

**4-H at
HOME**



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TEST OUT HYDROPONICS

Growing plants without dirt? Learn about the strange-but-true science of hydroponics.





Test Out Hydroponics

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About the Activity

Having good soil and water are vital to having a good garden. But did you know that some plants can grow with no soil? Let's test this out by growing soybeans in a test tube with only water, and not a speck of dirt.

This activity is part of our 4-H At-Home Garden Series. See the rest of the activities here.

Supplies

These simple supplies are all you'll need for this activity. Some of these, like the seeds, you may need to find at a specialty or plant store:

- Seed-starter tray
- Plastic, flat-bottom test tubes
- Rockwool cubes
- Plant labels
- Pipette
- Permanent marker
- Soybean seeds
- Water

Grades: 3-8

Topic: STEM, Biology

Time: 30 minutes





Activity Steps

Test Out Hydroponics -

1

Gently tuck the soybean seeds in the rockwool cubes. Place them in the seed -starter tray.

DID YOU KNOW? There are three main parts to soil: sand, silt and clay. Good soil has a healthy mix of all these soil types! Rockwool is used to germinate seeds and to transplant them into hydroponic systems!

2

Carefully water them using the pipette, which can help you deliver precise amounts of water to your plant. Make sure the whole rockwool cube is moist.

DID YOU KNOW? Hydroponics is a way to grow plants using only water! Gardeners and horticulturists often mix in nutrient-rich water, instead of soil.

3

Label your plants and place them in the seed-starter tray.

4

Put the lid on the seed-starter tray and adjust the humidity.

DID YOU KNOW? Our planet Earth is sometimes called the “water planet” because most of it is covered with water. That’s good for us, because all living things need water to live. All the water on the Earth is the same water we have used over and over again, thanks to the water cycle.

5

Place your seed starter tray inside your house near a sunny window. Make sure to label your test tubes with the name of the seed and the date you planted it in the test tube.

6

The seed will take about 3-7 days for it to germinate.

7

After about one week, the seeds are ready for the next step, which is to use the pipette to draw water from a cup or a bowl and fill the test tubes.

8

Carefully place the rockwool with the seedling into the test tube. The top lip of the rockwool should rest on the edge of the test tube. You might need to add more water in the test tube, to make sure the bottom of the rockwool is touching the water.

DID YOU KNOW? The key to watering plants is being patient and gentle. Try to avoid watering the stem, leaves and flowers, and instead, direct the water at the roots. The roots are what carry the water.

9

Finally, place the test tubes back by a sunny window. Make sure to maintain the water level in your test tube so your soybeans continue to have water!

DID YOU KNOW? About 97 percent of Earth’s water is salt water and another 2 percent is locked in ice! That leaves us with only 1 percent to provide fresh drinkable water.

10

Enjoy your very own Test Tube Hydroponics!



Test Your Knowledge

See how much you've learned about seed starting and hydroponics!

QUESTION 1

Why is the planet Earth sometimes called the "water planet?"

- a. Because it rains a lot.
- b. Most of the planet is covered in water.
- c. Because everything is the color blue.

QUESTION 2

What are the 3 main parts of soil?

- a. Sand, silt, clay.
- b. Rock, dirt, water.
- c. Clay, Sand, leaves.

QUESTION 3

When watering your plant, which plant part should you water?

- a. The leaves
- b. The flowers
- c. The roots

QUESTION 4

Of all water that is found on Earth, what percent of it is fresh, drinkable water?

- a. 97%
- b. 25%
- c. 1%

QUESTION 5

What is it called when you grow plants using only water and no soil?

- a. Water System
- b. Hydroponics
- c. Irrigation system

Reflection Questions

Bonus questions to inspire wonder:

- Why does the planet Earth only have 1% fresh water?
- Why do we need water in this world?
- Do you think hydroponic gardening is a good way to feed the world?



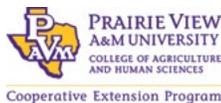
Investigate & Explore

Take your new knowledge to the next level.

The water you used to brush your teeth with this morning may have been some of the same water that rained on your great-great-grandparents' heads or that dinosaurs drank millions of years ago. All the water on the Earth is the same water we have used over and over again, thanks to the water cycle.

The next time you pour a glass of water or take a shower or bath, think about all the places that water may have been before!

Brought to you by:



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