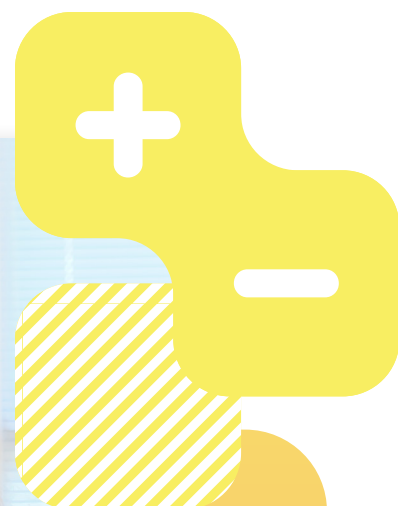
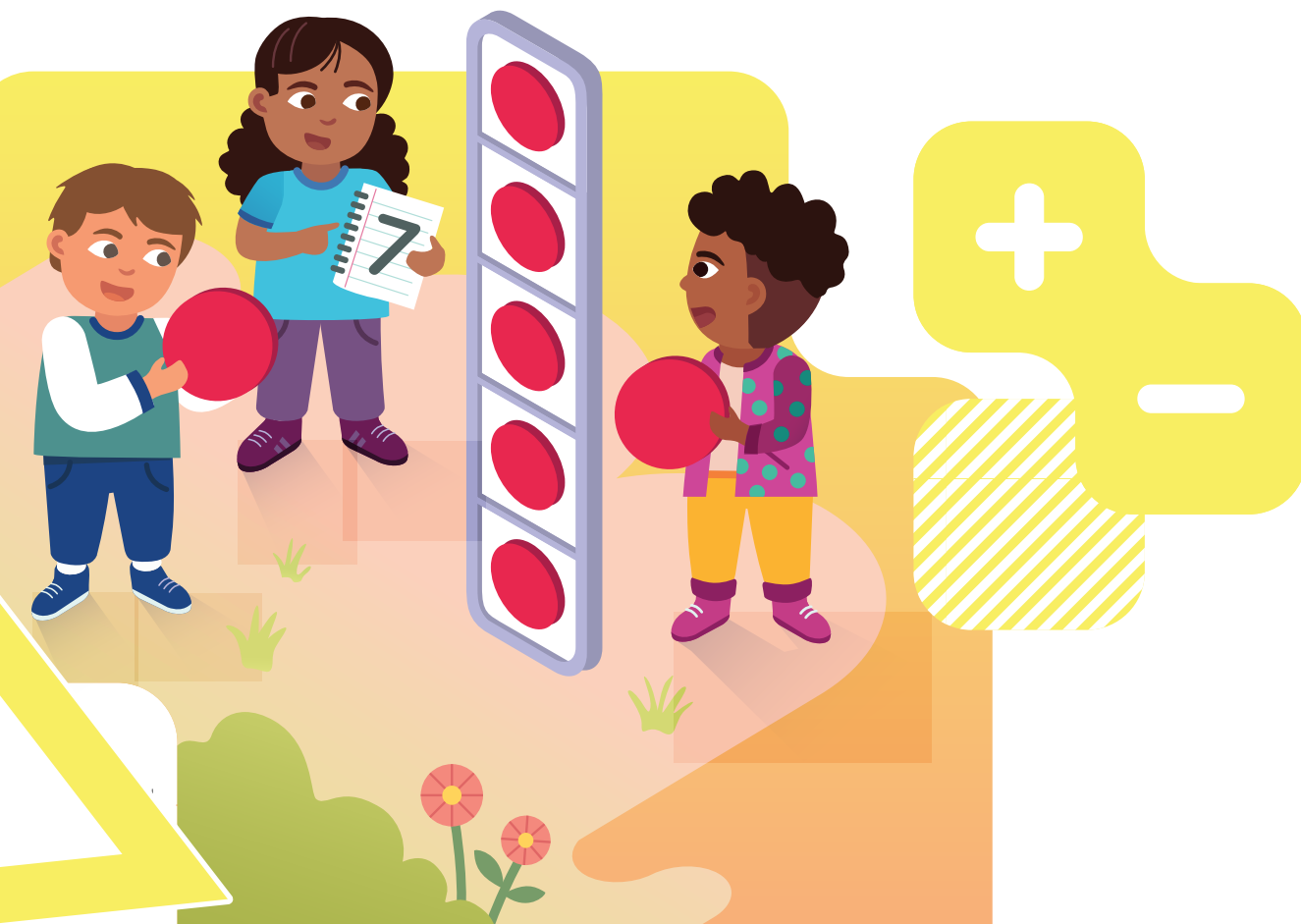


ESSENTIAL TOOLS

Hands-on manipulatives





Hands-on manipulatives

Math manipulatives are innovative hands-on learning tools designed to simplify and illustrate complex mathematical concepts. Students can physically interact with mathematical principles, transforming abstract ideas into tangible experiences. Each kit contains an assortment of objects like snap cubes, base ten blocks, geometric shapes, ten frames, and more—all designed to foster experiential learning and enhance mathematical thinking, connecting various mathematical ideas to achieve a deeper conceptual understanding and application that builds lifelong math proficiency.

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

Our approach to manipulatives in Amplify Desmos Math provides:

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

The Amplify Desmos Math manipulative kits are available for purchase to support the mathematics teaching and learning experience.

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

The contents of Amplify Desmos Math manipulative kits include materials that “students and teachers can use to illustrate and discover mathematical concepts, whether made specifically for mathematics (e.g., connecting cubes) or for other purposes” (van de Walle et al., 2013).

Amplify Desmos Math manipulative kit contents

Component	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6– Algebra 1
Four-inch clock			✓				
Six-inch protractor					✓	✓	✓
Algebra tiles							✓
Base ten cubes					✓	✓	
Base ten flats				✓	✓	✓	
Base ten rods		✓	✓	✓	✓	✓	
Base ten units		✓		✓	✓	✓	
Bucket balance				✓			
Clear plastic straws	✓						
Clock		✓	✓				
Compass							✓
Dot cubes		✓					
Double ten frames		✓	✓				
Five frames	✓						
Foam number cubes			✓	✓	✓		
Geoblocks	✓	✓					



Component	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6– Algebra 1
Geoboards				✓			
Geosolids	✓	✓					
Gram weights				✓			
Inch color tiles			✓	✓	✓		
Number cards 0–20	✓	✓	✓	✓	✓	✓	
Paper clips							
Pattern blocks	✓	✓		✓	✓		✓
Patty paper							✓
Place value mat		✓					
Play dough	✓						
Ruler			✓	✓	✓		✓
Snap cubes	✓	✓	✓	✓	✓	✓	✓
Tape measure			✓				✓
Ten frames	✓	✓	✓				
Two-color counters	✓	✓	✓	✓	✓	✓	✓



Kindergarten

In Kindergarten Unit 3, Lesson 12, Activity 1: *Making a New Shape*, students build an understanding of composing shapes by putting simple shapes together and describing the larger shape they made. Pattern blocks act as vivid, tactile guides that help students visualize and comprehend mathematical concepts. The colorful and diverse shapes engage students and pave the way for a profound understanding of various mathematical concepts, from geometry and measurement to the introduction of algebra, statistics, and probability. Pattern blocks translate abstract principles into tangible learning experiences, building students' curiosity into lasting grade-level understandings for all students.

Activity 1

Making a New Shape

Hands-On 

You'll need . . .



1 Discuss

- I used _____ to make my shape.
- The shape I made has _____.

Oral activity: No writing expected. Sample response shown.

I used a triangle and a square to make my shape.

The shape I made has 5 sides.

Directions: Work with your partner to put together 2 shapes to make a larger shape. Describe the new shape to your partner.

336 Unit 3 Flat Shapes All Around Us

Grade K manipulative kit

Product Description	# of Sets	Quantity	Notes
Clear plastic straws	2	500	2 sets of 250
Five frames	-	24	
Geoblocks	-	330	
Geosolids	24	144	24 sets of 6
Number Cards 0–20	-	12	
Pattern blocks	5	1,250	5 sets of 250
Play dough, 1 each	-	24	2 oz. containers
Snap cubes	7	700	7 sets of 100
Ten frames	-	24	
Two-color counters	3	600	3 sets of 200



Grade 1

In Grade 1, Unit 4, Lesson 8, Activity 1: *Special Edition Cards*, students read and interpret two-digit numbers and represent them using snap cubes and drawings to develop their conceptual understanding of the meaning of the digits in a two-digit number. As a tool for anchoring spatial reasoning and understanding whole numbers, snap cubes enhance students' ability to tackle addition, subtraction, and measurement. From examining growth patterns to engaging in spatial reasoning tasks, snap cubes help motivate and inspire all students to become math people for life.

Activity

1

Special Edition Cards

Hands-On 

Build each two-digit number using towers of 10 and single cubes to show the number of tens and ones.

You'll need . . .



Then create a drawing that shows the tens and ones.

Grade 1 manipulative kit

Product Description	# of Sets	Quantity	Notes
Base ten rods	3	150	3 sets of 50
Base ten units	15	1,500	15 sets of 100
Clock	-	1	
Dot cubes	2	12	2 sets of 6
Double ten frames	-	24	
Geoblocks	-	330	
Geosolids	12	72	12 sets of 6
Number Cards 0–20	-	12	
Paper clips (1 inch)	15	1,500	15 sets of 100
Pattern blocks	6	1,500	6 sets of 250
Place value mat	-	25	
Snap cubes	15	1,500	15 sets of 100
Ten frames	-	24	
Two-color counters	3	600	3 sets of 200



Grade 2

In Grade 2, Unit 1, Lesson 5, Activity 1: *What's Behind My Back?*, students write equations with missing numbers within 20 to represent snap cube towers and find the numbers that make the equations true. Snap cubes help support a profound understanding of mathematical concepts. By offering a tangible exploration of whole numbers, counting, and basic operations, they provide students an engaging platform to delve into the key principles of mathematics.

Activity 1

Introducing the Center, What's Behind My Back?

Stage 5

Let's figure out the missing part to make 20.

Pairs 

You'll need . . .



20 connecting cubes



double 10-frame



Recording Sheet



Set-up

- Build a tower of 20 connecting cubes.



How to Play

- Player A:** Hold 2 towers of 10 cubes behind your back and break off some cubes. Show your partner the rest.
- Player B:** Write an equation with a blank space to show what is missing.
- Player A:** Ask, "How many are behind my back? How do you know?"
- Player B:** Record the equation on the Recording Sheet.
- Switch roles and repeat.
- Continue playing until your Recording Sheet is full.

Grade 2 manipulative kit

Product Description	# of Sets	Quantity	Notes
Base ten flats	11	110	11 sets of 10
Base ten rods	5	250	5 sets of 50
Base ten units	12	1,200	12 sets of 100
Double ten frames	-	24	
Foam number cubes	16	96	16 sets of 6
Four-inch clock	-	12	
Inch color tiles	2	800	2 sets of 400
Large demo clock	-	1	
Number Cards 0–20	-	12	
Ruler	-	24	
Snap cubes	12	1,200	12 sets of 100
Tape measure	-	24	
Ten frames	-	24	
Two-color counters	3	600	3 sets of 200



Grade 3

In Grade 3, Unit 2, Lesson 2, Activity 2: *Creating and Comparing*, students create shapes using pattern blocks and then order their shapes from smallest to largest based on a common unit. Pattern blocks provide an engaging way to explore whole numbers and patterns. Building on students' curiosity, they introduce pivotal concepts related to geometry and graphing. Through the use of pattern blocks, teachers can facilitate interactive learning experiences that foster spatial reasoning and develop grade-level competencies.

Name _____ Date _____

Activity
2

Creating and Comparing

Hands-On 

You and your group members will each build a shape using pattern blocks. Then you will compare the areas of your shapes. Be prepared to explain how you know a shape takes up less or more space than other shapes.

You'll need . . . 



- 3 On your own, use up to 10 pattern blocks to build a shape.
- 4 As a group, order the shapes by their areas, from *smallest* to *largest*.
- 5 On your own, rearrange the pattern blocks from your first shape to build a second shape.
- 6 As a group, order the second shapes by their areas, from *smallest* to *largest*.
- 7 **Discuss** 

For any 2 shapes, how can you be sure which shape covers more space and has a larger area?

Oral activity: No writing expected.

Lesson 2 Which Covers More Space? 149

Grade 3 manipulative kit

Product Description	# of Sets	Quantity	Notes
Base ten flats	11	110	11 sets of 10
Base ten rods	5	150	5 sets of 50
Base ten units	2	200	2 sets of 100
Bucket balance	-	4	
Foam number cubes	2	12	2 sets of 6
Geoboards	-	24	
Gram weights	-	54	20 1G, 20 5G, 10 10G, 4 20G
Inch color tiles	3	1,200	3 sets of 400
Number Cards 0–20	-	12	
Pattern blocks	2	500	2 sets of 250
Ruler	-	24	
Snap cubes	7	700	7 sets of 100
Two-color counters	4	800	4 sets of 200



Grade 4

In Grade 4, Unit 1, Lesson 6, Activity 1: *Quilt Design*, students determine all of the possible pairs of whole-number side lengths for a given area of a rectangle to develop an understanding of factor pairs for whole numbers. Inch tiles provide a tactile approach to mathematical measurements. They aid in transforming abstract concepts into more digestible segments. These tiles not only promote exploration of measurement and geometry, but also encourage students to keep in tune with the rhythmic patterning of mathematics.

Activity
1

Quilt Design

Hands-on 

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

You'll need . . . 

Sample response shown for Problem 2.

- 1 Use the square tiles to determine *all* the different ways Mel's aunt could arrange the squares to make a rectangle.
 - Use the grid paper on the next page to draw each rectangle.
 - Label the side lengths of each rectangle.
- 2 Record the dimensions of each rectangle you created as a multiplication expression.
 $1 \times 24, 2 \times 12, 4 \times 6, 3 \times 8$
- 3 Discuss  **Oral activity: No writing expected.**
How do you know you have found all the possible rectangles that have an area of 24 square units?

38 Unit 1 Factors and Multiples

Grade 4 manipulative kit

Product Description	# of Sets	Quantity	Notes
Base ten cubes	-	12	
Base ten flats	12	120	12 sets of 10
Base ten rods	4	200	4 sets of 50
Base ten units	12	1,200	12 sets of 100
Foam number cubes	2	12	2 sets of 6
Inch color tiles	2	800	2 sets of 400
Number Cards 0–20	-	12	
Pattern blocks	1	250	
Ruler	-	24	
Six-inch protractor	4	24	4 sets of 6
Snap cubes	3	300	3 sets of 100
Two-color counters	2	400	2 sets of 200



Grade 5

In Grade 5, Unit 1, Lesson 9, Activity 1: *Putting It Together*, students combine rectangular prisms to make a new figure, recognizing that the volume of the new figure is equal to the sum of the volumes of the individual prisms that it is composed of. Snap cubes create a foundation for students to dive deeper into spatial reasoning tasks and whole number concepts including addition, subtraction, and place value. As a cornerstone of curiosity-driven learning, they allow students to physically manipulate their understanding of numerical relationships and measurement.

Activity

1

Putting It Together

Hands-On

You will be given 12 unit cubes.

You'll need . . .



- 1 Build a rectangular prism using all 12 unit cubes.
- 2 Join with a partner. Put your 2 rectangular prisms together to make 1 figure.
- 3 **Discuss**  **Oral activity: No writing expected.**
Join another pair. Share and compare the figures you created in Problem 2.
 - How are your figures similar? Different?
 - How are the volumes of your figures related? How do you know?
- 4 With your group, break apart your figures into individual unit cubes.
 - Each person builds a rectangular prism using some of the cubes.
 - Put all of the prisms together to make 1 figure.
- 5 **Discuss**  **Oral activity: No writing expected.**
What is the volume of your figure? How do you know? Be prepared to explain your thinking.

Grade 5 manipulative kit

Product Description	# of Sets	Quantity	Notes
Base ten cubes	-	12	
Base ten flats	4	40	4 sets of 10
Base ten rods	8	400	8 sets of 50
Base ten units	6	600	6 sets of 100
Number Cards 0–20	-	12	
Six-inch protractor	2	12	2 sets of 6
Snap cubes	13	1,300	13 sets of 100
Two-color counters	3	600	3 sets of 200



Grades 6–A1

Opportunities to use hands-on manipulatives are provided in Grades 6–Algebra 1, but are optional. The use of Amplify Desmos Math manipulative kits enhance student learning by helping simplify complex math concepts in a physical, tangible form by making abstract math concepts more concrete and interactive. The hands-on nature fosters deep conceptual understanding and encourages active learning, increasing student engagement while catering to various learning styles. This hands-on experience nurtures a sense of curiosity and helps deepen math proficiency.

This optional purchase is not required to successfully engage in the Amplify Desmos Math curriculum in grades 6–A1.

Product Description	# of Sets	Quantity	Notes
Algebra tiles	30	640	30 sets of 32
Compass	3	30	3 sets of 10
Pattern blocks	2	500	2 sets of 250
Patty paper	-	1,000	
Ruler	3	30	3 sets of 10
Six-inch protractor	5	30	5 sets of 6
Snap cubes	10	1,000	10 sets of 100
Tape measure	3	30	3 sets of 10
Two-color counters	3	600	3 sets of 200



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