

NATURE ACTIVITY

EXPLORING HYDROPONICS



Growing plants hydroponically provides a great way for kids to learn about science, math, engineering and technology. It also provides an introduction to plant basics, water conservation concepts, and innovative food production techniques. In this activity, kids learn how to use repurposed cartons to create fun hydroponic growing containers.

WHAT YOU'LL NEED:

- ☐ Small paper cartons (at least 2 per child)
- ☐ Looseleaf lettuce seeds
- ☐ Hydroponic nutrient solution*
- ☐ Rockwool*

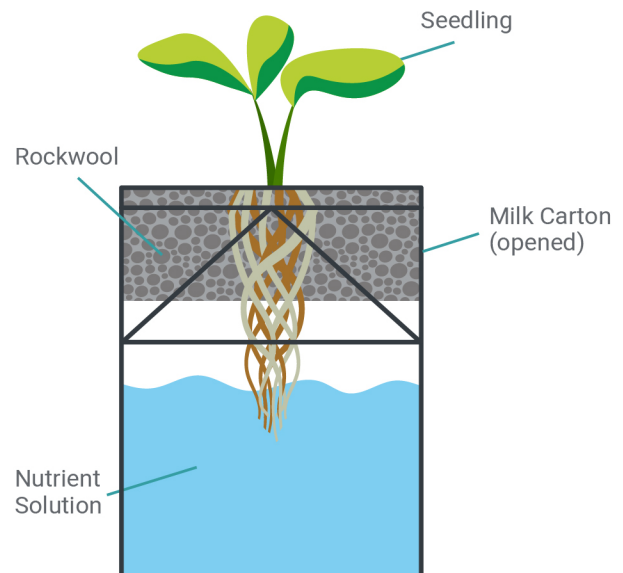
TIME: 3-4 weeks

INTRODUCTION:

Hydroponics, in its simplest form, is growing plants by supplying all necessary nutrients in the plants' water supply rather than through the soil. These alternative growing techniques have been developed to grow food plants in situations where traditional methods are challenging, such in parts of the world where space, good soil, and/or water are limited. Growing plants hydroponically helps gardeners and farmers grow more food more rapidly in smaller areas (greenhouses, living rooms, classrooms, and rooftops, for instance).

There are many different ways to grow plants through hydroponics that range from simple passive systems to very complex active set ups. To be successful, the key is for the hydroponic system to provide for all of a plant's needs, including water, nutrients, light, air, and structural support for the roots. In traditional gardening, plants get root support, nutrients, water, and oxygen from the soil. Without soil, hydroponic growers must find ways to provide water and the right balance of nutrients directly to the plants' roots.

A very simple hydroponic growing system can be made using rockwool and small paper cartons.



Follow the Nature Activity instructions on next sheet.

*Both rockwool and hydroponic nutrient solutions are available online from hydroponics suppliers



Presented by



With support from



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INSTRUCTIONS:

STEP 1

Wash and disinfect all cartons carefully. Let them dry thoroughly before using.

STEP 2

Cut rockwool into pieces sized so they will fit snugly into the cartons, and then soak the pieces of rockwool in a dilute hydroponic solution. Hydroponic nutrients are available in dried or liquid form. Most are concentrated and must be mixed with water.

Water between 65 and 75 degrees F is best. Tap water may contain significant concentrations of chlorine, which can adversely affect plant growth. If your water has a lot of chlorine, you can use distilled water or simply let water stand uncovered for a couple of days before using it. When mixing nutrient solutions, always dilute them to the concentration recommended by the manufacturer.

STEP 3

Plant lettuce seeds 1/4 inch deep in the rockwool, and then place the rockwool in a tray of dilute hydroponic water until seeds germinate, which will usually take 2 to 7 days. When using small cartons, 5 to 10 lettuce seeds per rockwool piece should be plenty. For the best success with lettuce seeds, keep tray in an environment where the temperature is about 70° F.

STEP 4

Once seeds have sprouted, move the rockwool with the seedlings to an empty carton. Each day, transfer the rockwool to a new, clean carton (you can alternate between 2 cartons, cleaning the empty one after using) and pour new nutrient solution over the rockwool into the new carton to a level that can reach the bottom of the rockwool. The reason for doing this is that roots need both air and water and this process of changing out the carton and solution daily provides them to the plants. Additionally, this process will discourage algae buildup in the solution and on the rockwool.

Any remaining diluted nutrient solution from the original carton can be used to water indoor plants or container gardens.

STEP 5

Harvest your lettuce and enjoy. Lettuce can be harvested as soon as true leaves appear. You can harvest the leaves all at one time, or harvest the largest leaves and allow the rest to keep growing, to keep plant alive for continual harvesting.

***Nutrient Disposal Caution:** Take care where you dispose of nutrient solutions. Houseplants, indoor plants, and container gardens are fine places to recycle the liquid. However, aquatic ecosystems are quite sensitive and the balance of minerals is very delicate. If there is a stream, lake, or other water source nearby, do not dispose of liquid nutrients on the ground. After disposing of any remaining solution, you can then wash, disinfect, and reuse the carton.

