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

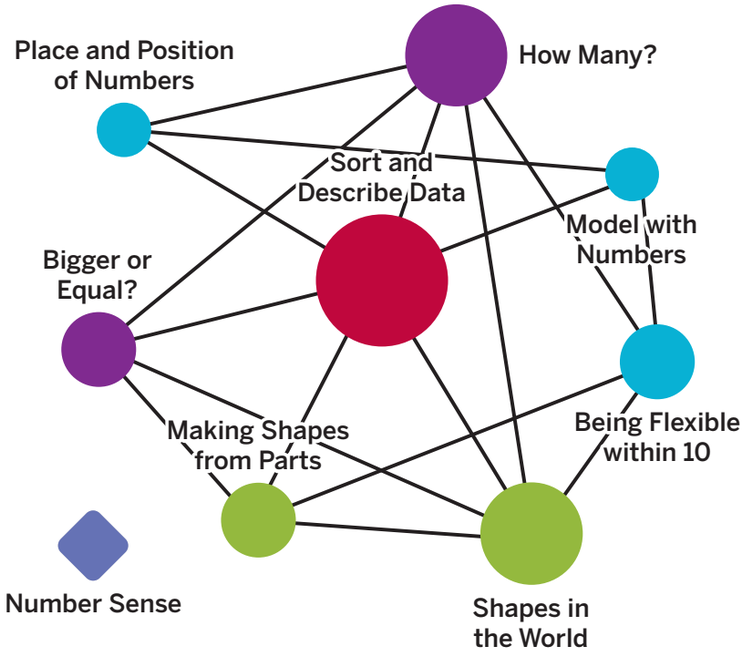
- CC1 Reasoning With Data
- CC2 Exploring Changing Quantities
- CC3 Taking Wholes Apart, Putting Parts Together
- CC4 Discovering Shape and Space

Meet the Big Ideas for Kindergarten

Amplify Desmos Math California, Kindergarten is designed around the eight California Big Ideas for Kindergarten as described in the California Mathematics Framework (Chapter 6, page 43). 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 Kindergarten, 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 Kindergarten, refer to the Progression of Big Ideas that precedes each sub-unit.

On the following pages, you can read more about the Kindergarten Big Ideas as outlined by the California Mathematics Framework (Chapter 6, pages 43–44) as well as how Amplify Desmos Math California develops each Big Idea and connects it to other Big Ideas.



CC1 Sort and Describe Data

Sort, count, classify, compare, and describe objects using numbers for length, weight, or other attributes.
K.MD.1, K.MD.2, K.MD.3, K.CC.4, K.CC.5, K.G.4

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 1**, they begin by exploring various tools they will use to sort, count, and compare objects – including connecting cubes, counters, 5-frames, pattern blocks, and solid shapes. Students use connecting cubes to support one-to-one correspondence in representing groups and use math tools to explore counting. They build on this understanding in **Unit 2** to use fingers and other math tools with spoken number names to count and describe objects. Students move on to organize and count using written numerals to tell how many objects or images and represent written numbers with groups of objects or images. They wrap up Unit 2 by arranging groups and numbers in order and representing groups of objects or images with written numerals. Then in **Unit 3,** students apply their understanding to sort, count, and compare shapes. In **Unit 4**, they analyze both organized and scattered arrangements of objects and images to determine their totals. In **Unit 5**, students analyze collected data, counting and representing the data as numbers within 10. In **Unit 6**, they count objects in various arrangements, recognizing the *10 + n* structure of teen numbers. In **Unit 7**, students compare the weights and capacities of various objects and sort shapes into categories based on shared attributes.

Spotlight on . . .

In **Unit 3, Lesson 5, Activities 1 and 2**, students connect the Big Ideas *Sort and Describe Data, Shapes in the World,* and *How Many?* They compare and describe shapes as they sort them based on their attributes, such as the number of sides.

Connecting to Other Big Ideas

- **CC2 How Many?** Unit 1 (Lessons 1, 4, 13–18), Unit 2 (Lessons 2–10, 12–19, 22), Unit 3 (Lessons 5–8, 12–14), Unit 4 (Lessons 2–6), Unit 5 (Lesson 11), Unit 6 (Lessons 2–6)
- **CC2 Bigger or Equal?** Unit 2 (Lessons 4–6, 8–11, 19–22), Unit 3 (Lessons 7 and 8)
- **CC3 Place and Position of Numbers** Unit 6 (Lessons 2–6)
- **CC3 Place and Position of Numbers** Unit 4 (Lessons 2–6)
- **CC4 Shapes in the World** Unit 3 (Lessons 7, 8, 12–14), Unit 7 (Lesson 3–5)
- **CC4 Making Shapes From Parts** Unit 1 (Lesson 13), Unit 3 (Lessons 12–14)

Connecting to Number Sense

- **NS Organize and Count** Unit 1 (Lessons 14–18), Unit 2 (Lessons 2–11, 12–19, 22), Unit 3 (Lessons 5–7), Unit 4 (Lessons 2–6), Unit 5 (Lesson 11), Unit 6 (Lessons 2–6)
- **NS Compare and Order on a Line** Unit 2 (Lessons 4–6, 8–11, 19–22)
- **NS Flexibly Add and Subtract** Unit 4 (Lessons 2–6)

CC2 How Many?

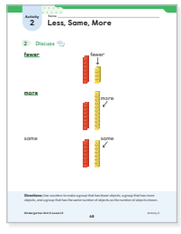
Know number names and the count sequence to determine how many are in a group of objects arranged in a line, array, or circle. Fingers are important representations of numbers. Use words and drawings to make convincing arguments to justify work. **K.CC.1, K.CC.2, K.CC.3, K.CC.4, K.CC.5, K.CC.6, K.CC.7, K.MD.3**

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 1**, they begin by exploring various tools they will use to count objects – including connecting cubes, counters, and 5-frames. They organize and count as they represent groups with math tools to support one-to-one correspondence in representing groups and subitize to determine how many are in a group. They wrap up Unit 1 by using math tools to determine the quantity of a group up to 10 as they answer "are there enough" questions. In **Unit 2**, students use their fingers and other math tools with spoken number names to count objects and determine how many are in a group of objects, regardless of arrangement. They move on to organize and count using written numerals to tell how many objects or images and represent written numbers with groups of objects or images. They build on this understanding in **Unit 3**, as they count and compare the quantities of shapes in groups to determine how many. In **Unit 4**, students determine the total of organized and scattered arrangements of objects and images. In **Unit 5,** they count data that was collected, representing the data values as numbers within 10 and in **Unit 6**, they count objects in various arrangements, recognizing the *10 + n* structure of teen numbers. In **Unit 7,** they determine the quantity of objects as they compose three-dimensional shapes to form larger shapes.

Spotlight on . . .

In **Unit 2, Lesson 5, Activities 1 and 2,** students connect the Big Ideas *How Many?, Sort and Describe Data,* and *Bigger or Equal?* They count objects and identify and make groups that have more, fewer, or the same number of objects as another group. They use their fingers and other representations to make convincing arguments.



Connecting to Other Big Ideas

- **CC1 Sort and Describe Data** Unit 1 (Lessons 1, 4, 13–18), Unit 2 (Lessons 2–10, 12–19, 22), Unit 3 (Lessons 5–8, 12–14), Unit 4 (Lessons 2–6), Unit 5 (Lesson 11), Unit 6 (Lessons 2–6)
- **CC2 Bigger or Equal?** Unit 1 (Lessons 7, 8–12), Unit 2 (Lessons 4–6, 19, 20, 22)
- **CC3 Place and Position of Numbers** Unit 6 (Lessons 2–7)
- **CC3 Being Flexible Within 10** Unit 4 (Lesson 1), Unit 7 (Lesson 9)
- **CC3 Model With Numbers** Unit 4 (Lessons 1–6), Unit 6 (Lesson 7), Unit 7 (Lesson 9)
- **CC4 Shapes in the World** Unit 3 (Lessons 12–14)
- **CC4 Making Shapes From Parts** Unit 1 (Lessons 5 and 13), Unit 3 (Lessons 12–14)

Connecting to Number Sense

- **NS Organize and Count** Unit 1 (Lessons 6–12), Unit 2 (Lessons 2–6, 8–10, 12–19, 22), Unit 3 (Lessons 5–7), Unit 4 (Lessons 2–6), Unit 5 (Lesson 11), Unit 6 (Lessons 2–7)
- **NS Compare and Order on a Line** Unit 1 (Lessons 7, 8, 10–12), Unit 2 (Lessons 4–6, 8–10, 19, 20, 22)
- **NS Flexibly Add and Subtract** Unit 4 (Lessons 2–6)

Keeping the Big Ideas at the Center (continued)

CC2 Bigger or Equal?

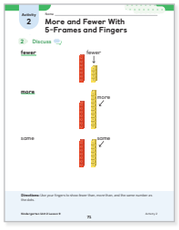
Identify a number of objects as greater than, less than, or equal to the number of objects in another group. Justify or prove your findings with number sentences and other representations. **K.CC.4, K.CC.5, K.CC.6, K.MD.2, K.G.4**

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 1**, they organize and count to first identify quantities and then to compare quantities within groups. They build on this understanding in **Unit 2** to use their fingers and other math tools to identify and make groups of objects that have more, fewer, or the same number of objects as another group. Students represent these quantities using number sentences (equations) written numerals. Then in **Unit 3**, students apply their prior comparison work to quantities of shapes by comparing the number of sides in two-dimensional shapes that they compose. In **Unit 7**, they compare quantities of objects as they compose three-dimensional shapes to form larger shapes.

Spotlight on . . .

In **Unit 2, Lesson 9, Activity 2,** students connect the Big Ideas *Bigger or Equal?* and *How Many?* They compare groups or objects with written numerals and circle the representation that shows more. They justify their findings by drawing pictures and discussing with their partner.



Connecting to Other Big Ideas

- CC1 **Sort and Describe Data** Unit 2 (Lessons 4–6, 8–11, 19–22), Unit 3 (Lessons 7 and 8)
- CC2 **How Many?** Unit 1 (Lessons 7, 8, 10–12), Unit 2 (Lessons 4–6, 8–10, 19, 20, 22), Unit 7 (Lesson 11)
- CC4 **Making Shapes From Parts** Unit 7 (Lesson 11)

Connecting to Number Sense

- NS **Organize and Count** Unit 1 (Lessons 7, 8, 10–12), Unit 2 (Lessons 4–6, 8–11, 19, 22), Unit 3 (Lesson 7)
- NS **Compare and Order on a Line** Unit 1 (Lessons 7, 8, 10–12), Unit 2 (Lessons 4–6, 8–11, 19–22), Unit 7 (Lesson 11)

CC3 Being Flexible Within 10

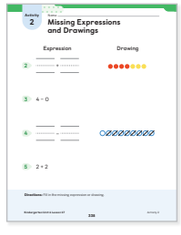
Make 10, add and subtract within 10, compose and decompose within 10 (find two numbers to make 10). Fingers are important. **K.OA.1, K.OA.2, K.OA.3, K.OA.4, K.OA.5, K.CC.6, K.G.6**

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 4**, students add within 10 to determine the total of organized and scattered arrangements of objects and images. They move on to represent and solve *Add To, Result Unknown* and *Take From, Result Unknown* story problems within 10. They wrap up Unit 4 by interpreting expressions both with and without context and determining the values of the expressions within 10. In **Unit 5**, students compose 5 using pattern blocks as they ask questions about quantity and progress to notice patterns in decomposition while decomposing numbers in more than one way. They extend their understanding of adding and subtracting within 10 to solve *Put Together/Take Apart, Both Addends Unknown* story problems in more than one way. They wrap up Unit 5 by matching representations of 10 – that they have counted or added – to given equations and decomposing 10 in various ways, including representing 10 as a pair of addends. In **Unit 7**, they make 10 while representing and solving story problems and use numbers and equations within 10 to represent composite shapes.

Spotlight on . . .

In **Unit 4, Lesson 17, Activity 2,** students connect the Big Ideas *Being Flexible Within 10* and *Model With Numbers*. They match drawings to expressions that represent addition and subtraction within 10 and fill in the missing expressions.



Connecting to Other Big Ideas

- CC2 **How Many?** Unit 4 (Lesson 1), Unit 7 (Lesson 9)
- CC3 **Model With Numbers** Unit 4 (Lessons 7–20), Unit 5 (Lessons 6–10, 12), Unit 7 (Lessons 9, 12, 14 and 15)
- CC4 **Shapes in the World** Unit 7 (Lesson 13)
- CC4 **Making Shapes From Parts** Unit 7 (Lesson 16)

Connecting to Number Sense

- NS **Organize and Count** Unit 5 (Lessons 2–10, 12–15)
- NS **Compare and Order on a Line** Unit 7 (Lessons 9, 12–15)
- NS **Flexibly Add and Subtract** Unit 4 (Lessons 7–20), Unit 5 (Lessons 2–10, 12–15)

CC3 Place and Position of Numbers

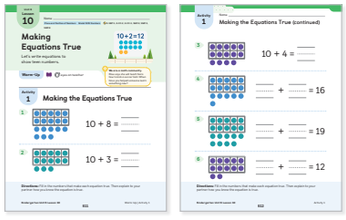
Get to know numbers between 11 and 19 by name and expanded notation to become familiar with place value, for example: 14 = 10 + 4. K.CC.3, K.CC.5, K.NBT.1

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 6**, they begin to compose and decompose groups of up to 19 objects, recognizing the *10 + n* structure of teen numbers. Students use this *10 + n* structure to decompose teen numbers into a ten and some ones, using 10-frames and equations to represent the decompositions. They wrap up Unit 6 by ordering the numbers 11–19 using their understanding of the *10 + n* structure of teen numbers.

Spotlight on . . .

In **Unit 6, Lesson 10, Activity 1**, students connect the Big Ideas *Place and Position of Numbers* and *Model With Numbers*. They connect addition expressions to 10-frame models to continue their familiarity with the numbers between 11 and 19 by name (writing their written numerals) and expanded notation (using the *10 + n* structure of teen numbers).



Connecting to Other Big Ideas

- CC1 Sort and Describe Data — Unit 6 (Lessons 2–6)
- CC2 How Many? — Unit 6 (Lessons 2–7)
- CC3 Model With Numbers — Unit 6 (Lessons 7–10)

Connecting to Number Sense

- NS Organize and Count — Unit 6 (Lessons 1–8)
- NS Flexibly Add and Subtract — Unit 6 (Lesson 9)

CC3 Model With Numbers

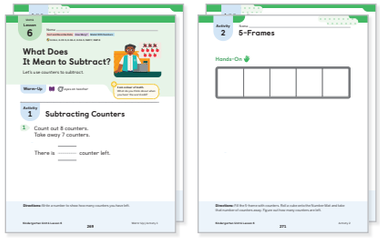
Add, subtract, and model abstract problems with fingers, other manipulatives, sounds, movement, words, and models. K.OA.1, K.OA.2, K.OA.5, K.NBT.1, K.MD.2

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 4**, students add to determine the total of organized and scattered arrangements of objects and images. They move on to and and subtract to determine the total or difference in given real-world situations. Students use their fingers, manipulatives, and other models to represent and solve *Add To, Result Unknown* and *Take From, Result Unknown* story problems within 10. They wrap up Unit 4 by interpreting expressions both within and without context and determining the values of the expressions within 10. In **Unit 5**, students add and subtract to solve *Put Together/Take Apart, Both Addends Unknown* story problems in more than one way. They wrap up Unit 5 by matching representations of 10 – that they have counted or added – to given equations. In **Unit 6**, they use the *10 + n* structure of teen numbers to determine the total number of dots in a group. They move on to decompose teen numbers into a ten and some ones, using 10-frames and equations to represent the decompositions. In **Unit 7**, they add and subtract to solve story problems and model problems using numbers and equations.

Spotlight on . . .

In **Unit 4, Lesson 6, Activities 1 and 2**, students connect the Big Ideas *Model With Numbers, Sort and Describe Data,* and *How Many?* They model subtraction problems using counters, movement, and 10-frames and count to determine how many counters are left after some are taken away.



Connecting to Other Big Ideas

- CC1 Sort and Describe Data — Unit 4 (Lessons 2–6)
- CC2 How Many? — Unit 4 (Lessons 1–6), Unit 6 (Lesson 7), Unit 7 (Lesson 9)
- CC3 Place and Position of Numbers — Unit 6 (Lessons 7–10)
- CC3 Being Flexible Within 10 — Unit 4 (Lessons 7–20), Unit 5 (Lessons 6–10, 12), Unit 7 (Lessons 9, 12, 14, 15)
- CC4 Shapes in the World — Unit 7 (Lesson 16)
- CC4 Making Shapes From Parts — Unit 7 (Lesson 16)

Connecting to Number Sense

- NS Organize and Count — Unit 4 (Lessons 2–6), Unit 5 (Lessons 10 and 12), Unit 6 (Lessons 7 and 8), Unit 7 (Lesson 12)
- NS Flexibly Add and Subtract — Unit 4 (Lessons 2–20), Unit 5 (Lessons 6–10, 12), Unit 6 (Lesson 9), Unit 7 (Lessons 9, 12, 14–16)

Keeping the Big Ideas at the Center (continued)

CC4 Shapes in the World

Describe the physical world using shapes. Create two-dimensional and three-dimensional shapes, and analyze and compare them. **K.G.1, K.G.2, K.G.3, K.G.4, K.G.5, K.G.6, K.MD.1, K.MD.2, K.MD.3**

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 1**, they begin to develop concepts of shapes as they are introduced to pattern blocks and solid shapes as math tools. They begin to describe the physical world around them using shapes. They build on this understanding in **Unit 3** as they develop geometric language to analyze, compare, and compose shapes. As students compose two-dimensional shapes, they analyze them and compare how many sides they have. They wrap up Unit 3 by describing the physical world using simple shapes, larger shapes, and positional words. In **Unit 7,** students build, describe, and compare two- and three-dimensional shapes. They move on to compare and sort shapes into categories based on shared attributes. Students identify three-dimensional shapes by name including cones, cubes, cylinders, and spheres. They wrap up Unit 7 by composing, analyzing, and comparing three-dimensional shapes.

Spotlight on . . .

In **Unit 3 Lesson 3, Activity 2**, students work toward the Big Idea *Shapes in the World.* They match shapes they see on a drawing of a house with known two-dimensional shapes to begin to describe the physical word using shapes.

Connecting to Other Big Ideas

- CC1 Sort and Describe Data — Unit 3 (Lessons 7, 8, 12–14), Unit 7 (Lessons 3–5)
- CC2 How Many? — Unit 3 (Lessons 12–14), Unit 7 (Lesson 10)
- CC3 Being Flexible Within 10 — Unit 7 (Lesson 13)
- CC3 Model With Numbers — Unit 7 (Lesson 16)
- CC4 Making Shapes From Parts — Unit 1 (Lessons 2 and 3), Unit 3 (Lessons 12–16), Unit 7 (Lessons 1–4, 7, 8, 10, 13, 16)

Connecting to Number Sense

- NS Organize and Count — Unit 3 (Lessons 5–7), Unit 7 (Lesson 10)
- NS Flexibly Add and Subtract — Unit 7 (Lessons 13 and 16)

CC4 Making Shapes From Parts

Compose larger shapes by combining known shapes. Explore similarities and differences of shapes using numbers and measurements. **K.MD.1, K.MD.2, K.G.4, K.G.5, K.G.6**

Developing the Big Idea

Students develop this Big Idea across multiple units. In **Unit 1**, they begin to combine shapes to compose larger shapes as they use various math tools, such as pattern blocks and connecting cubes. Their use of connecting cubes to compose shapes supports the idea of one-to-one correspondence in representing groups. They extend their understanding of shape composition in **Unit 3** to combine two-dimensional shapes to compose larger shapes, exploring how the shapes are alike and different. In **Unit 7**, students build, describe, and compare two- and three-dimensional shapes. They move on to compose, analyze, and compare three-dimensional shapes.

Spotlight on . . .

In **Unit 3, Lesson 16, Activities 1 and 2**, students connect the Big Ideas *Making Shapes From Parts* and *Shapes in the World.* They describe the shapes found in different artistic representations of quilts, including shapes that the artists composed to make new shapes. They create their own quilt design by composing larger shapes from known shapes.

Connecting to Other Big Ideas

- CC1 Sort and Describe Data — Unit 1 (Lesson 13), Unit 3 (Lessons 12–14)
- CC1 How Many? — Unit 1 (Lessons 5 and 13), Unit 3 (Lessons 12–14), Unit 7 (Lessons 10 and 11)
- CC2 Bigger or Equal? — Unit 7 (Lesson 11)
- CC3 Being Flexible Within 10 — Unit 7 (Lesson 13)
- CC4 Shapes in the World — Unit 1 (Lessons 2, 3), Unit 3 (Lessons 12–16), Unit 7 (Lessons 1–4, 7, 8, 10, 13, 16)

Connecting to Number Sense

- NS Organize and Count — Unit 7 (Lesson 10)
- NS Compare and Order on a Line — Unit 7 (Lesson 11)
- NS Flexibly Add and Subtract — Unit 7 (Lessons 13 and 16)