



UW-MADISON EXTENSION

SOGGY SCIENCE



Plants need water to survive and grow. Experiment with two gardening products to find out how they work to keep water close to plant roots. Which one would you use in your garden?

4-H PROJECT AREAS:

Science & Technology, Plant & Soil Science

LIFE SKILLS:

Critical Thinking, Decision Making, Learning to Learn

TIME:

30 minutes

MATERIALS:

- 9-oz. plastic cups (4 per participant or pair of participants)
- Plastic spoons (1 per participant or pair)
- Water storing crystals or gel crystals *
- Long-fibered sphagnum moss *
- Water
- ½ teaspoon measuring spoon
- 1 cup dry measuring cup
- Liquid measuring cup
- Cheesecloth (or scrap fabric works too)
- Rubber bands

* Find these in the gardening section of local department stores

PREPARE AHEAD OF TIME:

Cut cheesecloth or scrap fabric into 5 inch squares - enough for 2 per experiment.

Try the experiment yourself, so you know what to expect from the materials and the process.

Ask

What does it mean for something to “absorb” water?

What kinds of things in your home absorb water?

What happens when something absorbs too much water?

Did you know?

Gardeners use a variety of products to keep water close to the roots of their plants.

One product, long-fibered sphagnum (pronounced *sf-ag-num*) moss, is a special agricultural product. It comes back year after year, and has grown in marshes in western Wisconsin since prehistoric times, back when dinosaurs roamed the earth.

Today, it is used in gardening and farming, because it holds a lot of water - up to 20 times its weight - and kills bacteria that can make plants sick

Investigate

Show the photos of the microscopic views of two different products - long-fibered sphagnum moss and gel crystals - that gardeners use to absorb water and keep it close to plants' roots. Explain that microscopes look at things so tiny that we can't see them with our eyes.

Show youth the real products, and ask them to guess which picture goes with each product. Then ask for guesses – or hypotheses – about which one will absorb the most water.

Explain that the cells of the moss are shaped like tiny boots and water molecules can stick to the inside and outside of the cell. The gel crystals are scientifically designed to make water molecules stick to them, making them especially absorbent. Ask if this new information changes their hypothesis.



Create

Next, it is time to do a scientific experiment to test their hypothesis. Help the participants add a ½ teaspoon (flat) of gel crystals to one 9-oz. cup. Then add 1 cup (loosely-packed) moss to a second 9-oz. cup. Add ½ cup of water to each cup, stir and then let the cups sit for 5-10 minutes.

This is a great time to play an icebreaker game or have a snack, giving the children time to check on their experiments here and there.

Return to the experiment. Cover the tops of the two filled cups with the pre-cut fabric. Secure the fabric on top with a rubber band. Pour the remaining unabsorbed liquid into the extra two cups. The fabric filters the water and keeps the solid material in the cups.

Share/Reflect

Ask the participants:

Ask, What did you notice about the water you poured off?

Ask, Which product absorbed more water and held it?

Ask, Why do you think that happened?

Ask, Why might a gardener still want to use the product that absorbed less water?

After the experiment, you will probably have some dry materials left over. Consider sending a couple of scoops of each gardening product home with the children in zippered bags so they can experiment more at home.

More to Explore

Explore the neighborhood. Can you find any moss living nearby? Where does it grow?

Try mixing moss or gel crystals into the soil of a potted plant at home. Check how often the plants need to be watered, compared to other plants.

Try making Moss Graffiti. (Note: Use live moss, not the dried moss we used today.)

Relationship to 4-H...

4-H creates a safe space where youth can take what they know, develop an idea (or hypothesis) and test it out. It doesn't matter if their idea does or doesn't work. It doesn't matter if their hypothesis was or wasn't right. What *does* matter is the exploration of their ideas, trying something new, and knowing it is okay to fail sometimes. That's when the learning happens.

Resources:

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Moss or Gel Crystals?

The two pictures below are microscopic views of either long-fibered sphagnum moss or gel crystals. Microscopes look at things up close, things we can't even see with our eyes. Which one of these pictures do you think is the moss? Which is a picture of gel crystals? Why do you think so?"

