

Earth Science: Exploring Rocks

Activity Overview

Children collect, **explore**, and **investigate** rocks. They **observe** and **compare** the different textures, shapes, colors, sizes and other attributes of the class rock collection. They **sort and classify** the rocks into groups and further investigate the rocks based on their interests and questions.

*Science process skills are in bold.



Underlying Science Concepts:

- There are many different kinds of rocks.
- Rocks have different properties and characteristics.
- Rocks can be used for different purposes depending on their intrinsic characteristics.

Materials:

- A children's book about rocks (optional)
- Access to a location where children can collect rocks
- Containers or bags for collecting rocks (1 per child)
- Large bucket for teacher to collect larger/heavier rocks
- Tubs of water for washing rocks
- Small brushes such as old toothbrushes, sponges, and towels for "polishing" and drying rocks
- Magnifying lenses (optional)

Recommended books:

- *If you Find a Rock* by Peggy Christian
- *Everybody Needs a Rock* by Byrd Baylor

Getting Ready:

- Go outside ahead of time to choose a safe and clean location that has enough rocks for the children to collect. If rocks are not available on the school grounds, plan a walking field trip to a nearby area. Alternatively, you can have children bring rocks to school as "homework."

→ Engage

- Optional: Read a book about rocks to the children to inspire thinking and talking about rocks. Tell the children that after the story, they will have an opportunity to collect rocks.
- Talk with the children about rocks. You might ask if anyone has a rock collection at home or if they have collected rocks before. Ask, "Where have you found rocks?" "What do you know about rocks?" "What do you like about rocks?" "What is a rock?"

→ Explore

- Take the children outside on a rock hunt. Provide them with bags or small containers for collecting. Remind them to look closely at the rocks and only choose the ones that they find most interesting to put in their containers. You may want to set a limit, such as 5 or 10 rocks so the children will be more selective.
- You may want to bring a bucket in case you decide to collect any larger rocks that would not fit in the children's containers.
- As the children are collecting their rocks, talk with them about the textures, colors, sizes, and weights of the rocks they are finding. Take your time.
- When you return from the rock hunt, it's a good idea (and fun too!) for the children to wash their rocks and polish them with small brushes, sponges and towels.
- Gather ideas from the children about what they would like to do with their rocks now that they have collected them. Record their ideas and plan rock activities around their curiosities and interests.

Safety: Before going on the walk, talk with the children about how to collect their rocks safely and warn them not to pick up things like broken glass or trash.

More Ways to Explore Rocks

Below are some suggestions for activities and materials to enhance the children's explorations and play over a longer period of time. You and the children are sure to have many creative ideas about what to do with the rocks. The more experiences children have to touch, feel, sort, and play with rocks, the more they will discover about their interesting characteristics.

The Rock Museum: Set out the collected rocks on a table and invite children to examine them using magnifying lenses. Suggest that they organize the rocks for a "Rock Museum." They can choose how to sort and display them.

Paint Rocks: Painting rocks is a fun way to explore rocks' different shapes and textures.

One teacher covered rocks with shaving cream in a sensory tub for the children to feel and play with. The children enjoyed cleaning off the rocks too. While playing, they used lots of descriptive and mathematical language to communicate their observations.

Draw and paint pictures of rocks: Rocks have many combinations and shades of color. Drawing them or mixing paint to match their colors is a good way for children to notice details of different rocks' unique coloration.

Playdough and Rocks: Have the children use playdough or clay to create impressions of rocks by pressing them into the playdough and removing them. The impression left in the clay will give a visual representation of the rock's texture. Compare impressions of different rocks. You could play guessing games to identify which rocks were used to make each impression.



Weighing the Rocks: Put out balance scales so children can compare weights of rocks. Offer items such as counting bears, plastic counters, or small blocks so they can count how many are needed to balance with the weight of different rocks.

Design with Rocks: Bring in additional rocks and allow the children to create sculptures, designs, or patterns. Children enjoy arranging rocks in tubs of sand, and creating landscape designs. Garden, landscape and building design companies will often give donations.

➔ Reflect

- Bring the children together to share with each other about the discoveries they have been making or to show their creations to each other. Use this time to get more ideas for taking their investigations further.
- To help children reflect on their investigations and discoveries, take photos of the different rock exploration activities and display the photos in an area where the children can revisit them.

Throughout the rock investigations, you may want to take notes on the children's observations, questions, and discoveries. You can refer to your notes for further insights into their interests.

Ideas for Further Explorations

- Make a class book. Each child can illustrate a page with a drawing of their special rock and write (adult writes child's words) why it is special. The books *If You Find a Rock* by Peggy Christian or *Everybody Needs a Rock* by Byrd Baylor are great inspirations for a class book.
- Involve families by asking them to contribute rocks to include in the explorations. Having a variety and larger quantity of rocks will enhance the activities. Someone may have a crystal, fossil, or jewelry made from rocks that would make for interesting discussions.
- Provide children with tools to examine sand closely. Ask, "What is sand?" Look at sand under magnifying lenses and ask the children what they notice. What is the difference between sand and rocks? Bring in different kinds of sand. Use sifters with different sized holes to sift sand. Use damp sand to create sculptures.

Teacher Tips

Children will naturally sort and group the rocks according to different attributes. Take an interest in the ways children are making groups and help them to establish categories. Offer to help them write labels for their groups, encourage a lot of organizing, counting, and patterning.

Children can use a variety of tools while exploring rocks such as:

- Magnifying lenses to observe rocks
- Brushes to clean rocks
- Eyedroppers to drip water onto rocks
- Tongs to pick up rocks
- Balance scales to weigh rocks

Guiding Questions

- What do you notice about these rocks?
- How are they the same? How are they different?
- What different ways can you sort them? (by size, color, shape etc.)
- What kind of rocks do we have the most of? The least? How many more of this type are there?

Key Vocabulary

During the activities integrate the words below into your conversations. Children's vocabulary will build with practice.

- Rock
- Pebble
- Gravel
- Geology
- Geologist
- Weight
- Heavy/light
- Smooth/rough
- Shiny/dull
- Texture

Background Information for Teachers

Rocks are all around us - they are the mountains and canyons, they are on the ground, and found underwater. Rocks are solid, naturally occurring, and non-living. All rocks are composed of one or more minerals. For example, marble can be made of only one mineral (calcite), while granite is comprised of several minerals. Rocks have different properties including color, texture, luster (shininess), and hardness. Geologists (scientists who study rocks) group rocks into three different categories according to how they are formed: sedimentary, igneous, and metamorphic. However, through heating, squeezing, and weathering, rock is continually being created and changed into new rocks. This is called "the rock cycle."

Sedimentary rocks are formed by layers of sand, mud, and silt deposited over time and compressed.

Igneous rocks form from magma or lava from volcanoes that has cooled and hardened.

Metamorphic rocks have been changed over time by extreme pressure and heat.