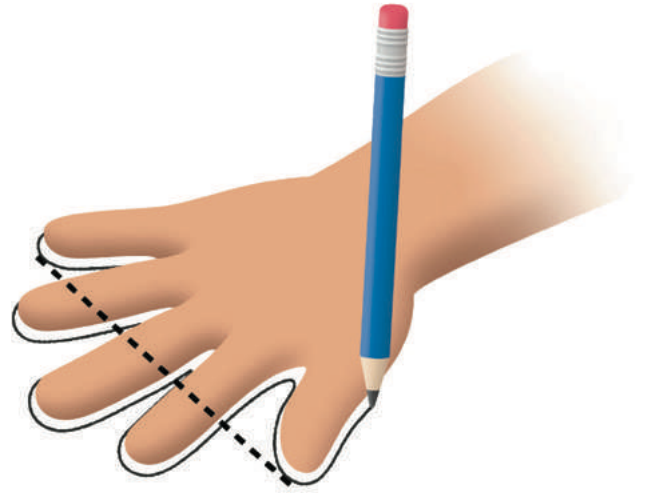


Measuring Length



Student Workbook



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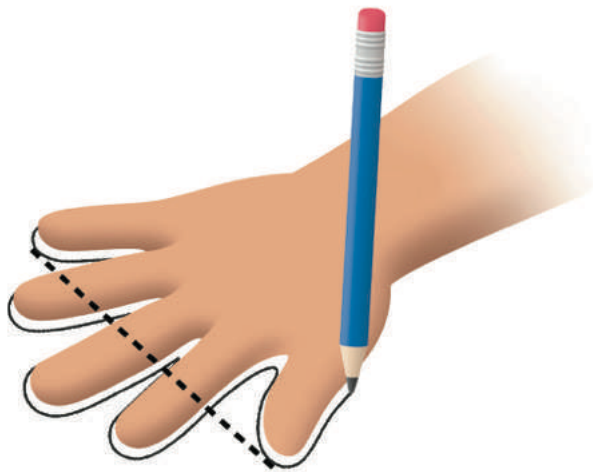
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Measuring Length

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Measuring Length
Student Workbook
Core Knowledge Mathematics™

Lesson 1: Standard Units of Measure

- Let's measure length.

Warm-up: What Do You Know About Measuring?

What do you know about measuring?



1.1: Priya's Pet



Use straws to measure the string that shows how long Priya's iguana is.

Priya's iguana is _____ straws long.

1.2: Use a Standard Unit

Use the cubes to measure Priya's string.

1. Priya's iguana is _____ cubes long.
2. Compare your measurement with another group.

Lesson 2: Measure in Centimeters

- Let's measure in centimeters.

Warm-up: Notice and Wonder: Centimeters

What do you notice? What do you wonder?

A



B



2.1: Length in Centimeters

1. Measure the length of the bearded dragon using the single centimeter cubes.

The bearded dragon is _____ centimeter cubes long.

2. Measure the bearded dragon using the 10-centimeter tool.

The bearded dragon is _____ 10-centimeter tools long.

3. How many centimeters long is the bearded dragon?

The bearded dragon is _____ centimeters long.

2.2: Measure with 10-centimeter Tools

1. Measure the length of each reptile in centimeters.

a. _____ cm

b. _____ cm

c. _____ cm

d. _____ cm

2. Compare your measurements with your partner's measurements.

3. How much longer is the day gecko than the threadsnake?

Lesson 3: Create and Use a Ruler

- Let's create rulers and use them to measure and compare lengths in centimeters.

Warm-up: Number Talk: Subtract Two Digits

Find the value of each expression mentally.

- $63 - 3$

- $63 - 20$

- $63 - 23$

- $63 - 24$

3.1: Create a Ruler

1. Use your tools to make a ruler that shows lengths in centimeters.
2. Compare your ruler with your partner's ruler.

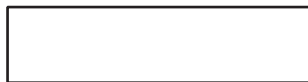
3.2: Measure and Compare Lengths

1. Use your ruler to measure the length of each rectangle. Don't forget to label your measurements.

A



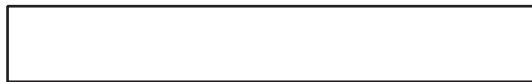
B



C



D



E



F



2. How many centimeters longer is rectangle A than rectangle B?

3. How many centimeters longer is rectangle F than rectangle D?

4. Which two rectangles are the longest? How long would the rectangle be if you joined them together?

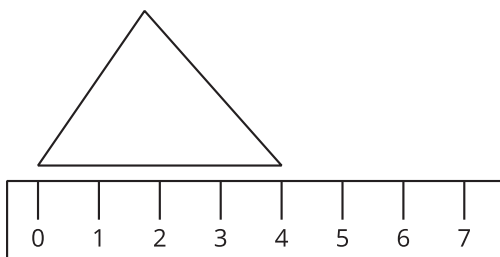
Lesson 4: Measure and Estimate in Centimeters

- Let's estimate and measure in centimeters.

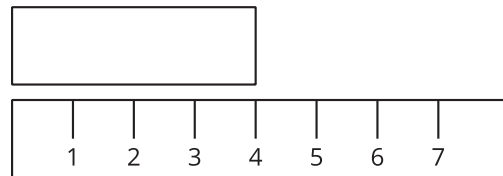
Warm-up: Which One Doesn't Belong: Length

Which one doesn't belong?

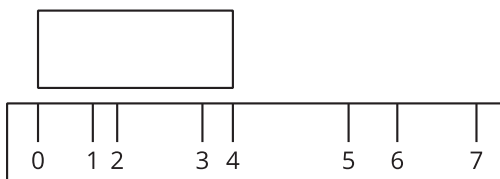
A



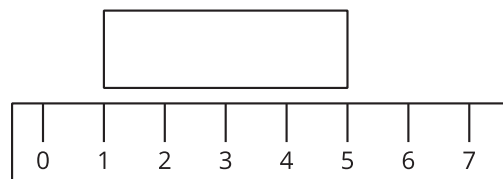
B



C



D



4.1: Estimate Length in Centimeters

1. Record an estimate that is:

too low	about right	too high

2. Record an estimate that is:

too low	about right	too high

3. Record an estimate for each object on the recording sheet.

4. Tell your partner why you think your estimates are “about right.”

Recording Sheet

object	estimate	measurement
Choose an object:		

4.2: Measure and Compare

1. Measure each object on your recording sheet. Record each length in centimeters.
2. Compare your measurements to your estimates.

Lesson 5: Measure in Meters

- Let's measure length in meters.

5.1: Reptiles to Measure

Each length of tape on the floor represents the length of a reptile.

A: gila monster



B: baby alligator



C: baby cobra



D: komodo dragon



1. Measure to find the length of each reptile. Don't forget the unit.

- a. What is the length of a gila monster?
- b. What is the length of a baby alligator?
- c. What is the length of a baby cobra?
- d. What is the length of a komodo dragon?

5.2: Measure with a Meter Stick

D: komodo dragon

E: adult alligator



F: adult cobra

G: ribbon snake



1. Measure the length of the komodo dragon in meters.
2. What is the same or different about your measurements for the komodo dragon from Activity 1 and Activity 2?

3. Measure each reptile in centimeters or meters. Don't forget the units.

a. How long is an adult alligator?

b. How long is an adult cobra?

c. How long is a ribbon snake?

Lesson 6: Compare Reptile Lengths in Story Problems

- Let's solve story problems about reptile lengths.

Warm-up: Number Talk: Fives and Tens

Find the value of each expression mentally.

- $5 + 5$

- $15 + 5$

- $15 + 15$

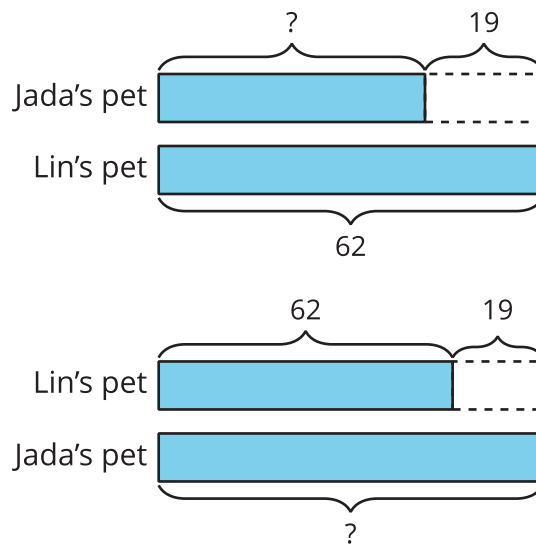
- $15 + 25$

6.1: Whose Pet is Longer?

1. Lin's pet lizard is 62 cm long. It is 19 cm shorter than Jada's. How long is Jada's pet lizard?

a. Whose pet is longer? _____

b. Circle the diagram that matches the story.



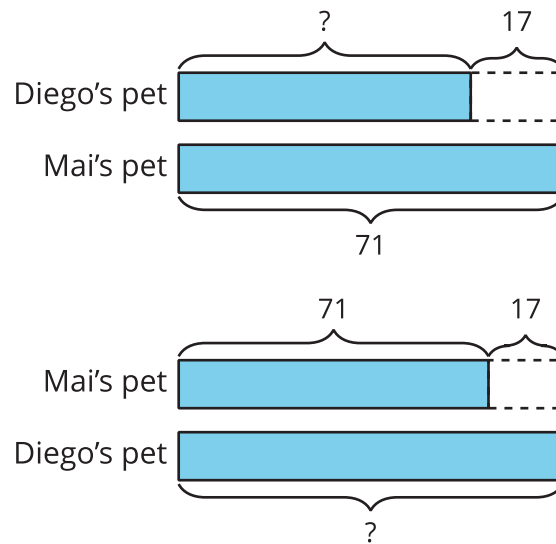
c. Solve. Show your thinking.

Jada's pet lizard is _____ cm long.

2. Diego and Mai have pet snakes. Mai's snake is 17 cm longer than Diego's. Mai's snake is 71 cm. How long is Diego's pet snake?

a. Whose pet is shorter? _____

b. Circle the diagram that matches the story.



c. Solve. Show your thinking.

Diego's pet snake is _____ cm long.

6.2: Guess My Reptiles

Partner A's reptiles

1. day gecko, 28 cm



2. komodo dragon, 98 cm



3. baby cobra, 46 cm



4. iguana, 65 cm



Partner B's reptiles

1. ribbon snake, 83 cm



2. gila monster, 55 cm



3. baby alligator, 71 cm



4. ringneck snake, 38 cm



1. Choose one reptile from your list and one reptile from your partner's list.
2. Fill in the blanks to create a story problem using the lengths of the reptiles you picked. Then share your sentences with your partner.

My reptile is _____ cm long.

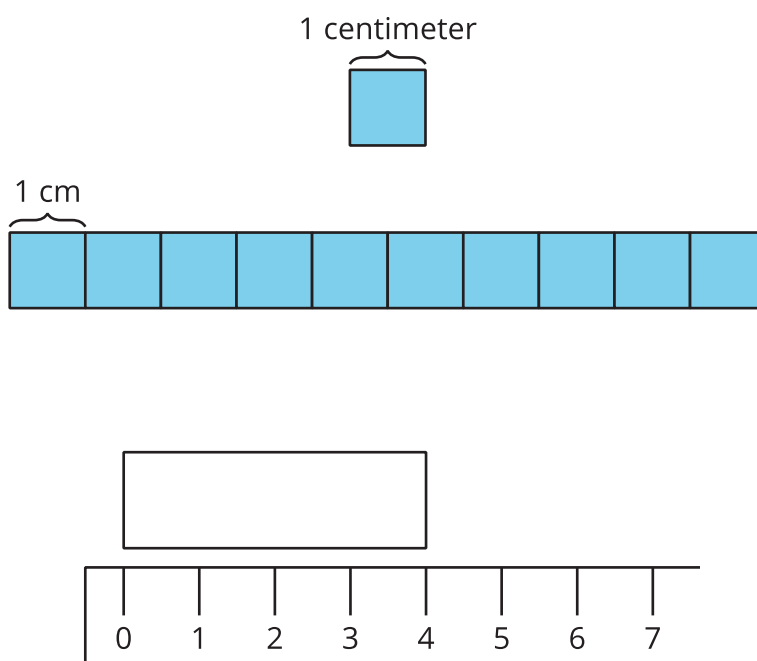
It is _____ cm _____(shorter/
longer) than one of your reptiles.

3. Which reptiles did your partner pick? Show your thinking.

Section Summary

Section Summary

In this section, we measured the length of objects using different length units. We learned that the **centimeter** is a standard length unit and we measured lengths in centimeters using base-ten blocks, rulers, and meter sticks. We learned that rulers represent length units using tick marks to show a length from zero.



We also learned that a meter is a length unit in the metric system that is longer than a centimeter. When measuring longer lengths, it is easier to use a meter stick. A meter has the same length as 100 centimeters.

Lesson 7: Center Day 1

- Let's estimate the length of an object and then measure it.

Warm-up: Number Talk: Subtract from 37

Find the value of each expression mentally.

- $37 - 20$

- $37 - 21$

- $37 - 17$

- $37 - 16$

7.2: Centers: Choice Time

Choose a center.

Estimate and Measure



Math Stories

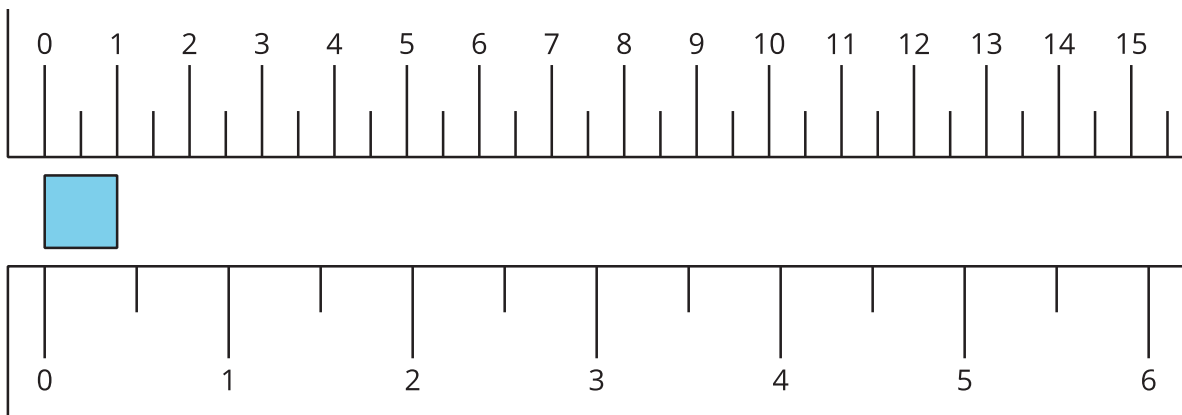


Lesson 8: What is an Inch?

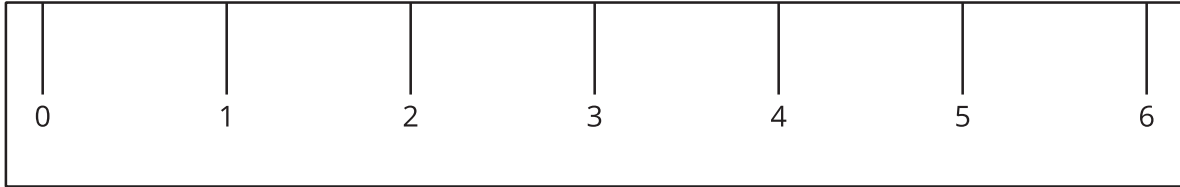
- Let's measure in inches.

Warm-up: Notice and Wonder: Inches and Centimeters

What do you notice? What do you wonder?



8.1: What is an Inch?



1. Find 2 items that are about an inch long.

a. _____

b. _____

2. Measure the length of each object.

object to measure	length in inches
marker	
colored pencil	
11 connecting cubes	
a book	
your choice objects:	

8.2: Measure the Sides of Shapes

1. Here is a rectangle.



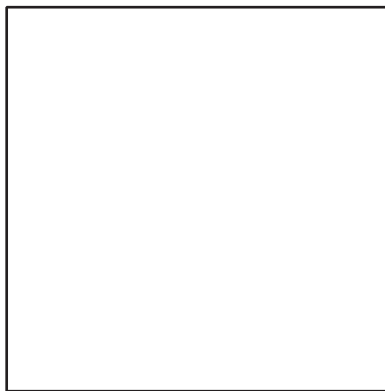
How long is the long side of the rectangle in inches?

Estimate: _____

Measure the long side of the rectangle.

Actual length: _____

2. Here is a square.



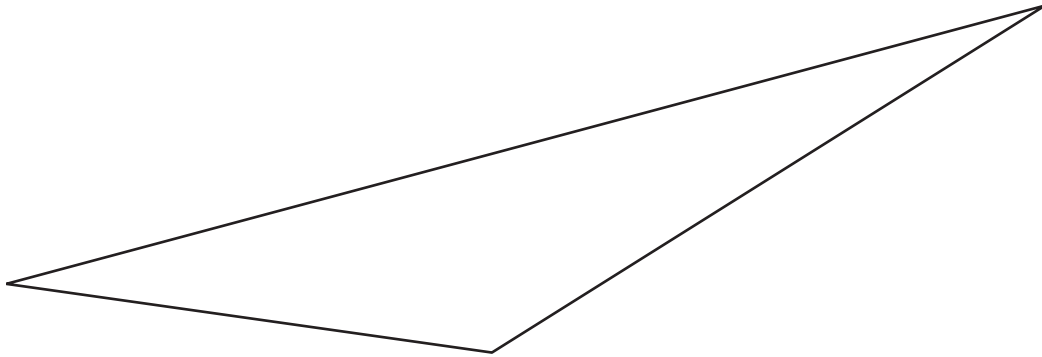
How long is a side of the square in inches?

Estimate: _____

Measure one side of the square.

Actual length: _____

3. Here is a triangle.



How long is the longest side of the triangle in inches?

Estimate: _____

Measure the longest side of the triangle.

Actual length: _____

Lesson 9: From Feet to Inches

- Let's measure longer lengths with customary units.

Warm-up: Estimation Exploration: Small Fry, Big Fish

How long is this Cobia fish in inches?



1. Record an estimate that is:

too low	about right	too high

2. Record an estimate that is:

too low	about right	too high

9.1: Measure the Length of Fish

1. Work with your group to measure the tape strips around the classroom in feet. Then measure the length in inches.

Tape A

largemouth bass



Length in feet: _____

Length in inches: _____

Tape B

spiny dogfish shark

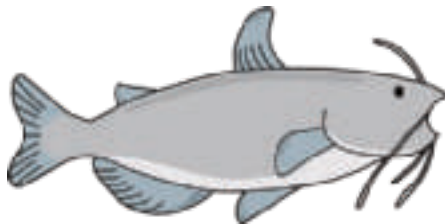


Length in feet: _____

Length in inches: _____

Tape C

catfish

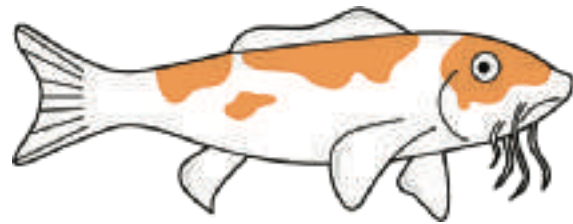


Length in feet: _____

Length in inches: _____

Tape D

koi



Length in feet: _____

Length in inches: _____

2. What did you notice about the number of feet compared to the number of inches when you measured the tape strips?

9.2: Inches or Feet?

1. Estimate the length of objects around the room. Say if you will measure in inches or feet.

object to measure	my estimate	circle inches or feet
		inches feet
		inches feet
		inches feet
		inches feet

2. Choose the best tool to measure each object. Complete the table to record your actual measurements.

object to measure	measurement tool	actual length (include unit)

Lesson 10: Measure with a Torn Tape

- Let's measure without starting at 0.

Warm-up: True or False: Constant Difference

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $10 - 0 = 12 - 2$

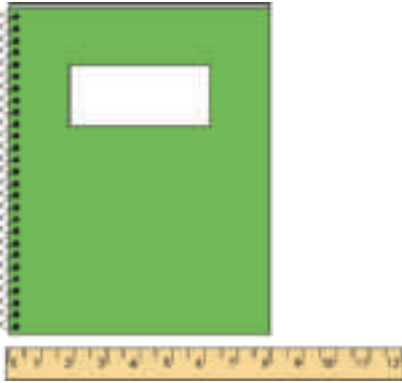
- $8 - 4 = 10 - 6$

- $12 - 4 = 10 - 3$

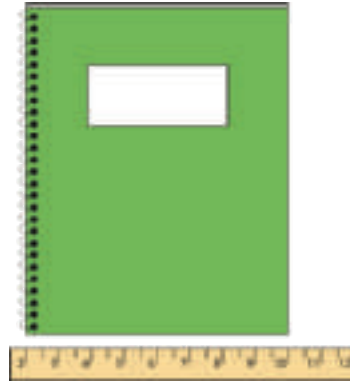
- $15 - 2 = 13 - 0$

10.1: The Notebook Problem

Jada and Han used an inch ruler to measure the short side of a notebook.



Han says 8 inches.



Jada says 8 inches.

1. How did Han and Jada get the same measurement?

2. Write an equation that could show Jada's thinking.

3. Measure an object using Jada's method.

- I measured a _____.
- I started with the number _____.
- I ended with the number _____.
- Equation: _____.
- The length of my object is _____.

4. What do you notice about you and your partner's measurements?

10.2: A Desktop to Measure

Lin is measuring her desktop in inches.

1. What is the length of the long side of the desktop? Show your thinking using drawings, numbers, or words.



Equation: _____

The long side of the desktop is _____.

2. What is the length of the short side of the desktop? Show your thinking using drawings, numbers, or words.



Equation: _____

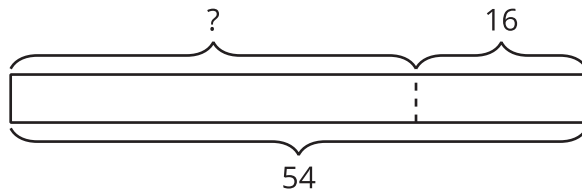
The short side of the desktop is _____.

Lesson 11: Saree Silk Stories: Necklaces and Bracelets

- Let's solve story problems about length.

Warm-up: Notice and Wonder: Take From

What do you notice? What do you wonder?



$$54 - 16 = ?$$

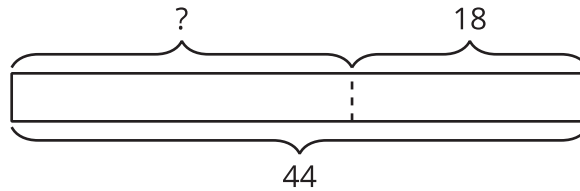
11.1: Saree Silk Ribbon Necklaces



What do you notice? What do you wonder?

Priya had a ribbon that was 44 inches long. She cut off 18 inches. How long is Priya's ribbon now?

Andre drew this diagram to help him think about the problem.



1. What does the “?” represent in the story?

2. Why do you think there is a dotted line between the parts?

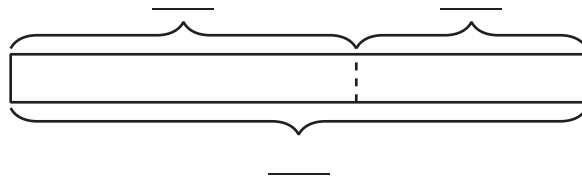
3. Find the unknown value. Show your thinking.

4. Priya's ribbon is _____ long.

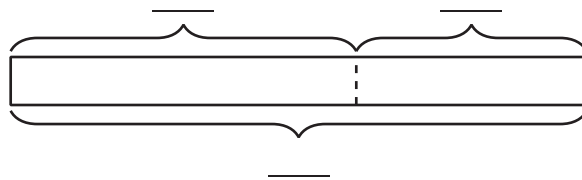
11.2: Saree Silk Ribbon Projects

Label the diagram. Find the unknown value. Show your thinking and don't forget the units.

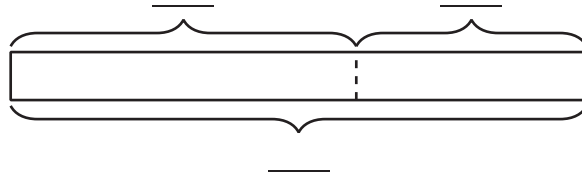
1. Elena started with 58 inches of ribbon. She gave Clare 27 inches of ribbon. How much ribbon did Elena keep for herself?



2. Han had a piece of ribbon that was 64 inches long. He cut off 28 inches to make a necklace for his sister. How much ribbon is left?



3. Priya cut off 25 inches of ribbon. She has 38 inches of ribbon left. How much ribbon did Priya start with?



Lesson 12: Saree Silk Stories: Friendship Bracelets

- Let's solve two-step story problems about length.

Warm-up: True or False: Place Value Comparisons

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $24 = 10 + 14$

- $15 + 12 = 27$

- $26 = 10 + 6 + 10$

- $58 = 20 + 20 + 8$

12.1: Share Ribbon with Friends



1. Solve. Show your thinking. Use a diagram if it helps. Don't forget the units.

a. Lin found a piece of ribbon that is 92 cm long. She cut a piece for Noah that is 35 cm. How much ribbon does Lin have left?

b. Then, Lin cut off 28 cm of ribbon for Jada. How much ribbon does Lin have left now?

12.2: Friendship Bracelets and Gifts



1. Solve. Show your thinking. Don't forget the units. Use a diagram if it helps.

a. Han has 82 inches of ribbon. He only needs 48 inches. How much should he cut off?

b. Han gives the ribbon he doesn't need to Clare. Clare uses it to make her ribbon longer. Her ribbon was 27 inches. How long is Clare's ribbon now?

2. Solve. Show your thinking. Don't forget the units. Use a diagram if it helps.

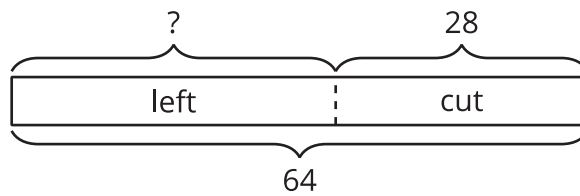
a. Andre's ribbon is too short. He has 28 inches of ribbon, but he needs it to be 50 inches long. How much more ribbon does he need?

b. Andre got the ribbon he needed from Mai. Mai now has 49 inches of ribbon left. How much ribbon did Mai start with?

Section Summary

Section Summary

In this section of the unit, we learned more about standard length units. We measured using inches and feet—two length units from the the U.S. customary system. We also solved two-step story problems about length and interpreted diagrams that represent taking a part away. This diagram shows that we know the length of the ribbon and how much was cut. The question mark represents the length of ribbon that is left.



Han had a piece of ribbon that was 64 inches long. He cut off 28 inches to make a necklace for his sister. How much ribbon is left?

Lesson 13: Center Day 2

- Let's complete equations and continue to estimate and measure.

Warm-up: Number Talk: Use Ten to Add

Find the value of each expression mentally.

- $58 + 10$

- $58 + 12$

- $58 + 13$

- $67 + 14$

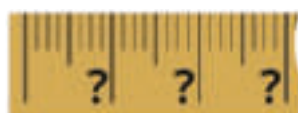
13.2: Centers: Introduce Number Puzzles, Within 100 with Composing

Choose a center.

Number Puzzles

$$14 = 8 + \square$$

Estimate and Measure



Target Measurements

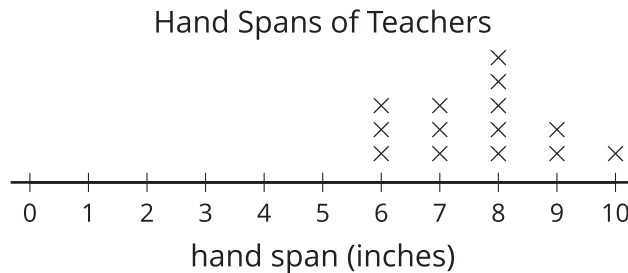
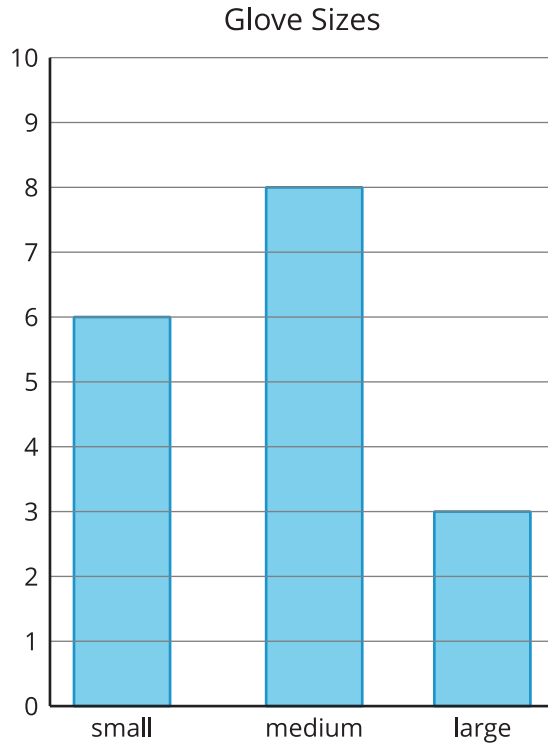


Lesson 14: What is a Line Plot?

- Let's learn a new way to represent data.

Warm-up: Notice and Wonder: "Handy" Graphs

What do you notice? What do you wonder?



14.1: Measure Our Hand Spans

1. Trace your hand. (Spread your fingers wide.)
2. Draw a line from your thumb to your pinky. This line represents your hand span. Measure the length of your hand span in inches.

My hand span is _____ inches.



Lesson 15: Create Line Plots

- Let's represent data in line plots.

Warm-up: Number Talk: Subtraction within 50

Find the value of each expression mentally.

- $47 - 20$

- $47 - 24$

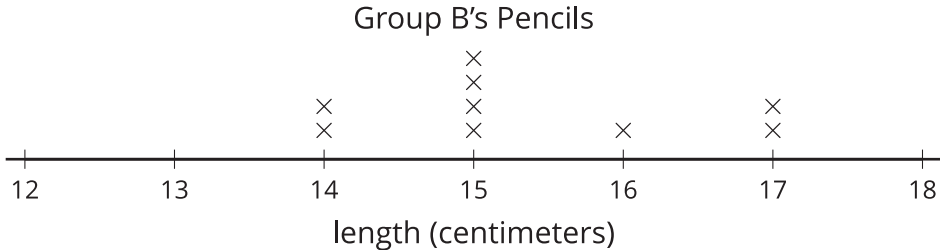
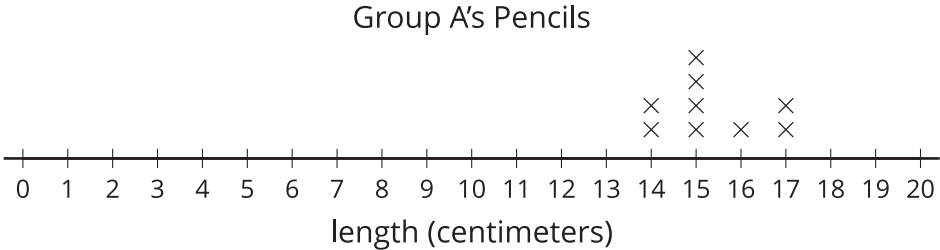
- $36 - 10$

- $36 - 15$

2. Create a line plot to represent the lengths of all the pencils in your group.



15.2: Plot Pencil Lengths



Use this data to create a line plot.

Group C	pencil length (centimeters)
Andre	12
Clare	10
Diego	10
Elena	10
Han	13
Jada	12
Kiran	14
Noah	16
Priya	14
Tyler	13



Lesson 16: Interpret Measurement Data

- Let's represent and make sense of data in line plots.

Warm-up: Number Talk: Addition within 50

Find the value of each expression mentally.

- $15 + 5 + 1$

- $25 + 6$

- $16 + 7$

- $37 + 6$

16.1: The Plant Project

Use the data in this table to create a line plot.

Group B	plant heights (centimeters)
Andre	33
Clare	25
Diego	27
Elena	25
Han	35
Jada	33
Kiran	26
Noah	30
Priya	26
Tyler	33

16.2: Interpret Measurement Data on a Line Plot

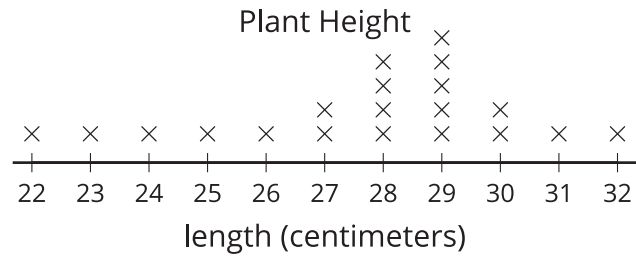
The Plant Project

Answer the questions based on your line plot.

1. What was the shortest plant height?
2. What was the tallest plant height?
3. What is the difference between the height of the tallest plant and the shortest plant? Write an equation to show how you know.



Answer the questions based on Han's line plot.



4. Han looked at this line plot and said that the tallest plant was 29 centimeters. Do you agree with him? Why or why not?

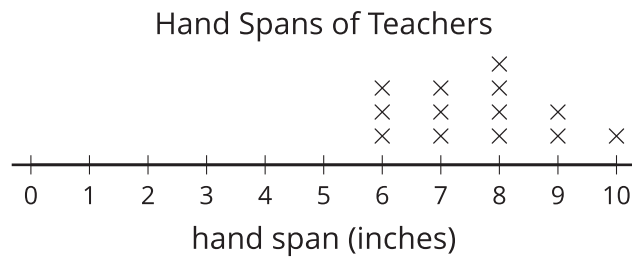
5. How many plants were measured in all?

6. Write a statement based on Han's line plot.

Section Summary

Section Summary

In this section of the unit, we learned about a new kind of graph. A **line plot** is a way to show how many of each measurement using an x for each measurement. The line and the numbers on it represent the units used to measure. Line plots for length look like a ruler or parts of a tape measure. We made our own line plots and used them to answer questions about the data represented.



From this line plot, we learn that 4 teachers have a handspan of 8 inches because there are 4 Xs above the 8.

Lesson 17: Center Day 3

- Let's measure to create line plots and add and subtract within 100.

Warm-up: Number Talk: Subtract from a Multiple of 10

Find the value of each expression mentally.

- $60 - 10$

- $60 - 11$

- $60 - 21$

- $70 - 32$

17.2: Centers: Choice Time

Choose a center.

Estimate and Measure



Number Puzzles

$$14 = 8 + \square$$

Target Measurements



Lesson 18: Make a Yard Stick

- Let's make a yardstick.

Warm-up: Number Talk: Threes and Fives

Find the value of each expression mentally.

- $3 + 5$

- $5 - 3$

- $5 - 3 + 5$

- $3 + 5 + 3 + 3$

18.1: Make a Yardstick

Your teacher will give you a rectangle. The long side of the rectangle measures 5 inches and the short side measures 3 inches.

Use the card to make a yardstick that shows all inch marks from 1 to 36 inches.

18.2: Compare Yardsticks

Measure the height of your desk using your yardstick.

Draw an x on your sticky note and add your measurement to the class line plot.

Use the completed line plot to answer the following questions:

1. What do you notice? What do you wonder?

2. What is the tallest measurement for the desks in the room?
3. What is the shortest measurement?
4. Find the difference between the tallest and the shortest measurements. Show your thinking.

18.3: Measure Your Arms

1. Measure the length of your hands from the wrist to the top of your middle finger.

a. hand length partner A: _____

b. hand length partner B: _____

2. Measure the length of your forearms from the outside of your elbow to your wrist.

a. forearm length partner A: _____

b. forearm length partner B: _____

3. Write two equations using the measurements in your group and write two statements describing what the equations tell you.

a. Equation 1: _____

Statement:

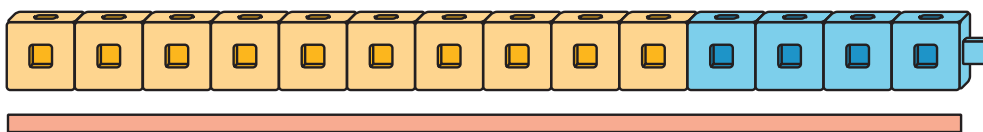
b. Equation 2: _____

Statement:

Section A: Practice Problems

1. Pre-unit

How many connecting cubes long is the rectangle?



2. Pre-unit

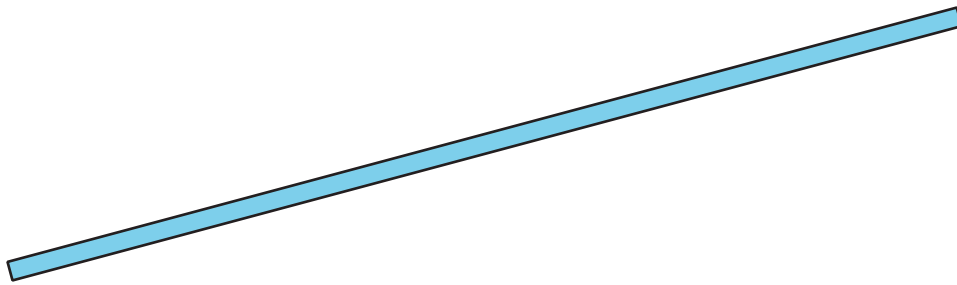
Jada has 16 red counters. She has 7 fewer yellow counters than red counters. How many yellow counters does Jada have? Show your reasoning with words, pictures, or numbers.

3. Pre-unit

A



B



C



a. Which rectangle is the longest?

b. Which rectangle is the shortest?

4. Pre-unit

Find the value of each expression.

a. $52 + 30$

b. $38 + 9$

c. $35 + 16$

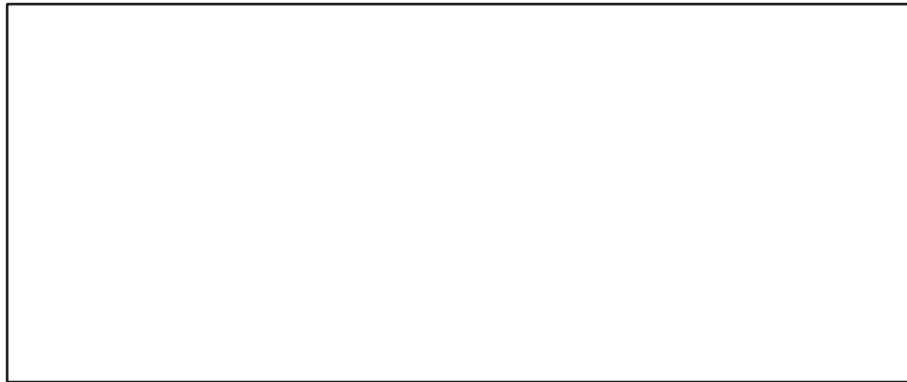
d. $85 - 7$

5. How many centimeters long is each rectangle?



(From Unit 3, Lesson 1.)

6. Here is a rectangle.

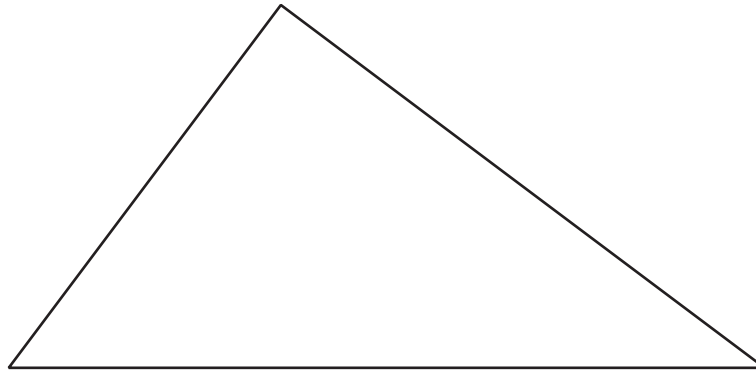


a. How many centimeters wide is the rectangle?

b. How many centimeters tall is the rectangle?

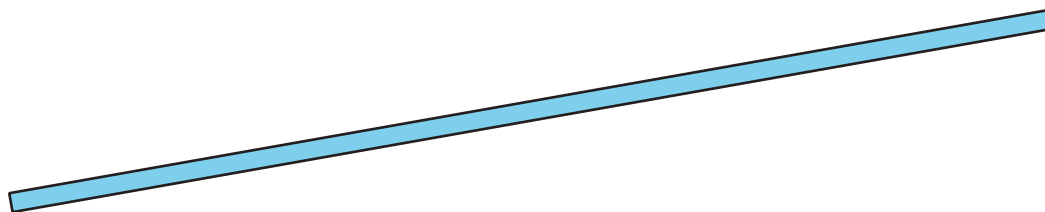
(From Unit 3, Lesson 2.)

7. How many centimeters long is each side of the triangle? Label each side.



(From Unit 3, Lesson 3.)

8. Here is a rectangle.



a. Estimate how many centimeters long the rectangle is.

_____ cm

b. Measure the rectangle and record the measurement.

_____ cm

c. How does your estimate compare to the actual length?

(From Unit 3, Lesson 4.)

9. A python is a snake that grows up to 9 meters in length.
- Is the python longer or shorter than the animals you measured?

- Is the python longer or shorter than the alligator and adult cobra together?

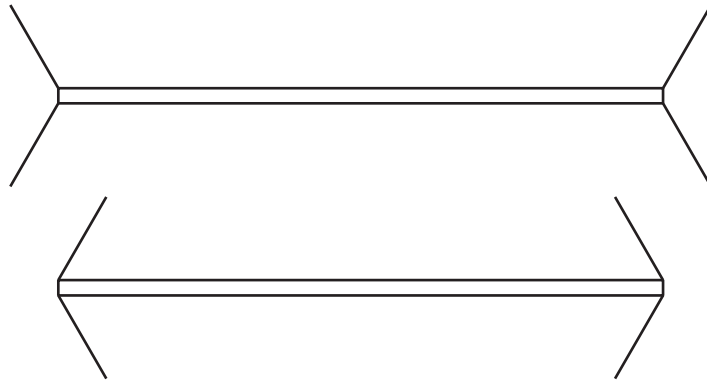
(From Unit 3, Lesson 5.)

10. Andre's snake is 85 centimeters long. His lizard is 28 centimeters long. How many centimeters longer is Andre's snake than his lizard? Show your thinking.

(From Unit 3, Lesson 6.)

11. Exploration

Here are 2 rectangles.



- Which rectangle do you think is longest?
- Measure with a centimeter ruler to check your guess.

12. Exploration

- Look for objects in the classroom that are about 1 centimeter long. Measure them and see how close they are to 1 centimeter.
- Look for objects in the classroom that are about 1 meter long. Measure them and see how close they are to 1 meter.

Section B: Practice Problems

1. a. What do you know about inches?

- b. What is the length of the rectangle in inches?



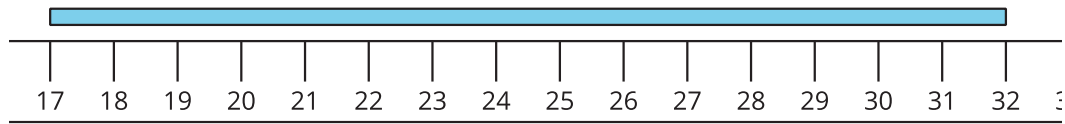
(From Unit 3, Lesson 8.)

2. a. An adult hippopotamus is 13 units long. Are the units inches or feet? Explain your reasoning.

- b. A piece of chalk is 2 units long. Are the units inches or feet? Explain your reasoning.

(From Unit 3, Lesson 9.)

3. a. What is the length of this rectangle in centimeters?



- b. Write an equation to show your thinking.

(From Unit 3, Lesson 10.)

4. Mai is making a headband from a piece of fabric. The fabric is 71 centimeters long. Mai cuts off 18 centimeters of the fabric. How many centimeters long is the fabric that is left?

(From Unit 3, Lesson 11.)

5. a. Diego has a piece of ribbon that is 95 centimeters long. He cuts off a piece that is 28 centimeters long. How much ribbon does Diego have left?

- b. Then Diego cuts off another piece that is 39 centimeters long. How much ribbon does Diego have left now?

(From Unit 3, Lesson 12.)

6. Exploration

Complete the table with objects in the classroom or at home that you think will match the given measurements.

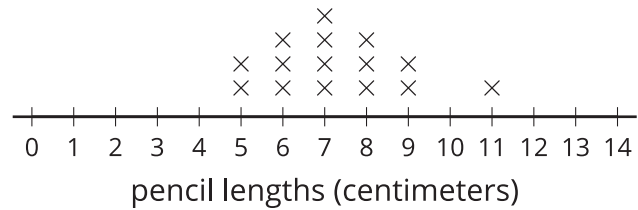
Object I measured	Estimated Measurement	Actual Measurement
	7 centimeters	
	7 inches	
	7 feet	
	7 meters	

7. Exploration

If all of your classmates stand side to side with your arms stretched out, about how long of a line do you think you can make? Explain your reasoning including the unit of measure you choose.

Section C: Practice Problems

1. The line plot shows the lengths of some pencils in centimeters.



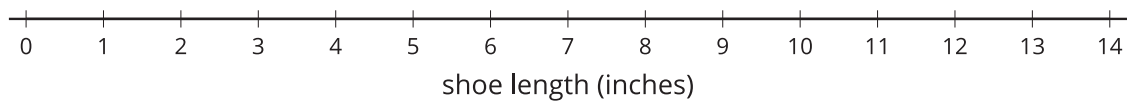
a. How long is the longest pencil? How long is the shortest?

b. What is the most common pencil length?

(From Unit 3, Lesson 14.)

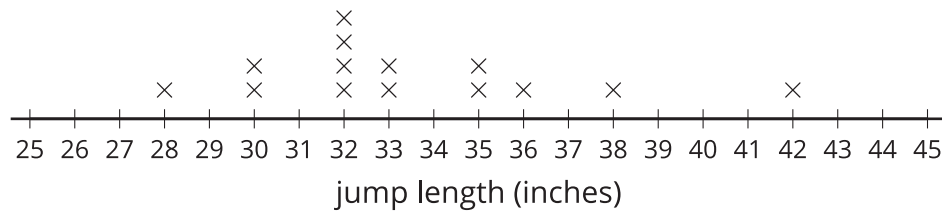
2. The table shows the lengths of different students' shoes in inches. Complete the line plot with the shoe length data.

Student	Shoe length in inches
Andre	7
Clare	7
Diego	8
Elena	8
Lin	6
Mai	7
Tyler	9



(From Unit 3, Lesson 15.)

3. The line plot shows the lengths some students jumped in inches.



a. What is the longest jump? What about the shortest?

b. How much longer is the longest jump than the shortest jump?

c. How many measurements are shown in the graph?

(From Unit 3, Lesson 16.)

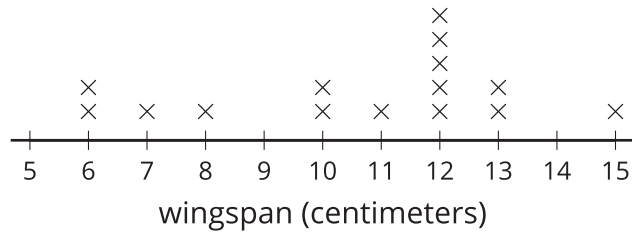
4. **Exploration**

Create and label a line plot for foot lengths so that all of these statements are true:

- a. There are 7 total foot lengths.
- b. The most common foot length measured was 6 inches.
- c. The difference between the longest foot and the shortest foot was 4 inches.

5. Exploration

Here are wingspans of some butterflies in Diego's collection.



Diego still has 2 more lengths to record. Which of these could change when Diego records these lengths? Explain your reasoning.

- a. The most common measurement
- b. The total number of measurements
- c. The longest measurement
- d. The shortest measurement

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