Exploring rocks and minerals

Grade level	6-8
Standards	MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
Goals	▪ Students can understand how rocks and minerals hold information about the geological processes that formed them. ▪ Students can use different observation techniques to describe rocks and minerals.
Time	1 hour
# students	5-40
Materials	▪ Large rock samples brought for display ▪ Small rock and mineral samples for students to handle ▪ Streak plates ▪ Nails and/or glass slides for hardness tests ▪ A dry erase board and markers (if teaching the lesson outdoors) ▪ Hand lenses or magnifying glasses (optional) ▪ HCl for teacher/facilitator demonstration with limestone (optional) ▪ Magnets for any magnetic samples (optional)

Lesson activities

Engage

- Begin by showing the students exciting samples: for example, "lava rocks" like vesicular basalt or fossils like corals or ammonoids. Ask students to describe what they see and where they think these samples may have come from.
- Explain how we use clues that we see in the rocks to understand how they formed and where they come from.
- Point out how rocks and minerals are all around us in life. Discuss the rocks and minerals that make up the San Gabriel Mountains that we can see from our own neighborhoods.
- Show large individual minerals, like a nice quartz crystal, and ask for student observations. Explain that a crystal like this is an individual mineral, and many minerals together make a rock.

- Show a granite slab or similar as an example of a rock with many minerals making it up. Ask for student observations.
- Explain the processes through which minerals come together to form a rock.
- Ask students to suggest processes or types of energy that could move or alter rocks: for example, heating and cooling, pressure, wind, water, gravity, and pressure. Emphasize how the geological processes that move and alter rocks and minerals sometimes leave behind clues that we can see and feel in those rocks and minerals.

Explore

- Break students into groups with their own rock and mineral samples to handle.
- Encourage students to make verbal and written observations of the rocks. Students can write sentences, use charts, make drawings, or have a discussion of the interesting features of the different samples.
- Encourage students to compare and contrast different samples. Help them connect their observations to how the rocks and minerals formed.
- Bring everyone back together to talk through their observations and interpretations. Connect students' observations back to the way that rocks and minerals form and move through Earth's systems.

Optional extension activities

- Encourage walks/hikes with their family to local trails (e.g., Eaton Canyon, Arroyo Seco, or the beach). Suggest that students notice that different locations have different types of rocks and minerals, and can think about why that may be.
- Suggest websites for students to visit if they were interested in the lesson:
  https://www.amnh.org/explore/ology/earth/if-rocks-could-talk2
  https://www.mindat.org/