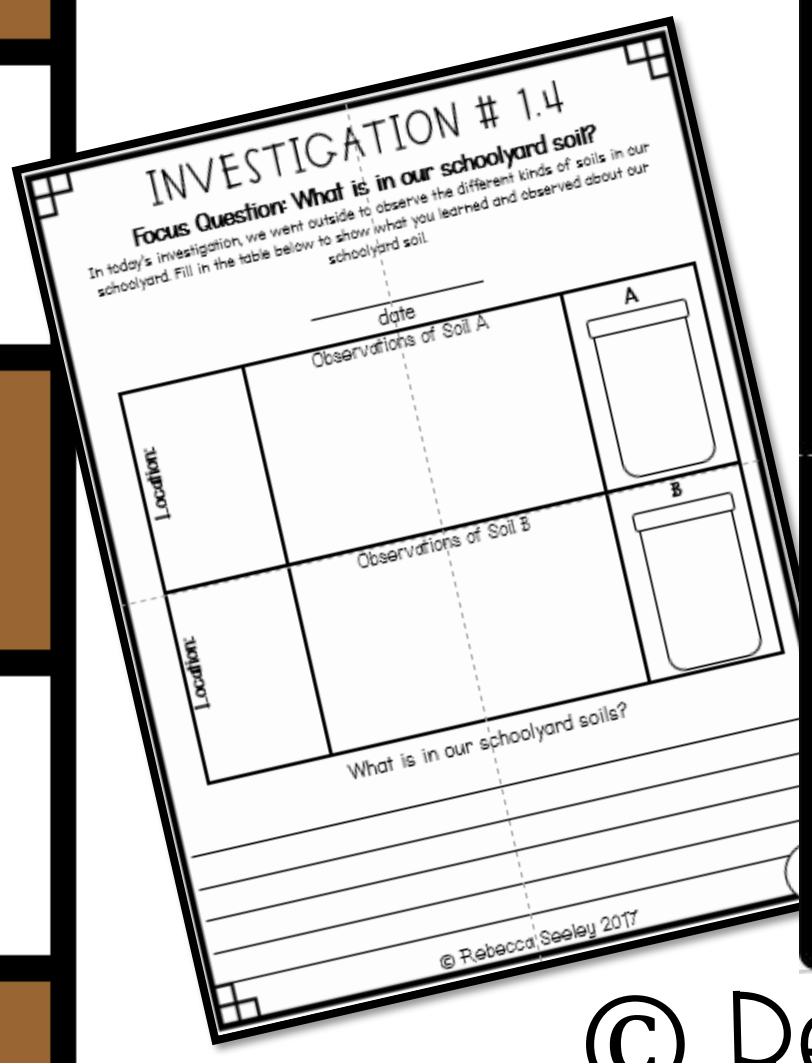
No Prep!

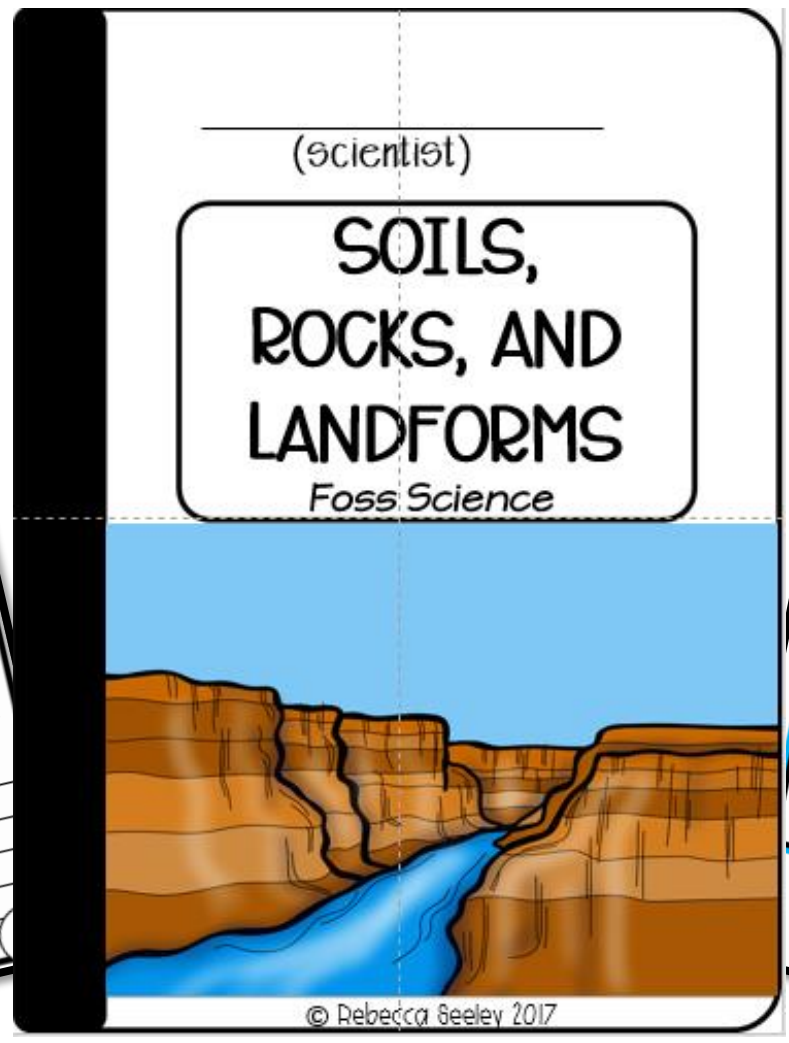
NGSS aligned

Soils, Rocks, and Landforms

For **FOSS** Science Kits

A comprehensive student journal that follows all of the focus questions and investigations for the Soils, Rocks, and Landforms FOSS kit. Over 60 picture supported vocabulary cards included!





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Just a little note...

Thank you for purchasing this pack. Please take the time to email me (rebecca.seeley81@gmail.com) with any questions you may have, as well as **leave feedback** on your purchase! This earns you TPT points you can use towards your next TPT purchase!
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Thanks so much and Happy Teaching!!

Teacher Tip

Thanks for purchasing this pack! I have tried to create an easy and fun way to learn using your FOSS Next Generation edition kit. The science notebook is to be used as you see fit. Print and use all of the pages, or simply print what you need/what you have time for. (I know science time can be hard to come by these days!!) I have also included some extra pages to enhance your teaching and your students' learning. I have left the page numbers empty so you can use them in any order you'd like.

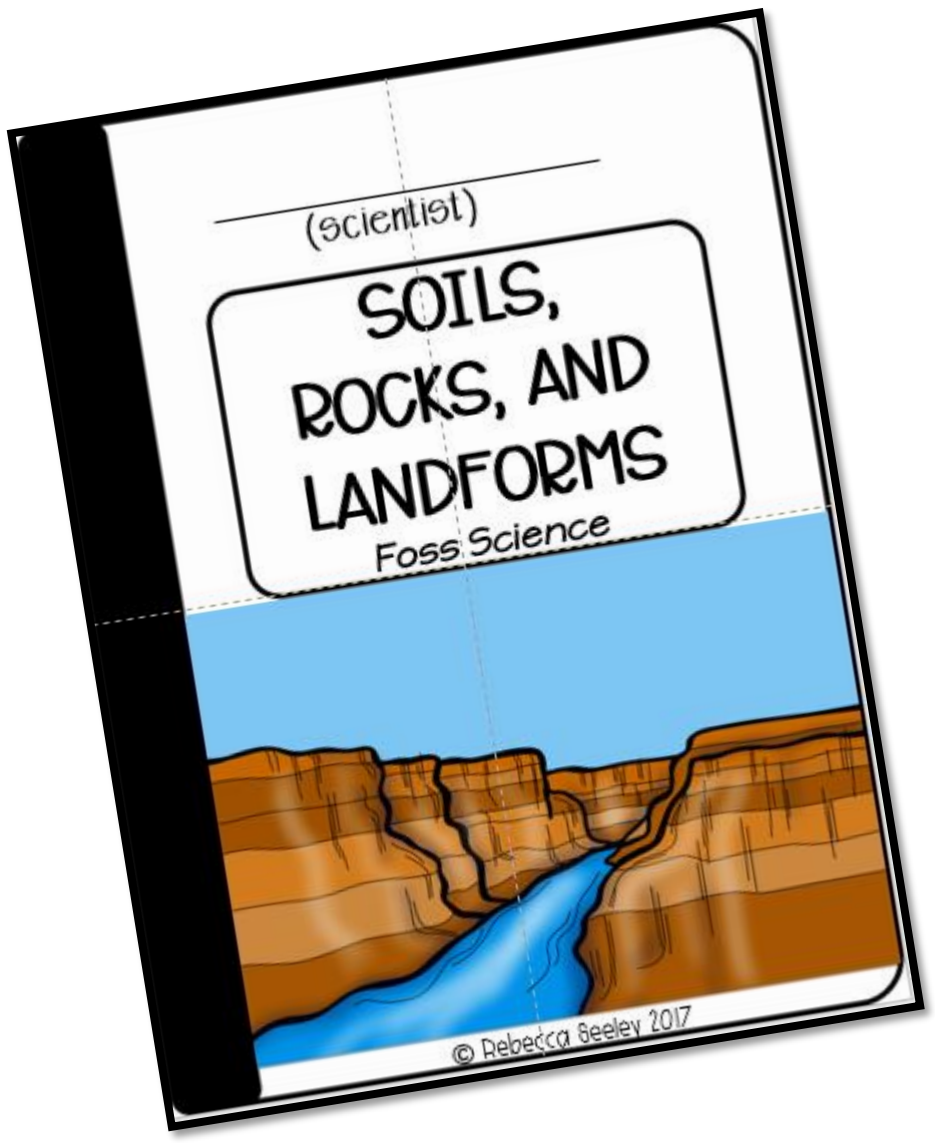
Check out the teacher tips throughout the pack for helpful hints and ideas. ☺

Teacher Tip

Science notebooking is a key component of FOSS science. On the next page you will find some simple guidelines to notebooking. I usually print this page out and laminate it. We go back and refer to it as we are notebooking to make sure we are covering all of the steps.

Science Notebooks

1. Date your entry
2. Think before you write
3. Use nice handwriting
4. Draw detailed pictures
5. Don't forget to label
6. Write in your table of contents
7. Share your findings

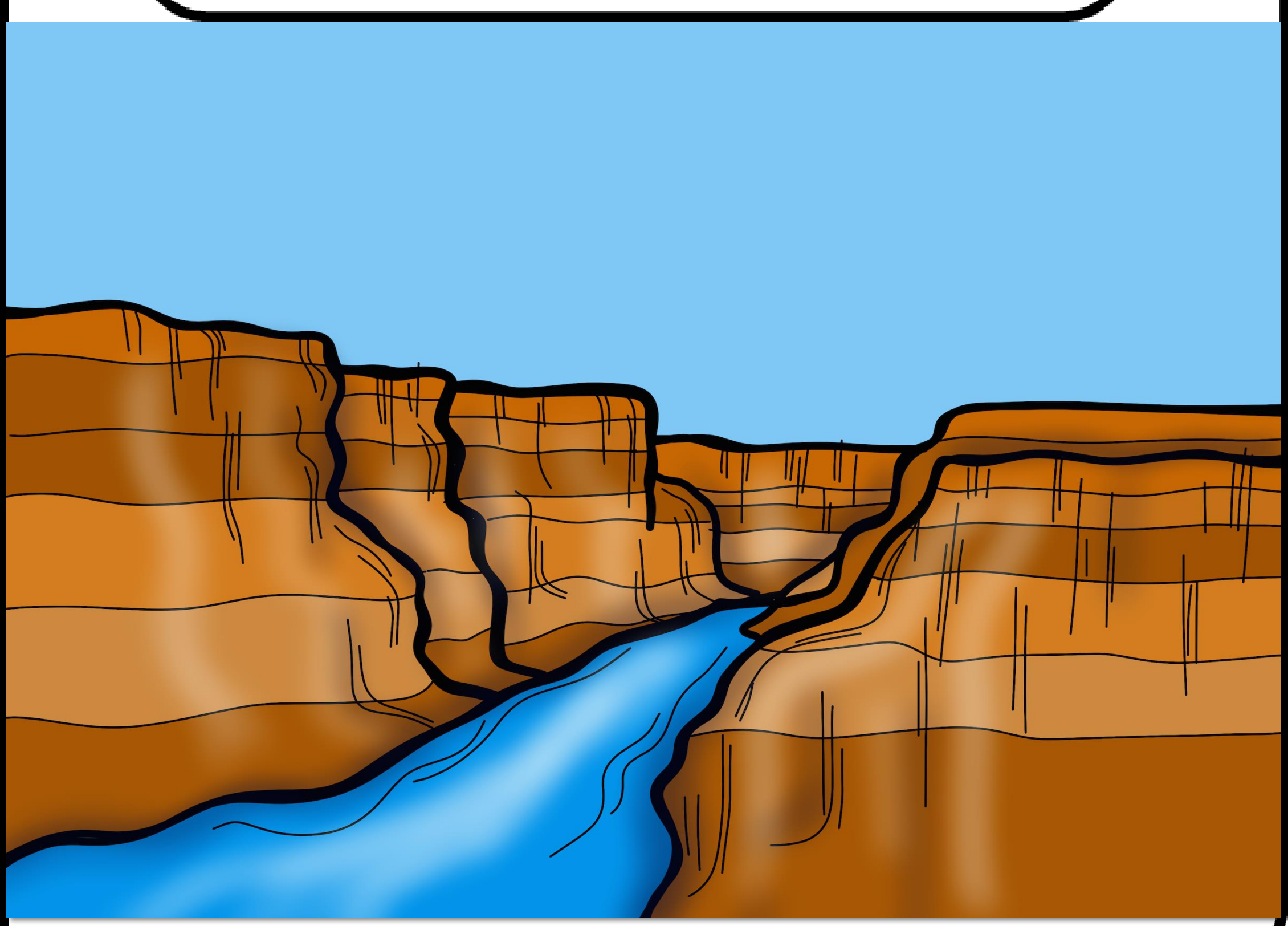


_____

(scientist)

SOILS, ROCKS, AND LANDFORMS

Foss Science



(scientist)

SOILS, ROCKS, AND LANDFORMS

Foss Science

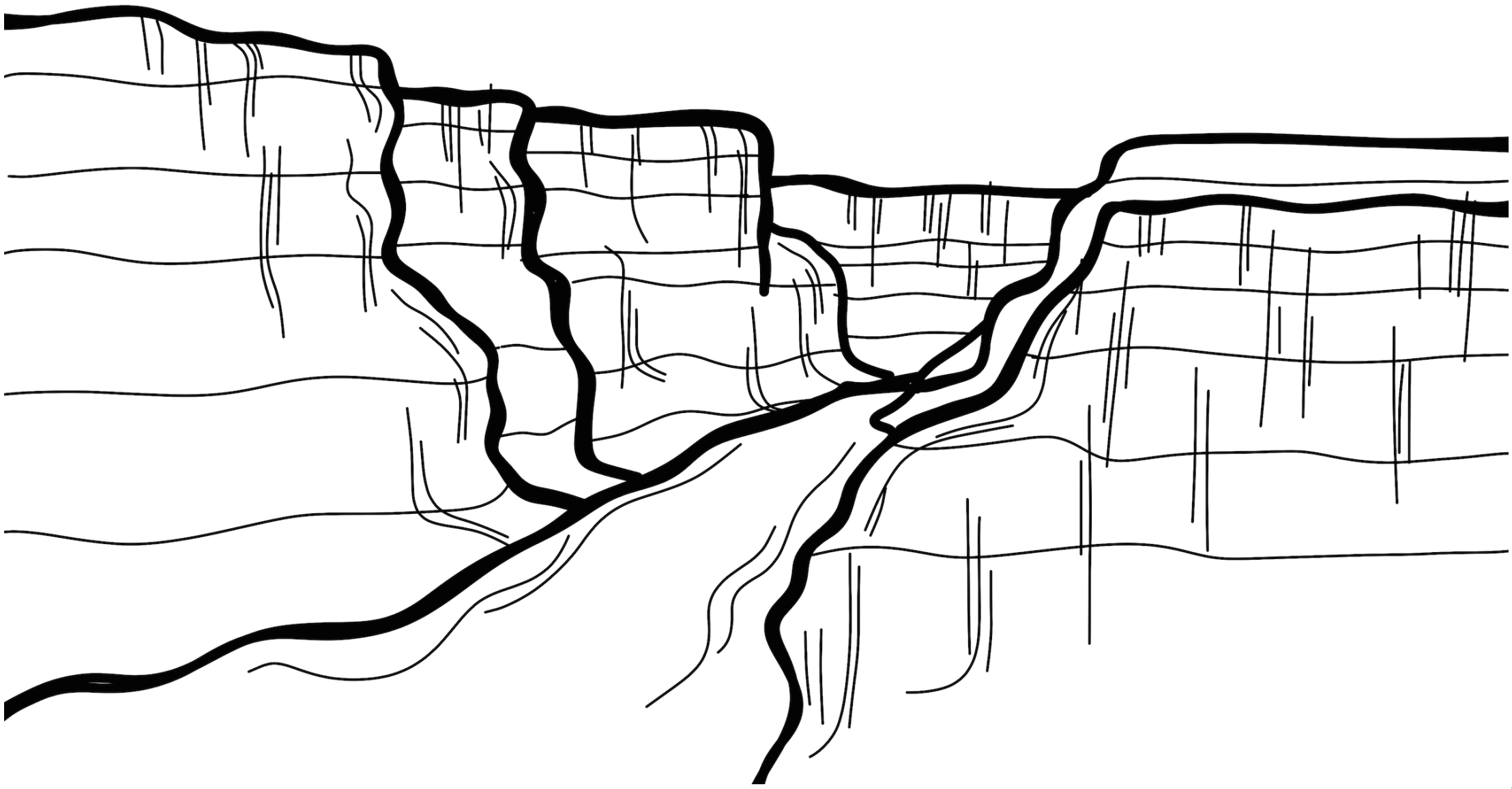


Table of Contents

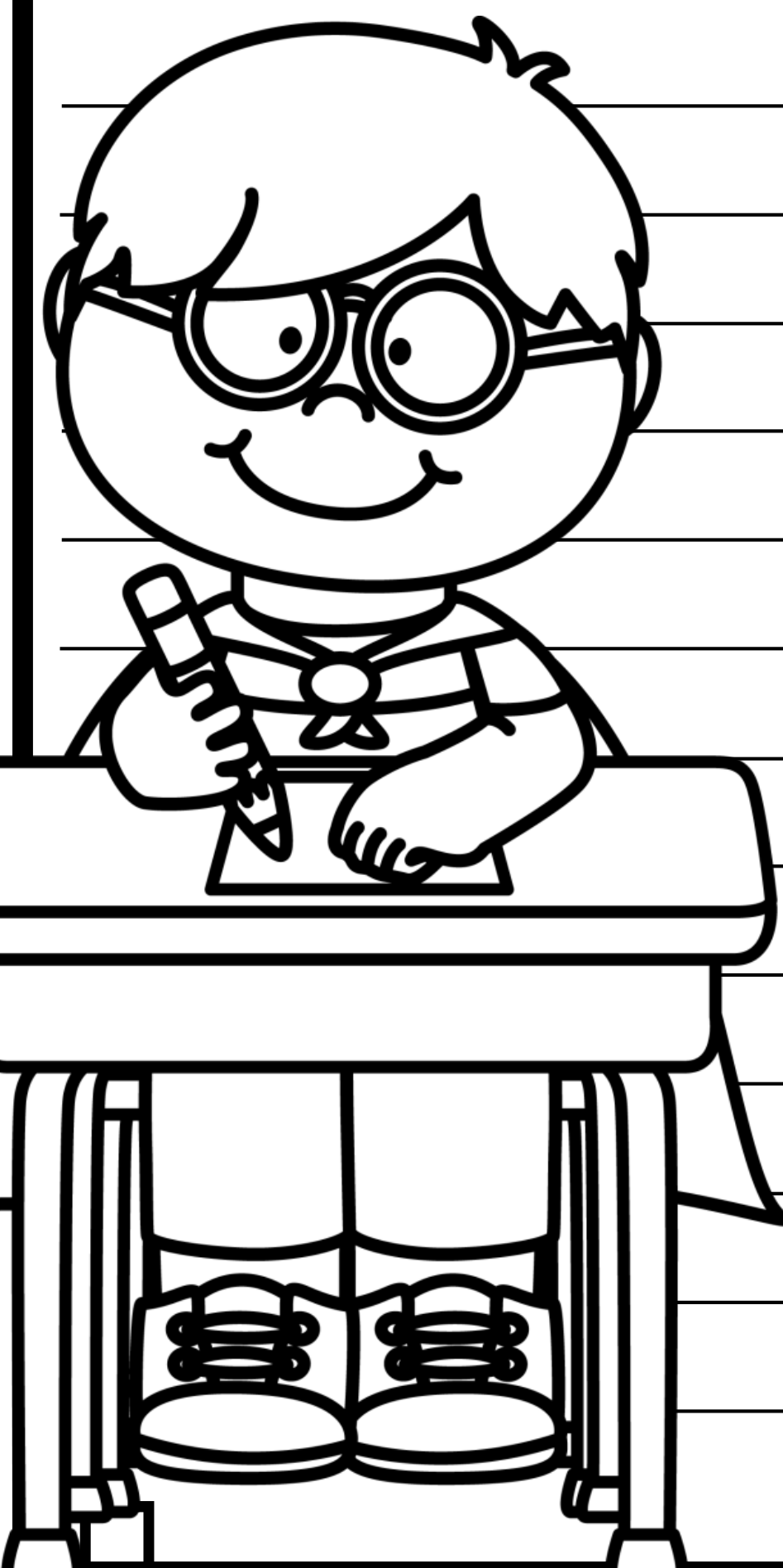
Scientists

can	have	are

Use your can/have/are chart to write 2 good sentences about scientists.

7 Minute Quick Write

[What I already know about soil, rocks, and landforms.]



Question, Question...

Who has a question?

[Write 3 questions you have about this science unit.]

1

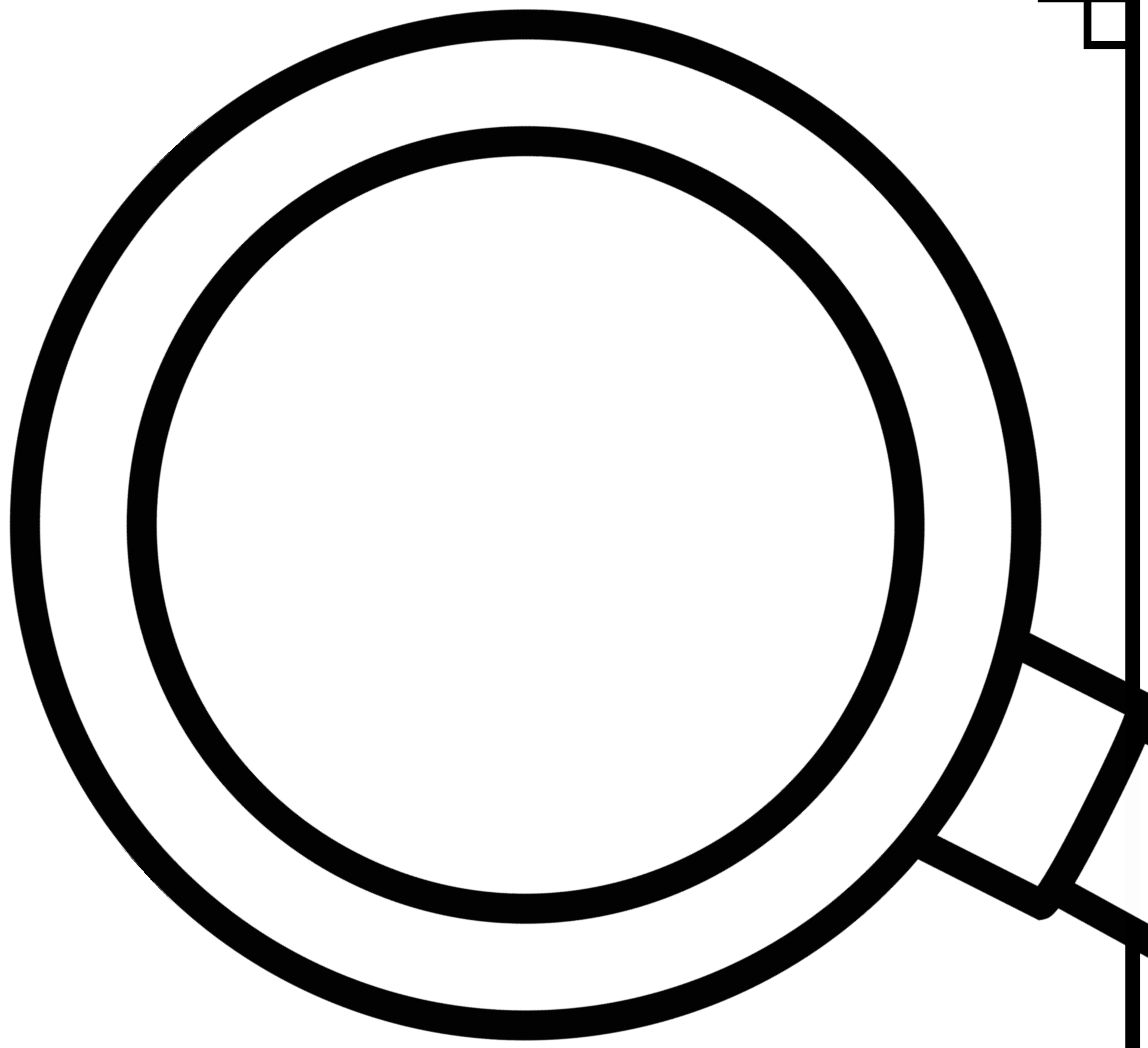
2

3

Teacher Tip

Many teachers have asked for more space for students to write their thinking/learning. I created this page to place after each investigation page. This provides more space for students to write their thoughts and observations down.

What did I learn in this investigation?



Write, Draw, and Label

INVESTIGATION # 1.1

Focus Question: What is soil?

In today's investigation we observed 4 different types of soil. Below, draw, label, and write about each type of soil. Then answer the questions to show what you learned.

_____

date

soil 1	soil 2
soil 3	soil 4

What different kinds of materials did you find in your soil?

What is humus? Why is it an important part of soil?

INVESTIGATION # 1.1

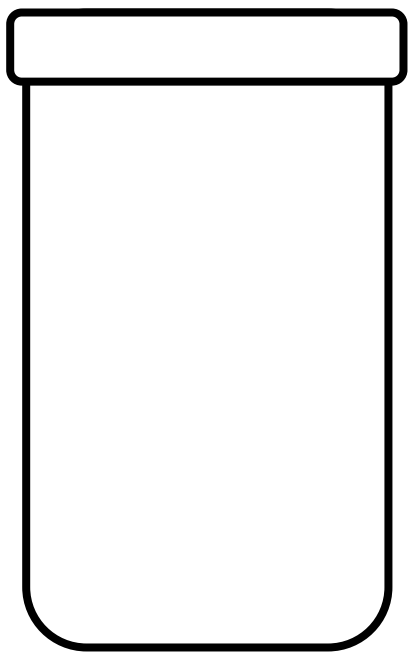
Focus Question: What is soil?

In today's investigation we observed the four different types of soil after they were mixed with water. Below, draw and label what each vial looked like after it settled. Answer the questions to show what you have learned.

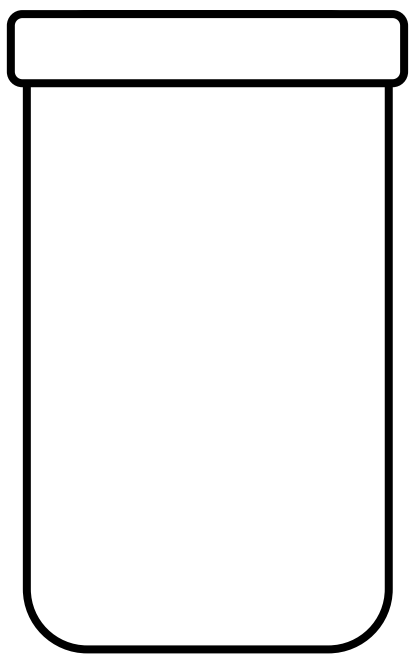
_____

date

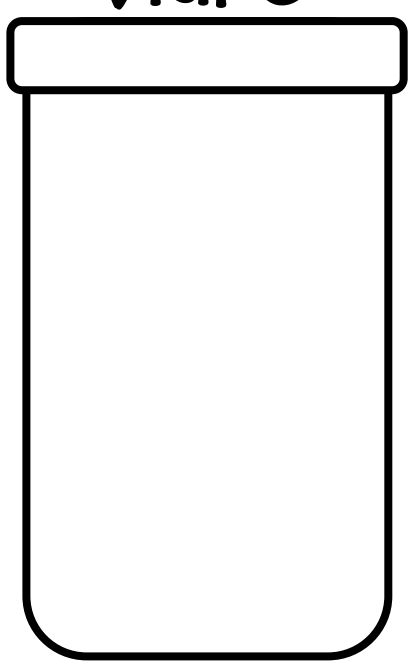
vial 1



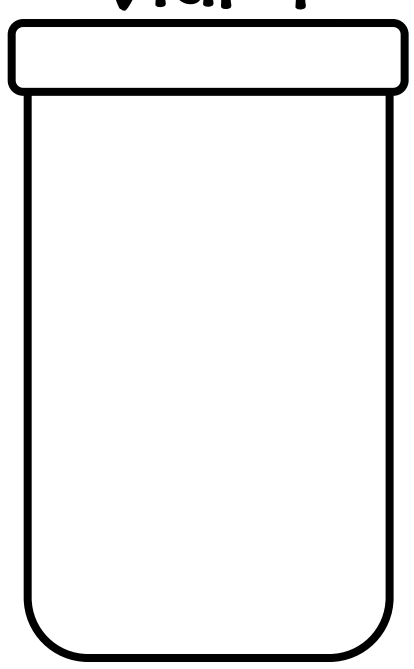
vial 2



vial 3



vial 4



Did all of the vials have the same amount of soil and the same number of layers?

Were all of the layers of similar earth materials the same size (depth) in all the different soils? Why/Why not?

INVESTIGATION # 1.1

Reading: "What is Soil?"

In today's reading we learned more about soil. After reading, record your thoughts and ideas about each question in the response column.

_____

date

Question:	Response:
What did you already know about soil? What is one thing you learned?	
What is humus? What does it do for soil?	
What differences do you see in the soils shown above?	
Where do you think these soils are found?	

INVESTIGATION # 1.2

Focus Question: What causes big rocks to break down into smaller rocks?

In today's investigation we worked with different kinds of earth materials to understand weathering. Think about the investigation and write, draw, and label your findings below. Use the ideas to guide your thinking.

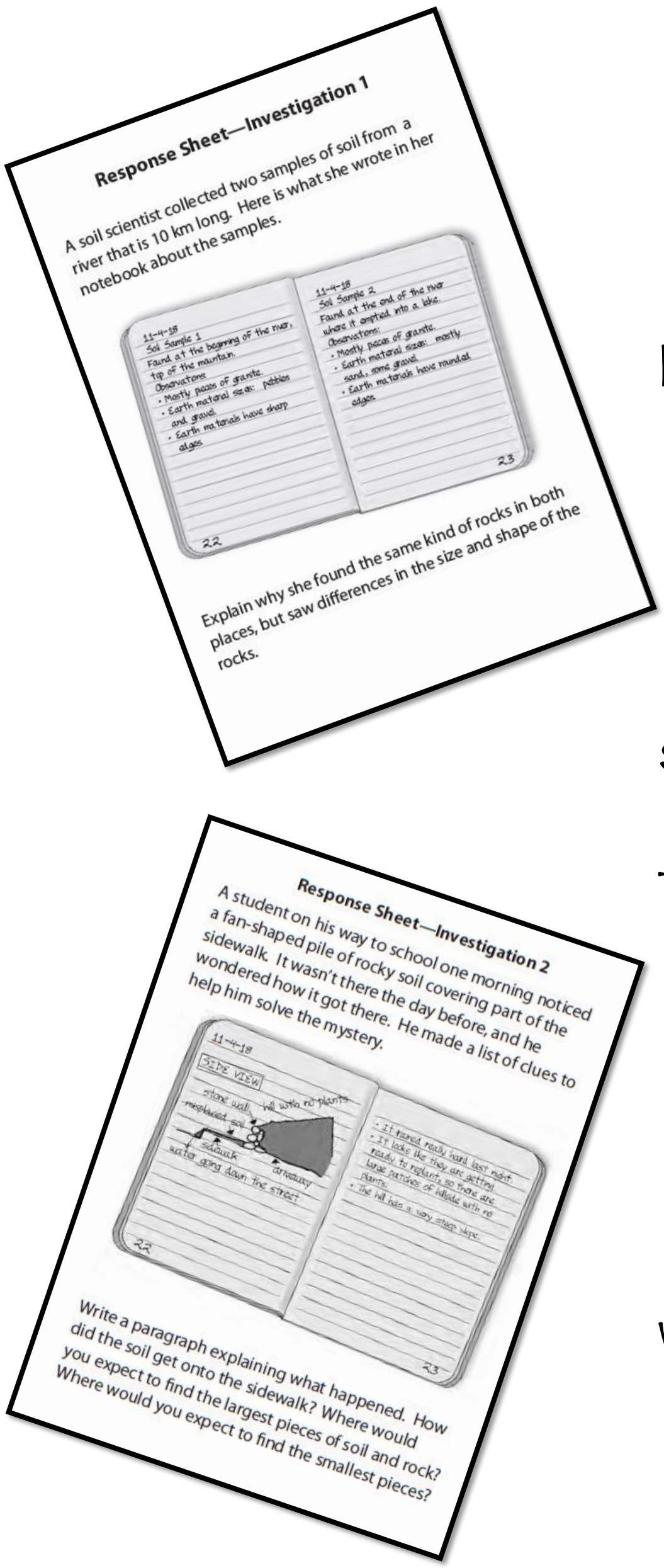
_____

date

Ideas to guide your thinking:

1. How did you break large pieces of rock into smaller pieces?
2. What happened when rocks tumble and hit each other?
3. What is weathering?
4. What are some examples of weathering? (causes of)

Teacher Tip



There are a few response sheets (found on Fossweb) that go with some investigations. These response sheets are for students to read through and look for things they agree and disagree with. The response sheets are "written" by a student. (See example)

I have created a few sheets that can be used with these sheets. One page is almost all blank- this is so you can print the half sheets and have your students glue or tape them into their journal. The other is more guided. You may want to put multiple copies in your journal, or simply have them as an extra. It is whatever works best for your class and the time you have for science.

RESPONSE SHEET
Thoughts

date

Response Sheet #

RESPONSE SHEET Thoughts

_____ date

_____ Response Sheet #

After reading the response sheet carefully, think about what you agree with and what you disagree with. Record your thoughts in the table below.

I agree with...	I disagree with...

INVESTIGATION # 1.3

Focus Question: How are rocks affected by acid rain?

In today's investigation, we learned about acid rain and how it affects rocks. Answer the questions below to show what you learned about acid rain.

_____
date

Acid Rain Evaporation:

What did you observe in each evaporation dish?

What conclusions did you draw from your observations?

Where did the white material in the evaporation dish come from?

Draw what you saw in each dish below.

Basalt

Marble

Limestone

Vinegar

Sandstone

INVESTIGATION # 1.3

Reading: "Weathering"

In today's reading we learned more about weathering. After reading record your thoughts and ideas to each question in the response column.

_____

date

Question:	Response:
What is the affect of acid rain on rocks?	
How do living organisms contribute to the weathering of rocks?	
How does ice cause weathering?	
What is different about the investigations in class and how things happen in the natural world?	

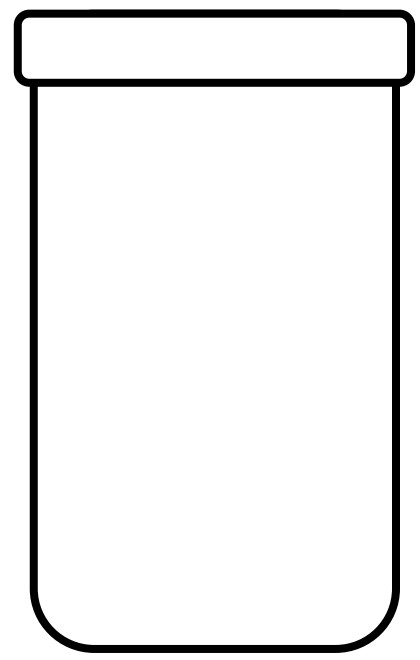
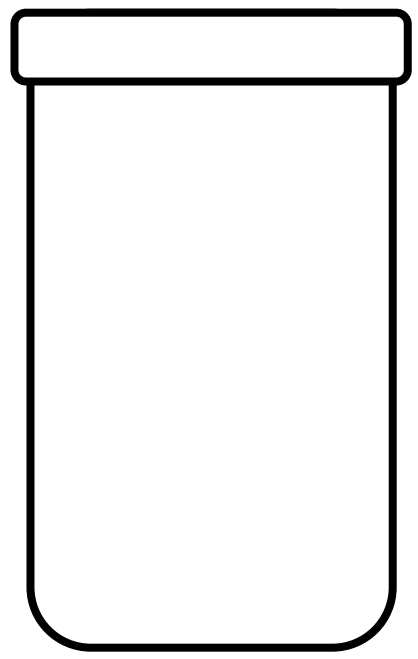
INVESTIGATION # 1.4

Focus Question: What is in our schoolyard soil?

In today's investigation we went outside to observe the different types of soil in our schoolyard. Fill in the table below to show what you learned and observed about our schoolyard soil.

_____

date

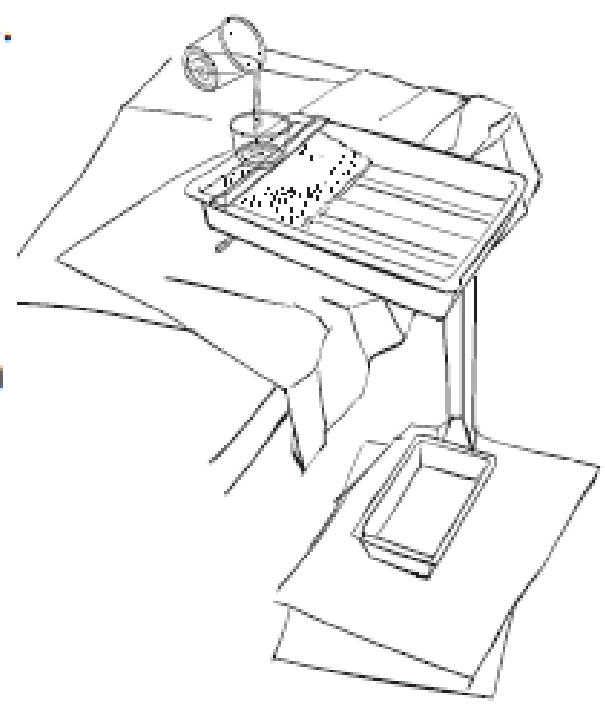
Location:	Observations of Soil A	A 
Location:	Observations of Soil B	B 

What is in our schoolyard soil?

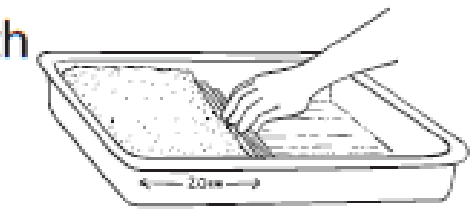
Teacher Tip

For this investigation you will need to print off or project notebook page 8 from FOSSweb. This page will help your students set up the standard stream table.

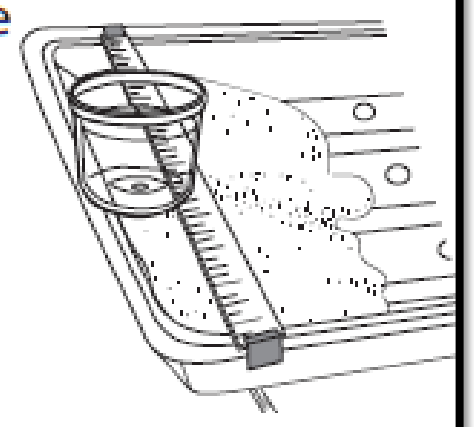
Standard Stream-Table Setup



1. Cover the table with newspapers.
2. Position the plastic tray so the end with the drain hole extends over the edge of the table.
3. Place the basin on newspaper on the floor under the drain hole.
4. Use the wood angle to push the earth material to the end of the plastic tray away from the drain hole. Make sure it is all behind an imaginary line, 20 centimeters (cm) from the end. Smooth the surface of the earth material with the wood angle to make a flat, even surface with a cliff-like edge.



5. Set a 30-cm ruler across the top of the tray, about 6 or 7 cm from the end. Secure it in place with small pieces of duct tape.



6. Support and center the standard water source on the edge of the plastic tray and the ruler.
7. Put a pencil under the tray to lift it a bit.
8. Use a 1-liter (L) container to add water to the water source, as your teacher directs.

INVESTIGATION # 2.1

Focus Question: How do weathered rock pieces move from one place to another?

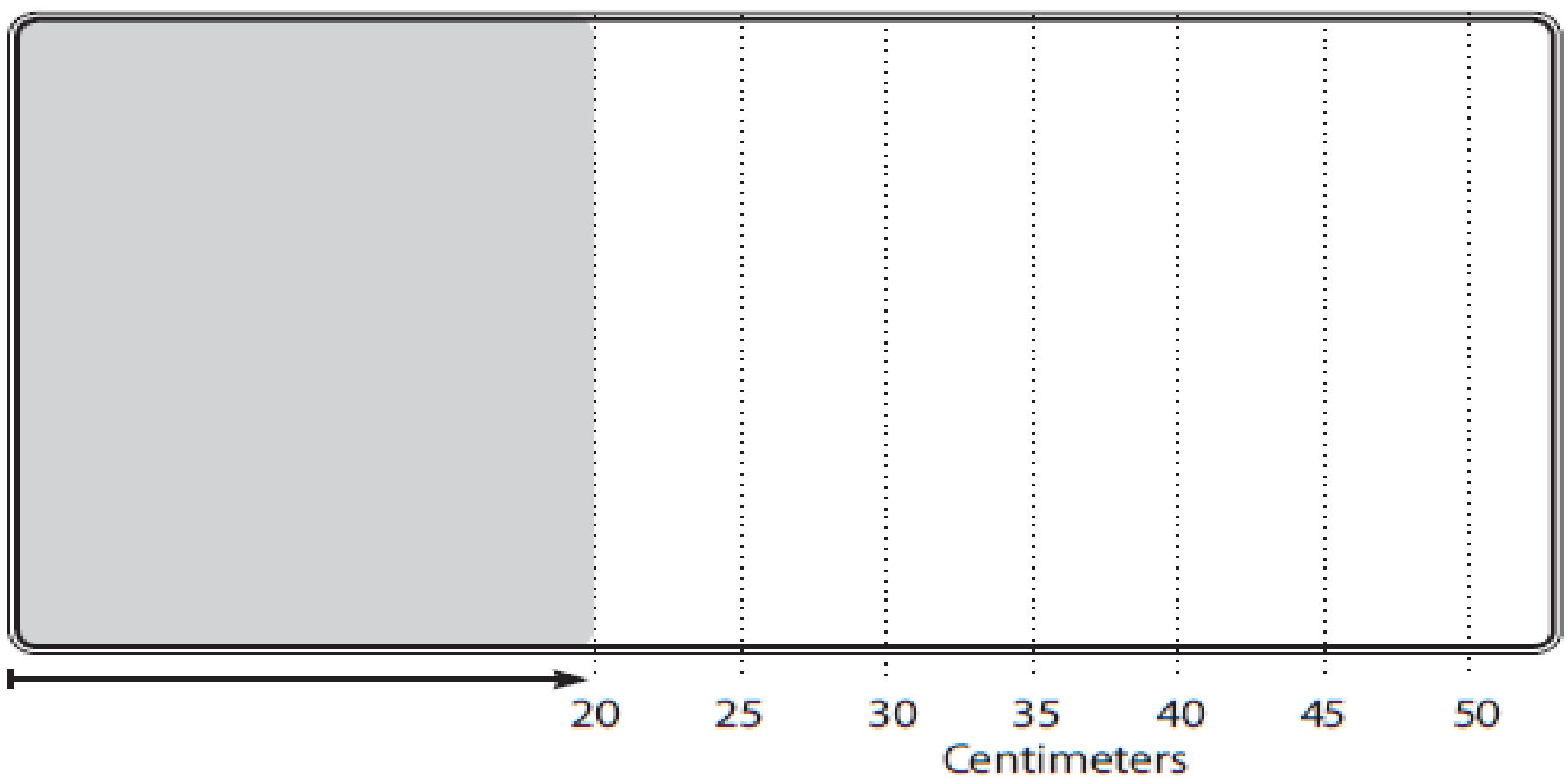
In today's investigation we created a model of a stream table. We learned many new vocabulary words and observed how rock pieces can move from place to place. In the next few pages of your journal record your observations to show what you have learned.

_____

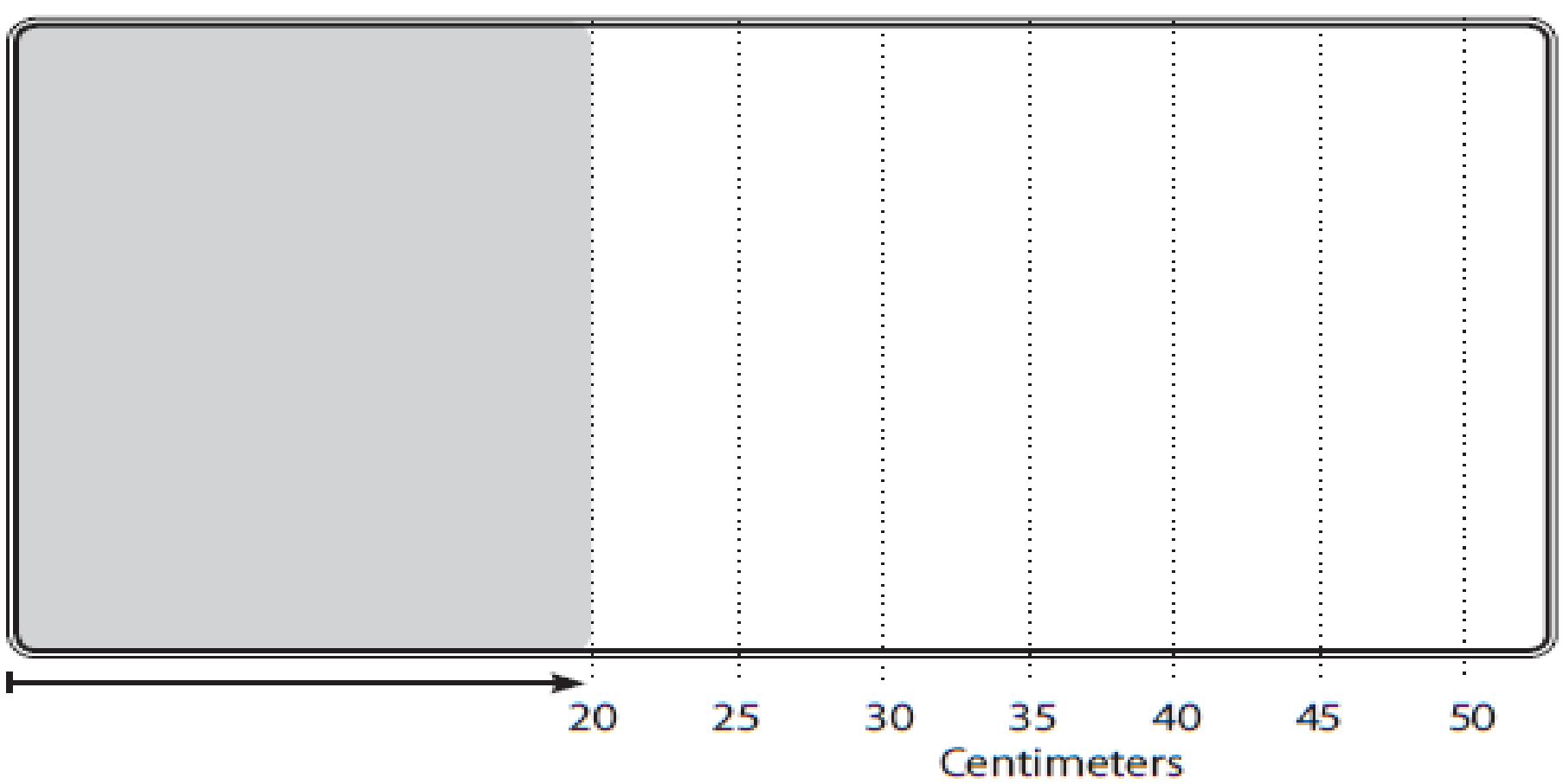
date

Stream-Table Observations

Condition _____



Condition _____



INVESTIGATION # 2.1

Focus Question: How do weathered rock pieces move from one place to another?

_____

date

My Stream-Table

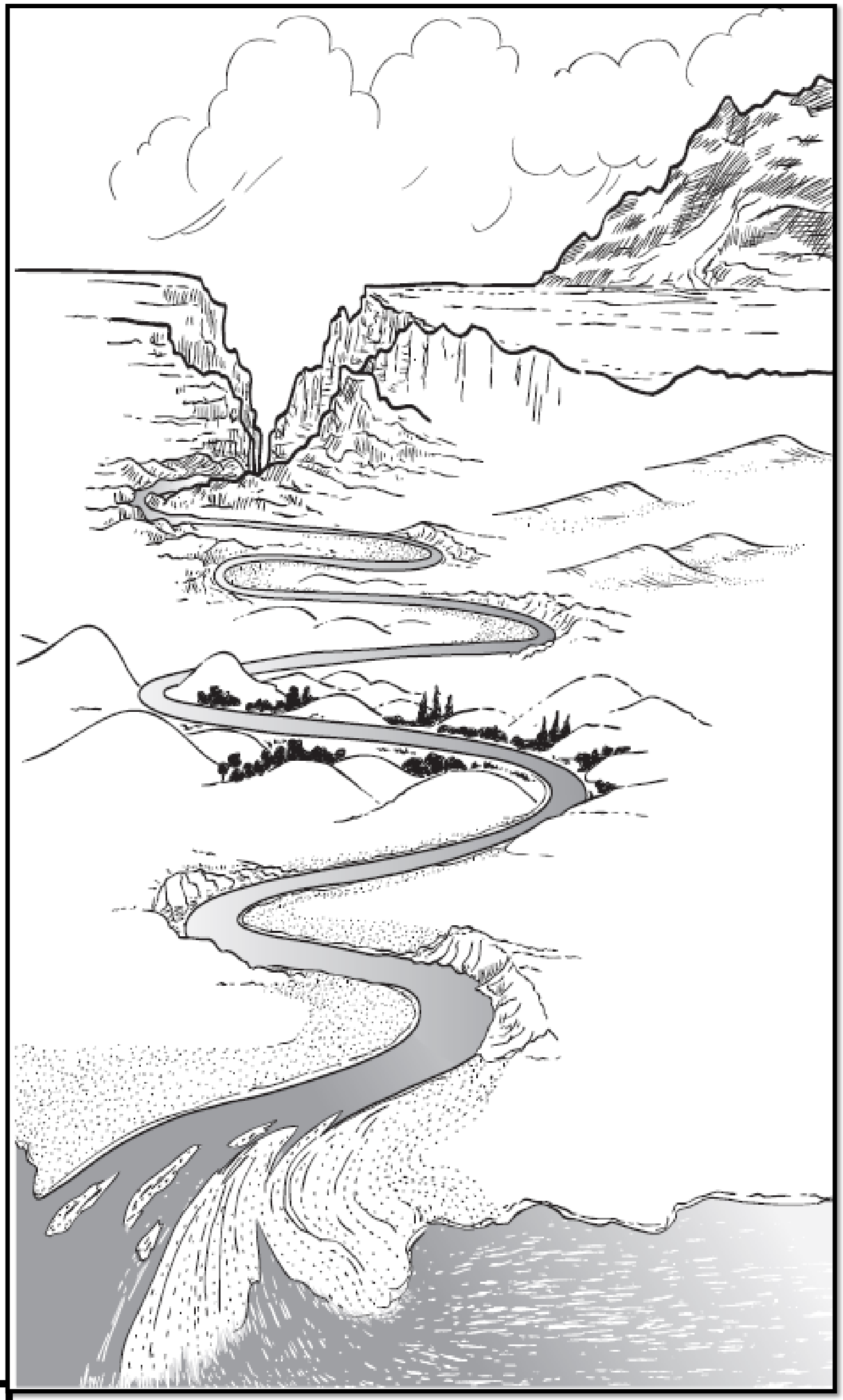
Draw a picture of your stream-table. Label the different parts. Write a few sentences to describe your stream-table.

INVESTIGATION # 2.1

Focus Question: How do weathered rock pieces move from one place to another?

Landform Vocabulary

Look at the list of vocabulary words. Read each definition and then label that landform on the diagram below.



alluvial fan- a fan shaped deposit formed when a fast-flowing stream flows out onto a dry area

canyon- a deep valley with steep sides eroded by a river

delta- a fan shaped deposit at the mouth of a river

deposition- the process by which eroded material settle out in another place

erosion- the process by which water, wind, or ice carries away earth materials

floodplain- the land that gets covered by water from a stream or river during a flood

hill- a small mountain; lower and less steep than a mountain

meander- a curve or loop in a river

mountain- a high uplifted area with steep slopes

valley- a low area between hills or mountains, often where a river flows.

INVESTIGATION # 2.1

Focus Question: How do weathered rock pieces move from one place to another?

In today's investigation we worked with stream table to observe landforms. Think about the investigation and write, draw, and label your findings below. Use the ideas to guide your thinking.

_____

date

Ideas to guide your thinking:

1. What is erosion?
2. Explain the shake-test and your results?
3. Did you see any sediment? What did it look like?
4. How do weathered rock pieces move from one place to another?

INVESTIGATION # 2.1

Reading: "Erosion and Deposition"

In today's reading we learned more about the processes that move and deposit earth materials. After reading, record your thoughts and ideas to each question in the response column.

_____
date

Question:	Response:
Describe and give examples of erosion.	
Describe and give examples of deposition.	
Describe how rocks in the mountains become sand on the beach.	
What do you think will happen to the Sierra Nevada Mountains in California in the next hundred million year?	

INVESTIGATION # 2.2

Focus Question: How does slope affect erosion and deposition?

In today's investigation we learned about slope using our stream-tables.
Answer the questions below to show what you have learned.

_____
date

1. Where did erosion occur? Did the slope make a difference in how much earth material eroded?

2. Did you notice any difference in the time it took for erosion or deposition?

3. Did the slope make a difference in the shape of the canyon that was left after the earth materials were carried away?

4. How far did the eroded materials travel in the trays?

5. Why do you think there was more erosion in the steeper tray?

6.. How does this help you explain what happened in the photos in the "Landforms Photo Album"?

INVESTIGATION # 2.3

Focus Question: Where are erosion and deposition happening in our schoolyard?

In today's investigation we went outdoors to investigate our schoolyard. Think about the investigation and write, draw, and label your findings below. Use the ideas to guide your thinking.

_____

date

Ideas to guide your thinking:

1. What is the difference between erosion and deposition?
2. How would you describe the general flow (direction) of water?
3. What is the general distribution of earth materials in deposited areas?
4. How might these processes contribute to soil formation?
5. How stable is the shape of the landform? What causes the shape of the land to change?

INVESTIGATION # 2.4

Focus Question: How do fossils get in rocks and what can they tell us about the past?

In today's investigation we learned more about fossils. Think about the investigation and write, draw, and label your findings below. Use the ideas to guide your thinking.

_____

date

Ideas to guide your thinking:

1. What is a fossil?
2. What are some types of fossils? Tell about them?
3. In what kind of rocks are most fossils found? How do they form?
4. What is meant by superposition and how does it help to date fossils?
5. What do scientists learn from studying fossils?

INVESTIGATION # 2.4

Reading: "Fossils Tell a Story"

In today's reading we learned more about fossils. After reading, record your thoughts and ideas to each question in the response column.

_____
date

Question:	Response:
How are geologists and paleontologists alike and how are they different?	
How are earth scientists able to determine the age of organisms that lived long ago?	
Compare what you did in class to what you read in the text. How do they compare?	
Sometimes a scientist finds fossils of ocean animals high up in the mountains. How could this happen?	

INVESTIGATION # 3.1

Focus Question: How can we represent the different elevations of landforms?

In today's investigation we learned about topographic maps and how they are able to show the different elevations of landforms. Write and draw what a topographic map is and explain how they are useful below.

_____
date

Topographic Maps

INVESTIGATION # 3.1

Reading: "Topographic Maps"

_____

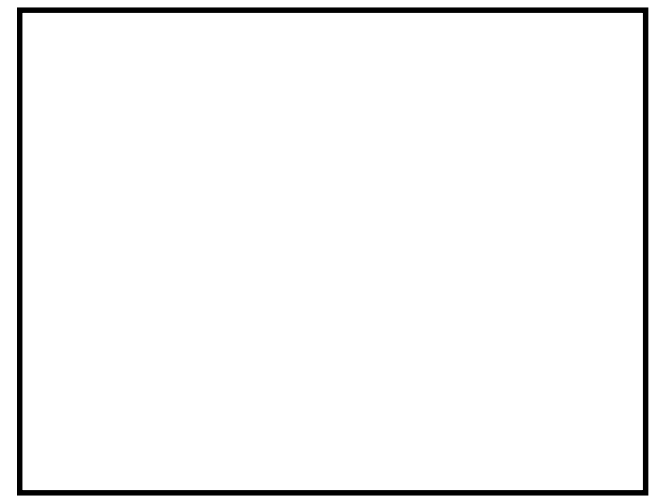
date

In today's reading we learned more about topographic maps. We learned about the features of topographic maps. Write a brief definition and draw a picture to go with each feature below.

contour lines _____

_____

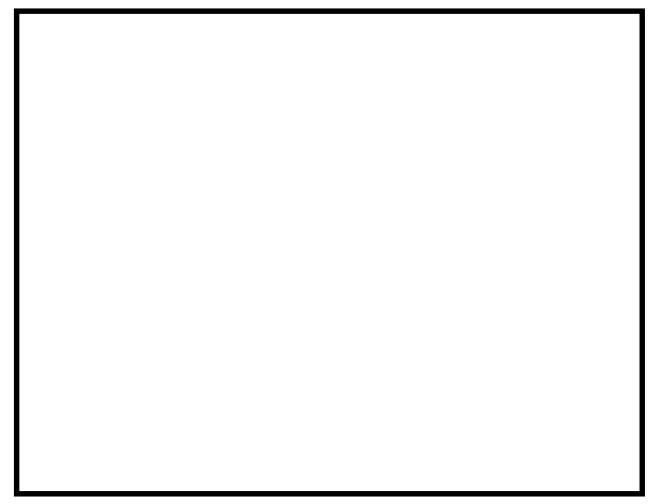
_____



index contours _____

_____

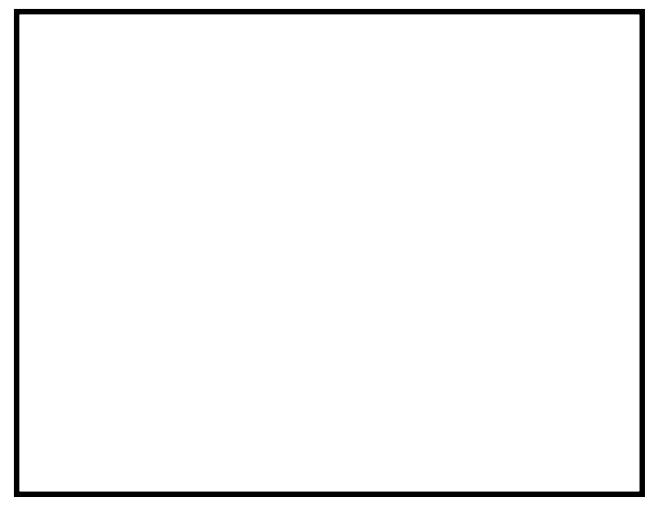
_____



scale _____

_____

_____



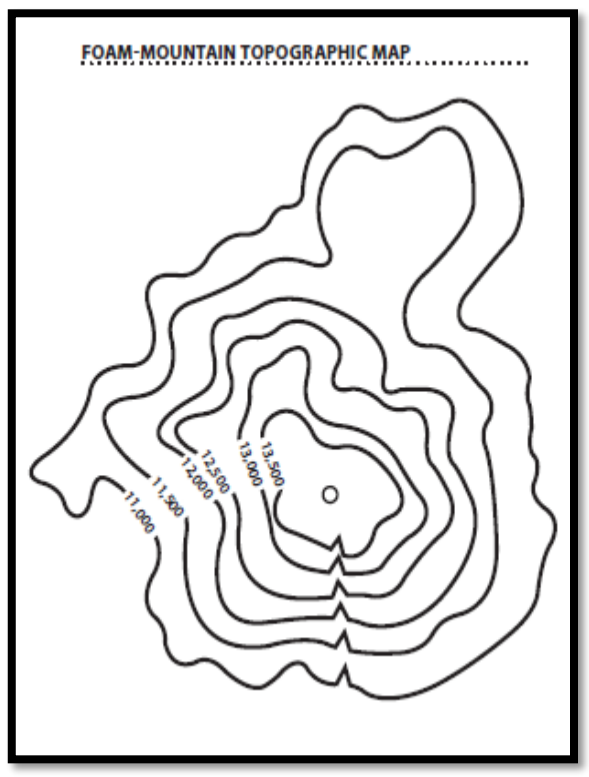
elevation _____

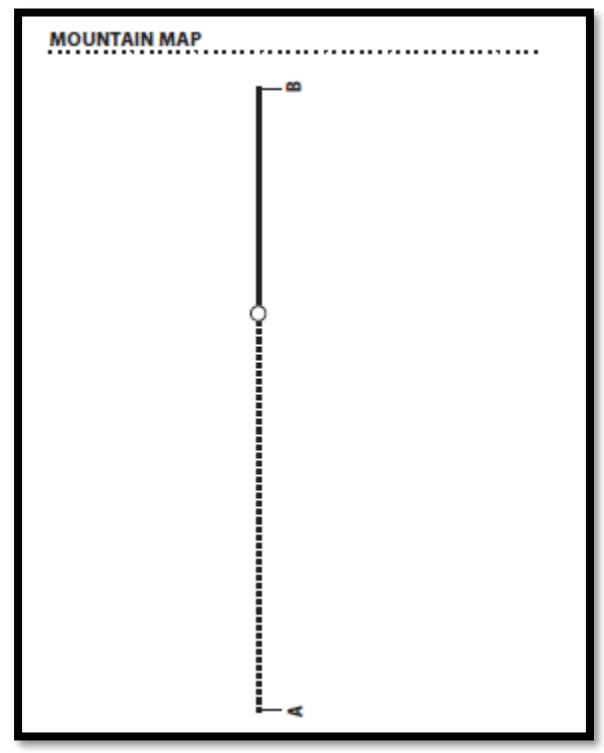
_____

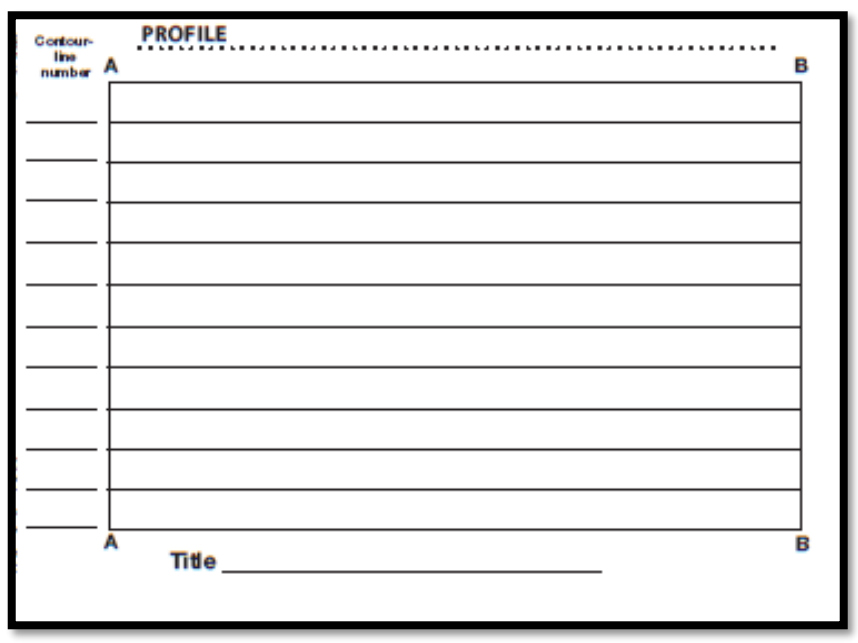
_____

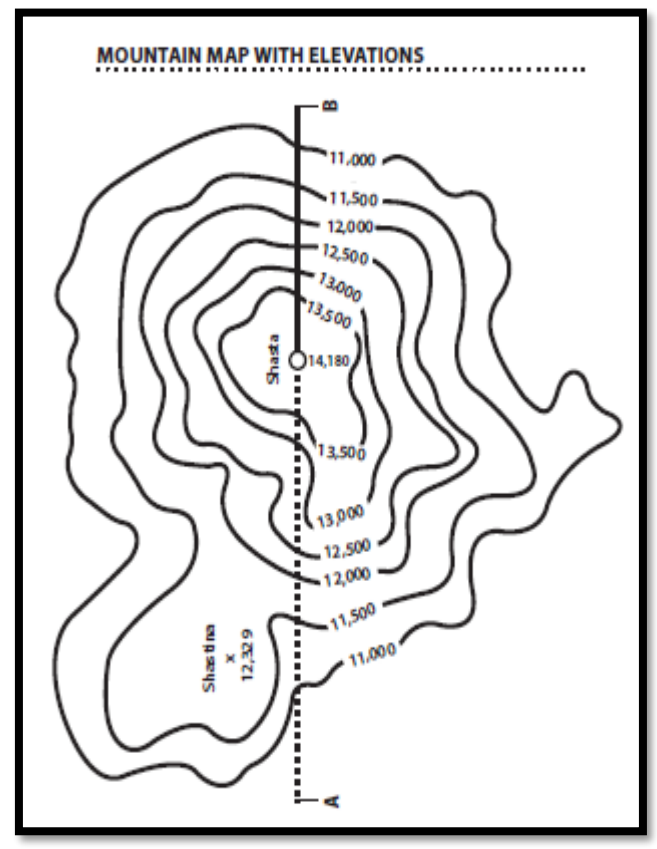
Teacher Tip

For this investigation you will need to print off the following pages from the teacher masters pgs. 13-16 on FOSSweb. The teacher video on FOSSweb can help give a great example of how to do this investigation. A reflection pages has been created for students to use after they have created the profile. With all of the folding and interaction needed between the profile and contour sheet- it is important to use the sheets provided by FOSS for this investigation.









INVESTIGATION # 3.2

Focus Question: How can we draw the profile of a mountain from a topographic map?

In today's investigation we worked with maps, profile sheets, and models to create a profile of Mount Shasta. Write your observations below. Use the questions to guide you.

_____
date

Ideas to guide your thinking:

1. What is a profile?
2. What new information does the profile provide about Mount Shasta?
3. Which side of the mountain shown on the profile sheet is steeper?
4. What did you learn about making a profile?

INVESTIGATION # 3.2

Reading: "The Story of Mount Shasta"

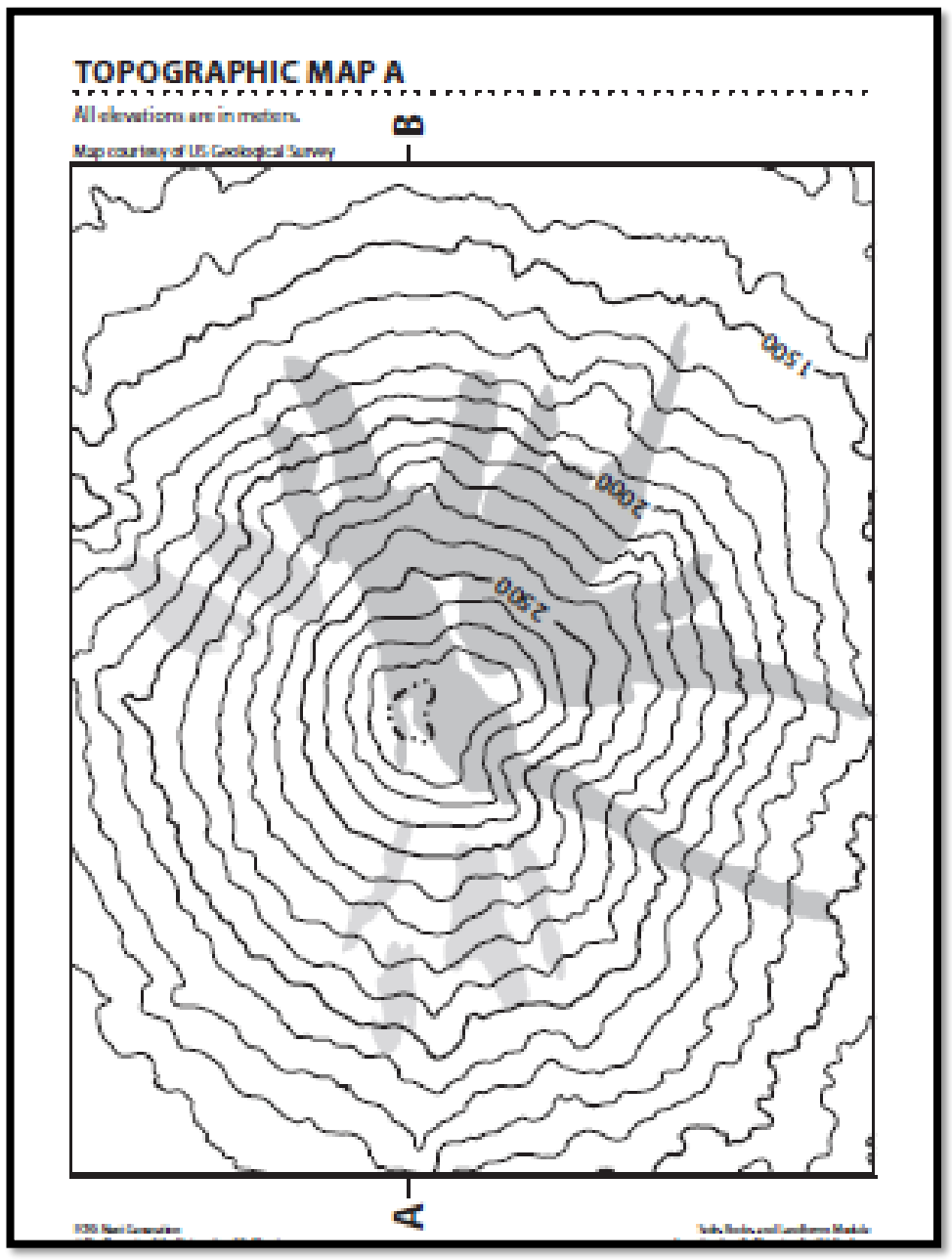
In today's reading we learned more about Mount Shasta. After reading record your thoughts and ideas to each question in the response column.

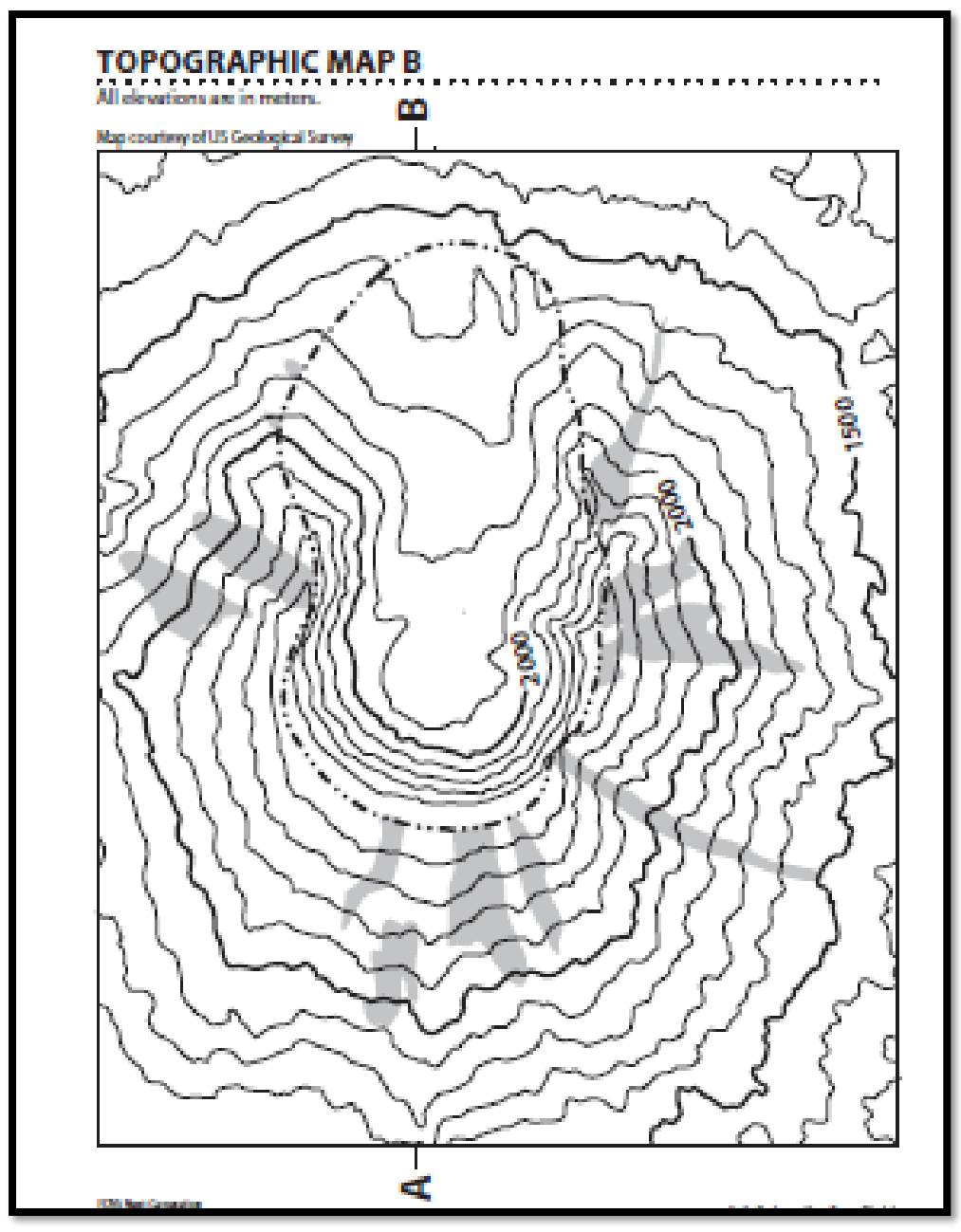
_____
date

Question:	Response:
What did the article make you think about?	
What descriptions in the article identify Mount Shasta as a volcanic mountain?	
John Muir and his companion Fay were surprised by a violent storm. Describe the storm and how the two explorers survived.	

Teacher Tip

For this investigation you will need to print off the following pages from the teacher masters pgs. 18 and 19 on FOSSweb. The teacher video on FOSSweb can help give a great example of how to do this investigation. A reflection page is provided for student use after the profiles are created.





INVESTIGATION # 3.3

Focus Question: How can scientists and engineers help reduce the impacts that events like volcanic eruptions might have on people?

In today's investigation we observed new topographic maps and created profiles. We also watched a video on Mount St. Helens. Answer the questions below to show what you learned.

_____

date

1. After studying the two topographic maps, do you think they are the same mountain? Why or why not?

2. Did your opinion change after drawing profile maps of the two topographic maps? Why or why not?

After watching the video...

3. What did you find most interesting about the video?

4. Several people who lived near Mount St. Helens at the time refused to leave when the scientists warned them to go. Why do you think they decided to stay?

5. After the big eruption of 1980, why were scientists so eager to get out on the mountain after each subsequent eruption?

INVESTIGATION # 3.4

Focus Question: What events can change Earth's surface quickly?

In today's investigation we discussed many different kinds of Earth changing events.
Below write and draw each event we talked about.

_____
date

earthquake

landslide

flood

volcanoes

INVESTIGATION # 4.1

Focus Question: What are natural resources and what is important to know about them?

In today's investigation we watched several short video clips about natural resources. Write, draw, and label your observations below. Use the questions to guide your thinking.

_____

date

Ideas to guide your thinking:

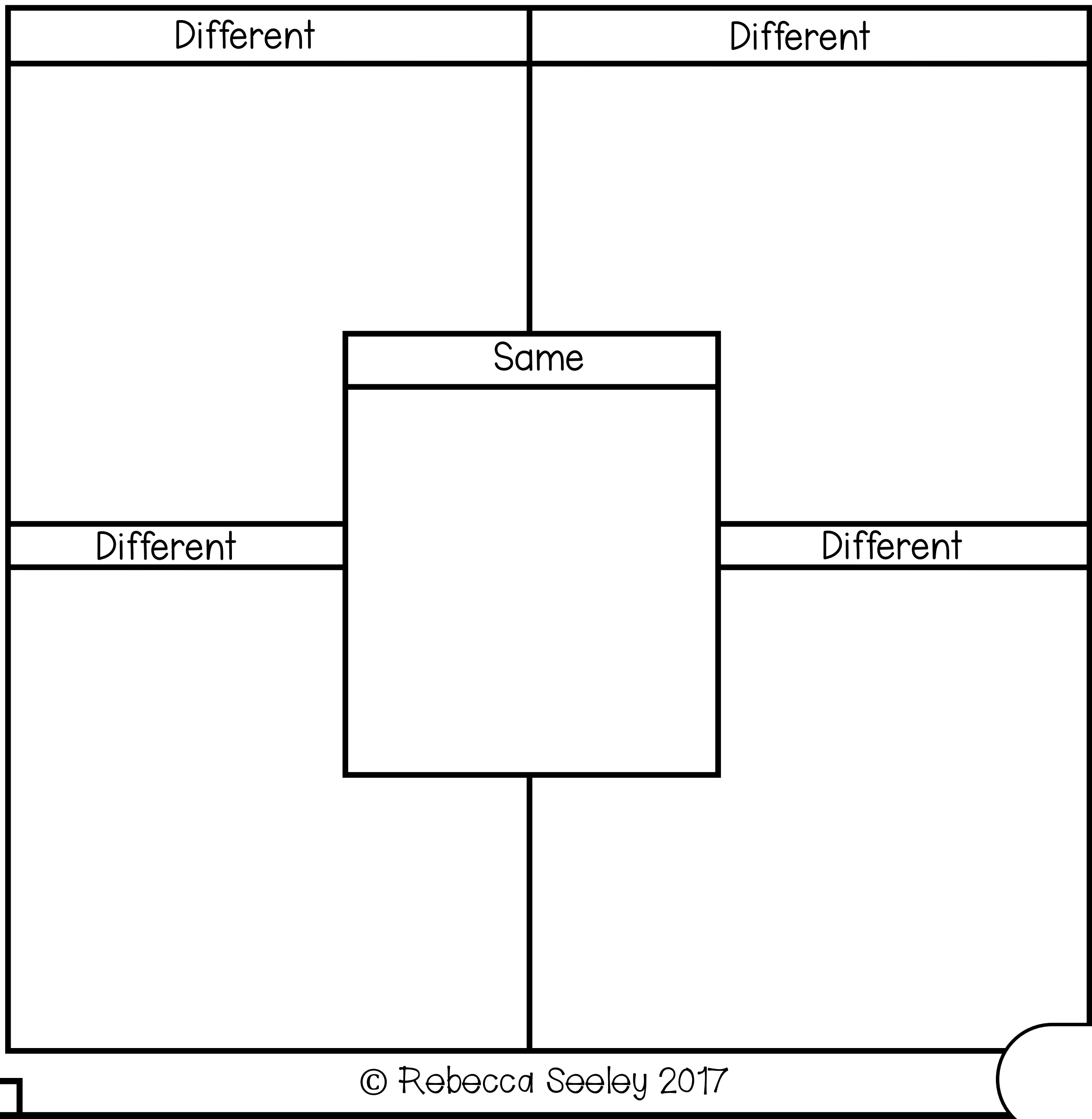
1. What is a renewable resource?
2. What is a nonrenewable resource?
3. What are some examples of alternative sources of energy?
4. Why are natural resources so important to us?

INVESTIGATION # 4.1

Reading: "Monumental Rocks"

In today's reading we learned about four monuments of worldwide significance. After reading fill out the graphic organizer below to compare and contrast the four monuments.

_____
date



INVESTIGATION # 4.2

Focus Question: How are natural resources used to make concrete?

In today's investigation we used natural resources to make a concrete stepping stone. Below write and draw each step we took to create the stepping stone.

_____

date

Step 1:

Step 2:

Step 3:

Step 4:

INVESTIGATION # 4.2

date

Think about it...

After reading the article and observing the results of making a concrete stepping stone, answer the focus question for investigation 4.2.

How are natural resources used to make concrete?

Ideas to guide your thinking:

1. What earth materials did we use to make concrete?
2. Why did we put sand and gravel in the concrete?
3. Why do you think concrete is a good building material?

INVESTIGATION # 4.2

Reading: "Making Concrete"

In today's reading we learned about concrete. After reading, record your thoughts and ideas to each question in the response column.

_____
date

Question:	Response:
Why did scientists and engineers study the concrete used to make the Roman Colosseum? What did they discover?	
Why is this study so important to us today?	
Where did the aggregates come from to make the concrete foundation used to build your school?	

INVESTIGATION # 4.3

Focus Question: How do people use natural resources?

In today's investigation we went on a walk to find things made out of natural resources. Record your observations below. Answer the questions to show your understanding.

_____
date

Natural Resource Walk

object	natural resource	location	notes/drawing

Why are certain natural resources used rather than others?

_____

_____

_____

If you were to design a sign with the school's name on it to be displayed in the front of the school, what natural resources would you use to make it? Why?

_____

_____

_____

_____

INVESTIGATION #4.3

Reading: "Earth Materials in Art"

_____
date

Today we read about earth materials used in art. Write three things you learned, two ideas you want to remember, and one question that you still have.

3 Things that you learned

2 Ideas you want to remember

1 Question you still have

Glossary

Write the word, define, and draw a picture to go with it.

Teacher Tip

You could have kids put each vocabulary word into their glossary as you put them up on your word wall!!! Kids love to add a detailed picture as well!

Use the following black checkered pages to blow up and turn into your word wall for each investigation. Just print the vocab cards at a slightly reduced size so more will fit on the page

Vocabulary:

Investigation 1

abrasion
acid rain
basalt
calcite
chemical reaction
chemical weathering
clay
conglomerate
earth material
expand
freeze
granite
gravel
humus
limestone
marble
model
pebble
physical weathering
rock
sand
sandstone
silt
soil
system
weathering

Investigation 2

alluvial fan
basin
canyon
cast
delta
deposition
erosion
flood
floodplain
fossil
imprint
landform
meander
mold
mountain
petrification
preserved remains
river channel
river mouth
sediment
shale
slope
superposition
valley

Investigation 3

contour interval
contour line
crust
earthquake
elevation
landslide
lava
magma
mantle
profile
satellite cone
sea level
topographic map
volcano

Investigation 4

aggregate
cement
concrete
fossil fuel
geothermal power
natural resource
nonrenewable resource
renewable resource
solar energy
wind power

Investigation 1:

Soils and Weathering

Investigation 2:

Landforms

Investigation 3:

Mapping Earth's Suface

Investigation 4:

Natural Resources

abrasion

the rubbing, grinding, and bumping of rocks that cause physical weathering

acid rain

a form of precipitation containing acid, which forms when carbon dioxide gas in the air dissolves in water droplets

basalt

a dark rock formed from cooling lava

Investigation 1 Words

calcite

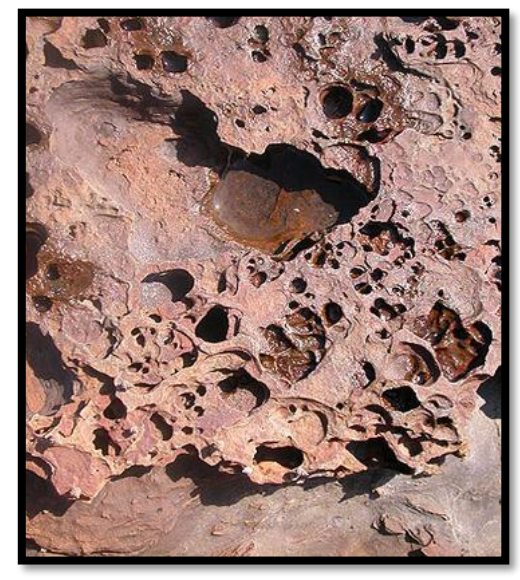
a common rock-forming mineral in the Earth's crust

chemical reaction

a process in which two or more materials mix in away that forms new material

chemical weathering

the process by which the minerals in a rock can change due to chemicals in water and air



Investigation 1 Words

clay

the smallest category of rock pieces; component of soil

conglomerate

a rock composed of smaller pieces like clay, silt, sand, gravel, and pebbles

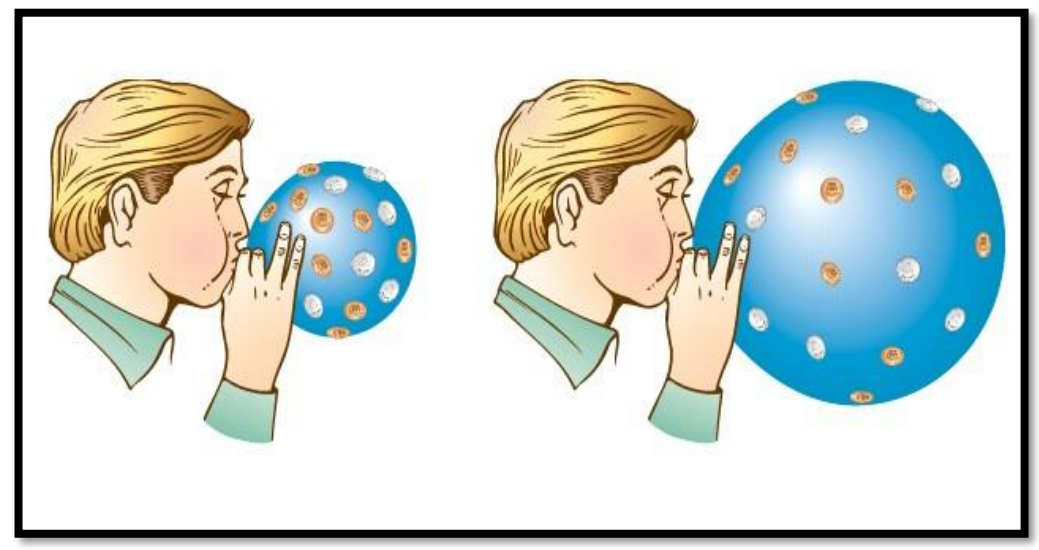
earth material

any natural resource that makes up Earth, including soil and water

Investigation 1 Words

expand

when the volume of a substance increases or gets bigger



freeze

to become hard or stiffened due to loss of heat

granite

an igneous rock that forms inside Earth

Investigation 1 Words

gravel

rocks that are smaller than pebbles but bigger than sand

humus

bits of dead plant and animal parts in the soil

limestone

a sedimentary rock made mostly of calcite

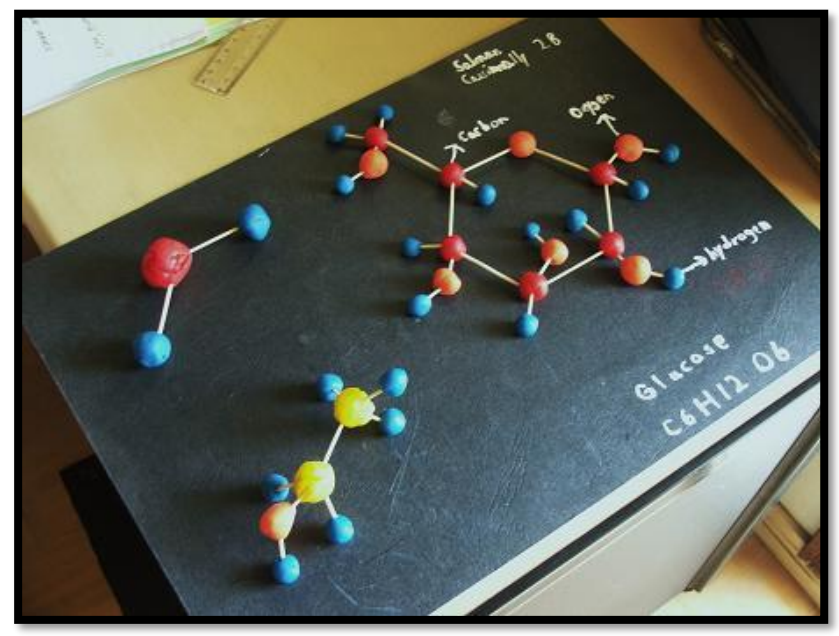
Investigation 1 Words

marble

a metamorphic rock formed when limestone is subjected to heat and pressure

model

a representation of the features and actions of a natural system or process



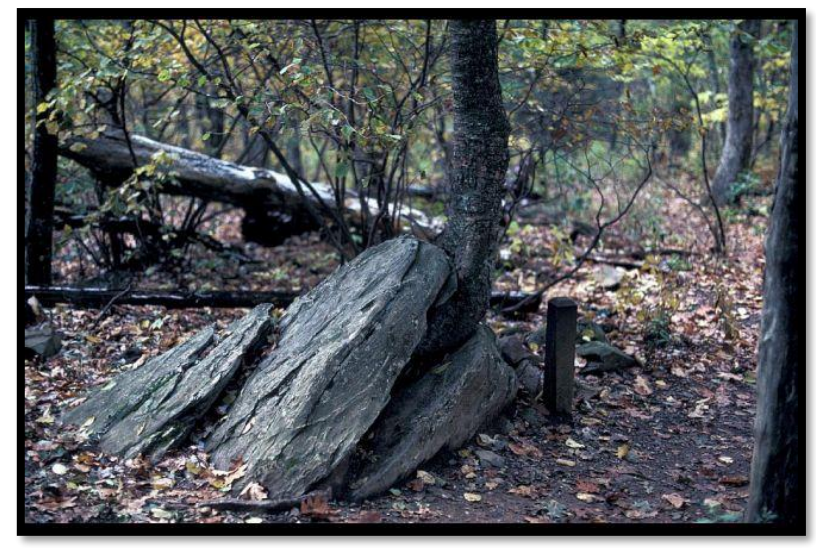
pebble

the largest category of rock pieces

Investigation 1 Words

physical weathering

the process by which rocks are broken down by breaking and banging



rock

a solid earth material made of two or more minerals

sand

rocks that are smaller than gravel, but bigger than silt

Investigation 1 Words

sandstone

a sedimentary rock
made of sand particles
stuck together

silt

rocks that are smaller
than sand, but bigger
than clay

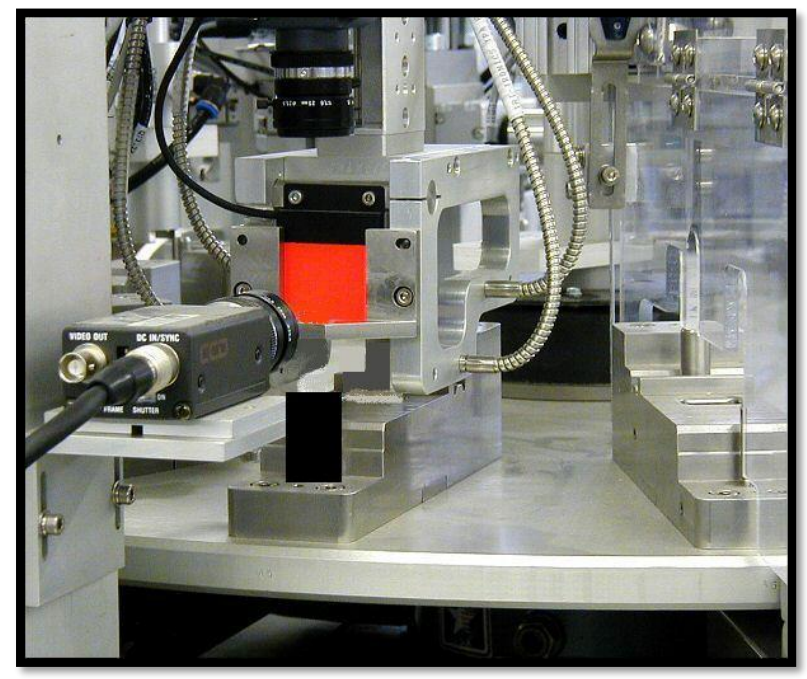
soil

a mix of humus,
sand, silt, clay, gravel,
and/or pebbles

Investigation 1 Words

system

two or more objects that work together in a meaningful way



weathering

the process by which larger rocks crack and break apart over time to form smaller rocks

Investigation 1 Words

alluvial fan

a fan shaped deposit of rocks formed where a stream flows from a steep slope onto flatter land

basin

a low area in which sediments are often deposited

canyon

a V-shaped gorge with steep sides eroded by a stream

Investigation 2 Words

cast

a copy of an organism, like a fossil, that is created by the minerals in a mold

delta

a fan shaped deposit of earth materials at the mouth of a stream

deposition

the settling of sediments

Investigation 2 Words

erosion

the carrying away of weathered earth materials by water, wind, or ice

flood

a large amount of water flowing over land that is usually dry

floodplain

land covered by water during a flood

Investigation 2 Words

fossil

any remains, trace, or imprint of animal or plant life preserved in Earth's crust

imprint

the outline of an organism left in sediment

landform

a feature of the land, such as a mountain, canyon, or beach

Investigation 2 Words

meander

a curve or loop in a river or stream

mold

a space in the sediments that fills with minerals

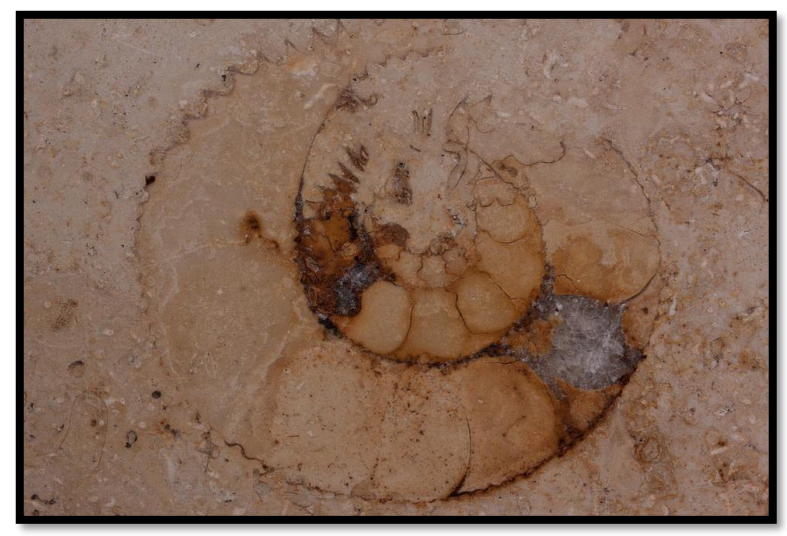
mountain

a high, steeply sloped area where rock is uplifted along a fault or created by a volcano

Investigation 2 Words

petrification

the process by which an organism is turned to stone over a long period of time



preserved remains

fossils

river channel

a river that flows deeper in the center and moves along a confined path

Investigation 2 Words

river mouth

the area of a river where it flows into sea or lake

sediment

pieces of weathered rock such as sand, deposited by wind, water, and ice

shale

rock that forms when a layer of a very small sediments (clay or silt) is compressed over millions of years

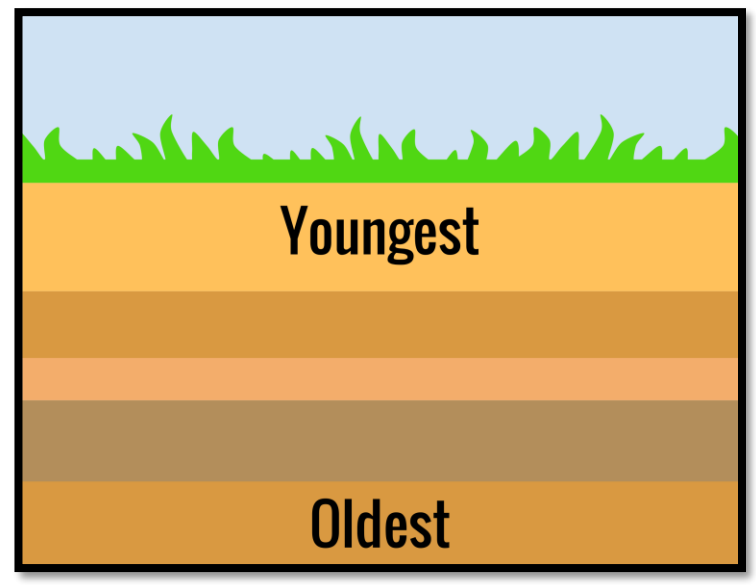
Investigation 2 Words

slope

the angle of the land over which water flows

superposition

the principle that rock layers and the fossils they contain are arranged in layers and that lower sedimentary layers are older than higher layers of rock



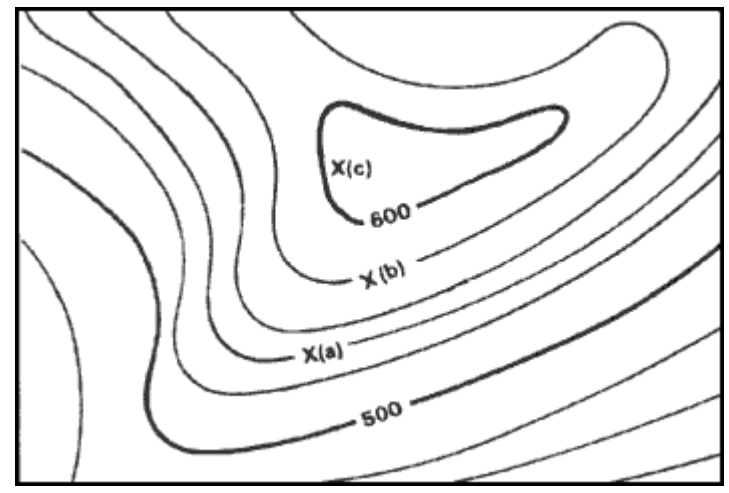
valley

a low area between mountains where a stream or glacier flows

Investigation 2 Words

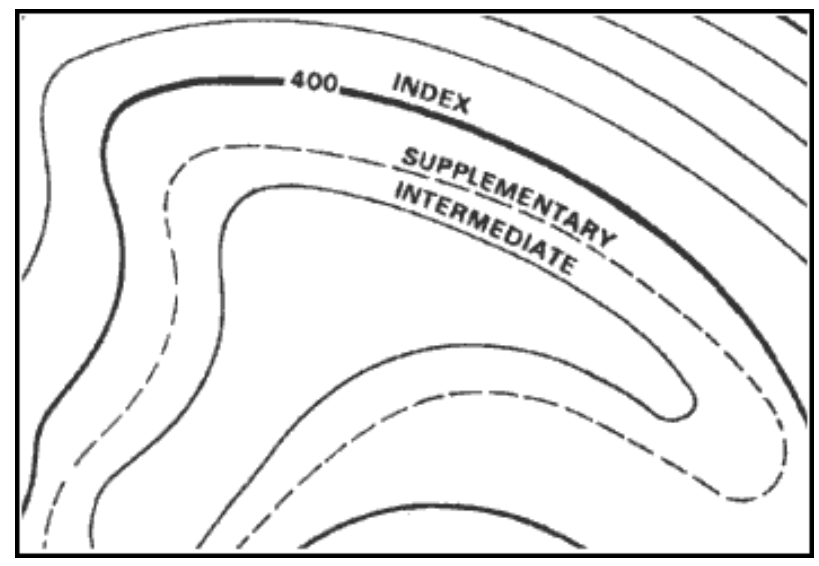
contour interval

the change in elevation between any two contour lines



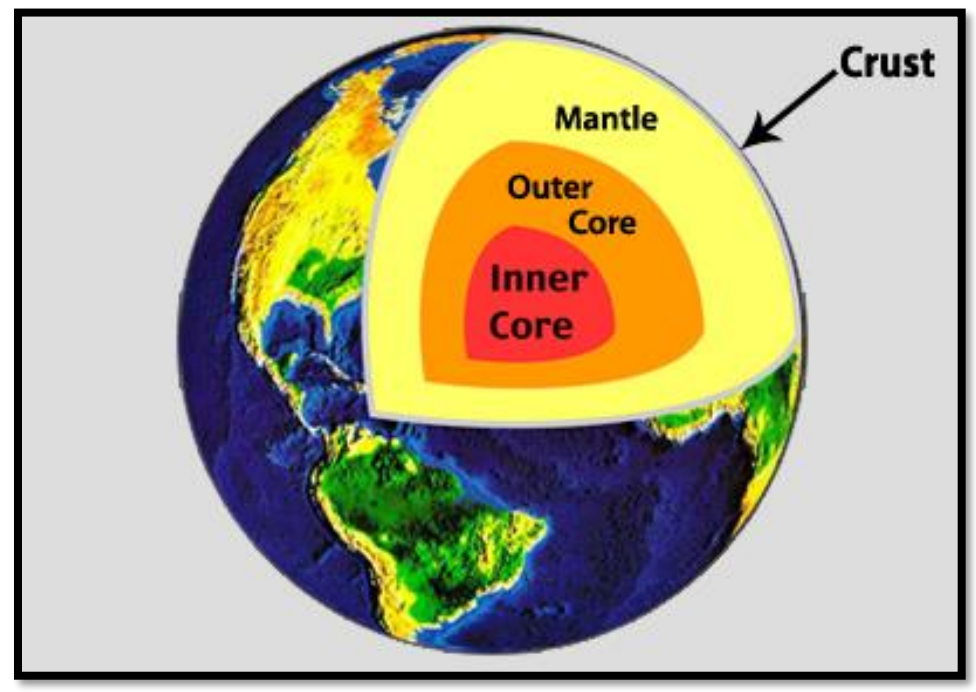
contour line

the curved lines on a topographic map that represent a specific elevation



crust

a single thickness of a material



Investigation 3 Words

earthquake

a sudden movement
of Earth's crust
along a fault

elevation

vertical distance or
height above sea
level

landslide

the sudden movement
of earth materials
down a slope

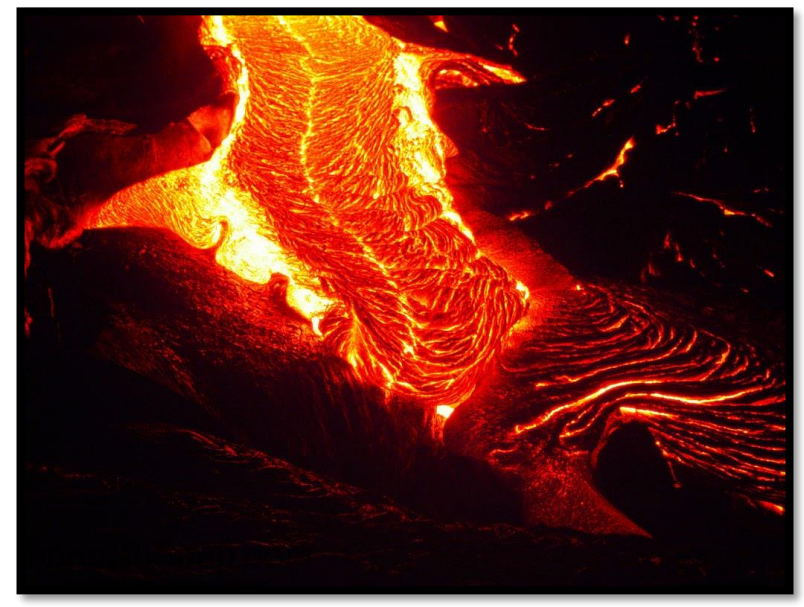
Investigation 3 Words

lava

melted rock erupting onto Earth's surface, usually from a volcano

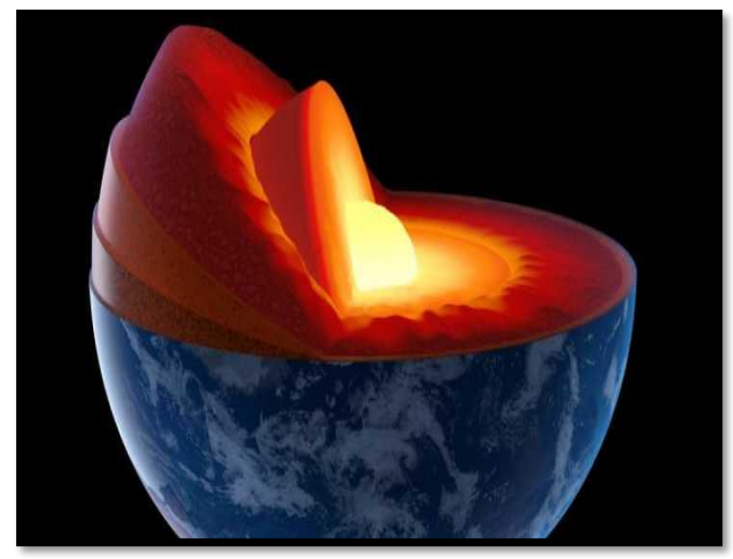
magma

melted rock below Earth's surface



mantle

the solid rock material between Earth's core and crust



Investigation 3 Words

profile

a side view or cross-section of a landform such as a mountain

satellite cone

the cone-shaped mound of volcanic material created by eruptions

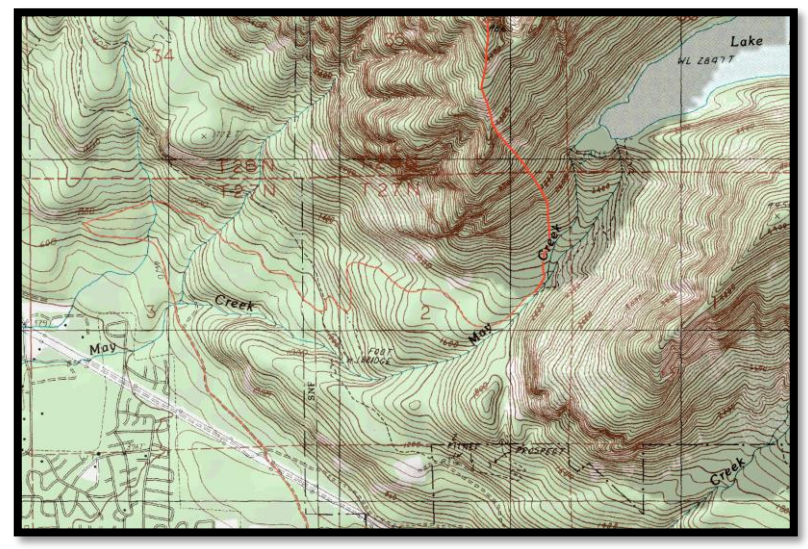
sea level

the average height of the ocean's surface, zero elevation

Investigation 3 Words

topographic map

a map that uses contour lines to show the shape and elevation of the land



volcano

an opening in Earth's crust where lava, cinders, ash, and gases come to the surface

Investigation 3 Words

aggregate

a mass of rock particles, such as pebbles, gravel, and sand

cement

a fine gray powder made from limestone; component of concrete

concrete

a mixture of gravel, sand, cement, and water

Investigation 4 Words

fossil fuel

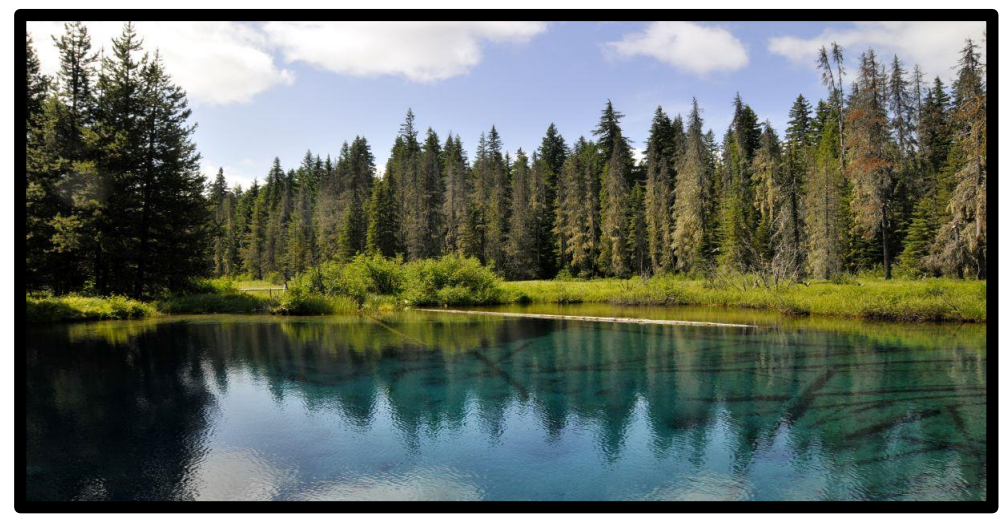
plants and animals that became buried under sediments millions of years ago, then slowly transformed into deposits of carbon-rich substances, such as coal, petroleum, and natural gas

geothermal power

alternative energy source that comes from the internal heat of the Earth

natural resource

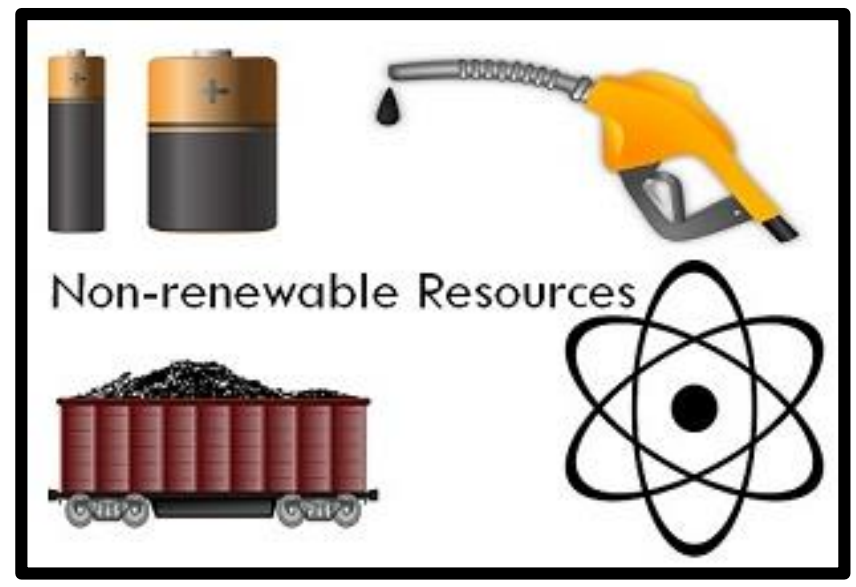
a material such as soil or water that comes from the natural environment



Investigation 4 Words

nonrenewable resource

a resource that is not replenished because it takes extended geological periods to form, such as rocks, minerals, and fossil fuels



renewable resource

a resource that is naturally replenished continuously and quickly, such as sunlight, water, and air

solar energy

an alternative energy source from the sun that drives the water cycle and produces wind, ocean waves, and flowing water in rivers and streams

Investigation 4 Words

wind power

an alternative energy source that uses the power of the wind

Investigation 4 Words

Many Thanks:

Graphics by the amazingly talented:

Fonts by the lovely:

Thank You!

If you find you need more pages for an investigation, please email me at rebecca.seeley81@gmail.com! I would be happy to add anything that is needed. I have not taught this kit however I have spent a long time going through the manuals and creating what I thought would be needed in addition to what my own students used. Please let me know if I missed anything that you would find helpful in your classroom.