



At Home Learning Resources

Grade 6 - Week 5

LOWELL PUBLIC SCHOOLS

Grab and Go Meals

*Available for Lowell Public Schools Students
on Weekdays While School is Closed*

Butler (12:45 - 1:30pm) 1140 Gorham St.	Murkland (12:45 - 1:15pm) 350 Adams St.
Greenhalge (10:30 - 11:15am) 149 Ennell St.	Pawtucketville (12 - 12:30pm) 425 West Meadow Rd.
Lincoln (1:30 - 2pm) 300 Chelmsford St.	Robinson (11:30 - 11:45am) 110 June St.
Moody (12 - 12:30pm) 158 Rogers St.	STEM Academy (10:30am - 1pm) 43 Highland St. <i>Meal service at South St. entrance</i>
NEW: Morey (12 - 12:30pm) 130 Pine St.	NEW: Stoklosa (11 - 11:30am) 560 Broadway St.
NEW: Westminster Village Apartments (12.45 - 1:15pm) 1307 Pawtucket Blvd.	

When you pick up that day's lunch, you can also pick up breakfast for the next morning.

Grade 6 ELA Week 5

Read the poems. Use the chart “Ways to Talk or Think about a Poem” to talk or think about the poems. Choose one of the strategies and write a response to each poem.

After reading the poems, try writing your own poetry. What language could you include? What message do you want to leave with your readers? Why is this important to you to write about? If you want, record your poem and share with your friends or teacher.

Ways to Talk or Think About a Poem

Think about the big ideas

- What issues are in the poem?
- What does the poet want you to think about the issues?
- What is the theme of the poem?

Look at the line breaks and stanza breaks

- How do the stanzas relate to each other?
- How do you connect one part with the next part?

Make inferences

- Who/what is in this poem?
- What are their relationships, ideas, feelings, or thoughts?

Relate the title to the poem

- How is it significant?

Clarify a confusing part

- Ask questions
- Look up words
- Talk your ideas through

Examine a metaphor or other literary device

- What things are being compared in the similes or metaphors? Why?
- How do they effect the meaning of the poem?

Make a personal connection

On Turning Ten

The whole idea of it makes me feel
like I'm coming down with something,
something worse than any stomach ache
or the headaches I get from reading in bad light –
a kind of measles of the spirit,
a mumps of the psyche,
a disfiguring chicken pox of the soul.

You tell me it is too early to be looking back,
but that is because you have forgotten
the perfect simplicity of being one
and the beautiful complexity introduced by two.
But I can lie on my bed and remember every digit.
At four I was an Arabian wizard.
I could make myself invisible
by drinking a glass of milk a certain way.
At seven I was a soldier, at nine a prince.

But now I am mostly at the window
watching the late afternoon light.
Back then it never fell so solemnly
against the side of my tree house,
and my bicycle never leaned against the garage
as it does today,
all the dark blue speed drained out of it.

This is the beginning of sadness, I say to myself,
as I walk through the universe in my sneakers.
It is time to say good-bye to my imaginary friends,
time to turn the first big number.

It seems only yesterday I used to believe
there was nothing under my skin but light.
If you cut me I would shine.
But now when I fall upon the sidewalks of life,
I skin my knees. I bleed.

- Billy Collins

Tysheen Stanton

The way I look at things is
You have to shoot for a goal,
Figuratively.
You have to run around,
Or through your opponent,
Literally.
You have to
Stand tall,
Move fast,
Play hard,
While everyone on the sidelines is
Looking at your every move.
You have to grab the ball,
Or the world,
With two hands
And jam that sucker home.
You watch me today at the tryouts.
I'm ready to step up to a whole new level.
Basketball is my life.
It's the only game in town.
It's the only thing I know.

- Mel Glenn (from *Jump Ball: A Basketball Season In Poems*)

Kind

I hadn't noticed
till a death took me outside
and left me there
that grass lifts so quietly
to catch everything
we drop and we drop
everything.

-Leonard Nathan

Summertime Sharing

Nikki Grimes

Danitra sits hunched on the stoop and pouts.
I ask her what there is to pout about.
“Nothin’ much,” she says to me,
but then I see her eyes following the ice cream man.

I shove my hand into my pocket
and find the change there where I left it.
“Be right back,” I yell, running down the street.
Me and my fast feet are there and back in just two shakes.

Danitra breaks the Popsicle in two and gives me half.
The purple ice trickles down her chin. I start to laugh.
Her teeth flash in one humongous grin,
telling me she’s glad that I’m her friend without even saying a word.

Ode to Family Photographs

Gary Soto

This is the pond, and these are my feet.
This is the rooster, and this is more of my feet.

Mama was never good at pictures.

This is a statue of a famous general who lost his arm,
And this is me with my head cut off.

This is a trash can chained to a gate,
This is my father with his eyes half-closed.

This is a photograph of my sister
and a giraffe looking over her shoulder.

This is our car's front bumper.
This is a bird with a pretzel in its beak.
This is my brother Pedro standing on one leg on a rock,
With a smear of chocolate on his face.

*Mama sneezed when she looked
Behind the camera: the snapshots are blurry,
The angles dizzy as a spin on a merry-go-round.*

But we had fun when Mama picked up the camera.
How can I tell?
Each of us is laughing hard.
Can you see: I have candy in my mouth.

Read “Ode to My Socks” by Pablo Neruda. This is an example of an Ode. An ode celebrates something ordinary as quite special. Try writing your own ode to something you love or cherish using the directions below.

Use these guidelines when working on your odes:

- Pick an ordinary place or thing.
- Give your subject praise or thanks. (*Oh, _____!*)
- Speak directly to the object.
- Use adjectives to describe it.
- Use verbs to bring that object to life. (*Personification*)
- Use repeated lines.

Ode to My Socks

Pablo Neruda

Maru Mori brought me
a pair
of socks
which she knitted herself
with her shepherd's hands,
two socks as soft
as rabbits.
I slipped my feet
into them
as though into
two
cases
knitted
with threads of
twilight
and goatskin.
Violent socks,
my feet were
two fish made
of wool,
two long sharks
sea-blue, shot
through
by one golden thread,
two immense blackbirds,
two cannons:
my feet
were honored
in this way
by
these
heavenly
socks.
They were
so handsome
for the first time
my feet seemed to me
unacceptable
like two decrepit
firemen, firemen
unworthy
of that woven
fire,
of those glowing
socks.

Nevertheless
I resisted
the sharp temptation
to save them somewhere
as schoolboys
keep
fireflies,
as learned men
collect
sacred texts,
I resisted
the mad impulse
to put them
into a golden
cage
and each day give them
birdseed
and pieces of pink melon.
Like explorers
in the jungle who hand
over the very rare
green deer
to the spit
and eat it
with remorse,
I stretched out
my feet
and pulled on
the magnificent
socks
and then my shoes.

The moral
of my ode is this:
beauty is twice
beauty
and what is good is doubly
good
when it is a matter of two socks
made of wool
in winter.

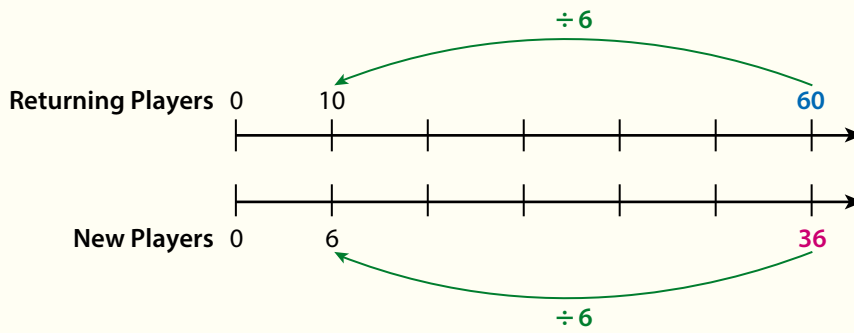
Practice Finding Equivalent Ratios

- Study the Example showing how to find equivalent ratios. Then solve problems 1–5.

Example

A soccer league has 60 returning players and 36 new players. Each team will have the same ratio of returning players to new players as the league has. How many new players will a team with 10 returning players have?

You can use a double number line to find ratios equivalent to $60 : 36$. Number pairs that line up vertically represent equivalent ratios.



You can divide each quantity in $60 : 36$ by 6 to find the equivalent ratio $10 : 6$. A team with 10 returning players will have 6 new players.

- Sophia says that you can solve the problem in the Example by multiplying both quantities in the ratio $60 : 36$ by $\frac{1}{6}$. Is Sophia correct? Explain.
- Which ratios are equivalent to $8 : 12$? Select all that apply.
 - A 4 : 6
 - B 12 : 8
 - C 16 : 20
 - D 24 : 36
 - E 56 : 84

Vocabulary

equivalent ratios

two ratios that express the same comparison.

Multiplying both numbers in the ratio $a : b$ by a nonzero number n results in the equivalent ratio $na : nb$.

- 3 A football field is 300 ft long. A sloth moving very quickly travels 60 ft every 5 min. Based on this ratio, how many minutes would it take a sloth to travel the length of a football field? Show your work.



SOLUTION _____

- 4 At a summer camp, the ratio of campers to adults is kept equivalent to 7 : 1.
- a. Use equivalent ratios to complete the table.

Campers	7		28	
Adults	1	2		30

- b. Next week, there will be 63 campers. How many adults should the camp have next week? Show your work.

SOLUTION _____

- 5 A manager of a clothing store always orders 2 small T-shirts and 3 large T-shirts for every 4 medium T-shirts. The manager plans to order 24 medium T-shirts. How many small T-shirts and large T-shirts should the manager order? Show your work.

SOLUTION _____

Practice Graphing a Table of Equivalent Ratios

- Study the Example showing how to graph a table of equivalent ratios. Then solve problems 1–5.

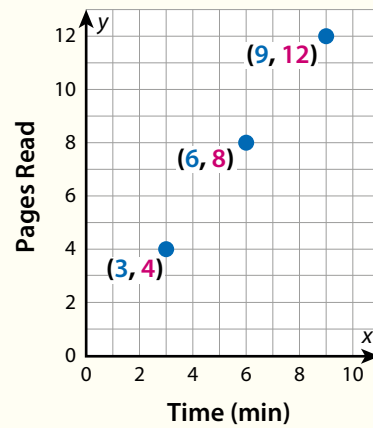
Example

Jade reads 4 pages every 3 min. Make a table of equivalent ratios to show how many pages Jade can read in 3 min, 6 min, and 9 min. Then graph the equivalent ratios.

Record the ratio 3 to 4 in one row of a table. Find equivalent ratios for 6 min and 9 min by multiplying each number in the ratio 3 : 4 by 2 and by 3.

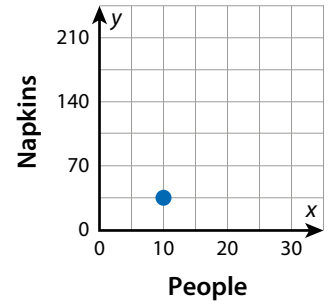
Time (min)	Pages Read
3	4
6	8
9	12

Think of each ratio in the table as an ordered pair (x, y) . The x -coordinate is the **time in minutes** and the y -coordinate is the **number of pages read**.



- How would the graph in the Example change if Jade reads 5 pages every 3 minutes instead of 4 pages every 3 minutes?
- The point $(7, 8)$ in the coordinate plane represents a ratio. Adela claims that you can find an equivalent ratio by adding the same number to both coordinates of the point. Is Adela correct? Explain.

3 Jordan and Mia are bringing napkins to a back-to-school picnic. They decide to bring 35 napkins for every 10 people who plan to attend. The point on the graph represents this ratio.



a. Plot another point that represents an equivalent ratio. Explain how you found the coordinates of this point.

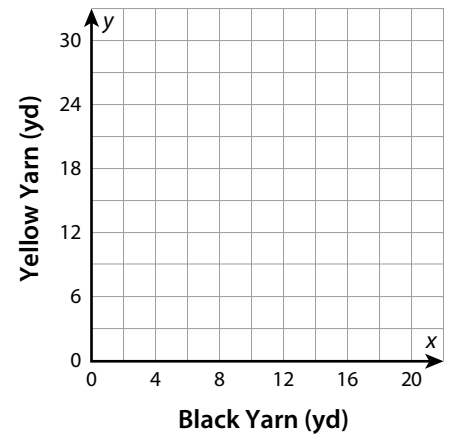
b. What do the coordinates of the point you plotted represent in this situation?

4 Allen is making a scarf for charity. He uses 4 yd of black yarn for every 6 yd of yellow yarn.

a. Complete the table of equivalent ratios.

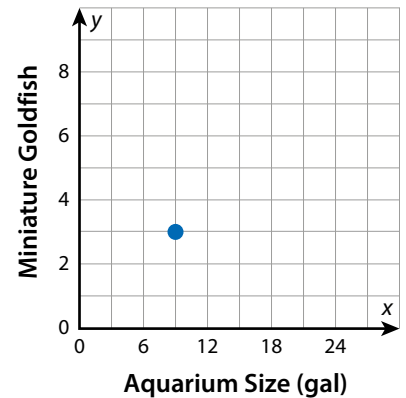
Black Yarn (yd)	2	4	12	
Yellow Yarn (yd)		6		30

b. Plot ordered pairs on the graph to represent the ratios.



5 An aquarium that holds 9 gal is the correct size for 3 miniature goldfish. The point on the graph represents this ratio relationship. Which ordered pairs represent equivalent ratios that would also be on the graph? Select all that apply.

- A (1, 3)
- B (3, 1)
- C (12, 6)
- D (15, 9)
- E (18, 6)



Practice Using Equivalent Ratios

► Study the Example showing how to use ratios to solve problems. Then solve problems 1–5.

Example

A company sells shampoo in two sizes of bottles. The ratio of the capacity of a bottle to its cost is the same for both sizes. A large bottle of shampoo contains 32 fl oz and costs \$8. A small bottle contains 12 fl oz. What is the cost of a small bottle of shampoo?

You can use a table of equivalent ratios.

Think of a way to get from 32 to 12 by using a combination of multiplication and division. Then use this combination to find equivalent ratios.

A small bottle of shampoo costs \$3.

Capacity (fl oz)	32	4	12
Cost (\$)	8	1	3

$\overset{\div 8}{\curvearrowright}$ $\overset{\times 3}{\curvearrowright}$
 $\underset{\div 8}{\curvearrowleft}$ $\underset{\times 3}{\curvearrowleft}$

- 1 The company in the Example decides to increase the capacity of its large bottles from 32 fl oz to 40 fl oz. It plans to keep the ratio of capacity to cost the same. How much should the company charge for a bottle that holds 40 fl oz? Show your work.

SOLUTION

- 2 Which ratio is equivalent to 3 : 18?
- A 6 : 21
 - B 5 : 20
 - C 7 : 42
 - D 12 : 2

Vocabulary

equivalent ratios

two ratios that express the same comparison.

Multiplying both numbers in the ratio $a : b$ by a nonzero number n results in the equivalent ratio $na : nb$.

- 3 A community garden is surrounded by a fence. The total length of the fence is 3,000 ft. For every 48 ft of fence, there are 4 posts. What is the total number of posts in the fence? Show your work.

SOLUTION _____

- 4 A company makes first-aid kits in different sizes. The ratio of fabric bandages to plastic bandages in each kit is 3 to 9. A small kit has 16 fabric bandages. How many plastic bandages should a small kit have? Show your work.

SOLUTION _____

- 5 A bag contains 6 red tiles and 15 yellow tiles. Lilia removes 2 red tiles. How many yellow tiles should she remove so that the ratio of red tiles to yellow tiles in the bag stays equivalent to 6 : 15? Show your work.

SOLUTION _____

Refine Finding Equivalent Ratios

► Complete the Example below. Then solve problems 1–9.

Example

A picture-hanging kit contains 2 short nails for every 8 long nails. There are 28 short nails. How many long nails does the kit contain?

Look at how you could use a table of equivalent ratios.

Short Nails	2	4	6	28
Long Nails	8	16	24	?

In each ratio, the number of long nails is 4 times the number of short nails.

$$? = 4 \times 28$$

SOLUTION _____

CONSIDER THIS . . .

How do you know that the ratios 4 : 16 and 6 : 24 are equivalent to 2 : 8?

PAIR/SHARE

How could you solve this problem a different way to check your answer?

Apply It

- 1 Nicanor keeps the tickets from all the sporting events he attends. The ratio of baseball tickets to basketball tickets in his collection is 3 : 5. Nicanor has 21 baseball tickets. How many more basketball tickets than baseball tickets does he have? Show your work.

CONSIDER THIS . . .

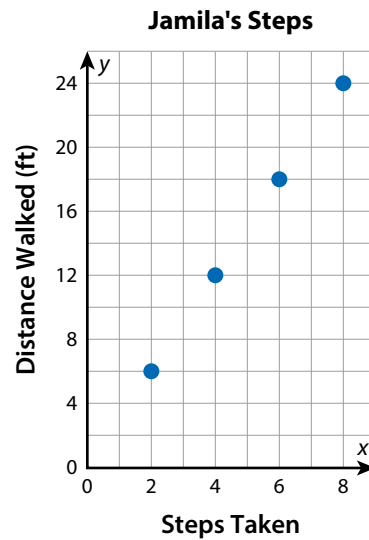
How does the ratio given in the problem show that Nicanor has more basketball tickets than baseball tickets?

SOLUTION _____

PAIR/SHARE

How did you use equivalent ratios to help you solve this problem?

- 2 The graph shows the relationship between the number of steps Jamila takes and the distance she walks. Based on the equivalent ratios shown in the graph, how many steps does Jamila need to take to walk 120 ft? Show your work.



CONSIDER THIS . . .

How can you show that the ordered pairs in the graph represent equivalent ratios?

PAIR/SHARE

How does the graph indicate that the number of steps Jamila must take to walk 120 ft is less than 120?

SOLUTION

- 3 Carson rides his bike for 30 min each day. He rides a total of 12 mi every 3 days. Based on this information, how many days will it take Carson to ride a total of 80 mi on his bike?

- A 4 days
- B 7 days
- C 10 days
- D 20 days

Galeno chose A as the correct answer. How might he have gotten that answer?

CONSIDER THIS . . .

How can you find the distance Carson rides in 1 day?

PAIR/SHARE

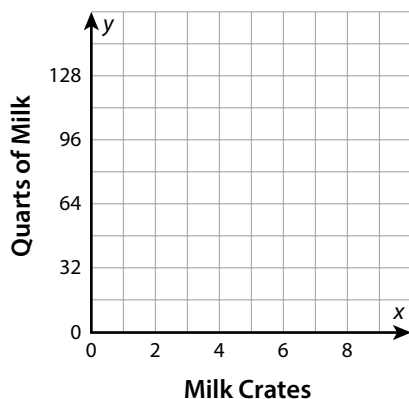
How can you check that your answer is reasonable?

- 4 Mr. Romano is ordering meat for a family reunion. He knows that 80 people plan to attend. He orders 1 lb of chicken for every 5 people and 3 lb of beef for every 10 people. Tell whether each statement is *True* or *False*.

	True	False
a. Mr. Romano orders 48 lb of beef.	<input type="radio"/>	<input type="radio"/>
b. Mr. Romano orders 16 lb of chicken.	<input type="radio"/>	<input type="radio"/>
c. The ratio of pounds of beef to pounds of chicken that Mr. Romano orders is 3 : 2.	<input type="radio"/>	<input type="radio"/>
d. The ratio of pounds of chicken to pounds of beef that Mr. Romano orders is 1 : 3.	<input type="radio"/>	<input type="radio"/>

- 5 Evelyn is making bows from blue and white ribbon. She uses 6 in. of blue ribbon for every 9 in. of white ribbon. Evelyn has 82 in. of blue ribbon and 114 in. of white ribbon. Which color of ribbon will she run out of first? Explain.

- 6 A dairy farm ships crates of milk to food stores. There are 48 quarts of milk for every 3 crates shipped. Plot points on the graph to show how many quarts of milk there are for shipments of 3, 4, 6, and 9 milk crates. Label each point with its ordered pair.



Practice Using Unit Rates to Find Equivalent Ratios

► Study the Example showing how to use a unit rate to find an equivalent ratio. Then solve problems 1–5.

Example

Winona and Reth are adding money to their subway fare cards. Winona pays \$26 for 8 rides. Each ride costs the same amount. How much does Reth pay for 7 rides?

The ratio of dollars to rides is 26 : 8. Divide to find the **unit rate**.

$$\begin{array}{l} \text{dollars} \rightarrow \frac{26}{8} = \frac{13}{4} = 3.25 \\ \text{rides} \rightarrow \end{array}$$

The rate is \$3.25 per ride.

Multiply the **number of rides** by the **unit rate** to find the missing value of the equivalent ratio.

$$7 \times 3.25 = 22.75$$

Reth pays \$22.75 for 7 rides.

Dollars	Rides
26	8
?	7

↙ × 3.25 ↘

- 1 Look at the problem in the Example. Rolando also adds money to his subway fare card. How much does Rolando pay for 20 rides? Show your work.

SOLUTION

- 2 Look at the problem in the Example. Vinh adds \$39 to his subway fare card. How many rides does Vinh buy? Explain how you can use the unit rate for rides per dollar to find the answer.

Vocabulary

rate

a ratio that tells the number of units of one quantity for 1 unit of another quantity.

unit rate

the numerical part of a rate. For the ratio $a : b$, the unit rate is the quotient $\frac{a}{b}$.

per

for each or for every. The word *per* can be used to express a rate, such as \$2 per pound.



- 3 Angela starts a blog about wheelchair basketball. In the first 4 days, the blog gets 22 new subscribers. At this rate, how many new subscribers can Angela expect in 30 days? Show your work.

SOLUTION _____

- 4 Ximena is typing a 2,500-word essay. In 9 minutes she types 396 words. At this rate, can Ximena type the essay in an hour? Explain.

- 5 Andrew saves the same amount of money each week. The table shows the amount he saves in different numbers of weeks. How much money does Andrew save in 40 weeks? Show your work.

Weeks	Dollars
7	224
9	288
11	352

SOLUTION _____

Practice Using Unit Rates to Compare Ratios

- Study the Example showing how to use unit rates to compare ratios. Then solve problems 1–5.

Example

Two teams of students are painting fences at Lakeside Middle School. The Blue Team paints 15 square meters in 6 hours. The Red Team paints 8 square meters in 4 hours. Which team paints faster?

You can compare the unit rates for square meters painted per hour.

Blue Team

$$\begin{array}{l} \text{square meters} \rightarrow \frac{15}{6} = 2.5 \\ \text{hours} \rightarrow \end{array}$$

Red Team

$$\begin{array}{l} \text{square meters} \rightarrow \frac{8}{4} = 2 \\ \text{hours} \rightarrow \end{array}$$

The team with the greater unit rate paints more square meters per hour.

$$2.5 > 2$$

The Blue Team paints faster.

- 1 Show how to solve the problem in the Example by comparing the unit rates for hours per square meter.
- 2 A news site offers a subscription that costs \$28.50 for 6 months. What is the unit price per month? Show your work.

SOLUTION

- 3 Khalid wants to buy a long sandwich for a party. Store A sells a 5-foot sandwich for \$42.50. Store B sells a 6-foot sandwich for \$49.50. Which store has the better buy? Show your work.



SOLUTION _____

- 4 A store sells two brands of hand lotion. Brand X costs \$3.25 for 5 fluid ounces. Brand Y costs \$6 for 8 fluid ounces. How much less per fluid ounce does Brand X cost than Brand Y? Show your work.

SOLUTION _____

- 5 Three friends make lemonade with different recipes. The table shows the ratio of lemon juice to the total amount of lemonade. Which friend makes lemonade with the strongest lemon flavor? Explain how to use unit rates to decide.

Name	Lemon Juice (cups)	Lemonade (cups)
Erin	2	12
Damita	4	16
Jayden	3	15

PADDLE POWER

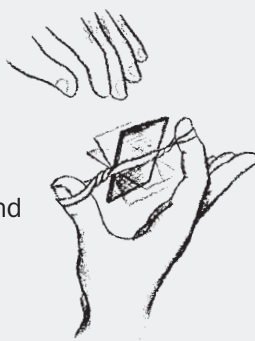
The Challenge

Build a boat that paddles itself using a rubber band as its power source.

In this challenge, kids (1) follow the design process to make a boat out of cups; (2) design and build working paddles; (3) use rubber bands to store and release energy; and (4) figure out ways to attach their paddles to their boats.

1 Introduce the challenge (5 minutes)

Begin by looping a rubber band over your thumb and index finger. Slide a 1 x 2-inch piece of chipboard through the rubber band and wind it up. Let go so the chipboard spins. Begin by telling kids the challenge. Tell them that they'll be using this kind of rubber-band-powered paddle to drive a boat across a container of water. Then get them thinking about storing and releasing energy. Ask:



- Where was the energy stored that made the paddle spin? (*In the rubber band*)
- Tell kids that the term for stored energy is **potential energy**. Ask, "How can you increase a rubber band's potential energy?" (*Wind it up more.*)
- How can you tell when potential energy stored in the rubber band is being used? (*Something moves.*)
- Tell kids the term for motion energy is **kinetic energy**. Ask, "What are some examples of kinetic energy that occur when a paddleboat moves through the water?" (*The rubber band unwinds; the paddle spins; the boat moves; waves spread out*)

2 Brainstorm and design (10 minutes)

Show kids the materials and ask, "How can you use these materials to make a boat that paddles itself through the water using a rubber band as its power source?" After discussing their ideas, have them sketch their designs on a piece of paper or in their design notebooks.

3 Build, test, evaluate, and redesign (35 minutes)

Distribute the challenge sheet and have kids begin building. If any of the following issues come up, ask kids questions to get them thinking about how they might solve their problems.

- Kids are all doing the exact same design. *Suggest different boat designs, such as: (1) Seal a cup by putting tape over the opening and floating it on its side; (2) Cut a cup in half lengthwise and tape the halves together to form an open boat; (3) Tape several cups together to make a raft; and (4) Use the chipboard for the boat's bottom and sides.*
- Water leaks into the cup. *Seal openings with duct tape.*
- The paddles are hard to attach to the cup. *(1) Tape straws or wooden skewers along the sides of a cup (or poke them through the sides and bottom) so they stick out far enough to loop a rubber band over them. (2) Build a frame out of straws or wooden skewers and mount it between two cups. Attach the rubber band and paddle to this frame.*



SHOW KIDS THE RELATED TV EPISODE



Photo: Parrish Kennington

In Paddle Power, kids figure out how to power a boat through the water. Show them the Aquatic Robotics episode in which *Design Squad* teams attempt to build a radio-controlled underwater robot. Get it online at pbs.org/designsquad.



Photo: Lauren Feinberg

A paddleboat moves when the rubber band's stored (**potential**) energy is converted into motion (**kinetic**) energy and spins the paddle.



Photo: Lauren Feinberg

Testing in a large container of water lets the boats paddle a good distance before hitting a side.

- The chipboard paddle warps when it gets wet. *Protect it by wrapping it in duct tape.*
- The paddle hits the frame that holds it. *Reposition the rubber band; widen or lengthen the frame; make the paddle smaller.*
- The frame holding the rubber band bends when the rubber band is wound tight. *Make sure the frame is securely taped to the cup. See if adding a crosspiece can help stiffen the frame. Also, move the rubber band toward the cup. The closer it is to the cup, the harder it will be to bend the frame. Finally, use wooden skewers. They're stronger than straws.*
- The boat tips and does not let the paddle hit the water properly. *Add weight to the boat to control its position. Tape a washer or two to the bottom of the hull. Weight used to keep a boat upright is called **ballast**.*

4 Discuss what happened (10 minutes)

Have kids talk about their designs and how they solved any problems that came up. Emphasize the key themes in this challenge—potential and kinetic energy—by asking questions such as:

- What are some examples of potential and kinetic energy in your paddleboat? (*An example of potential energy is the wound rubber band. Examples of kinetic energy include the things that moved, like the paddle, rubber band, boat, and water.*)
- How can you store a lot of energy in your boat? (*Wind up the rubber band tighter, or use more than one rubber band.*)
- What was the hardest problem to solve when building your boat? (*Answers will vary, but perfecting the paddles and attaching them to the cup is often quite challenging.*)

FOR EVENTS

- Draw kids into your area by asking, “How quickly can you get a boat to power itself through the water?”
- It's hard to make boats that float well with cups smaller than 8 ounces. If you want to give kids more design options, offer them two different-sized cups, such as 8- and 12-ounce cups.
- Test boats in large containers. Kiddie pools, underbed storage containers, or wallpaper trays offer kids longer, more satisfying travel times for their boats. In addition, even when a boat doesn't go straight, it can still go reasonably far before hitting a side.
- To avoid overcrowding, provide one kiddie pool per 20 participants expected, one underbed storage container per 10 kids expected, or one wallpaper tray per 4 kids expected. Since kids won't all be testing at once, these numbers will provide plenty of open water for testing.
- Large containers filled with water are heavy and awkward. Put the container where you want it on the floor of the testing area. Then use a bucket to fill and empty it.
- Have towels on hand to mop up spills.

To determine how many materials you'll need for different-sized events, for information on obtaining large quantities of materials, and for other general event tips, see page 7.

PADDLE POWER



YOUR CHALLENGE

Design and build a boat that paddles itself across a container of water using a rubber band as its power source.

BRAINSTORM & DESIGN

Look at your materials and think about the questions below. Then sketch your ideas on a piece of paper or in your design notebook.

1. How can you use these materials to make a boat that floats well?
2. How will you attach a rubber band and paddle to your boat?
3. How big a paddle do you need so that it reaches the water and drives the boat?
4. How will you make sure your boat doesn't sink, tip, or roll over?

BUILD, TEST, EVALUATE & REDESIGN

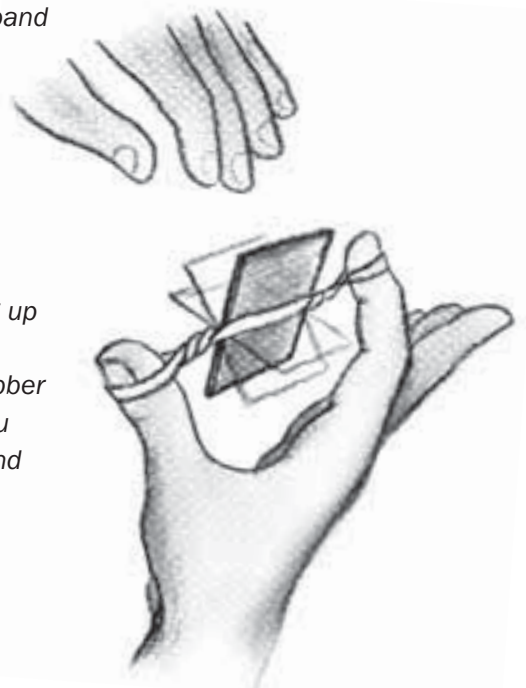
Use the materials to build your paddleboat. Then test it by winding it up, putting it in the container of water, and releasing it. When you test, your design may not work as planned. The saying, "If at first you don't succeed, try, try again," is at the heart of the design process. Testing a design and then revising it based on what you've learned is a key to success. Study the problems and then redesign. For example, if your paddleboat:

- tips—*Add some weight to the bottom of the boat to help keep it upright.*
- has a warped paddle—*Think of some ways to waterproof the paddle.*
- has a paddle that hits the frame holding it—*See if moving the rubber band makes a difference. Also consider changing the size of the frame or the paddle.*
- has parts that bend when the rubber band is wound tight—*Make sure parts are taped on securely. Also, see if moving the rubber band makes a difference. The closer it is to the boat, the harder it will be to bend things. Finally, find ways to add support to any parts that bend.*
- doesn't make it across the container—*Experiment with ways of storing up more energy. Your boat moves by changing stored energy (**potential energy**) into motion energy (**kinetic energy**). The more you wind the rubber band (or the more rubber bands you use), the more potential energy you store. When you let go, this potential energy turns into kinetic energy, and the boat moves.*

as built on TVTM
pbs.org/designsquad

MATERIALS (per person)

- chipboard (8 ½ x 11 sheet)
- wide container partially filled with water (e.g., kiddie pool, bathtub, underbed storage container, wallpaper tray)
- duct tape
- 2 paper cups (8 ounce or larger)
- 5 rubber bands
- scissors
- towels (paper or cloth)
- 4 straws
- washers (1-inch or larger)
- 4 wooden skewers



TAKE IT TO THE NEXT LEVEL

- Watch your fingers! Add an on-off switch so you can start and stop the paddle.
- Ready. Set. Go! Experiment with the paddle, the rubber band, or the boat's shape to increase its speed. Then race other paddleboats.
- Tugboat time! Carry or tow a Ping-Pong ball from one side of the container to the other.

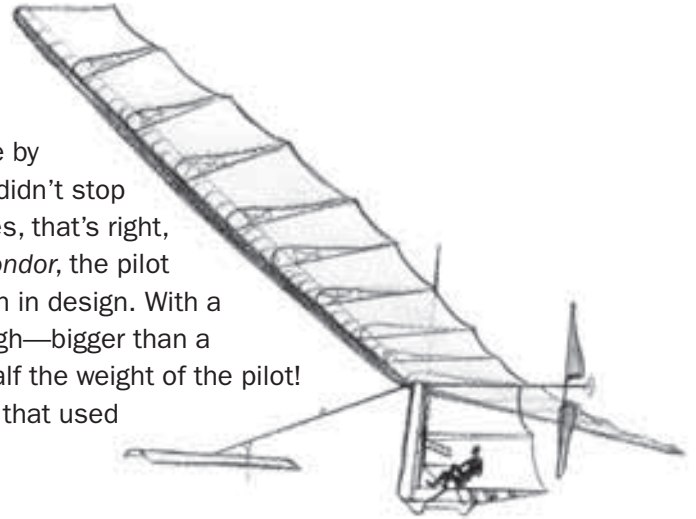
MAKE IT ONLINE

Is that a bird or a plane?

Build an airplane that flies by flapping its wings out of wood, wire, tissue paper, rubber bands, and glue. See how on Make Magazine's project page at makezine.com/designsquad.

ENGINEERING IN ACTION

Engineer Paul MacCready was always intrigued by the way birds soared through the air. As an adult, he brought his passion to life by building gliders that won contests and set records. His success didn't stop with gliders—he built the world's first human-powered aircraft. Yes, that's right, *human* powered! In one of MacCready's planes, the *Gossamer Condor*, the pilot pedaled a modified bike to spin a propeller. It was a breakthrough in design. With a wingspan of 96 feet, the *Condor* was 30 feet long and 18 feet high—bigger than a tractor-trailer truck. And it weighed only 70 pounds—less than half the weight of the pilot! MacCready made his planes light and strong with clever designs that used materials in new ways. His motto was “do more with less.”



Look at the materials below. MacCready used all but one to build the Condor. Guess which one wasn't a part of his incredible flying machine?

- | | | |
|---|--------------------|-------------------------|
| A. Mylar® plastic (like in silver balloons) | C. Bicycle parts | F. Piano wire |
| B. Aluminum tubes | D. Cardboard | G. Clear household tape |
| | E. Titanium panels | H. Styrofoam® |

(Answer: E. Titanium panels. Even though titanium is a lightweight metal, it's still a lot heavier than Mylar®.)



Watch the **DESIGN SQUAD** Aquatic Robotics episode on PBS or online at pbs.org/designsquad.

Mylar is a registered trademark of DuPont Teijin Films. Styrofoam is a registered trademark of Dow Chemical Company.



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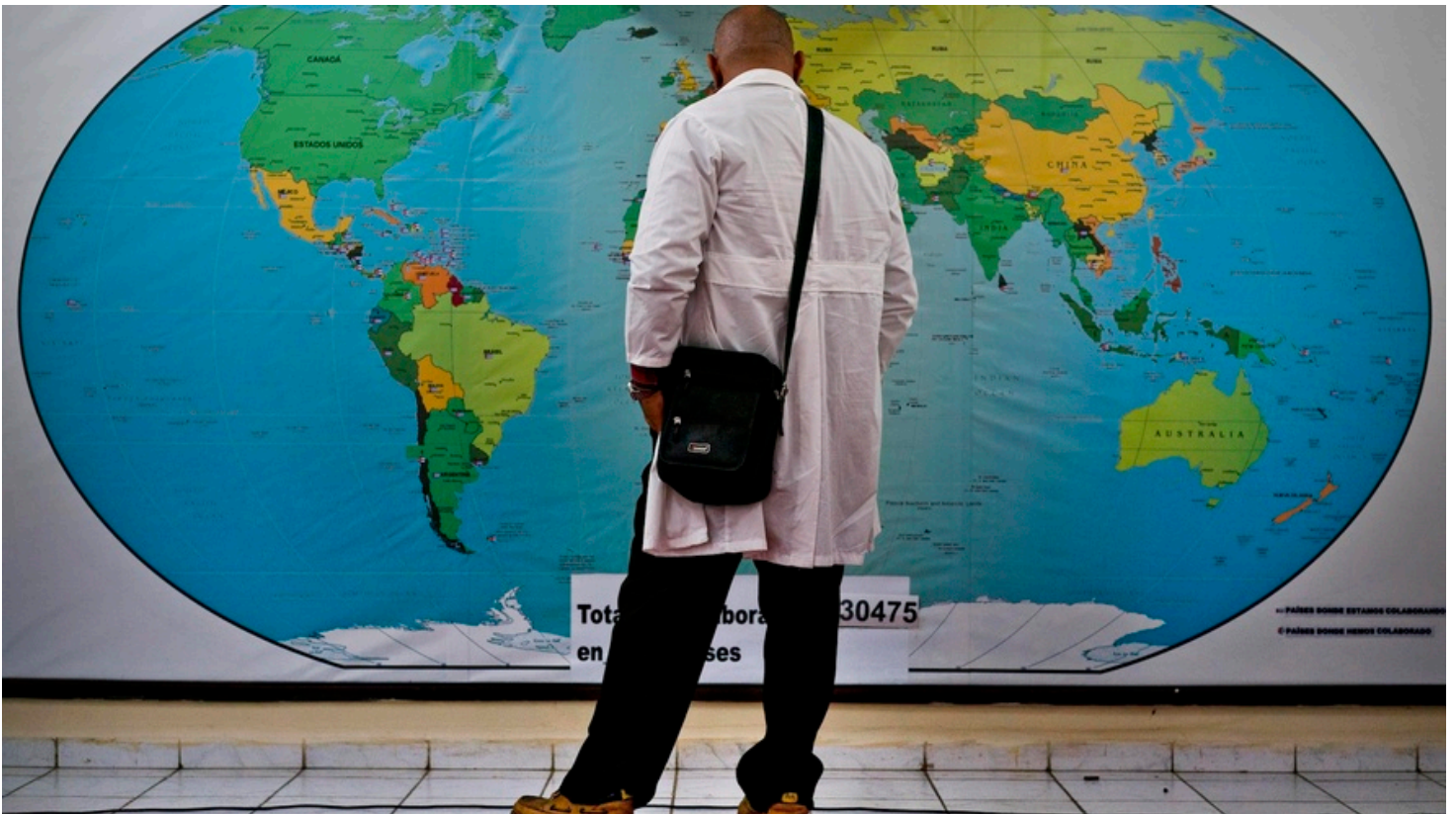


The common mistakes that are in our mental maps of the world

By National Geographic, adapted by Newsela staff on 08.27.19

Word Count **631**

Level **740L**



Cuban doctor Ralfis Carbort looks at a map of the world. Photo by: Ramon Espinosa/AP Photo

Most of us have a rough map of the world in our minds. We use it any time we think about places. These mind maps are not always correct, though. In fact, many of the maps in our heads share the same errors. Some of the errors are quite large and surprisingly hard to correct.

For example, we all know that South America is south of North America. You may be surprised at how far east it is, though. Nearly the entire South American continent is east of Florida.

Perception Vs. Reality

John Nelson is a cartographer. He creates maps. Maps in our minds have to be simplified, he says. This can lead to mistakes.

Africa is often in the wrong place in people's mind maps as well. North Americans often think Africa is located mostly in the southern half of the planet. They think it is similar to South America. The truth is that around two-thirds of Africa is north of the equator. Africa actually goes about as far north as Norfolk, Virginia.

Europe is also often placed much farther south in people's minds than it really is. People often think it is directly across the Atlantic Ocean from the mainland United States. It actually lines up better with Canada. Paris, France, is farther north than Montreal, Canada. Barcelona, Spain, is about as far north as Chicago, Illinois. Venice, Italy, lines up with Portland, Oregon.

Flat Maps Distort Our View Of The World

Locations aren't the only way the maps in our minds can be wrong. We also make mistakes about the size of places compared to each other. This may come from looking at flat maps. Trying to show a round globe on a flat surface appears to move things around. This is especially obvious for certain kinds of maps, such as the Mercator map. These maps were common in many 20th-century classrooms.

For example, Greenland appears too large on Mercator maps. It seems to be similar in size to South America. In fact, South America is more than eight times bigger than Greenland.

Other examples are even more surprising. Brazil doesn't seem that big on many maps. The truth is that it's bigger than the entire mainland United States. It's almost as large as Canada. Alaska is giant on some maps. However, it's actually a little smaller than Libya in North Africa.

Anthony Robinson is a geographer. He works at Penn State University in Pennsylvania. He says thinking about the world on a flat map twists our ideas about how to get from one place to another. For example, you can draw a line on a flat map from Washington, D.C., to Shanghai, China. It will seem that the most direct path is west over the United States and the Pacific Ocean. However, planes going to Asia usually fly over the North Pole. When looking at a globe instead of a flat map, it makes sense.

Even Experts Get It Wrong

Even once we've learned the truth about these mistakes, they often stick around. One reason may be that our ideas of the world are basically simple shortcuts, says cartographer Dylan Moriarty. The maps in our minds are similar to the the subway map of New York City, he says. They are a helpful tool, but they are not as detailed as the real world.

These map mistakes are so common that even experts make them. A 1985 study of world maps in people's minds found that geographers made some of the same mistakes as everyone else. This is true for cartographers, too. The "eastiness" of South America still surprises Nelson sometimes. "I really have to look again at a map and be like, is that really the case?" he says. "Sure enough, it is."

Quiz

1 Read the section "Perception Vs. Reality."

Which selection explains that Europe is farther north than people recall?

- (A) Maps in our minds have to be simplified, he says. This can lead to mistakes.
- (B) North Americans often think Africa is located mostly in the southern half of the planet.
- (C) The truth is that around two-thirds of Africa is north of the equator.
- (D) People often think it is directly across the Atlantic Ocean from the mainland United States. It actually lines up better with Canada.

2 Read the paragraph below from the section "Flat Maps Distort Our View Of The World."

Locations aren't the only way the maps in our minds can be wrong. We also make mistakes about the size of places compared to each other. This may come from looking at flat maps. Trying to show a round globe on a flat surface appears to move things around. This is especially obvious for certain kinds of maps, such as the Mercator map. These maps were common in many 20th-century classrooms.

What inference can the reader make based on this paragraph?

- (A) When we read maps, we do not make good guesses about locations.
- (B) Cartographers did not know much about the world in the 20th century.
- (C) Classrooms should only teach using a globe.
- (D) Flat maps can make places look bigger or small than they really are.

3 Read the following two paragraphs from the section "Flat Maps Distort Our View Of The World".

For example, Greenland appears too large on Mercator maps. It seems to be similar in size to South America. In fact, South America is more than eight times bigger than Greenland.

Other examples are even more surprising. Brazil doesn't seem that big on many maps. The truth is that it's bigger than the entire mainland United States. It's almost as large as Canada. Alaska is giant on some maps. However, it's actually a little smaller than Libya in North Africa.

What is the structure of these paragraphs?

- (A) compare and contrast
- (B) cause and effect
- (C) chronological order
- (D) problem and solution



These map mistakes are so common that even experts make them. A 1985 study of world maps in people's minds found that geographers made some of the same mistakes as everyone else. This is true for cartographers, too. The "eastiness" of South America still surprises Nelson sometimes. "I really have to look again at a map and be like, is that really the case?" he says. "Sure enough, it is."

What does this paragraph do in this section?

- (A) It shows the cause of why people mistake the location of South America on a map.
- (B) It describes the effect of people misidentifying the location of South America on a map.
- (C) It provides an example of how even experts make mental mistakes regarding maps.
- (D) It explains how difficult it is for geographers and cartographers to create maps.

ESL at Home Gr. 6-8 Weeks 5-6

Use notebook paper to complete these activities. Do one each day!

Monday	Tuesday	Wednesday	Thursday	Friday
<p>Who is your favorite book or movie character? Write or draw what would happen if you met them in real life.</p>	<p>Look at the food in your home. Create a pretend menu for lunch. Example: Pretzel and jelly sandwich with a side of tuna fish: \$4.67 Chocolate chip scrambled eggs with salsa ice cream: \$5.99</p>	<p>Unscramble these animal names, then draw the animal. caro rwmo cnaotu rumle</p>	<p>Make a t-chart of healthy and unhealthy foods in your home.</p> 	<p>Create your own superhero. Draw and label a costume and superpowers. Write about a time the superhero saved someone.</p>
Monday	Tuesday	Wednesday	Thursday	Friday
<p>Use boxes or books to create a ramp. Find five things to roll down the ramp. What rolls the farthest? What rolls the shortest?</p>	<p>Design a plan for your dream neighborhood. Draw and label a map of the homes, streets, and businesses you would have.</p>	<p>Create a commercial for your new neighborhood. Tell what makes it special and why people should move there.</p>	<p>Listen to any song. Write down any similes you hear. Ex: "I came in LIKE a wrecking ball."</p> 	<p>Choose two animals, like a horse and an alligator. Imagine what they would look like if they were put together. Draw it, and write about its ecosystem.</p>

Earth Day



Celebrating 50th Year Anniversary of Earth Day on April 22, 2020

Earth Day Challenge

Earth Day is an annual event celebrated around the world on April 22 to demonstrate support for environment protection. Earth Day was founded in the United States by United State Senator Gaylord Nelson as a “national teach-in on the environment” that was first held on April 22, 1970. On Earth Day, people do things to help the environment. They clean beaches, recycle cans, bottles, and newspapers, donate money to environmental groups, sign petitions, and teach others about the importance of protecting the environment.

What Can You Reduce?

What Can You Reuse?

What Can You Recycle?

Earth Day Pledge



Celebrating 50th Year Anniversary of Earth Day on April 22, 2020

My name is: _____

I promise that I will try to

1. _____
2. _____
3. _____

Some ideas to consider:

- use less water.
- use less electricity.
- spend more time in nature.
- use both sides of paper.
- only buy things that I truly need.
- eat more vegetables.
- use rechargeable batteries.
- grow vegetables in my garden.
- plant a tree.
- recycle and reuse items.