Name: _____

mystery science

Second Grade

Student Booklet
With Anchor Layer

mystery science

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...

Bracken Cave

mystery science
Animal Biodiversity | Anchor Layer

Name: _____ Drawing Number: _____

What do you think lives in the cave?

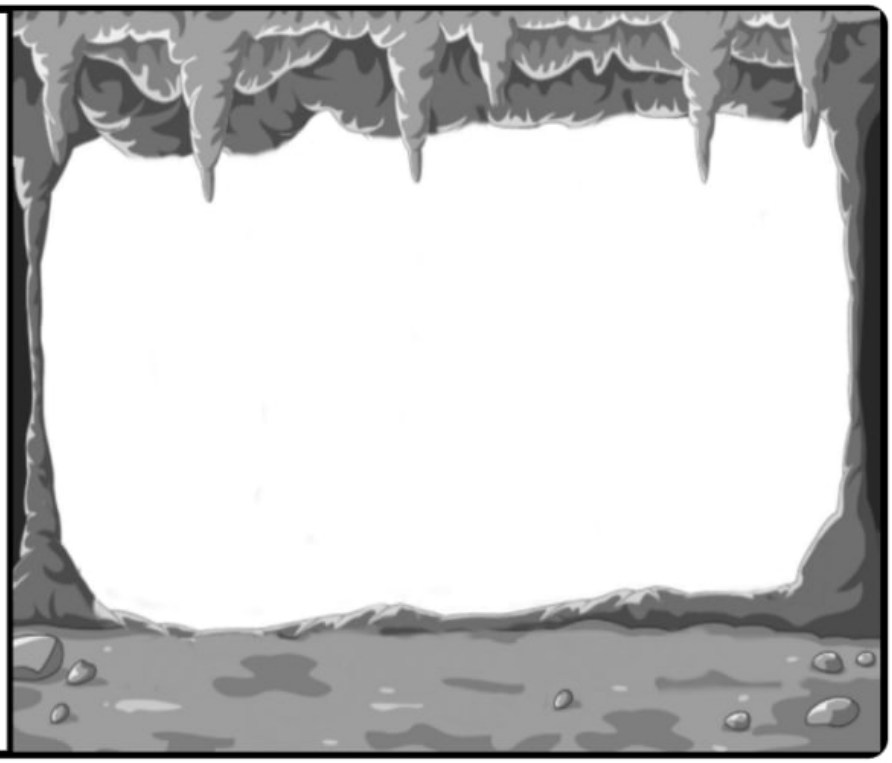
I think it is

_____

_____

_____

_____



CUT CUT

Bracken Cave

mystery science
Animal Biodiversity | Anchor Layer

Name: _____ Drawing Number: _____

What do you think lives in the cave?

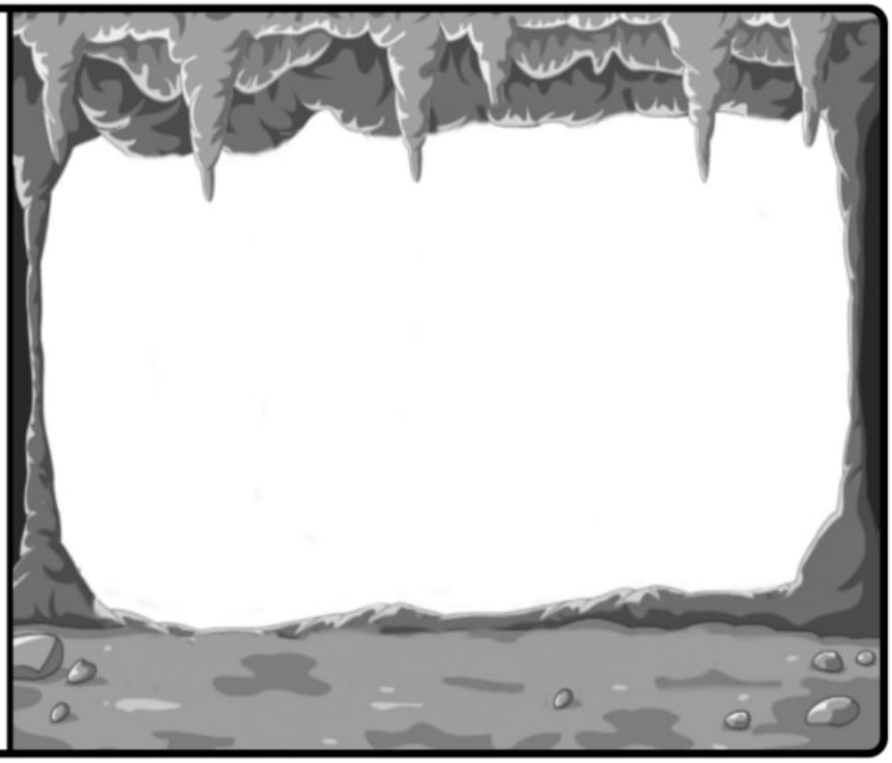
I think it is

_____

_____

_____

_____



Design a Bat Rest Stop

mystery science
Animal Biodiversity | Anchor Layer

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 Layer

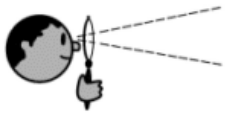
Name: _____ Design Number: _____

What would you use to build your Bat Rest Stop?	
_____	
_____	
_____	
_____	
_____	

See-Think-Wonder Chart

Name: _____

mystery science

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

Penguin

Has bones inside its body

Lays eggs

Has feathers

Mystery science

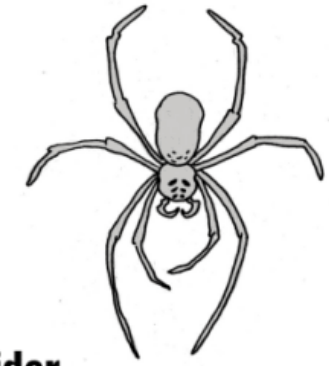
Squirrel

Has bones inside its body

Gives birth (doesn't lay eggs)

Has hair or fur

Mystery science



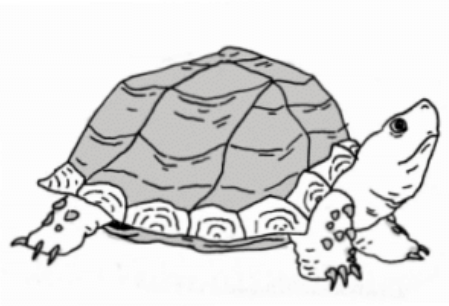
Spider

Doesn't have any bones at all

Lays eggs

Doesn't have fur or feathers or scales

Mystery science



Turtle

Has bones inside its body

Lays eggs

Has scales

Mystery science

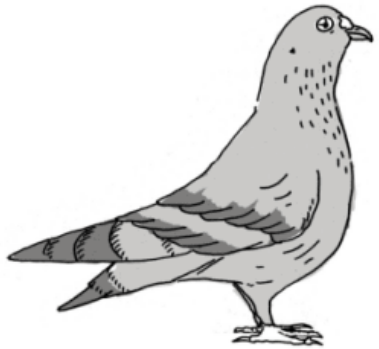
Ladybug

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

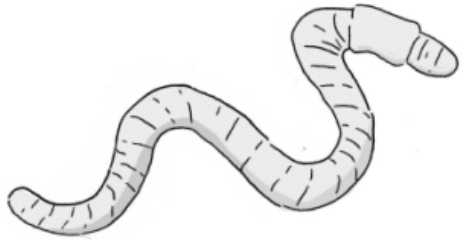
Snake

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

Cat

Has bones inside its body

Gives birth (doesn't lay eggs)

Has hair or fur

Mystery science

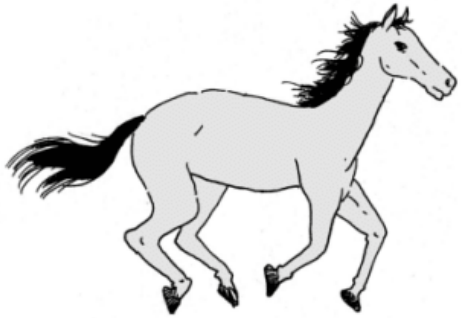
Elephant stag beetle

Doesn't have any bones at all

Lays eggs

Doesn't have fur or feathers or scales

Mystery science



Horse

Has bones inside its body

Gives birth (doesn't lay eggs)

Has hair or fur

Mystery science

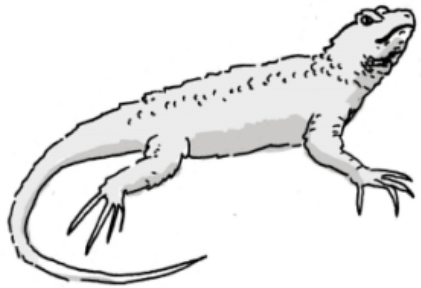
Ostrich

Has bones inside its body

Lays eggs

Has feathers

Mystery science



Lizard

Has bones inside its body

Lays eggs

Has scales

Mystery science

Mystery science

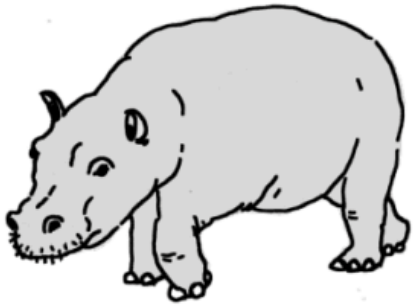
How many different kinds of animals are there?

Challenge Cards

#1. 

#2. 

#3. 



Name: _____

bones / no bones

lays eggs / gives birth

hair / feather / scales / none

Mystery science

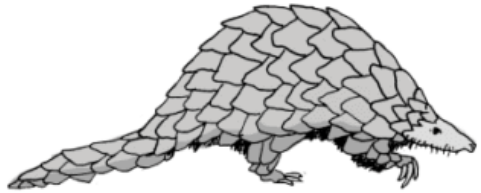
Name: _____

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

Mystery science

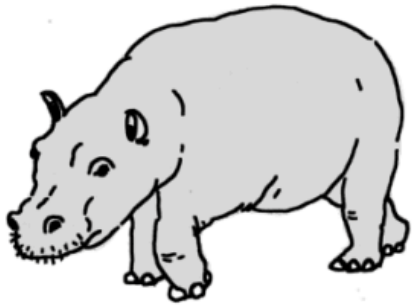
How many different kinds of animals are there?

Challenge Cards

#1. 

#2. 

#3. 



Name: _____

bones / no bones

lays eggs / gives birth

hair / feather / scales / none

Mystery science

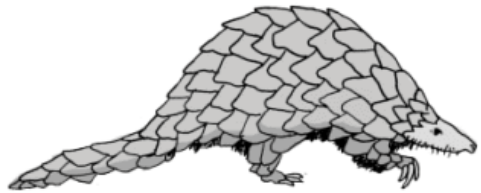
Name: _____

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

mystery science

Name: _____
Date: _____

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 <u>outsides</u> 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?

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

Name: _____

Date: _____

mystery science

Why would a wild animal visit a playground?

The Mystery of the Bighorn Sheep in the Park

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

DESERT **PARK**

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

DESERT **PARK**

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

_____

_____

_____

_____

Name: _____

Date: _____

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.

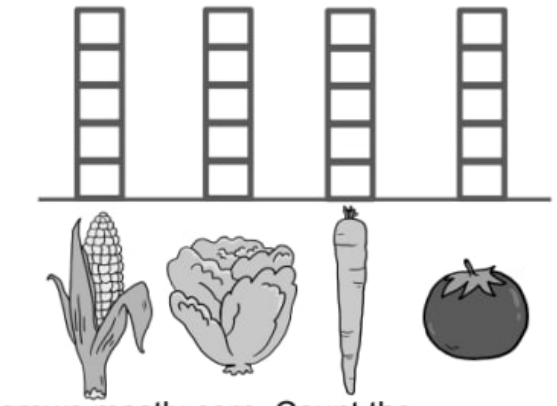
True False Measure the water in each fish tank and compare them.

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.

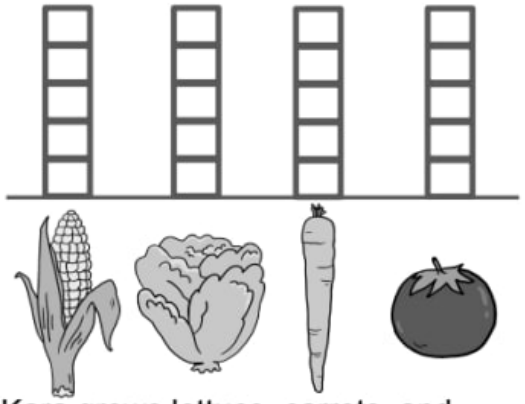
Cristal wants to make a diverse salad with lots of different vegetables. Observe what is being sold at Eli's farm and Kara's garden to figure out where she should shop.

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.

a. Eli's farm.
b. Kara's garden.
c. 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? _____

_____

_____

_____

Name: _____

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?

_____

Name: _____

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 _____

_____.

Name: _____

Date: _____

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

_____.

Name: _____

Mystery science

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

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?

_____

_____

mystery science

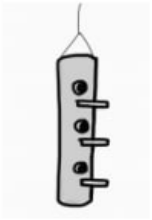
Name: _____

Date: _____

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 <u>same</u> in both habitats?

_____

_____

What do you think is the <u>biggest difference</u> between the habitats?

_____

_____

Animal Biodiversity

Name: _____
Date: _____

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?

_____

_____

_____

_____

_____

12. Fill out the Claim-Evidence-Reasoning chart based on the bird feeder you designed.

Claim: My bird feeder will attract: (circle one) Finches Jays Woodpeckers Cardinals
Evidence: Draw your bird feeder design and label the parts.
Reasoning: My feeder will attract _____ (the bird you chose above) because...

mystery science

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...

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.

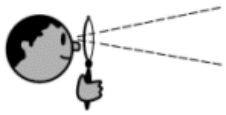
_____

_____

See-Think-Wonder Chart

Name: _____

mystery science

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

Rain Tree models

Teacher prep instructions:
Cut on the thick black lines

MYSTERY science
How did a tree travel halfway around the world?

STOP

Rain Tree

STOP

STOP

Rain Tree

STOP

STOP

Rain Tree

STOP

STOP

Rain Tree

STOP

STOP

Rain Tree

STOP

STOP

Rain Tree

STOP

Maple models

Teacher prep instructions:
Cut on the thick black lines

MYSTERY science
How did a tree travel halfway around the world?

Koa models

Teacher prep instructions:
Cut on the thick black lines

MYSTERY science
How did a tree travel halfway around the world?

Koa

Koa

Koa

Name: _____

Date: _____

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.

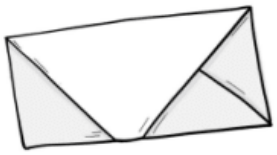
1. Examine the seeds above and look for patterns in the shape of their structures.
Circle **True** or **False** for each sentence.

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.

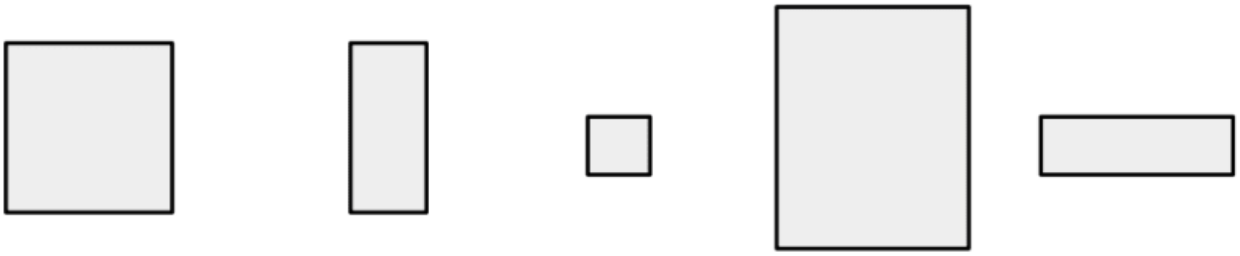
True False The seeds that use the wind all have fuzzy, spiky structures.

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

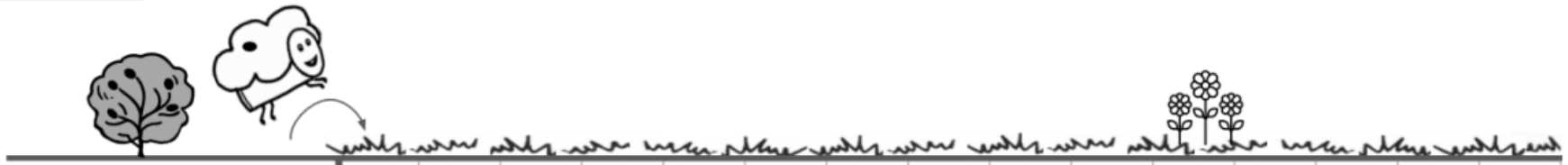
Name: _____

mystery science
Why do seeds have so many different shapes?

Seed A

Number of hops away:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Test 1															
Test 2															
Test 3															

Seed B



Number of hops away:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Test 1															
Test 2															
Test 3															

Name: _____

Date: _____

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

Name: _____
Date: _____

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.

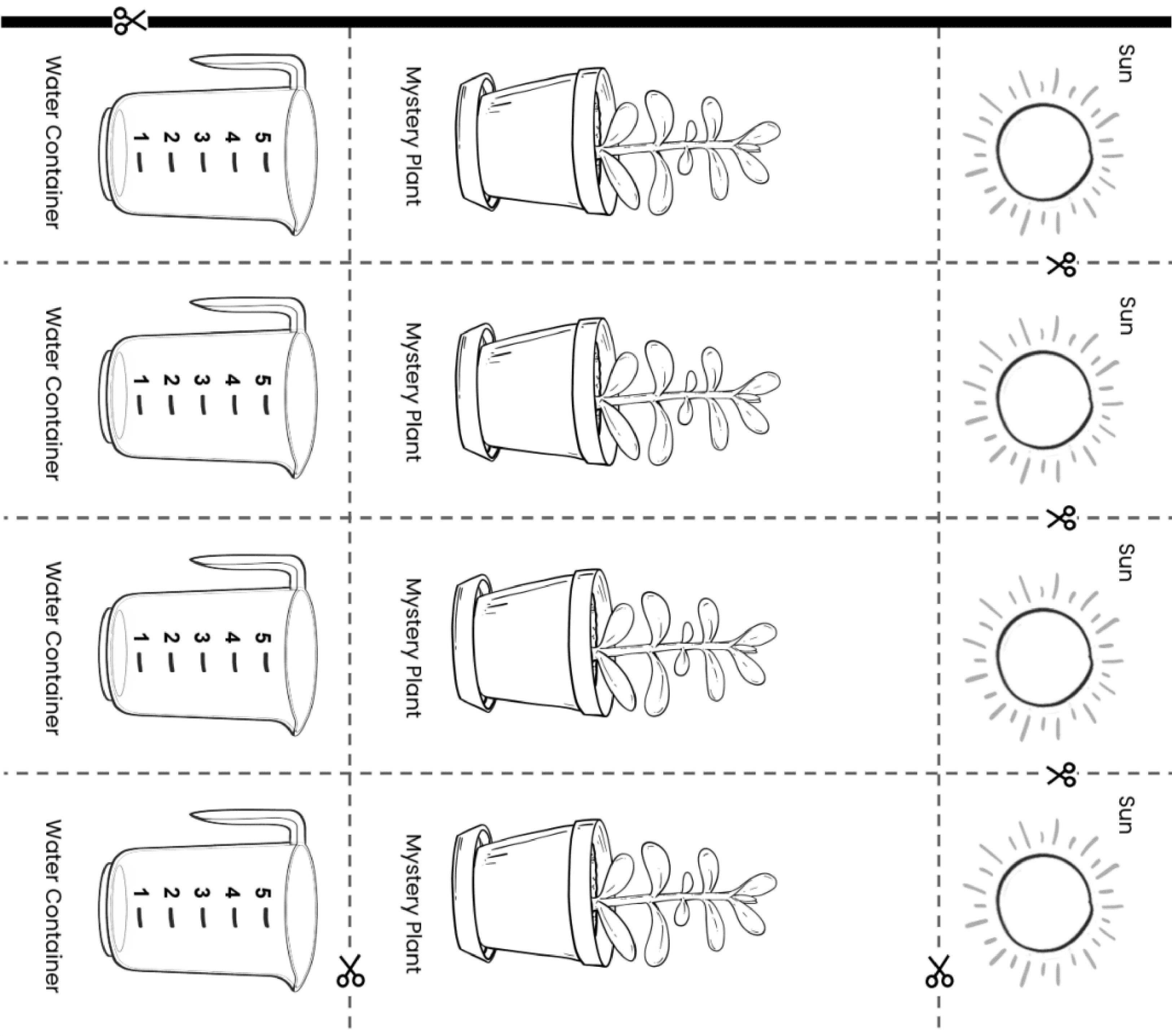
Grown in the Light	Grown in the Dark

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.

Build-Your-Own Experiment

Mystery science

How much water should you give a plant?



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**.

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**.

Experiment Ideas

mystery science

How much water should you give a plant?

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

Ahmed

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

Bianca

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.

Carlos

Name: _____

Date: _____

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.

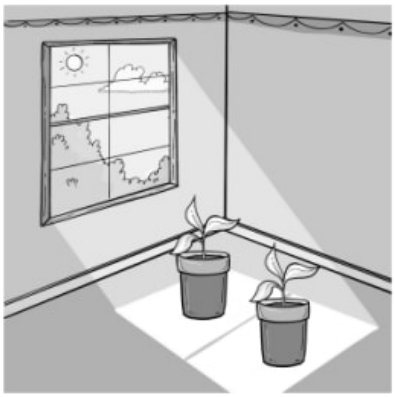
1. Sheila first wants to do an experiment to test how much **water** her plants need to grow and stay healthy. What is the best experiment to test how much **water** the plants need?

a. Give the plants the same amount of water.

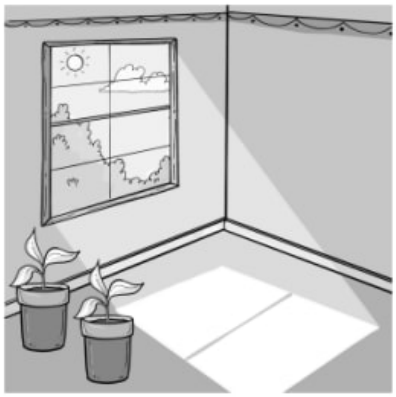
b. Give one plant a lot of water and one plant only a little water.

c. Do not give the plants any water.

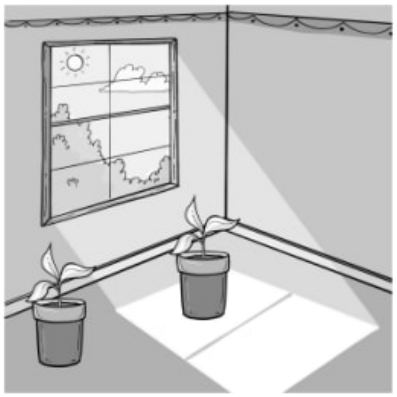
2. Sheila wants to do an experiment to test the amount of **sunlight** her plants need to grow and stay healthy. What is the best experiment to test how much **sunlight** the plants need?



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

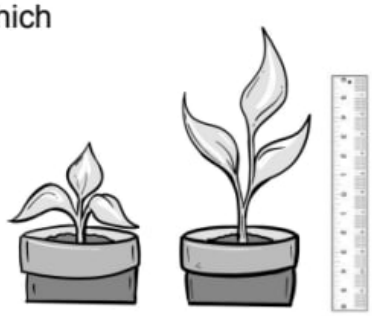


b. Place both plants in the shade (see the picture above).



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?

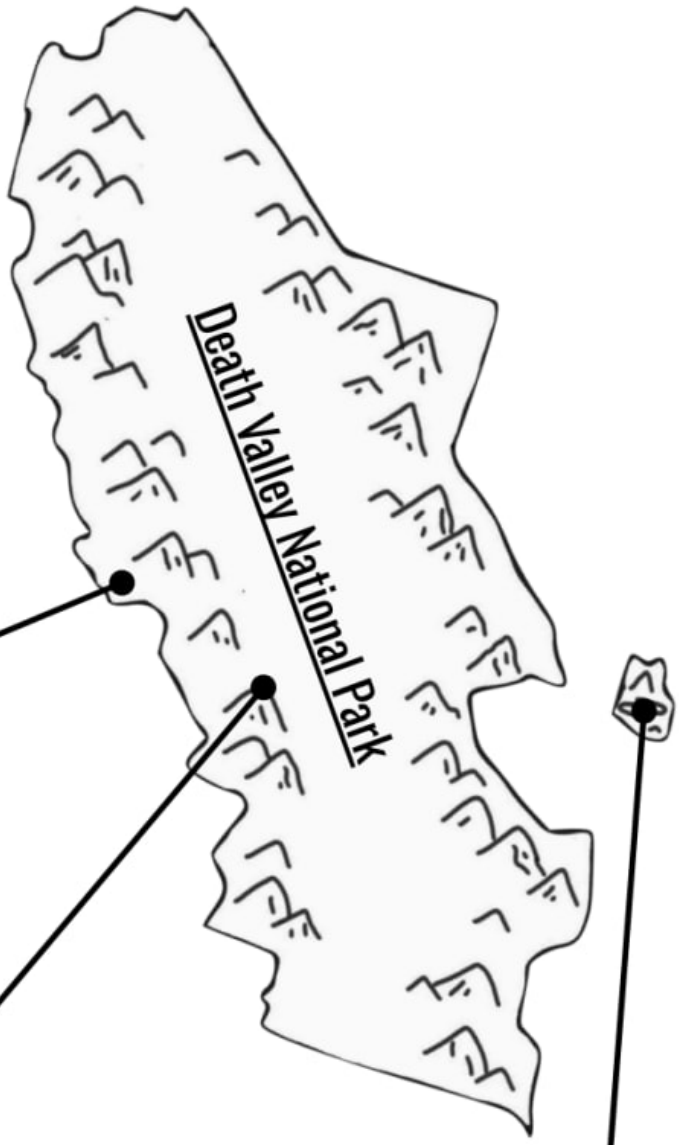
a. Sheila should put all the plants in a place with lots of sunlight.
b. Sheila shouldn't give the plants any sunlight.
c. Sheila should put all the plants in a place with shade.
d. Sheila won't know how much sunlight to give her plants.

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:

- _____
- _____
- _____

Name: _____

Date: _____

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.

mystery science

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...

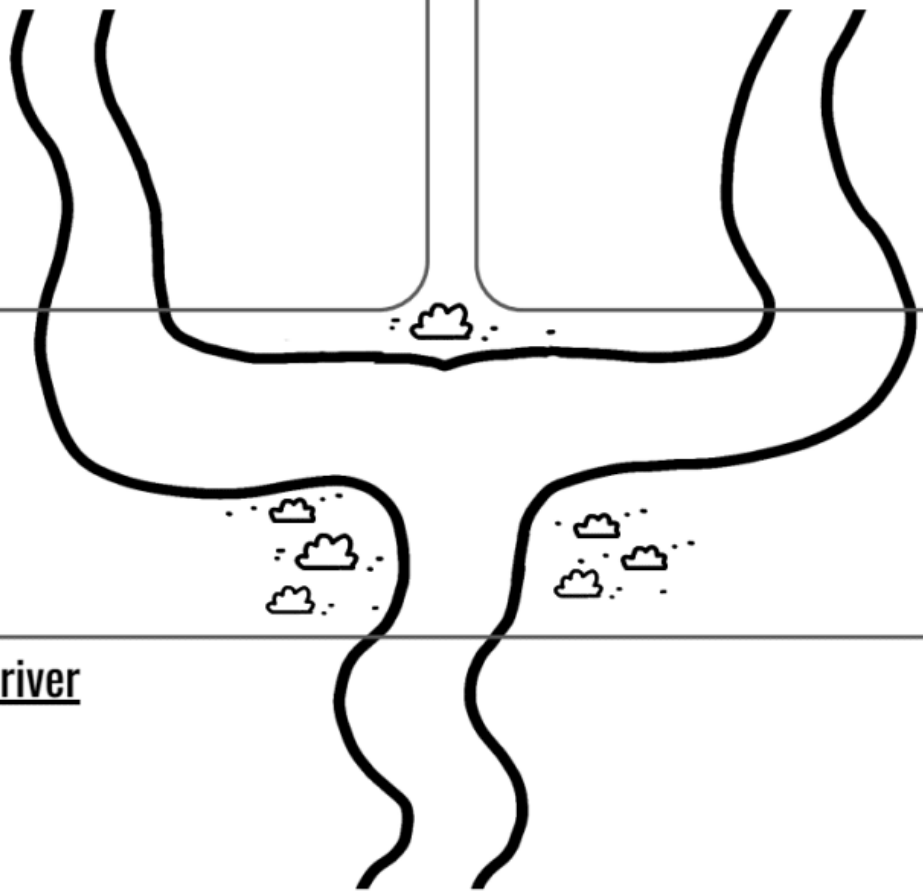
Strange River

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

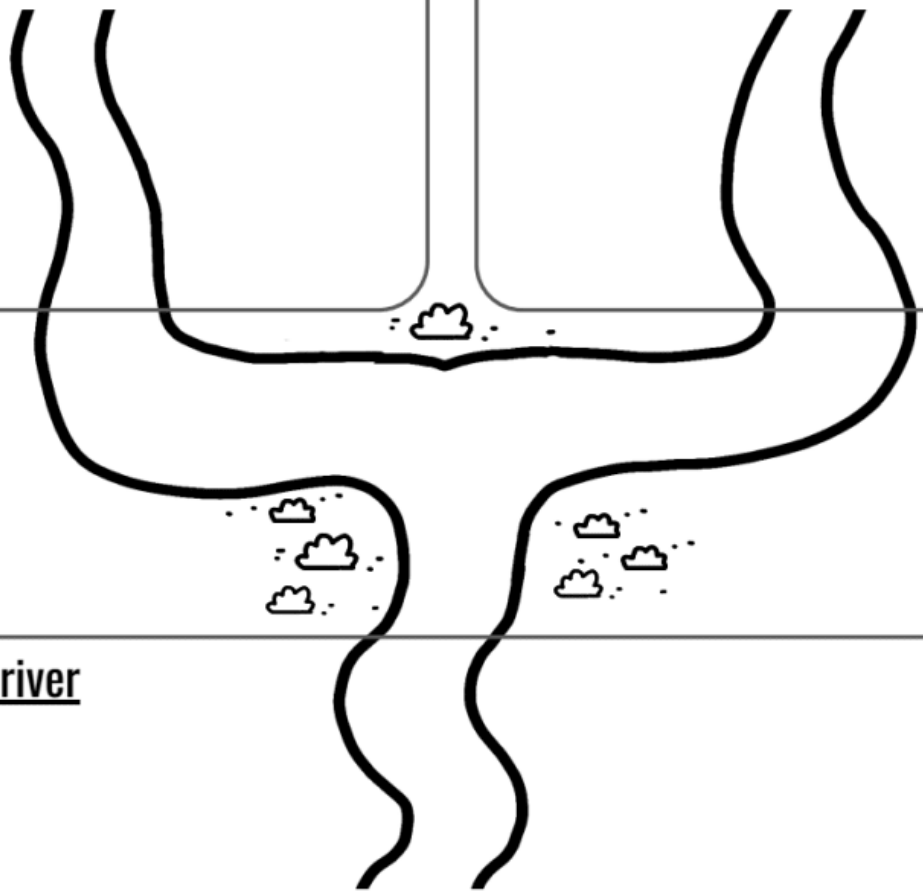
Strange River

Name: _____ River Drawing Number: _____

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

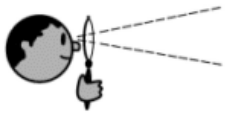


End of the river

See-Think-Wonder Chart

Name: _____

mystery science

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

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

put sticker here

put sticker here

put sticker here

put sticker here

Names (both partners):

_____

mystery science

Name: _____
Date: _____

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?

_____

_____

_____

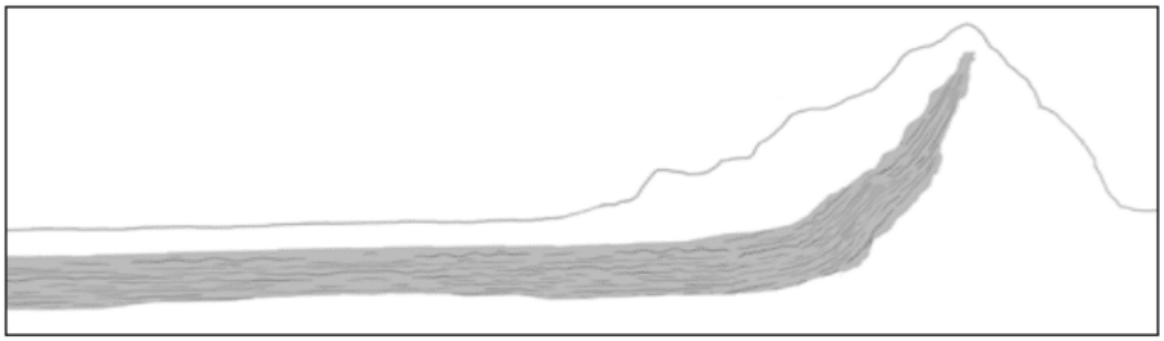
_____

_____

_____

_____

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



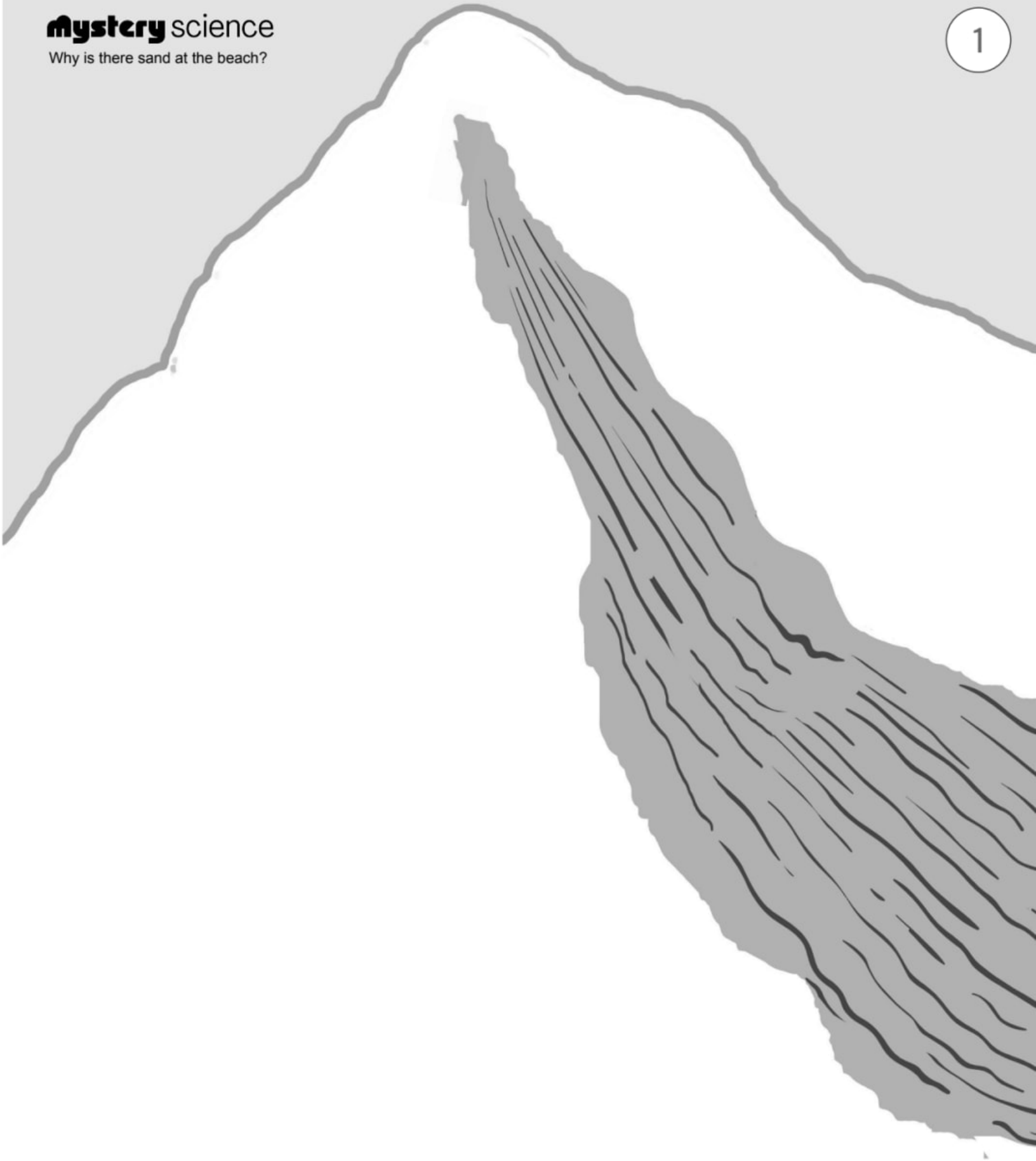
How do you know? Use words:

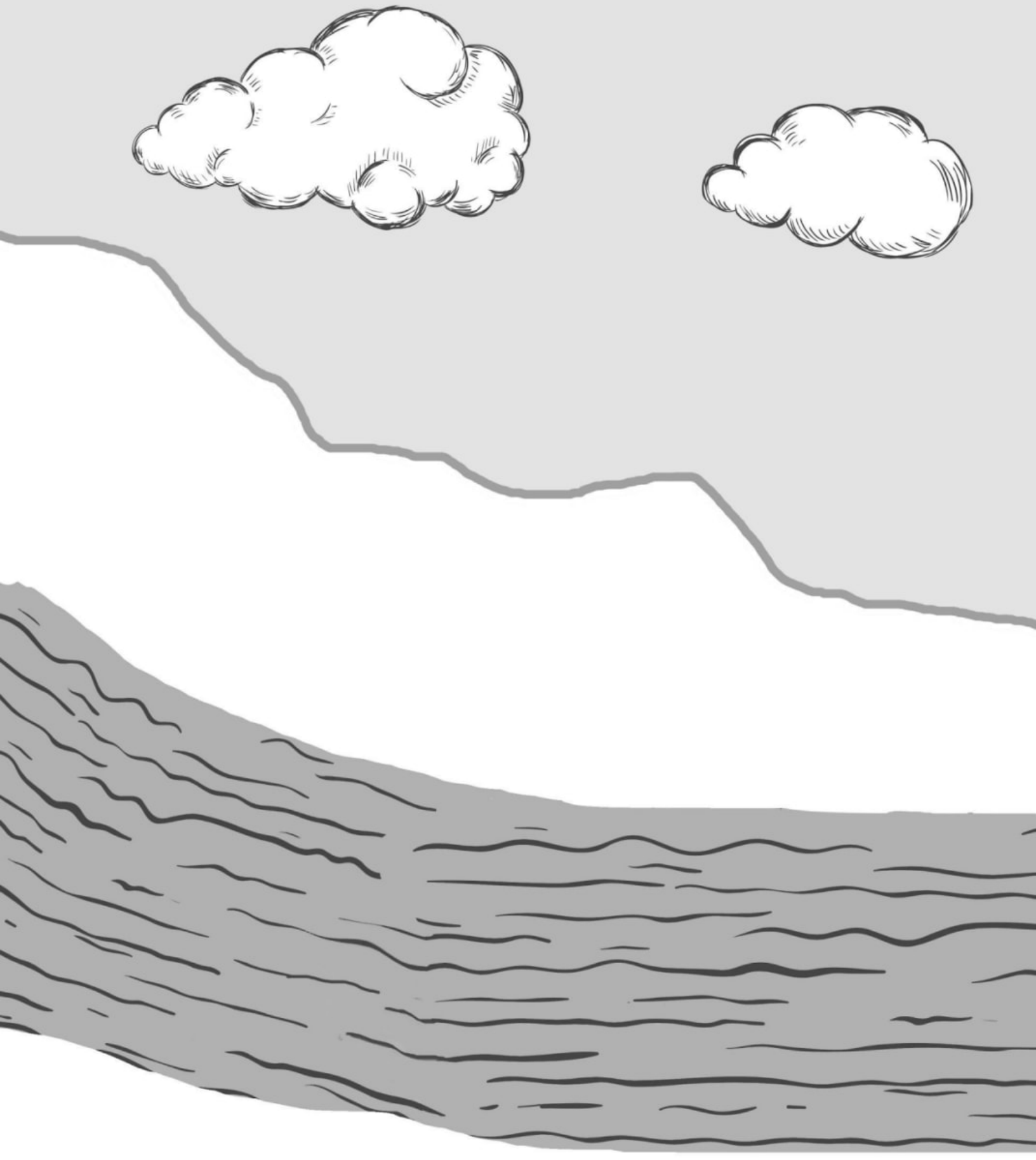
Draw the river rocks

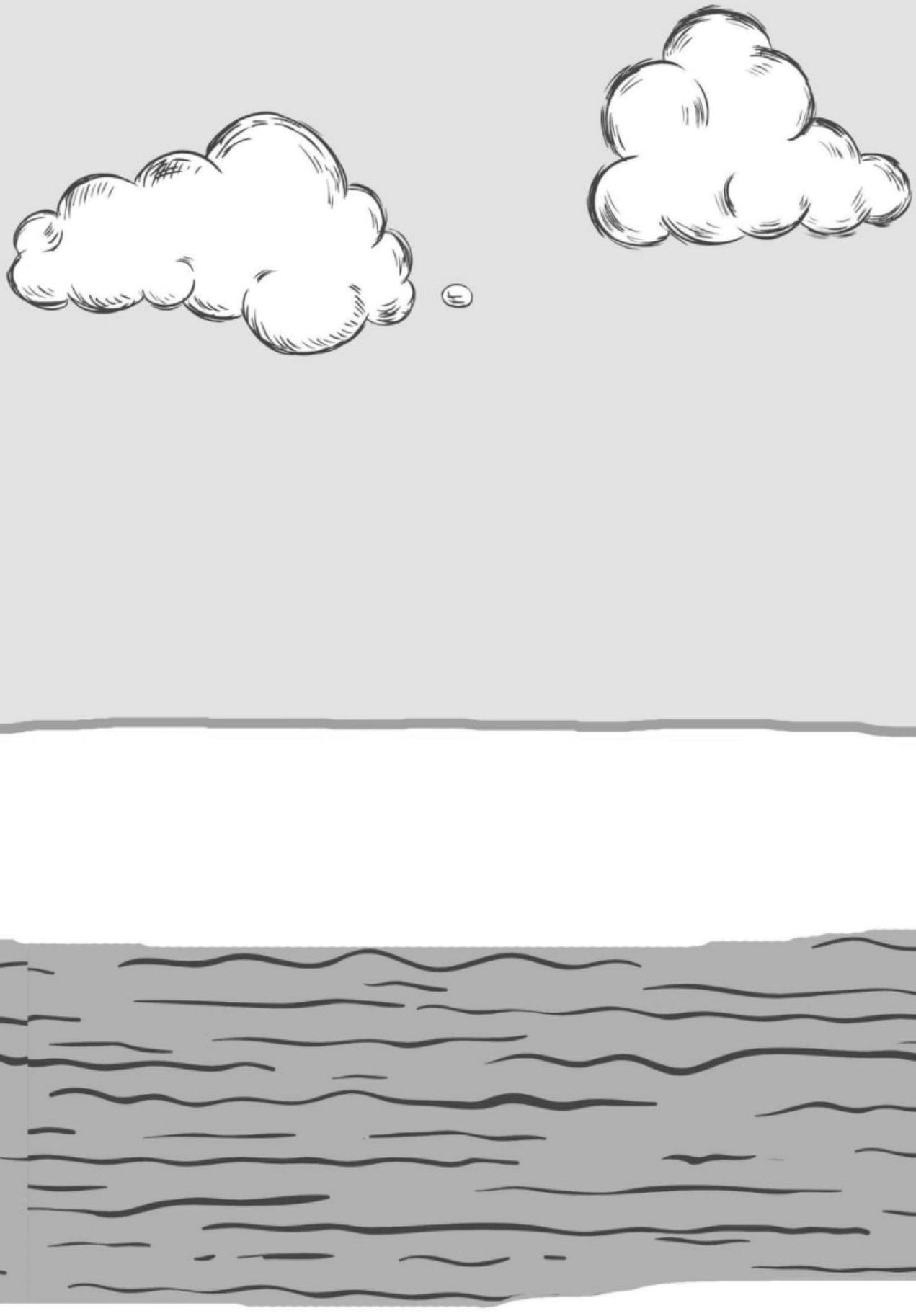
mystery science
Why is there sand at the beach?

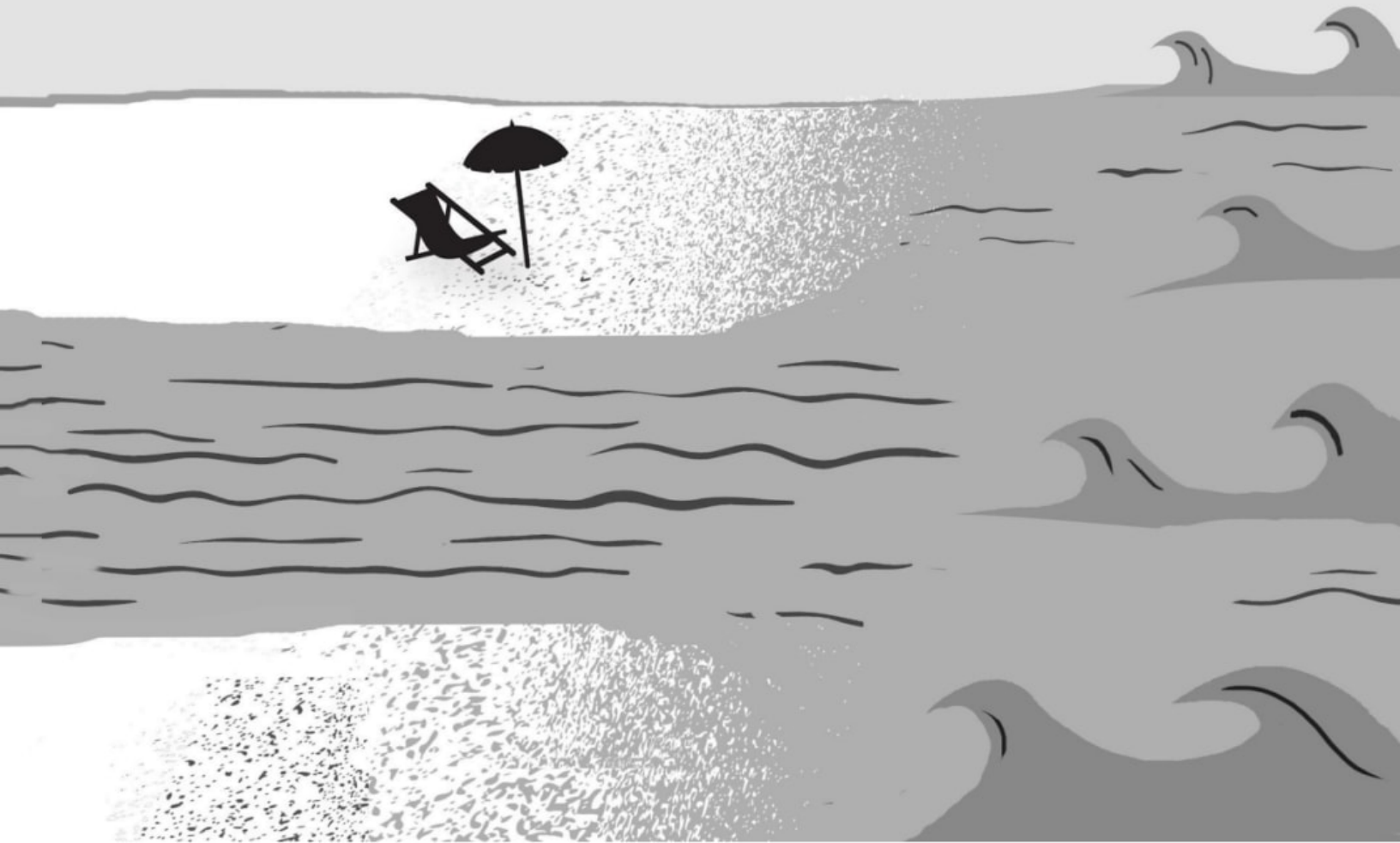
Name: _____

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









mystery science

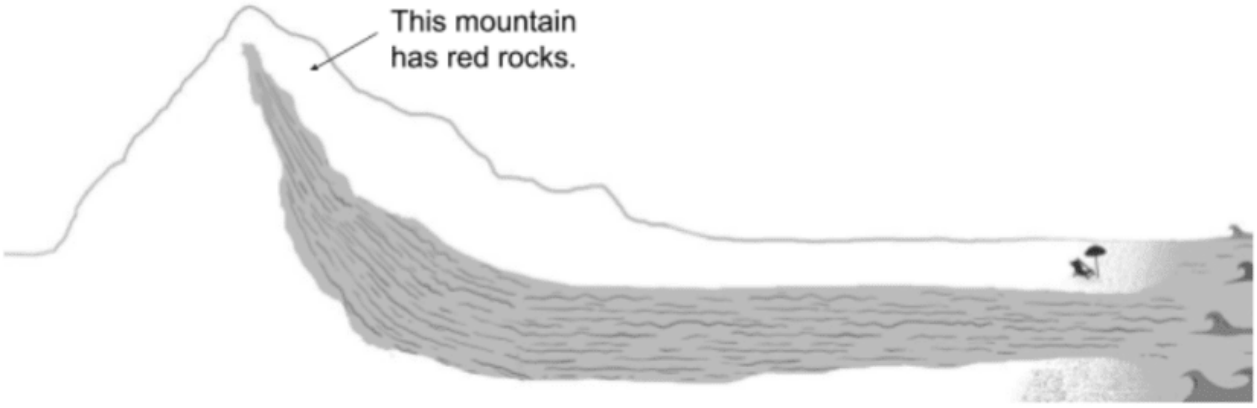
Name: _____

Date: _____

Why is there sand at the beach?

Lesson Assessment

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



_____

_____

_____

_____

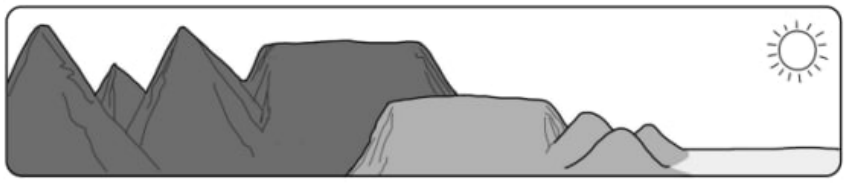
_____

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

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 = Clay soil

= City and pavement

= Giant rainstorms

1

2

El Paso

3

Dallas

Austin

4

San Antonio

5

Houston

clay

clay

clay

clay

clay

N

W E

S

Mexico

Gulf of Mexico

mystery science

Where do flash floods happen?

Flash Flood Finder

Name: _____

KEY


= a lower place near a higher place


= bottom of cliff or slope


= clay soil


= pavement


= giant rainstorms

1

2

3

4

5

mystery science

Where do flash floods happen?

Flash Flood Finder

Name: _____

KEY


= a lower place near a higher place


= bottom of cliff or slope


= clay soil


= pavement


= giant rainstorms

1

2

3

4

5

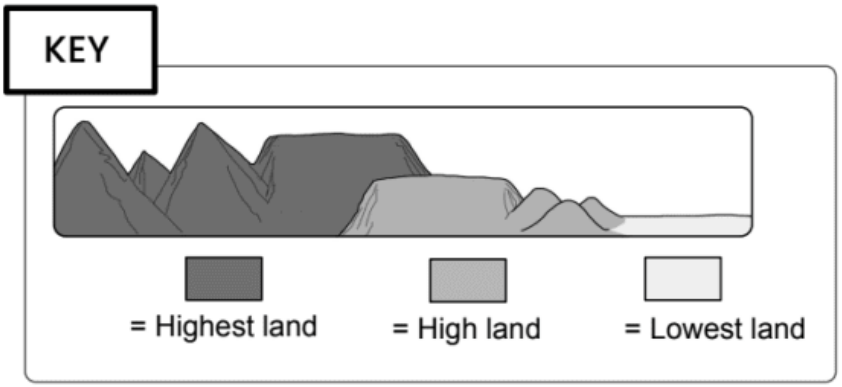
mystery science

Where do flash floods happen?

Name: _____

Date: _____

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.

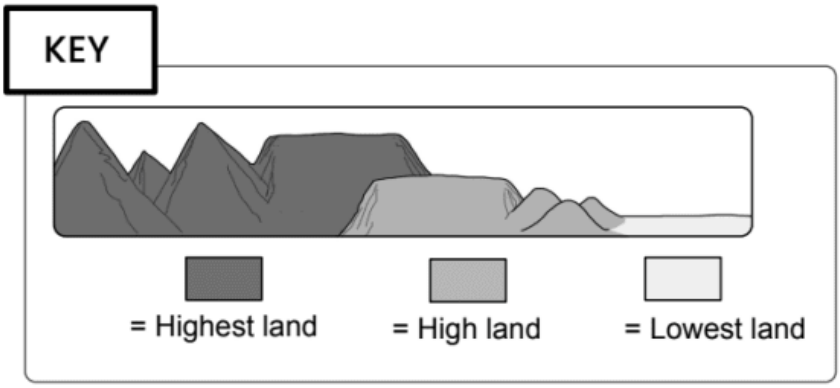
Circle **True** or **False** for each sentence.

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.

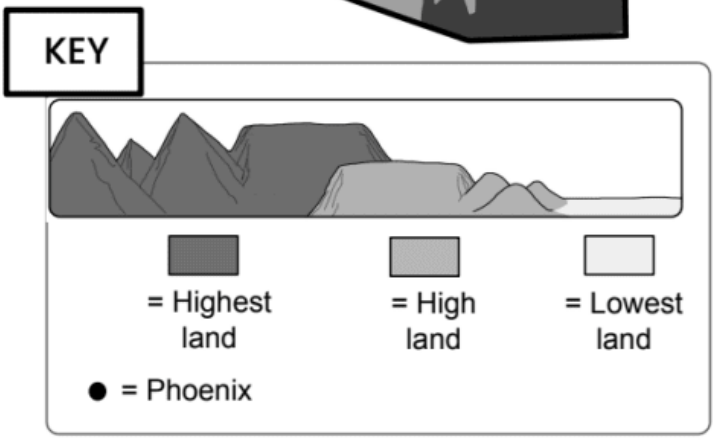
True False If you traveled to the top right part of the state of Arizona, you would probably see some of the highest land, including mountains.



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.



Name: _____

How did water change your land?

Rainstorm # 1

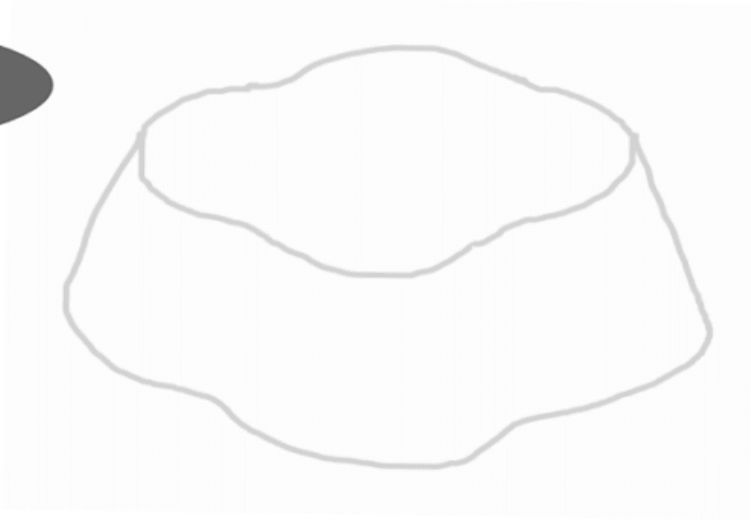
Draw what happened:

Rainstorm # 2

Draw what happened:

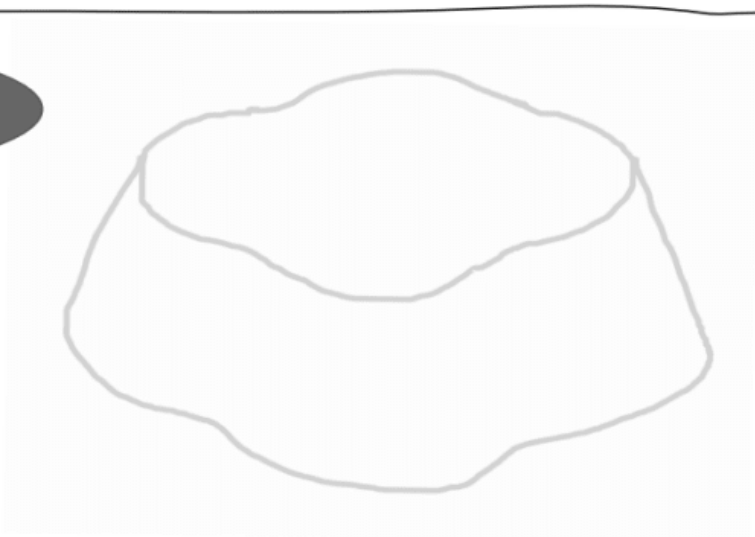
Rainstorm # 3

Draw what happened:



Rainstorm # 4

Draw what happened:



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

mystery science

Name: _____

Date: _____

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?

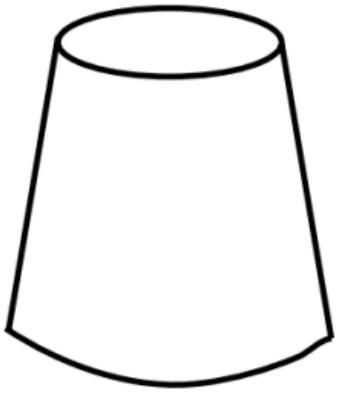
3. Do you think canyons form very quickly or very slowly? Why or why not?

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?

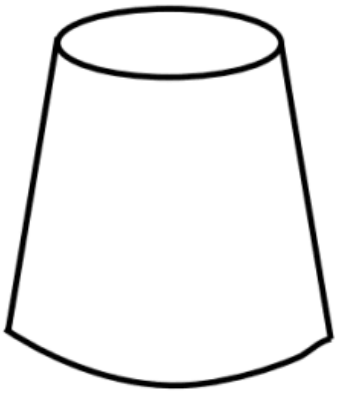
_____

_____

_____

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?

_____

_____

_____

mystery science

Name: _____

Date: _____

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?

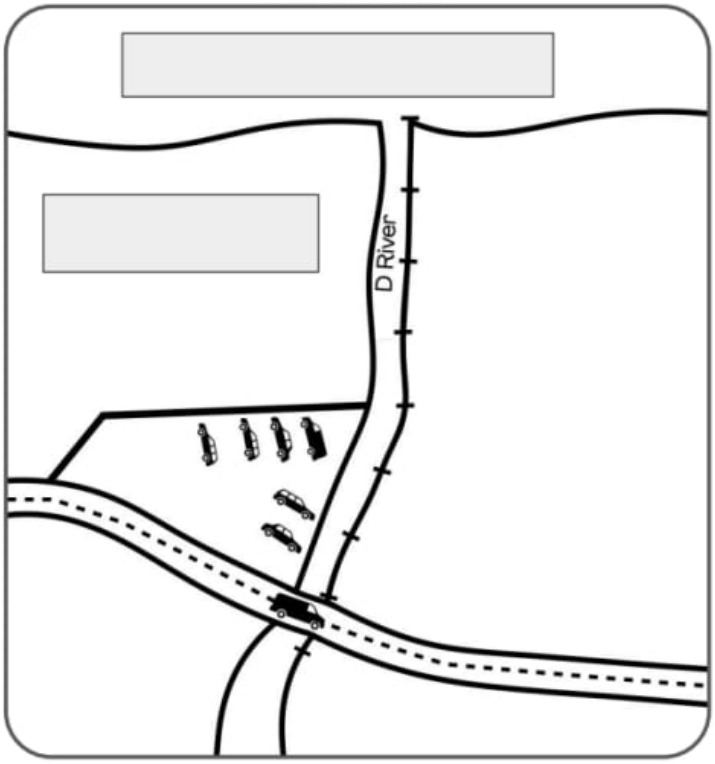
mystery science
Erosion & Earth's Surface | Performance Task

Shortest River

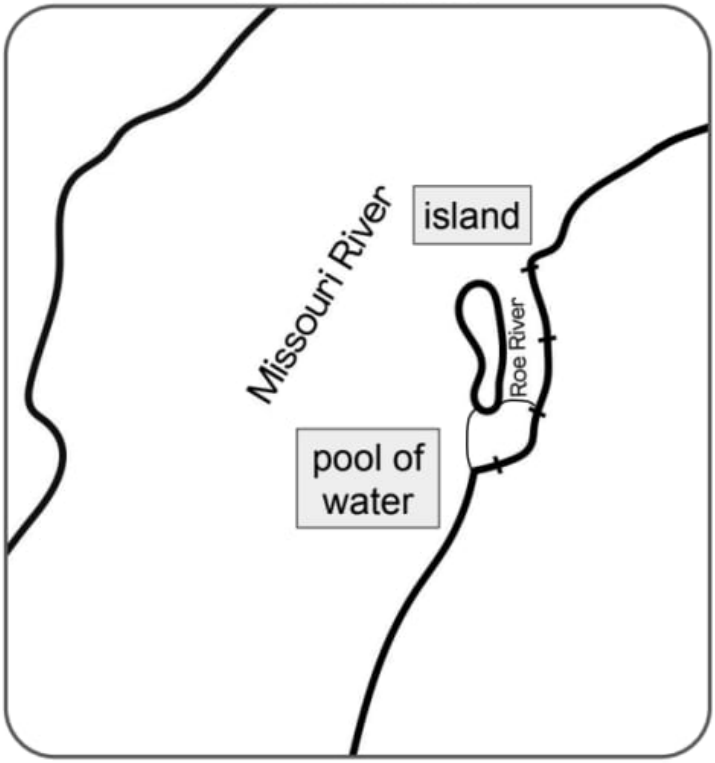
Name: _____

Follow the instructions on-screen to label these drawings.

The D River



The Roe River



How long do you think the <u>D River</u> is?

I think _____

_____.

How long do you think the <u>Roe River</u> 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 <u>higher</u> and which is <u>lower</u>?

The source is _____, and the mouth is _____.

Name: _____
Date: _____

Unit Assessment

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

_____

_____

_____

_____

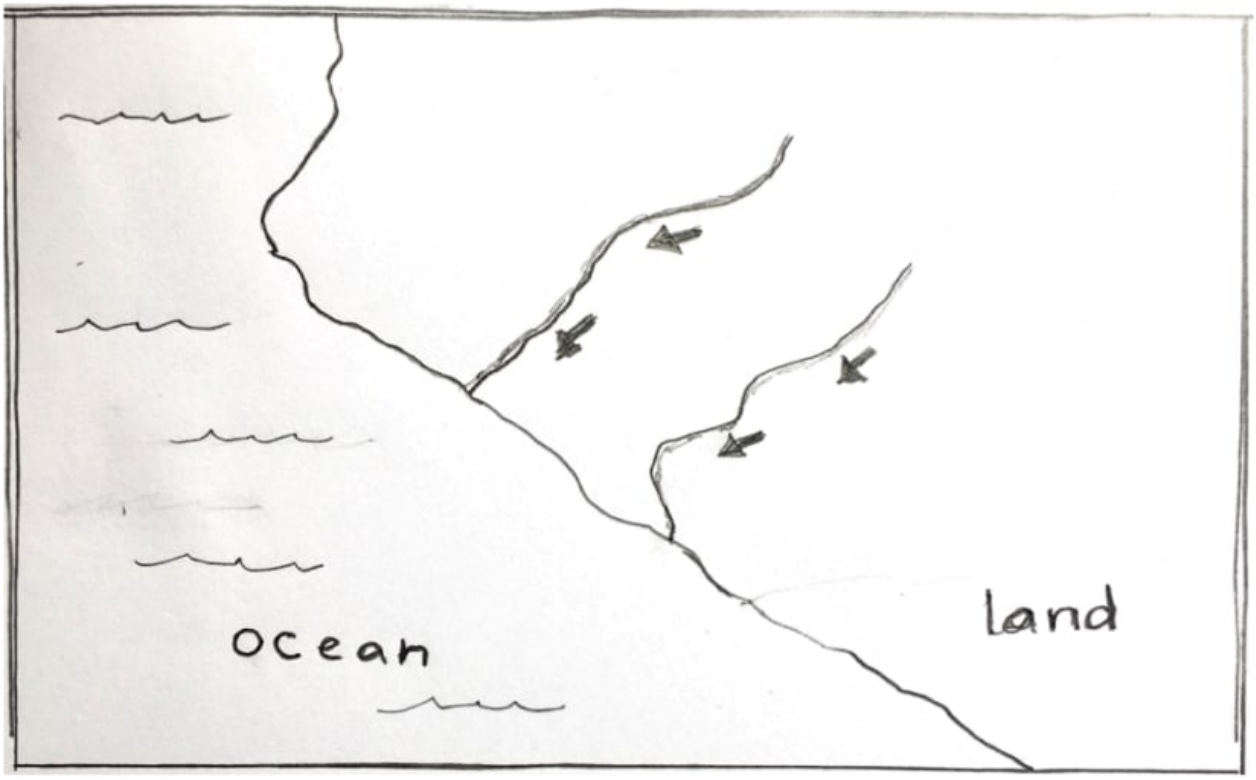
_____

_____

_____

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?

mystery science

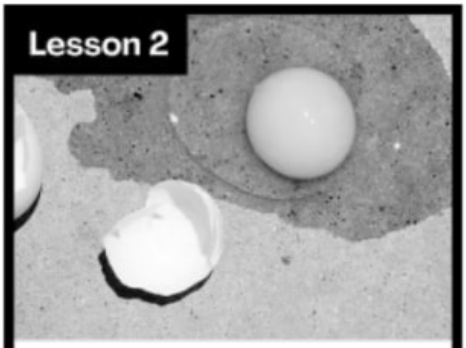
Material Properties

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

Why are so many toys made out of plastic?

Lesson 4

What materials might be invented in the future?

Lesson 5

Could you build a house out of paper?

Lesson 6

How do you build a city out of mud?

I am also curious about...

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**:

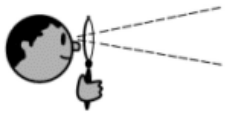
_____

_____

See-Think-Wonder Chart

Name: _____

mystery science

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

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

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Name: _____
Date: _____

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	waterproof	heavy
opaque	soft	strong
light	heat-trapping	absorbent
	stretchy	

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 *(not see through)*	

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 

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Name: _____
Date: _____

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

_____

Testing Candy for Camp Way-Too-Hot

Name: _____

Candy #1:

_____

Draw candy #1 here:

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

Yes No

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

Yes No

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?

Yes No

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

Yes No

Draw what candy #2 looks like now:

Do you think candy #2 is:

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

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Name: _____
Date: _____

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 _____

_____

Name: _____

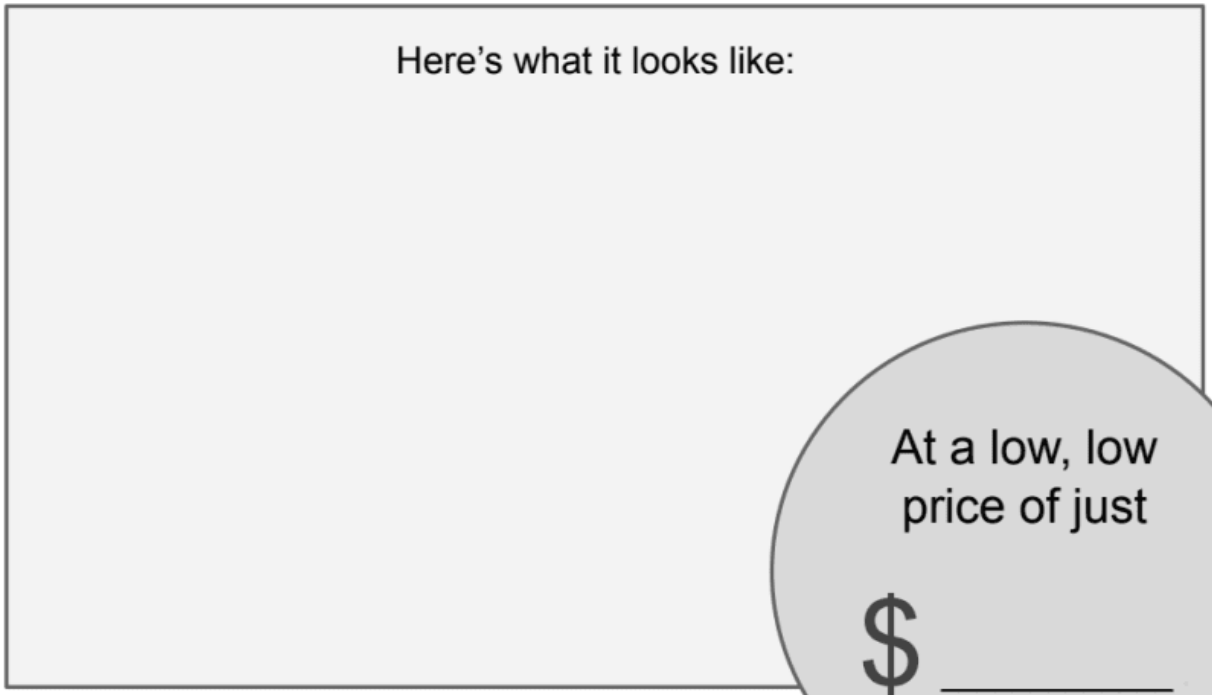
My invention is called the

_____

It makes your life better because

_____

Here's what it looks like:



At a low, low price of just

$ _____

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What materials might be invented in the future?

Name: _____
Date: _____

What materials might be invented in the future?

Lesson Assessment

1. What could you create using these three new materials? Describe and draw pictures of your inventions below.

kinda-sticky glue (glue that sticks but also comes off easily)	**electrochromic glass** (glass that changes from see-through to opaque)	**superconductor** (material that floats near a magnet)
I would invent:	I would invent:	I would invent:

2. Sometimes new materials combine two different properties. For example, parachutes are made out of a material that is *light* but *very strong*. What could you make by combining two of the properties below into a new material?

Circle **two materials** below.

light	heavy	see-through	sticky
squishy	stretchy	slippery	edible (you can eat it!)

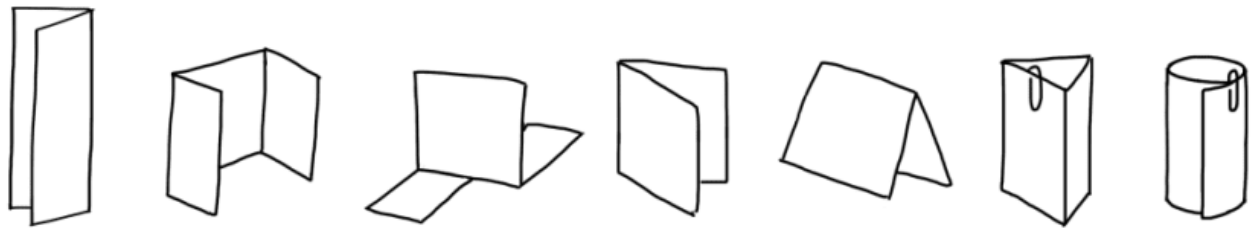
I would create a material that is both _____ and _____.
With the material, I would invent _____

_____

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?

_____

_____

_____

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Could you build a house out of paper?

Name: _____

Date: _____

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…

_____

_____

_____

_____

_____

_____

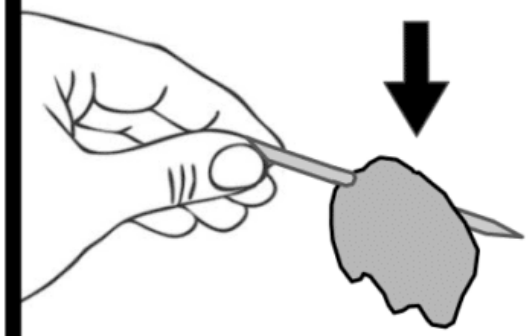
4. What is one example of a large structure that is made from smaller pieces?

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

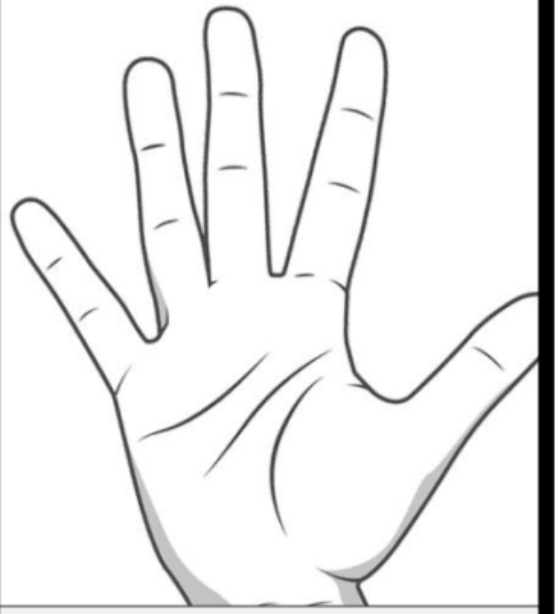
2

shape

A B C

3

clean fingers



A B C

Name: _____

Date: _____

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.

a. 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.

b. Miles can mix the soil with water to make mud and compare the mud with the dry sandy soil and the dry clay soil.

c. 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*_____

_____

_____

_____

_____

Material Properties

Name: _____
Date: _____

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. 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… _____

_____

_____

10. 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… _____

_____

_____

11. 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_____.

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

You could make paper stronger by… _____

_____

_____

_____

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

I would invent... _____

_____

_____

_____

_____