



## Unit 6

# Measuring Lengths of Up to 120 Length Units



### Essential Questions

- How can we compare the lengths of objects?
- How can we measure and describe the lengths of objects?
- How can representing the relationship between the amounts in a story problem help us solve?



### Unit Story: Side By Side

You can read the Unit Story with your student by visiting the Unit Story page on the Caregiver Hub.



## Unit Investigation

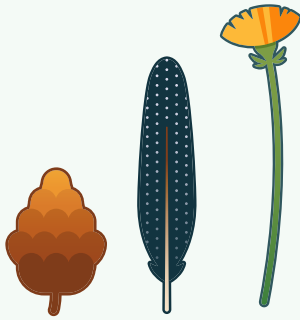
**Lesson 1** is the Unit Investigation. Students explore comparing heights of block towers and classroom objects and justify their comparisons to build curiosity and apply their own knowledge in a variety of ways. Use the **Caregiver Connection** to help students continue to explore the math they will see in the unit.

### Caregiver Connection

Students may enjoy comparing the lengths or heights of objects at home. Encourage students to look for things that are longer, shorter, or taller than other objects. You can ask:

- “Which object is taller? Which object is shorter? How do you know?”
- “How could you describe the height of these objects?”

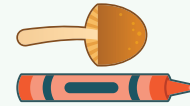
You can compare the lengths or heights of objects when they are lined up at their endpoints. You can also compare 2 objects to the length of a third object.



The pine cone is *shortest* and the dandelion is *tallest*.

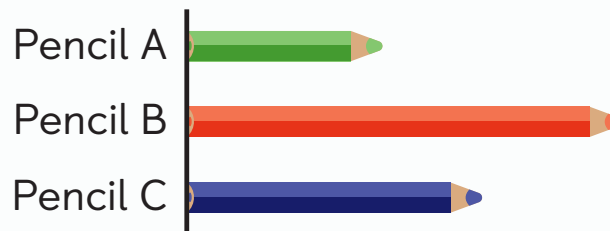


The worm is *longer* than the mushroom.



## Try This

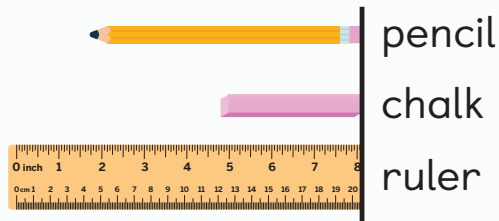
- 1 List the objects in order from *shortest* to *longest*.



shortest

longest

- 2 List the objects in order from *longest* to *shortest*.

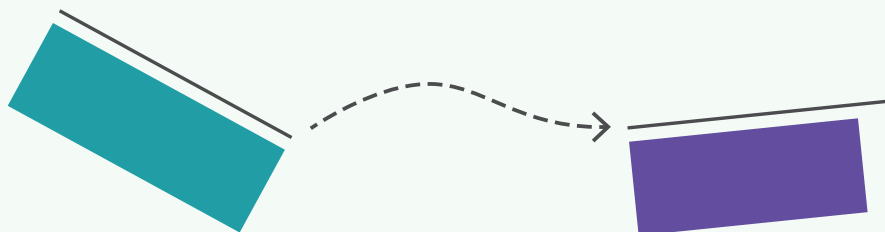


longest

shortest

## Summary | Lesson 3

A third object, such as a piece of string, can be used as a tool to compare the lengths of 2 objects that cannot be lined up by their endpoints.

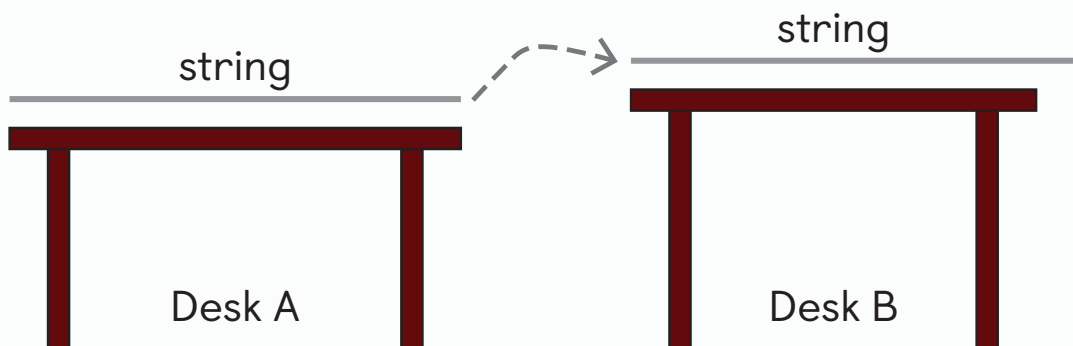


The purple rectangle is shorter than the green rectangle.

### Try This

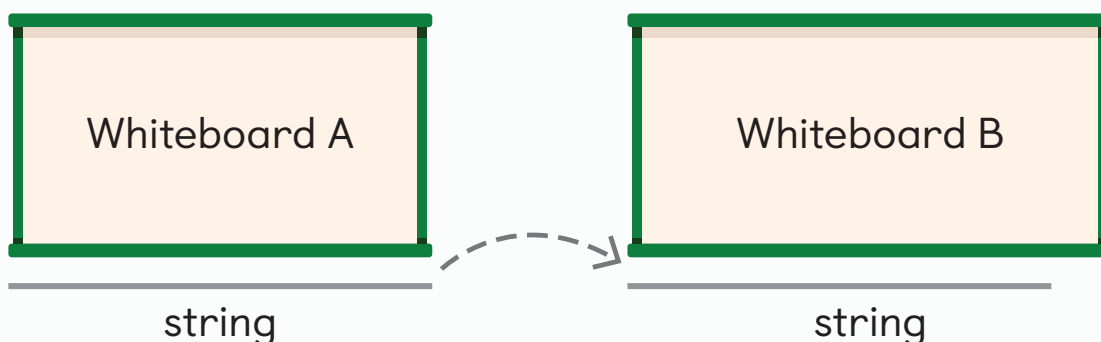
For Problems 1 and 2, fill in the blank with the word *shorter* or *longer* to make the statement true.

1



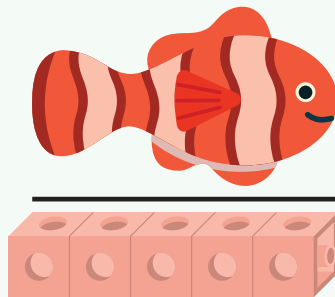
Desk A is \_\_\_\_\_ than Desk B.

2



Whiteboard A is \_\_\_\_\_ than Whiteboard B.

The **length** of an object can be described as a number of length units from endpoint to endpoint.

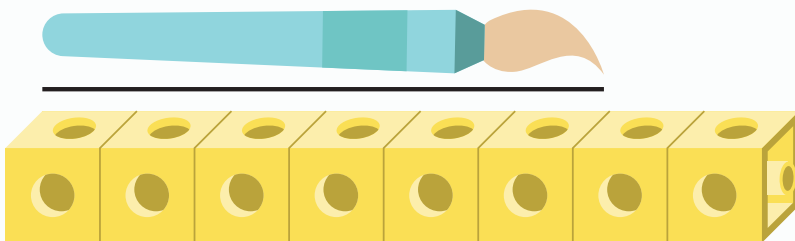


The length of the fish is 5 connecting cubes.

## Try This

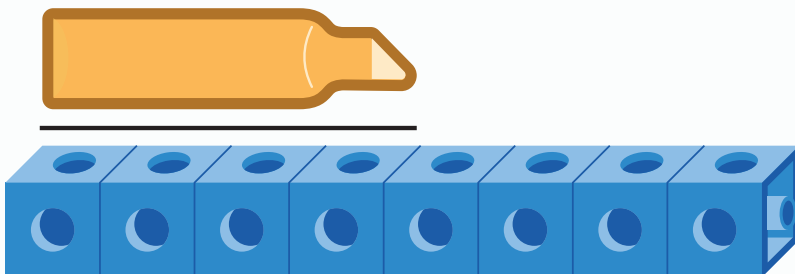
For Problems 1 and 2, fill in the blank to make the statement *true*.

1



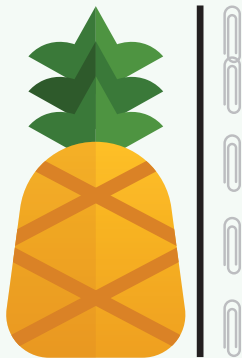
The paintbrush is \_\_\_\_\_ connecting cubes long.

2

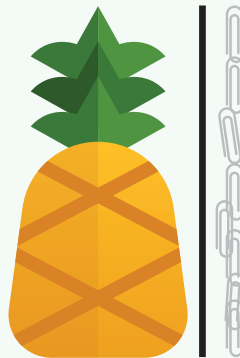


The highlighter is \_\_\_\_\_ connecting cubes long.

To measure the length or height of an object, measure the object from end to end with same-length units and without gaps or overlaps.



gaps



overlaps



The pineapple is 6 paper clips tall.

## Try This

For Problems 1 and 2, fill in the blank to make the statement true.

1



The marker is \_\_\_\_\_ paper clips long.

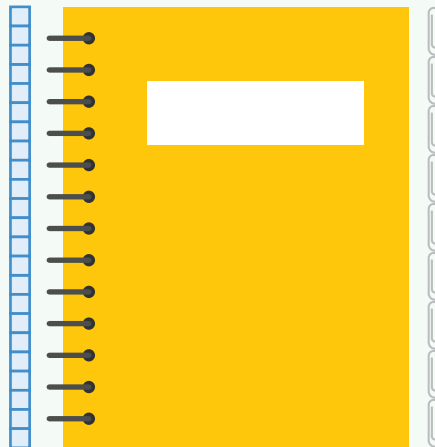
2



The crayon is \_\_\_\_\_ paper clips long.

The length of an object can be measured more than once using different length units. Measurements should include a number and the length unit so others can understand the measurement.

The notebook is  
23 unit cubes long.



The notebook is  
9 paper clips long.

## Try This

1



Tape A



Record the length of Tape A in paper clips.

length: \_\_\_\_\_

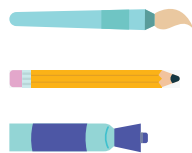
Record the length of Tape A in unit cubes.

length: \_\_\_\_\_

## Sub-Unit 1 | Summary

### In this sub-unit . . .

- We compared the lengths and heights of 3 objects to place them in order by length or height.

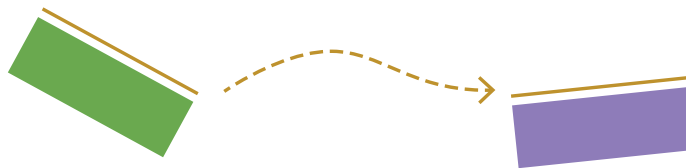


longest to shortest



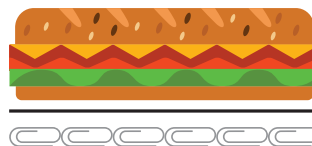
shortest to tallest

- We used a third object to compare the lengths of 2 objects that could not be lined up.



The purple rectangle is shorter than the green rectangle.

- We measured the lengths of objects and described each length with a number and length unit.



The length of the sandwich is 6 paper clips.

**Math tip:** To measure the length or height of an object, use same-length units with no gaps or overlaps.

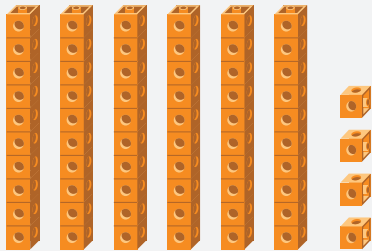
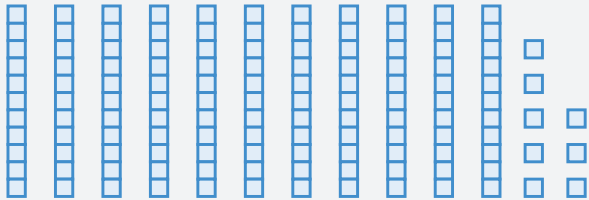
When measuring a length that is much longer than the length unit, it is helpful to make groups of ten and count by 10 and 1 to find the length.



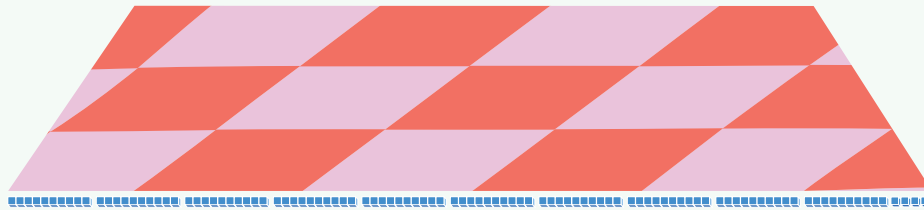
10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 101, 102, 103, 104, 105, 106, 107, 108 Bald eagle's wingspan length: 108 connecting cubes

## Try This

- Shawn and Han measured the length of a toy snake with different length units. Record each length.

| Length unit                                                                                                 | Length |
|-------------------------------------------------------------------------------------------------------------|--------|
| <p>connecting cubes</p>  |        |
| <p>unit cubes</p>        |        |

Tens rods are helpful for measuring lengths with unit cubes because you can count by 10 and 1 to find the total amount of length units used to measure.

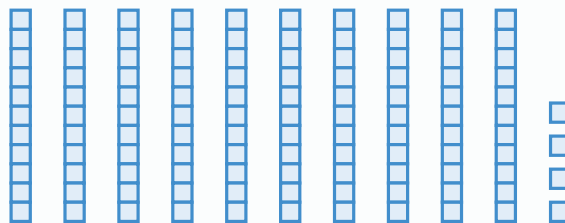


10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 101, 102, 103, 104

The length of the rug is 104 unit cubes.

## Try This

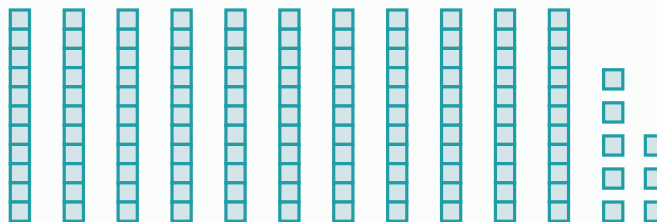
- 1 Priya measured the length of a rug using the unit cubes.



Record the length of the rug in unit cubes.

length: \_\_\_\_\_

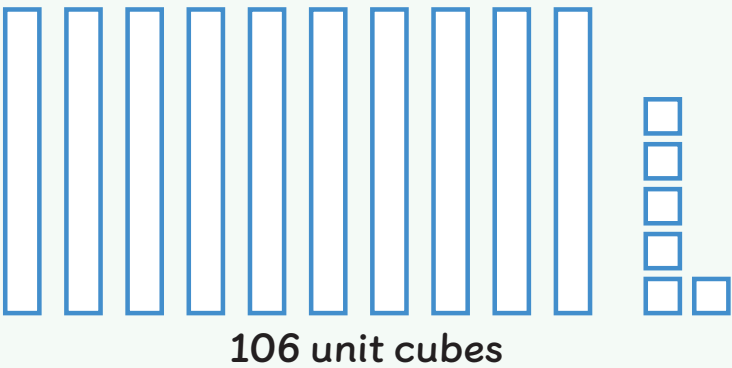
- 2 Shawn measured the length of a bench using the unit cubes.



Record the length of the bench in unit cubes.

length: \_\_\_\_\_

Numbers up to 120 can be represented with tens and ones. When recording measurements with 100 to 120 length units, the numbers are written with 3 digits.



Try This

The table shows the number of unit cubes that represent the height of each student.

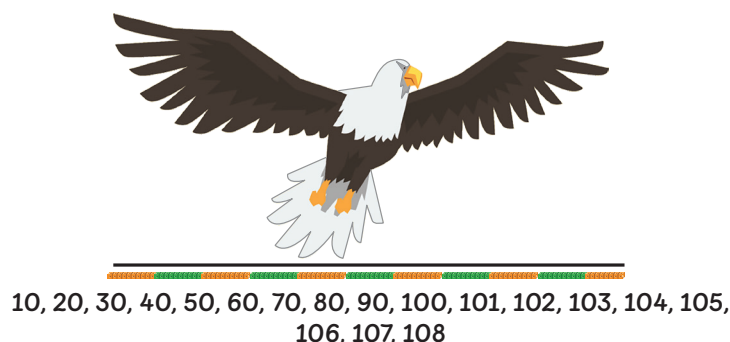
| Priya | Shawn |
|-------|-------|
|       |       |

For Problems 1 and 2, record the height of each student in unit cubes.

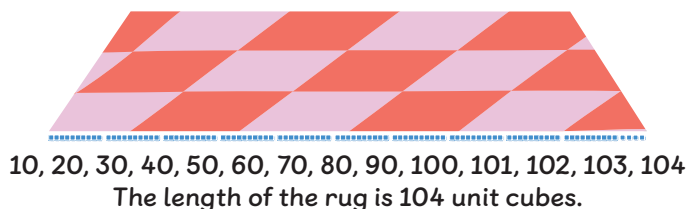
|   | Student | Height<br>(number and length unit) |
|---|---------|------------------------------------|
| 1 | Priya   |                                    |
| 2 | Shawn   |                                    |

### In this sub-unit . . .

- We measured lengths much longer than the length units we used by grouping the units so that we could count by 10 and by 1 to find the length.

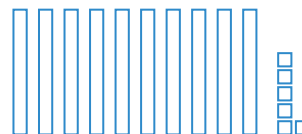


- We found that tens rods are a helpful tool for measuring lengths in unit cubes because each tens rod is made up of 10 unit cubes.



- We represented lengths from 100 to 120 units as numbers of tens and ones and recorded the measurements as 3-digit numbers.

We used 10 tens rods and 6 unit cubes to measure the tape. The tape is 106 unit cubes long.



🔥 **Math tip:** It can be helpful to notice if you used 10 tens rods, because then you can count starting at 100.

To find the total length of 2 or more objects, you can add the lengths. To compare lengths and find the difference between the lengths of objects, you can add or subtract.

Mom found lengths of string to hang the bird feeder.

The red string is 6 paper clips long.

The blue string is 9 paper clips long.

How long are the red and blue strings together?

$$6 + 9 = \underline{15}$$

How many paper clips shorter is the red string than the blue string?

$$9 - \underline{3} = 6 \text{ or } 6 + \underline{3} = 9$$

## Try This

- 1 Clare recorded the lengths of her 3 ribbons.

| Ribbon       | Length             |
|--------------|--------------------|
| red ribbon   | 7 connecting cubes |
| blue ribbon  | 5 connecting cubes |
| green ribbon | 6 connecting cubes |

If Clare lines up the 3 pieces of ribbon, what is the total length of the 3 ribbons?



Show your thinking.

answer: \_\_\_\_\_

equation: \_\_\_\_\_

In a story problem where 2 amounts are being compared, thinking about which amount is unknown can help you represent and solve the problem.

Sean's footprint is 10 connecting cubes long.

A black bear's footprint is 4 cubes shorter than Sean's footprint.

What is the length of a black bear's footprint?

I know the length of Sean's footprint. I need to find the length of the bear's footprint.

Sean

|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|

Black bear ?

## Try This

- 1 A bear's footprint is 16 connecting cubes long.  
A wolf's footprint is 9 connecting cubes shorter than a bear's footprint.  
How long is a wolf's footprint?



Show your thinking.

answer: \_\_\_\_\_

equation: \_\_\_\_\_

In story problems that describe an amount that is taken away, the unknown amount could be the starting amount. To find the starting amount, add the amount that is taken away and the amount that is left over.

Trevor has some blocks.

He gives 6 blocks to Sean.

Now Trevor has 9 blocks.

How many blocks did Trevor have before giving some to Sean?



$$\underline{\quad} - 6 = 9$$

$$6 + 9 = \underline{15}$$

$$\underline{15} - 6 = 9$$

Trevor had 15 blocks  
before giving some to Sean.

## Try This

- 1 Priya and her mom made some granola bars. Priya gave 11 of them to her friend. Now there are 4 bars left. How many granola bars were there to start?



Show your thinking.

answer: \_\_\_\_\_

equation: \_\_\_\_\_

Equations can be used to represent what happens in a story problem. They can also be used to represent different ways to find the unknown amount.

Sean saw 6 kids at the playground.  
He also saw some kids on the field.  
Altogether he saw 14 kids.  
How many kids did Sean see on the field?



$$6 + \underline{\quad} = 14$$

$$14 - 6 = \underline{\quad}$$

## Try This

Circle 2 equations that could be used to find the unknown amount.

**i** Show your thinking.

- 1** Diego has 14 marbles.  
He gave some of them to Shawn.  
Now Diego has 6 marbles.  
How many marbles did Diego give to Shawn?

$$14 + 6 = \underline{\quad}$$

$$6 + \underline{\quad} = 14$$

$$14 - 6 = \underline{\quad}$$

When finding an unknown amount in a story problem or equation, representing the relationship between the amounts could help you decide how to solve.

$$\underline{\quad} + 12 = 20$$



$$20 - 12 = \underline{8}$$

## Try This

- 1 Clare has 9 crayons.  
Diego has 6 more crayons than Clare.  
How many crayons does Diego have?



Show your thinking.

answer: \_\_\_\_\_

equation: \_\_\_\_\_

You can use addition and subtraction strategies that you know to interpret data.

I can make 10 to find the total in all categories.

| Heights of Towers |              |
|-------------------|--------------|
| blue tower        | 9 unit cubes |
| red tower         | 5 unit cubes |
| yellow tower      | 2 unit cubes |

$$9 + 2 + 5 = \underline{\quad}$$

1   1

$$9 + 1 = 10$$

$$10 + 5 = 15$$

$$15 + 1 = \underline{16}$$

## Try This

Jada recorded the points she scored for a game.

| Round        | Points    |
|--------------|-----------|
| first round  | 11 points |
| second round | 7 points  |
| third round  |           |



**Show your thinking.**

1

Jada scored 5 more points in the third round than the second round.

How many points did she score in the third round?

answer: \_\_\_\_\_ equation: \_\_\_\_\_

## Sub-Unit 3 | Summary

### In this sub-unit . . .

- We solved problems about lengths using addition and subtraction.

The heights of the 3 bottles are 8 unit cubes, 5 unit cubes, and 6 unit cubes. What is the height of the bird feeder when the bottles are stacked on top of each other?

$$8 + 6 + 5 = \underline{19}$$

The red string is 6 paper clips long. The blue string is 9 paper clips long. How many paper clips shorter is the red string than the blue string?

$$9 - \underline{3} = 6 \text{ or } 6 + \underline{3} = 9$$

- We solved story problems in which the difference between the lengths is known and 1 of the lengths being compared is unknown.

Sean's footprint is 10 connecting cubes long.  
A black bear's footprint is 4 cubes shorter than Sean's footprint.  
What is the length of the black bear's footprint?



- We solved story problems that describe an amount that is taken away from an unknown starting amount.

Trevor has some blocks.  
He gives 6 blocks to Sean.  
Now Trevor has 9 blocks.  
How many blocks did Trevor have before giving some to Sean?



$$\underline{\quad} - 6 = 9$$

$$6 + 9 = \underline{15}$$

$$\underline{15} - 6 = 9$$

Trevor had 15 blocks before giving some to Sean.

 **Math tip:** Thinking about which amounts are known and unknown can help you represent and solve a problem.

# Try This | Answer Key

## Lesson 2

1 Pencil A, Pencil C, Pencil B

2 ruler, pencil, chalk

## Lesson 3

1 longer

2 shorter

## Lesson 4

1 6

2 4

## Lesson 5

1 9

2 5

## Lesson 6

1 5 paper clips

2 13 unit cubes

## Lesson 7

1 64 connecting cubes

2 118 unit cubes

## Lesson 8

1 104 unit cubes

2 118 unit cubes

## Lesson 9

1 106 unit cubes

2 120 unit cubes

## Lesson 10

1 Sample work and equation shown.

$$7 + 5 + 6$$

3 2

$$7 + 3 = 10$$

$$2 + 6 = 8$$

$$10 + 8 = 18$$

answer: 18 connecting cubes

equation:  $7 + 5 + 6 = 18$

## Lesson 11

1 Sample work and equation shown.

b 

w 

answer: 7 connecting cubes

equation:  $16 - 9 = 7$

## Lesson 12

1 Sample work and equation shown.

$\underline{\quad} - 11 = 4$

11 

answer: 15 bars

equation:  $11 + 4 = 15$

## Lesson 13

1 Sample work shown.

6 

$6 + \underline{\quad} = 14$

$14 - 6 = \underline{\quad}$

## Lesson 14

1 Sample work and equation shown.

C 

D 

answer: 15 crayons

equation:  $9 + 6 = 15$

## Lesson 15

1 Sample work and equation shown.

$7 + 5 = 7 + 3 + 2$

$10 + 2 = 12$

answer: 12 points

equation:  $7 + 5 = 12$

## English

## Español

### A

**a one/ones** An amount that has a value of 1. The plural of one is ones.



**a ten/tens** A group of 10 ones. The plural of ten is tens.



**add** To combine numbers to find the sum.

**una unidad/unidades** Una cantidad que tiene un valor de 1. El plural de unidad es unidades.



**una decena/decenas** Un grupo de 10 unidades. El plural de decena es decenas.



**sumar** Combinar números para hallar la suma.

## English

## Español

## D

**difference** The amount you get when you subtract one number from another.

$$10 - 6 = 4$$

**digit** Any of the numbers 0 through 9.

**diferencia** La cantidad que obtienes cuando restas un número a otro.

$$10 - 6 = 4$$

**dígito** Cualquiera de los números del 0 al 9.

## E

**estimate** A guess you make about a value based on what you know.

**estimación, estimar**  
Suposición que haces acerca de un valor basándote en lo que sabes.

## F

**fewer**



fewer



**menor cantidad**



menor cantidad

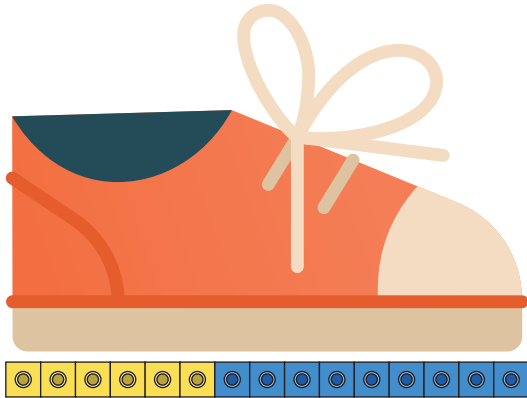


## English

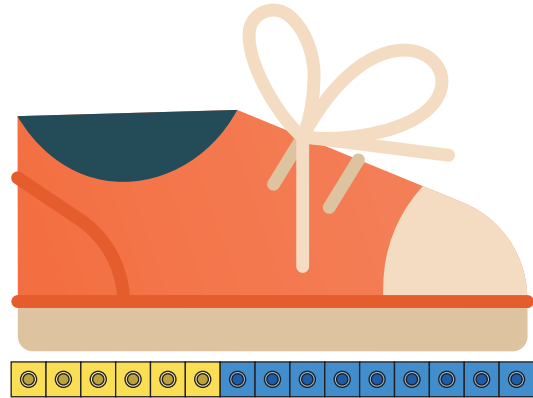
## Español

### L

**length** How long an object is from endpoint to endpoint. It is measured in same-length units.



**longitud** Cuán largo es un objeto de un extremo a otro. Se mide en unidades de una misma longitud.



**longer**



**más largo**



### M

**more**



**mayor cantidad**



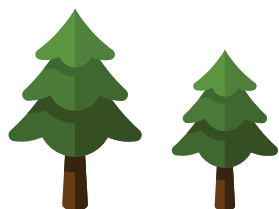
## English

## Español

## S

**shorter**

shorter



shorter

**subtract** Find the difference between numbers.**sum** The total when 2 or more numbers are added.

$$8 + 6 = 14$$

**más corto/más bajo**

más corto



más bajo

**restar** Hallar la diferencia entre números.**suma** El total cuando se suman 2 o más números.

$$8 + 6 = 14$$

## T

**taller**

taller

**más alto**

más alto