

Name: _____

mystery science

Second Grade

Student Booklet
With Anchor Layer

What are you curious about?



Animal Biodiversity

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



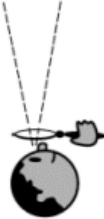
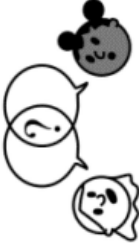
How could you get more birds to visit a bird feeder?

I am also curious about...

See-Think-Wonder Chart

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Name: _____

See What did you observe? 	Think How can you explain what is happening? 	Wonder What questions do you have? 

Design a Bat Rest Stop

mystery science

Animal Biodiversity | Anchor Phenomenon

Name: _____

Design Number: _____

What would you use to build
your Bat Rest Stop?



CUT

CUT

Design a Bat Rest Stop

mystery science

Animal Biodiversity | Anchor Phenomenon

Name: _____

Design Number: _____

What would you use to build
your Bat Rest Stop?



Bracken Cave

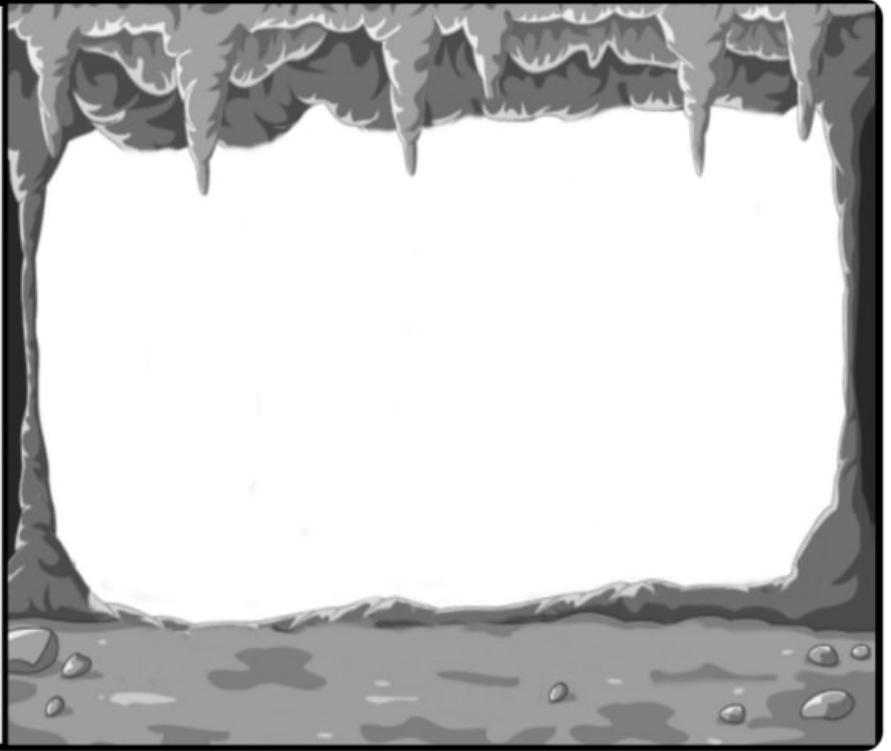
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Animal Biodiversity | Anchor Phenomenon

Name: _____ Drawing Number: _____

What do you think
lives in the cave?

I think it is



CUT

CUT

Bracken Cave

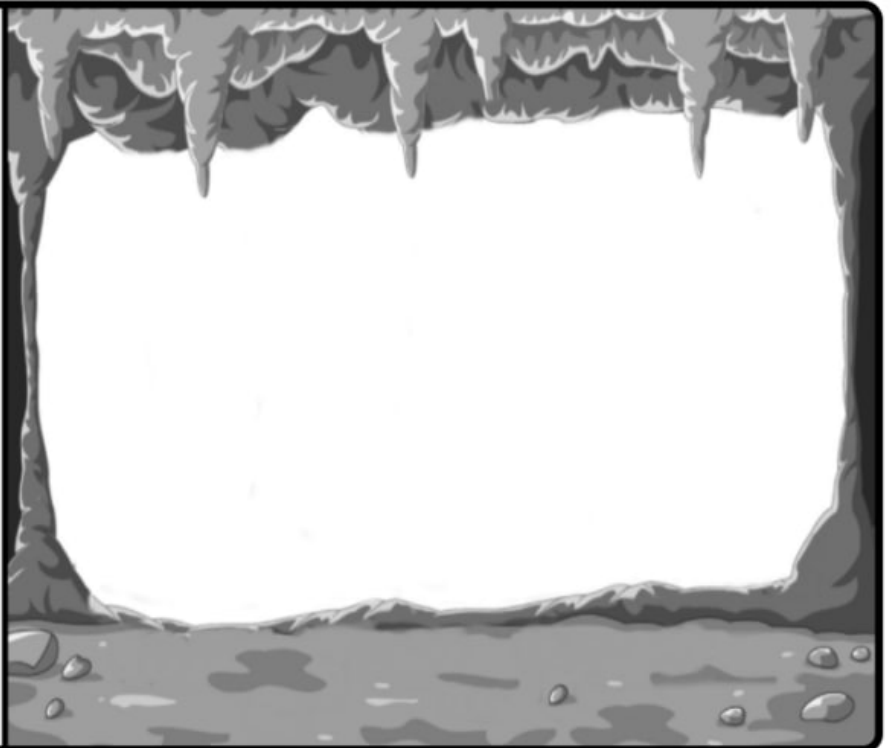
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Animal Biodiversity | Anchor Phenomenon

Name: _____ Drawing Number: _____

What do you think
lives in the cave?

I think it is



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

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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



Ladybug

Doesn't have any bones at all

Lays eggs



Doesn't have fur or feathers or scales

mystery science



Squirrel

Has bones inside its body



Gives birth (doesn't lay eggs)

Has hair or fur



mystery science



Pigeon

Has bones inside its body



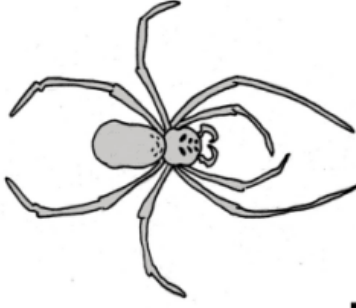
Lays eggs



Has feathers



mystery science



Spider

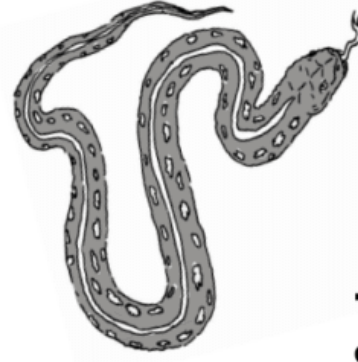
Doesn't have any bones at all

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



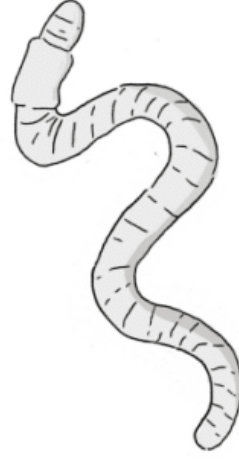
Lays eggs



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



Monarch butterfly

Doesn't have any bones at all

Lays eggs



Doesn't have fur or feathers or scales

mystery science



Elephant stag beetle

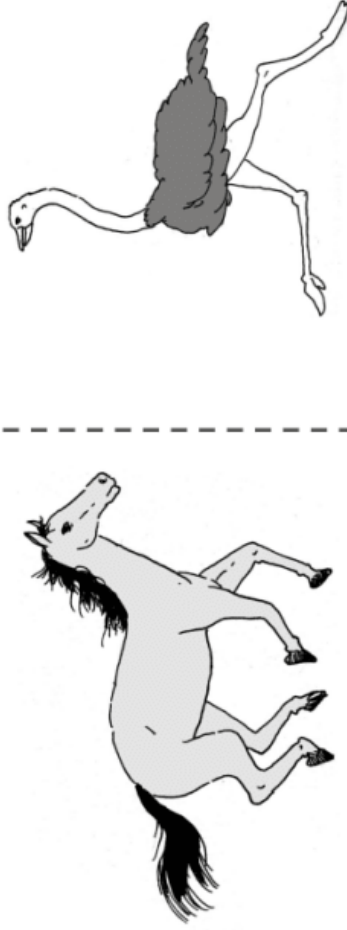
Doesn't have any bones at all

Lays eggs



Doesn't have fur or feathers or scales

mystery science



Ostrich

Has bones inside its body



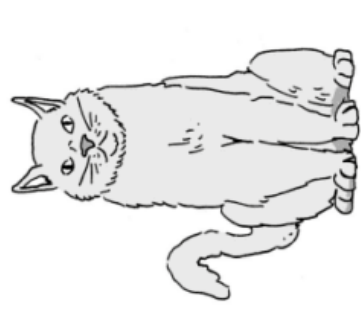
Lays eggs



Has feathers



mystery science



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.

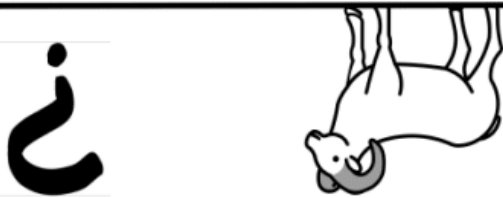
4. Bats have wings and can fly, but scientists do not group them with birds. Why is that?

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

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



Desert Habitat





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



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.

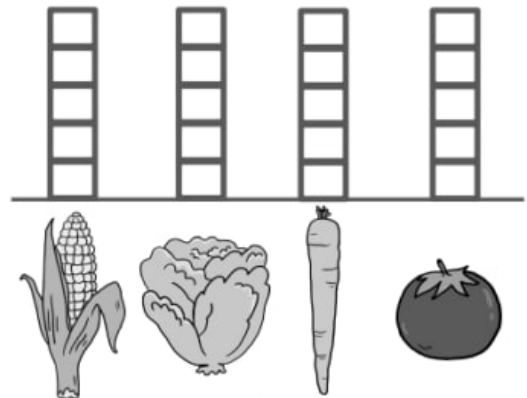
True False Count up the different kinds of plants in each fish tank and compare them.

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.



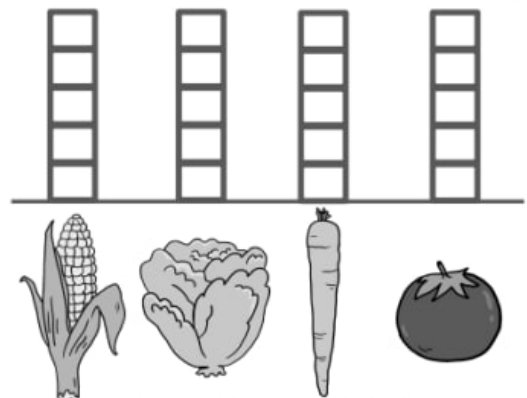
Vegetables From Eli's Farm



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?

My Bird Feeder

Name: _____

mystery science

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

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

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

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

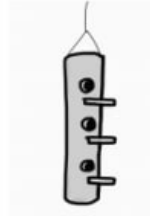
1. Choose the type(s) of feeders each bird would be MOST LIKELY to visit, and explain your answer choices below.



tray feeder



nectar feeder



tube feeder

X

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."

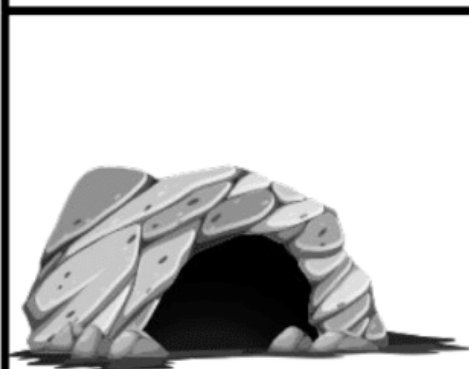
What do you think? How would you respond to Ahmed and Kristina?

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?

Bat Habitats

Name: _____

Inside Bracken Cave



Write two things to describe what it is like inside of the cave:

Which types of living things did you find inside the cave?

Mammals

Invertebrates

Birds

Reptiles

Plants

Under Congress Avenue Bridge



Write two things to describe what it is like under the bridge:

Which types of living things did you find under the bridge?

Mammals

Invertebrates

Birds

Reptiles

Plants

What is one thing that is the same in both habitats?

What do you think is the biggest difference between the habitats?

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 Adaptations

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



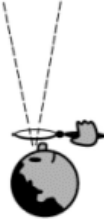
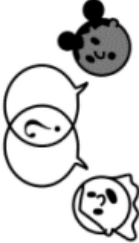
How much water should you give a plant?

I am also curious about...

See-Think-Wonder Chart

mystery science

Name: _____

See What did you observe? 	Think How can you explain what is happening? 	Wonder What questions do you have? 

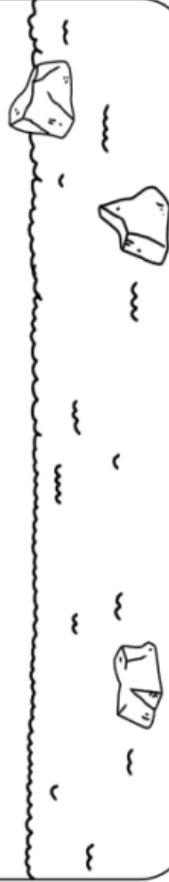
Superbloom Cycle

Name: _____

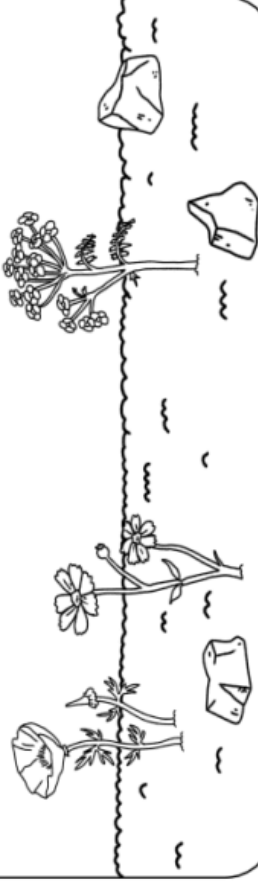
2. What causes the flowers to grow and bloom?

Write your ideas.

1. This is one spot in Death Valley. You can see dirt and a few rocks. Draw anything else that you think is needed for the superbloom cycle to happen.



3. This is the same spot in Death Valley. A superbloom is here! Draw anything else that you think is needed for the superbloom cycle to happen. Then, you can color these flowers and draw more of your own.



4. What causes the flowers to dry up and disappear?

Write your ideas.



1 2	STOP	Maple	Seed	B A
1 2	STOP	Maple	Seed	B A
1 2	STOP	Maple	Seed	B A
1 2	STOP	Maple	Seed	B A
1 2	STOP	Maple	Seed	B A



Koa

Seed

Koa

Seed

Koa

Seed

Rain Tree models

Teacher prep instructions:
Cut on the thick black lines



MYSTERY
science

How did a tree travel
halfway around the world?



Rain Tree



Seed



Rain Tree



Seed



Rain Tree



Seed



Rain Tree



Seed



Rain Tree



Seed



Rain Tree



Seed



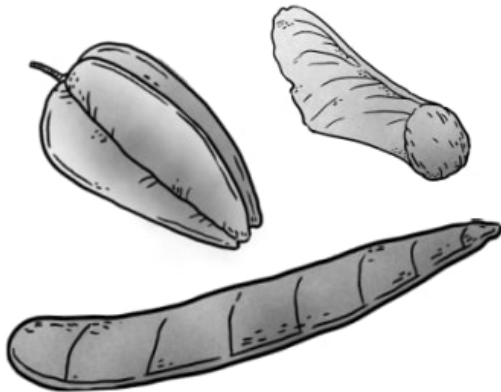
Lesson Assessment



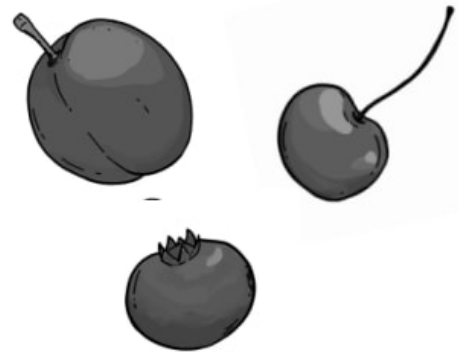
Joey enters a contest at school where he needs to drop a piece of paper in front of a fan. The piece of paper that travels the farthest distance using the wind from the fan wins the contest!

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.

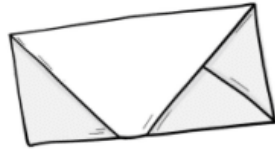
True False The seeds that use the wind all have long, flat structures.

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

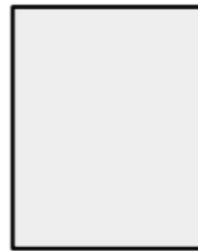


B



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



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



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

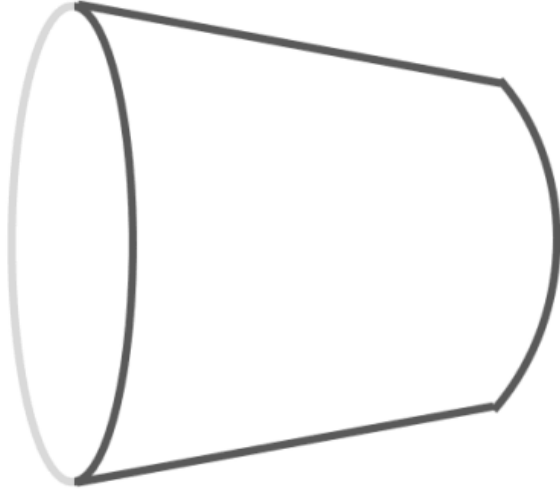
- a. The flat parts will stick to Max.
- b. The smooth parts will stick to Max.
- c. The red parts will stick to Max.
- d. The spiky parts will stick to Max.

Draw the Radishes

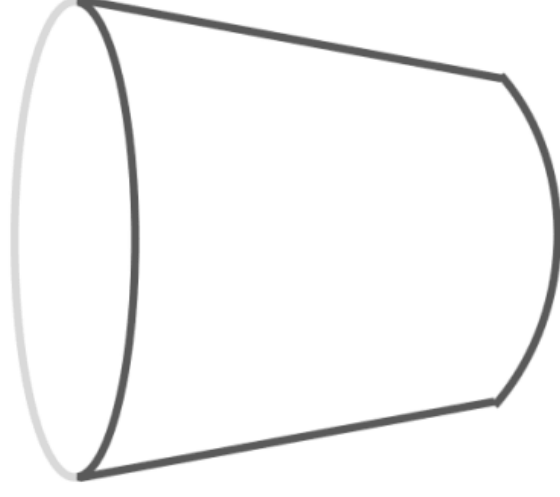
Name: _____

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?

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?

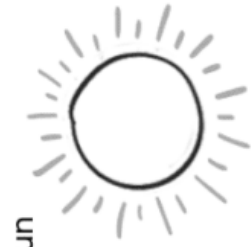
Box A

Box B

RESULTS:

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

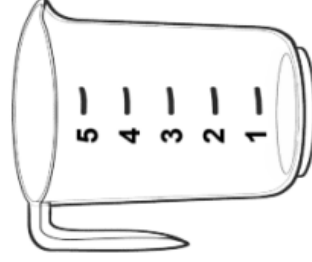
Build-Your-Own Experiment



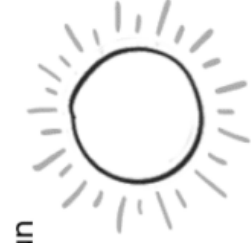
Sun



Mystery Plant



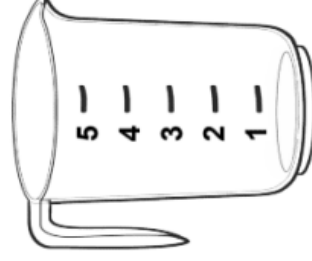
Water Container



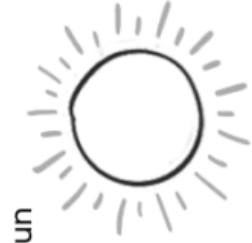
Sun



Mystery Plant



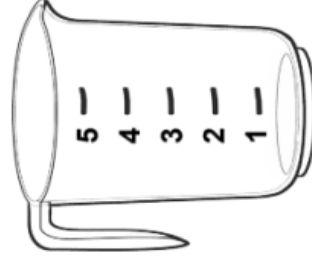
Water Container



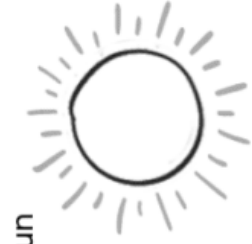
Sun



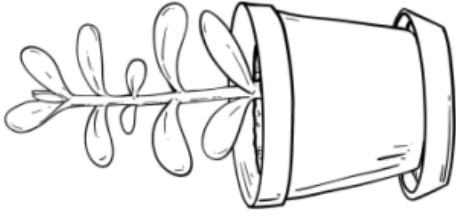
Mystery Plant



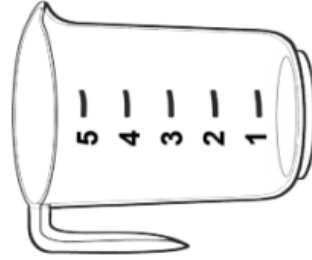
Water Container



Sun



Mystery Plant



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.

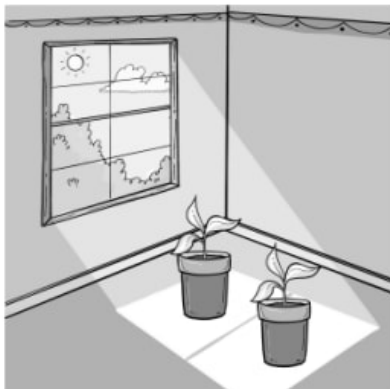


b. Give one plant a lot of water and one plant only a little water.



c. Do not give the plants any water.

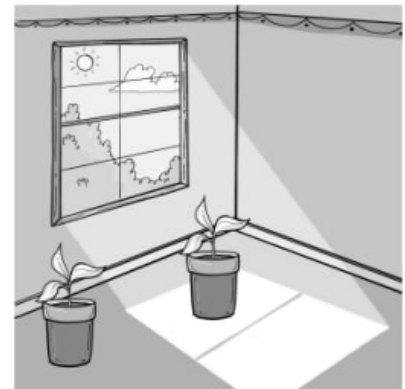
2. Sheila wants to do an experiment to test the amount of **sunlight** her plants need to grow and stay healthy. What is the best experiment to test how much **sunlight** the plants need?



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.

Water and Life in Dry Death Valley

Name: _____

Directions:

Write down three things to describe the water at each location.

1. Darwin Falls

The water here is:

- _____
- _____
- _____

2. Telescope Peak

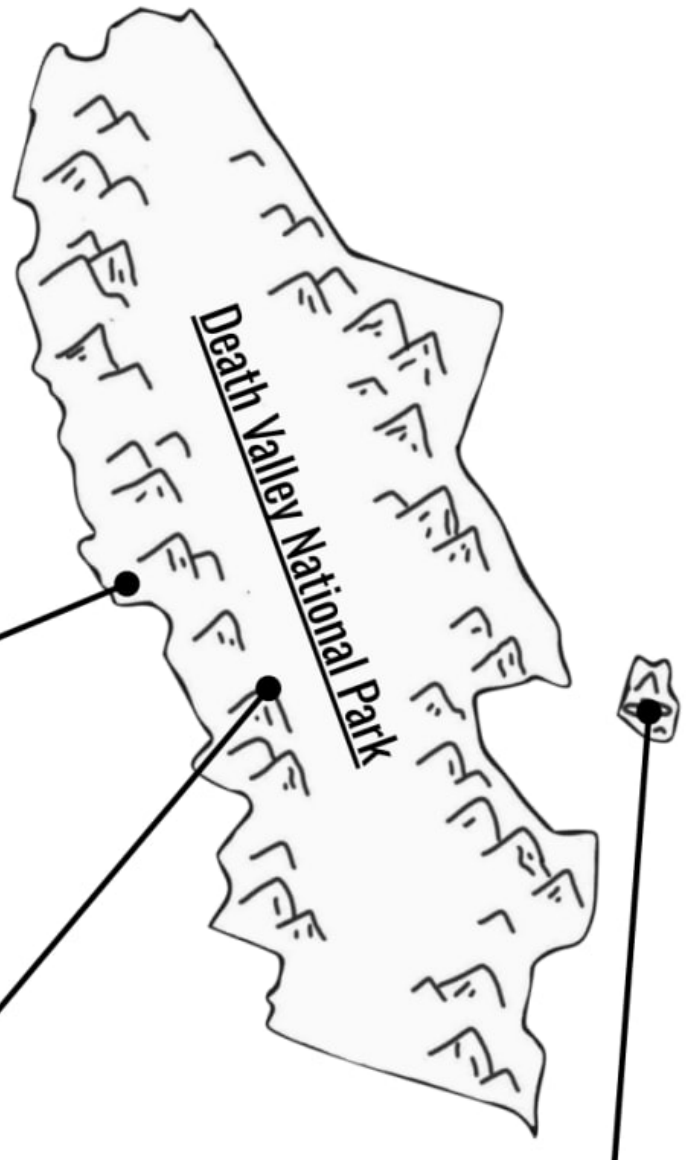
The water here is:

- _____
- _____
- _____

3. Devils Hole

The water here is:

- _____
- _____
- _____



End of Unit Assessment

1. Plants have ways of getting their seeds to travel away from them because _____:

- a. they want to help animals.
- b. seeds that travel away from the parent are more likely to get light.
- c. seeds need water to grow.

2. If you move a plant from a dark room and place it on a sunny windowsill, what will happen?

- a. The leaves will stay the same.
- b. The leaves will move away from the sunlight coming from the window.
- c. The leaves will move toward the sunlight coming from the window.

3. If you planted a cactus in the forest, the cactus would probably _____.

- a. get too much water and not enough light.
- b. get too much light.
- c. live really well.
- d. be eaten by the forest animals.

4. If you notice that a plant has leaves that are yellow and wilting, what would you do?
Choose all the correct answers. There may be more than 1 correct answer.

- a. Put the plant in a dark room because it is getting too much sunlight.
- b. Put the plant in a sunny room because it is getting too little sunlight.
- c. Make sure the soil is dry because it is getting too much water.
- d. Make sure the soil is wet because it is getting too little water.

5. Look at the three seeds shown below. Which one do you think travels by wind, which one travels by animals, and which one by water? Why do you think that?



Coconut



Maple Seed



Cherry Pit

5a. The coconut travels by _____.

I think this because _____

5b. The maple seed travels by _____.

I think this because _____

5c. The cherry pit travels by _____.

I think this because _____

6. How does a cactus survive in the desert where there is so little water?

7. Two plants grew in two different closed boxes. One box has a small hole in the top corner. The other box had no holes. Both plants got plenty of water. Draw what you think each plant would look like, if you took them out of the boxes.

**Grown in a Box
with One Hole**

**Grown in a Box
with No Holes**

8. Explain why you think the plants will look like your drawings above.
Explain in terms of what plants need to survive.

Erosion & Earth's Surface

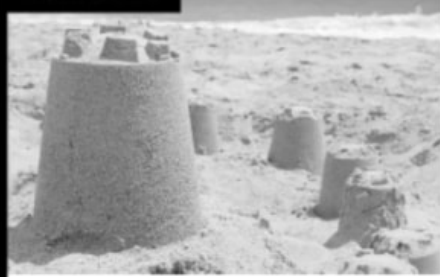
2nd Grade • NGSS • Unit Worksheets

Lesson 1



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

Lesson 2



Why is there sand at the beach?

Lesson 3



Where do flash floods happen?

Lesson 4



What's strong enough to make a canyon?

Lesson 5



How can you stop a landslide?

I am also curious about...

Strange River

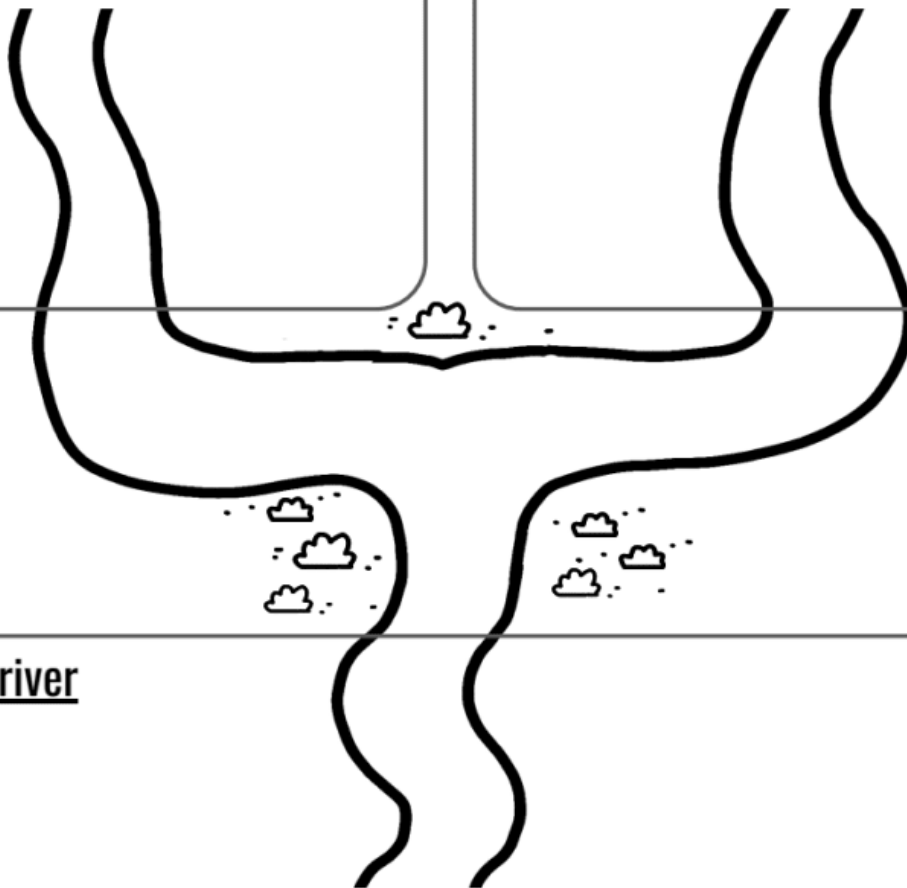
Name: _____ River Drawing Number: _____

Draw what you think is making each river have the color that it does.
Then draw where you think the rivers end up going.

Start of the Missouri River

Start of the Strange River

End of the river



Strange River

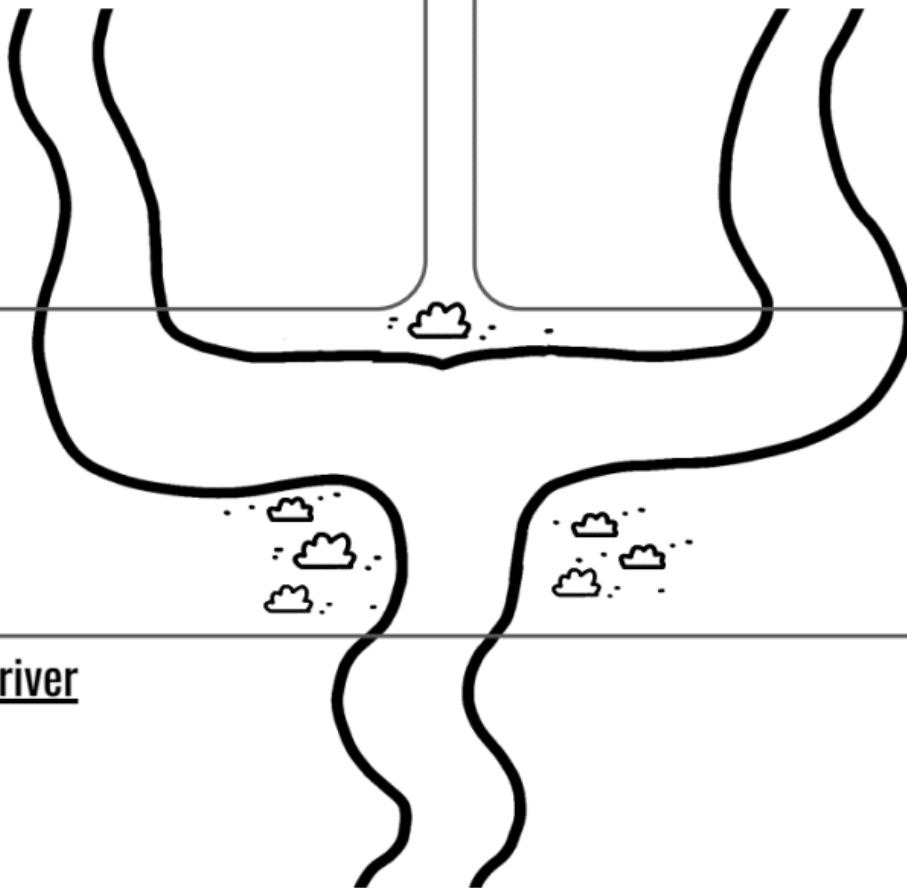
Name: _____ River Drawing Number: _____

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Start of the Missouri River

Start of the Strange River

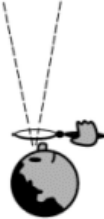
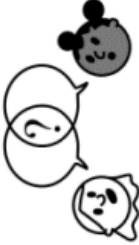
End of the river



See-Think-Wonder Chart

mystery science

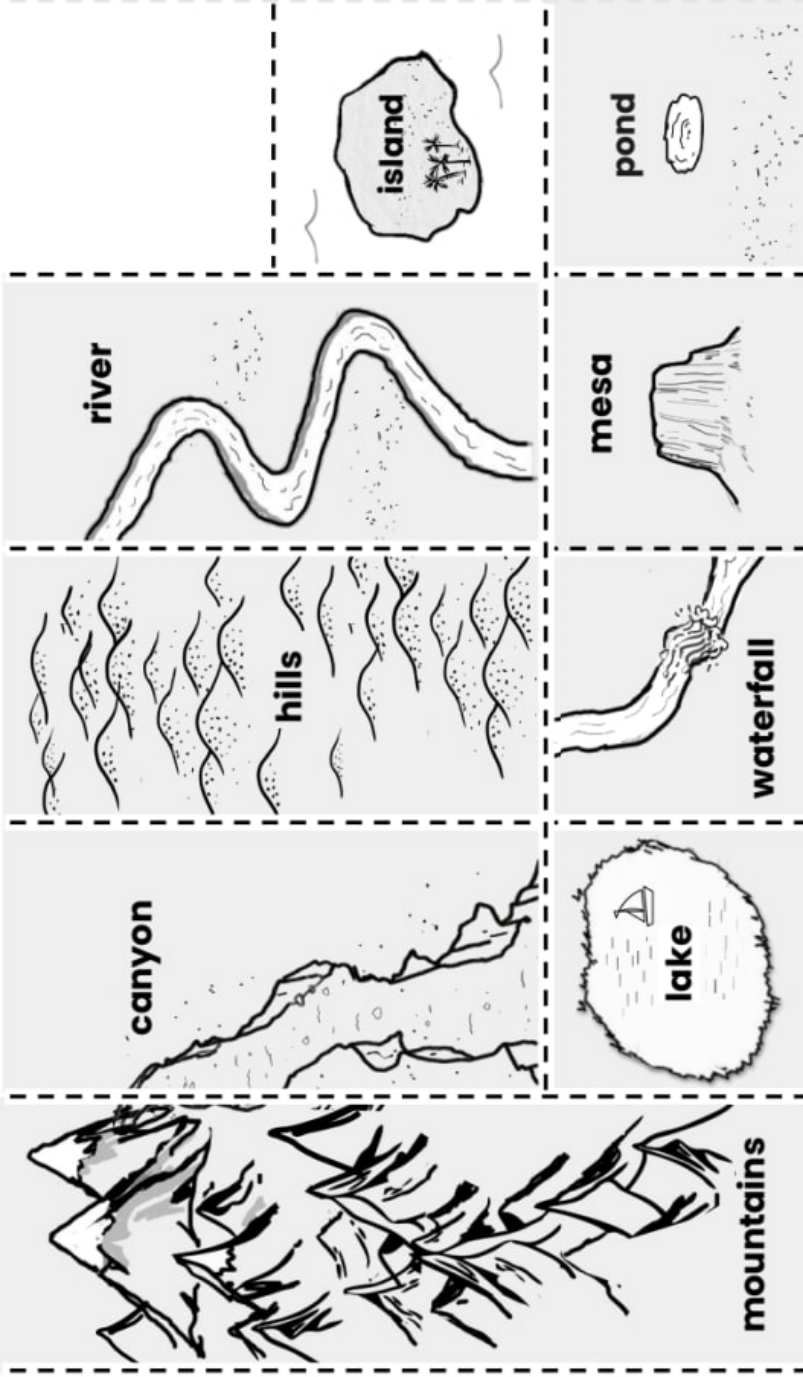
Name: _____

See What did you observe? 	Think How can you explain what is happening? 	Wonder What questions do you have? 

Map Pieces

mystery science

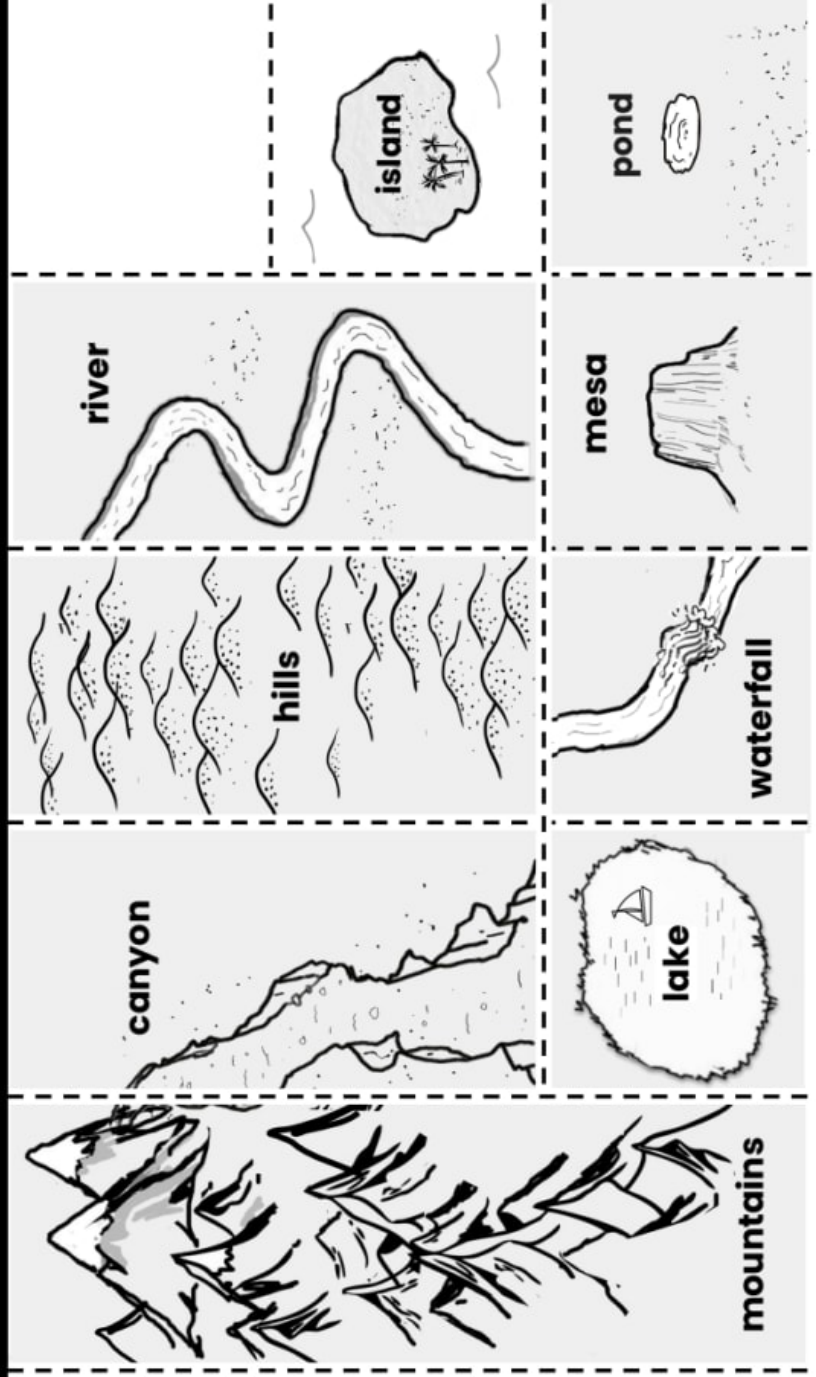
Where's the best place
to hide a treasure?



Map Pieces

mystery science

Where's the best place
to hide a treasure?

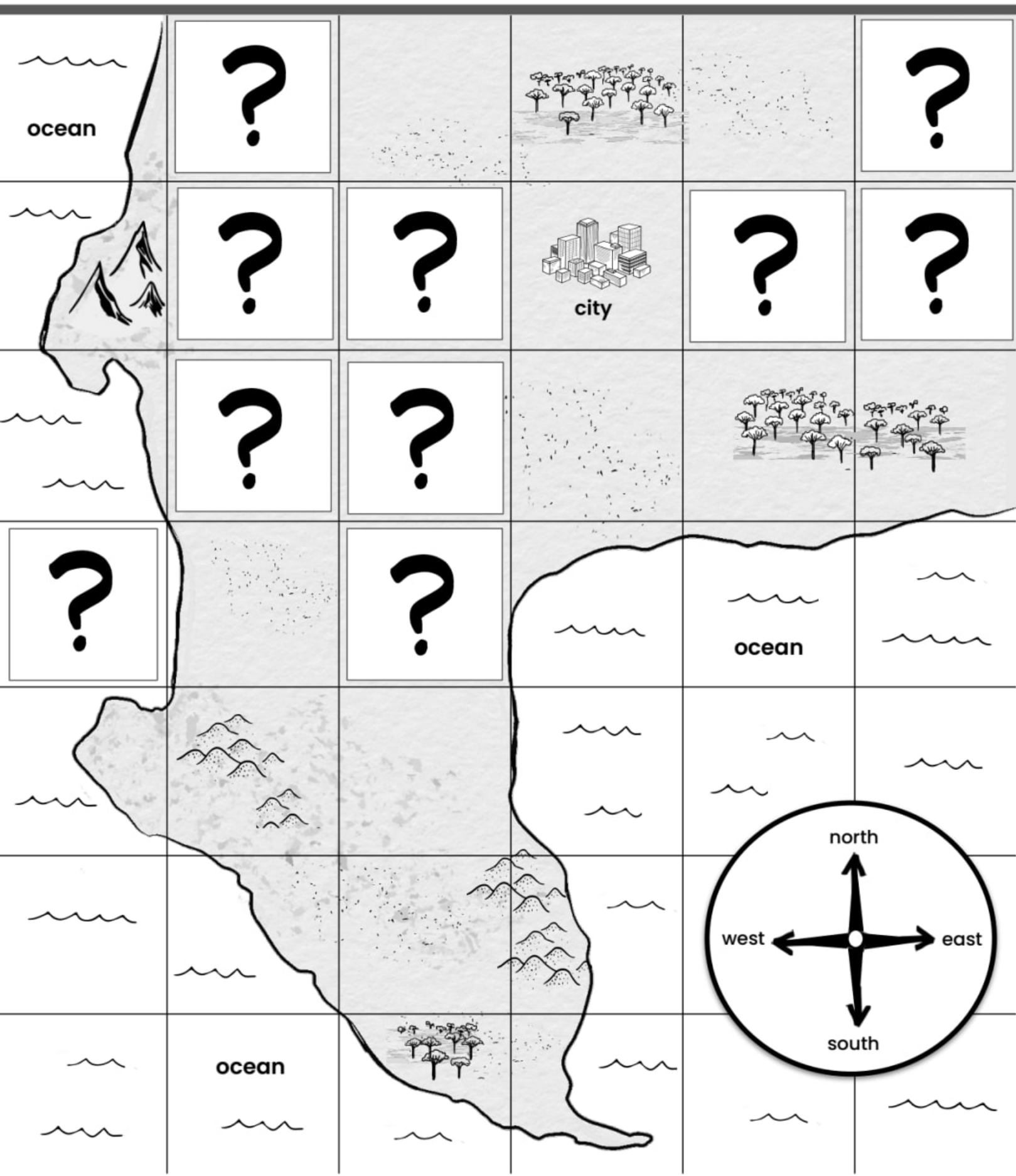


Treasure Map

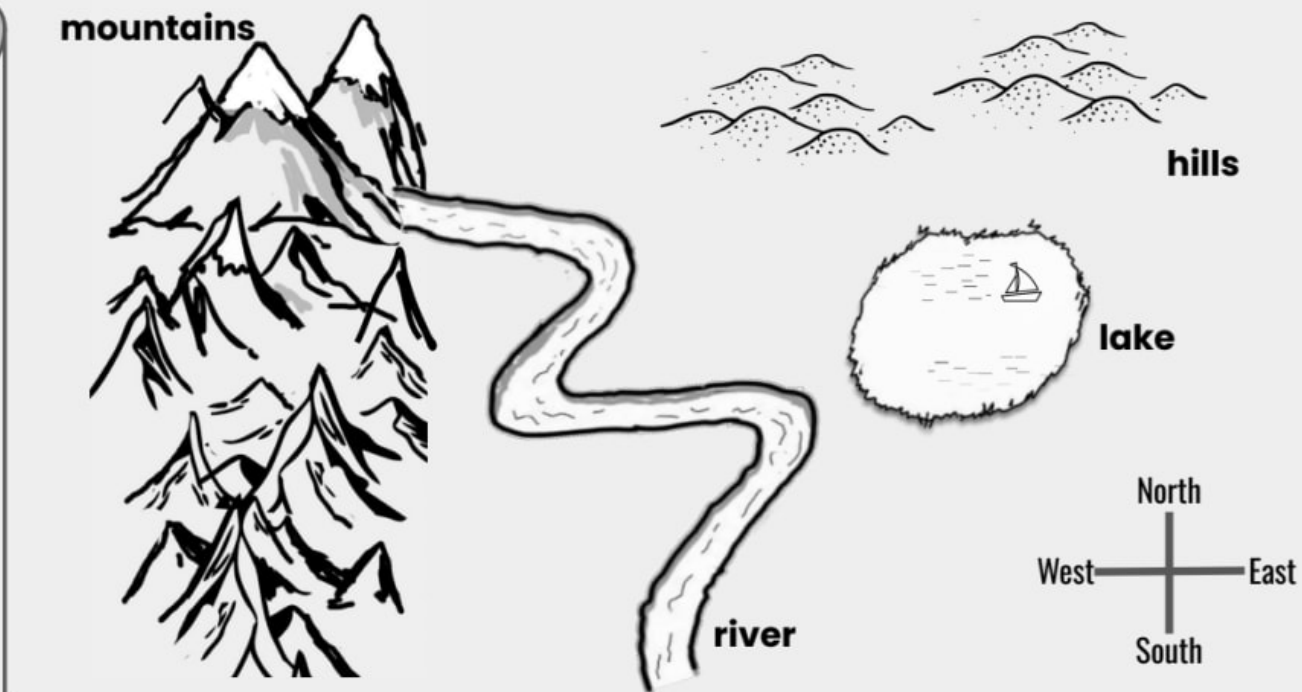
Name: _____

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):

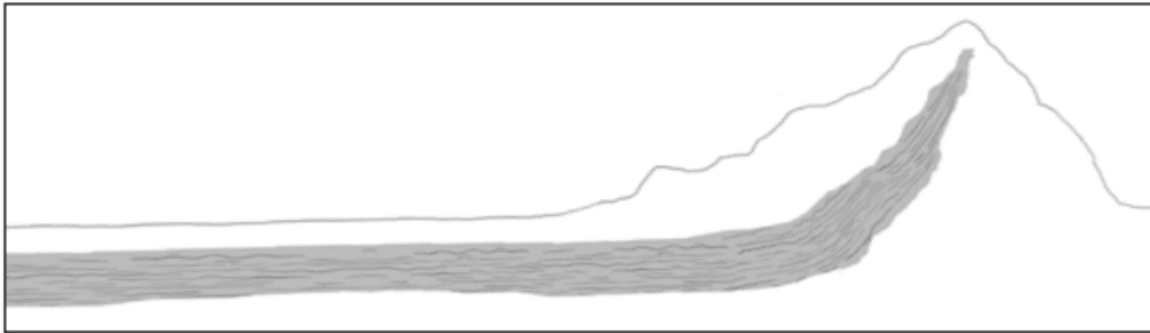
put sticker
here

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

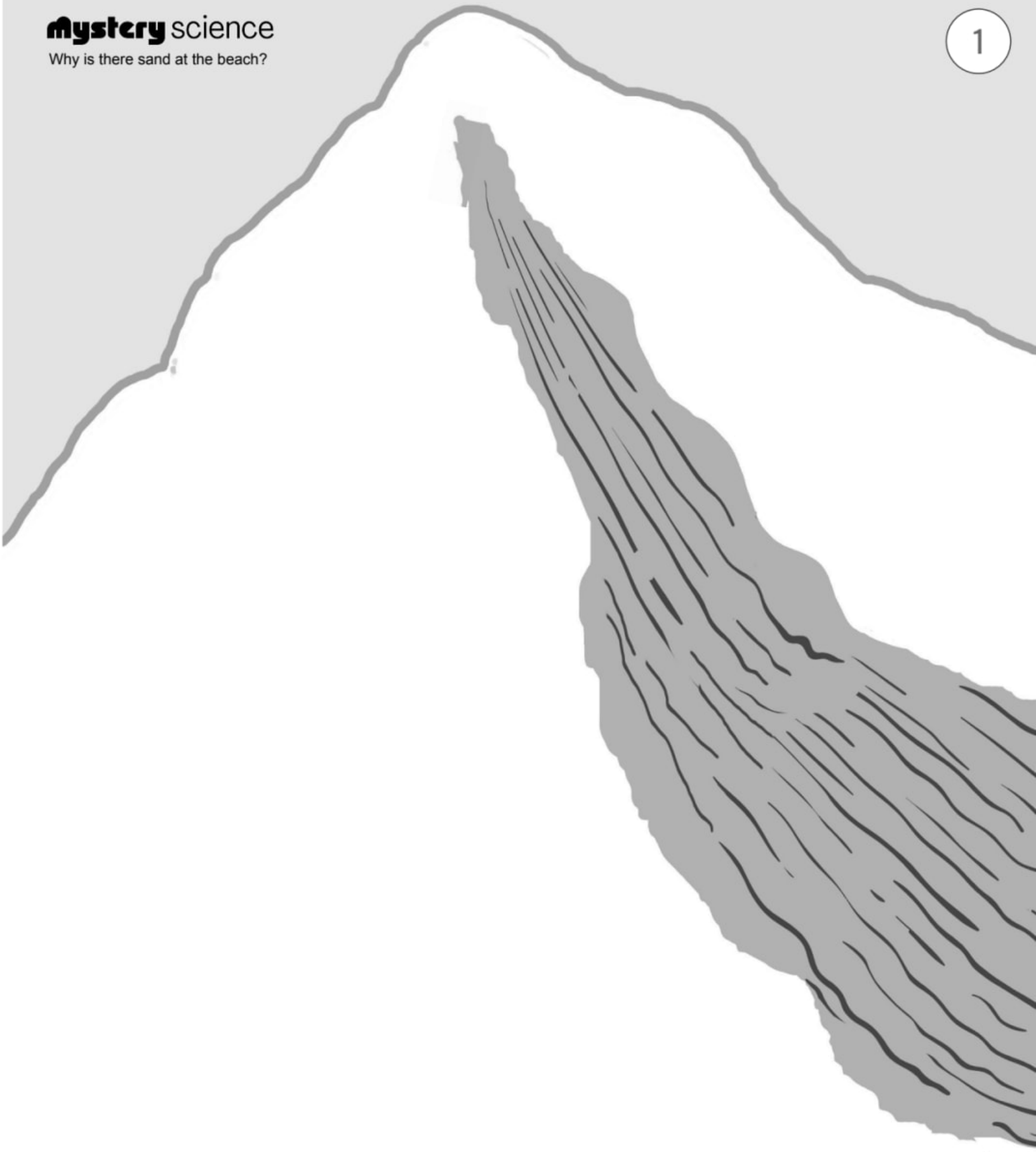
Lesson Assessment

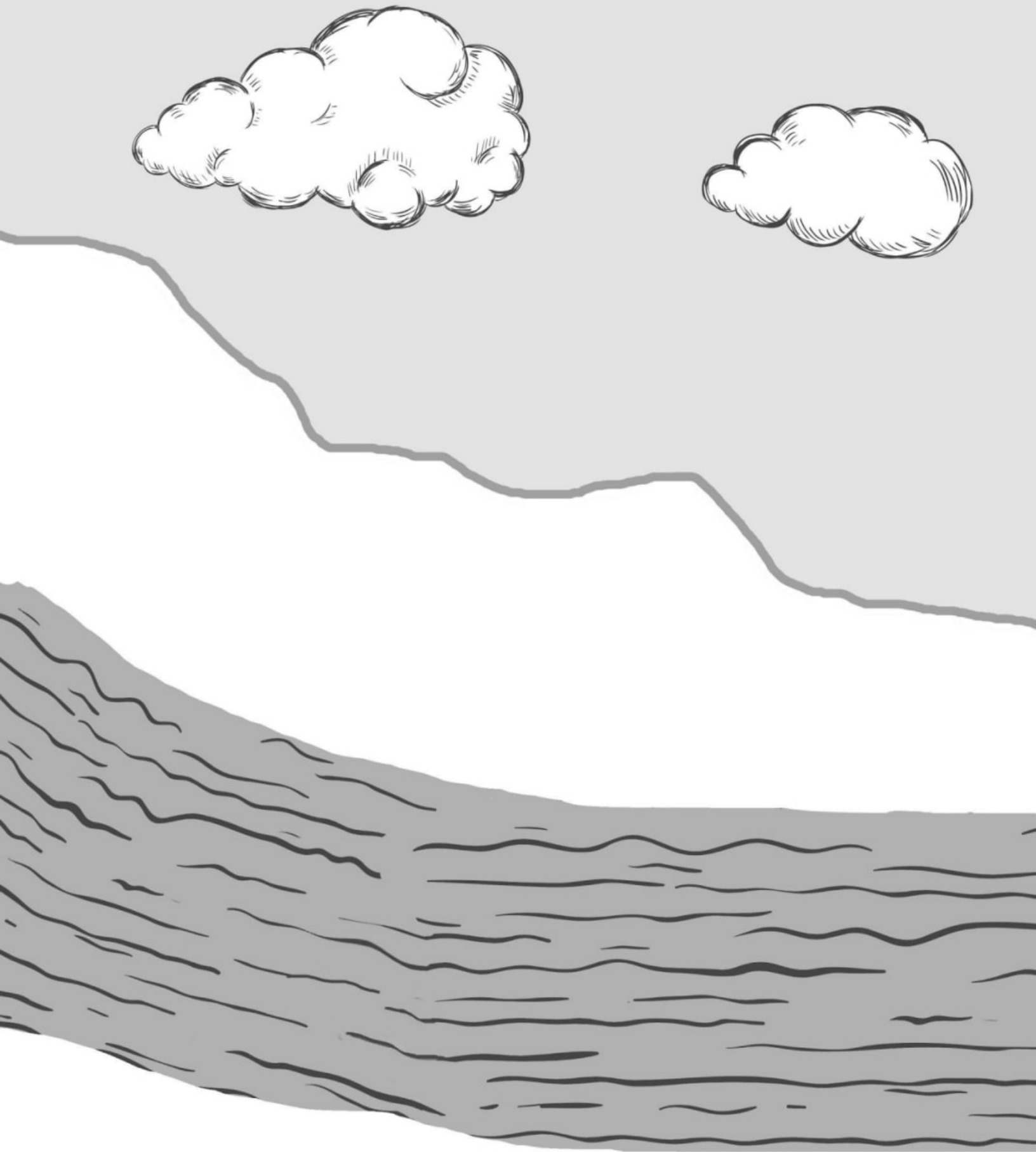
1. Some rivers are as wide as lakes. When you see one, how can you tell it's a river, and not a lake?

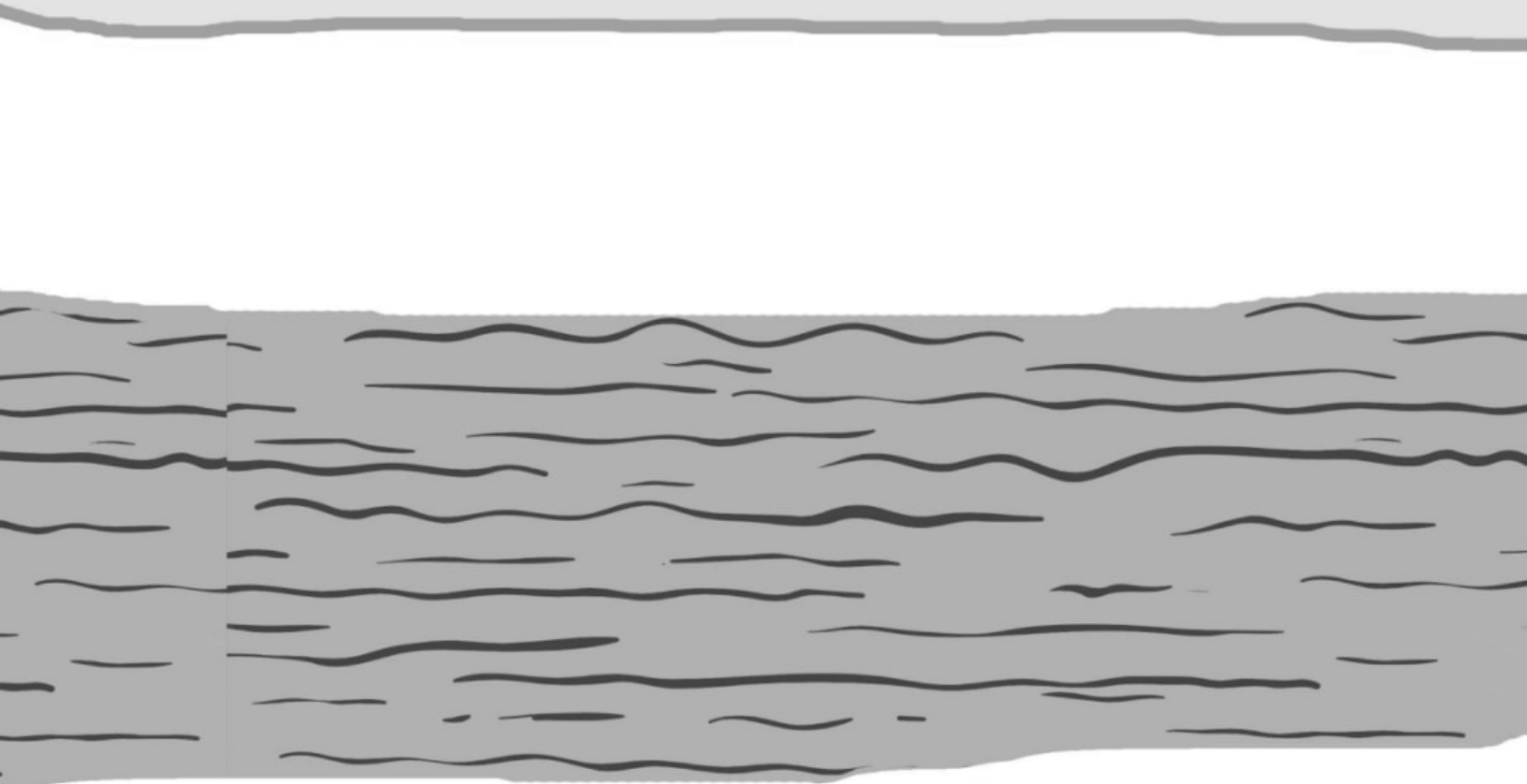
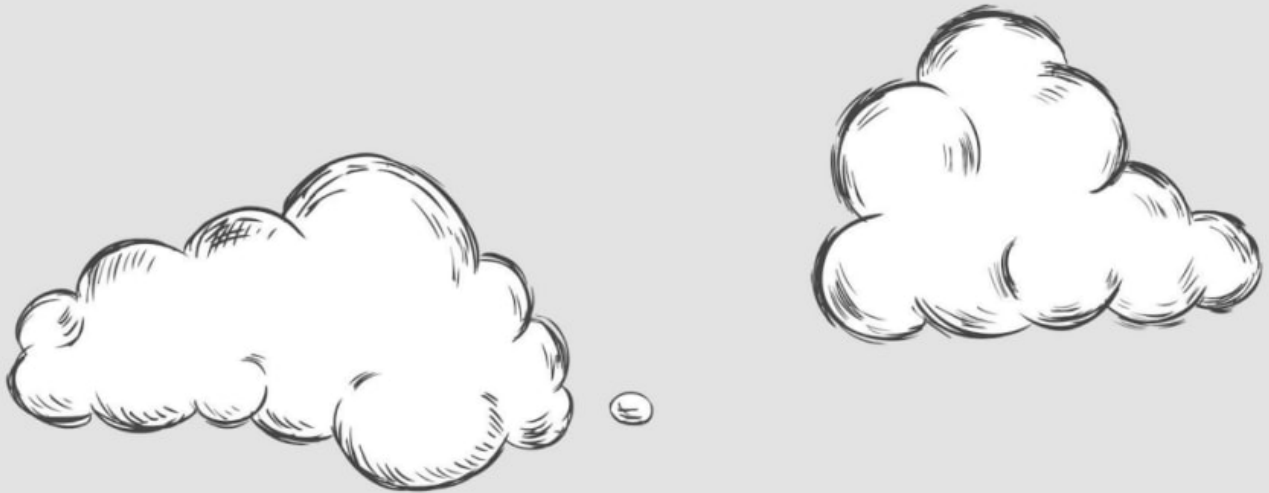
2. Which way does this river flow? Draw an arrow.

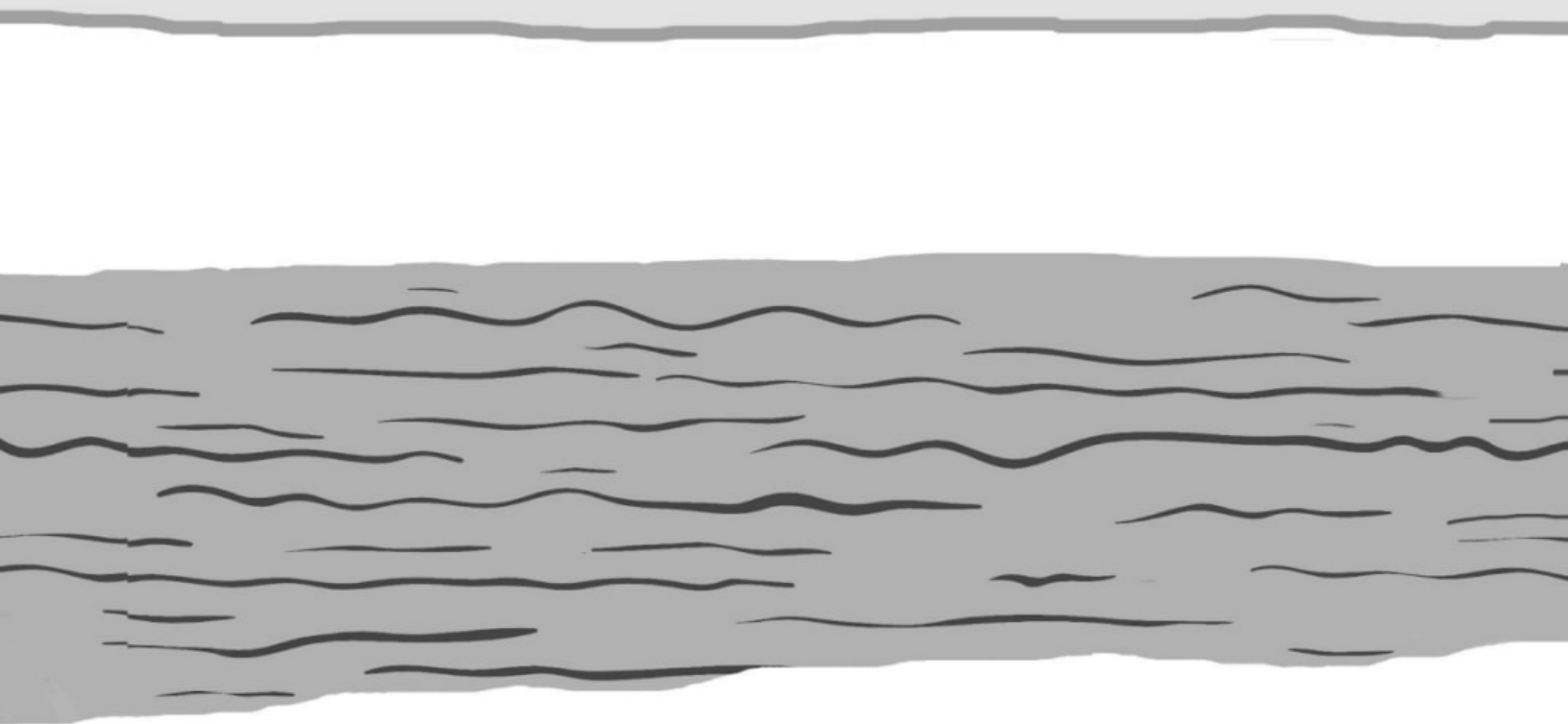
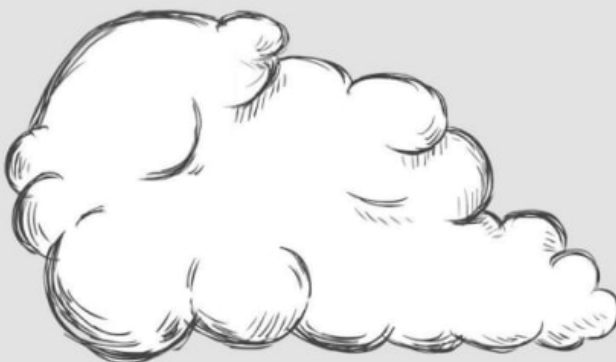


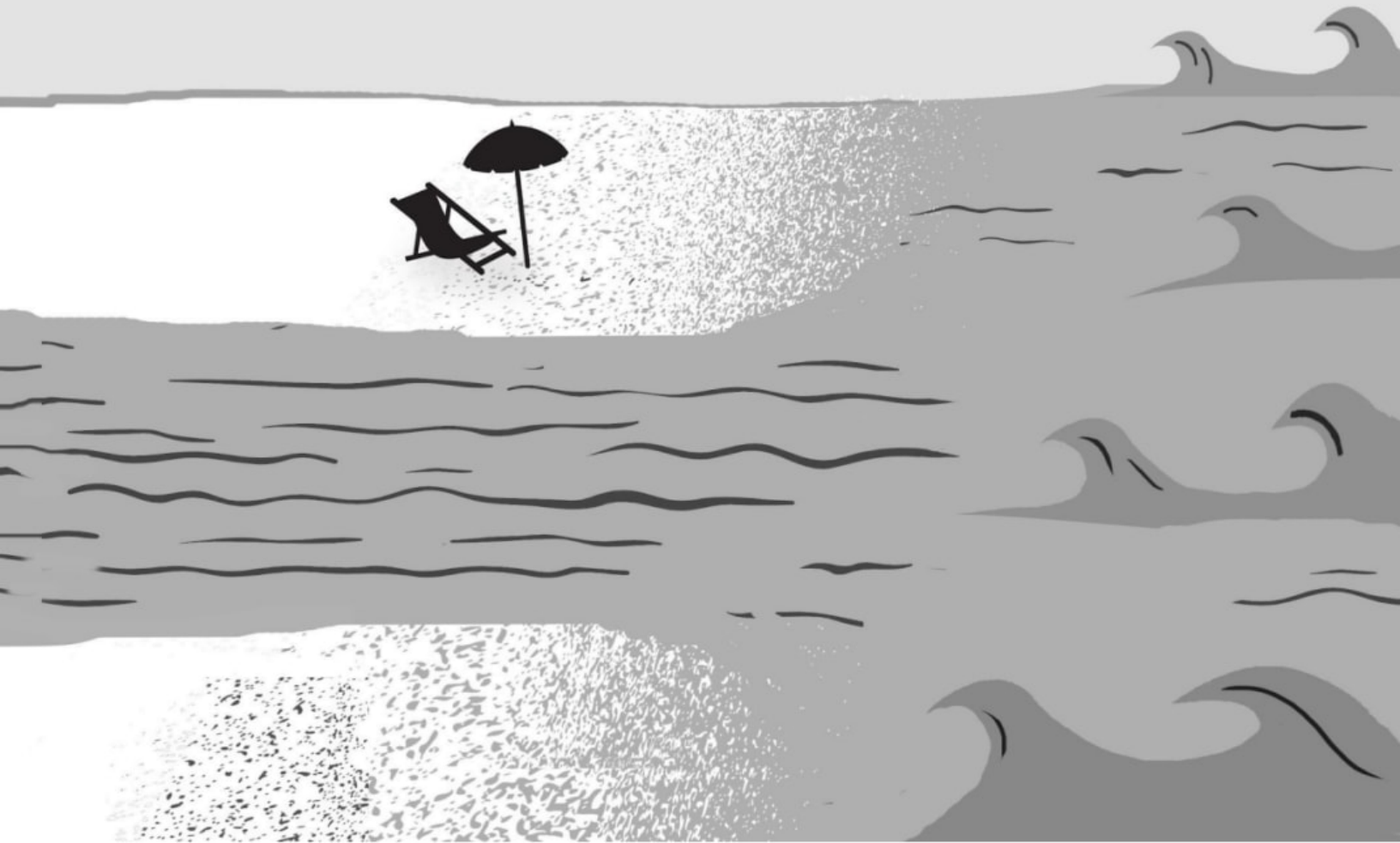
How do you know? Use words:









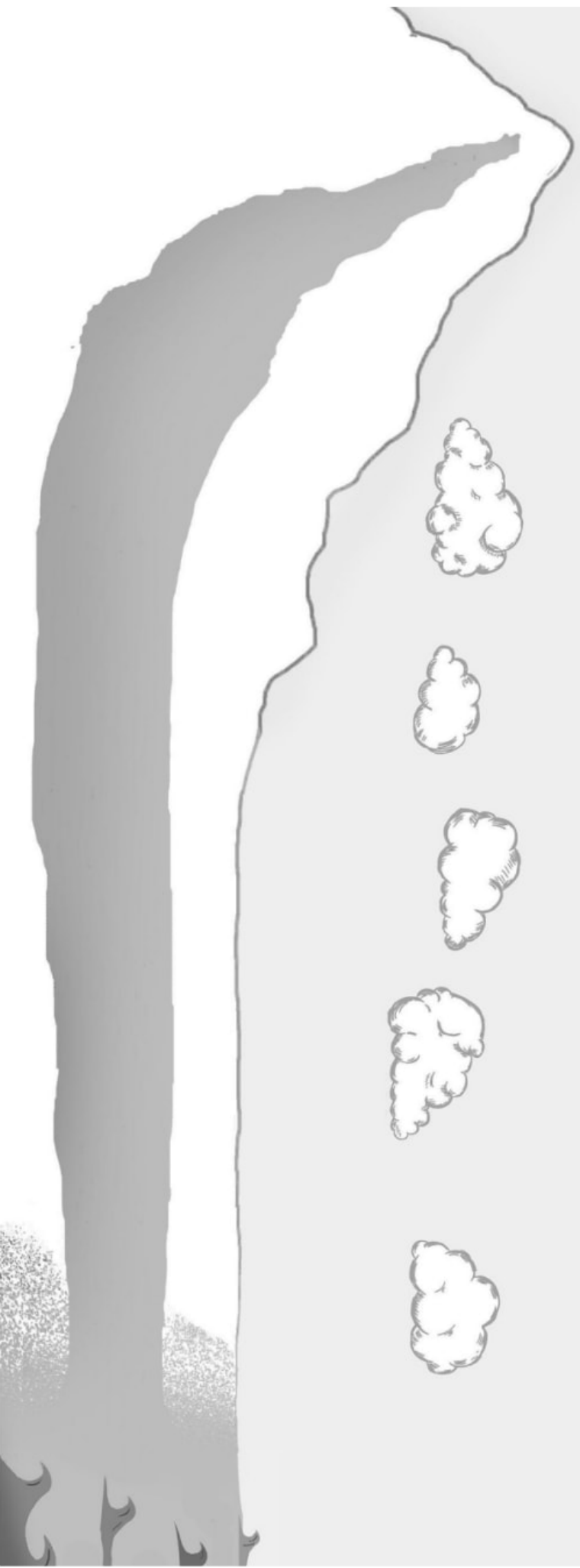


Draw the river rocks

mystery science
Why is there sand at the beach?

Name: _____

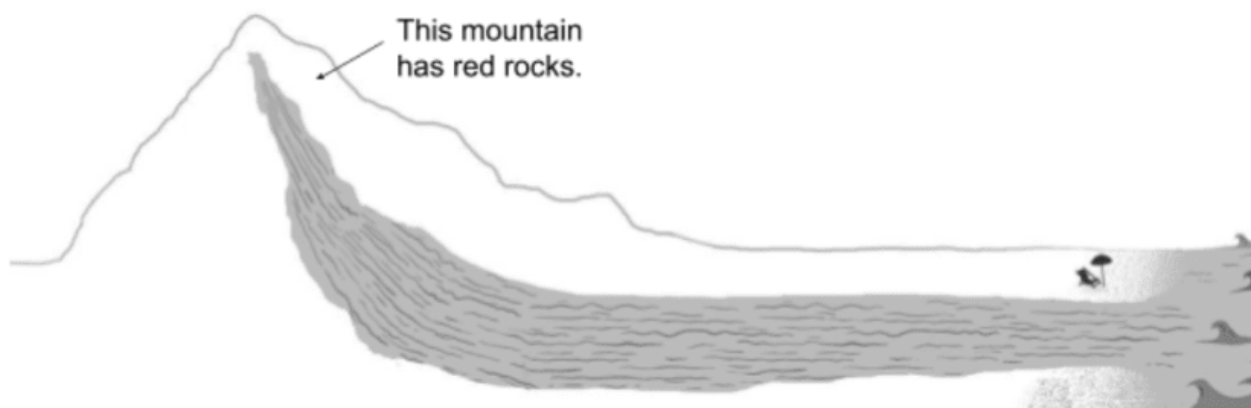
Draw rocks breaking up in the river,
starting at the top of the mountain
and ending at the ocean.



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:

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

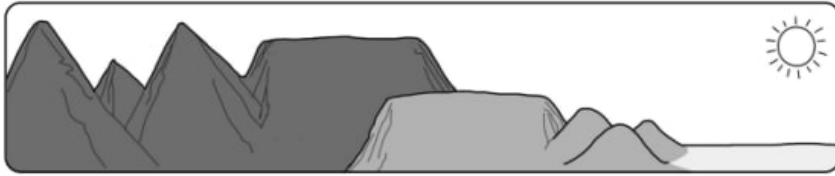
5

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

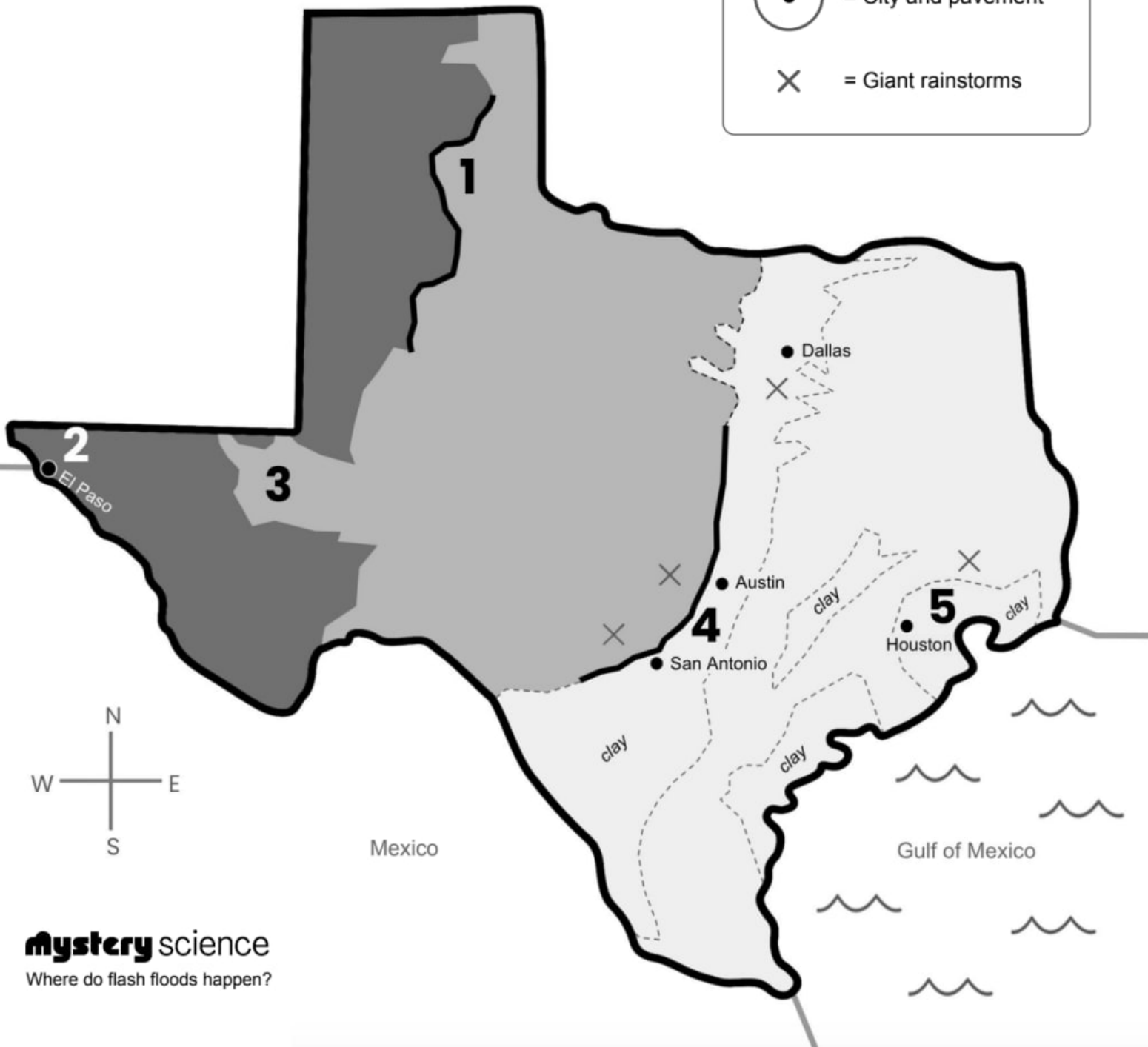
= Water

= Cliffs and rocky slopes

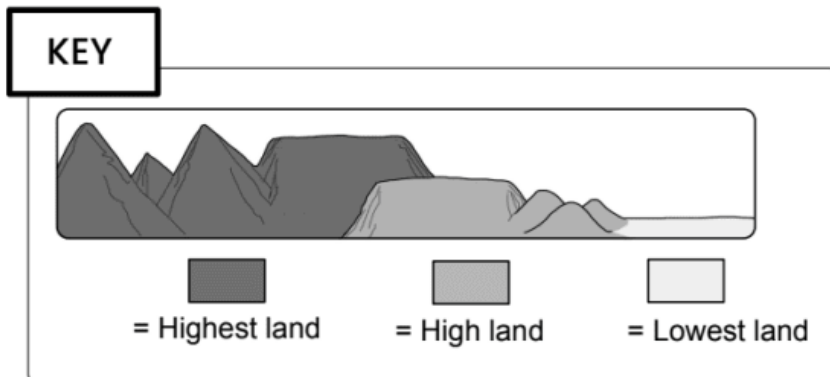
= Clay soil

= 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.

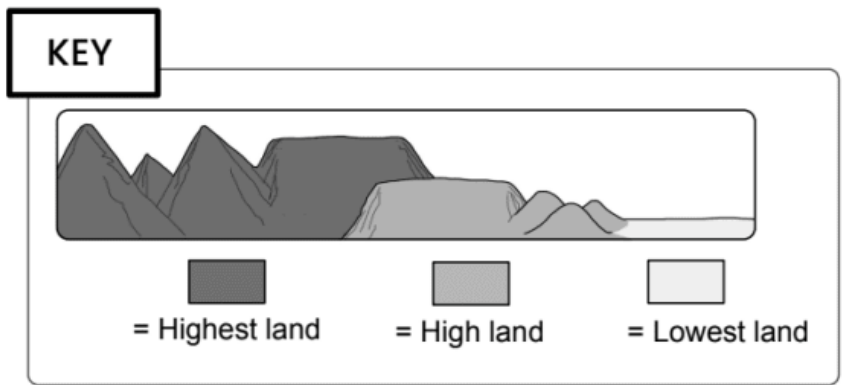
Circle **True** or **False** for each sentence.

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.

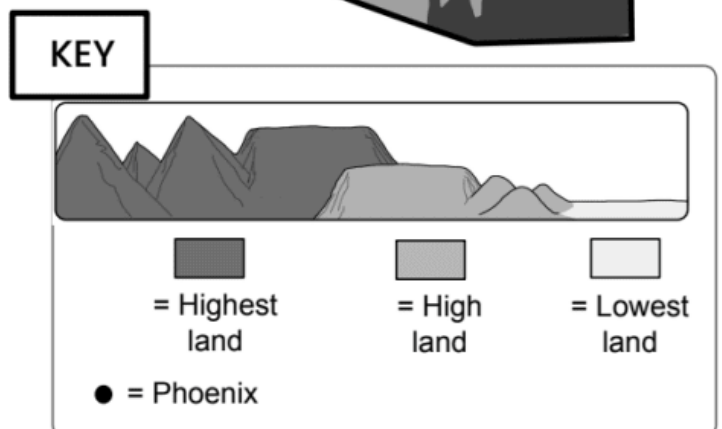
True False If you traveled to the top right part of the state of Arizona, you would probably see some of the highest land, including mountains.



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?

- a. Number 1
- b. Number 2
- c. Number 3
- d. Number 4
- e. 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.



How did water change your land?

Name: _____

Rainstorm # 1

Draw what happened:



Rainstorm # 2

Draw what happened:



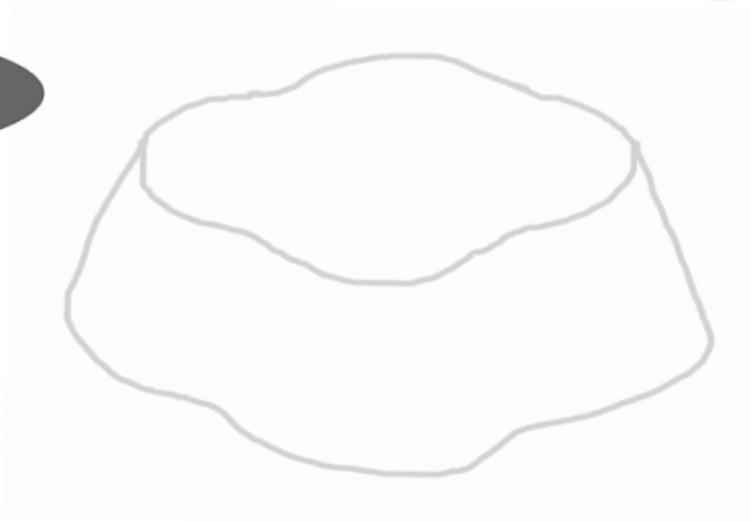
Rainstorm # 3

Draw what happened:



Rainstorm # 4

Draw what happened:



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

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?

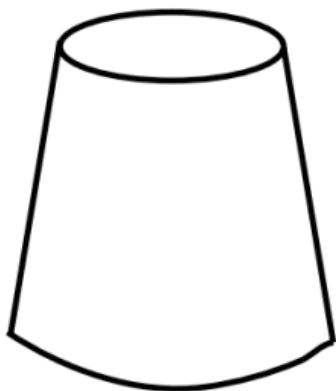
3. Do you think canyons form very quickly or very slowly? Why or why not?

Save the Hills

Name: _____

First Test

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



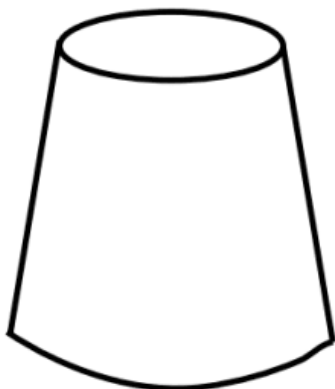
What do you think will happen?

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?

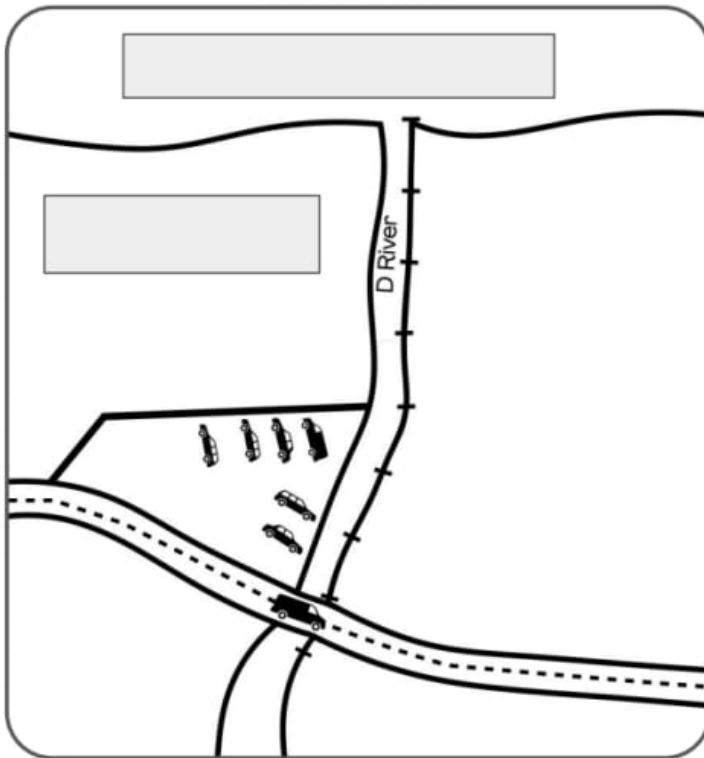
C. Which materials worked best to stop erosion? Why do you think that was?

Shortest River

Name: _____

Follow the instructions on-screen to label these drawings.

The D River

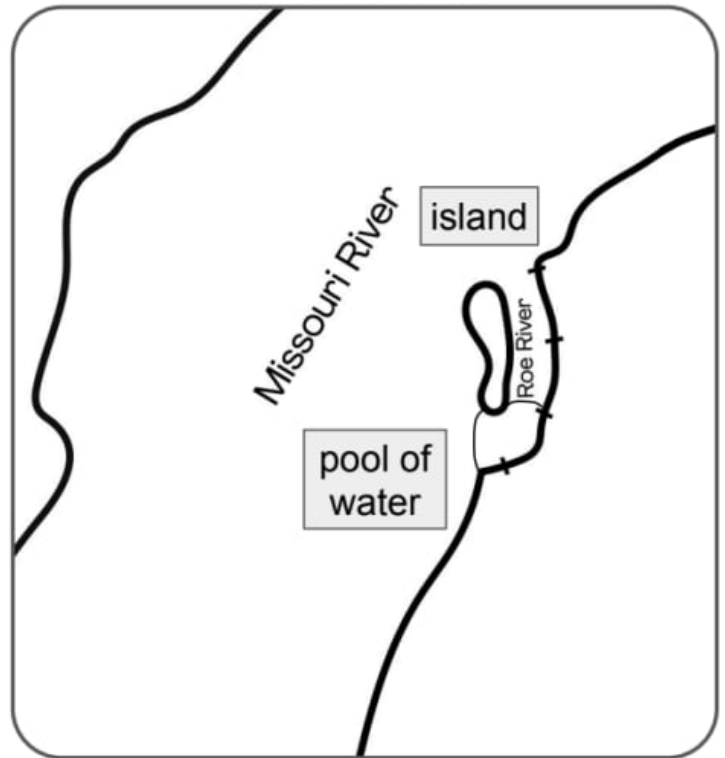


How long do you think the D River is?

I think _____

_____.

The Roe River



How long do you think the Roe River is?

I think _____

_____.

Which river do you think is shorter? Why do you think that?

I think _____,

because _____.

Rivers flow downhill. Which end of a river is higher and which is lower?

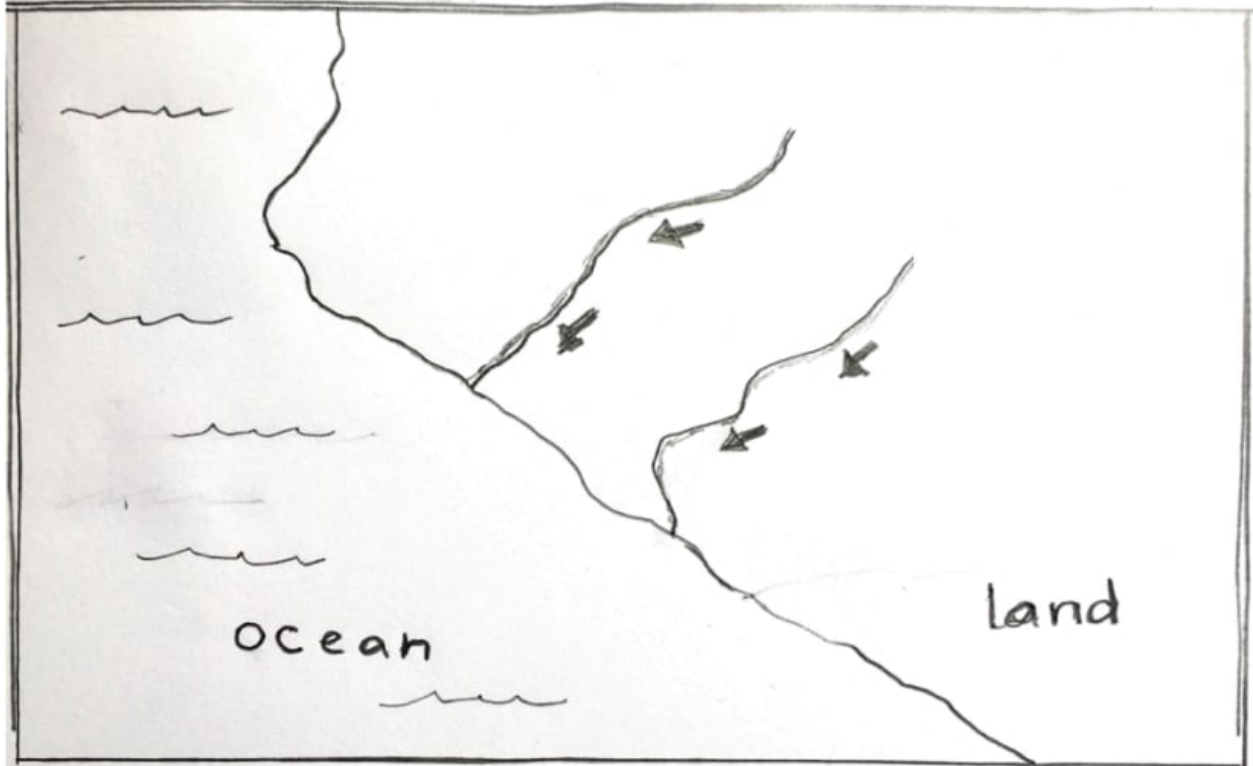
The source is _____, and the mouth is _____.

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

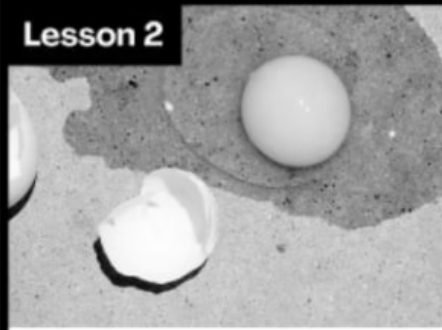
2nd Grade • NGSS • Unit Worksheets

Lesson 1



Why do we wear clothes?

Lesson 2



Can you really fry an egg on a hot sidewalk?

Lesson 3



What materials might be invented in the future?

Lesson 4



Could you build a house out of paper?

Lesson 5



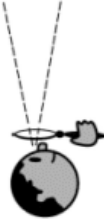
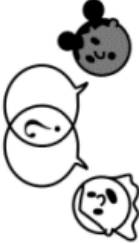
How do you build a city out of mud?

I am also curious about...

See-Think-Wonder Chart

mystery science

Name: _____

See What did you observe? 	Think How can you explain what is happening? 	Wonder What questions do you have? 

Beat the Heat

Name: _____

Describe what they wear on their **head and face**:



Draw what the foundry workers wear to stay safe.

Describe what they wear on their **body and arms**:

Describe what they wear on their **hands**:

Describe what they wear on their **legs**:

Describe what they wear on their **feet**:

Mad Hatter's Worksheet

Name: _____

1). Softness test

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



aluminum foil



paper plate



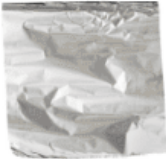
paper towel



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

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?

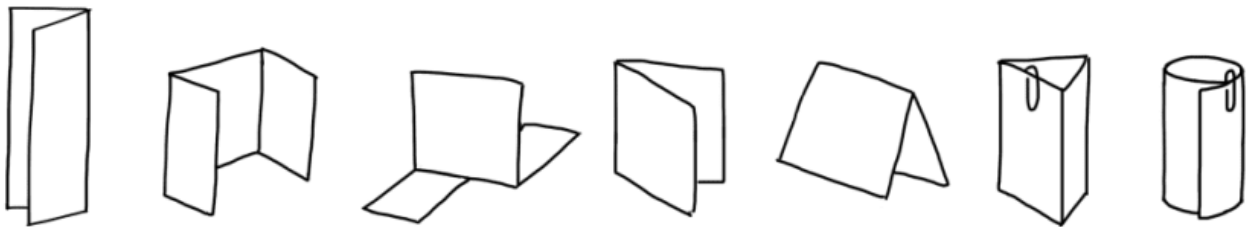
The _____ would feel **hotter** because that material is

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?

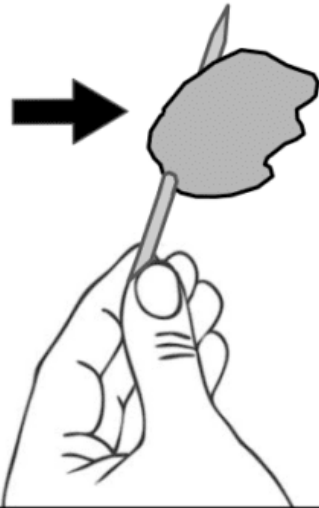
I think paper COULD / COULD NOT (circle one) be used to build a house because...

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



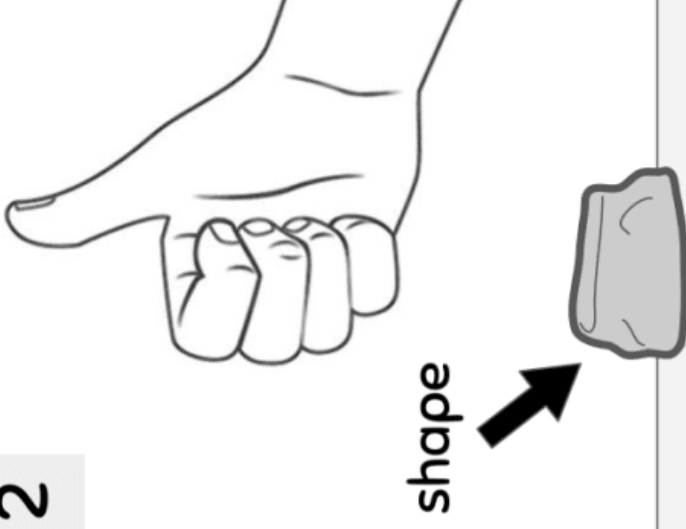
stays on

A

B

C

2



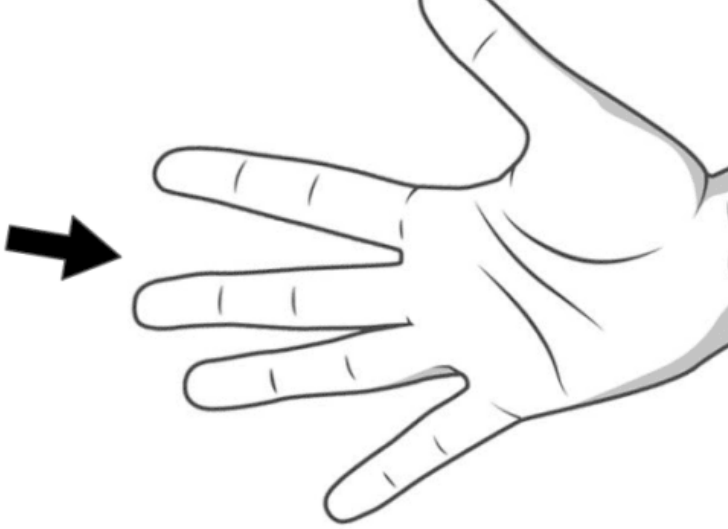
shape

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.

Recycle with Fire

Name: _____

Describe the **metal** before we do anything to it:



Is the **metal** meltable or flammable?
Circle one:

Meltable Flammable



Describe the **metal** after it cools back down:

Describe the **paper** before we do anything to it:



Is the **paper** meltable or flammable?
Circle one:

Meltable Flammable



Describe the **ash** after it cools back down:

Is **melting metal** with fire a good way to recycle it? Circle one:

Yes No

Why do you think that?

I think that because _____

Is **burning paper** with fire a good way to recycle it? Circle one:

Yes No

Why do you think that?

I think that because _____

Unit Assessment

Multiple Choice

1. If it's really hot and sunny outside, you probably want to wear clothes that are...
 - a. waterproof.
 - b. heat-trapping.
 - c. see-through.
 - d. absorbent.

2. Why are oven mitts NOT made out of metal?
 - a. Metal lets the heat through to your hand.
 - b. Metal is too expensive.
 - c. Metal is too heavy.
 - d. Metal isn't very comfortable.

3. Why do you need a metal pan to fry an egg on a hot sidewalk?
 - a. The pan will keep the egg from getting dirty.
 - b. The pan makes it easier to serve the egg.
 - c. The pan conducts heat from the sidewalk.
 - d. The pan absorbs heat from the sun.

4. What do popsicles and plastic toys have in common?
 - a. Both of them can get very cold.
 - b. Both of them are liquids.
 - c. Both of them are made out of water.
 - d. Both of them can be melted into shapes.

5. Why was it easier to make plastic toys instead of wooden toys?
 - a. Plastic doesn't need to be carved by hand.
 - b. Plastic doesn't grow in the ground.
 - c. Plastic can be painted different colors.
 - d. Plastic doesn't have bark that needs to be removed.

6. Scientists invent new materials so that they can...
- a. tell each other about them.
 - b. invent things to solve problems.
 - c. store the materials in their laboratories.
 - d. do as many experiments as possible.
7. A _____ can be built out of smaller pieces of _____.
- a. House..... wood
 - b. Skyscraper..... concrete and steel
 - c. Wall..... brick
 - d. All of the above

Short Answer

8. If you are designing **winter boots**, which material properties would you choose?
Circle as many properties as you want.

heavy

soft

see-through

absorbent

stiff

stretchy

heat-trapping

waterproof

Explain why you chose your answers above.

9. 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... _____

10. What's the difference between clothing that people wear when it's cold compared to when it's hot? Complete the sentences below.

When it's cold, people wear clothing that is _____

because _____.

When it's hot, people wear clothing that is _____

because _____.

11. What are two ways you could change the properties of paper to make it stronger?

You could make paper stronger by... _____

12. What futuristic material would you invent and what would you make with it?

I would invent... _____

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

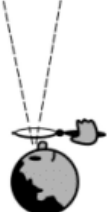
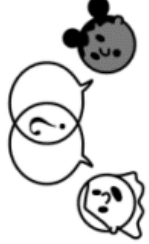


Why are so many toys made out of plastic?

I am also curious about...

See-Think-Wonder Chart

Name: _____

	See What did you observe? 		Think What do these all have in common? 		Wonder What questions do you have? 	
	Birds landing on water					
	Crayon in a pan					
	Marker in a fire					

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 _____



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 _____



Where do animals find the water they need?

Mystery science

Explore the
Arctic!

Name: _____

Water Journal



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 walruses. 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.

Walruses 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. Finish this sentence.

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 _____

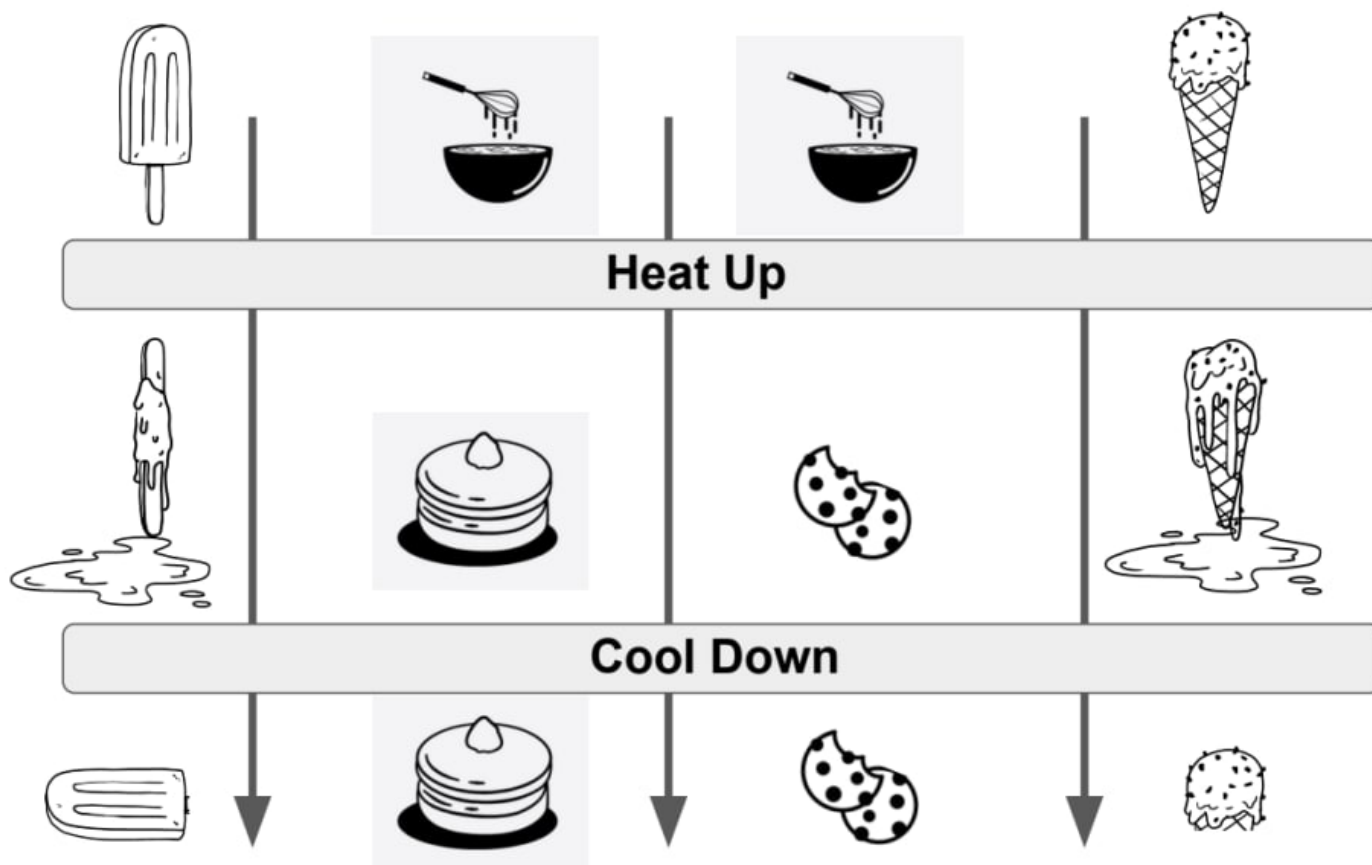
YES / NO

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

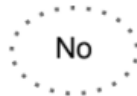
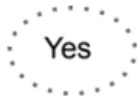
Name: _____

Candy #1:

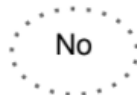
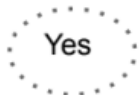
Draw candy #1 here:



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:

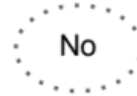
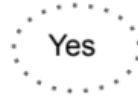
- ☐ totally solid
- ☐ partially melted (soft & squishy)
- ☐ melted into a liquid

Candy #2:

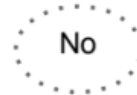
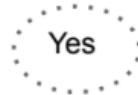
Draw candy #2 here:



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 _____
