SciGirls Activity 1
Bogs

Icebreaker
Decide which material is the real Super Soaker!

SciGirls Skill: Observing

Guide your girls as they

1) Loosely fill the first cup with potting soil, to about an inch below the lip. Weigh the cup with the soil.
2) Slowly add water to the cup of soil. Allow the water to soak in. Continue to add slowly, only until the soil seems to hold no more water. Check this by gently tipping the cup, watching for excess water to spill out. Weigh the cup, soil, and water. By subtraction of the two measurements, determine the weight (lbs) or mass (grams) of water added.
3) Repeat Steps 1 and 2, using sphagnum moss. Determine the amount of water held by the moss.
4) Repeat Steps 1 and 2, using sand. Determine the amount of water held by the sand.
5) The cups may be emptied into separate piles, and the soil, moss, or sand allowed to air dry for re-use at a later time.
6) Determine the amount of water held by each material, in reference to its original weight. You may treat the cup weight as negligible. Guide students through the calculation at right.

You'll need:

- potting soil, about 1 pound per pair of students
- sphagnum moss, from a garden supply store
- sand
- 16 oz. plastic cups, 3 per pair of students
- water
- a scale, capable of registering up to 5 pounds

Amount of water held = [(cup, soil, water weight) – (cup, soil weight)] ÷ (cup, soil weight)

Example:
Cup, soil, water weight = 3.8 lb.
Cup, soil weight = 1.6 lb.

Amount held =
(3.8 – 1.6) ÷ (1.6) = 1.4
meaning the soil holds 1.4 times its weight in water

SciGirls Suggestion: Discuss the ability of these different earth materials to retain water. Discuss how that might affect the ability of these materials to preserve something buried in them. Ask students if they think water acts to preserve or decay things. Discuss other facts, such as temperature, presence of oxygen, presence of bacteria.

Investigation

Bury Me Not!

We're Maya and Amy! We heard about a cool traveling exhibit at Pittsburgh's Carnegie Museum of Natural History called *The Mysterious Bog People*. The bog people are actually mummies! The exhibit shows how things can be preserved in a bog, but we also learned that not everything can be preserved there. We have bogs near us in Pittsburgh, so we wondered: What kind of stuff is preserved in a bog?

You'll need:

- four buckets, 5-gallon size, with lids
- sand, about 5 gallons
- sphagnum moss, about 5 gallons
- black dirt or compost, about 5 gallons
- water
- items that can decompose: for example, apples, cotton cloth swatches, leather swatches, chunks of uncooked meat, a chicken bone
- kitchen scale
- optional: latex gloves [Note: non-latex gloves are available for individuals with latex allergy.]

We took our investigation out into the field—literally! We decided to bury objects—including meat, apple, animal bones, leather, wool, and butter—in a nearby bog, in water, and in regular ground. We wondered if the bog could preserve things better than the ground or the water could. We also left the same objects exposed to the air. Then we checked the objects after two weeks and after a month to see what happened!

Find out more about this bogs investigation at pbskidsgo.org/dragonflytv/show/bogs.html. Then surf to pbskidsgo.org/dragonflytv/contact/index.html to tell us what you learned!

Check out this investigation on the SciGirls DVD. Select "Bogs" from the main menu.

SciGirls Want to Know

Get outside and observe how different materials decompose (or don't!) when buried.

Preparation steps

1) Observe and record the appearance of the apples to be buried. Look for any initial bruising. Weigh them on a kitchen scale, and write down the measurements. Keep these notes for reference when students inspect the items weeks later.
2) Fill the first bucket about halfway with sand. Place an apple in the bucket, and cover it with sand so the apple is 4-6 inches below the surface.
3) Repeat, using moss, black dirt, or plain water in the remaining buckets, burying the apple 4-6 inches below the surface. It's fine if the apple floats in the water bucket. You may also choose to moisten the sand, dirt, and moss with water, or to leave them relatively dry.
4) You may include more than one item in each bucket. That is, you can bury an apple, a piece of meat, and a cloth swatch in each of the buckets.
5) Cover the buckets, and set them outside. Allow them to stand for at least two weeks before having students inspect the contents.

Guide your girls as they

6) Dig up the apples and other items, inspect them for decay, and re-weigh them. Write down carefully your observations of how they look, feel, and smell! Note comparisons between the different environments. That is, how does an apple buried in sand compare to the one buried in moss?

SciGirls Secret

This activity has a bit of a gross factor, which some kids will love, but others may find repulsive. Remind kids that there really are scientists and investigators who deal with rotting and decaying things, such as crime scene investigators (CSIs).

SciGirls Suggestion: If the apples were buried in dry sand and moss, you will likely find that they lose weight, as they dry and shrivel. Some weight loss may also come from chunks of the apple remaining in the bucket, due to decay. Have the kids make notes about why they observe any weight changes in the apples and other items.

SciGirls Synthesize

Data and Analysis

1) Write the weight measurements of each apple into a table, looking for changes from the beginning of the experiment to the end.
2) Prepare a graph that shows how these weight measurements changed over time.

Keep Exploring!

Food scientists work hard at finding ways to prevent food from decaying. One way to preserve things is to dry them. Have kids take an apple, slice it in half, and weigh each piece on a kitchen scale. Then put one half in a plastic zipper bag and leave the other half out of the bag, exposed to the air. Next have them set the two apple slices in a dark, dry place for two weeks. Look at the apple pieces again, and weigh them. What changes do they see? The slice that lost the most weight probably dried out more. Is it preserved better than the other slice?