TurfMutt's Erosion Experiment

PSSSTTT! Hi, I'm TurfMutt—maybe you've seen me sniffing around the neighborhood lately. *Shhhhh!* ! I know I look like an ordinary dog but I'm actually a superhero and I need your help.

I've been tracking some damage caused by a real bad guy—**DUST DEMON**. Ever heard of him? He's making the soil around here disappear and polluting the air by a process called *erosion*.

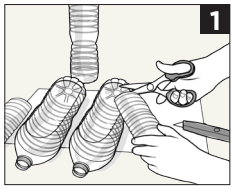
Every year Dust Demon (alongside other sources of erosion) throws dirt, pollutants, and other particles into the air, and swipes nearly 6 billion tons of soil, making it even tougher for green things to grow. Luckily, I know a thing or two about how to fight him!

Materials

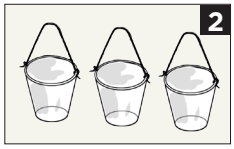
- ☐ 3 identical plastic water bottles
- ☐ 3 clear plastic cups
- ☐ potting soil
- ☐ collection of twigs, bark, leaves, and roots
- ☐ seeds for fast-growing herbs or small plants
- ☐ scissors
- ☐ twine or yarn
- ☐ water
- ☐ hole punch
- ☐ watering can

What to do

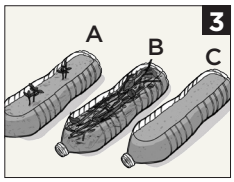
1. **Cut** off the top sections of all three bottles as shown in the illustration. (Save one of these tops to use as a cover for the bottle that contains the seeds. It will make a mini-greenhouse and help the seeds to germinate faster.)



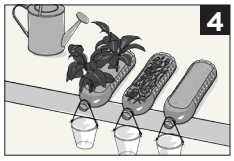
2. **Punch** holes in both sides of each cup. String the twine through the holes so that each cup becomes a tiny bucket.



3. **Fill** the three bottles with an equal amount of potting soil. Next steps:
Bottle A: Add potting soil only.
Bottle B: Add potting soil and twigs, bark, leaves, roots, and other dead or dry material.
Bottle C: Plant the seeds by pressing them lightly into the potting soil. Water them and place the bottle in a sunny spot. Once the plants have grown, continue to the next step of this experiment.



4. **Arrange** the bottles as shown and remove the caps. Hang the cups from the top of each bottle.



Science Investigation

Make a Hypothesis!

1. **Which** bottle will keep the soil in place best?
Why? _____

_____

2. **What** happens if you change the slope of the soil in the bottles? _____

_____

Report on the Results

1. **Observe** the water. What differences do you see in each of the cups that are hanging from the bottles? _____

_____

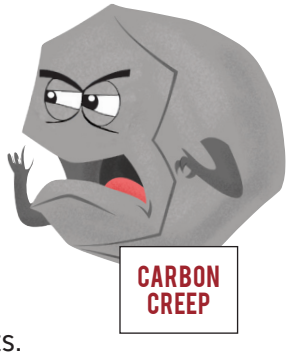
At Home

Research one of these examples of erosion to present in class:

- Wind erosion in Arizona resulting in sand tufas
- Wind and water erosion in North Carolina at the Cape Hatteras lighthouse
- Soil erosion in Iowa

Describe how erosion has changed the landscape in the example. Then answer these questions in your presentation: *What might happen over time if these conditions continue? What are humans doing to help stop erosion?*

Crush Carbon Creep!



Did you know that plants are superheroes like TurfMutt? Trees and grass absorb carbon dioxide (CO_2) through their leaves. They store the carbon and release oxygen so that CO_2 doesn't have a chance to blanket Earth and heat things up!

This map can help you get a grip on the power of plants. Imagine that when you plant a tree at a corner or an intersection, it can absorb the CO_2 all the way to the end of any straight path. (No, it can't go around corners.) Figure out where you need to plant trees in order to absorb the carbon dioxide on every path.

Use a pencil—it's harder than it looks! You'll need to plant at least six trees to cover every path.