

Window Gardens



Materials:

Recycled materials - water bottles work great

Duct tape, or other tape

Scissors

String

Other supplies and tools found around the house. We used a small screwdriver to poke holes.

Soil

Seeds (if you don't have soil and seeds right now, just test with water to see if your system will work)

Lesson Plan

Plants have numerous requirements that must be met in order for them to survive.

Engineers must consider the needs of plants when designing vertical farm systems.

We are going to investigate the resources plants need in order to survive, so we can engineer ways to deliver these resources in our vertical gardens.

Question: **What do plants need to stay healthy?**

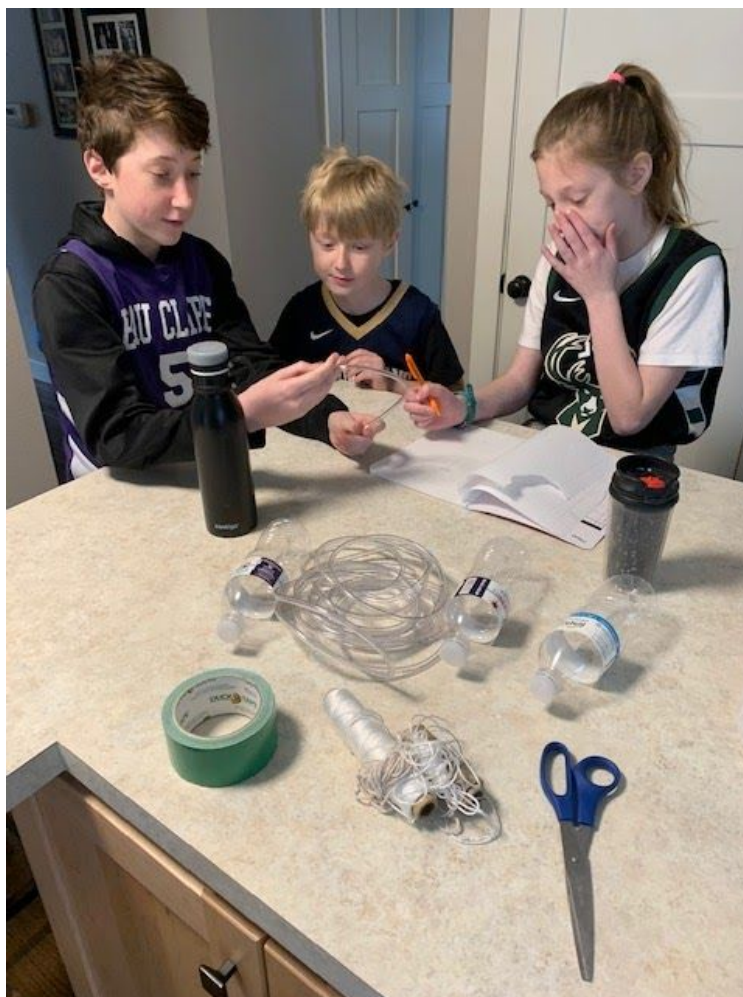
Your challenge today will be to engineer a small window garden, which is a way to grow plants that are stacked vertically so they take up very little space along the ground.

Your garden will need to hold three different plants (each in a different plastic bottle) while also being able to deliver all of the necessary resources for the plants.

Question: **How can you imagine reusing a water bottle like the one I provided to make a garden in a window? How can you minimize the horizontal area of your window garden? If the bottles are stacked on top of each other, how can you deliver water to your plants?**

Watch:

[The Windowfarms Project](#)



Window Garden Challenge

Activity 1

GOAL:

Engineer a window garden that supports three plants while using as little horizontal space as possible.

CRITERIA

Things you or your design needs to do

You will work in groups to engineer your garden.

Your garden must support 3 plants.

Your garden should take up as little horizontal space as possible.

Your garden must be able to hang on a sturdy hook or using suction cups on a pane of glass.

Your garden should be able to deliver all necessary resources for plant growth, including light and water.

CONSTRAINTS

Ways you and your design are limited

You will have three recycled bottles and can only use the available materials.

The scissors and measuring tape can be used as tools but cannot be used as a part of the structure.

You have 30 minutes to create your garden structure and 10 minutes to plant your plants.

Sketch your design

How do you imagine your window garden will work? How will you deliver water to your window garden?

Find a place to hang your garden

Test your design

If your design hangs on its own you can plant your garden using one of each kind of plant.

If your design does not work, make the needed changes.

Answer the following questions:

How are the needs of the plants being met in your design?

How did you engineer your window garden to hang above ground?

Does water reach all of the plants in your window garden?

How much space would you need if you planted these plants on the ground in a row compared to the space needed for the window garden?

I'd love to see your designs!! Email some pictures to vanessa@lilypadlab.com or share on our FB page