Be CALM

Measurement and Data

Beginning Curriculum for Adults Learning Math

STUDENT PACKET

Public Adult Education of MA
LIVE TO LEARN

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Because math and science build futures

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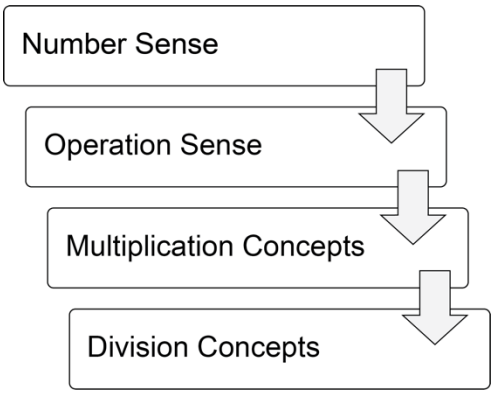
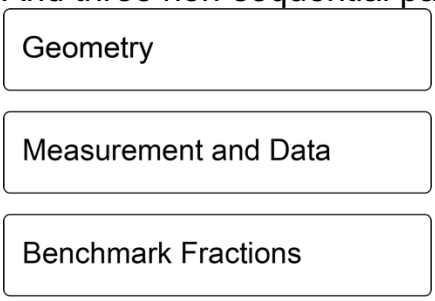
The BeCALM series includes four sequential packets:



And three non-sequential packets:



Pages 34 & 35 “Measure and Compare”

Page 37 “Background on the Metric System” adapted from Investigations

Page 38 “Metric Scavenger Hunt”

Page 39 “My Sizes in Metric”

[NOTE: The presented content is for example only, and may not appear in the same format (or order) as the original publication.]

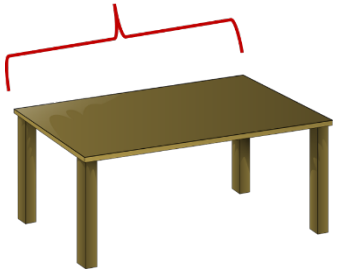
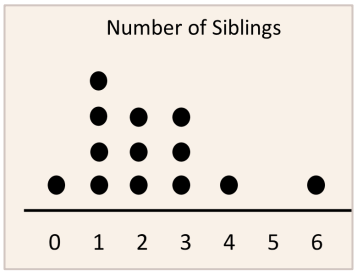
UNIT 1: Steps and Directions

In this unit, you will learn about some basic ideas in measurement and data.

Think and share:

A time when you got lost trying to get somewhere.

Vocabulary List for This Unit

Word	Definition	Example
unit (of length)	What you _____ when you are measuring Must be the same _____ to be useful	
length	How _____ something is in one direction	
dot plot	A dot plot has numbers along the bottom, and one _____ for each time that number appears in the data	
data	Measurements or counts of things in the real world	

Word	Definition	Example
median	When you put all of the _____ in order, the median is the number in the _____.	
range	The difference between the _____ data point and the _____ data point	

Talking about Quantity

Quantity means “how many of something”

Name	Number of steps to walk across the room
Anhad	12
Carmen	14
Rose	15
Patrick	17

These examples compare the quantity of steps:

1. Anhad took the least steps.
2. Carmen took more steps than Anhad.
3. Rose took fewer steps than Patrick.
4. Patrick took the most steps.

Talking about Length

Patrick

shortest step

Carmen

Anhad

longest step

These examples compare the size or length of the steps:

- Patrick's steps are shorter than Carmen's.
- Anhad's steps are longer than Patrick's.
- Patrick's steps are the shortest.
- Anhad's steps are the longest.

Large Steps

Name	Number of steps

Who took the most steps?

Who took the least steps?

Who took the longest steps? How do you know?

Small Steps

Name	Number of steps

Who took the most steps?

Who took the least steps?

Who took the shortest steps? How do you know?

Vocabulary Review 1

Word Bank:			
unit	length	dot plot	data

Fill in the blank with the correct vocabulary word.

1. The example above is using square tiles as a

   _____.

2. The _____ of the tape dispenser is 6 tiles.

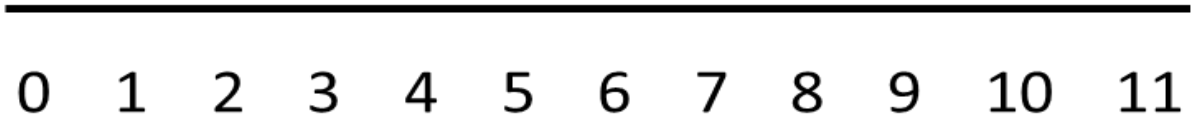
3. If you want to know how tall each student in the class is, you will have to collect _____.

4. This is an example of a _____. Each dot represents one person. Each dot is placed over the number of hours that person slept.

Siblings Dot Plot

How many siblings (brothers and sisters) do you have?

Name	Number of siblings



Robot Directions

Write directions from your starting point to your target.

Write one direction on each line. Each line should tell the robot a number of steps to take or to turn.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Vocabulary Review 2

Word Bank:			
dot plot	data	median	range

Fill in the blank with the correct vocabulary word.

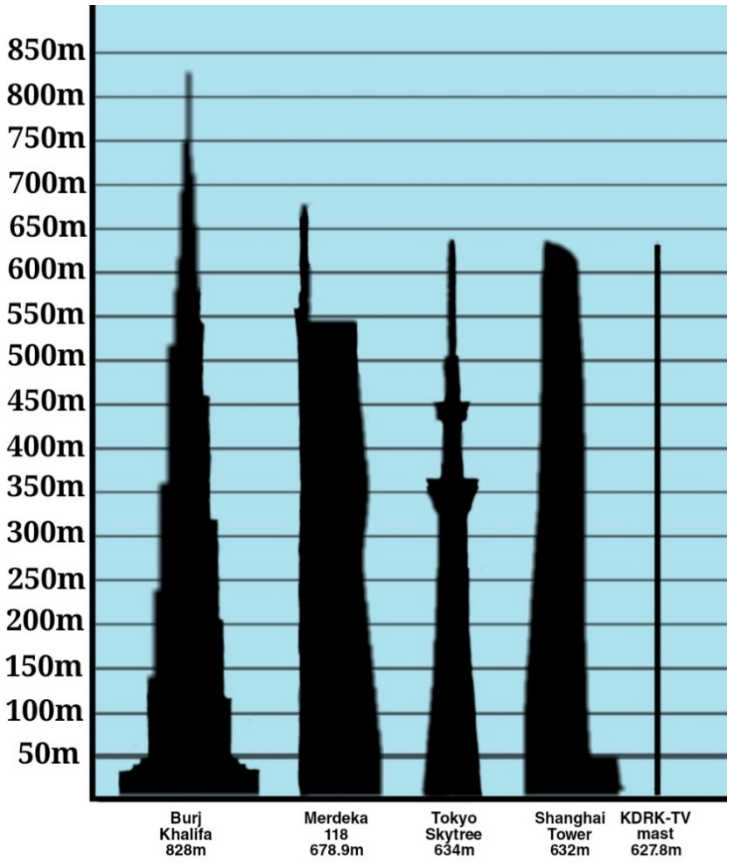
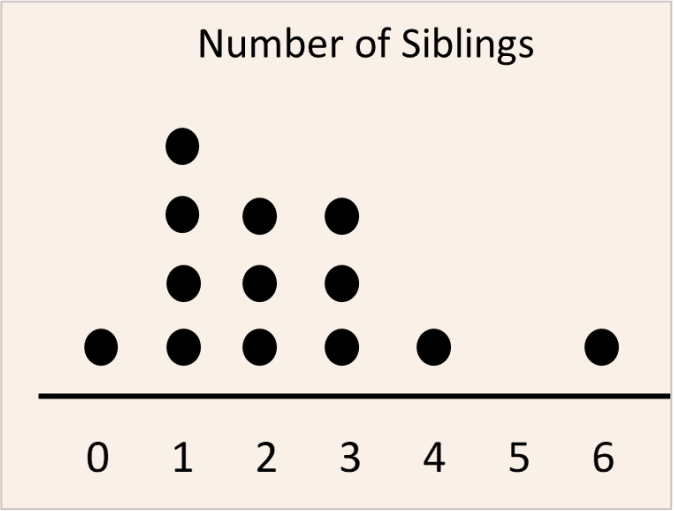


Image credit: Wofwhineoffire, CC BY-SA 4.0 via Wikimedia Commons

1. The picture above shows the five tallest buildings in the world (in 2023). The height of the Tokyo Skytree is the _____ for this group.



2. This is a _____ showing the number of siblings each person in a class has.

3. The _____ for this set of data is 6.

4. A dot plot is a way of looking at _____ to help us understand it better.

Health Literacy: Children's Growth Charts

When children are young, doctors keep track of their height and growth. Sometimes, a doctor will say that a child is in a certain "percentile" for height.

The 50th percentile is another name for the median. This means that it is a middle value. If a child is in the 50th percentile for height, that means that half of the children their age are taller than they are, and half of the children are shorter.

If the percentile is higher than 50, the child is in the taller half of children their age.

If the percentile is lower than 50, the child is in the shorter half of children their age.

Median Height of Girls by Age (Data from CDC)

Age (years)	Median Height (50^{th} percentile) in inches
2	33
3	37
4	40
5	42
6	45
7	48

Exit Ticket/Homework

The class counted how many steps it took each person to walk down the hall.

Name	Number of steps
Maria	25
Jose	21
Fatima	29
Jamal	19

Who had the longest steps? How do you know?

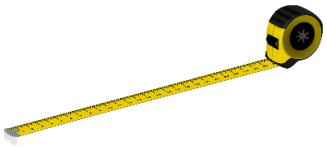
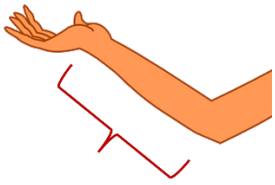
UNIT 2: Measuring Length

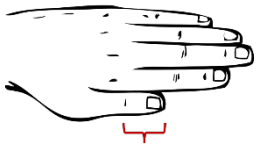
In this unit, you will learn how to measure length using different measurement tools, including rulers, yardsticks, and tape measures. You will learn to use and estimate with different units, including feet, inches, and centimeters.

Think and share:

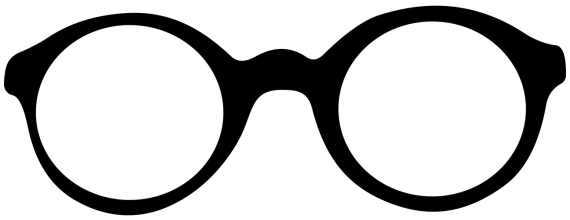
A time when you had to measure or estimate the length of something.

Vocabulary List for This Unit

Word	Definition	Example
ruler	A measuring tool Used to measure the _____ of small objects	
yardstick	A measuring tool Used to measure the _____ of medium objects	
measuring tape	a measuring tool used to measure the _____ of longer objects or spaces	
foot (feet)	A measurement unit Contains _____ inches	

Word	Definition	Example
inch	A measurement unit _____ of them make one foot	
metric system	A system of measurements that uses _____ and _____ to measure length	

Who Is Right?



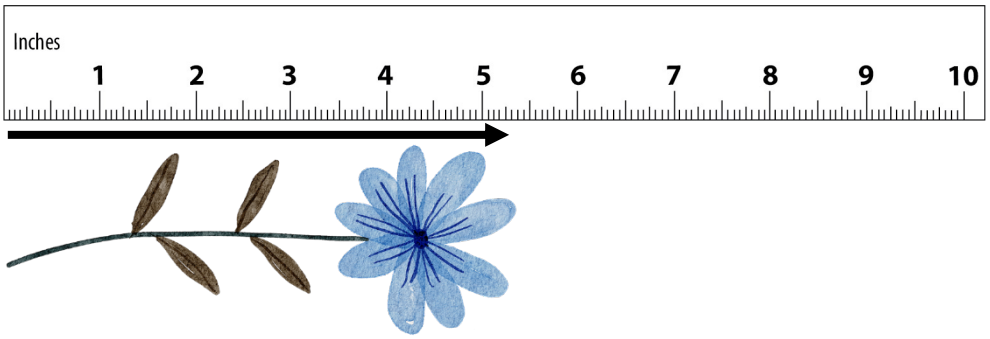
Marcel said, “The glasses are about 6 inches long.”

Diana said, “No, they are about 7 inches long.”

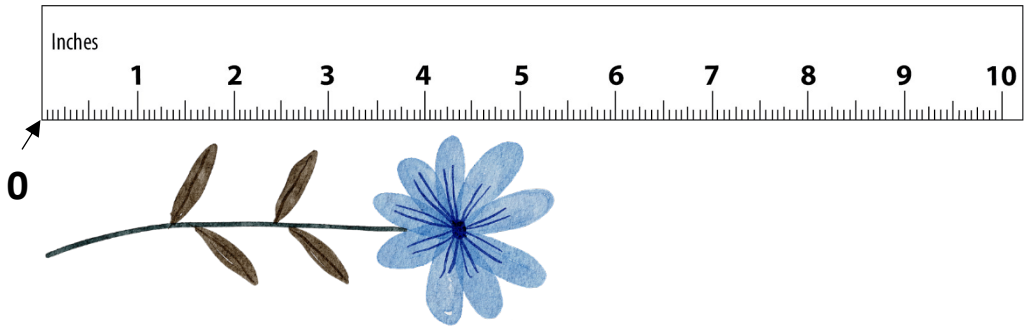
Who is right? Why?

Notes on Using a Ruler

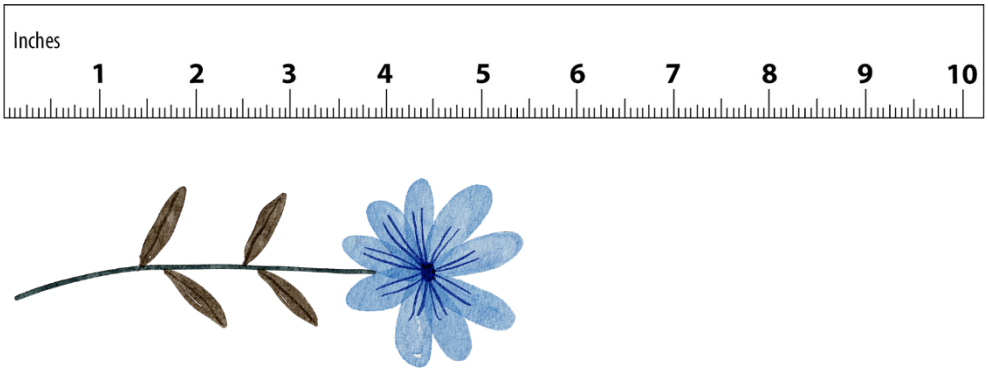
Point the ruler in the same direction as the length that you want to measure.



Start measuring at the 0 on the ruler. It might not be labeled.



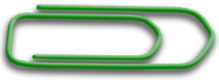
Choose the inch (the labeled number) closest to the end of the length.

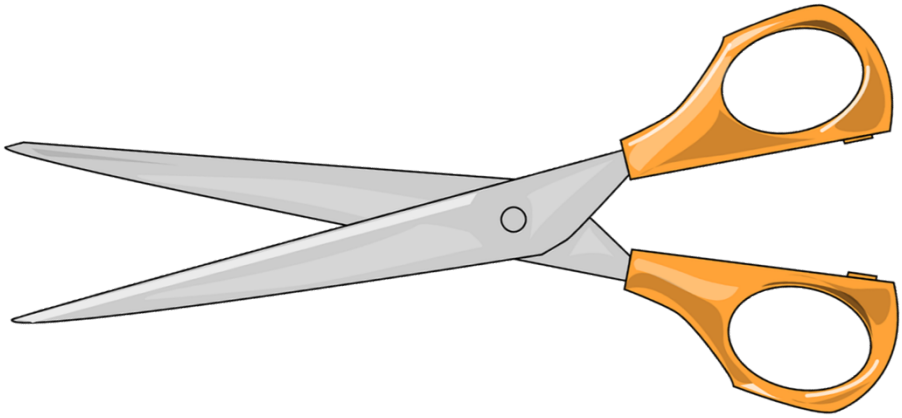


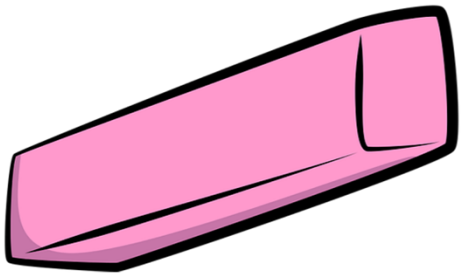
Classroom Measurements – Small Objects

Object	Length (inches)

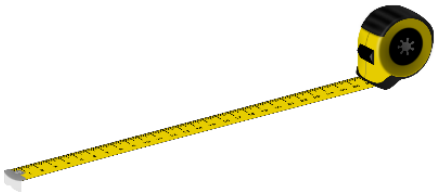
Classroom Measurements – Small Objects (Remote)







Classroom Measurements – Large Objects



Object	Length (inches)

Vocabulary Review 3

Word Bank:		
ruler	yardstick	measuring tape
feet	inches	

Fill in the blank with the correct vocabulary word.

1. Phil wants to buy a new couch. First, he needs to use a _____ to measure how much space he has in his living room.

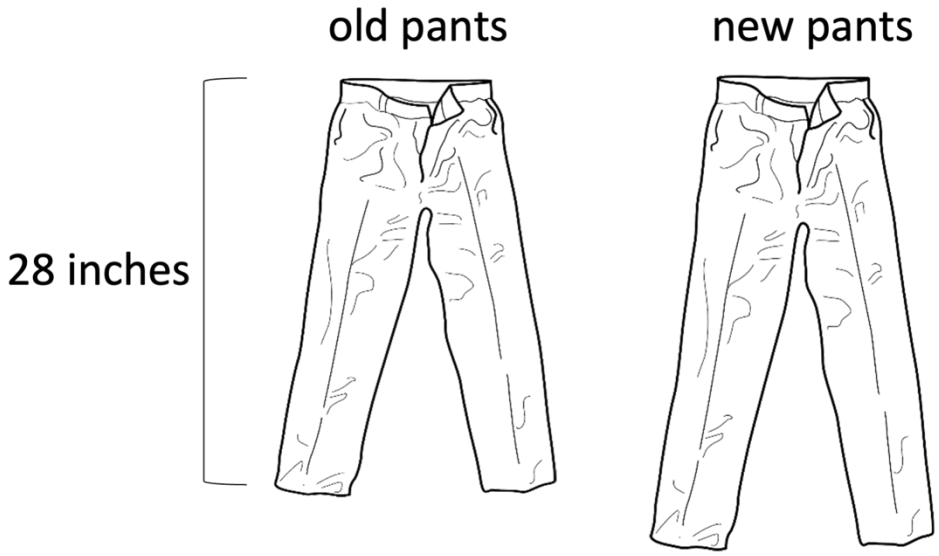
2. Phil needs a couch that is no more than 9 _____ long.

3. Ellen is buying a new cell phone. She wants it to be the same size as her old cell phone. She measures her cell phone with a _____.

4. Ellen's cell phone is 6 _____ long.

5. Melissa uses a _____ to measure the height of her dog.

Who Is Right?

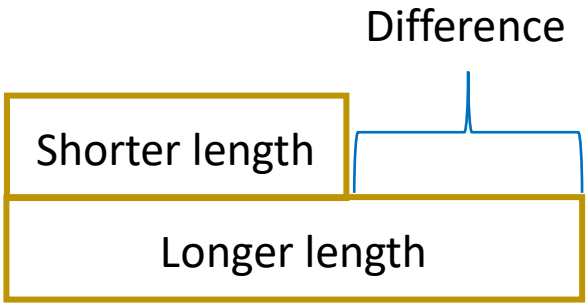


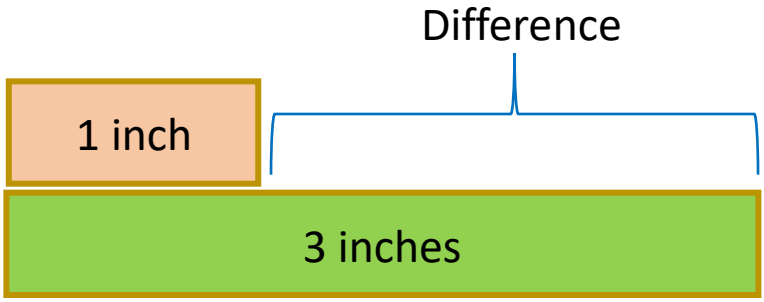
Linh: The legs on these new pants are 4 inches longer than the legs on my old pants.

Ariam: Your old pants were 28 inches long. There is no way that the new pants are only 4 inches long.

Comparing Lengths: Difference

Sometimes we want to compare the length of two things. We want to talk about <u>how much longer or shorter</u> one of them is than the other. This is called the **difference**.



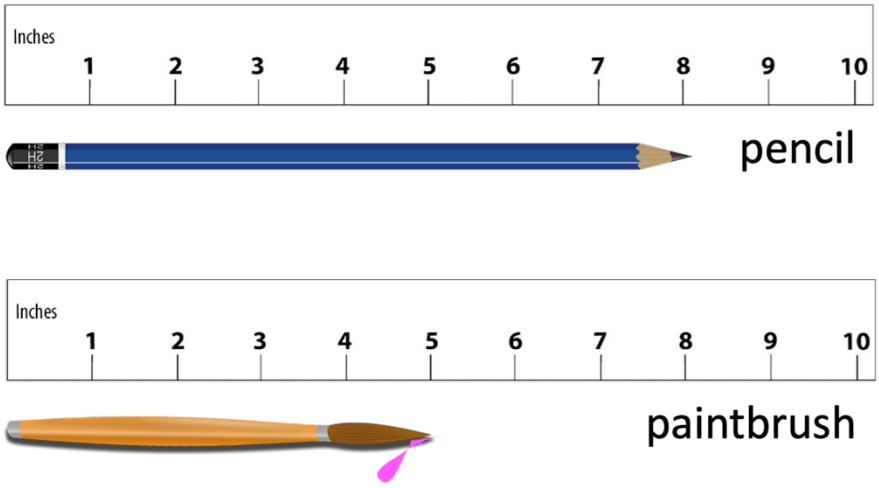


The **length** of the shorter rectangle is 1 inch.

The **length** of the longer rectangle is 3 inches.

The **difference** between the rectangles is 2 inches.

Asking for the Difference



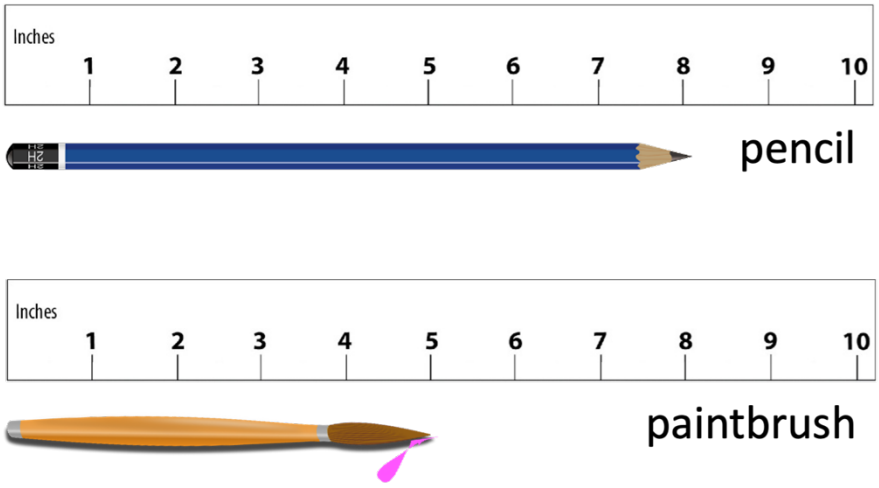
What is the difference between the two objects? ____ inches

How much	longer shorter	is	…	than	…?

How much longer is the pencil than the paintbrush?

How much shorter is the paintbrush than the pencil?

Comparing Lengths: Examples



How much longer is the pencil? _____

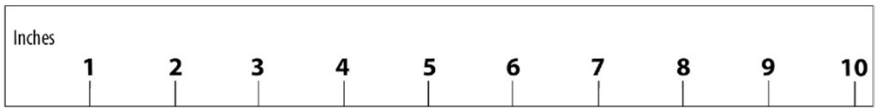
(difference)

…	is	[difference]	longer shorter	than	…

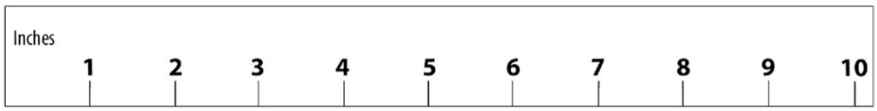
The pencil is 3 inches **longer** than the paintbrush.

The paintbrush is 3 inches **shorter** than the pencil.

Comparing Lengths: Practice 1



bee



grasshopper

How much shorter is the bee than the grasshopper?_____

(difference)

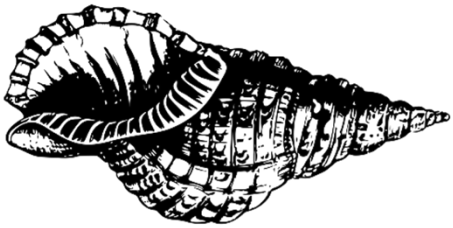
Fill in the blanks.

...	is	[difference]	longer shorter	than	...

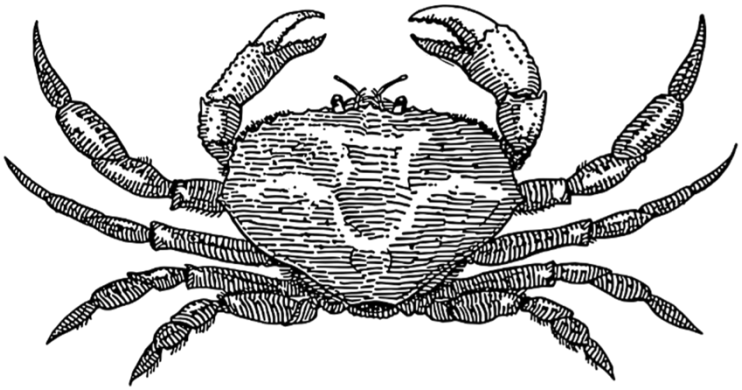
The _____ is _____ shorter than the _____.

The _____ is _____ longer than the _____.

Comparing Lengths: Practice 2



shell



crab

How much shorter is the shell than the crab? _____

(difference)

Fill in the blanks.

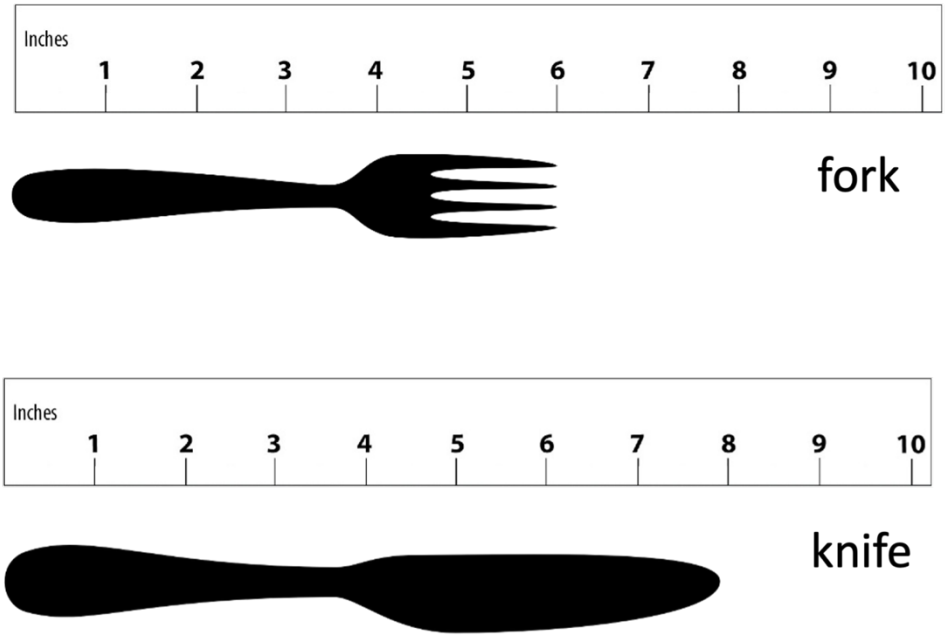
…	is	[difference]	longer shorter	than	…

The _____ is _____ shorter than the _____.

The _____ is _____ longer than the _____.

Two Truths and a Lie

Which statement is the lie?



A) The fork is 6 inches shorter than the knife.

B) The knife is 2 inches longer than the fork.

C) The fork is 2 inches shorter than the knife.

More Practice Comparing Lengths

Write 3 sentences to compare the lengths of different objects.

Example:

The paper clips are _1 inch_ longer than the pushpins.

(difference)

1.

2.

3.

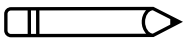
Measure and Compare

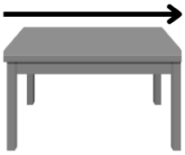
1. Measure each of these things. Write down your measurements.
2. Write a sentence saying how much bigger one thing is than the other. Show or tell how you figured it out.

ID card 

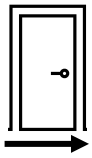
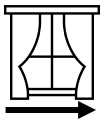
marker 

ruler 

pencil 

length of table 

length of bookshelf 

height of a chair 	height of a table 
width of a dictionary 	length of your reading book 
width of the door 	width of a window 

Introduction to Metric Measurements

Most countries in the world use the metric system. Scientists all use the metric system so that they can easily compare results. Because of this, scientists in the U.S. know the metric system, but many other U.S. citizens do not.

Source: Federal Highway Administration - MUTCD, Public domain, via Wikimedia Commons

Liberia is another country that uses the U.S. Standard System of measurement. Freed slaves from the United States helped to found the country of Liberia in the early 1800s. They brought the US measurement system with them. It is still used in Liberia today.

The United States has tried to change to the metric system. Americans did not want to change because it is difficult to learn a new system, and it can be expensive. In the 1980s, there was a major effort to change to the metric system. For a short time, speed limit signs had both kilometers and miles per hour. This attempt by the U.S. government failed. The U.S. still uses U.S. Standard measurements today.

Metric Scavenger Hunt

Things that are 1 meter long and 1 centimeter long

Things I found that are about 1 meter long:

Things I found that are about 1 centimeter long:

My Sizes in Metric

distance around your head =

_____ cm

(Fasten your "head string" to this sheet of paper with tape.)

height =

_____ cm

sleeve length = _____ cm

pants length = _____ cm

foot length = _____ cm

Image by Clker-Free-Vector-Images from Pixabay

Health Literacy: Talking About Height

In the US, an adult's height is usually given in feet and inches. Sometimes a child's height is given in inches only.

Unit	Plural	Abbreviation	Symbol
foot	feet	ft	'
inch	inches	in	"

Roberta is 5' 2".

Roberta is five feet, two [inches].

Practice:

Take turns reading each sentence out loud to a partner.

Read the symbols and abbreviations as regular words.

1. My husband is 6' 3". He is the tallest person in my family.
2. I am 5' 2".
3. My son is 42" tall.
4. My father is 5'10". He is taller than me.
5. My daughter is 36" tall. She is the shortest.

Problem Solving: Ordering Uniforms

Mariana needs to order school uniforms for her children. She is looking at the size chart below.

Children's Uniform Shirts

	Size	Age	Height	Weight
XS (4/5)	4	3-4 yr	39"-41"	33-37
XS (4/5)	5	4-5 yr	42" - 44"	38-42
S (6/7)	6	5-6 yr	45" - 46.5"	43-48
S (6/7)	7	6-7 yr	47 - 49.5"	49-57
M (8)	8	7-8 yr	50" - 52"	50-67
L (10/12)	10	9-10 yr	53" - 55.5"	68-77
L (10/12)	12	11-12 yr	56" - 58.5"	78-87
XL (14/16)	14	12-13 yr	59" - 61"	88-97
XL (14/16)	16	14 yr and up	62" - 64"	98 and up
XXL (18/20)	18	14 yr and up	65" - 66.5"	98 and up
XXL (18/20)	20	14 yr and up	67" - 69"	98 and up

Her children have the following ages and measurements:

Milo	(age 4)	Height: 41"	Weight: 40 lbs
Lacey	(age 7)	Height: 50"	Weight: 49 lbs
Persephone	(age 8)	Height: 51"	Weight: 53 lbs

What size should she order for each child? How did you decide?

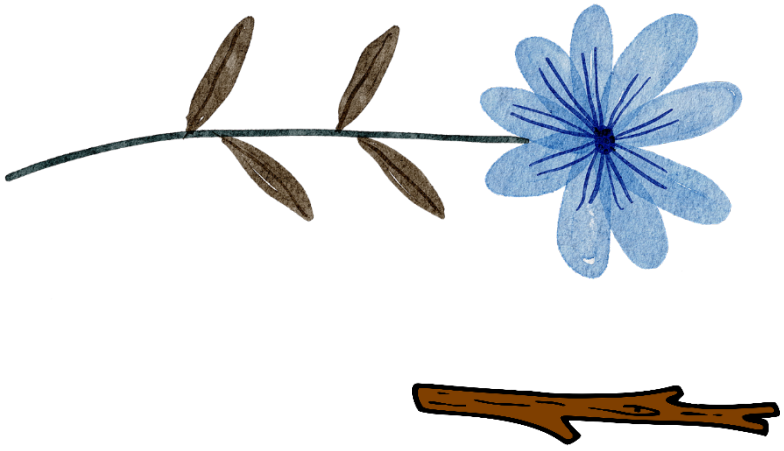
Exit Ticket/Homework

Measure the pictures in inches. Then fill in the blanks.

The flower is _____ inches long.

The stick is _____ inches long.

The _____ is ____ inches longer than the _____.



UNIT 3: Using Dimensions

In this unit, you will learn how talk about the dimensions (length, width, and height) of an object.

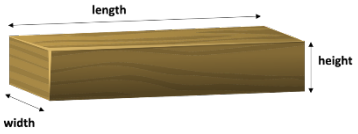
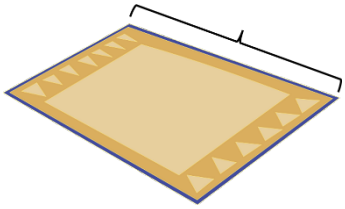
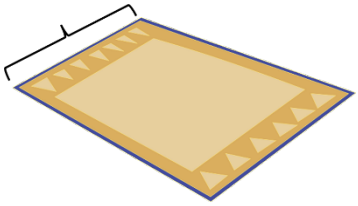
You will complete a project where you will measure the dimensions of part of your classroom and search online for a piece of furniture to fit in that space.

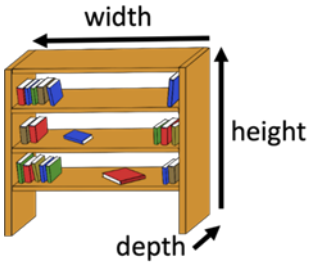
Image by MJ Jin from Pixabay

Think and share:

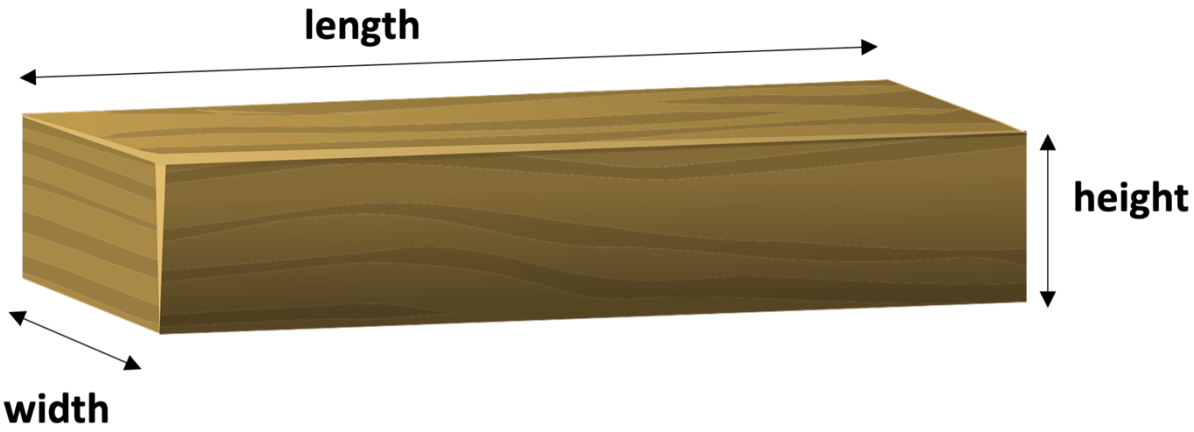
A time when you had to decide if something would fit in your home.

Vocabulary List for This Unit

Word	Definition	Example
dimensions	Measurements of an object in different directions. Usually includes _____, _____, and _____.	
length long	Often, the _____ of two dimensions.	
width wide	Often, the _____ of two dimensions.	
height high	The measurement _____	

Word	Definition	Example
depth deep	In furniture, the measurement out from the _____.	

Dimensions

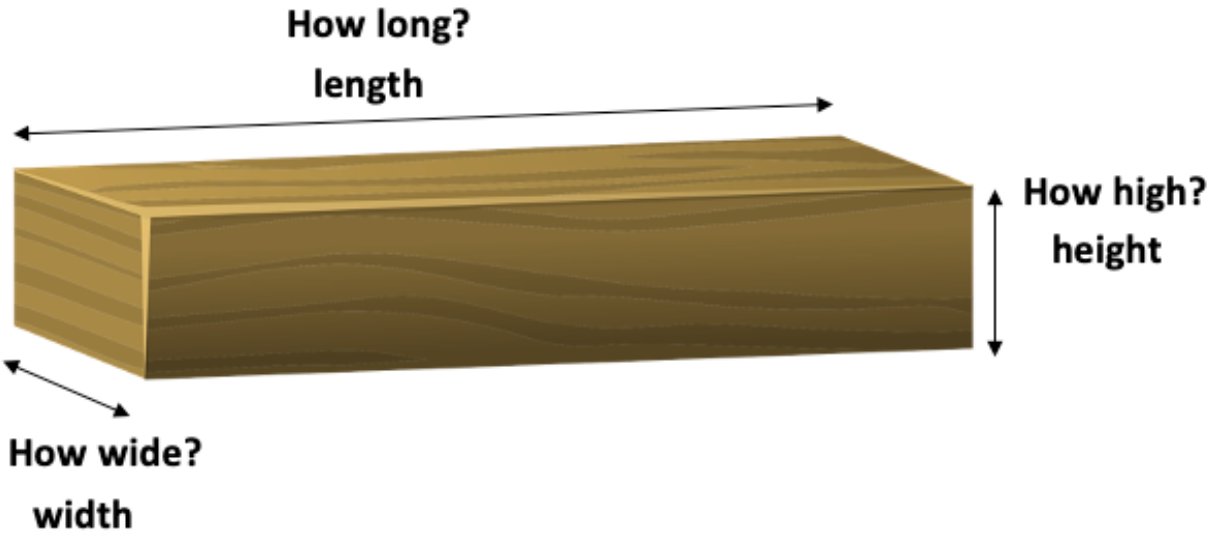


The words above are nouns. They use “the”.

The height of the tree is 30 feet.

The width of the classroom is 15 feet.

The length of the table is 8 feet.



Here are the adjective forms.

- How high is the tree? *The tree is 30 feet high.*
- How wide is the classroom? *The classroom is 15 feet wide.*
- How long is the table? *The table is 8 feet long.*

Dimensions Grammar Practice

Circle the correct word in each sentence.

1. The laptop is 15 inches (width/wide).
2. The table is 2 feet (height/high).
3. The (width/wide) of the table is 2 feet.
4. My cell phone is 6 inches (length/long).
5. The (height/high) of the building is 45 feet.
6. The (length/long) of her hair is 12 inches.

Measure Dimensions

Measure the dimensions of classroom tables and chairs to the closest foot.

The chair is _____ ft _____.

The chair is _____ ft _____.

The chair is _____ ft _____.

The table is _____ ft _____.

The table is _____ ft _____.

The table is _____ ft _____.

Now, measure the dimensions of classroom tables and chairs to the closest inch.

The chair is _____ in _____.

The chair is _____ in _____.

The chair is _____in _____.

The table is _____ in _____.

The table is _____ in _____.

The table is _____ in _____.

Review of Dimensions

Circle the correct word in parentheses to complete the sentence.

1. The table is 5 ft (length/long).
2. The (width/wide) of the bookshelf is 28 in.
3. The (height/high) of the chair is 3 ft.
4. The hallway is 100 ft (length/long).
5. How (length/long) is the classroom?
6. What is the (height/high) of the bookshelf?
7. What is the (width/wide) of the refrigerator?
8. How (width/wide) is the river?

Final Project: Buying Furniture

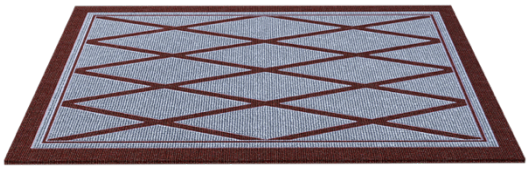
When you buy a piece of furniture for your home, you need to make sure that it will be the right size for your space. You need to measure the space you have in your room and compare this to the dimensions of the furniture you are going to buy.

For this project, you will measure part of the classroom and use a website to find a piece of furniture that will fit the space.

Part 1: Area Rug (uses length and width, uses feet)

Part 2: Bookshelf (uses width, depth, and height, uses inches)

Part 1: Area Rug



1. Your teacher will show you which part of the classroom to use. Measure the length and width of the floor that you want an area rug to cover. Measure to the nearest foot.

   Write the dimensions here.

   Width: _____

   Length: _____

2. Go to Wayfair.com. Search for “Area rugs”.

3. Find a rug that you like that would fit the space well. **Note:** Many of the rugs come in different sizes. It is ok for a rug to be a little smaller or a little larger than the floor markings.

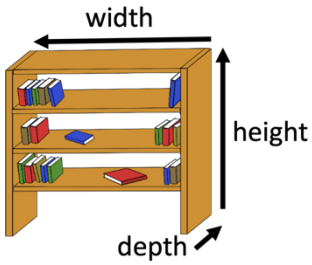
4. Write the dimensions of the rug you chose here:

   Width: _____

   Length: _____

5. Write a sentence comparing the length of your rug and the length of the floor space. For example: “Our rug is 1 foot shorter than the floor space.”

Part 2: Bookshelf



1. Your teacher will show you which part of the classroom to use. Measure the width, depth, and height of the space available for the bookshelf. Measure to the nearest inch.

   Write the dimensions here.

   Height:_____

   Width:_____

   Depth:_____

2. Go to Wayfair.com. Search for “bookshelf.”

3. On the left side, you will see an option to search by “Size.” Click that option. Make choices that will help you find bookshelves that are the right size.

4. When you look at individual bookshelves, you will have to find the information about “Dimensions.” **Note:** It is ok for a bookshelf to be a little smaller than the available space, but not larger.

5. Write the dimensions of the bookshelf you chose here:

   Height:_____

   Width:_____

   Depth:_____

6. Write a sentence comparing the width of your bookshelf and the width of the available space. For example: “Our bookshelf is 2 inches shorter than the available space.”