



Rock to Apple : Soil Exploration

Grade: 5

Time: 30 minutes

Objective : Students will make the connection between their food sources and geology. They will understand that the land available for food production (**topsoil**) is limited.

Location: Garden, outdoors or open classroom space

Adapted from: Shelburne Farms *From Rock To Cheese* activity & lesson

Curriculum Connections:

Science and Technology: Understanding Earth and Space Systems:

Conservation Of Energy and Resources

Overall Expectations:

1. Analyze the immediate and long-term effects of energy and resource use on society and the environment, and evaluate options for conserving energy and resources.

Specific Expectations

1. Relating Science and Technology to Society and the Environment

1.1 Analyze the long-term impacts on society and the environment of human uses of energy and natural resources, and suggest ways to reduce these impacts.

Materials:

Note: Some of these materials are the actual item such as rock and apple or if messy in a small plastic sealed bag. Others as indicated are laminated cards.

ROCK

WIND card

GRAVEL (chunky)

GRAVEL (smooth)

SAND

CLAY (dry)

CLAY (moist)

ORGANIC MATTER

WORM card

SOIL

APPLE SEEDS

RAIN card

SUN card

APPLE SEEDLING card

APPLE TREE card

FLOWER card

BEE card

APPLE SEEDLING card

APPLE TREE WITH FLOWERS card

APPLE TREE WITH FRUIT card

APPLE

= 21 clues/samples (make extras/doubles so that larger classes can play)

Procedure:

1. Introduction: Ask a volunteer to stand up and hold the rock, and another student to stand up and hold the apple. Ask these two students to stand side by side and explain that they represent the start of the story (rock) and the end of the story (apple).

Explain that the class will have to figure out together how to complete the story “from rock to apple”: each student will be telling one step in the sequence, and will place themselves accordingly

in a circle by figuring out the sequence.

Randomly distribute the “clues” to the class – have some of them pair up if there are more students, or have multiple cards of the elements (wind, rain, sun).

2. Unscramble the steps: Now the students have to arrange themselves so that the story makes sense from start (rock) to finish (apple). They may discuss amongst themselves as they move around until the class is satisfied that the sequence makes sense.

3. Once they’ve put themselves in order, each individual or team has to explain their part of the ‘rock to apple’ story. You can start them off with “Once upon a time there was a rock...” and you can also prompt in between participants with “and then?”. While the students narrate, a teacher writes down the steps in order. If necessary (e.g. if the ordering is way off), after the kids arrange themselves and narrate, you can facilitate them to re-arrange themselves and re-tell the story.

4. Discuss how long it actually takes to get from Rock to Soil! Get the students to guess. **It takes 100 years for one inch of topsoil to form.**

Elaborate on the soil composition – soil is a mixture of rock matter, sand, clay, organic matter like dead plants and animals, and billions of micro-organisms. Soil composition is so complex, that we only know a tiny fraction (less than 1%) of the organisms that live in it. Western Science has acquired more knowledge about the surface of the moon than the earth under our feet!

Discussion questions:

Topsoil: how much is there?

-Discuss how much soil we have available to grow food on. Ask students “How much soil is there available for farming? Do you think there is a lot?” The **Apple Earth** activity will allow participants to explore these questions. **Apple Earth** uses an apple to vividly illustrate how small a percentage of our planet’s surface is actually topsoil suitable for farming.

Top soil is rich because it is full of nutrients, minerals and micro-organisms

Soil in Southern Ontario:

-Bring out a soil map to show the soil conditions in Ontario. You can ask student what the region of the map is. Show them how we live on some of the best soil in the world! The region is called the Green Belt for a good reason. Ask them to pinpoint what the lines travelling through the map are and what the circles are. i.e. paved roads, cities.

Erosion and soil conservation:

-Ask students to consider the fact that a lot of our good soil is eroding due to human activities i.e. deforestation, development etc. As we see in Southern Ontario, much of our valuable topsoil is paved over with roads, highways and cities. Why is this critical or important?

What can we do?

*-Discuss how we can respond to the shortage of topsoil. Soil conservation is one solution. But there are others! Soil creation is another. “**How do we make soil?**” You can ask the class to look again at the steps from “rock to apple” and show them that we can speed up the process by ...
COMPOSTING!*