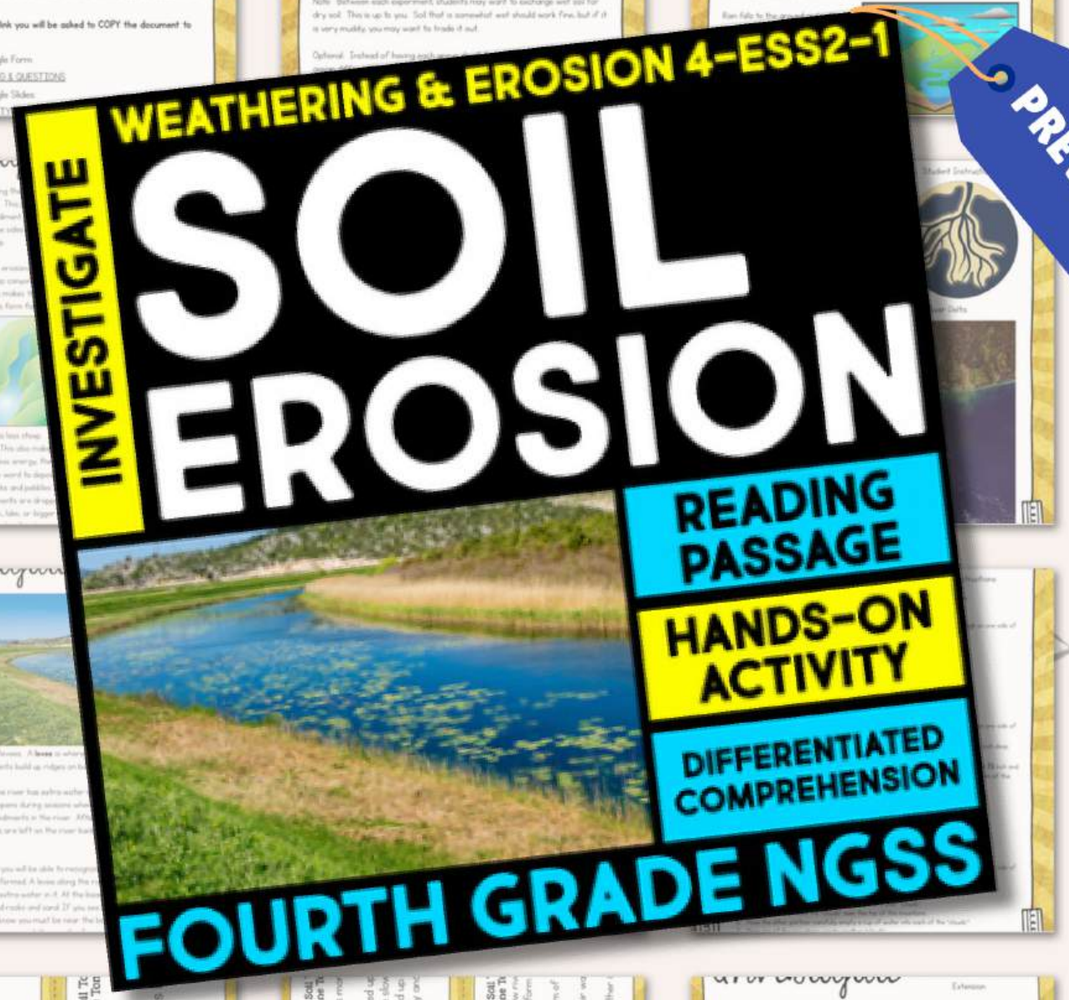


4TH GRADE

Be a Soil Scientist!

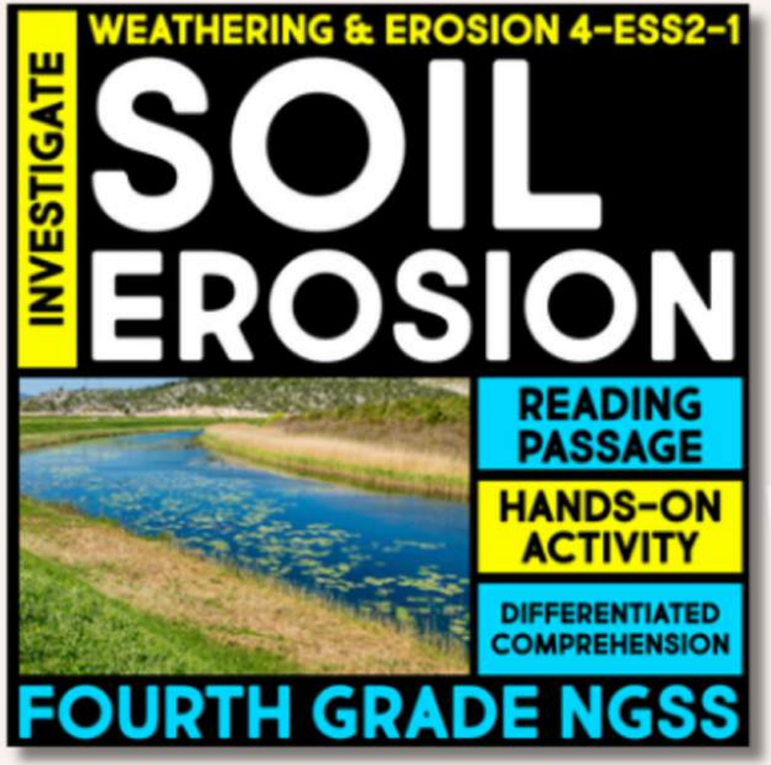
INVESTIGATE

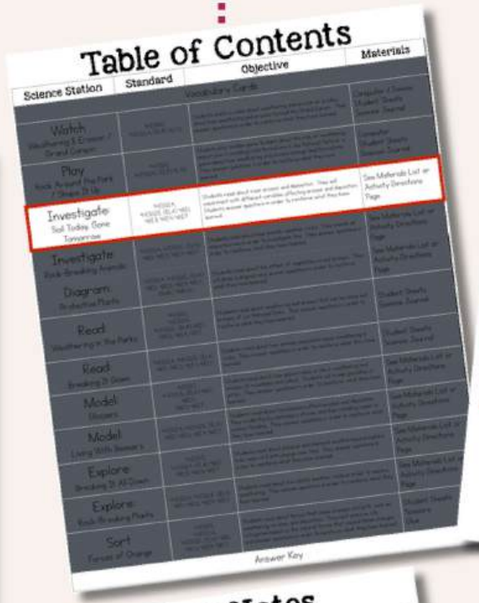
SOIL EROSION AND DEPOSITION

Hands-on Science Station 4th Grade

KEEP SCROLLING TO SEE WHAT'S INSIDE!

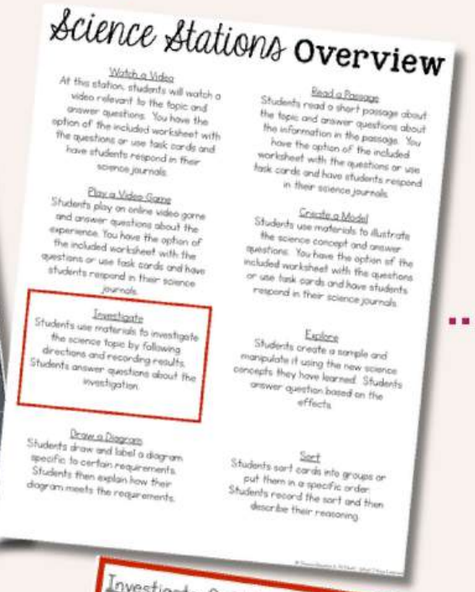
ACTIVITY OVERVIEW




Table of Contents

Science Station | Standard | Objective | Materials

Answer Key


Science Stations Overview

Watch a Video
At this station, students will watch a video relevant to the topic and answer questions. You have the option of the included worksheet with the questions or use task cards and have students respond in their science journals.

Play a Video Game
Students play an online video game and answer questions about the experience. You have the option of the included worksheet with the questions or use task cards and have students respond in their science journals.

Investigate
Students use materials to investigate the science topic by following directions and recording results. Students answer questions about the investigation.

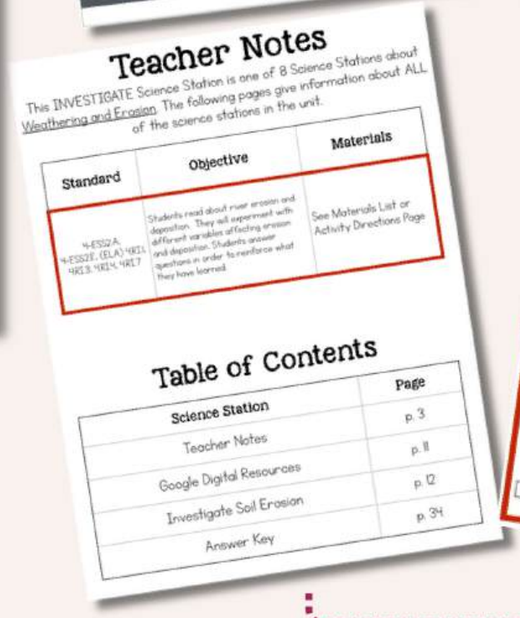
Draw a Diagram
Students draw and label a diagram specific to certain requirements. Students then explain how their diagram meets the requirements.

Read a Passage
Students read a short passage about the topic and answer questions about the information in the passage. You have the option of the included worksheet with the questions or use task cards and have students respond in their science journals.

Create a Model
Students use materials to illustrate the science concept and answer questions. You have the option of the included worksheet with the questions or use task cards and have students respond in their science journals.

Explore
Students create a sample and manipulate it using the new science concepts they have learned. Students answer question based on the effects.

Sort
Students sort cards into groups or put them in a specific order. Students record the sort and then describe their reasoning.

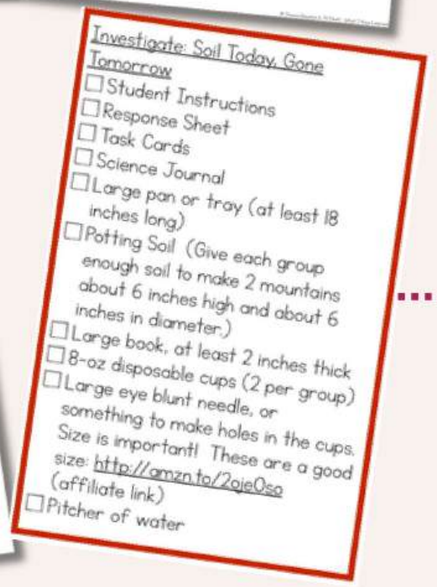

Teacher Notes

This INVESTIGATE Science Station is one of 8 Science Stations about Weathering and Erosion. The following pages give information about ALL of the science stations in the unit.

Standard	Objective	Materials
4-ESS2-A, 4-ESS2-E, (ELA) RI.4.1, RI.4.3, RI.4.4, RI.4.7	Students read about river erosion and deposition. They will experiment with different variables affecting erosion and deposition. Students answer questions in order to reinforce what they have learned.	See Materials List or Activity Directions Page

Table of Contents

Science Station	Page
Teacher Notes	p. 3
Google Digital Resources	p. 11
Investigate Soil Erosion	p. 12
Answer Key	p. 34


Investigate: Soil Today, Gone Tomorrow

- ☐ Student Instructions
- ☐ Response Sheet
- ☐ Task Cards
- ☐ Science Journal
- ☐ Large pan or tray (at least 18 inches long)
- ☐ Potting Soil (Give each group enough soil to make 2 mountains about 6 inches high and about 6 inches in diameter.)
- ☐ Large book, at least 2 inches thick
- ☐ 8-oz disposable cups (2 per group)
- ☐ Large eye blunt needle, or something to make holes in the cups. Size is important! These are a good size: http://amzn.to/2ojeOso (affiliate link)
- ☐ Pitcher of water

Table of Contents

Science Station Overview

Materials Checklist

Teacher Notes & Table of Contents

WHAT'S INCLUDED
INVESTIGATE SCIENCE STATION

- Teacher Notes
- Student Text in two formats
- Student Instructions
- Activity Sheets for observation
- Differentiated Questions
- Answer Key
- Google Form
- Google Slides



INVESTIGATE

READING IN TWO FORMATS

ENGAGING ACTIVITY & WORKSHEETS

Investigate Soil Today, Gone Tomorrow

Student Instructions

Have you ever visited a river? You may have noticed that not every part of the river looks the same. There are sometimes sandy beaches along parts of the river. You will see the river flow swiftly in some places and slowly in others. You may decide to go for a swim. You will look for slower moving water. You may look for a place for your day of fun. What causes these differences? What do they have to do with erosion and deposition.

Rivers carry water down the riverbed. As water flows, it picks up **sediments** are bits of broken rock. The carrying of sediments is called **erosion**. Rocks on the bottom and sides of the river are worn away bit by bit. This happens slowly over a long time.

Moving water has energy. Rivers with more water flowing in them have more energy. More erosion happens in a river with more energy. More energy means more sediments, like pebbles and rocks, are picked up. Larger sediments, like pebbles and rocks, are picked up from the bottom and sides of the river. As they scrape against the bottom and sides of the river, they are scraped off and carried along.

Rain falls to the ground and gathers in streams. Streams flow into rivers. The land that a river gets its water from is called a **drainage basin**. Snow also melts and flows into rivers. A drainage basin is the area of land where the water from rain, melting snow, and melting ice comes together. Drainage basins are often found in mountain ranges with steep slopes. They gather water into a low area. Water from drainage basin drains into streams.

Investigate Soil Today, Gone Tomorrow

Name:

Streams flow downhill. Along the way, they join together. Where the land is steep, water moves fast. This part of the river has a lot of energy. The energy to move a lot of sediment. More erosion happens. There is less erosion on the sides of the river. River

Further down the river, it is less steep. The river slows down. It becomes wider and bends in some places. This also makes the river slow down. There is now less energy in the river. With less energy, the river drops sediments. This is deposition. Deposition comes from the word to deposit. **Deposition** means to deposit, or drop off sediments. Larger rocks and pebbles are laid down first. As the river loses more energy, smaller sediments are dropped off. The river moves toward a body of water, such as an ocean, lake, or bigger river. As it does so, it slows down. Where the river meets a larger body of water is called the mouth of the river. This is where the river ends.

p. 2

An example of a delta in the United States is the Mississippi River Delta

Deposition can also create levees. A **levee** is where sediments have been dropped along the river. The sediments build up ridges on both sides of the river.

Levees often form when the river has extra water in it. This happens during heavy rain and floods. It also happens during seasons when snow is melting. Heavy rain and melting snow pick up sediments in the river. After some time, the water level goes back down. Sediments are left on the river banks. Levees are made by these sediments.

p. 2

Investigate Soil Today, Gone Tomorrow

Student Instructions

In this activity, you are going to investigate what happens in river erosion and deposition.

Part 1: Steep Slope vs. Gradual Slope

1. Take your 2 pans with dirt in them. Carefully build up mountains about 6 inches high on one side of each pan. The mountains should be about the same size and shape.
2. Place a book under the mountain end of one pan.
3. Draw your mountains and label your drawings.
4. Fill two cups without holes in the bottom with water.
5. Find the cups with holes in the bottom. These are your "clouds."
6. Have one partner hold the "clouds" over the top of the mountains.
7. Have the other partner carefully empty the cups of water into the "clouds."
8. Observe what happens and record your observations.

Part 2: Straight Riverbed vs. Curved Riverbed

1. Take your 2 pans with dirt in them. Carefully build up mountains about 6 inches high on one side of each pan. The mountains should be about the same size and shape.
2. On one mountain, make a straight riverbed. With your fingers, dig a straight river from the top to the bottom and 2 inches wide. Make it run straight from the top to the bottom.
3. On the other mountain, make a curved riverbed. With your fingers, dig a curved river from the top to the bottom 2 inches wide. Make it have at least one curve in it as it runs from the top to the bottom of the mountain.
4. Draw your mountains and label your drawings.
5. Fill two cups without holes in the bottom with water.
6. Find the cups with holes in the bottom. These are your "clouds."
7. Have one partner hold the "clouds" over the top of the mountains.
8. Have the other partner carefully empty the cups of water into the "clouds."
9. Observe what happens and record your observations.

Part 3: One Cloud vs. Two Clouds

1. Take your 2 pans with dirt in them. Carefully build up mountains about 6 inches high on one side of each pan. The mountains should be about the same size and shape.
2. Draw your mountains and label your drawings.
3. Fill three cups without holes in the bottom with water.
4. Find the cups with holes in the bottom. These are your "clouds."
5. Have one partner hold the "clouds" over the top of the mountains.
6. Have the other partner carefully empty a cup of water into the "clouds" over one of the mountains, empty another "cloud."
7. Over one of the mountains, empty another "cloud."
8. Observe what happens and record your observations.

Investigate Soil Today, Gone Tomorrow

Name: Alex Chen

Activity Sheet

Part 1: Steep Slope versus Gradual Slope

Steep Slop (with Book) | Gradula Slope (without book)

Before the experiment

Drawing with labels: Mountain (Dirt), Slope (Steep), Pan, Book (Underneath)

Drawing with labels: Eroded Mountain, Mudslide, Pan Bottom, Book

After the experiment

Drawing with labels: Mountain (Dirt), Slope (Gradual), Pan

Drawing with labels: Less Eroded Mountain, Some Wet Dirt, Pan Bottom

On each mountain, where did most of the erosion happen?

Most erosion happened on the steep part of the

ed like the rain was cutting

ts get deposited?

vn to the bottom of the pan,

ferent on each of the mountains?

had lots of erosion and the

e. The gradual mountain only

Investigate Soil Today, Gone Tomorrow

Name: Alex P.

Activity Sheet

Part 2: Steep Slope versus Gradual Slope

Straight Slop (with straight channel) | Graduula Slop (with curved channel)

Before the experiment

Drawing with labels: BOOK, STRAIGHT RIVER, FINGERS DIGGED, STRAIGHT RIVER

Drawing with labels: BOOK, CURVED RIVER

After the experiment

Drawing with labels: CLOUD, ERODED RIVER, DIRT PUDDLE

Drawing with labels: CLOUD, CURVED RIVER

1. Where did most of the erosion happen?

In the straight pan it was all in

the curved pan it was at the be

2. Where did the sediments get deposited?

In the straight pan at the botto

pan it piled up at the curves ar

How was erosion different on each of the mountains?

The straight one dug a deep hole

curved one made smaller piles of

down, and the whole channel got

Investigate Soil Today, Gone Tomorrow

Name: Liam Davies

Activity Sheet

Part 3: One Cloud Versus Two Clouds

One Cloud | Two Clouds

Before the experiment

Drawing with labels: CLOUD, MOUNTAIN, COLLECTION PAN

Drawing with labels: CLOUD, CLOUD, CLOUD, MOUNTAIN, COLLECTION PAN

After the experiment

Drawing with labels: CLOUD, EROSION CHANNEL, SMALL SEDIMENT PILE, STREAM

Drawing with labels: CLOUD, CLOUD, MASSIVE EROSION, HUGE SEDIMENT PILE, BIG MUDDY RIVER

On each mountain, where did most of the erosion happen?

On both mountains, erosion happened right under where the water fell the most, on the sides and top.

On each mountain, where did the sediments get deposited?

All the sediments got washed away and piled up at the very bottom of the mountain and into the plastic collection pan.

After the experiment, how was erosion different on each of the mountains?

The "Two Clouds" mountain was eroded way more! It had huge channels and was almost flattened, while the "One Cloud" mountain only had small channels and less dirt was

INVESTIGATE
DIFFERENTIATED QUESTIONS

SHORT ANSWER

FILL-IN-THE BLANK

TASK CARDS:
SHORT ANSWER & MULTIPLE CHOICE

Investigate

Soil Today. Gone Tomorrow

Student Instructions

Streams flow downhill. Along the way, they join together into rivers. Since the slope is steep, water moves fast. This part of the river has more energy. There is enough energy to move a lot of sediment. More erosion happens on the bottom of the river. There is less erosion on the sides of the river. Rivers closer to the drainage basin tend to be narrow and deep.

When rivers cause a lot of erosion, they form a valley. Over many years, so much erosion happens that a deep canyon may form. Sometimes, too much rain or melting snow enters the river. This makes the river flood. During floods, erosion happens quickly. Valleys and canyons form faster.



Further down the river, it is less ste
and bends in some places. This also
energy in the river. With less ene
Deposition comes from the word
off sediments. Larger rocks a
more energy, smaller sediment
of water, such as an ocean,
the river meets a larger bo
where the river ends.

Investigate

Soil Today. Gone Tomorrow

Student Instructions

Deposition makes new land. It makes beaches along rivers. It also makes deltas. A **delta** is the large area of land at the mouth of the river. It is formed where sediments are deposited. This is why deltas are found near oceans, lakes, and seas.



An example of a delta in the United States is the Mississippi River Delta.



Investigate

Soil Today. Gone Tomorrow

Name: _____

1. What is erosion?

Erosion is the carrying away of sediments.

2. What causes rivers to have more energy?

Rivers have more energy when they are faster or when they have more water.

3. What happens when there is more energy in the water?

When there is more energy in the water, it picks up more sediment and causes more erosion.

4. Describe how rivers begin.

Rivers begin high in the mountains. Rainwater and snowmelt gather in drainage basins. These drain into streams, which join together into rivers.

5. How do canyons form?

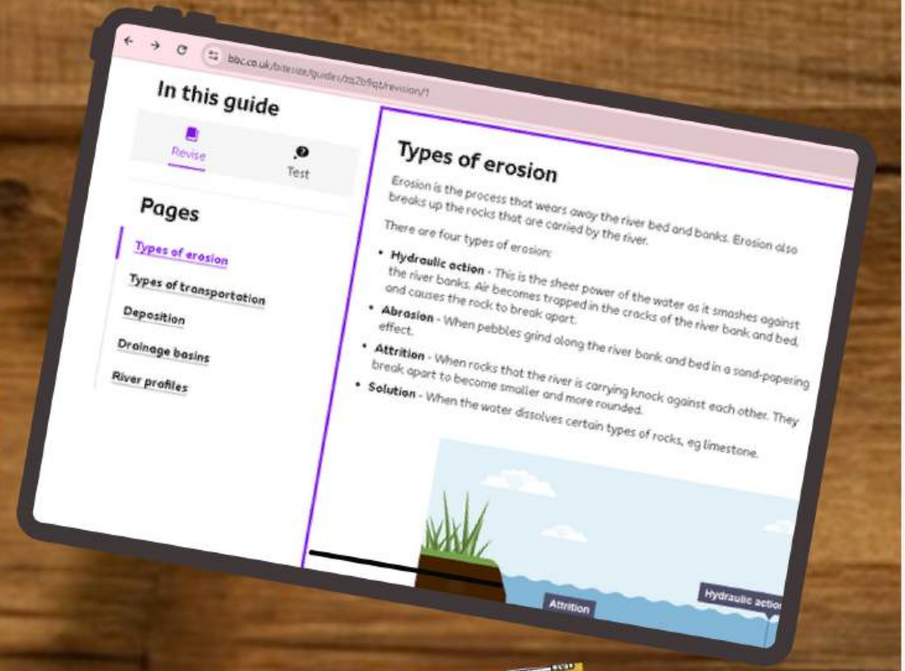
Valleys form when rivers cau… …rn into canyons if there is a lot of erosion.

6. What is deposition?

Deposition is the depositing, or laying do…

7. What is formed by deposition?

Deposition forms beaches on the sides of rivers and … …ths of rivers. Deposition also forms levees where sediments have bee… …when the river had extra water.)



Investigate

Soil Today. Gone Tomorrow

Extension

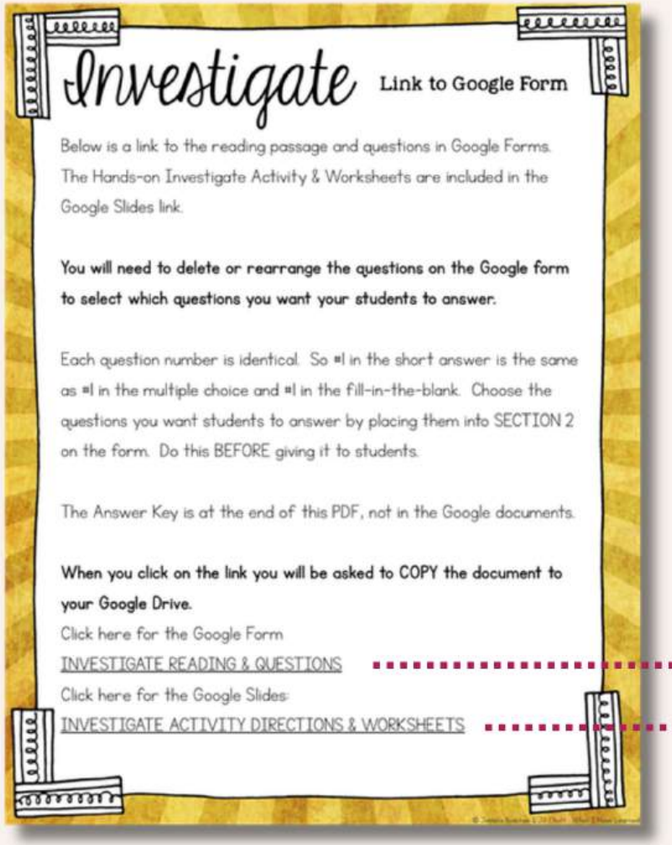
Materials:

- Computer

As an extension, go to

http://bit.ly/BitesizeErosion

DIGITAL VERSIONS


Investigate Link to Google Form

Below is a link to the reading passage and questions in Google Forms. The Hands-on Investigate Activity & Worksheets are included in the Google Slides link.

You will need to delete or rearrange the questions on the Google form to select which questions you want your students to answer.

Each question number is identical. So #1 in the short answer is the same as #1 in the multiple choice and #1 in the fill-in-the-blank. Choose the questions you want students to answer by placing them into SECTION 2 on the form. Do this BEFORE giving it to students.

The Answer Key is at the end of this PDF, not in the Google documents.

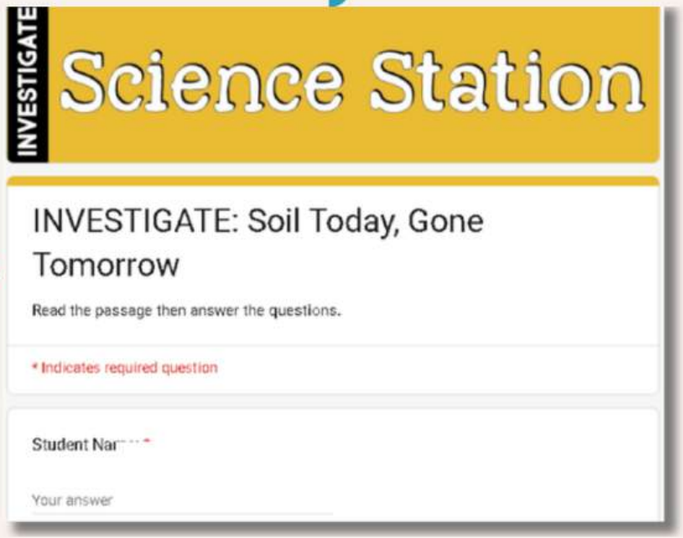
When you click on the link you will be asked to COPY the document to your Google Drive.

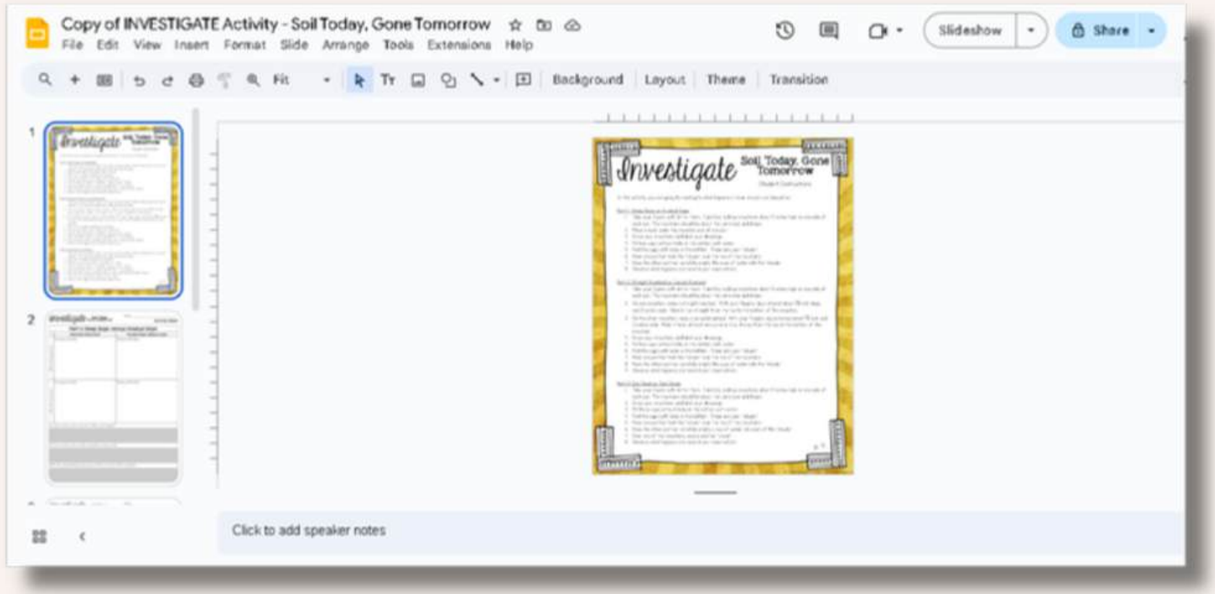
Click here for the Google Form

INVESTIGATE READING & QUESTIONS

Click here for the Google Slides:

INVESTIGATE ACTIVITY DIRECTIONS & WORKSHEETS





DIGITAL VERSIONS

- ✔ Google Sheet with Activity & Directions
- ✔ Google Form with Reading & Questions

Answer keys provided

YOU WILL LOVE THIS BECAUSE



Hands-On STEM Exploration

This investigation connects science to real environmental challenges, helping students understand erosion's impact on landscapes.



Differentiated for All Learners

Multiple question formats (short answer, fill-in-the-blank, task cards) ensure accessibility and engagement for diverse student needs.



Easy Prep, Maximum Engagement

Teacher notes, student instructions, and answer keys provide everything you need for an exciting, stress-free lesson!

TEACHERS LOVE IT!

Great addition to our science curriculum. Does a great job of filling in the gaps.

Tina Wright



This resource had more than I needed to teach a lesson on erosion by water. I wish I had more time to do all three investigations with the whole class.

Christine T.



My passion is making learning accessible to all students.
I love scaffolding learning, breaking down the concepts and building them up so that students can see the connections.
I love figuring out the small components that build up to the big ideas and helping students see it all.



teach MATH | teach SCIENCE | teach READING | teach WRITING

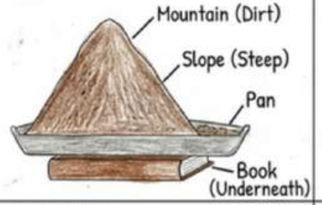
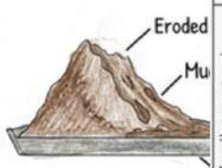
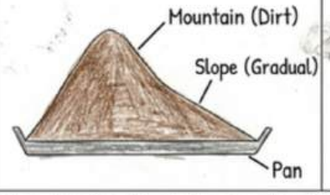
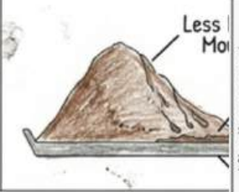
What I have LEARNED

Investigate Soil Today, Gone Tomorrow

Name: Alex Chen

Activity Sheet

Part 1: Steep Slope versus Gradual Slope

	Steep Slop (with Book)	Gradula Slope (without
Before the experiment	Drawing with labels: 	Drawing with labels: 
After the experiment	Drawing with labels: 	Drawing with labels: 

On each mountain, where did most of the erosion happen?

Most erosion happened on the steep part of mountain. It looked like the rain was cut right into it.

On each mountain, where did the sediments get deposited?

Sediment went down to the bottom of the making a big pile.

After the experiment, how was erosion different on each of the mountains?

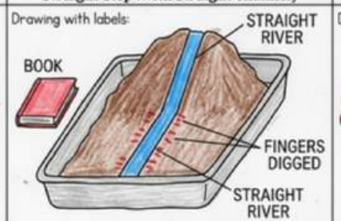
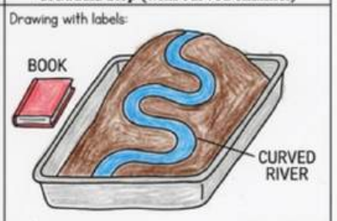
The steep mountain had lots of erosion and dirt went everywhere. The gradual mountain had a little bit.

Investigate Soil Today, Gone Tomorrow

Name: Alex P.

Activity Sheet

Part 2: Steep Slope versus Gradual Slope

	Straight Slop (with straight channel)	Graduula Slop (with curved channel)
Before the experiment	Drawing with labels: 	Drawing with labels: 
After the experiment	Drawing with labels: 	Drawing with labels: 

1. Where did most of the erosion happen?

In the straight pan it was all in the middle, in the curved pan it was at the bends.

2. Where did the sediments get deposited?

In the straight pan at the bottom, in the curved pan it piled up at the curves and bends.

How was erosion different on each of the mountains?

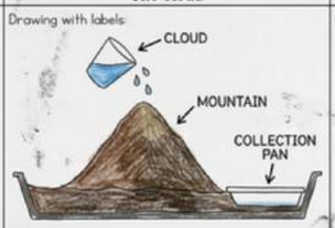
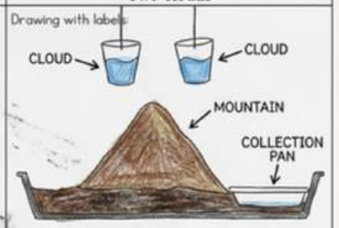
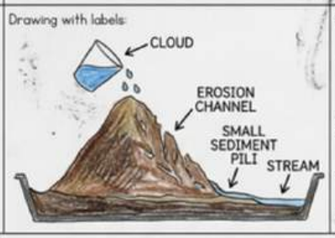
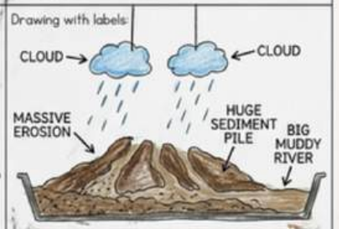
The straight one dug a deep hole really fast. The curved one made smaller piles of dirt as it went down, and the whole channel got wider slowly.

Investigate Soil Today, Gone Tomorrow

Name: Liam Davies

Activity Sheet

Part 3: One Cloud Versus Two Clouds

	One Cloud	Two Clouds
Before the experiment	Drawing with labels: 	Drawing with labels: 
After the experiment	Drawing with labels: 	Drawing with labels: 

On each mountain, where did most of the erosion happen?

On both mountains, erosion happened right under where the water fell the most, on the sides and top.

On each mountain, where did the sediments get deposited?

All the sediments got washed away and piled up at the very bottom of the mountain and into the plastic collection pan.

After the experiment, how was erosion different on each of the mountains?

The "Two Clouds" mountain was eroded way more! It had huge channels and was almost flattened, while the "One Cloud" mountain only had small channels and less dirt was moved.