

EARTH ROCKS!

LESSON TEMPLATE

K-2: TYPES OF ROCKS

date:

Objective(s):

Students will be able to list characteristics of rocks.
Students will be able to identify features that classify rocks.
Students will be able to describe how specific kinds of rocks are formed.

Warm Up:

Ask the students if they have any rocks on hand! If they do, go get a couple of them and type in the comments what they feel like. You can also have them react to the stream as you name potential characteristics that their rocks might have if they are not ready for typing.

Useful Links:

<https://www.nps.gov/subjects/geology/how-rocks-are-classified.htm>

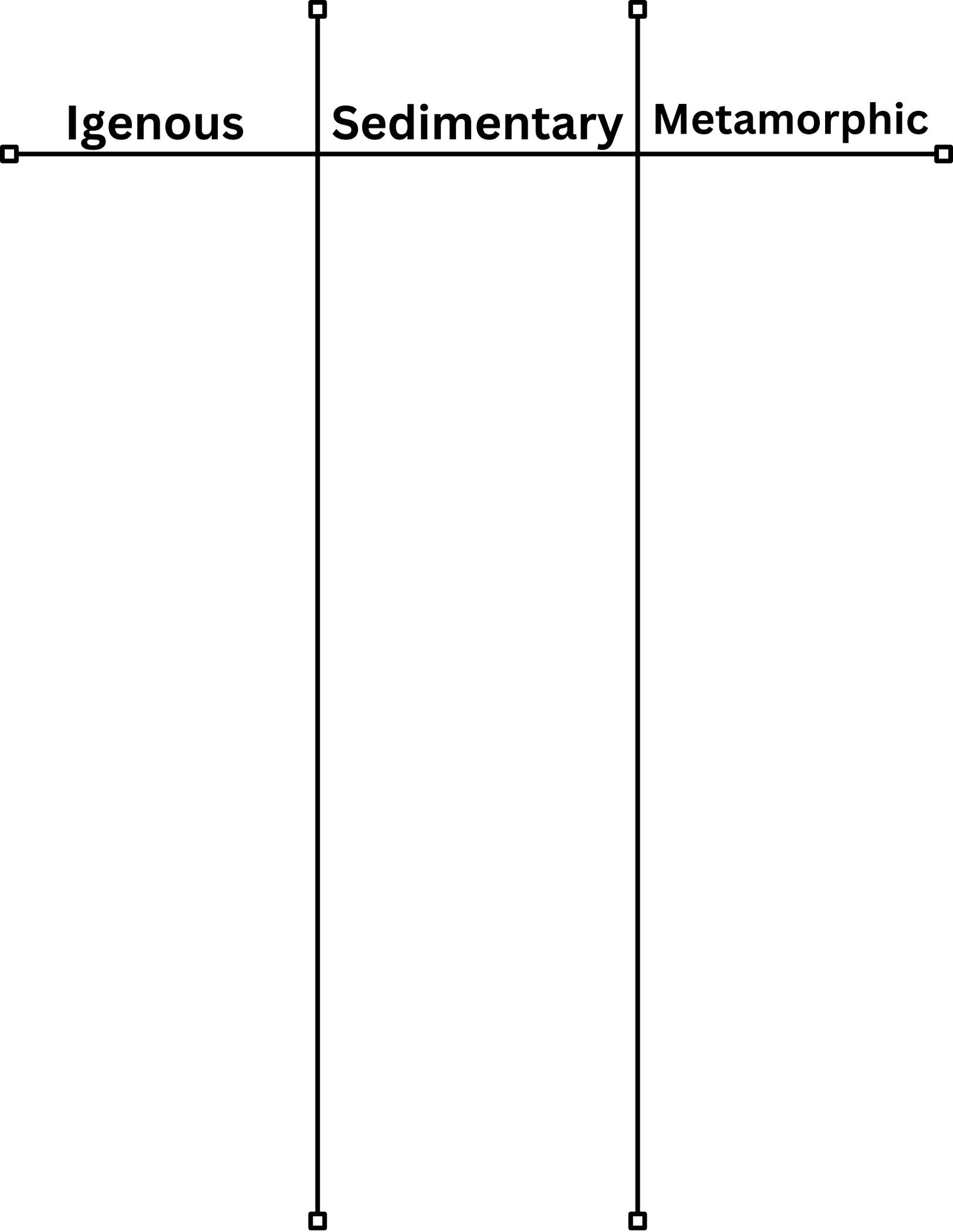
https://www.youtube.com/watch?v=w-tXJkMI_Mw

Instructional Time with Independent Practice (40 min)

1. Introduce the terms composition and texture. Define these terms and explain to students that these are the main features that scientists look at when determining the type of rock that they are looking at.
2. Introduce the three main types of rocks: igneous, sedimentary, and metamorphic.
 - a. Break down the major features of these rocks.
 - i. It is useful to use a chart to keep these ideas organized. Within a chart you can list:
 1. Features of each kind of rock
 2. How they are formed
 3. Where they are found
 4. How they are used
3. Introduce the rock cycle to show how rocks will go through different phases as they are formed
 - a. Introduce the following terms during this time
 - i. Weathering
 - ii. Erosion
 - iii. Crystallization
 - b. Many students will benefit from seeing the rock cycle drawn out to see how it may go from one form to the next
4. When breaking down the rock cycle, make sure to include the action that makes the rock form into the new type of rock that it is becoming
 - a. Heat
 - b. Pressure
 - c. Chemical Action
 - d. Weathering/Erosion
 - e. Melting
 - f. Solidification

Closing (10 min):

You can use a variety of polls to have students match the feature of a rock to the type of rock it belongs to. You can also have questions where students need to answer which action takes place in the rock cycle for a rock to form into itself. Encourage the students to look around their homes and neighborhoods to identify and classify different rocks.



K-2: VOLCANOES

date:

Objective(s):

Students will be able to identify the parts of a volcano.
Students will be able to define magma, as well as other pieces that are included in volcanic matter.
Students will be able to describe how volcanoes have impacted the earth as a structure.
Students will be able to determine activity that leads to volcanic eruptions.
Students will be able to explain what happens when a volcano explodes.

Warm Up:

Place a poll in the classroom having students select an answer as to the layers of a volcano. As the students are trickling into the class, begin to talk about different elements of the earth and how they will be taught in this course and what they will be learning about the features of the earth.

Useful Links:

<https://www.youtube.com/watch?v=lAmqsMQG3RM>

<https://www.ready.gov/kids/games/data/dm-english/index.html>

Instructional Time with Independent Practice (40 min)

1. Begin by completing a close read with the students. There is one included that can be used for this. As you read through this passage with the students, highlight key terms that are the most important for the lesson.
2. Introduce students to the layers of a volcano. You can do this by using an image, video, or a diagram that you may have. It is important to show them the different areas located on a volcano and the role that each of them play during the eruption.
3. Define magma for the group and define some of the different elements, solids, and gases that are found within magma. Many learners enjoy hearing about how each of these factors impact the magma and the process that comes from volcanic eruption.
 - a. While discussing magma, make sure to discuss how as magma changes within the volcano, this is what causes the volcano to erupt. Describe how different elements change causing the magma to rise and flow from the top.
4. Once the students understand the elements found in magma, explain how a volcanic eruption has a variety of impacts on the earth and the population, such as:
 - a. Climate Change
 - b. Air Quality
 - c. Water/marine life
 - i. This would be a great opportunity to throw a poll into the class for engagement to get students to interact with the class. EX: Which of the following do you think is NOT impacted by a volcanic eruption.
5. While explaining the impact that a volcano has in the areas mentioned above, make sure to also show students examples of what is happening while the volcano is actively erupting and the immediate impacts of the magma flowing.

Closing (10 min):

Have the students answer in the chat if they have any other questions about volcanoes that can be covered at the beginning of the next class. If they do not have any questions, have them write what their favorite fact that they learned from the day included and/or if their thoughts about volcanoes have changed.

VOLCANOES



EXPLORING VOLCANOES

Have you ever heard of a volcano? Volcanoes are like mountains that can explode with hot lava and ash. They are very powerful and can be found all around the world.

Inside a volcano, there is a big chamber filled with hot, melted rock called magma. When the pressure builds up, the volcano can erupt and send the magma shooting out. This is what causes lava to flow down the sides of the volcano.

Volcanoes have different layers just like a cake. The top layer is called the crater, which is where the lava comes out during an eruption. Below the crater is the conduit, which is like a tunnel that connects the magma chamber to the surface. The base of the volcano is called the base, and it is made up of layers of rock and ash that have built up over time.

Sometimes, volcanoes can be very dangerous and cause a lot of damage. But they are also important for the Earth because they help create new land and shape the landscape. Scientists study volcanoes to learn more about how they work and how to keep people safe.

Next time you see a picture of a volcano, remember all the layers inside and the power that lies beneath the surface. Volcanoes are truly amazing natural wonders!

VOLCANOES



VOLCANO VOCABULARY

1. Volcano: A mountain that can erupt with hot lava, ash, and rocks.
2. Lava: Hot, melted rock that flows out of a volcano during an eruption.
3. Eruption: When a volcano releases lava, ash, and gases into the air.
4. Crater: The bowl-shaped opening at the top of a volcano where lava comes out.
5. Ash: Fine, powdery particles that are released during a volcanic eruption.
6. Magma: Molten rock beneath the Earth's surface that can erupt as lava.
7. Steam: Hot, invisible water vapor that can be released from a volcano.
8. Vent: An opening in the Earth's crust where lava and gases can escape during an eruption.

K-2: EARTHQUAKES

date:

Objective(s):

Students will be able to describe what happens under the surface of the earth during an earthquake.
Students will be able to distinguish between layers of the earth and what they are made from.
Students will be able to define what a tectonic plate is and what is happening with it during an earthquake.
Students will be able to list the severity of an earthquake based on the Richter Scale.

Warm Up:

Begin by covering any questions that may have gone unanswered from the last class. Once you have answered the questions, have the students react in class if they have ever felt an earthquake before. Post a poll for the students to answer what they think causes an earthquake

Useful Links:

<https://www.youtube.com/watch?v=dJpIU1rSOFY>

<https://annex.exploratorium.edu/fault-line/>

<https://www.ready.gov/kids/games/data/dm-english/index.html>

<https://www.usgs.gov/programs/earthquake-hazards/cool-earthquake-facts>

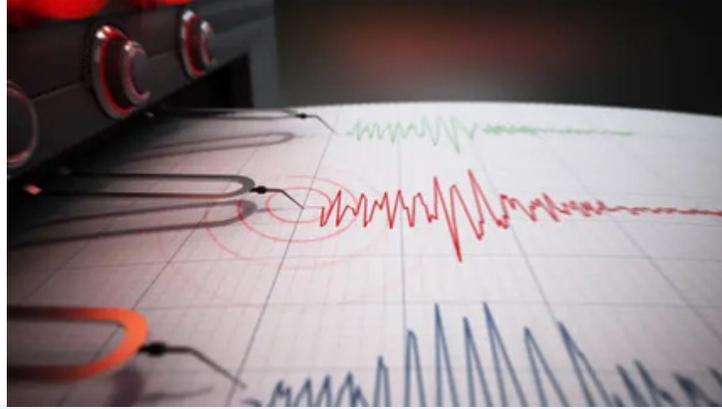
Instructional Time with Independent Practice (40 min)

1. Begin by introducing the layers of the earth and what occurs within each layer.
 - a. Introduce vocabulary terms within this part of the lesson such as:
 - i. crust
 - ii. mantle
 - iii. core
 - iv. fault line
 - v. tectonic plate
2. Introduce fault lines and tectonic plates. Students may benefit from seeing a map of fault lines around the planet. To keep a higher level of engagement, have students react if they live near a fault line.
3. Discuss how tectonic plates move due to the layers of the earth shifting and how the the level of severity can change due to proximity to the fault lines.
 - a. Introduce the richter scale and devices that scientists use to study earthquakes
4. Begin to explore famous earthquakes and the impacts that they had on the environments
 - a. Where were they? When were they?
 - b. This is when it would be important to further discuss how those earthquakes were measured and studied by scientists.
 - i. What did they learn from that earthquake and how did that impact further studies?
5. Introduce things that people can do to prepare for earthquakes and safety precautions to take during an earthquake.

Closing (10 min):

Review the key ideas from the lesson. Have the students add any questions that they might have to the chat, as well as list the most interesting fact that they learned during the lesson. Encourage them to speak with the adults in their home about a disaster/earthquake safety plan.

VOLCANOES



EXPLORING THE LAYERS OF THE EARTH AND EARTHQUAKES

Did you know that the Earth is made up of different layers? The Earth has three main layers: the crust, the mantle, and the core.

The crust is the outer layer of the Earth. It is like the hard shell of an egg. The crust is where we live, and it is made up of rocks and soil. The crust is not all the same. It is divided into pieces called tectonic plates.

Beneath the crust is the mantle. The mantle is like a thick, gooey soup. It is made up of hot rocks that can flow like melted cheese. The mantle is so hot that rocks can melt and move around.

At the very center of the Earth is the core. The core is like a big, hot ball of metal. It is made up of iron and nickel. The core is so hot that it can melt metal!

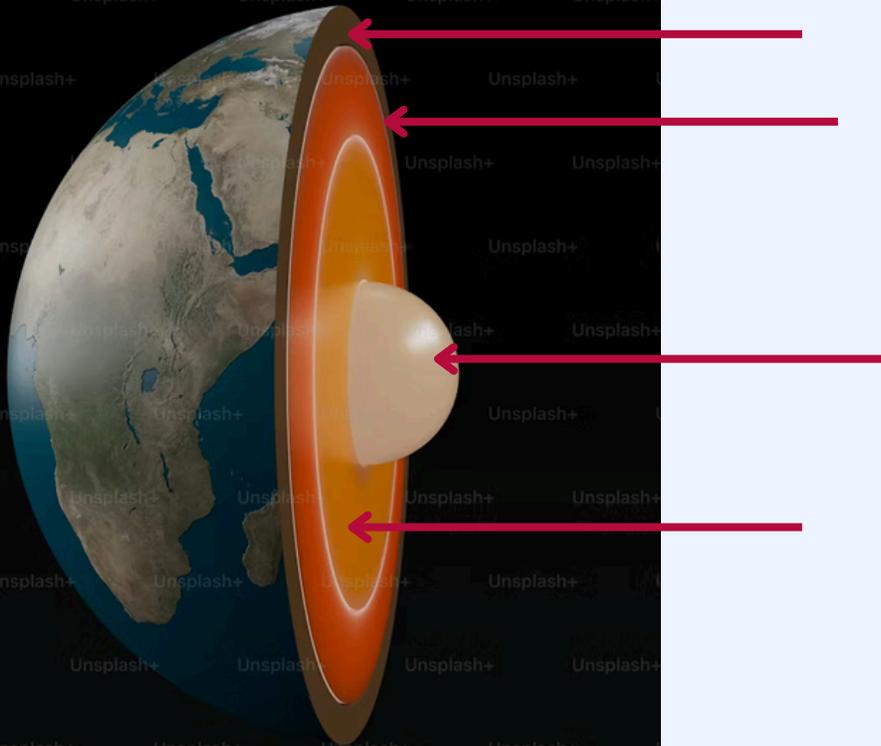
Sometimes, the rocks in the Earth's crust move and shake. This is called an earthquake. Earthquakes can be very scary, but scientists study them to learn more about the Earth.

Scientists use special tools called seismometers to study earthquakes. Seismometers can detect the shaking of the Earth's crust. By studying earthquakes, scientists can learn more about the layers of the Earth and how they move.

So next time you feel the Earth shake, remember that it's just the Earth's layers moving and scientists are working hard to understand it better!

VOLCANOES

Directions: Cut out the terms and glue them next to the piece of the earth that they belong to.



Crust

Inner Core

Mantle

Outer Core

EARTHQUAKES



EARTHQUAKE VOCABULARY

1. Earthquake: A sudden shaking of the ground caused by movements in Earth's crust.
2. Seismograph: A machine that measures and records earthquakes.
3. Richter scale: A scale used to measure the strength of an earthquake.
4. Epicenter: The point on Earth's surface directly above where an earthquake starts.
5. Fault: A crack in Earth's crust where earthquakes can occur.
6. Aftershock: Smaller earthquakes that follow the main earthquake.
7. Shake: The feeling of the ground moving during an earthquake.
8. Tectonic plates: Large pieces of Earth's crust that move and can cause earthquakes.
9. Preparedness: Being ready for an earthquake by having a plan and emergency supplies.

K-2: STONEHENGE AND THE PYRAMINDS

date:

Objective(s):

Students will be able to define what a monument is.

Students will state the importance of manmade monuments and structures from early history around the world.

Students will be able to list some of the first manmade structures made from the earth and the importance that those structures held for those individuals at that time.

Warm Up:

Pose the question - "What is the purpose of a monument?" Have the list any monuments that they might know in the chat. Discuss why we build monuments and let them know we are going to explore what is considered to be one of the earliest monuments created.

Useful Links:

<https://www.english-heritage.org.uk/visit/places/stonehenge/history-and-stories/history/>

Instructional Time with Independent Practice (40 min)

1. Show images of Stonehenge. Explain that these are stones that were created and placed without modern technologies.
 - a. Discuss some of the strategies that people may have used to place this structure. Questions that you can answer during this:
 - i. How did they get these pieces into place?
 - ii. Where were these pieces gathered from?
 - b. Explain the importance that Stonehenge has had on society today in terms of architecture, history, understanding people of the past, etc.,
2. Show images of the pyramids and have students post in the comments what they think of it
 - a. Explain the historical significance that these played for the Egyptians and the materials that were taken from the Earth to create these.
 - b. Discuss common tools that might have been used to create these pyramids during this timeframe.
3. Relate these monuments back to previous lessons - how might the weather and earth impact these over time? Discuss methods that scientists, archeologists, etc. may use to preserve these monuments.

Closing (10 min):

Encourage the students to do further research about other manmade monuments from prehistoric and early history. Pose the questions - how were these made? What tools do you think they used? Do they share common features that you may see in other monuments that makes you think that ideas and resources were shared/common.

K-2: GRAND CANYON

date:

Objective(s):

Students will be able to explain the processes of erosion and weathering.
Students will be able to make predictions about how the Grand Canyon might change over time.
Students will be able to list elements found within the grand canyon.
Students will be able to recite historical based facts of the Grand Canyon.

Warm Up:

Have students react to the class if they have ever been to The Grand Canyon. In the chat, have them make educated guesses as to how they think this canyon was formed.

Useful Links:

<https://www.nationalgeographic.com/travel/national-parks/article/grand-canyon-national-park>

Instructional Time with Independent Practice (40 min)

1. Review the concept of erosion and the types of rocks that are formed from erosion.
2. Show students an image of The Grand Canyon
 - a. Explain that this is estimated to be about six million years of erosion in one demonstration
 - b. This canyon was eroded by the Colorado River
 - c. Over time, many canyons combined into The Grand Canyon, forming the massive piece of eroded earth that we all see today
3. What else is special about the Grand Canyon past the history of erosion?
 - a. Discuss the types of rocks that are formed within the Grand Canyon and how there is layering within it that is distinct for the region with deep reds.
 - i. Break down each layer of the grand canyon. You can draw out a cliff side and break it into pieces in which the canyon is made, such as:
 1. Redwall Limestone
 2. Coconino Sandstone
 3. Hermit Shale
 4. Supai Group
 5. Tapeats Sandstone
 - ii. This would be an opportunity to discuss the chemical reactions and processes that impact coloration of rocks.
4. Read a passage about The Grand Canyon and the history behind it.
 - a. This would be a time to do a close read and highlight important details to assist in the development of reading comprehension.
5. While they have yet to find dinosaur bones within the Grand Canyon, scientists have found many types of fossils
 - a. This is a great spot to segway into next week's lesson about fossils and begin to plant some initial vocabulary.

Closing (10 min):

Have the students answer a variety of polls on the Grand Canyon going over topics that you covered during your lesson. Encourage the students to continue to research different rocks and how they are formed, as well as how erosion and weathering impacts the earth.

THE GRAND CANYON



THE GRAND CANYON

The Grand Canyon is one of the most famous natural wonders in the world. Located in the state of Arizona in the United States, it is a massive canyon that was carved by the Colorado River over millions of years.

The Grand Canyon is 277 miles long, up to 18 miles wide, and over a mile deep. It is known for its colorful rock formations, steep cliffs, and breathtaking views. The canyon is divided into two main sections: the South Rim and the North Rim. The South Rim is the most visited part of the canyon, with numerous viewpoints and hiking trails that offer stunning vistas of the canyon and the river below.

The Grand Canyon is not only a popular tourist destination, but it is also a geologist's dream. The layers of rock that make up the walls of the canyon tell a story of the Earth's history, with each layer representing a different period of time. Fossils found in the canyon provide evidence of the diverse plant and animal life that once inhabited the area.

Visitors to the Grand Canyon can explore the canyon by foot, on muleback, or by rafting down the Colorado River. The Grand Canyon also offers opportunities for camping, stargazing, and learning about the Native American tribes that have lived in the area for thousands of years.

Overall, the Grand Canyon is a natural wonder that never fails to impress and inspire those who visit it. Its sheer size and beauty make it a must-see destination for anyone who loves the great outdoors and wants to experience the wonders of nature up close.

K-2: FOSSILS

date:

Objective(s):

Students will be able to describe what a fossil is composed of.
Students will be able to dictate how a fossil is formed.
Students will be able to list types of fossils that can be found.

Warm Up:

Review the previous lesson of The Grand Canyon. Remind the students that while they have not found dinosaur bones in the Grand Canyon, that they have found fossils. Have the students post in the chat what they currently know about fossils - as well as any questions that they might have about fossils.

Useful Links:

<https://playideas.com/25-fun-fossil-ideas-for-kids/>

<https://samnoblemuseum.ou.edu/common-fossils-of-oklahoma/how-to-become-a-fossil/different-kinds-of-fossils/>

Instructional Time with Independent Practice (40 min)

1. The most famous examples of fossils are dinosaur bones - so let's begin by breaking down the process of how dinosaur bones are formed
 - a. The dinosaur dies
 - b. Scavengers and the environment eat away at the flesh until all that is left are bones.
 - c. The bones are quickly buried into mud
 - d. Over time, sand and mud build up in layers over the bones
 - e. The minerals from these layers build into the bones so that they harden into rocks
 - f. As the rock erodes away, we are able to see a fossil
2. These steps can be drawn out for students - you can also keep the students engaged by having them draw the process out as well. When discussing layers, erosion, etc., these would be ideal times to review previous lessons for the key ideas that were covered.
3. While these are the most famous kinds of fossils, we can also find molds, casts, amber, and many other forms of preservation that are fossilized to give us a glimpse at history.
4. Explore a variety of fossils with the students
 - a. You can create T-Charts for students to be able to keep track of the fossils that are covered
 - b. If your students are struggling to keep up with the information, you can also pick two types of fossils to compare and contrast in a Venn Diagram

Closing (10 min):

Tell the students to picture life thousands of years from now - what kind of things will the fossils about people of today have? What will individuals of that time find in our fossils that may be unique compared to what we are able to find today?