent the distributive property in mathematical reasoning.	<b>Unit 4, Lessons 9, 10, 13</b>
3.MD.C.7.D	Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	<b>Unit 2, Lessons 10–13</b>

# Standards for Mathematical Content

<b>3.MD.D</b> Geometric measurement: recognize perimeter.		
<b>3.G</b> Geometry		<b>Lesson(s)</b>
<b>3.G.A</b> Reason with shapes and their attributes.		
3.MD.D.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	<b>Unit 7</b> , Lessons 6–13
3.G.A.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	<b>Unit 7</b> , Lessons 2–5, 8, 9
3.G.A.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.	<b>Unit 5</b> , Lesson 3

# Standards for Mathematical Practice

The following correlations show the alignment of Amplify Desmos Math to the Standards for Mathematical Practice.

## MP1 Make sense of problems and persevere in solving them.

**Unit 1**, Lessons 1, 3–5, 10, 11, 13, 17, 18  
**Unit 2**, Lessons 1, 2, 7, 9, 11, 13  
**Unit 3**, Lessons 1, 4, 5, 8, 9, 10, 14, 19, 21

**Unit 4**, Lessons 1, 3, 4, 6, 9, 13, 15–20  
**Unit 5**, Lessons 1, 14

**Unit 6**, Lessons 1, 9, 13  
**Unit 7**, Lessons 1, 8–10, 13

## MP2 Reason abstractly and quantitatively.

**Unit 1**, Lessons 1–7, 10, 12–14, 17,  
**Unit 2**, Lessons 3–7, 11  
**Unit 3**, Lessons 1, 3, 5, 9, 20–22

**Unit 4**, Lessons 1, 2, 4–6, 9, 10, 12, 13,  
15, 17, 20  
**Unit 5**, Lessons 10–12, 14, 15

**Unit 6**, Lessons 1, 3, 5, 13–17  
**Unit 7**, Lesson 10

## MP3 Construct viable arguments and critique the reasoning of others.

**Unit 1**, Lessons 7, 15, 16  
**Unit 2**, Lessons 1–5, 7, 11, 12  
**Unit 3**, Lessons 4, 6, 11, 13, 19, 20

**Unit 4**, Lessons 6, 10, 12, 13, 15, 18  
**Unit 5**, Lessons 2, 3

**Unit 6**, Lessons 1, 3, 8, 10, 14, 16  
**Unit 7**, Lessons 3, 4, 7, 8, 10, 11

## MP4 Model with mathematics.

**Unit 1**, Lessons 2, 6, 11, 16  
**Unit 2**, Lessons 4, 9, 13  
**Unit 3**, Lessons 1, 21, 22

**Unit 4**, Lessons 3, 5, 17  
**Unit 5**, Lessons 5, 12

**Unit 6**, Lessons 2, 16  
**Unit 7**, Lesson 13

## MP5 Use appropriate tools strategically.

**Unit 2**, Lessons 1, 8  
**Unit 3**, Lessons 3, 8, 9, 11, 14, 19–21

**Unit 4**, Lessons 11, 16

**Unit 6**, Lessons 2, 8

## MP6 Attend to precision.

**Unit 1**, Lessons 1, 7, 8, 14–17  
**Unit 2**, Lessons 2, 3, 5, 8, 10

**Unit 3**, Lessons 4, 6, 7, 10–13, 15, 17,  
19, 22  
**Unit 4**, Lessons 2, 10, 13

**Unit 5**, Lessons 1–3, 6, 7, 10, 11  
**Unit 6**, Lessons 2–4, 6, 11, 12, 17  
**Unit 7**, Lessons 2–6

## MP7 Look for and make use of structure.

**Unit 1**, Lessons 2–7, 9–11, 13–18  
**Unit 2**, Lessons 3, 5–12  
**Unit 3**, Lessons 2–5, 7–19

**Unit 4**, Lessons 1, 3–8, 10–12, 14, 15,  
17–19  
**Unit 5**, Lessons 1, 3–11, 13–17

**Unit 6**, Lessons 2, 4–8, 10–12,  
14–17  
**Unit 7**, Lessons 1–9, 11–13

## MP8 Look for and express regularity in repeated reasoning.

**Unit 1**, Lessons 2, 5–11, 13, 18  
**Unit 2**, Lesson 9

**Unit 3**, Lessons 2, 3, 5, 7, 9, 10, 13, 14,  
16, 18  
**Unit 4**, Lessons 3–7, 9, 14, 17, 19

**Unit 5**, Lessons 5, 8–11, 13–17  
**Unit 6**, Lessons 6, 7, 10, 14, 15, 17  
**Unit 7**, Lessons 7, 9, 11, 12