

## INSTRUCTIONS FOR TEACHERS

### Activity 1: **Right Plant, Right Place**

#### Understanding the role grass plays in a healthy ecosystem

**Essential Question:** How does grass help keep our water and air clean and the planet cooler?

**Materials:** Student Worksheet 1 Be a Super Observer, drawing supplies, construction paper

**Time Recommended:** Two class periods

#### Engage: **Right Plant, Right Place**

- 1 **Get** students thinking about your local environment! What does it look like? What makes it unique?  
**Share** a copy of Student Worksheet 1 *Be a Super Observer* with each student and complete it together. Point out and celebrate the differences of your natural surroundings and others around the country.
- 2 **Ask** students what they know about grass. Make a list of their answers on the board and name places nearby that are grass-covered.
- 3 **Explain** the important role that native grass plays in your local ecosystem. Use the details below in a manner that is appropriate to your students' level:
  - a. **Grass Cools the Planet:** Each grass blade acts like a mini cooler, producing moisture and absorbing heat. On a really hot day, lawns can be 86 degrees Fahrenheit cooler than asphalt and 57 degrees cooler than bare soil. Read the experiment below to learn more.
  - b. **Grass Cleans Water:** Grass absorbs rainwater and can make it 10 times less acidic than water running off a hard surface. This protects our rivers and streams. We'll explore this more in Activity 2.
  - c. **Grass Cleans Air:** Grass takes carbon dioxide from the air and stores it, leaving behind the oxygen we need to breathe (photosynthesis). In the United States, turfgrass grabs and stores more than 8 million tons of carbon every year.
  - d. **Grass Makes Soil Stick:** Grass is a great defense against erosion. It holds the soil better than any other plant because of its giant root system. A single grass plant can have more than 300 feet of roots!
- 4 **Remind** students that grass is a very hard worker. The blades above the ground are important, but so are the roots. Ask: *Does grass have a few roots or lots of roots?* Remind students that a single grass plant can have more than 300 feet of roots. Also explain that grass that isn't watered as often and turns brown will spring back naturally, and may even have stronger roots than grass that is watered frequently. Why would this be helpful to the environment? What color would students expect this stronger, dryer grass to be?

#### Explore: **Find Heat Islands**

- 5 **Hold up** an outdoor thermometer and ask: *Who knows what this is? Does anyone know how it works?* Explain that a thermometer measures temperature (or how warm or cold something is). Point out the red line within the tube and the measurement lines along the side. Explain that the red line is a liquid (alcohol). As the air outside the thermometer warms up, the liquid in the tube expands and rises, making the red line rise. When the outside air is cool, the liquid contracts and the red line goes down.
- 6 **Announce** that students are now ready to find out how grass helps keep Earth cool. Explain that heat islands are bare spots like parking lots and built-up parts of cities that absorb the sun's heat and then give it off into the air. Heat islands can raise the air temperature 22 degrees above that of nearby planted, grassy areas—and increase air pollution.
- 7 **Take** students outside to demonstrate the difference a heat island can make in air temperature.
  - a. **Place** an outdoor thermometer in a sunny, paved area, away from plants and grass.
  - b. **Place** a second outdoor thermometer in a sunny, grassy area.
  - c. **Wait** 10 to 20 minutes. Record and chart the final temperatures.

#### Explain: **What Happened?**

- 8 **Ask:** *What were the results of our experiment?* (Answer: The paved area was much hotter.) *Why is the plant- and tree-covered area cooler?* (Answer: Plants and trees act like natural air conditioners producing moisture and providing shade while absorbing heat.)
- 9 **Search** for more heat islands! As homework, challenge students to work with their families to identify three more heat islands in the community.

Name \_\_\_\_\_

# BE A SUPER OBSERVER



**Woof! I'm TURFMUTT.** Did you know that grass, trees, and other plants help fight off the evil forces that attack our green Earth, our clean blue waters, and our sparkling air? It's true, and I'm here to help them. I know I look like an ordinary dog, but *shhhhh*...I'm actually a superhero!

You can help, too, but first you need to look around outside and really open your eyes.

## 1. Finish these sentences about your town or city.

My state's name is \_\_\_\_\_.

My town or city's name is \_\_\_\_\_.

Number of people who live in my town or city: \_\_\_\_\_

## 2. What changes do you observe during each season? \_\_\_\_\_

## 3. Look out your window. What do you see? Check the boxes. Remember to look near and far!

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> tall mountains                           | <input type="checkbox"/> small trees (most are smaller than houses) | <input type="checkbox"/> <b>pavement</b>                |
| <input type="checkbox"/> rolling hills                            | <input type="checkbox"/> fruit trees                                | <input type="checkbox"/> tall buildings                 |
| <input type="checkbox"/> flat plains                              | <input type="checkbox"/> green grass                                | <input type="checkbox"/> houses                         |
| <input type="checkbox"/> farmland                                 | <input type="checkbox"/> brown grass                                | <input type="checkbox"/> water (rivers, lakes, streams) |
| <input type="checkbox"/> tall trees (most are taller than houses) | <input type="checkbox"/> rocky or <b>bare</b> ground                |   |

What three things on this list do you see the *most*? Circle them.

## 4. Turn this page over and draw a picture of what you see out your window.

### WORDS TO KNOW

**bare** (adjective): not covered

**pavement** (noun): the hard top of a road or driveway