

Strike It Rich (SIR) teaches students about geology, specifically the geology of Sabino Canyon and the Catalina Mountains. It spices the science with some fun, as students have a chance to pan for garnets in Sabino Creek. We ask the students to observe what they see around them—the rocks, canyon, mountains, water. We orient them by giving names they might recognize to these features: Catalina Mountains, Sabino Canyon, Sabino Creek.

SIR introduces students to the study of geology and the structure of the Earth—the crust, mantle, and core.

We review the building up of the Catalina Mountains and how they are worn down by weathering and erosion. We use the hillside cliffs and boulders, cobbles, gravel, and sand in the stream channel to illustrate these principles.

We focus on the role of water (rain and snow) and how it cuts canyons, creates floods, moves sediments, and forms aquifers where groundwater is stored. We ask students to consider how they can affect the balance between replenishment and withdrawal in the aquifers that supply Tucson's water.

SIR introduces students to rocks and minerals, noting that minerals are the “building blocks” of rocks and that rocks are a combination of minerals. We review the types of rocks:

- **Igneous rock:** Called “fire rock” because it forms from molten (melted) rock that rises within the earth's crust. If the rock cools slowly underground, it forms granite. If it spews out onto the surface it is called lava. We do not see igneous rock in Sabino Canyon.
- **Sedimentary rock:** For thousands, even millions of years, weathered pieces from earth's surface wash downstream and settle to the bottom in rivers, lakes, and oceans, layer after layer. The weight of the layers pressing down turns the bottom ones into rock. There is no sedimentary rock in Sabino Canyon.
- **Metamorphic rock:** These rocks are formed when sedimentary or igneous rocks are “morphed” into a different type of rock. The original rock is subjected to pressure and heat, causing changes in the minerals and therefore in the rock itself. Metamorphic rock is in Sabino Canyon.
- **Gneiss:** The type of metamorphic rock that makes up the front range of the Catalina Mountains as seen from Tucson—called Catalina Gneiss.

We then introduce the five minerals in Catalina Gneiss:

- **Feldspar:** white to pink; opaque; reflects light in planes like a mirror
- **Quartz:** white to gray; translucent; glistens (not expressed as perfect crystals in Catalina Gneiss); hard
- **Mica:** metallic; transparent; flat sheets in tiny ‘books’ that break into shiny flakes
- **Garnet:** dark red; gem-like; hard; second heaviest mineral in Catalina Gneiss
- **Magnetite:** black; metallic but dull; magnetic; heaviest mineral in Catalina Gneiss

We ask the students to compare individual samples of pure minerals to Catalina Gneiss and understand that this is like comparing the ingredients in a cake (minerals) with a whole cake (rock).

SIR introduces the technique of panning and why it works to separate minerals (the density or “heft” of each mineral makes the heavier sink to the bottom of the pan).

SIR teaching materials include a model of the Earth and of Basin and Range mountains, rock and mineral photo cards, physical hand samples, tools for examining specimens, and authentic gold pans.