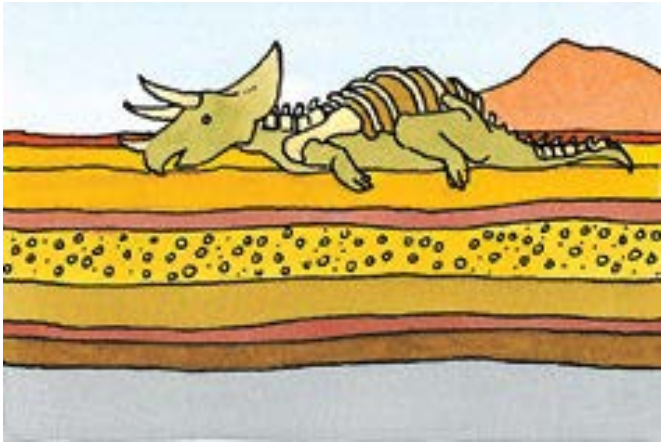
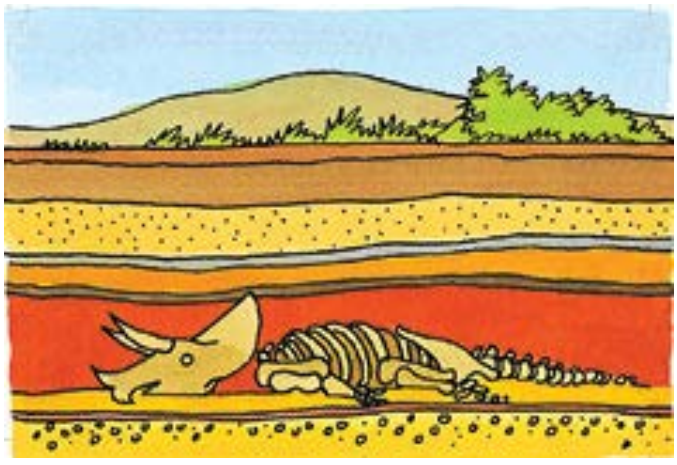
Sedimentary Rocks and Fossils

Academic Content Standards

- Be familiar with how geological strata form and understand the order in which geological strata accumulated.
- Understand how sedimentary rocks form and categorize them according to their characteristics.
- Comprehend how fossils form.
- Understand how fossils can demonstrate the conditions on Earth in the past.
- Cite various examples of how fossils can be utilized as a resource in our lives.





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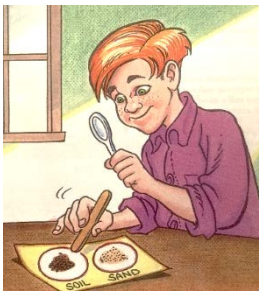
What is soil? What is sand?

Write and/or draw pictures to show what you already know about these questions.

Look at the soil and sand samples provided. Use a chopstick to carefully move the soil and sand around. If there are living things, please do not hurt them. Try to answer as many questions as you can to complete the chart below.

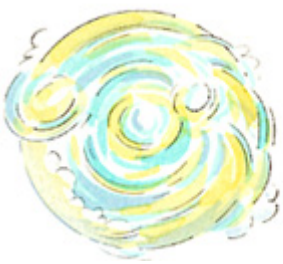


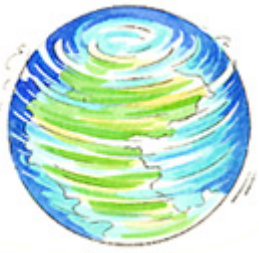
Questions to answer	Soil	Sand
Does it all look brown and black, or are there some other colors? Are there plants or insects? Is there anything shiny? Are the particles different sizes, or are they mostly the same size? Are things stuck together, or are they mostly separate from each other? If you move the soil or sand through your fingers, does it break apart or leave a mark? **Now add water a little water.** Does the soil or sand absorb the water? Does the water break the soil or sand apart? Does the wet soil or sand leave a mark when rubbed across paper?		

Share Your Results.

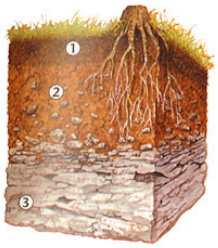
Discuss your ideas and findings with your classmates. Were there any interesting observations?

The Earth probably started as a huge cloud of dust and gases that turned into a spinning ball of hot, liquid rock. Then the surface cooled and became a rocky crust. Clouds then formed and rain fell to make the seas.

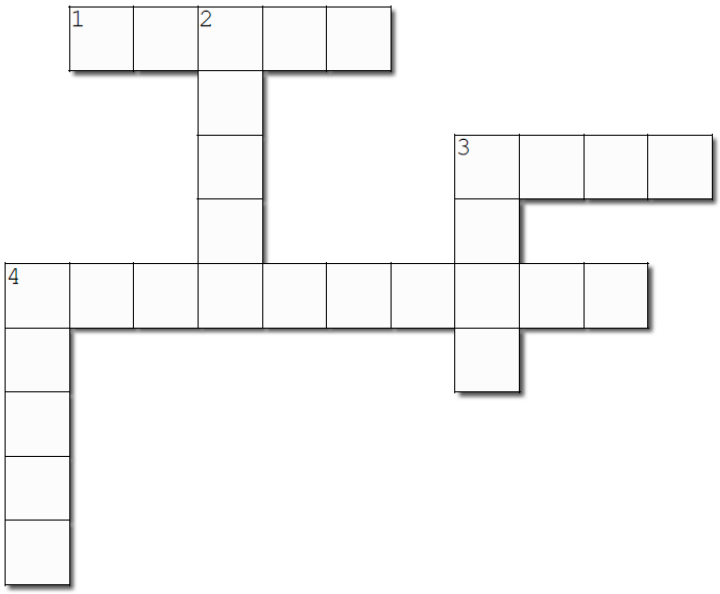




This rocky crust then started to break down as wind, water, and ice hit it. The breaking down of rocks is called weathering. This is how sand is made. Sand is the small, loose particles made from these broken rocks and shells. Soil is also made up of broken rocks and shells, but it also has lots of dead plants and animals in it too that break down into nutrients that allow plants to grow. You will also find lots of living animals in soil.



Use the information above to help you complete the crossword below.



Across

1. The Earth is made up of large _____.
3. This is made from broken rocks and shells.
4. The breaking down of rocks due to the wind, water, or ice.

Down

2. The rocky outside of the Earth.
3. This is made from broken rocks, shells, dead plants, and dead animals.
4. This liquid breaks down rock.

What is soil? What is sand?

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Why can you see layers in the Earth?

Write and/or draw pictures to show what you already know about this question.

1. Fill a plastic bottle about ¾ full of water.
2. Very slowly add a cup of soil sample. Watch how it sinks.
3. Once all the soil is in the bottle, fill the rest of the bottle with water.
4. Shake it strongly a few times and place it somewhere where no one will touch it.
5. Look at the bottle the following day.

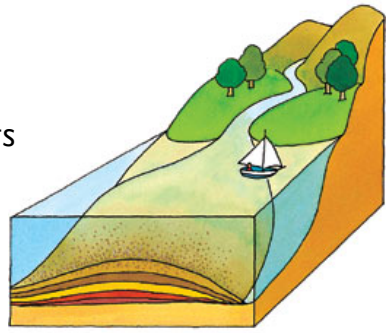
Take notes of what you saw. Draw pictures to help show your observations.

Share Your Results.

Discuss your ideas and findings with your classmates. Were there any interesting observations?

We now know that the Earth is covered with rocks that are breaking down to make sand and soil. There are also dead plants and dead animals in the soil. Water can carry and move these things. They eventually end up in rivers, lakes, and the seas where they sink to the bottom. The sand and soil that settles at the bottom of the rivers, lakes, and seas is known as sediment.

The heavier particles, such as rocks and sand will settle first. The lighter particles take more time to sink to the bottom of the water. This continues over many years and the sediments start to make layers. Newer layers form on top of the older layers. This makes the bottom layers get squashed and squeezed together, forming layers called strata. New rocks called sedimentary rocks are made.



A great place to see this stratum is at the Grand Canyon in America, which was made after millions of years.

Find the answers to these questions in the wordsearch.

1. This can carry and move sand and soil.
2. The sand and soil that sinks to the bottom of lakes is known as a ___.
3. ___ particles will sink faster than lighter particles.
4. The layers made by sediment being squashed together are called ___.
5. When new layers form on older layers, the older layers get squashed and ___ together.
6. These are the rocks made when the sediment is squashed together.
7. You can see many layers of rock at the Grand ___.
8. At what three places can the sand and soil sink to the bottom of?

M I W D B V Z O Z Z Q G K K I H X U H K
B Z L J O C B F H S E B V L D M K Z X S
Q D A F R A G K F K S C S E J F Z H E P
A B Y J E C V H W O Y W S H V E B D T D
F I W S T A L G J A R P K L U O I W Z M
B T U W A N R B Z Y H Q L L Z M N H W F
H P A R W Y T Q S H O T H H E Q H S A G
O K M H F O R D C V L A Z N S M M Y T H
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J J B E Y R A T N E M I D E S V Y F J G
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Why can you see layers in the Earth?

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Name: _____ Student Number: ____ Homeroom: ____

What are sedimentary rocks?

Write and/or draw pictures to show what you already know about this question.

1. Use a magnifying glass to observe some sedimentary rocks. Write information about the color, texture, and grain size in the chart below.
2. Try making your own sedimentary rock.

Rock Samples	Information about the rock (color, texture, grain size, etc.)
1	
2	
3	
4	

Share Your Results.

Discuss your ideas and findings with your classmates. Were there any interesting observations?

We learnt that sedimentary rocks are made when sand and soil sink to the bottom of rivers, lakes, and the seas and then get squashed together as more layers pile up on top.

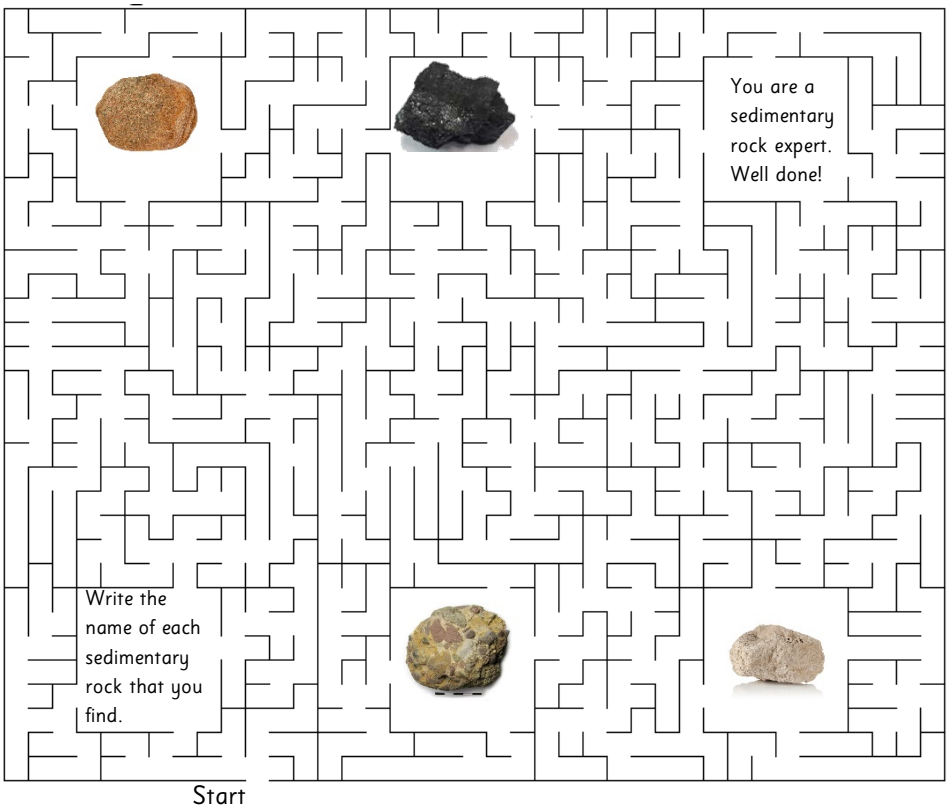
Coal is an example of a sedimentary rock. Coal is made when dead plants get covered with mud or sand. The mud squeezes down on the dead plants. Then, after millions of years, the plants become coal. Coal is solid black and shiny with no grains that can be seen.

Limestone is a type of sedimentary rock that is mostly made from the shells of marine animals. The shells fall to the sea floor and get squashed by newer layers of sediments. It looks yellow, white, or gray. You can see fine grains. It will dissolve in acids. The Sphinx in Egypt is made of limestone.

conglomerate

sandstone

Conglomerate is a type of sedimentary rock that is made up of rounded pebbles and sand cemented together. Sandstone is a medium grained sedimentary rock that is made of sand. It is often looks red or brown.



What are sedimentary rocks?

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Name: _____ Student Number: ____ Homeroom: ____

How do we know there were dinosaurs?

Write and/or draw pictures to show what you already know about this question.

1. Spread the oil clay out to cover the bottom of the plastic container. Push in the plastic dinosaur and then remove it from the clay.

2. Measure 100 grams of Plaster of Paris in a cup. Add 70 mL of water and stir it. Quickly pour it into the plastic container.

3. Wait for the Plaster of Paris to harden overnight. Then, carefully remove it from the paper clay to reveal your fossil.

4. Add a small amount of matcha powder to a cup and some coffee grains to another cup. Add a small amount of water to each and stir.

5. Dip a cotton bud in the coffee cup and use it to paint the fossil.

6. Dip a different cotton bud in the matcha cup and use it to paint around the dinosaur.

What happened? Draw pictures to help show your observations.

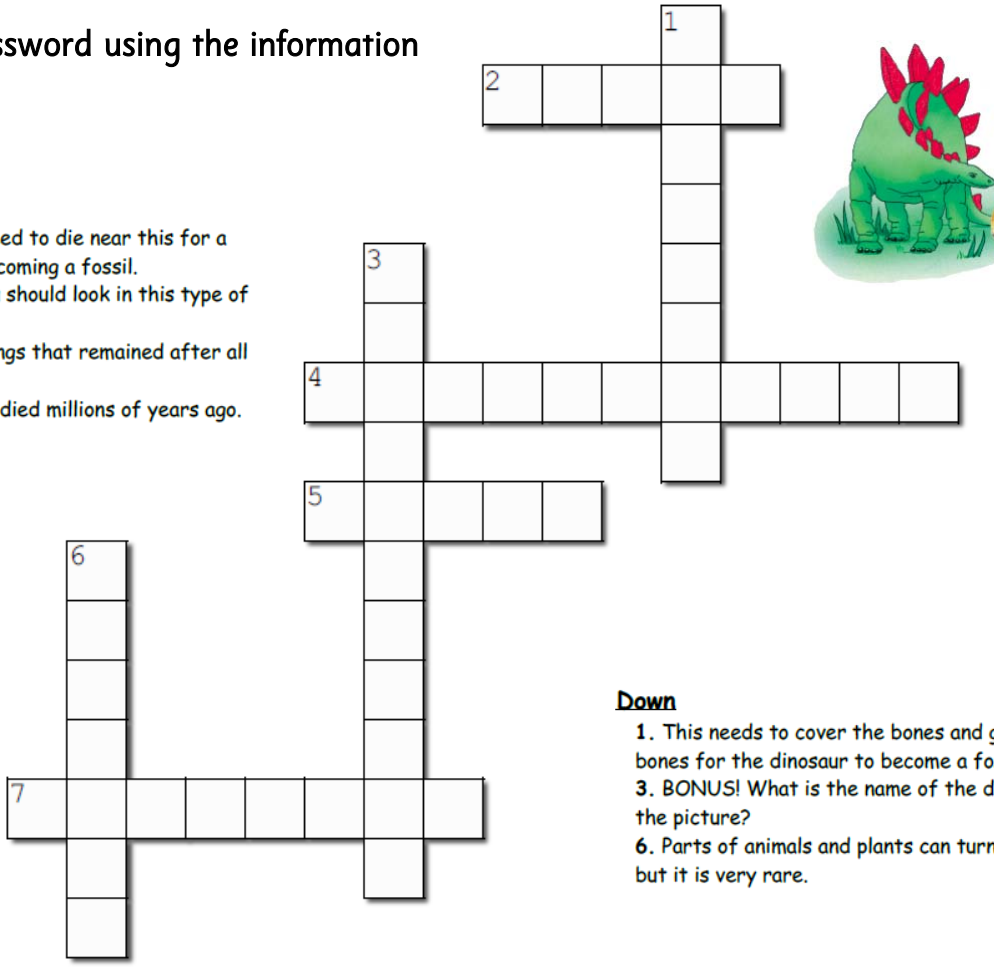
Share Your Results.

Discuss your ideas and findings with your classmates. Were there any interesting observations?

Have you ever seen a live dinosaur? The answer is no. They all died millions of years ago. Then how do we know dinosaurs existed? Some dinosaurs were preserved in rocks after they died.

When a dinosaur died near water, its flesh soon rotted away. Only the bones were left behind. Water would then cover the bones. Sediment would start covering the bones up. As new layers of sediment pushed down, it turned the older layers into rocks. The sediment also went into the tiny holes of the dinosaur's bones and became hard. The dinosaur bones became a fossil. Fossils are parts of dead animals and plants that have been preserved under the ground. If you want to find a fossil, you should look in sedimentary rocks.

Complete the crossword using the information you have learnt.



Across

2. A dinosaur would need to die near this for a higher chance of it becoming a fossil.
4. To find a fossil, you should look in this type of rock.
5. These were the things that remained after all the flesh rotted away.
7. A large animal that died millions of years ago.

Down

1. This needs to cover the bones and go into the bones for the dinosaur to become a fossil.
3. BONUS! What is the name of the dinosaur in the picture?
6. Parts of animals and plants can turn into these, but it is very rare.

How do we know there were dinosaurs?

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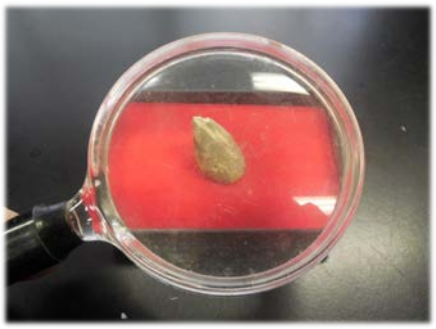
Name: _____ Student Number: ____ Homeroom: ____

What can we learn about by studying fossils?

Write and/or draw pictures to show what you already know about this question.

Use a magnifying glass to look at different fossils. Complete the chart with as much information as you can.



Questions to answer	Fossil	Observations
Do you think the fossil was made by an animal or a plant? What part of the animal or plant do you think made the fossil? Where do you think this fossil was found or where did it live? Are there any other interesting things about the fossil?	1	
	2	
	3	
	4	
	5	

Share Your Results.

Discuss your ideas and findings with your classmates. Were there any interesting observations?

Fossils can tell us many things about the past. They help us understand what plants and animals existed. The living things that lived a long time ago are now extinct. This means they have all disappeared. It may be because the place they lived changed and they could no longer find food, water, or shelter.

Scientists can use the fossils to find out what extinct animals looked like. They can also find out what kind of food they ate by studying their teeth and poop. They can find out what the environment looked like by finding fossils of plants. If they find shells, it means water covered that area a long time ago. The deserts today might have been oceans millions of years ago. Fossils found in deeper strata show us what animals lived before other animals. Fossils can teach us a lot of interesting things.

Find the answers to these questions in the wordsearch.

1. The remains of plants and animals that lived in the past.
2. Finding fossils of these show the area was once an ocean.
3. Something is ___ if it has all disappeared.
4. These can help a scientist know what the environment was like.
5. These help scientists know what animals ate.
6. The natural surrounding of living things, such as the land or sea.

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What can we learn about by studying fossils?

_____

_____

Main Ideas – Review Questions

After completing this unit, you should be able to answer these questions. Write your answers in complete sentences.

1) What is sand?

2) What is soil?

3) Why can you see layers in the Earth?

4) What are sedimentary rocks? Give some examples.

5) How do we know there were dinosaurs?

6) What can we learn about by studying fossils?