Build a Tree

Grade Level: K, 1, 2, 3, 4

Duration: 45- 60 minutes

Classification: Classroom, STEM Spark

Subject(s): Biology, Environmental Science, Ecology, Forestry

Categories (STEM): Science

Keywords: Design, Canopy, Habitat, Leaf

Introduction

- Summary: Learn why trees grow in certain ways through the visualization of constructing a model tree.
- Description: Students will be challenged to build a tree and understand the basic biology of trees and why trees grow the way they do in different habitats.

Online Resources: https://www.youtube.com/watch?v=Qmp2SLZHUcg

Vocabulary

- Root system: the roots constantly provide water and nutrients to the plant moving the water and nutrients up the plant.
- Tree Trunk: the tree trunk supports the crown (top) of the tree. It also is a highway for water and nutrients to go from the roots to the branches and leaves.
- Biome: community of organisms with common characteristics.
- Habitat: home and environment of a plant or animal.

Materials

Material	Quantity	Reusable?
Masking Tape	1 per 2-3 students	No
Brown Paper Grocery Bag	1 per 2-3 students	No
'10 X 6' Green tissue paper	4 per 2-3 students	No
Scissors	1 per 2-3 students	No
*Pre-Cut Cardboard Triangle	1 per 2-3 students	Yes
*'10 X 10' Square Cardboard	1 per 2-3 students	Yes
Box of Markers	8 per 2-3 student	Yes
Box of Sharpies	8 per 2-3 student	Yes

*These are base materials. Base materials are used only during longer activities.

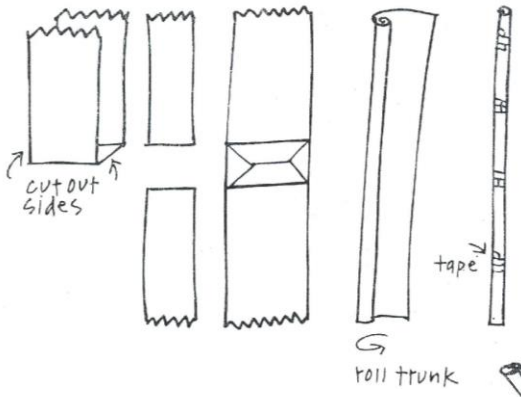
Directions

BEFORE STUDENTS ARRIVE

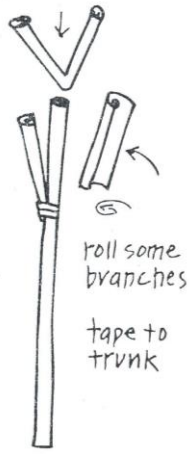
- Make an example tree
- Lay out all materials on a single desk for easy access before passing out materials to students

AFTER STUDENTS ARRIVE

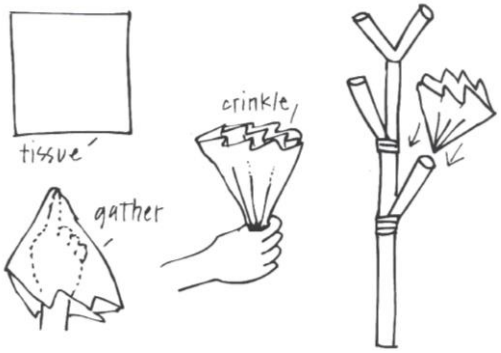
- Ask some questions to the students about trees and discuss some tree background information:
    - What do trees need to survive? (Water, soil, light)
    - Why might one tree survive while one next to it does not? (taller, deeper roots)
    - Why are the benefits of a tree being tall? Why would that be bad?



- Ask students to form groups of 2-3.
- Hand out necessary supplies to each group.
- [each group] Cut the narrow side panels out of the paper bag, save for later use. (Younger students may need help with this).
- Lay the bag out flat. Make a 1 cm fold along one long edge. (use the demo tree to help students visualize what it should look like).
- Roll the paper bag tightly around the fold to make a long, skinny tube. When finished, the tube should be tight and about 1 inch in diameter by 30 inches long.
- Tape the tube shut using short pieces along the side. This is the trunk of the tree.
- Roll one of the narrow side panels using the same method as the trunk and tape it shut.
- Bend the side panel in half and insert it into the top of the trunk to make a branch.
- Roll the second narrow panel similar to the first panel. Cut in half, then tape to the trunk to create more branches.

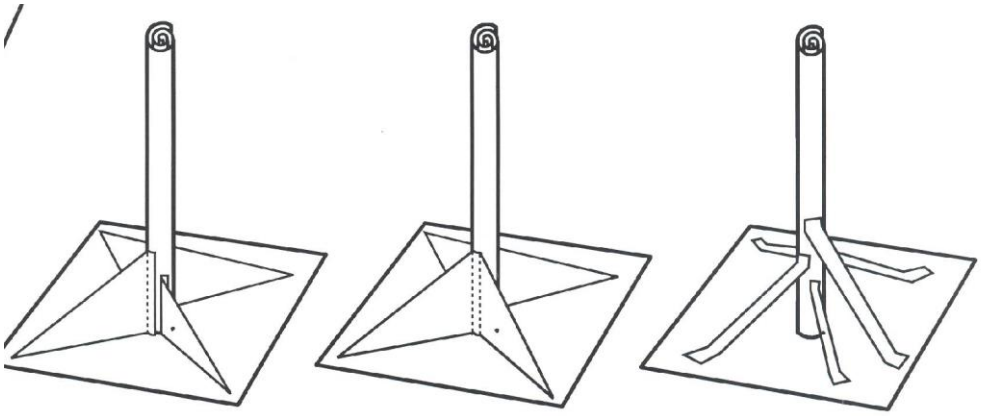


- The final step of the tree is to create leaves. Students should do this by placing an index finger on the center of the tissue paper. Gather paper around your finger to form a handle (see picture to the right – demonstrate this!). Crinkle the paper to look like leaves. Stuff into branch tubes and tape in place.



Activity Extension

- The extension to this activity is making a base to the tree.
- Hand out two cardboard triangles and one flat base to each group. Tell them to use these materials to form a base for the tree. THEY CAN FOLD THE TRIANGLES, BUT NOT CUT THEM. If there are not enough triangles, they can also use tape.



Discussion Questions

- Now that you have built a tree, what are the problems faced when building a tall tree? (more likely to fall over or break)
- Why is it good for a tree to be taller than trees around it? (gets more light, rain)
- Would it be better for a tree to grow taller or have deep roots? (they need to do both to thrive)
- What different shapes do trees come in? (round treetop -oak-, cone shaped - pine-, oval - cedar)
- Why does leaf shape matter in trees? (The larger the leaf, the more light it can collect. Trees that grow in the shade have larger leaves because there is less light in the shade)
- Why do pine trees have needles instead of big leaves? (Most pine trees do not lose their leaves in the winter. Needles help them save the water they got during warm months)
- What type of trees do you think live in these climates?
    - Artic? (cone shaped trees like pines because their needle leaves hold more water which is essential in a cold, dry climate)
    - Rainforest? (Big leaved trees to grab as much sun as they can)
    - Deciduous forest like here in Iowa? (oaks, maples, trees that drop their leaves)
    - Mountains? (pines, small trees. Except above the tree line -5,000ft- because the elevation is too high for trees to grow)

Extension discussion questions

- How do roots hold up Trees? (by stabilizing the tree under the ground like an anchor)
- What do roots do for trees? (roots absorb water and nutrients. All roots have tiny hairs which helps the plant absorb as much as they possibly can from the soil)

What is happening?

- Students will learn about tree habitat and tree growth.
- Trees are built in different ways based on the habitat in which they live.
- Trees have to be fully armed for their environment because they cannot move if they don't like their current habitat

Applications:

- Majors
  - Forestry
  - Environmental Science
  - Ecology
  - Environmental Studies
  - Biology
- Jobs
  - Biologist
  - Forest Ranger
  - Forester
  - Environmental Scientist
  - Ecologist
  - Forest Fire-fighter
- Hobbies
  - Arborist
  - Wildlife Photography
  - Log/Wood carving
- Real world applications
  - Forests are home to many species including animals, plants and fungi
  - Trees create oxygen for everyone to breathe
  - Some trees have medicinal properties