

ADVENTURES IN THE PLANT KINGDOM (LEVEL 1)

Description	Learners will explore the plant kingdom and learn about the importance of plants in our lives through different experiments and activities that will illustrate how plants behave and some of their characteristics.
Leading Question	Can you design your own plant?
Total Time Required	5.8 hours over 5 days
Subjects	Science
Supplies Required	Pen/pencil, paper, color pencils/crayons, scissors, 6 plastic bottles or 3 plastic bottles and 3 paper cups/small lightweight bowls, plant with roots, soil, leaves, water, string/thread, jar, seed, paper towels, and food coloring (optional)
Learning Outcomes	<ul style="list-style-type: none"> - Understanding how plants are living things. - Understanding the different parts of a plant and listing some of their functions. - Understanding the general life cycle of a plant. - Understanding some of the uses of plants in daily life.
Previous Learning	None
Supervision	High to medium

DAY 1

Today you will begin by understanding the characteristics of living things and how plants adapt to their environment.

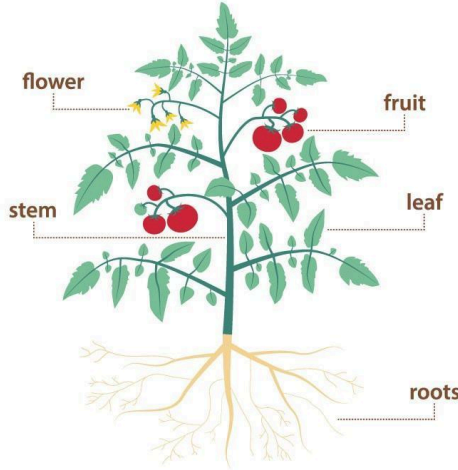
Suggested Duration	Activity and Description
10 minutes	<ul style="list-style-type: none"> - Explore your surroundings and look for examples of living and nonliving things from your home or neighborhood. - Write or draw a list of 5 living and 5 non-living things. Living: dog; non-living: book.
20 minutes	<ul style="list-style-type: none"> - In what ways are living and nonliving things different? - Everything in life can be classified as living and nonliving, and that that living things fall into either the animal kingdom (Kingdom Animalia) or the plant kingdom (Kingdom Plantae) and have certain characteristics:


	<ul style="list-style-type: none"> - They move - They breathe - They are sensitive, which means they respond to changes around them - They grow - They reproduce - They eat - They get rid of waste 								
20 minutes	<ul style="list-style-type: none"> - Create the following table in your notebooks selecting 3-4 characteristics and giving examples of how living things demonstrate it. - Use examples from the plant kingdom, but write examples from the animal kingdom if it is too challenging. <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Characteristic</th> <th>Living thing example</th> </tr> </thead> <tbody> <tr> <td>Moving</td> <td>e.g. sunflowers moving with the sun</td> </tr> <tr> <td>Breathing</td> <td>e.g. tree leaves breathing</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <p>Take a walk around your house or neighborhood with an adult and see how many plants in the form of trees, flowers, vegetables etc. you can see. Notice the different types and sizes of plants' leaves and flowers you find, and draw some of these in your notebook or paper. You can also create a "map" of all the trees and plants around you.</p>	Characteristic	Living thing example	Moving	e.g. sunflowers moving with the sun	Breathing	e.g. tree leaves breathing		
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15 minutes	<p>Numeracy extension:</p> <ul style="list-style-type: none"> ● If you have 5 roses and 3 apples, how many plants do you have in total? ● Draw a tree with 30 leaves and write numbers 1-30 on each leaf ● If you have \$10 and you bought a flower for your mother for \$5, how much money do you have left? ● Make a numbered list of all the different colors you see in trees e.g. 1) brown wood, 2) green leaves, 3) pink flowers, 4) yellow fruit etc. 								

DAY 2

Identify the main parts of a plant and understand the functions of the different parts of the plant.

Suggested Duration	Activity and Description
20 minutes	<ul style="list-style-type: none"> ● Look for a plant outside or inside your home. Pull it out of the soil gently to look at the roots and then place it back gently. Explain that below the

	<p>ground, plants have roots in the soil, that's why we can't just pick plants easily. The long part that emerges above the ground is called a stem. The stem usually has leaves. Many plants bear flowers and fruits..</p> <ul style="list-style-type: none"> ● If no plant is available, they can draw a flower, small plant or tree and label each part.  <p>Source: https://www.greenandvibrant.com/parts-of-a-plant</p>
<p>15 minutes</p>	<ul style="list-style-type: none"> ● Explore the functions of each part. Reflect on how plants, like all living things, eat and breathe. ● How do you think plants eat? Breathe? What parts do you think help them do these things? ● Plants need sunlight and water to live and eat. They use the sun's energy to make their own food, but they also eat through their roots and stem! <p>Do the following experiment to see how plant roots absorb water:</p> <ul style="list-style-type: none"> - Place 3 clear plastic or glass cups next to each other in a line - Add water to the first and last cup, leaving the middle cup empty - Bring two long pieces of paper towels and twist them to create a long thick piece - Place one end of the first paper towel in the first cup and the other end in the center cup. Do the same for the other paper towel so that the center cup has two ends of both pieces of paper towels. Your setup should look like the following:

	 <ul style="list-style-type: none"> - If you have different food coloring or colored liquids, you can pour them in the first and last cup to see a cool color change effect in the end result. You can also color or paint the two paper towels blue and yellow to see how the colors mix. - Wait for 3 hours then come back to it. What do you think will happen? - You will observe that the center cup has filled up with water from the other cups! This is how plant roots collect nutrients from the soil and deliver it to the plant for the stem to then take it upward.
<p>10 minutes</p>	<ul style="list-style-type: none"> - Think of the stability function of a root and how it allows the plant to stay firm in the ground. Draw a tree and cut it out. Then try to make it stand. - Notice that the tree falls because there is nothing attaching it to the ground. - If you tape a toothpick or small stick behind it and then stick it in a cardboard or piece of paper, it will stand. - This is what roots allow plants to do. This protects plants from flying away in the wind!
<p>15 minutes</p>	<p>Plants breathe through their leaves. Do an experiment to observe plant respiration or breathing:</p> <ul style="list-style-type: none"> - Place 2-3 fresh leaves of any plant in a glass bowl, preferably shallow - Add lukewarm or hot water to the bowl and submerge the leaves just below the surface. Make sure they stay in this position - Wait for 2-3 hours then come back to it. What happened? You should see small bubbles forming on top of the leaves. They might be too small, so get closer to the leaves. The bubbles indicate that plants produced oxygen from breathing.
<p>10 minutes</p>	<p>Write down or draw some of the functions of different plant parts. If you cannot write yet, draw a plant leaf and air to illustrate the breathing function of leaves, for example. Compare some of the functions to those performed by human body parts. For example, draw a leaf and human nose to illustrate the</p>

	parts that allow humans and plants to breathe; feet and roots can also be compared.
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DAY 3

Today you will be introduced to plant life cycles and understand some of the uses of plants for humans.

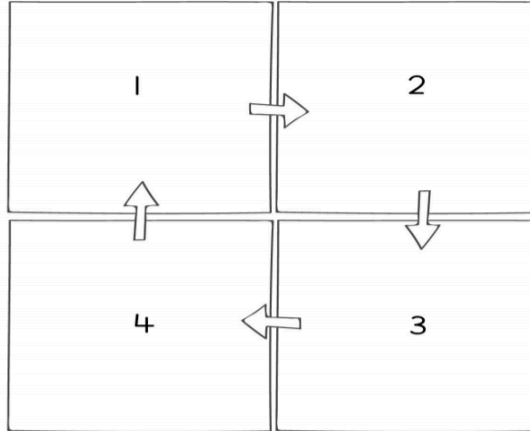
Suggested Duration	Activity and Description
10 minutes	<ul style="list-style-type: none"> Imagine what the life cycle of a plant looks like. Prompts: <ul style="list-style-type: none"> Where do plants come from? How do we grow plants such as, for example, a flower? After a plant grows out of the soil, what happens to it? How long does it stay in that form? How does a plant change with time? Explain that plants start out as seeds, then grow to plants gradually over time, and then they wilt or die. We call the process of plants growing from seeds germination or sprouting. The life cycle of a flower is as follows: seed -> root comes out of seed -> seedling grows out of the ground -> stem and leaves grow -> flowers grow -> flowers make fruits/vegetables and seeds
10 minutes	Optional: You can try to grow your own plants by sprouting pea or bean seeds in a jar and observe growth over 2 weeks. Simply push seeds down a glass jar filled with wet paper towels or tissue paper and observe how roots come out and how the seeds grow into a plant.
5 minutes	Enact the life cycle of any plant of your choice by lying down in a fetal position covered in a blanket or cover (to represent a seed), then coming out of the cover to represent the plant after it grows. You can extend your arms gradually to represent the stem developing branches. Finally, you can tilt forward or the side to represent wilting or the end of the life cycle.
20 minutes	<ul style="list-style-type: none"> Create a labeled plant life cycle illustration from seed to plant: <ul style="list-style-type: none"> Draw the stages of plant life for a flower – 1. seed, 2. rooting seed, 3. small plant with leaves, 4. adult plant with flowers and fruit/vegetables Color and cut out these drawings using a pair of scissors Draw four big boxes and label them 1-4. These should be big enough to put the drawings inside Decide which drawing should go on each box. The box labeled 1 should have the seed drawing inside because that is the first stage in a flower’s life cycle. Continue placing the other drawings in the other boxes. You can glue, tape, or staple them in the boxes

- Label each box as seed, sprout, plant, or flower

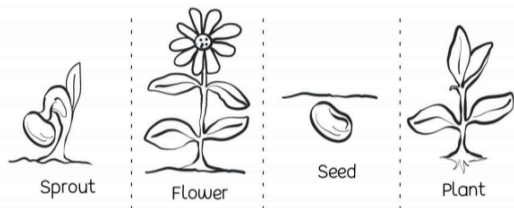
Life Cycle of a Plant

Color and cut out the pictures and paste them in order

Name _____



www.cleverlearner.com



Source:

<http://cleverlearner.com/science/images/life-cycle-of-a-plant-preschool-worksheets.pdf>

If this is too challenging, simply draw three diagrams for the different stages of plant life – seed, small plant, tree or seed to flower for an even simpler diagram.

10 minutes

Now think of some of the uses of plants in our lives. Create the following table in your notebooks to see how plants are used in our daily lives. Use the help of an adult in completing the table. Write the plant in one column and its use in the other. An example has been done in the table below:


Plant	Use
Orange	Eating

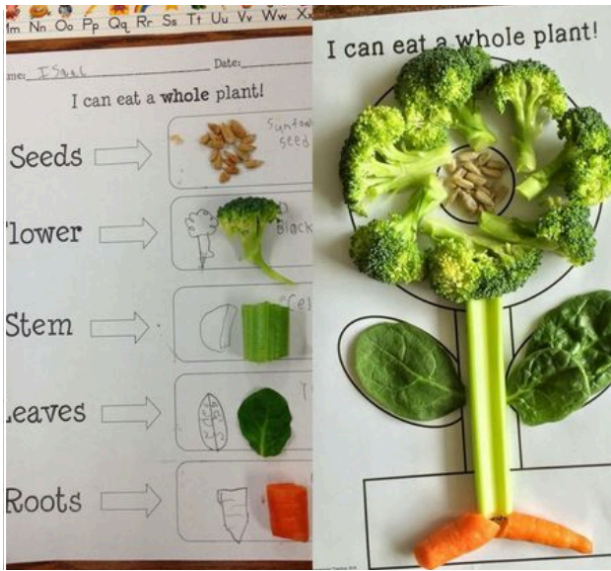
Present your table of uses of plants to humans to family members/class for feedback.

	<p>Family feedback will include:</p> <ul style="list-style-type: none"> - What they loved about about the table of uses and the presentation? - What could be improved? - Any other suggestions for improvement <p>Use the feedback to revise your table of uses of plants to humans</p>
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Day 4

Today you will create your own plant model and share it with your family.

Suggested Duration	Activity and Description
20 minutes	<p>Now you will create a typical plant like a flower or design your own plant. You can first draw a few flowers you like, then think about how to design your own flower. For your own plant, think of the following:</p> <ul style="list-style-type: none"> ● A creative name for your plant ● How the plant eats ● Whether the plant has a flower or just leaves ● The colors of each part ● The kind of environment or country the plant grows in
20 - 30 minutes	<p>Either draw and color the plant or create 3D models such as the following, making sure that each part of the plant is labeled (flower, stem, leaves, and root):</p> 

	<p>Write one word under each label to illustrate the function of each part. For example, you can write breathing next to the leaves.</p> <p>Source: https://www.pinterest.com/pin/348395721166351529/</p>
<p>30 minutes</p>	<p>Optional: Did you know that some of the fruits and vegetables we eat come from different parts of the plant? Carrots are actually roots and grow under the ground! Create an edible flower model with the help of an adult to show we eat different parts of plants. Look in your kitchen for examples of vegetables and fruits that come from different parts of plants or you can purchase some of these next time you go grocery shopping. Suggestions:</p> <ul style="list-style-type: none"> • Flower: broccoli, cauliflower, artichoke, strawberries • Stem: celery, asparagus, spring onions • Leaves: spinach, lettuce, kale, rocca/arugula • Root: sweet potatoes, carrots, ginger, beetroot <p>Draw an outline of a flower and ask an adult to cut the vegetables and fruits into small parts so they can be placed on the outline as shown below. You may even include seeds such as pumpkin seeds, pistachios, walnuts, or cashew nuts:</p>  <p>Source : https://www.pinterest.com/pin/27232772726599701/</p>
<p>10 minutes</p>	<p>Present your plant models to family members/class for feedback. Family feedback will include:</p> <ul style="list-style-type: none"> - What they loved about about the plant model and the presentation? - What could be improved - Any other suggestions for improvement

	Use the feedback to revise your plant model.
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Additional Enrichment Activities	<ul style="list-style-type: none"> • Learners can do an experiment to observe how the stem transports water upward. Place a lettuce leaf in a cup filled with colored liquid (or add food coloring to water). Observe how the leaf turns into the color of the liquid after a few hours. • Learners can experiment with 3 different set ups to see what plants need to grow. They will insert a wet paper towel in 2 jars and place a seed inside each one. In another jar, they will place dry paper towels. They will then place one of the jars with wet paper towels and the jar with dry paper towels in the sun, and leave one of the jars with wet paper towels in a dark place. Learners will check back in a week to see the progress of the seeds. They will find that the jar with water which was placed in the sun was the only one that grew a sprout, which means that water and light are necessary for plant growth.
Modifications for Simplification	Learners can limit the activities to a labelled figure of plant parts and write a few words to signify the different uses humans have for plants and finally designing their own plant.

ASSESSMENT CRITERIA

A majority of my learners were able to:

- Accurately label parts of plants.
- Accurately label plant life cycle.
- Critically think and identify the uses of plants in daily life.
- Create and label a 3D or 2D plant model.
- Reflect on the differences between different types of plants.