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**Alaska Indoor Gardening Curriculum**

**Do You Know the Parts of Plants?**

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**Suggested Grade Levels:** K-6

**Time:** 40-45 minutes

**Teaching Goal:** Students will review what plants need to grow and learn about the Parts of Plants. They will discuss various plant parts they eat.

**Learning Objectives:**

To explore the plant life cycle by focusing on individual plant parts.

**Core Ideas:**

* Introduction to Plant Anatomy
* Plant Life Cycles
* Plant Dynamics (circulation and nutrient uptake)
* Photosynthesis
* Singing to Remember
* Recording Scientific Data
* Standardized Science Measurements
* Drawing Conclusions from Experimentation (hands-on, observation, drawing, and note-taking)

**Alaska Science Standards:** K-LS1-1, 1-LS1-1, 2-LS4-1, 3-LS4-4

**NGSS Standards:** K-LS1-1, K-ESS2-2, K-ESS3-1, 1-LS1-1, 2-LS2-1, 3-LS1-1

**Materials:**

* + Vegetable samples/salad parts (Be sure to wash all the plants ahead of time or with the students)
	+ Bowl for salad
	+ Paper towels
	+ Paper plates and utensils
	+ Cutting board and knife
	+ Tent Signs with each plant part name on them ( at end of lesson)
	+ Copies of the Plant Parts Diagram
	+ Copies of the Plant Parts Coloring page
	+ Crayons and colored pencils
	+ Plant Part Plumbing by Susan Blackaby
	+ Tops and Bottoms by Janet Stevens

**Vocabulary:**

1. *Chlorophyll:* A green pigment that captures light energy for photosynthesis.
2. *Flowers:* the reproductive part of plants.
3. *Fruits:* the fleshy substances that usually surround seeds. They protect the seeds and attract animals to eat them. This helps in seed dispersal.
4. *Leaves:* the parts of the plant where photosynthesis usually occurs—where food for the plant is made.
5. *Photosynthesis:* The process by which plants, algae, and some bacteria use sunlight, carbon dioxide, and water to make food.
6. *Roots*: anchor the plants in the soil and absorb nutrients and water that are needed by the rest of the plant.
7. *Seeds:* contain plant material that can develop into another plant.
8. *Stems:* support the upper part of the plant and act as a transport system for nutrients, water, sugar, and starches.

**Background for Teachers:**

Plants are a very important part of our lives because thousands of plants which are around are used by us to make food. Plants are some of the most amazing things in the world - they can make their own food! A plant makes its own food in a special process known as photosynthesis. Just like animals and people need food and the chance to breathe, plants do too - and plants use their roots in order to get special vitamins and nutrients from the ground that they are in. Plants also need a lot of sunshine if they are going to grow properly.

Plants start their lives as seeds. A seed needs to germinate if it is going to have the chance to grow. Water and warmth are very important for germination to occur. Once it has done this, things get really exciting as the seedling begins to grow and become a small plant. Once the plant grows enough, it will produce a flower which will be pollinated either by an animal or wind. Once pollinated, the flower will form a seed and the process starts all over again.

MostPlants have 6 different parts, all of which can be used for food. Leaves, stems, flowers, roots, seeds, and fruit. The function of the roots is to absorb and take in water available in the environment (most often soil); leaves provide surface area in which **photosynthesis** is conducted; the stem provides support for the plant and a pathway through which food and water travel within the plant. Flowers turn into fruits which most often enclose the seeds.

**Procedure:**

1. Introduction

Teach or review “What is the LAW for plants?” L.A.W. (light, air, water- best for younger students) and/or PL.A.N.T.S. (place, light, air, nutrients, thirsty, soil-best for older students).

2. Discuss the 6 plant parts, looking at examples as you go through the list:

 *Set up the plant part tents (found at the end of the lesson). Set aside a sample of one of*

*each type of plant part as you go through each so the students can examine them later.*

**Roots:** Anchor the plants in the soil and absorb nutrients and water that are needed by the rest of the plant. What roots do we eat? Root foods include carrots, radishes, beets, onions, parsnips, and turnips.

**Stem:** Stems give the plant support. The xylem and phloem within the stem distribute the water and sap throughout the plant. Leaves, flowers, and branches develop from buds on the stem. Photosynthesis can occur in the stem. Some of the stems we eat include: cacti, celery, asparagus, rhubarb, bok choy, and bananas.

**Leaves:** The parts of the plant where photosynthesis usually occurs—where food for the plant is made. The green color of leaves is from chlorophyll, a pigment that captures light energy and uses it to convert water and carbon dioxide into plant food and oxygen. Leaves we eat include lettuce, cabbage, brussel sprouts, spinach, arugula, and parsley.

\*\*Make the connection between roots, stems and leaves and the transportation of water and food throughout the plant.

**Flowers:** A flower is the part of a plant that blossoms. Flowers produce the seeds that can become new plants. They often have showy petals and fragrances to attract pollinators such as birds, bees, and other insects. Most flowers have four main parts: petals, stamen (anther and filament), pistil (stigma, style and ovary), and sepals. After flowers are pollinated and fertilized, they produce seeds in the ovary of the flower. Most plants, including many trees, grow some kind of flower. Flowers we eat include broccoli, cauliflower, artichokes, nasturtium, and squash flowers,

**Fruits:** Fruits are the fleshy substances that usually surround seeds. They protect the seeds and attract animals to eat them. Fruits we eat are tomatoes, cucumbers, peppers, apples, pears, blueberries, cherries, etc.

**Seeds:** contain plant material that can develop into another plant. This plant material is called an embryo. Seeds are covered with a protective seed coat and have one or two cotyledons. Cotyledons are the food for the baby plant until it can make its own food from light and are often the first embryonic leaves of the plant. Seeds we eat include: peanuts, cashews,

3. Sing the Parts of Plants song:

**Do You Know the Parts of Plants? Tune: Head, Shoulders, Knees, And Toes**

Do you know the parts of plants,
Parts of plants?
Do you know the parts of plants,
Parts of plants?
All kinds of plants that grow and grow and grow.
Do you know the parts of plants,
Parts of plants?

The roots hold the plant in place,
Plant in place. (2x)
The roots hold the plant in place,
Plant in place.
The roots store food and water, too.
The roots hold the plant in place,
Plant in place.

The stem move water up the plant,
Up the plant.
The stem move water up the plant,
Up the plant.
The stem brings water to the leaves.
The stem move water up the plant,
Up the plant.

The leaves soak up the sun,
Soak up the sun.
The leaves soak up the sun,
Soak up the sun.
The sun helps the plant to grow and grow and grow.

The leaves soak up the sun,
Soak up the sun.

The flower grows into a fruit,
Into a fruit.
The flower grows into a fruit,
Into a fruit.
Inside the fruit are little tiny seeds.
The flower grows into a fruit,
Into a fruit.

4. Look at the Plant Parts We Eat handout and the Plant Part Diagram

Discuss the plant parts just talked about. Let them investigate the plant parts put aside

with magnifying lenses. Let them color the plant parts page.

5**.** Eat the Plants! –Make a large salad or let them take some of each of the plant parts on a plate. Read one of the books about plant parts while they are eating. Sing the Plant Parts Song.

6. Have students take the Plant Parts Quiz (optional)

***Ending Activity (5 minutes)***

Come back together for a quick review of the plant parts. If there is time, read *Tops and Bottoms*.

**Extensions:**  Individual Plant Parts Lessons: Leaf Factory, Stems, Flower Investigation, Seeds

Alternative Parts of Plants song:

**Parts of Plants Song (Tune: Muffin Man)**

Oh, do you know the parts of plants,
The parts of plants, the parts of plants?
Do you know the parts of plants
That make them grow and grow?

The roots, they hold the plant in place,
The plant in place, the plant in place.
The roots they hold the plant in place
Soak up food and water, too.

The stem moves water up the plant,
Up the plant, up the plant.
The stem moves water up the plant
Brings water to the leaves.

The leaves soak up the rays of sun,
The rays of sun, the rays of sun.
And help the plant make food.

The flower grows into a fruit,
Into a fruit, into a fruit.

The flower grows into a fruit, which holds the tiny seeds.

Now you know the parts of plants,
The parts of plants, the parts of plants,
Now you know the parts of plants,
That make them grow and grow.

Alternative song [Listen to or singBanana Slug String Band song “Roots, Stems, Leaves. Flowers, Fruits and Seeds.”](https://bananaslugs.bandcamp.com/track/roots-stems-leaves)

**Assessment:** Please see the quiz at the end of this lesson.

**References:**

**Books:**

*The Budding Botanist (AIMS Activities Grades 3-6) Investigations with Plants*

by Evalyn Hoover, Howard Larimer, Sheryl Mercier, Michael Walsh, Dave Youngs and Beverly Tillman 2009 ISBN: 1-881431-40-1

*Plant Plumbing: A Book About Roots and Stems* (Growing Things)

by Susan Blackaby 2003 ISBN: 1-4048-0109-X; ISBN: 978-1-4048-0385-5

*Tops & Bottoms*

by Janet Stevens ISBN: 0-15-292851-0

**Websites:**

Illinois ACES College of Agricultural, Consumer and Environmental Sciences <http://www.aces.uiuc.edu/vista/html_pubs/hydro/require.html>

Gardening Know How <https://www.gardeningknowhow.com/special/children/how-plants-grow.htm>

Roots, Stems and Leaves Diagrams: <http://mandevillehigh.stpsb.org/teachersites/laura_decker/ap_roots_stems_and_leaves_diagrams.htm>

<http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/green_world/planttransportrev1.shtml>

<http://water.usgs.gov/edu/watercycletranspiration.html>

Plant Parts Diagram





**Plant Parts Quiz**

1. **Why do you think people call some foods they eat vegetables when they are really**

**fruits?**

a. They are really flowers

b. They are green

c. They come from the plant

d. Vegetables are the part under the ground

 **2**. **Why are tomatoes really a fruit, but most people call them vegetables?**

a. Because the seeds are so tiny

b. Because they are not crunchy

c. Because they have seeds on the inside surrounded by fleshy outer covering

d. Because they do not grow on trees and fruits grow on trees

 **3. How can someone decide if a plant is a vegetable or a fruit?**

a. They can look for the seeds. If the seeds are inside an outer covering it is a

 fruit.

b. They can look at the color. Fruits will be brightly colored.

c. They can look at where it is located on the plant.

d. They can tell by the size of the plant part.

 **4. Which statement is an OPINION?**

a. Fruits have a fleshy covering over the seed or seeds.

b. Fruits are better to eat than vegetables.

c. Fruits are developed from a flower.

d. Fruits are often called vegetables.

**Roots**

**Stems**

**Leaves**

**Flowers**

**Fruits**

**Seeds**