

The Many Uses of Plants

Students learn about the different materials that are made from plants as well as how important plants are to our everyday lives.

Grade Level: 4th

Phenomena:

Items we use everyday come from plants or products made from plants.

Objectives:

- Students will examine a variety of materials and determine which ones are made from plants.
- Students will describe ways that plants are used in every day life.

Materials:

- Materials made from plants: newspaper, wooden pencil, crayon, toothpicks, Peanut M n M's, paper towel, sponge (synthetic), 100% cotton towel, cinnamon, bottle of vanilla flavoring, magazine, cardboard box, stick of chewing gum, wooden chopsticks, empty can of paint, cork, rubber gloves, classroom desk, piece of cellophane, plastic comb, raisins
- Object cards
- Posters
- Student worksheet
- Plant readings

Appendixes:

- Object cards: Pages 4-5
- Student worksheet: Page 6
- Plant readings: Pages 7-8
- Plant use reference: Page 9

Time Considerations:

Preparations: 10 minutes

Lesson Time: 45-65 minutes

Introduction: 10 minutes

Activity 1: 10-15 minutes

Activity 2: 10-15 minutes

Activity 3: 10-15 minutes

Conclusion: 5-10 minutes



Next Generation Science Standards

4-LS1-1.

Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Science and Engineering Practices (SEP):

Engaging in argument from evidence.

Disciplinary Core Ideas:
Structure and Function

Crosscutting Concepts:
Systems and System Models

Excellence in Environmental Education Guidelines

Strand 2.2—The Living Environment

- C)** Learners understand basic ways in which organisms are related to their environments and to other organisms.

This lesson has been adapted from American Forest Foundation's *We All Need Trees*:

American Forest Foundation. (2008). *We All Need Trees*. In *Project Learning Tree: Pre K-8 Environmental Education Activity Guide* (pp.65-68).

Background

People use products that come from plant parts every day. When most people think of things that come from plants, they generally think of items that come from trees, such as paper. Wood provides lumber for furniture, houses, doors, clocks, cabinets and much more.

Another part of a plant that is used often is cellulose, which is the major component of most plant fiber. Paper is made from cellulose, and paper products that include books, wrappers, cereal boxes, magazines, newspapers, food labels and more.

The fruits and nuts we like to eat come from plants as do foods like chocolate and peanut butter. Without plants we wouldn't have many of our favorite candies. Even flavoring, such as vanilla, that we use for cooking, comes from plants. Many synthetic materials are also made from plants. These include, cellophane and plastics, along with synthetic sponges.

Preparation

Gather all the materials needed for each station. These items are listed in the materials section or other items that are derived from plants can be selected.

Have the object cards and enough worksheets for each student to receive one. Object cards will be used in activity 2. Worksheets will be used in activity 3.

Make two posters: one that says “Comes From Plants”, and one that says “Does Not Come From Plants” and hang posters on the wall so that they are on either side of the classroom.

Set up each station with an object and a number.

Introduction

Begin by holding up a wooden pencil and ask students where it came from?

Doing the Activity

Introduce to students the idea that many things we use every day come from plants and trees.

Let students know that today they will investigate the many uses of plants by finding out what household items we use every day actually come from plants.

Activity 1: What’s It Made Of?

Start by holding up an object card and ask the students if they think it is made from plants or not.

Demonstrate the movement of this activity: show (point out) that there is a poster on one side of the classroom that says

“Comes From Plants” and another poster on the other side of the room that says “Does Not Come From Plants”.

Instruct the students that the goal of this activity is to stand next to the poster that this object best represents (in other words, does this object come from a plant or not?)

Do this activity with each of the object cards and allow the



students to discuss their reasoning as to why they are standing where they are for each one.

Inform students the class will return to this activity at the end of the lesson to see if their opinions have changed.

Activity 2: Plant-tectives

Tell the students that in order to investigate plants and their uses, they will be doing an activity that involves groups moving freely around the room and looking at objects that may or may not be made from plants.

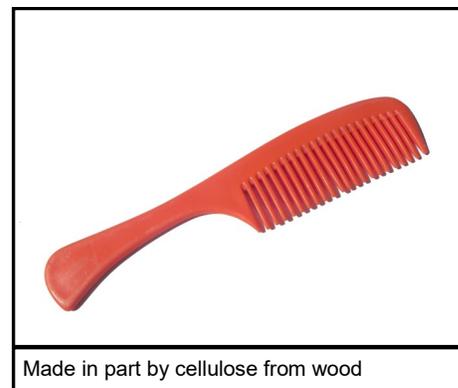
In groups of two, students will have 15 minutes to move around to as many stations as possible and decide whether the

object at that station is made from a plant or not. Note, it is best to use some of the objects from the object cards so when students repeat activity one, they will have a better idea of what items are made of.

Hand worksheets out to students. Stations are numbered. Students are to circle yes or no on their worksheet by the objects number after they have decided its origin, as well as a short reason under the explanation column. Explain that they are to only circle yes or no in the round one column for now.

When groups are finished going to each station and deciding whether or not the object is made from a plant, they are to receive their tree reading from the instructor. When students have their tree reading, they should read it out loud to each other. Then, if students choose to, they may return to objects and revise their answers based on what they read.

After students are finished with both the stations and the tree readings, allow them another



five minutes to revise their answers.

Activity 3: The Big Reveal

Go through each station, revealing whether or not the item comes from a plant. Also, allow the students to explain their answers.

Conclusion

Be sure to explain the part of the plant the object came from. Explain to the class they will be repeating the first activity: What's It Made Of? Students should all be on the "Comes From Plants" side.

Has this changed? Why or why not? Allow students to discuss their reasons. Are all of the same objects on the same side? Why or why not?

Assessment

Observe students who changed any of the items on the list or added an object after the activity

has taken place. This shows that students grasped an understanding of what the lesson was about.

Extensions

Ask students if they can name anything that doesn't come from plants in whole or in part?

Ask students to find objects in their home and make a list of five items that come from plants, and five items that are not from plants.

Ask students to collect objects from home and bring these objects back and tell the rest of the class what items come from plants and what part of the plant was used to make the product. Along with objects made from plants, have them bring one that is not.

Vocabulary

Bark: the hard covering on the outside of a tree

Cellulose: component of plant cell walls

Gum: a thick liquid from various plants

Plant Products: a product made from plant material, examples: coca, tobacco, ethanol, plant hormone, natural resin

Resin: A yellow or brown, sticky substance that oozes from pine, balsam and other trees and plants. It is used to make varnishes, lacquers, plastics, glue and rubber.

Sap: the liquid that flows through a plant, carrying water and food from one part of the plant to another

Wood: a hard fibrous substance that chiefly composes trees and bushes and is found beneath their

Sources

- American Forest Foundation. (2008). *We All Need Trees*. In *Project Learning Tree: Pre K-8 Environmental Education Activity Guide* (pp.65-68).

Images:

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**Rubber
Gloves**

**Tooth
Picks**

**Paper
Towel**

Sponge

Book

Crayon

Name: _____

Number	Object	Round 1	Round 2	Notes
1		Yes / No	Yes / No	
2		Yes / No	Yes / No	
3		Yes / No	Yes / No	
4		Yes / No	Yes / No	
5		Yes / No	Yes / No	
6		Yes / No	Yes / No	
7		Yes / No	Yes / No	
8		Yes / No	Yes / No	
9		Yes / No	Yes / No	
10		Yes / No	Yes / No	
11		Yes / No	Yes / No	
12		Yes / No	Yes / No	
13		Yes / No	Yes / No	
14		Yes / No	Yes / No	
15		Yes / No	Yes / No	
16		Yes / No	Yes / No	
17		Yes / No	Yes / No	
18		Yes / No	Yes / No	
19		Yes / No	Yes / No	
20		Yes / No	Yes / No	

How Plants are Used . . .

All land plants contain a compound called cellulose, which provides them with rigidity and support. It's the number-one component in wood. People use cellulose from wood to make a variety of products besides paper. For example, cellulose can be mixed with certain chemicals and squeezed into fibers that are used to make carpets, wigs, and fabric . . . Cellulose is also used as a key ingredient in cellophane, sausage casings, explosives, shatterproof glass, sponges, shampoo thickeners, . . . and many other products. Processed with certain chemicals, cellulose many also be used to produce molded plastics for eyeglass frames, hairbrush handles, steering wheels, and so on.



How Plants are Used . . .

“It would be hard, if not impossible, to find a part of a tree that people do not use in some way. The bark of many trees, for example, is used for many different products. Most bottle corks are made from the bark of cork oak trees . . . The spongy bark of these trees is made into bulletin boards, the inner cores of baseballs, and many other products.”

“Some trees produce saps called gums and resins that are used to make paint thinner, chewing gum, medicines, and many other products. For hundreds of years, South American Indians have extracted the sap or latex from the rubber tree to make products such as rubber-soled shoes and containers.” “Maple trees produce a sap that people turn into maple syrup”

Trees provide people with fruits and nuts such as apples, coconut, pecans, lemons, and olives, and spices such as allspice and nutmeg. Tree leaves, trunks, and other parts also provide ingredients for paints, road building materials, medicines, artificial vanilla, . . . inks and hundred of other products.”



How Plants are Used . . .

“Look around you and chances are you’ll see a lot of things made out of wood. People use wood to build houses and other buildings; to construct doors, floors, fences, and furniture, and to make many other products including bowls, boats, paddles, crates, and baskets, and baseball hats

To make wood products, people first harvest trees and process them into lumber. After the trees have been cut down, the branches are removed and they are cut into logs. Then, the logs are loaded onto trucks and transported to a sawmill.” “Depending on how the wood will be used, the trees will be cut in different ways.

What products a tree is used for depends on the type of tree it is. For example, hardwood trees such as oak and maple are often used for flooring and high quality furniture, while softwood . . . trees are usually used for papermaking, lower quality furniture, houses, and crates. Plants contain a compound called cellulose to give them rigidity and support.”



Plant Use Reference

- Newspaper – Cellulose from wood
- Wooden pencil – Wood from tree
- Crayon – Sap from tree
- Toothpicks – Wood from tree
- Peanut M&Ms – Cocoa bean and peanut
- Paper towel – Cellulose from wood
- Sponge (synthetic) - Cellulose from wood
- 100% cotton towel – Cotton plant
- Cinnamon – Cinnamon plant
- Bottle of vanilla flavoring – Vanilla plant
- Aspirin– willow bark
- Cardboard box – Cellulose from wood
- Stick of chewing gum – Sap from tree
- Wooden chopsticks – Wood from tree
- Empty can of paint – Sap from tree
- Cork – Wood from tree
- Rubber gloves – Milk from tree
- Classroom desk – Wood from tree
- Soda - high fructose corn syrup from corn
- Plastic comb – Cellulose from wood
- Raisins – Grape plant led



