



Keeping the Big Ideas at the Center

Support your students in thinking about mathematics as an integrated and connected set of Big Ideas, rather than isolated topics.

To help you ensure deep, active learning for all of your students, the California Mathematics Framework centers instruction around the investigation of grade-level Big Ideas. These Big Ideas enfold clusters of standards together and are connected to each other and to authentic real-world and mathematical contexts. By designing instruction around student investigations that are focused on a set of interconnected Big Ideas, students are able to link many mathematical understandings into a coherent whole. (Chapter 1, pages 15–17)

Each Big Idea falls under one or more Content Connections (CC1, CC2, CC3, and CC4). These Content Connections help organize and connect each set of grade-level Big Ideas and provide mathematical coherence across the grades. (Chapter 1, page 24)

Content Connections

CC1 Reasoning With Data

CC2 Exploring Changing Quantities

CC3 Taking Wholes Apart, Putting Parts Together

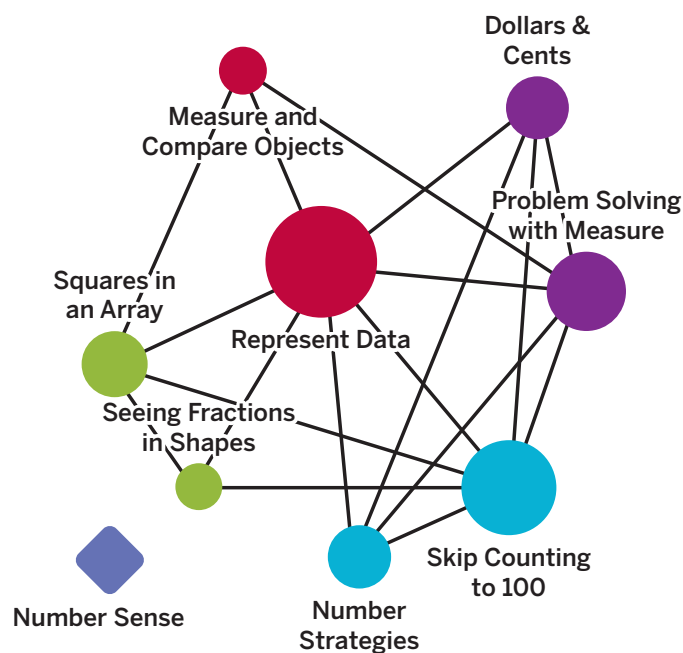
CC4 Discovering Shape and Space

Meet the Big Ideas for Grade 2


Amplify Desmos Math California, Grade 2 is designed around the eight California Big Ideas for Grade 2 as described in the California Mathematics Framework (Chapter 6, page 47). The Big Ideas are represented by circles of varying sizes, with the size of each circle indicating the relative importance of the Big Idea it represents. This is determined by the number of connections, represented by line segments, the Big Idea has with other Big Ideas. Big Ideas are considered to be connected to one another when they enfold two or more of the same standards. The color of each Big Idea indicates its associated Content Connection. (Chapter 1, page 15)

In Grade 2, students spend the majority of their time investigating authentic problems that are structured to connect content standards, practice standards, and one or more Big Ideas. For more information about the development of the Big Ideas in Grade 2, refer to the Progression of Big Ideas that precedes each sub-unit.

On the following pages, you can read more about the Grade 2 Big Ideas as outlined by the California Mathematics Framework (Chapter 6, pages 47–48) as well as how Amplify Desmos Math California develops each Big Idea and connects it to other Big Ideas.



CC1 Measure and Compare Objects

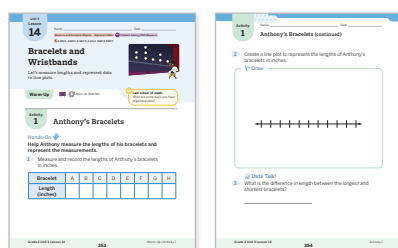
Determine the length of objects using standard units of measure, and use appropriate tools to classify objects, interpreting and comparing linear measures on a number line.  2.MD.1, 2.MD.2, 2.MD.3, 2.MD.4, 2.MD.6, 2.MD.9

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 3**, they estimate, measure, and compare the lengths of objects using standard units of measure. Students build on this understanding in **Unit 4** to represent and compare numbers on a number line, using equally-spaced tick marks that represent linear measures from 0. Then in **Unit 6**, they compare two-dimensional shapes and measure their side lengths using rulers and then look for and measure specific attributes of three-dimensional shapes. In **Unit 8**, students create rectangular arrays by using square tiles and partitioning rectangles into rows and columns. They apply their understanding of arrays to estimate and measure the length and width of the rectangles using inch tiles.

Spotlight on . . .

In **Unit 3, Lesson 14, Activity 1**, students connect the Big Ideas *Measure and Compare Objects*, *Represent Data*, and *Problem Solving With Measure*. They measure the lengths of Anthony's bracelets, in inches, and create a line plot to represent data and determine the difference between the longest and shortest bracelet.



Connecting to Other Big Ideas

CC1 Represent Data Unit 3 (Lessons 13–15)

CC2 Problem Solving With Measure
Unit 3 (Lessons 2, 3, 13–15)

CC3 Number Strategies Unit 3 (Lesson 6)


CC4 Seeing Fractions in Shapes Unit 6 (Lesson 5)

CC4 Squares in an Array Unit 8 (Lesson 12)

Connecting to Number Sense

NS Compare and Order on a Line:
Unit 3 (Lessons 13–15)

CC1 Represent Data

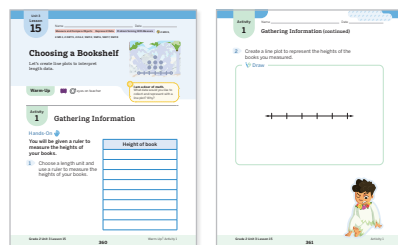
Represent data by using line plots, picture graphs, and bar graphs, and interpret data in different data representations, including clock faces to the nearest 5 minutes.  2.MD.1, 2.MD.2, 2.MD.3, 2.MD.4, 2.MD.6, 2.MD.9

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 1**, they sort, collect, represent, and interpret data using bar graphs and picture graphs. In **Unit 3**, they generate length measurement data, represent the data in line plots, and interpret the data. In **Unit 6**, they split analog clocks into quarters and halves to represent 15-minute intervals. They recognize that the numbers on a clock face represent 5-minute intervals and that they can skip count by 5s to tell time.

Spotlight on . . .

In **Unit 3, Lesson 15, Activity 1**, students connect the Big Ideas *Measure and Compare Objects*, *Represent Data*, and *Problem Solving With Measure*. In Activity 1, they choose a length unit, measure the heights of different books, and create a line plot to represent the data. In Activity 2, they answer questions and solve problems about the data they collected in Activity 1.



Connecting to Other Big Ideas

CC1 Measure and Compare Objects
Unit 3 (Lessons 13–15)

CC2 Dollars and Cents Unit 2 (Lesson 4)

CC2 Problem Solving With Measure Unit 3 (Lesson 15)

CC3 Skip Counting to 100 Unit 6 (Lesson 13)

CC3 Number Strategies Unit 1 (Lessons 11, 13, and 14),
Unit 2 (Lesson 4)

CC4 Seeing Fractions in Shapes
Unit 6 (Lessons 12 and 14)

Connecting to Number Sense

NS Flexibly Add and Subtract Unit 2 (Lessons 3–5)

Keeping the Big Ideas at the Center (continued)

CC2 Dollars and Cents

Understand the unit values of money and compute different values when combining dollars and cents.

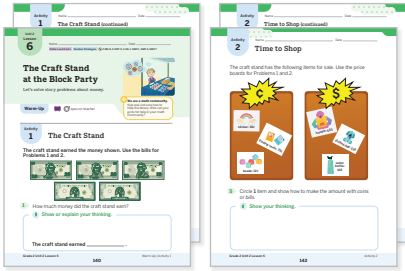
 2.MD.8, 2.MD.5, 2.NBT.1, 2.NBT.2, 2.NBT.5, 2.NBT.6, 2.NBT.7

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 2**, students learn the values of individual coins and find the values of groups of like and mixed coins. In **Unit 3**, they solve one- and two-step story problems involving money and represent them with equations.

Spotlight on . . .

In **Unit 2, Lesson 6, Activities 1 and 2**, students connect the Big Ideas *Dollars and Cents*, *Number Strategies*, and *Skip Counting to 100*. In Activity 1, they use skip counting and addition strategies within 100 to solve problems involving money. In Activity 2, they show how to make different values when combining coins or bills.



Connecting to Other Big Ideas

CC1 Represent Data Unit 2 (Lesson 4)

CC2 Problem Solving With Measure

Unit 3 (Lessons 11 and 12)

CC3 Skip Counting to 100 Unit 2 (Lesson 6)


CC3 Number Strategies Unit 2 (Lessons 3–6)

Connecting to Number Sense

NS Organize and Count Unit 2 (Lesson 6)

NS Flexibly Add and Subtract Unit 2 (Lessons 2–6)

CC2 Problem Solving With Measure

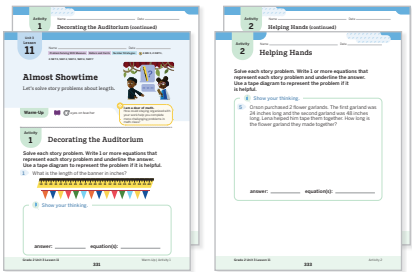
Solve problems involving length measures using addition and subtraction. *This Big Idea is also categorized under CC4: Discovering Shape and Space.*  2.NBT.7, 2.NBT.1, 2.MD.1, 2.MD.2, 2.MD.3, 2.MD.4, 2.MD.5, 2.MD.6, 2.MD.9, 2.OA.1

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 3**, they solve one- and two-step story problems involving length measures using addition and subtraction. In **Unit 4**, they solve addition and subtraction problems on the number line, using equally-spaced tick marks that represent linear measures from 0.

Spotlight on . . .

In **Unit 3, Lesson 11, Activities 1 and 2**, students connect the Big Ideas *Problem Solving With Measure*, *Dollars and Cents*, and *Number Strategies*. In Activity 1, they solve story problems involving length measures using various addition and subtraction strategies. In Activity 2, they continue solving similar story problems that now include money.



Connecting to Other Big Ideas

CC1 Represent Data Unit 3 (Lesson 15)

CC1 Measure and Compare Objects

Unit 3 (Lessons 2, 3, 14, and 15)

CC2 Dollars and Cents Unit 3 (Lessons 11 and 12)

CC3 Number Strategies Unit 3 (Lessons 10–12),

Unit 4 (Lessons 9 and 10)

Connecting to Number Sense


NS Compare and Order on a Line

Unit 3 (Lessons 13–15)

NS Flexibly Add and Subtract Unit 2 (Lesson 2–6),

Unit 3 (Lessons 11 and 12)

cc3 Skip Counting to 100

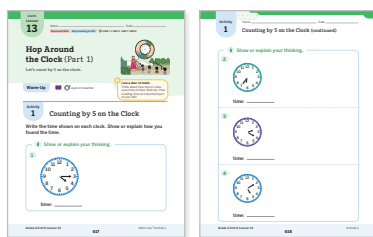
Use skip counting, counting bundles of 10, and expanded notation to understand the composition and place value of numbers up to 1,000. This includes ideas of counting by 5s, 10s, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing.  **2.NBT.1, 2.NBT.3, 2.NBT.7, 2.OA.4, 2.G.2**

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 2**, they use skip counting to find the values of groups of like and mixed coins as they solve story problems involving money. In **Unit 5**, students expand their knowledge of the base-ten system to view hundreds as bundles of 10 and use expanded notation to understand composition and place value of numbers up to 1,000. In **Unit 6**, they recognize that the numbers on a clock face represent 5-minute intervals and that they can skip count by 5s to tell time. In **Unit 7**, students develop understanding of place value and composition of numbers up to 1,000 and use that understanding to add and subtract numbers within 1,000, including problems where decomposing a ten and/or a hundred is necessary. In **Unit 8**, students look for patterns in even and odd numbers when adding and skip counting and apply their understanding of skip counting, expanded notation, place value, and composition to partition rectangles into rows and columns of equal-sized squares and find the total number of squares.

Spotlight on . . .

In **Unit 6, Lesson 13, Activity 1**, students connect the Big Ideas *Skip Counting to 100* and *Represent Data*. They interpret analog clock faces by skip counting by 5 to measure time.



Connecting to Other Big Ideas

- CC1 Represent Data** Unit 6 (Lesson 13)
- CC2 Dollars and Cents** Unit 2 (Lesson 6)
- CC3 Number Strategies** Unit 2 (Lesson 6), Unit 7 (Lessons 2–19)
- CC4 Seeing Fractions in Shapes** Unit 8 (Lesson 13)
- CC4 Squares in an Array** Unit 8 (Lesson 13)

Connecting to Number Sense

- NS Organize and Count** Unit 2 (Lesson 6), Unit 5 (Lessons 1–12), Unit 7 (Lessons 2–15)
- NS Compare and Order on a Line** Unit 2 (Lesson 6), Unit 5 (Lessons 9–12)
- NS Flexibly Add and Subtract** Unit 2 (Lesson 6), Unit 7 (Lessons 2–19)

cc3 Number Strategies

Add and subtract two-digit numbers, within 100, without using algorithms — instead encouraging different strategies and justification. Compare and contrast the different strategies using models, symbols, and drawings.

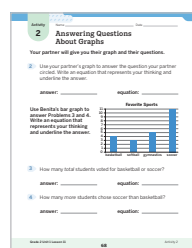
 **2.MD.5, 2.NBT.5, 2.NBT.6, 2.NBT.7, 2.OA.1, 2.OA.2**

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 1**, they build fluency adding and subtracting within 100 using different strategies, such as tape diagrams and the relationship between addition and subtraction. In **Unit 2**, students add within 100 as they find the values of groups of mixed coins and solve problems involving money. In **Unit 3**, they solve one- and two-step story problems involving addition and subtraction within 100 and are encouraged to use a variety of strategies. In **Unit 4**, students represent addition and subtraction story problems and equations on a number line. In **Unit 7**, they add numbers within 1,000 using strategies based on place value, and compose tens and hundreds as needed in order to find the sum. They move on to subtract numbers within 1,000 using strategies based on place value, including problems where decomposing a ten and/or a hundred is necessary. They choose strategies to add and subtract within 1,000 based on place value, the properties of operations, or the relationship between addition and subtraction. Students explain their reasoning for choosing strategies and explain why their strategies work. They explore estimating the sums of and differences between 2 three-digit numbers to justify the reasonableness of their answers. In **Unit 8**, they look for patterns in even and odd numbers when adding and skip counting.

Spotlight on . . .

In **Unit 1, Lesson 11, Activity 2**, students connect the Big Ideas *Number Strategies* and *Represent Data*. They use their understanding of picture graphs and bar graphs to solve *Put Together and Compare* problems about data.



Connecting to Other Big Ideas

- CC1 Represent Data** Unit 1 (Lessons 11, 13, and 14)
- CC1 Measure and Compare Objects** Unit 3 (Lesson 6)
- CC2 Dollars and Cents** Unit 2 (Lessons 3–6)
- CC2 Problem Solving With Measure** Unit 3 (Lessons 10–12), Unit 4 (Lessons 9 and 10)
- CC3 Skip Counting to 100** Unit 2 (Lesson 6), Unit 7 (Lessons 2–19)

Connecting to Number Sense

- NS Organize and Count** Unit 1 (Lessons 5, 6, 15, and 16), Unit 2 (Lessons 6–16, 20–22), Unit 4 (Lesson 12), Unit 7 (Lessons 2–15)
- NS Flexibly Add and Subtract** Unit 1 (Lessons 13–16), Unit 2 (Lessons 3–22), Unit 4 (Lessons 7, 8, 12, and 13), Unit 7 (Lessons 1–19)

Keeping the Big Ideas at the Center (continued)

CC4 Seeing Fractions in Shapes

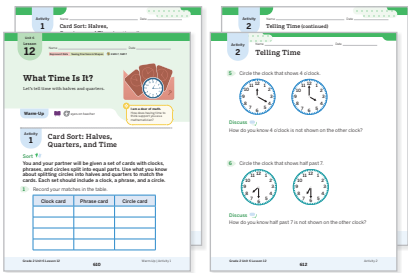
Divide circles and rectangles into equal shares and know them to be standard unit fractions. Identify and draw two-dimensional and three-dimensional shapes, recognizing faces and angles.  2.G.1, 2.G.2, 2.G.3, 2.MD.7

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 6**, they identify, sort, draw, and compare shapes based on their attributes and partition rectangles and circles into halves, thirds, and fourths. Later in the same unit, they move on to split circular analog clocks into quarters and halves to represent equal shares of 15-minute intervals. In **Unit 8**, students partition rectangles into rows and columns of equal-sized squares and find the total number of squares.

Spotlight on . . .

In **Unit 6, Lesson 12, Activities 1 and 2**, students connect the Big Ideas *Seeing Fractions in Shapes* and *Represent Data*. They use fractions of halves and quarters on circular analog clocks to tell time, using phrases such as *half past*, *quarter past*, and *quarter to*.



Connecting to Other Big Ideas

- CC1 Measure and Compare Objects** Unit 6 (Lesson 5)
- CC1 Represent Data** Unit 6 (Lessons 12 and 14)
- CC3 Skip Counting to 100** Unit 8 (Lesson 13)
- CC4 Squares in an Array** Unit 8 (Lesson 13)

CC4 Squares in an Array

Partition rectangles into rows and columns of unit squares to find the total number of square units in an array.

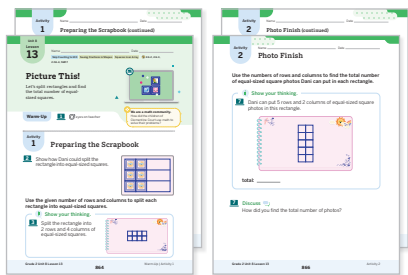
 2.OA.4, 2.G.2, 2.G.3, 2.MD.6

Developing the Big Idea

Students develop this Big Idea throughout **Unit 8**. They analyze the structure of the rows and columns of an array and use the array to find the total number of objects. Students move on to represent the number of objects in an array with equations and create rectangular arrays by using square tiles and partitioning rectangles into rows and columns. They use the concept of an array estimate and measure the length and width of the rectangles using inch tiles. Students wrap up Unit 8 by partitioning rectangles into rows and columns of equal-sized squares and find the total number of squares.

Spotlight on . . .

In **Unit 8, Lesson 13, Activities 1 and 2**, students connect the Big Ideas *Squares in an Array*, *Skip Counting to 100*, and *Seeing Fractions in Shapes*. They partition rectangles into rows and columns of equal-sized squares showing the fractional relationships of the squares to the whole rectangles. They then use skip counting by rows or columns to determine the total number of squares in each rectangle.



Connecting to Other Big Ideas

- CC1 Measure and Compare Objects** Unit 8 (Lesson 12)
- CC3 Skip Counting to 100** Unit 8 (Lesson 13)
- CC4 Seeing Fractions in Shapes** Unit 8 (Lesson 13)

Connecting to Number Sense

- NS Flexibly Add and Subtract** Unit 8 (Lessons 10 and 11)