



standards based curriculum

Materials to inspire your USDA Fresh Fruit & Vegetable Program

ROCKS TO BONES

Through asking questions, constructing explanations, and engaging in arguments based on evidence, students will tell the story of how minerals in rocks moved through biogeochemical cycles to arrive in a vegetable and then into our bodies.

Intermediate & Middle Grades

Time: 20 minutes

Before you begin...

- Group students into small groups (3-5 students per group)
- **Gather materials**
 - FFV snack, including example of whole item
 - One set of story elements per group (see cards included), placed in an envelope (one set per envelope). Feel free to include a photo of today's FFV snack as the "plant" card in the story elements.

Instructions

1. Tell students you have a riddle for them: how are bones connected to rocks? Explain that you have an activity that will help them solve this riddle.
2. Assign students to groups. You can reveal the contents of the envelopes to the whole group, or let each group discover the contents on their own. Explain that students need to put each element in the envelope in order that tells a story that can explain how bones are connected to rocks.
3. Let each group wrestle with the riddle, circulating as they work. Alternatively, you can do this activity as a whole group.
4. Once groups have arrived at a conclusion, let each group explain to the class how they solved. Explore differences. Once all groups have shared, let the groups reconvene to determine if they would like to revise their thinking and story.



ROCKS TO BONES CONT...

5. Regroup and ask for any groups that revised their story to share their new thinking. All groups should eventually arrive at a story that looks something like this:
- The basis for all soil is rock (small rock)
 - Rocks weather (rain) to become sand, clay, gravel (crushed rock)
 - Sand, clay, gravel mix with organic matter (brown leaves)
 - To become soil (soil)
 - Soil is a habitat for many plants (growing vegetables)
 - Plants grow by the energy of sunlight, through a process called photosynthesis (picture of sun)
 - People eat plants (vegetable and person)
 - Nutrients and minerals from plants are used by our bodies, including calcium in our bones (bones)

Placement of the sun and rain/water can vary depending on the way students choose to tell the story (since the sun drives the water cycle and winds which cause weathering). Rocks are made of minerals, and some contain calcite (calcium). When rocks break down, the calcite goes into the soil. The plants absorb the calcite in the soil. When we consume plant contains, the calcite, in turn, becomes part of our bodies. You can say we are made of rocks. We are what we eat!

Extension

- Students can create a poster representing the processes.
- Students can identify the cycles, systems, and inputs/outputs present in the story.

Standards Alignment

Crosscutting Concepts

- Structure & Function
- Systems & System Models

Disciplinary Core Idea

- Life Science
- Earth & Space Science

Science & Engineering Practices

1. Asking questions (for science)
2. Developing and using models
4. Analyzing and interpreting data
6. Constructing explanations (for science)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information



ROCKS TO BONES CONT...

