

Name: _____

mystery science

Second Grade

Student Booklet

What are you curious about?



Animal Biodiversity & Habitats

2nd Grade • NGSS • Unit Worksheets

Lesson 1



How many different kinds of animals are there?

Lesson 2



Why would a wild animal visit a playground?

Lesson 3



Why do frogs say "ribbit"?

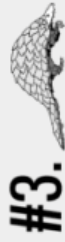
Lesson 4



How could you get more birds to visit a bird feeder?

I am also curious about...

Challenge Cards



Name: _____

bones / no bones

lays eggs / gives birth

hair / feather / scales / none

mystery science

Name: _____

bones / no bones

lays eggs / gives birth

hair / feather / scales / none

mystery science

Name: _____

bones / no bones

lays eggs / gives birth

hair / feather / scales / none

mystery science

Challenge Cards



Name: _____

bones / no bones

lays eggs / gives birth

hair / feather / scales / none

mystery science

Name: _____

bones / no bones

lays eggs / gives birth

hair / feather / scales / none

mystery science

Name: _____

bones / no bones

lays eggs / gives birth

hair / feather / scales / none

mystery science



Penguin

Has bones inside its body

Lays eggs

Has feathers

mystery science



Squirrel

Has bones inside its body

Gives birth (doesn't lay eggs)

Has hair or fur

mystery science



Ladybug

Doesn't have any bones at all

Lays eggs

Doesn't have fur or feathers or scales

mystery science



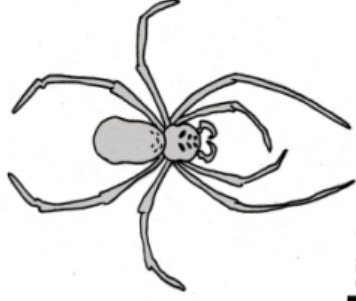
Pigeon

Has bones inside its body

Lays eggs

Has feathers

mystery science



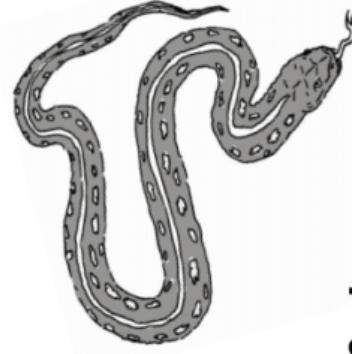
Spider

Doesn't have any bones at all

Lays eggs

Doesn't have fur or feathers or scales

mystery science



Snake

Has bones inside its body

Lays eggs

Has scales

mystery science



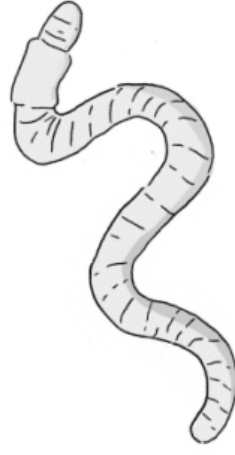
Turtle

Has bones inside its body

Lays eggs

Has scales

mystery science



Earthworm

Doesn't have any bones at all

Lays eggs

Doesn't have fur or feathers or scales

mystery science





Hawk

Has bones inside its body

Lays eggs

Has feathers

mystery science



Bat

Has bones inside its body

Gives birth (doesn't lay eggs)

Has hair or fur

mystery science



Elephant stag beetle

Doesn't have any bones at all

Lays eggs

Doesn't have fur or feathers or scales

mystery science



Ostrich

Has bones inside its body

Lays eggs

Has feathers

mystery science



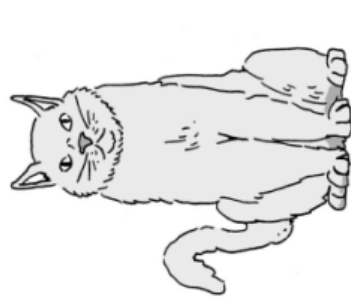
Monarch butterfly

Doesn't have any bones at all

Lays eggs

Doesn't have fur or feathers or scales

mystery science



Cat

Has bones inside its body

Gives birth (doesn't lay eggs)

Has hair or fur

mystery science



Lizard

Has bones inside its body

Lays eggs

Has scales

mystery science



How many different kinds of animals are there?

Lesson Assessment

1. Match the group of animals with its characteristics.

- | | |
|--|--|
| ☐ Invertebrates | a. Bones, scales, lays eggs |
| ☐ Reptiles | b. Bones, hair or fur, gives birth to live young |
| ☐ Birds | c. Bones, feathers, lays eggs |
| ☐ Mammals | d. Bones, moist skin, lays eggs |
| ☐ None of the above | e. No bones |

2. Put an **X** next to the characteristics that scientists use to group animals.

- ☐ Whether it has bones or no bones
- ☐ What color it is
- ☐ Whether it lays eggs or gives birth to live young
- ☐ What it eats
- ☐ Where it lives
- ☐ Whether it has scales, feathers, or hair

3. TRUE or FALSE? (circle one) Scientists only look at the outsides of animals' bodies to figure out which group they belong to.

4. Bats have wings and can fly, but scientists do not group them with birds. Why is that?

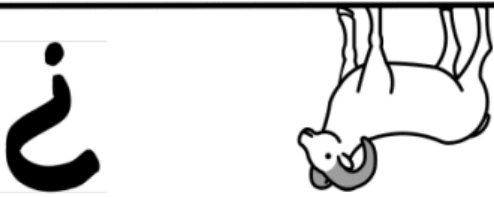
5. Tarantulas are covered in hair, but scientists do not group them with mammals. Why is that?

mystery science

Date: _____

Name: _____

The Mystery of the Bighorn Sheep in the Park



4. Why do you think the bighorn sheep go back to the desert habitat at night?

DESERT **PARK**

3. Where can the bighorn sheep hide from predators? (Circle your answer)

DESERT **PARK**

2. Where can the bighorn sheep find the most food? (Circle your answer)

Park Habitat





What was the total number of animals that you found in the **PARK**? _____

Desert Habitat





What was the total number of animals that you found in the **DESERT**? _____

1. Did you find some kinds of animals in both habitats? **YES** **NO**

Lesson Assessment



Fish Tank #1



Fish Tank #2

1. Fatima wants to buy a fish tank. She is choosing between Fish Tank #1 and Fish Tank #2. Fish Tank #1 has animals and plants from a pond habitat. Fish Tank #2 has animals and plants from an ocean habitat. Fatima wants the fish tank with the highest diversity. What could Fatima do to help her decide which fish tank to buy?

Circle **True** or **False** for each sentence.

True False Count up the different kinds of animals in each fish tank and compare them.

True False Measure the water in each fish tank and compare them.

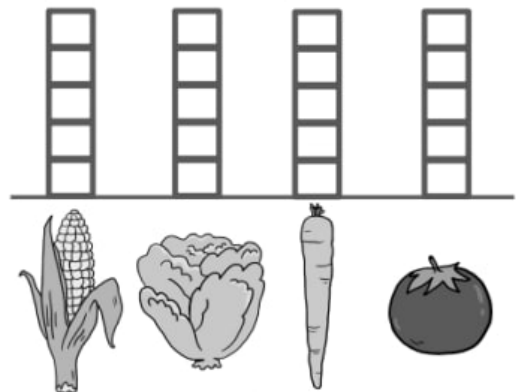
True False Count up the different kinds of plants in each fish tank and compare them.

True False Count up the total number of **one kind** of fish in each fish tank and compare them.

Cristal wants to make a diverse salad with lots of different vegetables. Observe what is being sold at Eli's farm and Kara's garden to figure out where she should shop.



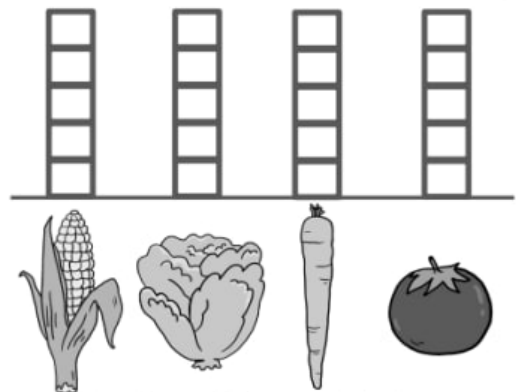
Vegetables From Eli's Farm



2. Eli sells vegetables that he grows on his farm. Eli grows mostly corn. Count the vegetables on display at Eli's shop. Add an X to the graph above for each vegetable that Eli is selling.



Vegetables From Kara's Garden



3. Kara sells vegetables that she grows in her garden. Kara grows lettuce, carrots, and tomatoes. Count the vegetables on display at Kara's shop. Add an X to the graph above for each vegetable that Kara is selling.

4. Where should Cristal shop to make a diversified salad? Circle the correct answer.

- Eli's farm.
- Kara's garden.
- Eli's farm and Kara's garden are equally diverse.

5. What information from the graphs can help Cristal make her choice of where to shop for vegetables? _____

Who's Calling?

1. Learn to identify frogs by their calls:

	Kind of frog	Write a few words to remind yourself of what it sounds like.
	Wood Frog	
	Spring Peeper	
	American Bullfrog	
	Northern Leopard Frog	
	American Toad	

2. What kind of frog do you hear in Challenge #1?

3. What kind of frog do you hear in Challenge #2?

How Many Kinds of Frogs?

4. Listen to which kinds of frogs each place has:

OAKWOOD POND

In spring, this tiny pond is a shallow puddle in the woods. In summer, it dries up. There are no flowing streams or swamps here.

Oakwood Pond: check off what kinds of frogs you hear

Wood Frog	
Spring Peeper	
American Bullfrog	
Northern Leopard Frog	
American Toad	

SWEDE LAKE

This lake has swampy places with many plants, places with shallow water, and streams flowing into the lake. There's water here all year long.

Swede Lake: check off what kinds of frogs you hear

Wood Frog	
Spring Peeper	
American Bullfrog	
Northern Leopard Frog	
American Toad	

5. Which place has more kinds of frogs?

My claim is that _____ has more kinds of frogs. My evidence is that _____

Why do frogs say “ribbit”?

Lesson Assessment

1. Which is true about frogs and toads?
 - a. All frogs say “ribbit” but toads make other sounds.
 - b. Frogs and toads never live in the same places.
 - c. Toads are the kind of frog that has drier, rougher skin.
 - d. Only toads will give you warts.

2. Why do frogs call?
 - a. That’s the sound of their breathing.
 - b. Male frogs call to attract females.
 - c. Frogs call because they’re hungry.
 - d. Frogs call to tell people where they are.

3. If you visited two ponds, how could you tell which pond had more kinds of frogs?

4. What kind of habitat do frogs look for during egg-laying season? Why do they need that kind of habitat?

1) Discuss what your bird feeder needs:

1a) What kind of bird do I want to come to my feeder? _____



Finches

- Eat seeds
- Like to stand on a peg while eating



Jays

- Eat seeds
- Like to stand on a tray while eating



Woodpeckers

- Eat seeds and bugs
- Like to hang on the sides of feeders to eat



Cardinals

- Eat seeds
- Like to stand on a tray while eating

1b) What does that bird eat? _____

1c) Where does the bird like to stand when it eats? _____

1d) How can my feeder keep birds safe from cats? _____

2) Fill in the blanks to write your problem statement:

I want _____ to come to my yard. I need a bird feeder with _____ and _____
(kind of bird) (kind of food)

_____ for my bird to stand on. I will make the bird feeder safe from cats by _____
(place to stand)

_____.

Name: _____

3) Here are my ideas for a bird feeder:

Draw at least two ideas for bird feeders. Be sure you show:

- Where will the food be?
- Where will the birds stand?
- What will keep the birds safe from cats?

Use the back of the page to draw any more ideas.

Idea #1**Idea #2**

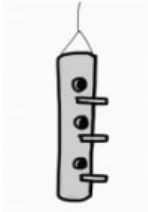
4) I've built my prototype. What next?

A real bird feeder needs to hold together in wind and rain. What materials could you use to make a real feeder that's like your prototype?

How could you get more birds to visit a bird feeder?

Lesson Assessment

1. Choose the type(s) of feeders each bird would be MOST LIKELY to visit, and explain your answer choices below.

			X
tray feeder	nectar feeder	tube feeder	none of these

Finches will most likely visit _____

because... _____



Hawks will most likely visit _____

because... _____



Hummingbirds will most likely visit _____

because... _____



Doves will most likely visit _____
because... _____



2. Two friends are discussing what is most important for attracting a bird to a feeder.
Ahmed says, "I think that having the **kind of food a bird likes** is most important."
Kristina says, "I think that having a **place for the bird to perch** is most important."

What do you think? How would you respond to Ahmed and Kristina?

3. In the activity, you made a *prototype* of a bird feeder. How would you want to change your prototype to create a final version of your feeder?

Unit Assessment

Multiple Choice

1. A butterfly is...

- a. A bird, because it has wings and can fly
- b. A reptile, because it lays eggs
- c. An invertebrate, because it doesn't have bones
- d. None of the above



2. A pangolin is...

- a. A reptile, because it has scales
- b. A mammal, because it has hair and gives live birth
- c. Both a reptile AND a mammal, because it has characteristics of both groups
- d. None of the above



3. Why do frogs and toads look for wet habitats during egg-laying season? Choose the **BEST** answer.

- a. That's where male frogs can find female frogs
- b. It's easier to hide in wet, swampy areas
- c. Their calls sound louder over water
- d. They need to lay their eggs in water

4. A bird feeder will attract birds if it...

- a. Has the right kind of food
- b. Has places for birds to perch or stand
- c. Is protected from cats and other predators
- d. All of the above

True/False

Circle TRUE or FALSE for each statement.

- | | | |
|------|-------|--|
| TRUE | FALSE | 5. Scientists can identify frogs by listening to their calls. |
| TRUE | FALSE | 6. Frogs usually have drier, wartier skin than toads. |
| TRUE | FALSE | 7. Only one kind of frog makes a call that sounds like “ribbit.” |
| TRUE | FALSE | 8. The Amazon rainforest has the most kinds of frogs. |

Short Answer

9. Three friends are discussing what would happen if scientists discovered a new animal. What would scientists do to figure out which group the new animal belongs to?

Dhara says, “I think scientists would look at the *outside* of the animal.”

Xavier says, “I think scientists would look *inside* the animal.”

Luo says, “I think scientists would look at the inside *and* the outside of the animal.”

Who do you agree with most and why?

10. What are the differences between a prototype and a final version of something?

11. In your own words, what is a habitat? Why do some habitats have more animals than others?

Plant Growth & Interactions

2nd Grade • NGSS • Unit Worksheets

Lesson 1



How did a tree travel halfway around the world?

Lesson 2



Why do seeds have so many different shapes?

Lesson 3



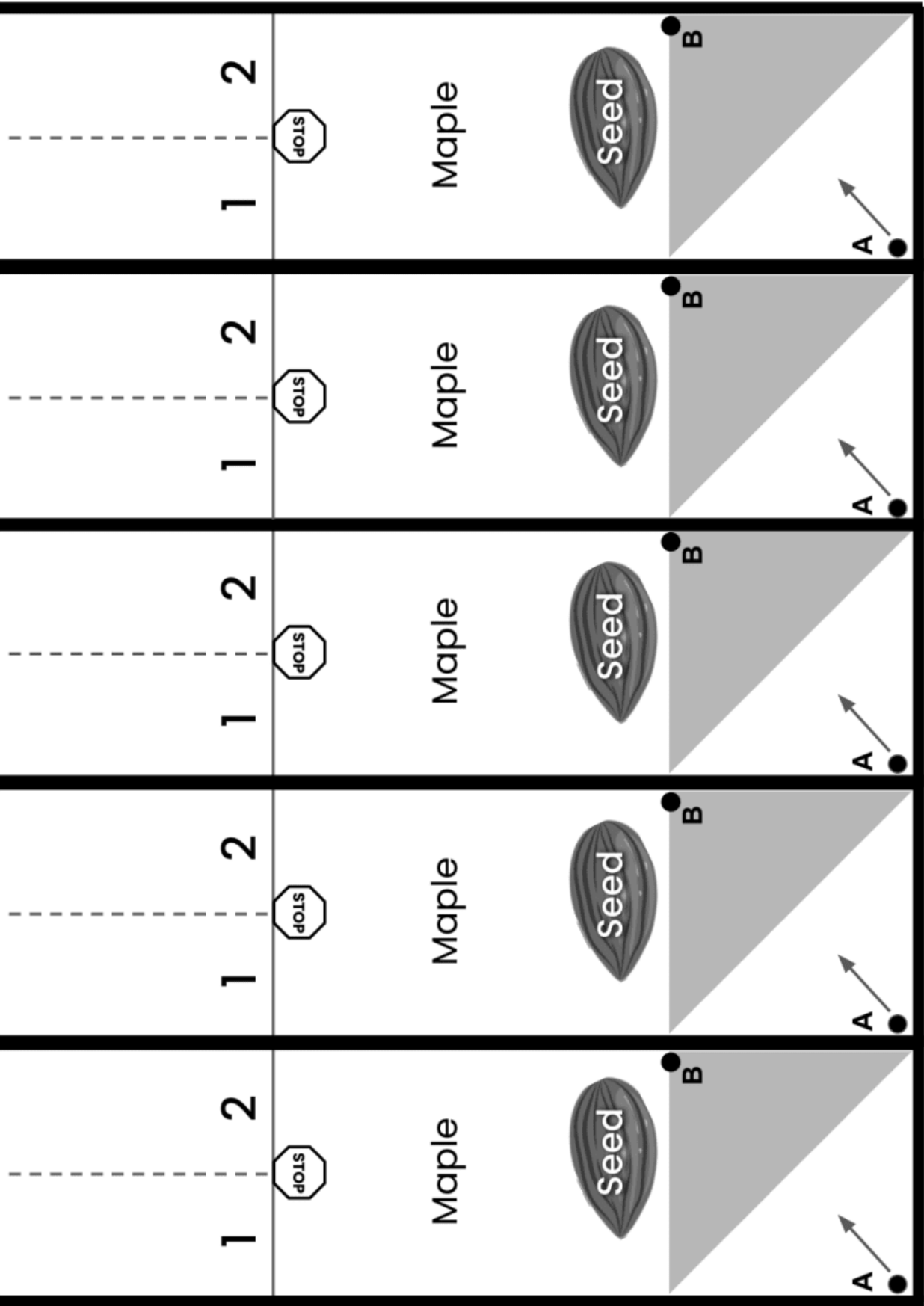
Could a plant survive without light?

Lesson 4



How much water should you give a plant?

I am also curious about...





Koa



Seed

Koa



Seed

Koa



Seed



Rain Tree



Seed



Rain Tree



Seed



Rain Tree



Seed



Rain Tree



Seed



Rain Tree



Seed



Rain Tree



Seed



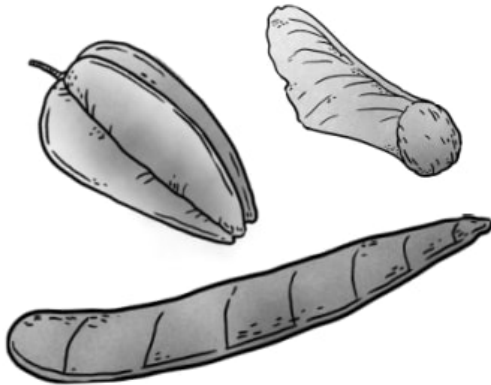
Lesson Assessment



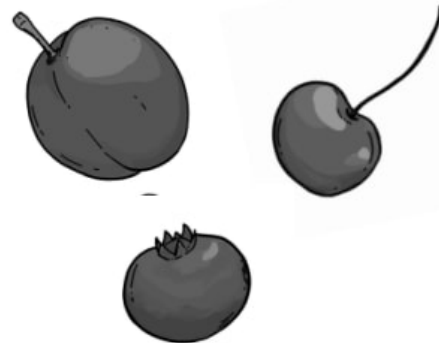
Joey enters a contest at school where he needs to drop a piece of paper in front of a fan. The piece of paper that travels the farthest distance using the wind from the fan wins the contest!

Joey learned about seeds that use the wind to travel and disperse. He learned that the shape of the seed is very important. Joey wants to use this information to help him win the Wind Contest.

Seeds That Use the Wind to Travel



Seeds That **DON'T** Use the Wind to Travel



1. Examine the seeds above and look for patterns in the shape of their structures.
Circle **True** or **False** for each sentence.

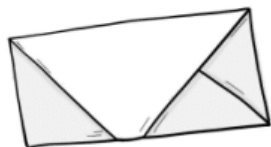
True False The seeds that use the wind all have long, flat structures.

True False The seeds that use the wind all have round structures.

True False The seeds that use the wind all have fuzzy, spiky structures.

2. Joey tries shaping his paper in different ways. He tries folding the paper (A). He also tries crumpling the paper into a ball (B). Circle which of these you think Joey should use in the Wind Contest.

A



B



3. Why did you choose your answer to question 2?

- a. The shape of the paper is round so it can float on the wind.
- b. The shape of the paper is long and flat so it can float on the wind.



4. You are given five pieces of paper (shown above). Imagine you can crumple, tear, or tape these pieces together into any shape you'd like! If you entered the Wind Contest, how would you shape these pieces of paper to win?

Draw how you would change the shape of these paper pieces in the box below.

5. Explain the reason why you changed the shape of the paper the way you did.

I changed the shape of the paper so that it is _____

because _____.

Fluffadoo Seed Travel

Name: _____

mystery science
Why do seeds have so
many different shapes?

Seed A

																
	Test 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Test 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Test 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Seed B

																
	Test 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Test 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Test 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Lesson Assessment

Priya takes her dog, Max, on a walk.
Max loves to walk on the grass and even
in the bushes! At the end of their walk,
Priya notices that there are some seeds
stuck to Max.



1. Which **structure** does Max have that
makes certain seeds stick to him?

- a. His smooth nose
- b. His brown eyes
- c. His fuzzy fur
- d. His wet tongue

2. Priya notices lots of different kinds of seeds on her walk with Max. Some seeds are flat. Some seeds are smooth. Some seeds are red. Some seeds are spiky. Priya notices that only some of the seeds stick to Max.

Draw a seed that you think **WILL**
stick to Max's fur.

Draw a seed that you think **WILL NOT**
stick to Max's fur.

3. Why do you think that the seed you drew in the left box will stick to Max?

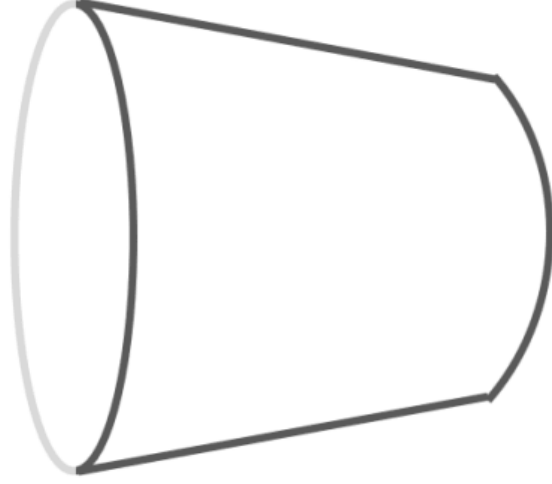
- a. The flat parts will stick to Max.
- b. The smooth parts will stick to Max.
- c. The red parts will stick to Max.
- d. The spiky parts will stick to Max.

Draw the Radishes

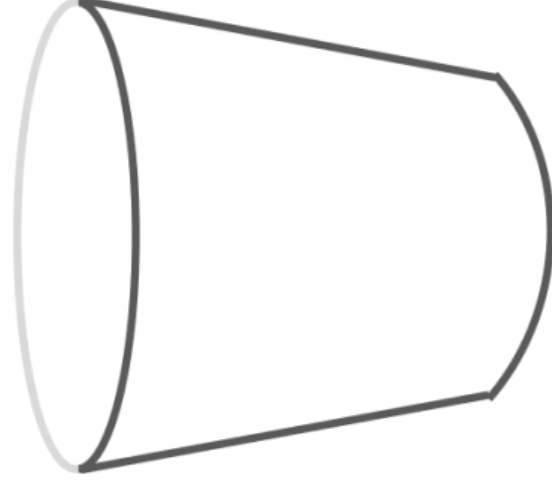
Name: _____

Drawing will help you notice things about your plants. Draw a picture of the plant that was in the light and the plant you kept in the dark. Notice how they are the same and how they are different.

Plant in sunlight 



Plant in darkness



mystery science

Could a plant survive without light?

Could a plant survive without light?

Lesson Assessment

1. Why do you think roots are the first thing to grow after a seed cracks open?

- a. Roots grow first so that they can reach sunlight.
- b. Roots grow first so that they can reach water.
- c. Roots grow first so that they can reach air.

2. What is a sign that a plant is unhealthy?

- a. The plant has leaves that are yellow and not green.
- b. The plant has grown roots.
- c. The plant has lots of green leaves.

3. Which of the following is true for when a plant needs sunlight?

Choose all the correct answers. There may be more than 1 correct answer.

- a. When a plant is a seed, it needs sunlight to sprout.
- b. When a plant is a seed, it does not need sunlight to sprout.
- c. When a plant has leaves, it needs sunlight in order to grow and be healthy.
- d. When a plant has leaves, it does not need sunlight in order to grow and be healthy.

4. If you want to grow a healthy plant, what should you give the plant?

Choose all the correct answers. There may be more than 1 correct answer.

- a. Give the plant plenty of rocks.
- b. Give the plant plenty of water.
- c. Give the plant plenty of sunlight.
- d. Give the plant plenty of soil.

5. You plant a tomato seed and grow it in the light. At the same time, you plant a different tomato seed and grow it in the dark. You give both plants the same amount of water. Draw what you think each plant will look like after one week.

Grown in the Light

Grown in the Dark

6. Why does the tomato plant grown in the dark look different than the one grown in the light? Explain in terms of what plants need to grow.

Experiment Ideas

I think we
should keep one
plant in the
sunlight and
one plant in the
shade.

I think we should
give one plant
lots of water and
one plant just a
little water.

I think we should
give one plant lots
of water and
sunlight and one
plant just a little
water and put it in
the shade.



Ahmed



Bianca



Carlos

Sunlight Experiment



Name: _____

mystery science

How much water should
you give a plant?

Do the Mystery Plants grow better with
LOTS of sunlight or just a **LITTLE** sunlight?

Box A

Box B

RESULTS:

The Mystery Plants grow better with **lots of sunlight** / **just a little sunlight**.

Water Experiment



Name: _____

mystery science

How much water should
you give a plant?

Do the Mystery Plants grow better with
LOTS of water or just a **LITTLE** water?

Box A

Box B

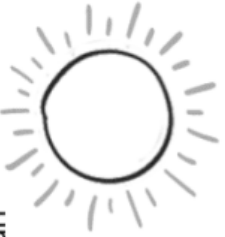
RESULTS:

The Mystery Plants grow better with **lots of water** / **just a little water**.

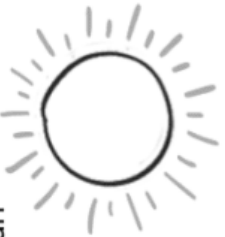
Build-Your-Own Experiment

mystery science
How much water should
you give a plant?

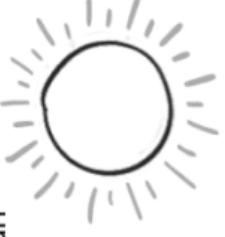
Sun



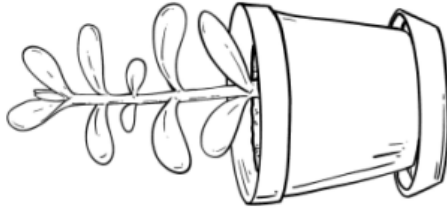
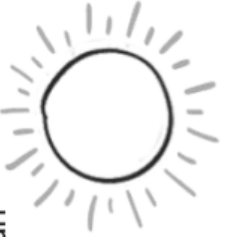
Sun



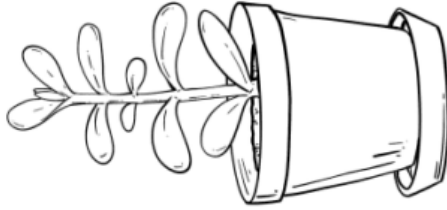
Sun



Sun



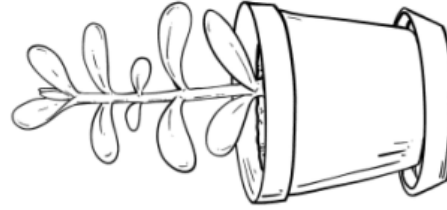
Mystery Plant



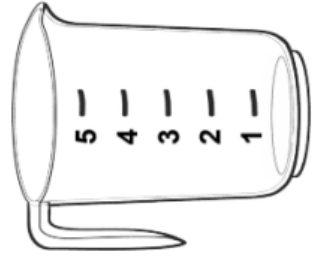
Mystery Plant



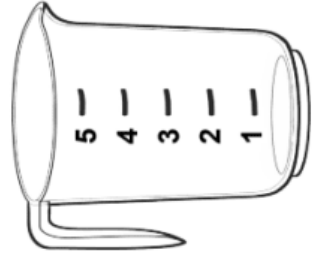
Mystery Plant



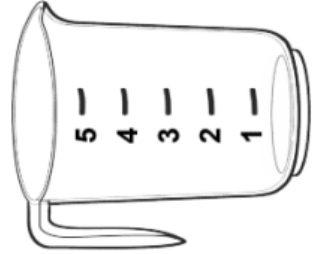
Mystery Plant



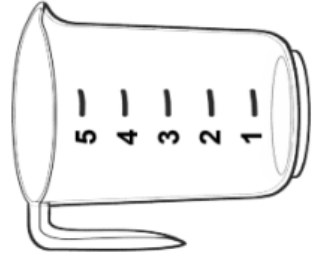
Water Container



Water Container



Water Container



Water Container



Lesson Assessment



Sheila brought four new plants home. She wants to take care of them, but there's a problem. Sheila doesn't know how much water or sunlight these plants need to grow and stay healthy.

All four plants are the same kind and they are all about the same size and shape.

1. Sheila first wants to do an experiment to test how much **water** her plants need to grow and stay healthy. What is the best experiment to test how much **water** the plants need?



a. Give the plants the same amount of water.

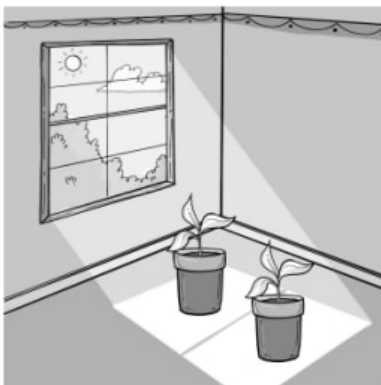


b. Give one plant a lot of water and one plant only a little water.



c. Do not give the plants any water.

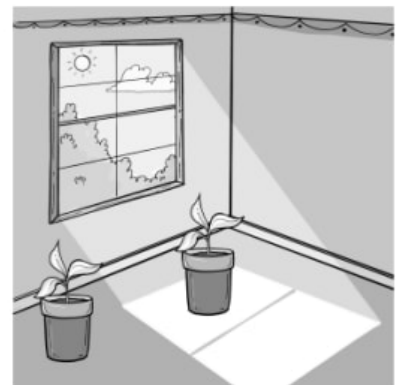
2. Sheila wants to do an experiment to test the amount of **sunlight** her plants need to grow and stay healthy. What is the best experiment to test how much **sunlight** the plants need?



a. Place both plants where there is lots of sunlight (see the picture above).



b. Place both plants in the shade (see the picture above).



c. Place one plant in the sunlight and one in the shade (see the picture above).

3. After the experiments, what can Sheila do to tell which plants are healthier?

Circle all the correct answers.

- a. Measure how tall each plant is.
A healthy plant will grow taller.



- b. Feel how wet the soil of each plant is.
A healthy plant will have wet soil.



- c. Count the number of leaves on each plant.
A healthy plant will grow more leaves.



4. After the experiment, the plant given only a small amount of water grows a lot more than the others. Using this information, how much water should Sheila give her plants?

- a. Sheila should give all these plants lots of water.
- b. Sheila shouldn't give the plants any water.
- c. Sheila should give all the plants a small amount of water.
- d. Sheila won't know how much water to give her plants.

5. After the experiment, the plant in the place with lots of sunlight grows a lot more than the others. Using this information, how much sunlight should Sheila give her plants?

- a. Sheila should put all the plants in a place with lots of sunlight.
- b. Sheila shouldn't give the plants any sunlight.
- c. Sheila should put all the plants in a place with shade.
- d. Sheila won't know how much sunlight to give her plants.

Unit Assessment

1. Seeds can move in different ways. Some seeds use the wind to travel. Other seeds use animals to travel. Draw a line to match each seed shown below with what it uses to travel.



Seed A



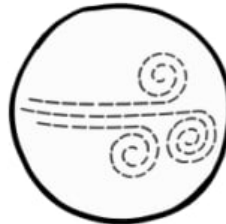
Seed B



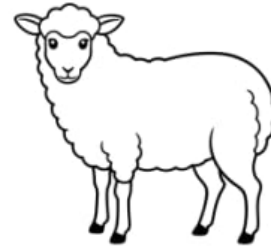
Seed C



A Squirrel



The Wind



A Sheep

2. Some seeds stick to animals. Those seeds use the animal to travel. Two dogs are shown below. Which dog is a seed most likely to stick to? Why? Circle the best answer.

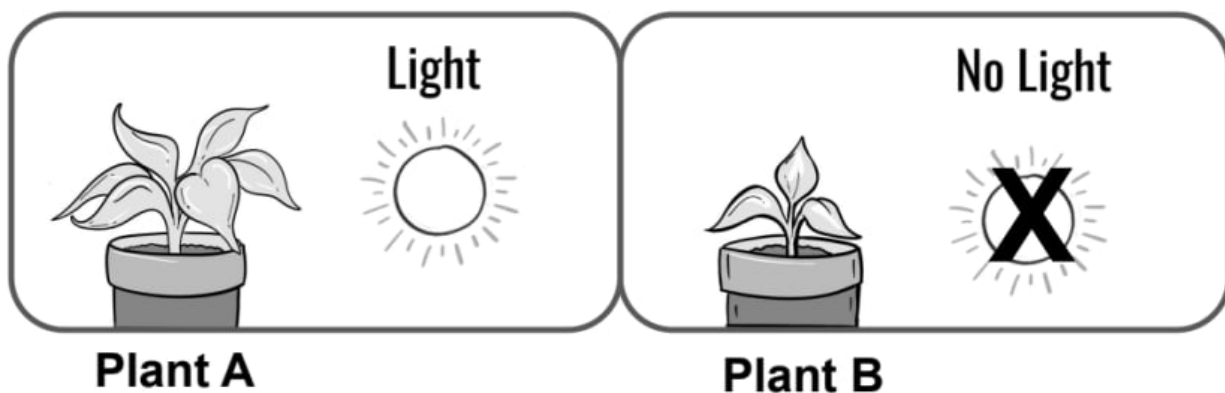
- a. Dog A because it is big.
- b. Dog B because it is small.
- c. Dog A because it is smooth.
- d. Dog B because it is furry.



Dog A



Dog B



3. Jasmeet ran an experiment with two plants. Plant A got lots of sunlight. Plant B did not get any sunlight. Both plants got plenty of water.

After two weeks, Plant A (grown in the sunlight) had lots of leaves. The leaves were green. Plant B (grown with no sunlight) only had three leaves. The leaves were yellow.

Which of the two plants do you think is healthier? There may be more than 1 answer. Choose all the correct answers.

- a. Plant A because it has lots of leaves.
- b. Plant B because it has three leaves.
- c. Plant A because it has green leaves.
- d. Plant B because it has yellow leaves.

4. Explain why you think the two plants look the way they do. Explain in terms of what plants need to survive.

5. Plant A continues to get lots of sunlight. Plant B continues to not get any sunlight. What do you think will happen? Circle the best answer.

- a. Plant A will eventually die because it needs less sunlight to survive.
- b. Plant B will eventually die because it needs more sunlight to survive.

Erosion & Earth's Surface

2nd Grade • NGSS • Unit Worksheets

Lesson 1



Where's the best place to hide a treasure?

Lesson 2



If you floated down a river, where would you end up?

Lesson 3



Why is there sand at the beach?

Lesson 4



Where do flash floods happen?

Lesson 5



What's strong enough to make a canyon?

Lesson 6



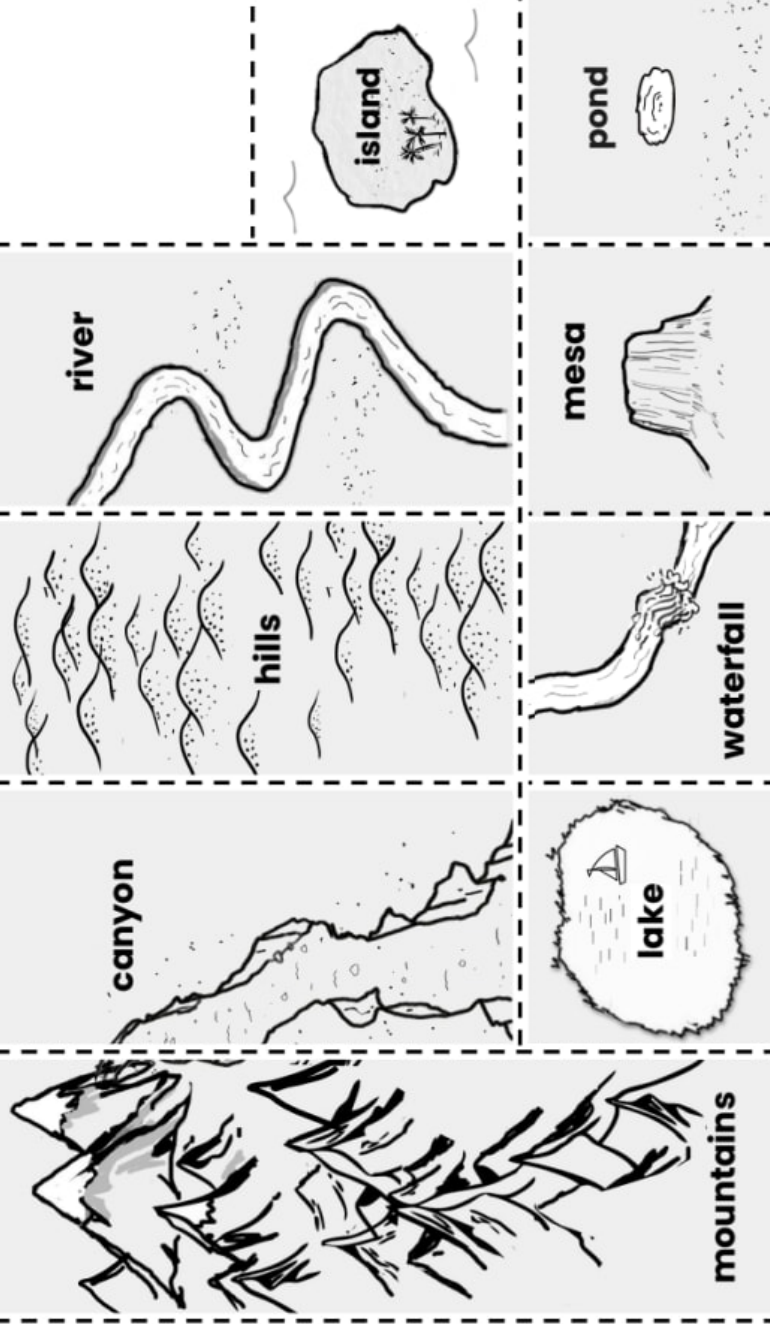
How can you stop a landslide?

I am also curious about...

Map Pieces

mystery science

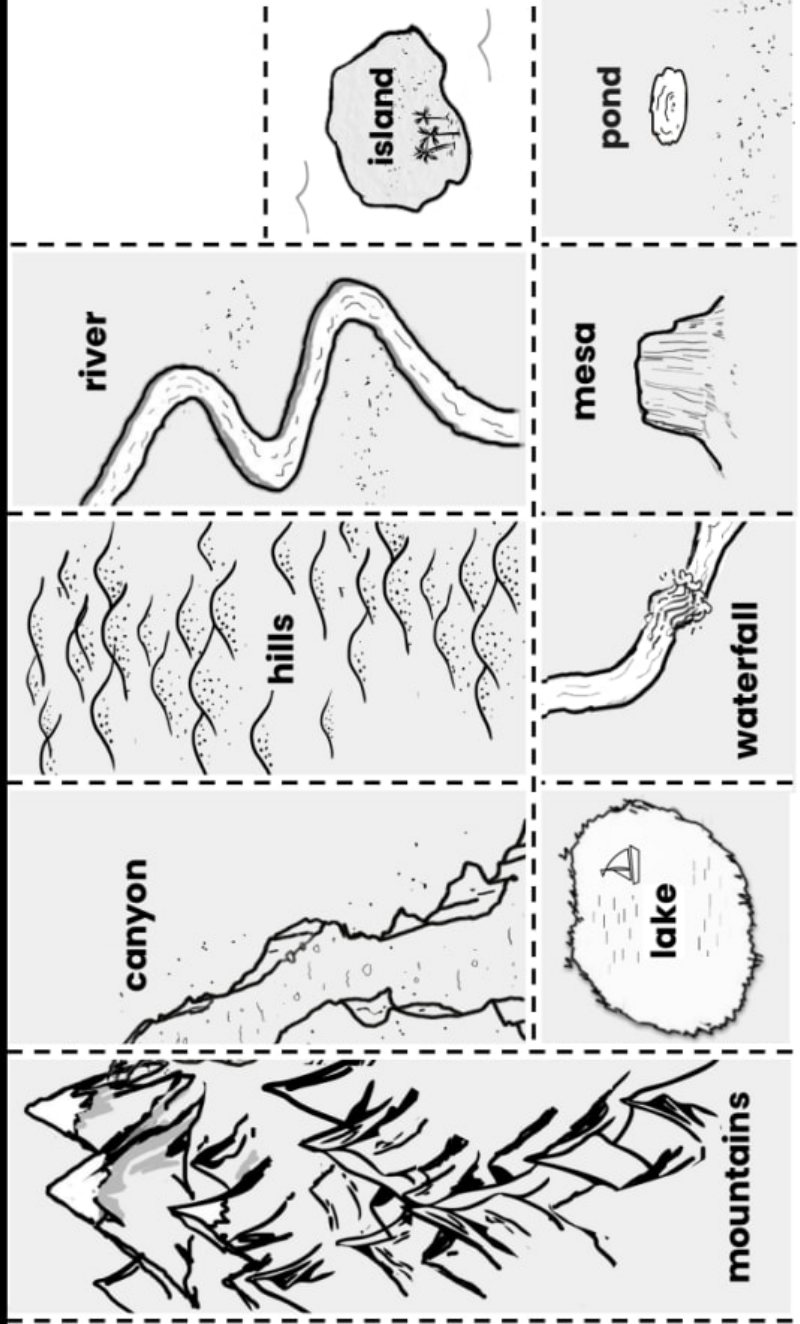
Where's the best place
to hide a treasure?



Map Pieces

mystery science

Where's the best place
to hide a treasure?

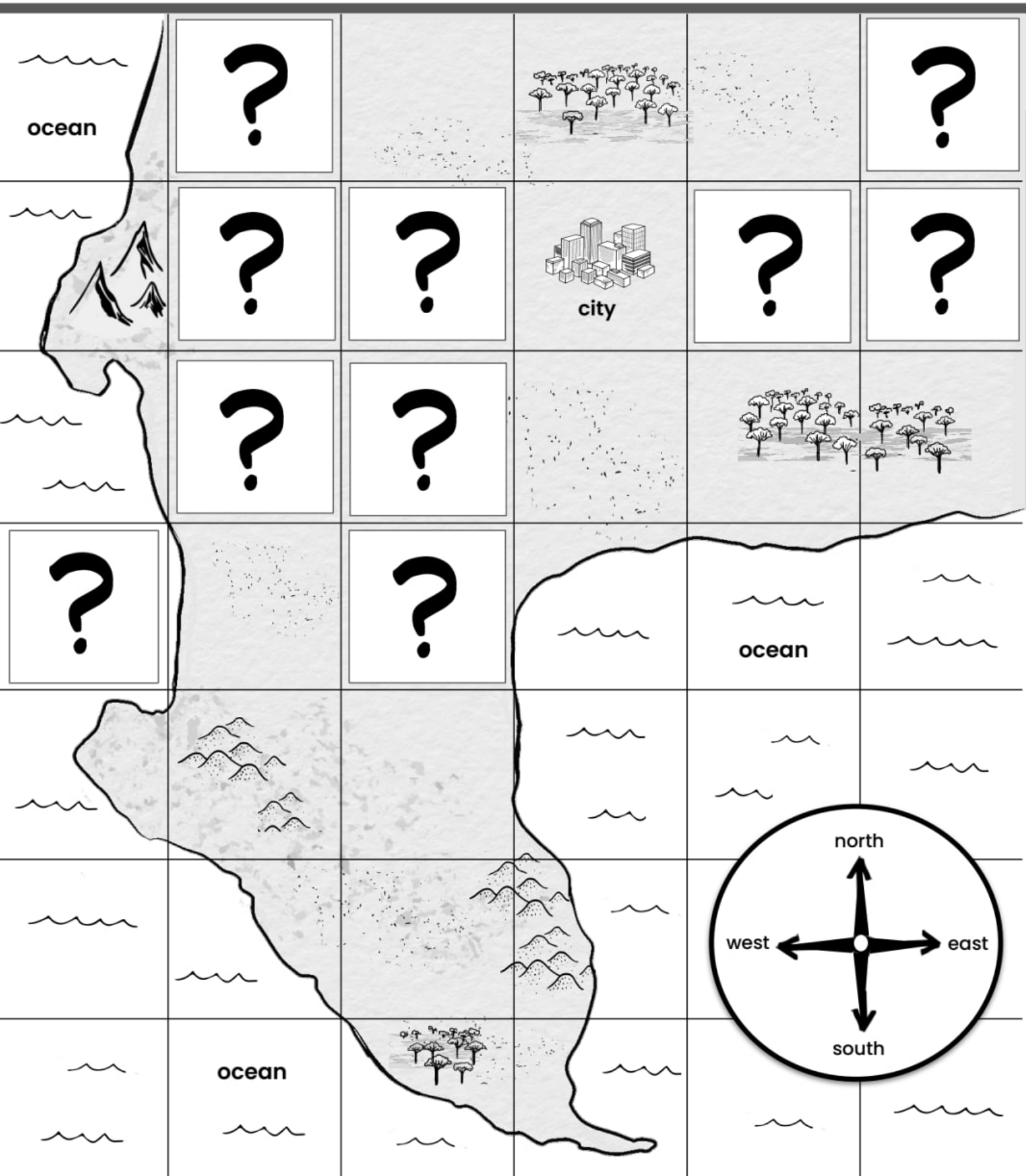


Treasure Map

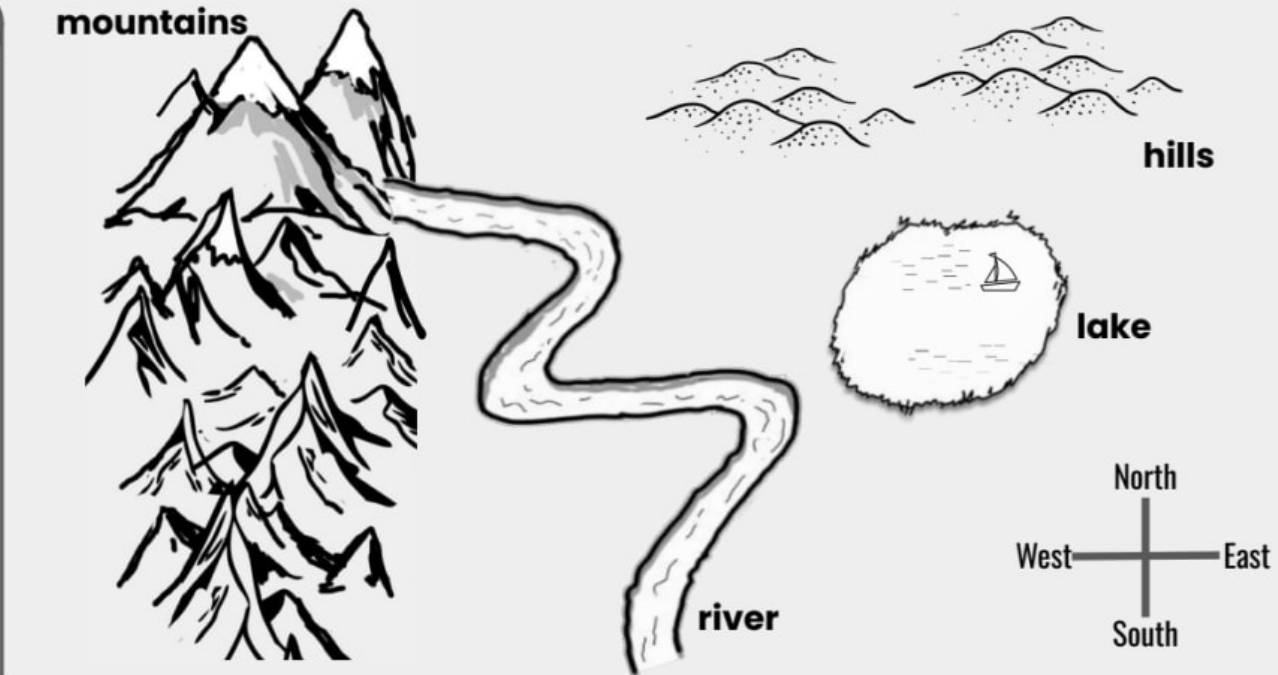
Name: _____

mystery science

Where's the best place to hide a treasure?



Lesson Assessment



You found a treasure map! There are 3 places where a treasure is hidden on this map! Can you find them all?

The map shows the land and water features in this area. It also has a compass to show directions.

Use the clues below and the compass to find the secret location of all 3 treasures.

Treasure #1

To the north are tall spots with rounded tops. To the south is water with land all around it.

Write an "X" on the map to show where this treasure is located!

Treasure #2

To the west are tall, pointy peaks. To the east is long, winding, flowing water.

Write a "Y" on the map to show where this treasure is located!

Treasure #3

To the west are tall, pointy peaks. To the south is long, winding, flowing water. To the east are tall spots with rounded tops.

Write a "Z" on the map to show where this treasure is located!

put sticker
here

mystery science

If you floated down a river, where would you end up?

put sticker
here

put sticker
here

Names (both partners):

put sticker
here

Lesson Assessment

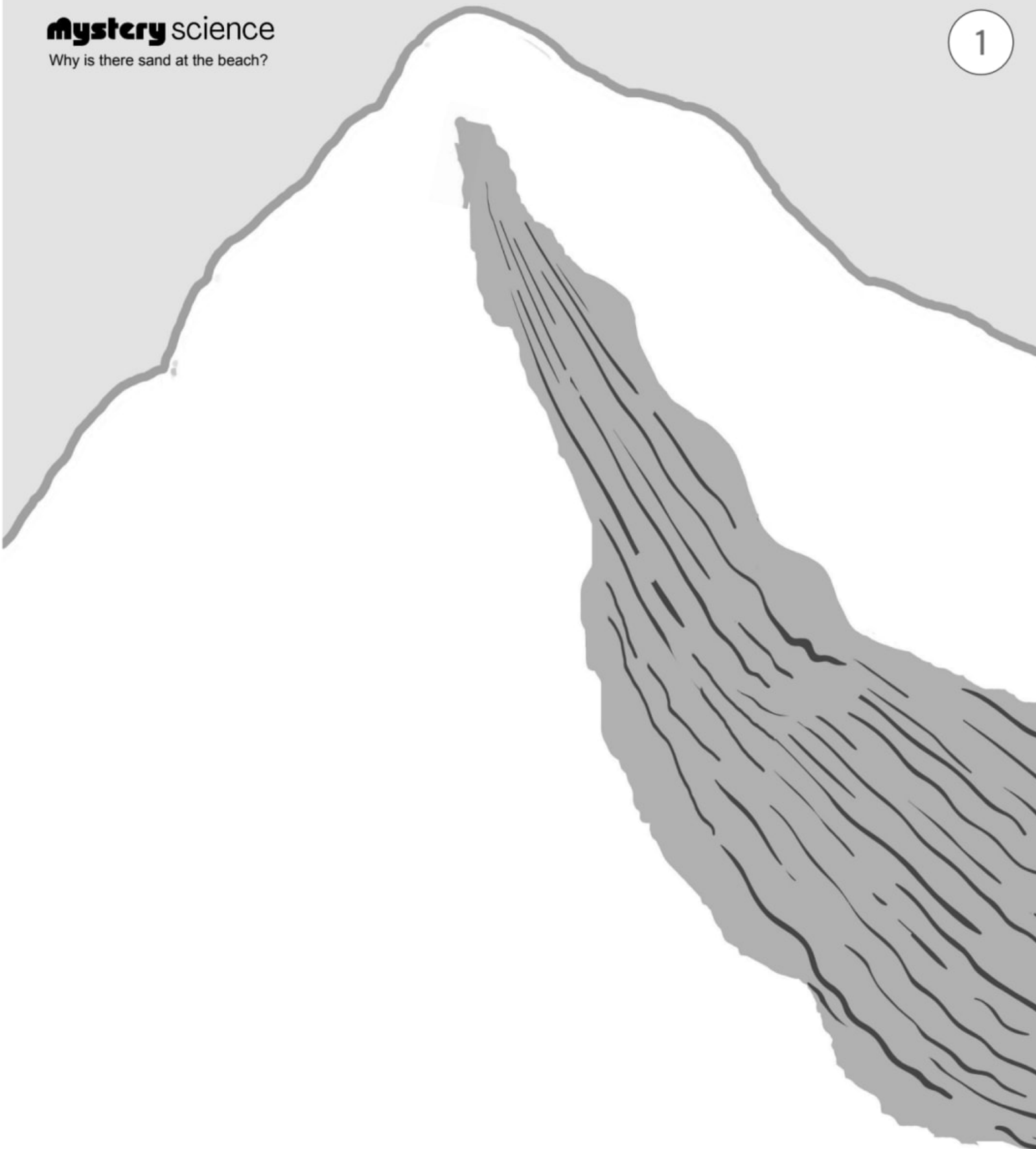


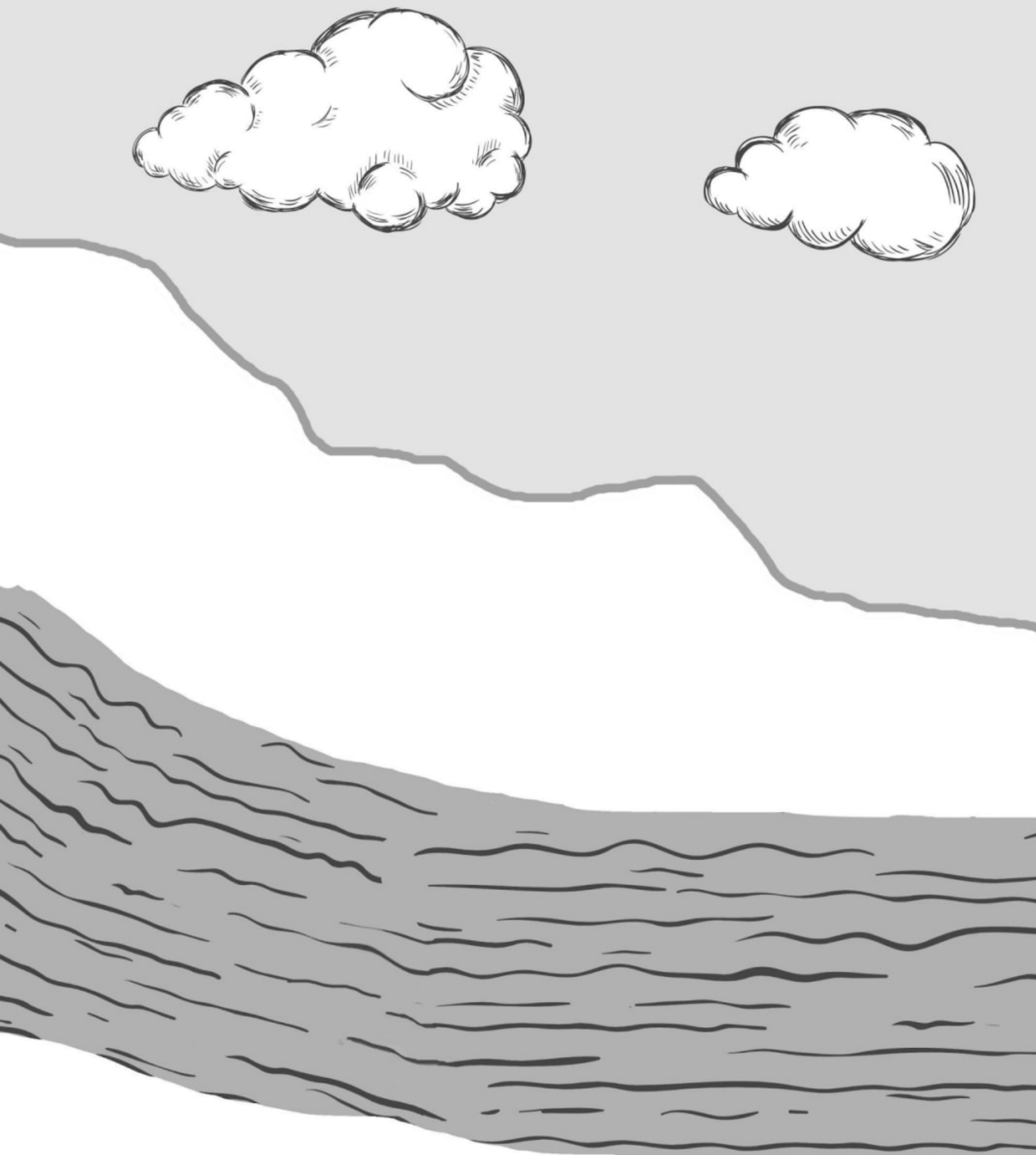
The map above shows some mountains and four rivers. The arrows show the direction that each river flows. The map also has a compass to show the directions north, south, east, and west.

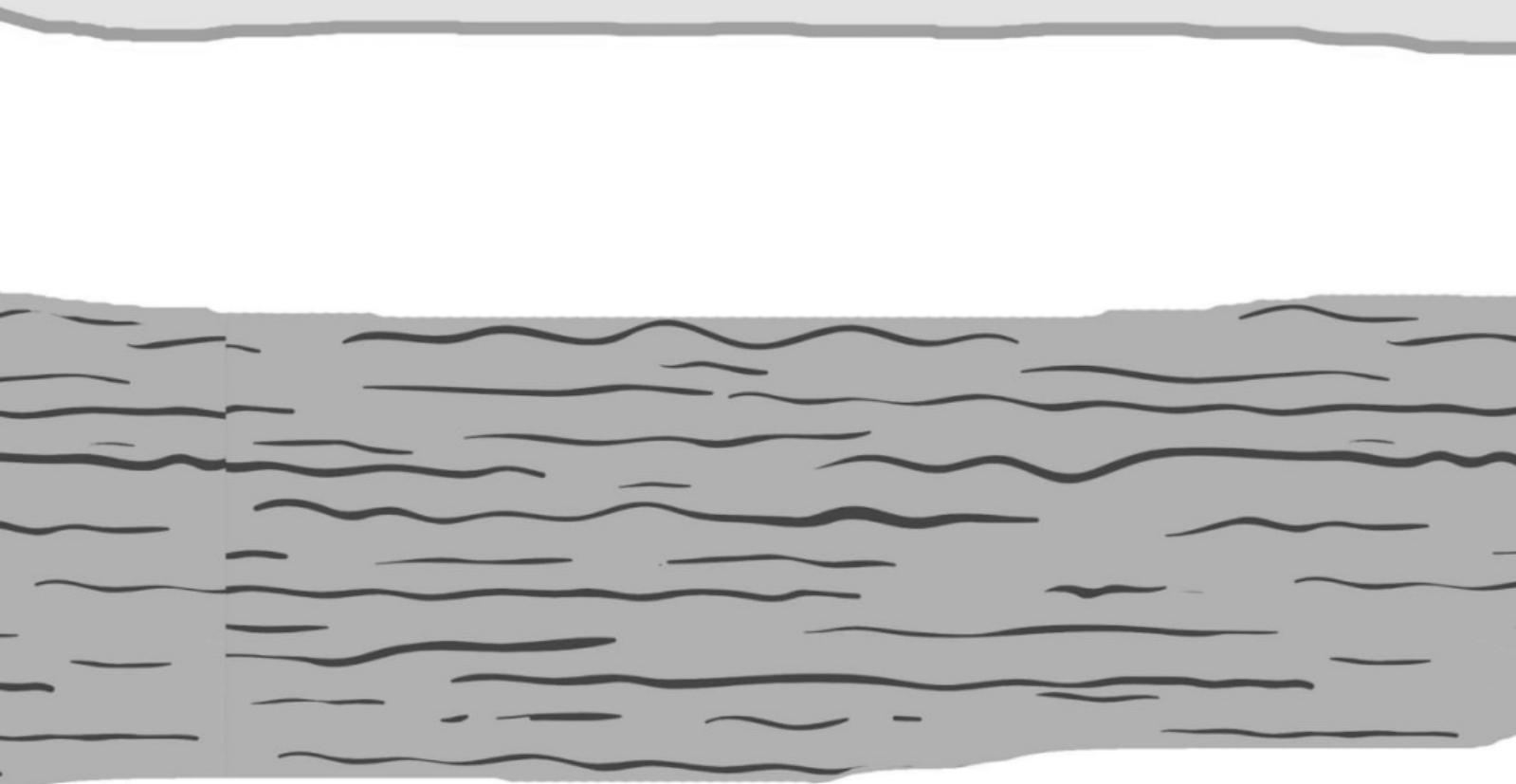
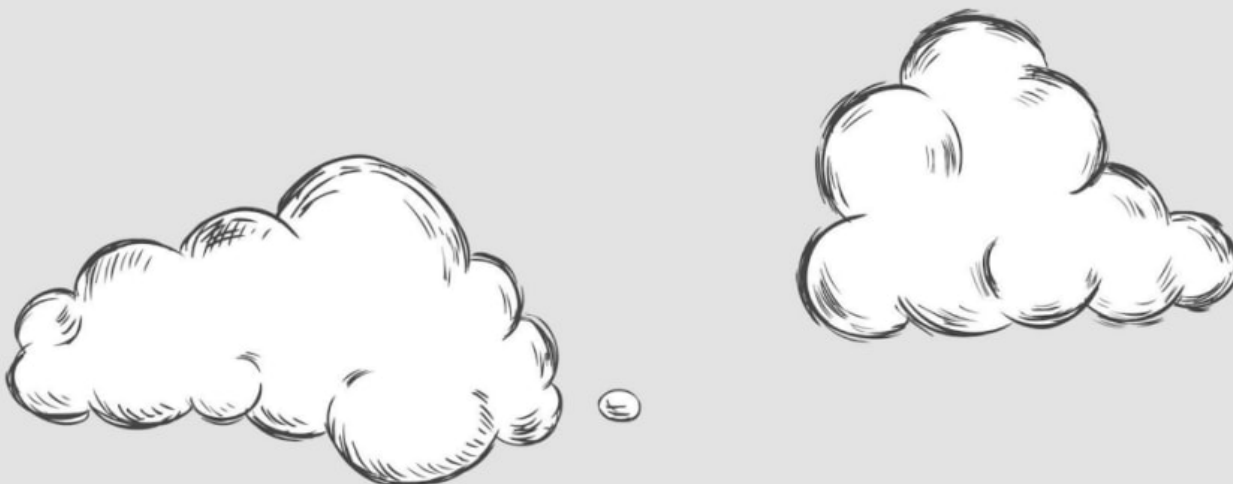
Use the map to help you answer each question below. **Circle True or False.**

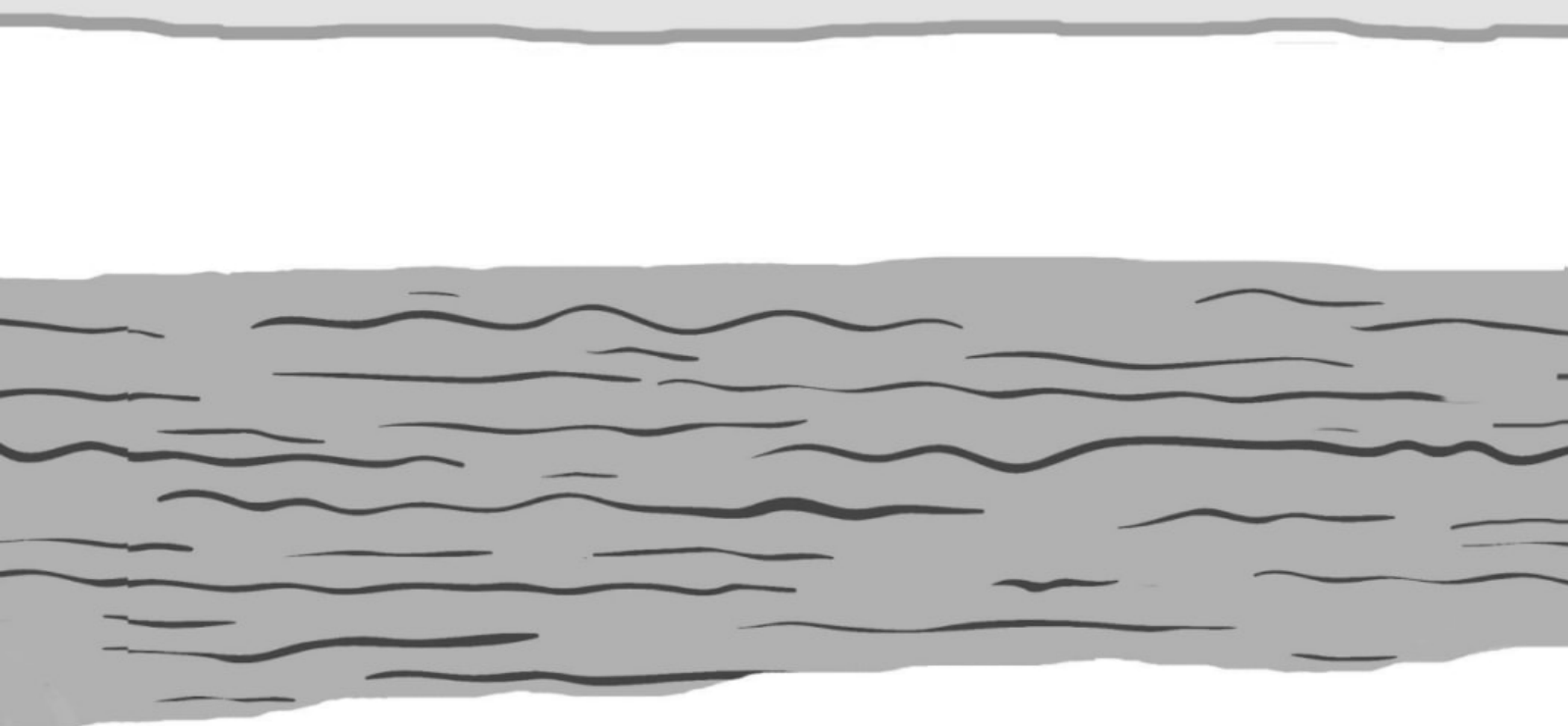
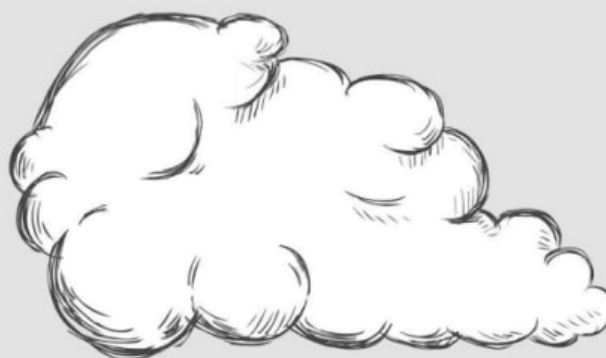
1. True False All rivers flow from east to west.
2. True False All rivers flow from north to south.
3. True False All rivers flow from high places like mountains to lower places.
4. True False All rivers flow from low places to higher places, like mountains.

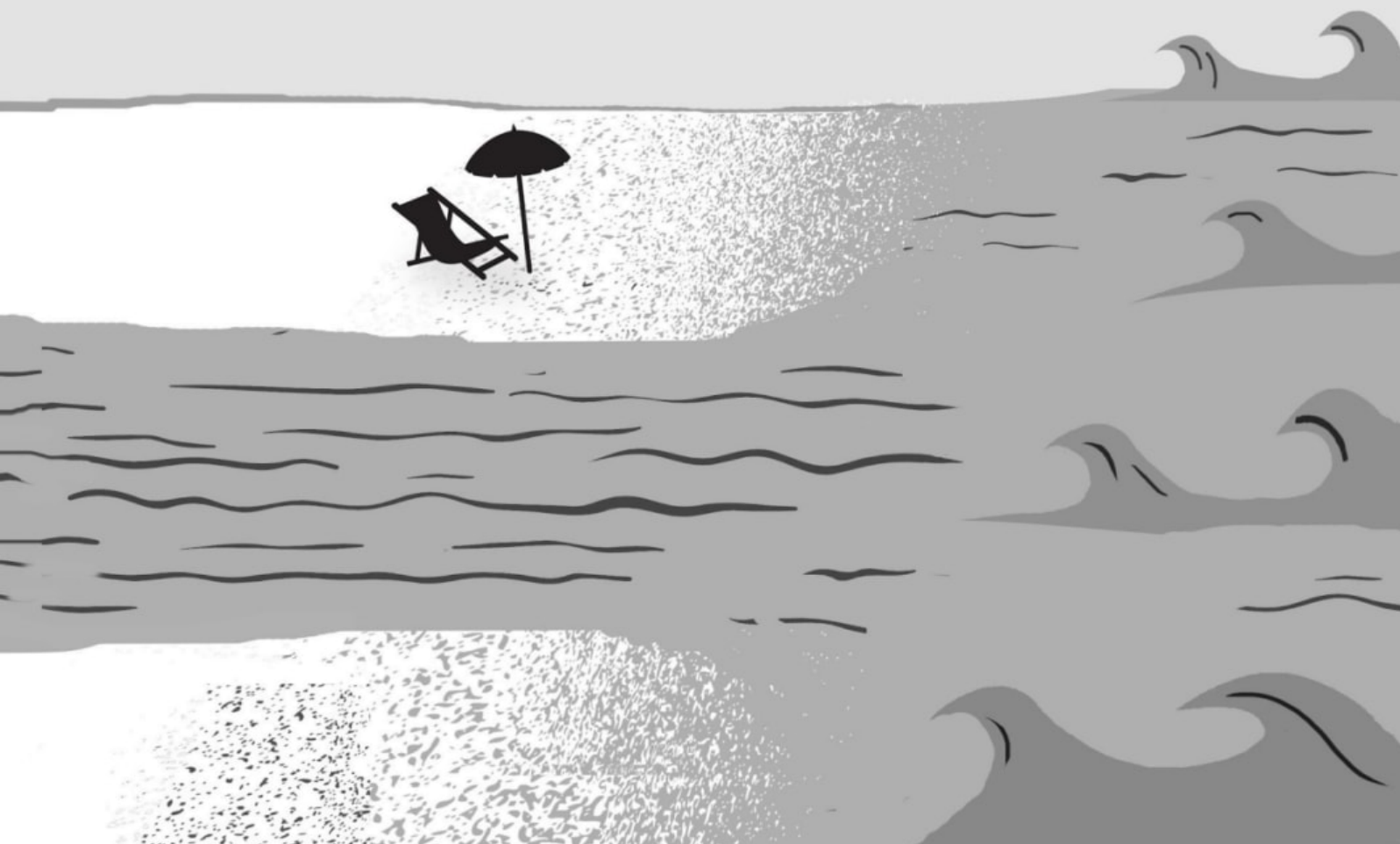
5. If you floated all the way down a river, where might you end up? Use the map to help you answer this question.







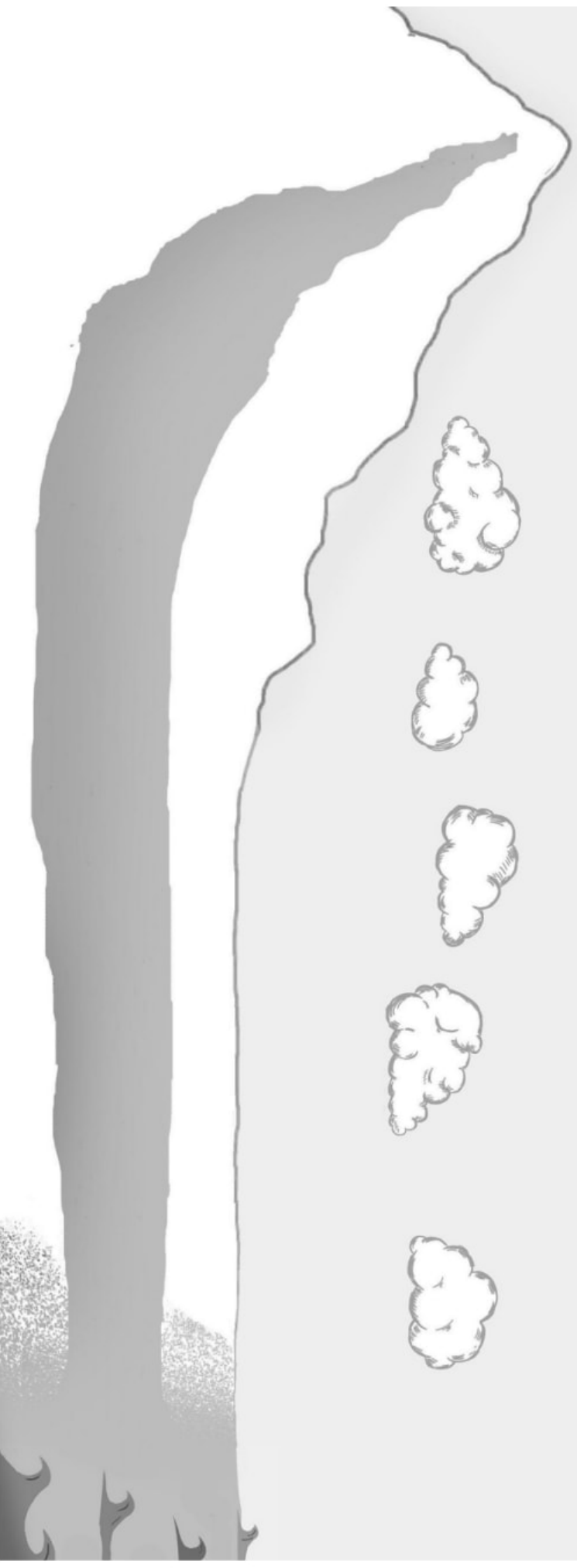




Draw the river rocks

Name: _____

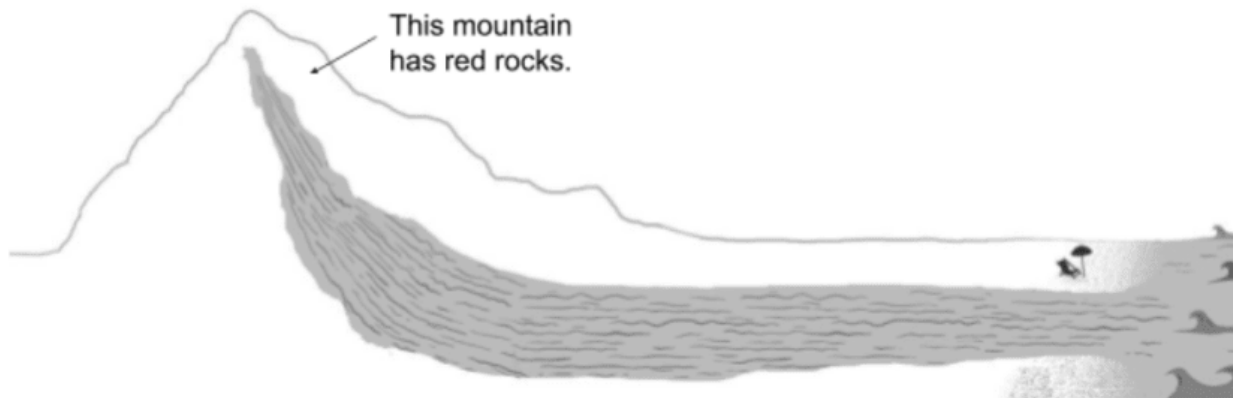
Draw rocks breaking up in the river,
starting at the top of the mountain
and ending at the ocean.



Why is there sand at the beach?

Lesson Assessment

1. What color will the sand be at this beach? Why do you think that?



2. Why is there sand at the beach? Draw a picture and use words:

mystery science

If you floated down a river, where would you end up?

Flash Flood Finder

Name: _____

KEY



= a lower place near a higher place



= bottom of cliff or slope



= clay soil



= pavement



= giant rainstorms

mystery science

Where do flash floods happen?

1

2

3

4

5



Flash Flood Finder

Name: _____

KEY



= a lower place near a higher place



= bottom of cliff or slope



= clay soil



= pavement



= giant rainstorms

mystery science

Where do flash floods happen?

1

2

3

4

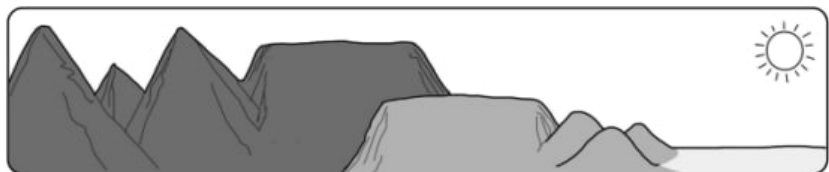
5

Texas Explorer

Name: _____

KEY

The numbers on the map mark places where Flash Flood Alley might be.



= Tall mountains and flat-topped mountains



= Lower flat-topped mountains and hills



= Low plains



= Water



= Cliffs and rocky slopes



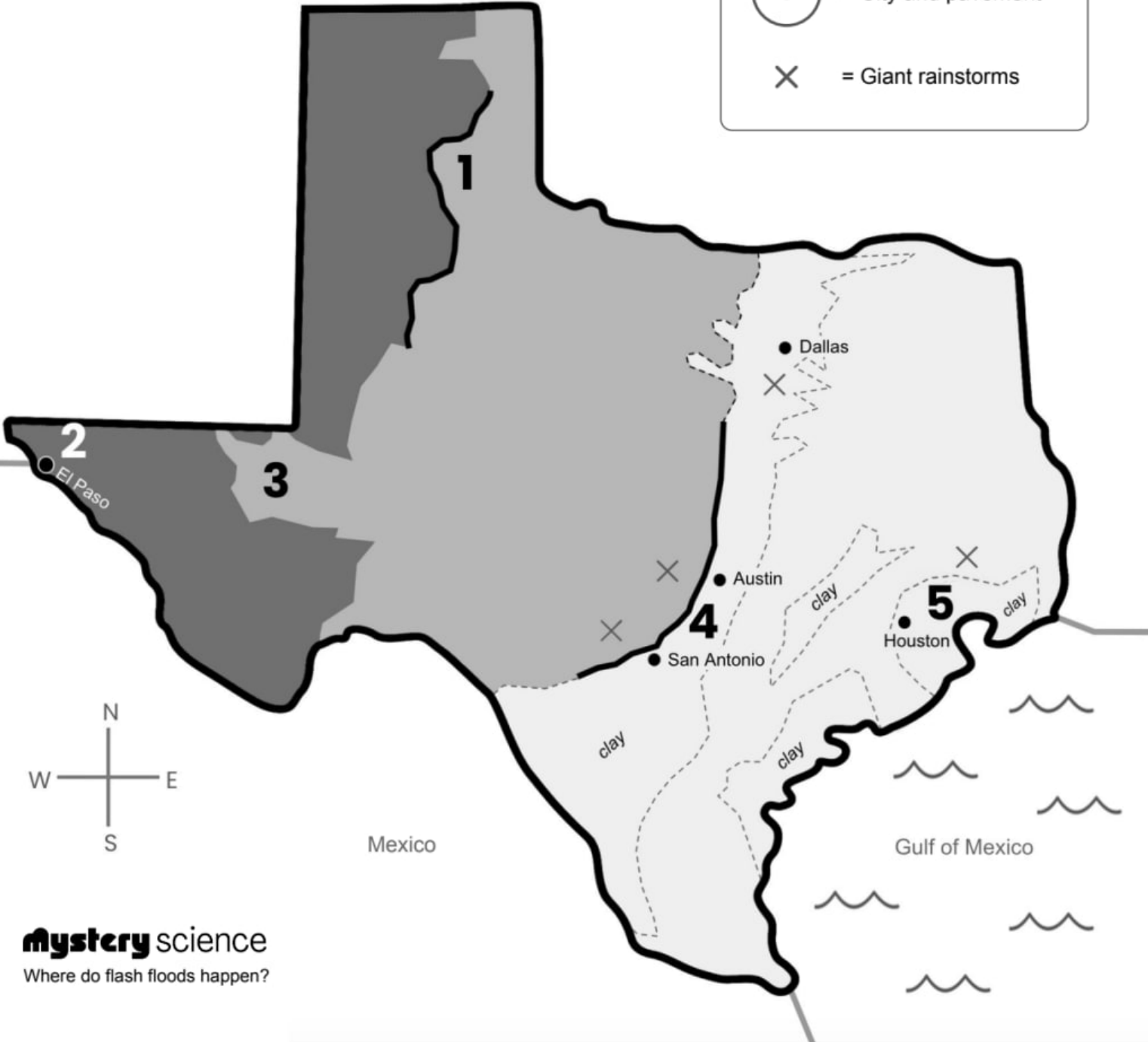
= Clay soil



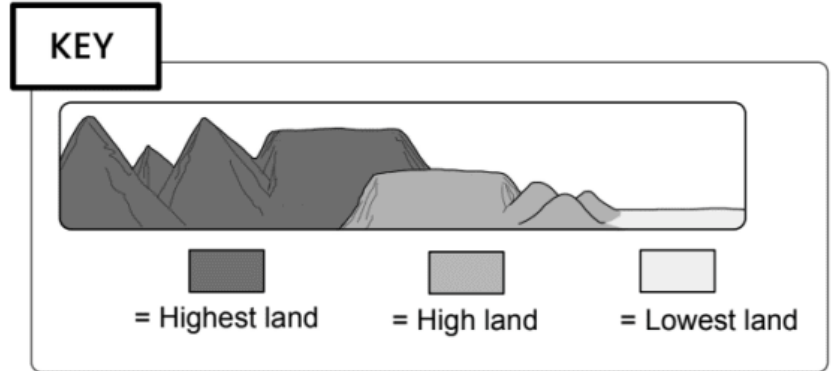
= City and pavement



= Giant rainstorms



Lesson Assessment



1. The map above shows the US state of Arizona. The key to the right of the map tells you what each shade of gray means. Use the map and the key to answer the following questions.

Circle **True** or **False** for each sentence.

True False The dark gray on the map shows where the land in Arizona is the highest.

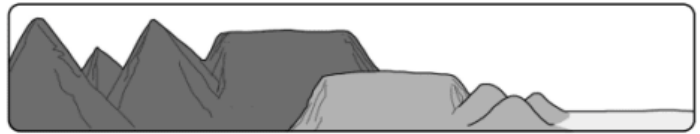
True False The light gray on the map shows where the land in Arizona is the lowest.

True False The light gray on the map shows where there are lakes in Arizona.

True False If you traveled to the top right part of the state of Arizona, you would probably see some of the highest land, including mountains.



KEY



 = Highest land

 = High land

 = Lowest land

2. Flash floods happen in the state of Arizona. Flash Floods are most likely to happen when there is lower land next to higher land. Using the information from the map of Arizona above, which number is most likely to be a place where a flash flood will happen?

- Number 1
- Number 2
- Number 3
- Number 4
- Number 5

3. Sophia lives in the city of Phoenix, Arizona. Should Sophia be ready for a flash flood? Why or why not? Use information from the map and the map's key on the right to answer.



KEY



 = Highest land

 = High land

 = Lowest land

● = Phoenix

How did water change your land?

Name: _____

Rainstorm # 1

Draw what happened:



Rainstorm # 2

Draw what happened:

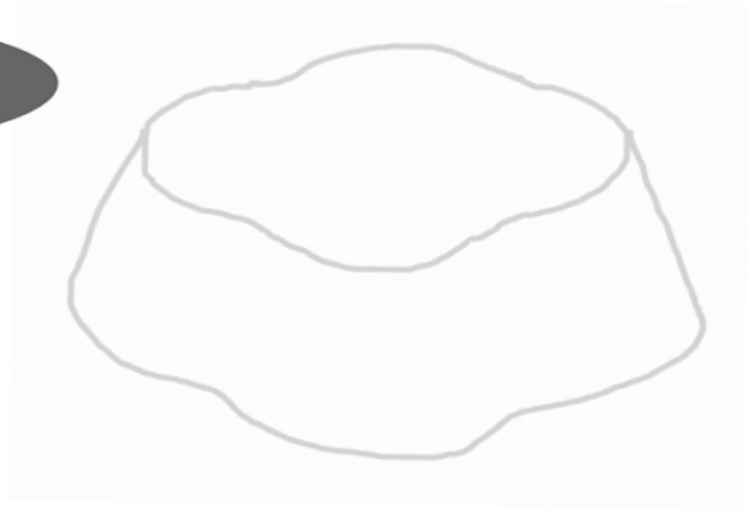


mystery science

What's strong enough to make a canyon?

Rainstorm # 3

Draw what happened:



Rainstorm # 4

Draw what happened:



Look back at all of your drawings.
How did the water change your land?

mystery science

What's strong enough to make a canyon?

What's strong enough to make a canyon?

Lesson Assessment



1. Imagine a dump truck dumped a big mound of dirt in the park. Will the dirt stay in that mound forever? Why or why not?

2. How do canyons form?

3. Do you think canyons form very quickly or very slowly? Why or why not?

mystery science

What's strong enough to make a canyon?

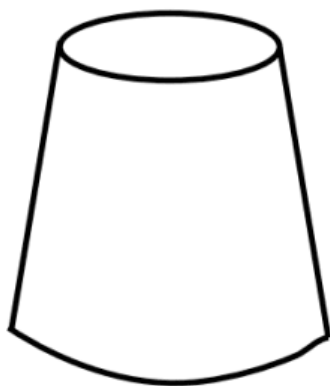
Dump truck image credit: VECTORWORKS_ENTERPRISE/Shutterstock

Save the Hills

Name: _____

First Test

1. Draw and label what you added to your first hill to try to protect it from erosion.



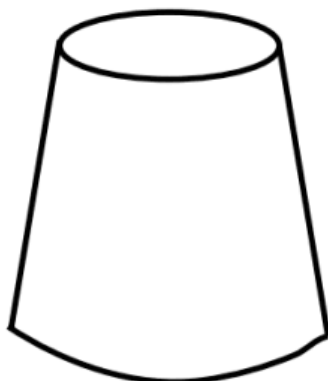
What do you think will happen?

2. Draw what your first hill looked like after the rain.

What did happen?

Second Test

3. Draw and label what you added to your second hill to try to protect it from erosion.



What do you think will happen?

4. Draw what your second hill looked like after the rain.

What did happen?

How can you stop a landslide?

Lesson Assessment

1. This is a diagram of a hillside where plants are helping to stop erosion. Match the numbers on the diagram with the descriptions.

- _____ Plants hold down the soil with their roots
- _____ Leaves keep raindrops from hitting the soil
- _____ Dead plants on the ground soak up rainwater



2. A wildfire burns away all the plants on this hill!

Is a landslide more or less likely to happen now?

MORE / LESS (circle one)

Explain your thinking:

3. Reflect on the “Erosion Engineering” activity:

A. What problem were you trying to solve?

B. Which materials did you use in your design? Why did you choose these materials?

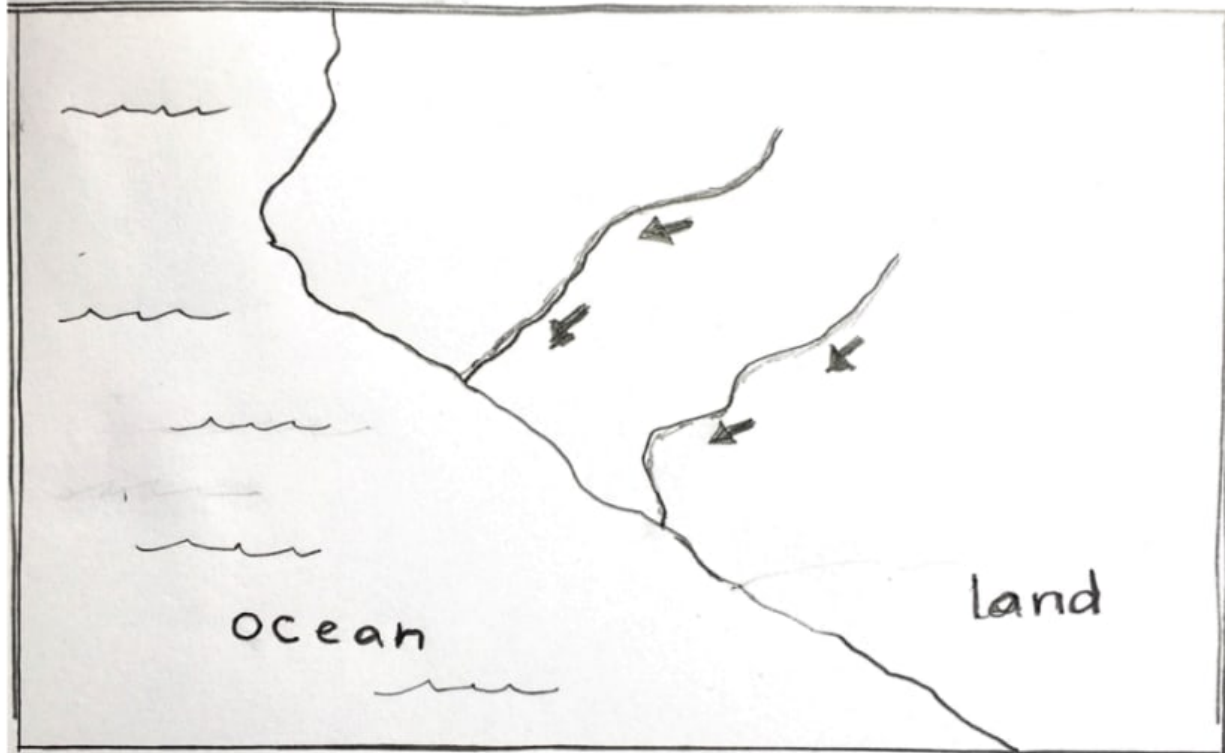
C. Which materials worked best to stop erosion? Why do you think that was?

Unit Assessment

1. If it never rained, do you think the world would look different? Explain.

2. Here is a map showing two rivers. If there are mountains, where do you think they are?

Look at this map and draw where you think there might be mountains:



Why did you put mountains there?

3. Why is there sand at the beach? Draw a picture to show your understanding.

4. Imagine a friend said to you, "Water can't be as powerful as an excavator!" Do you agree or disagree? Why?

Material Properties

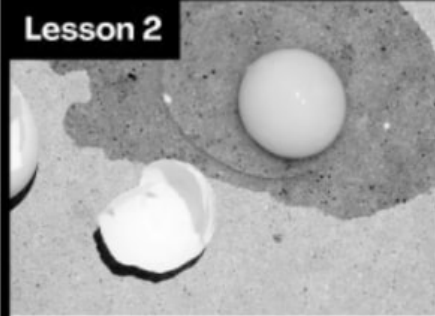
2nd Grade • NGSS • Unit Worksheets

Lesson 1



Why do we wear clothes?

Lesson 2



Can you really fry an egg on a hot sidewalk?

Lesson 3



Could you build a house out of paper?

Lesson 4



How do you build a city out of mud?

I am also curious about...

Mad Hatter's Worksheet

Name: _____

1). Softness test

Circle the materials that are soft enough to put on your head.



aluminum foil



paper plate



paper towel



paper bag

2). Sweat-soaker test

Circle the materials that soak up water. They'll soak up sweat too.



aluminum foil



paper plate



paper towel



paper bag

3). Stiffness test

Circle the materials that are stiff. They will make good brims.



aluminum foil



paper plate



paper towel



paper bag

mystery science

Why do we wear clothes?

Why do we wear clothes?

Lesson Assessment

1. Which properties would you want your clothing to have if you were...

running and jumping: _____

playing in the snow: _____

swimming: _____

Examples of Properties:

stiff
opaque
light

waterproof
soft
heat-trapping
stretchy

heavy
strong
absorbent

2. Fill in the missing material, properties or examples in the table below:

Material	Properties	Example(s)
cotton	soft, absorbent, opaque	
metal		armor, pans
	bouncy, stretchy, waterproof	balls, tires, erasers, rain boots

3. Draw a picture to show **how you would test a material** to see if it was:

Property	Draw test here...
Waterproof	
Opaque (<i>not see through</i>)	

Feel The Heat

Name: _____

Mitten Materials

1.



aluminum

Can you tell the bottles apart?

☐ Yes

☐ No

2.



cloth

Can you tell the bottles apart?

☐ Yes

☐ No

3.



styrofoam

Can you tell the bottles apart?

☐ Yes

☐ No

4.

Circle which mitten-materials **protect you from feeling the heat**.
(Scientists call this **INSULATING**.)

aluminum



cloth



styrofoam



mystery science

Can you really fry an egg on a hot sidewalk?

Can you really fry an egg on a hot sidewalk?

Lesson Assessment

1. If you had to walk across hot pavement, which material would protect your feet the best? (Circle one)

cotton socks styrofoam shoes metal shoes barefoot (no material)

Why did you choose that material? I chose _____ because ...

2. Why would you need a metal pan to fry an egg on a hot sidewalk?

You need a metal pan to fry an egg because _____

3. When you get into a car on a hot day, which would feel hotter, the **metal door handle** or the **cloth seats**? Why?

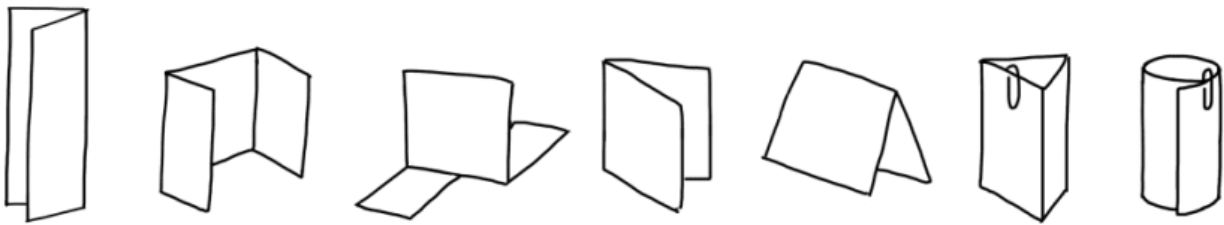
The _____ would feel **hotter** because that material is

The _____ would feel **less hot** because that material is

Paper Towers

Name: _____

1. You used note cards to make pieces to build a tall tower. What did your pieces look like? You can circle our pictures, draw your own pictures, or describe your pieces in words.



2. Could you use the same pieces to build a tall tower and a strong tower? How?

3. Is making towers with cards *different* from building real buildings? How?

4. Is making towers with cards *similar* to building real buildings? How?

Lesson Assessment

1. Which are properties of paper?

- a. strong and stiff
- b. flexible and foldable
- c. heavy and hard

2. TRUE or FALSE? (circle one) We can change the properties of paper by folding it to make it bend less easily.

3. Based on your experiments building paper structures, do you think paper could be used to build an entire house? Why or why not?

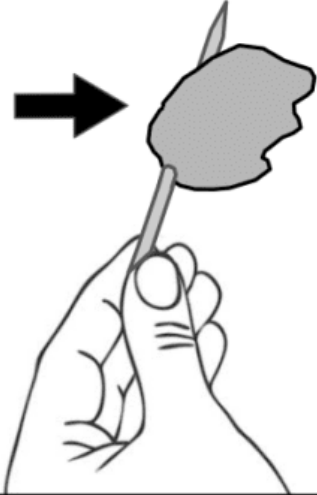
I think paper COULD / COULD NOT (circle one) be used to build a house because...

4. What is one example of a large structure that is made from smaller pieces?

A _____ is one example of a large structure made from smaller pieces. It is made from pieces of _____
_____.

Name: _____

1



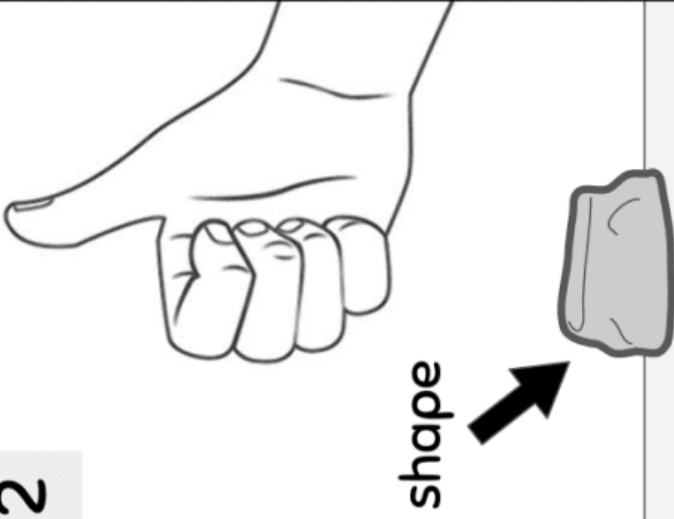
stays on

A

B

C

2



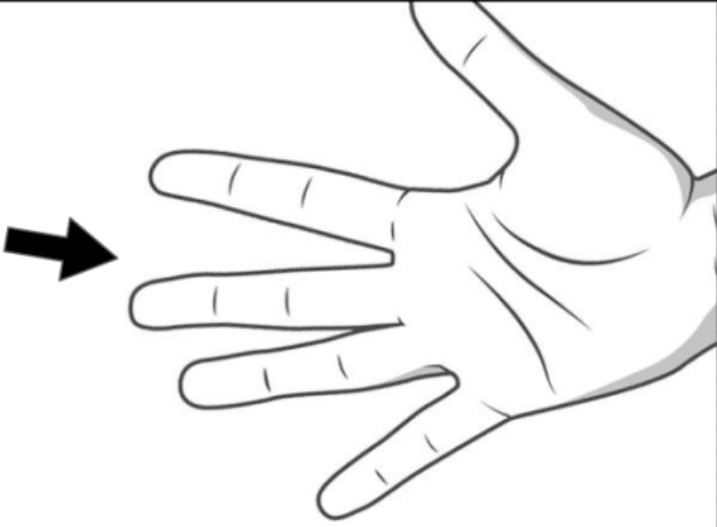
shape

A

B

C

3



clean fingers

A

B

C

Lesson Assessment



1. Miles wants to study the soil where he lives. He gathers soil from his backyard. Miles has two other soil samples—sandy soil and clay soil. Miles writes down his observations for each dry soil sample in the table below.

	 Miles's Soil	 Sandy Soil	 Clay Soil
Color	White	White	Red
Dry Texture	Rough	Rough	Soft

Using information from the table above, circle **True** or **False** for each sentence.

- True False The color of Miles's soil is the same as the color of sandy soil.
- True False The dry texture of Miles's soil is the same as the dry texture of sandy soil.
- True False Miles's dry soil has properties that are the same as the properties of dry clay soil.

2. Miles wants to know if the soil from his backyard has the properties that can be used to make a mud house. What observations can Miles make to help him figure this out?

Circle the best answer.

- Miles can feel the texture of his soil and compare it with the color of the sandy soil and the color of the clay soil.
- Miles can mix the soil with water to make mud and compare the mud with the dry sandy soil and the dry clay soil.
- Miles can mix the soil with water to make mud. He would need to mix the sandy soil with water and the clay soil with water to compare all three muds.



3. Miles adds water to the soil from his backyard. He also adds water to the sandy soil sample and the clay soil sample. He writes down his observations in the table below.

	 Miles's Soil	 Sandy Soil	 Clay Soil
Color	White	White	Red
Dry Texture	Rough	Rough	Soft
Wet Texture	Sticky	Not Sticky	Sticky

Using information from the table above, circle **True** or **False** for each sentence.

True False The wet texture of Miles's soil is the same as the wet texture of sandy soil.

True False Miles's soil has some properties that are the same as the properties of clay soil.

4. You discovered that the best mud for building is made from soil that is a mix of clay and sand. These soils have some properties of sandy soils and some properties of clay soils. Look at the information in the table above. Could Miles build a house with the soil where he lives? Why or why not? Make sure to write about the properties of each soil to support your answer.

Unit Assessment

Miguel cooks food in a hot frying pan. The pan has a handle. Miguel wants to wrap the pan's handle in a material so that the heat DOES NOT travel to his hand. Miguel wraps 3 different materials around the frying pan handle to test how much heat he can feel. Here are the results:



Material:	Aluminum Foil	Paper Towel	Cloth
How Hot:	Very hot	Warm	Cool

1. An insulator is a material that heat does NOT easily travel through. What do the results of Miguel's experiment tell you about the properties of these materials? Circle your answer.

- Aluminum foil is the best insulator.
- A paper towel is the best insulator.
- Cloth is the best insulator.
- All three materials are the best insulators.

2. If Miguel wants to figure out which of these materials has the property of being the most flexible, what could he do? Circle the best answer.

- He could put the materials in the freezer and measure how cold they get.
- He could bend the materials and measure how easy or difficult they are to fold.
- He could touch the materials and measure how rough or smooth they feel.

3. Miguel has a warm cup of hot chocolate. It's a very cold day. Miguel wants the heat from the mug to travel to his hands to keep them warm. He wants to wrap the mug in a material that is a conductor. Which material should he wrap the mug in? Use information from the experiment above to help you answer. Circle your answer.

- He should wrap the mug in aluminum foil.
- He should wrap the mug in paper towels.
- He should wrap the mug in cloth.

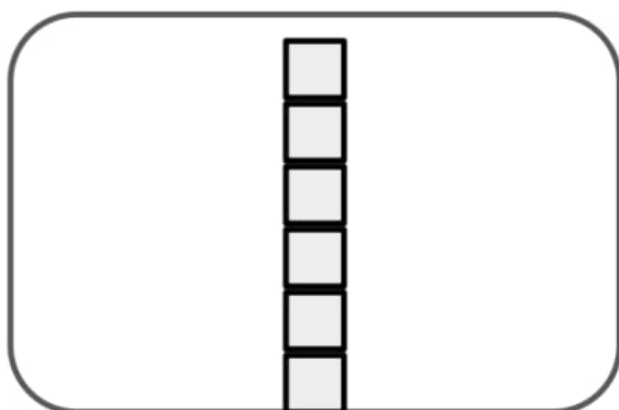




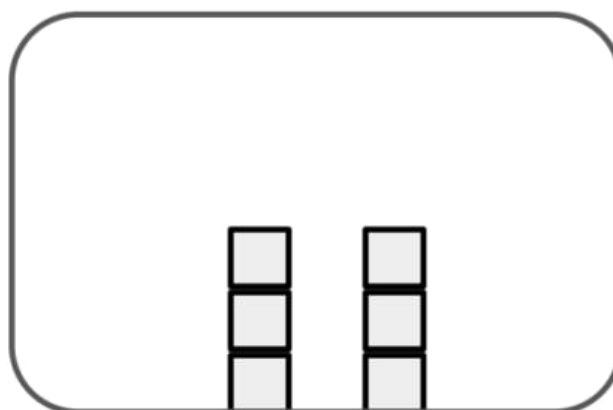
Material:	Aluminum Foil	Paper Towel	Cloth
Water Absorbed:	0 spoonfuls	4 spoonfuls	2 spoonfuls

4. Miguel is curious about the other properties of these materials. He tests whether each material can absorb water. He pours a small amount of water on each material and measures how much water they absorb. If Miguel wants to design new waterproof boots to wear in the rain, which material should he wrap the boots in?

- Aluminum foil
- Paper towels
- Cloth



Tallest Tower



Hold Up a Heavy Book

5. Leela is in a building block competition! She only has 6 blocks and must arrange the blocks to win challenges. She has completed two challenges. In the first challenge, she had to make the tallest tower. In the second challenge, she had to make sure the blocks could hold up a heavy book.

Circle **True** or **False** for each sentence below using information from Leela's competition.

- | | | |
|------|-------|---|
| True | False | The number and size of the blocks are the same in each challenge. |
| True | False | The number and size of the blocks are different in each challenge. |
| True | False | The same blocks were disassembled and then reassembled to win each challenge. |
| True | False | The six blocks can be disassembled and reassembled to win more challenges. |

States of Matter

2nd Grade • NGSS • Unit Worksheets

Lesson 1



Where do animals find the water they need?

Lesson 2



How is an ice cube like a crayon?

Lesson 3



Why are so many toys made out of plastic?

I am also curious about...

Place 1

1. The water in this place is... (circle all that apply)



liquid



solid



2. What are the humpback whales doing in the liquid/solid water?

The whales are _____



3. What are the orcas doing in the liquid/solid water?

The orcas are _____



Place 2

4. The water in this place is... (circle all that apply)



liquid



solid



5. What is the polar bear doing in the liquid/solid water?

The polar bear is _____



6. What are the seals doing in the liquid/solid water?

The seals are _____



Where do animals find the water they need?

Mystery science

Water Journal



Explore the
Arctic!

Name: _____

Place 3

7. The water in this place is... (circle all that apply)



liquid



solid



8. What are the polar bears doing in the liquid/solid water?

The polar bears are _____



9. What is the ermine doing in the liquid/solid water?

The ermine is _____



Lesson Assessment

Marco visits a zoo and sees an animal that lives in the Arctic—a walrus! Marco reads a sign that has lots of information about walrus. This is what the sign says:

Wonderful Walrus Information



The walrus is a large animal that lives in the cold Arctic. There's a lot of water in the Arctic. Some water is frozen as large pieces of sea ice. This ice floats on top of the water, kind of like giant ice cubes! A walrus will sit on top of these pieces of ice to rest.

Walrus dive into the ocean water, swim to the bottom, and find food. They really enjoy eating clams. Once they find food, they swim back to the ice. They'll sit on the ice while they eat their food.

Use the walrus information to answer the questions below.

1. The water where the walrus lives is ...

Circle the best answer.



only
liquid water



only
solid ice



liquid water
and
solid ice

2. **Circle True or False** for each sentence based on the walrus information.

True False A walrus needs liquid water to help it survive.

True False A walrus needs solid ice to help it survive.

3. Complete the sentence below.

If there is no solid ice in the Arctic, then the walrus _____

Art Supply Standoff

Name: _____

material 1

vs.

material 2

Circle the words that describe the properties of each material.

Round 1 - Starting Properties

solid / liquid

sticky / smooth

can break into pieces / cannot break into pieces

other: _____

solid / liquid

bendy / not bendy

dark brown / tan

other: _____



Round 2 - Heat it up!



solid / liquid

sticky / smooth

can break into pieces / cannot break into pieces

other: _____

solid / liquid

bendy / not bendy

dark brown / tan

other: _____



Round 3 - Cool it down!



solid / liquid

sticky / smooth

can break into pieces / cannot break into pieces

other: _____

solid / liquid

bendy / not bendy

dark brown / tan

other: _____

Can it Undo?

Are the properties in Round 3 similar to what you observed in Round 1?

YES / NO

I think this because _____

YES / NO

I think this because _____

mystery science

How is an ice cube like a crayon?

Breakfast Brawl

Name: _____

material 1

vs.

material 2

Circle the words that describe the properties of each material.

Round 1 - Starting Properties

solid / liquid
floppy / runny
some parts see-through / no parts see-through
other: _____

solid / liquid
squishy / drippy
see-through / not see-through
other: _____



Round 2 - Heat it up!



solid / liquid
floppy / runny
some parts see-through / no parts see-through
other: _____

solid / liquid
squishy / drippy
see-through / not see-through
other: _____



Round 3 - Cool it down!



solid / liquid
floppy / runny
some parts see-through / no parts see-through
other: _____

solid / liquid
squishy / drippy
see-through / not see-through
other: _____

Can it Undo?

Are the properties in Round 3 similar to what you observed in Round 1?

YES / NO

I think this because _____

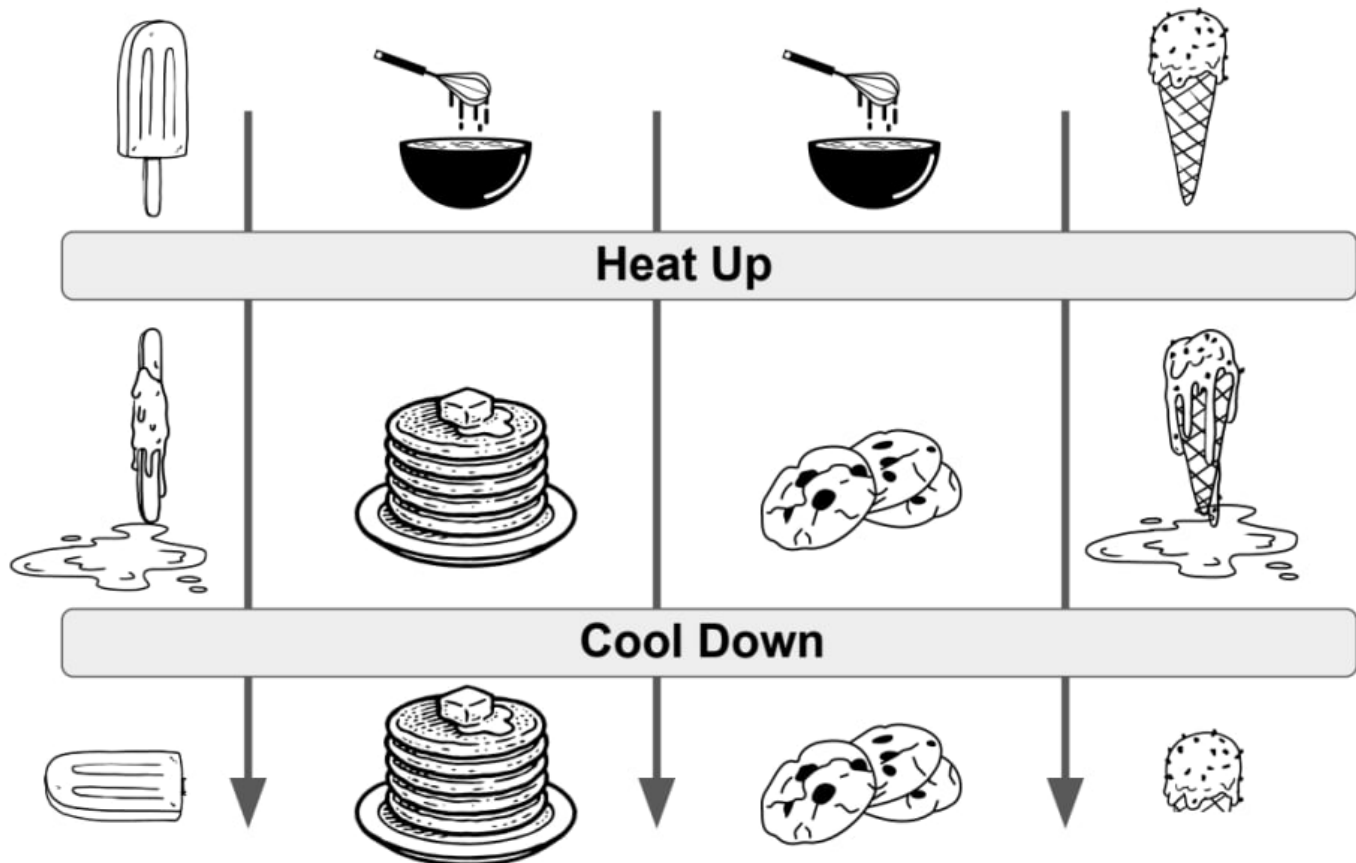
YES / NO

I think this because _____

mystery science

How is an ice cube like a crayon?

Lesson Assessment



Aija loves desserts! She is curious what will happen to different desserts when she heats them up and then cools them down. She heats up a popsicle, cake batter, cookie dough, and ice cream. Then she cools them all down. The images above show what happened.

1. Which desserts go back to how they started after being heated up and cooled down?

Circle all the correct answers.

Popsicle

Cake Batter

Cookie Dough

Ice Cream

2. Which desserts do NOT go back to how they started after being heated up and cooled down? **Circle** all the correct answers.

Popsicle

Cake Batter

Cookie Dough

Ice Cream

3. **Circle True or False** for each sentence based on Aija's dessert experiment.

True False Some changes caused by heating **CAN** be reversed by cooling.

True False Some changes caused by heating **CANNOT** be reversed by cooling.

Testing Candy for Camp Way-Too-Hot

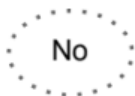
Name: _____

Candy #1:

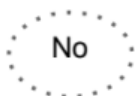
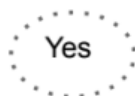
Draw candy #1 here:



Did candy #1 lose its shape in the hot water?



When you squish candy #1 with your fingers, does it change shape?



Draw what candy #1 looks like now:



Do you think candy #1 is:

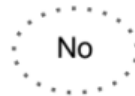
- ☐ totally solid
- ☐ partially melted (soft & squishy)
- ☐ melted into a liquid

Candy #2:

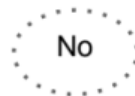
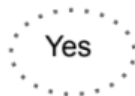
Draw candy #2 here:



Did candy #2 lose its shape in the hot water?



When you squish candy #2 with your fingers, does it change shape?



Draw what candy #2 looks like now:



Do you think candy #2 is:

- ☐ totally solid
- ☐ partially melted (soft & squishy)
- ☐ melted into a liquid

Why are so many toys made out of plastic?

Lesson Assessment

1. Which materials could be used to make lots of copies of something? (You can circle more than one.)

ice	bread	plastic	butter
chocolate	cheese	wood	candy

How did you decide which materials would work?

You can make lot of copies of something by using materials that _____

2. What's so special about plastic? Why are so many toys made out of plastic?

A lot of toys are made out of plastic because _____

3. If you found a new material, how would you test it to see if it was meltable?

If I found a new material, I would _____

Unit Assessment

Kira lives by a lake. During the cold winter, the water in the lake freezes. The top of the lake is frozen as solid ice. People ice skate on the lake. During the warm summer, the ice melts to liquid water. People swim in the lake. When the weather gets cold again, the water freezes back to ice.

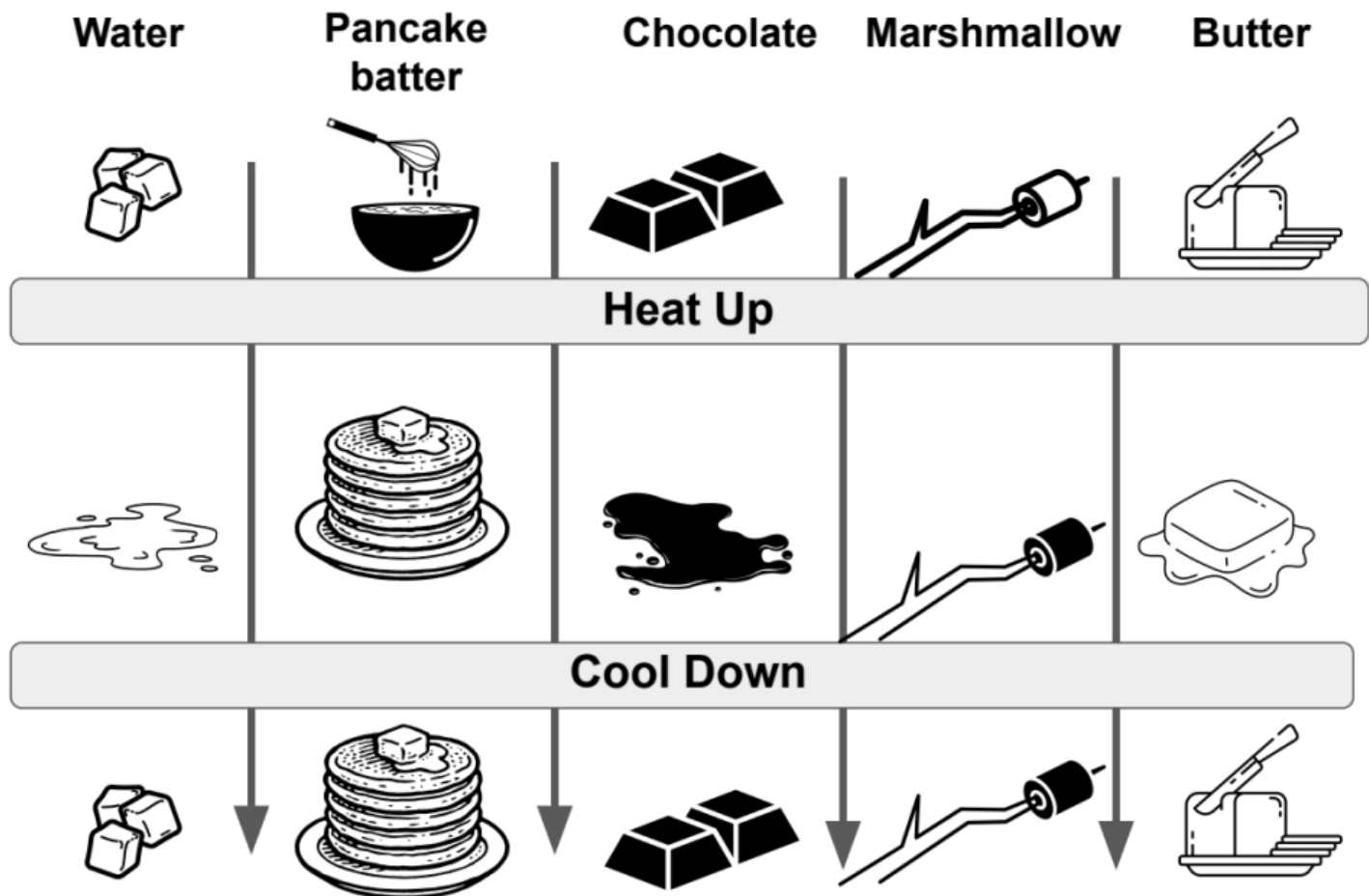
1. **Circle True or False** for each sentence below about the lake near where Kira lives.

- | | | |
|------|-------|---|
| True | False | The water in the lake is always a liquid. |
| True | False | The water in the lake is always a solid. |
| True | False | The water in the lake is sometimes a liquid and sometimes a solid. |
| True | False | The water in the lake can change to a solid and then reverse back to a liquid. This is an example of a reversible change. |



2. Kira also lives by the ocean. The ocean is much bigger than the lake. The water in the ocean is salty, but the water in the lake is not salty. The water in the ocean also doesn't freeze in the winter like the water in the lake. The lake and the ocean are both bodies of water. **Circle True or False** for each sentence below.

- | | | |
|------|-------|--|
| True | False | Bodies of water can be different sizes. |
| True | False | All bodies of water are salty. |
| True | False | Some bodies of water freeze to ice in the winter, but some do not. |



3. Kira loves to imagine what the world would be like if it were made of food items! Imagine marshmallow mountains and chocolate lakes! Which foods have the ability to reverse back to the way they were, like water? Use information from the table above to help you answer. There may be more than 1 correct answer. **Circle all your answers.**

- a. Pancake batter
- b. Chocolate
- c. Marshmallow
- d. Butter

4. Kira wonders what would happen if the water in the lake were replaced with pancake batter! Remember that people love to swim in the lake when the water is liquid. They also love to skate on top of the lake when it is solid ice. Will this be possible if the lake is filled with pancake batter? Use information from the table above to help you answer.
