

## ADVENTURES IN THE PLANT KINGDOM (ALL AGES)

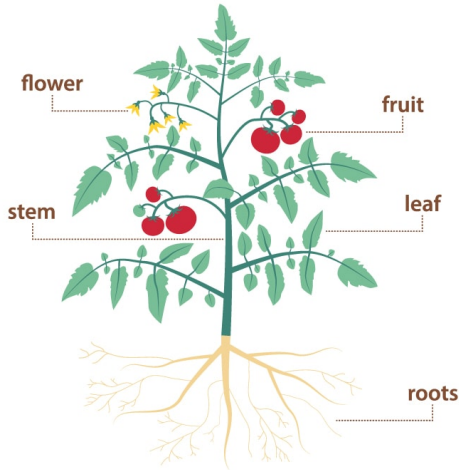
Ages 4 to 7 (Level 1)


<b>Description:</b>	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.
<b>Leading question:</b>	Can you design your own plant?
<b>Age group:</b>	4-7
<b>Subjects:</b>	Science
<b>Total time required:</b>	4 hours over 4 days
<b>Self-guided / Supervised activity:</b>	High supervision
<b>Resources required:</b>	Pen/pencil, paper, color pencils/crayons, leaves, water, plastic/paper cups, paper towels and food coloring (optional)

Day	Time	Activity and Description			
1		Learners will understand the characteristics of living things and how plants look like in different environments.			
	25 minutes	Learners will explore their surroundings and look for examples of living and non-living things from their homes or neighborhood. They will write or draw a list of 5 living and 5 non-living things, e.g. living – dog, non-living – book. Learners can be given prompts to encourage them to understand that plants are living things. For example, point to a houseplant, tree, bush etc. and ask the learner whether that is a living or non-living thing.			
	20 minutes	Explain that everything in life can be classified as living and non-living, and that living things have certain characteristics: <ul style="list-style-type: none"><li>• They move</li><li>• They breathe</li><li>• They are sensitive, which means they respond to changes around them</li><li>• They grow</li><li>• They reproduce or have babies</li><li>• They eat</li><li>• They get rid of bodily waste</li></ul>			
	20 minutes	Learners will create the following table in their notebooks selecting 3-4 characteristics and giving examples of how living things demonstrate it. Encourage learners to use examples from the plant kingdom, but allow them to write examples from the animal kingdom if this is too challenging. <table border="1"><thead><tr><th>Characteristic</th><th>Living thing example</th></tr></thead><tbody><tr><td> </td><td> </td></tr></tbody></table>	Characteristic	Living thing example	
Characteristic	Living thing example				

EAA welcomes feedback on its projects in order to improve, please use this link:

<https://forms.gle/LGAP9k17fMyJrKJN7>

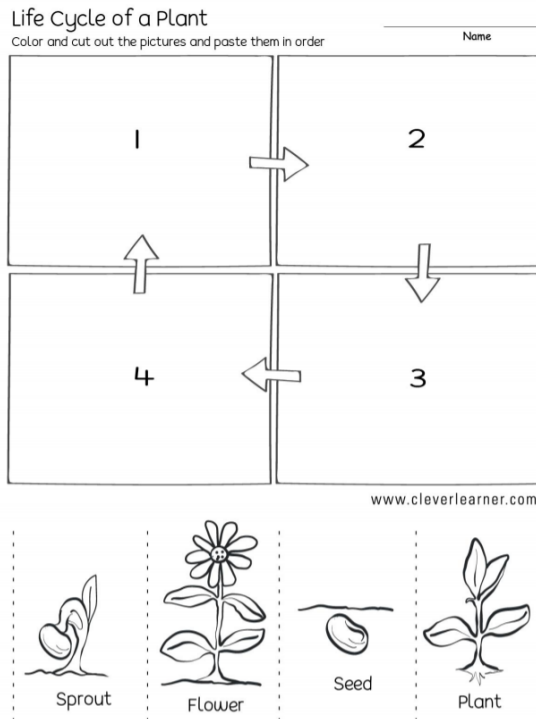
		Moving	e.g. sunflowers moving with the sun
		Breathing	e.g. humans breathing air
	10 minutes	<p>Learners will take a walk around their house or neighborhood with an adult and see how many plants in the form of trees, flowers, vegetables etc. they can see. They will notice the different types and sizes of plants' leaves and flowers they find, and draw some of these in their notebook or paper. They can also create a "map" of all the trees and plants around them.</p> <p>Numeracy extension:</p> <ul style="list-style-type: none"> <li>• If you have 5 roses and 3 apples, how many plants do you have in total?</li> <li>• Draw a tree with 30 leaves and write numbers 1-30 on each leaf</li> <li>• If you have \$10 and you bought a flower for your mother for \$5, how much money do you have left?</li> <li>• 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.</li> </ul>	
2	20 minutes	<p>Learners will identify the main parts of a plant and understand how plants change with time.</p> <p>Learners will look for a plant outside or inside their homes. Learners can pull it out of the soil gently to look at the roots and then place it back gently. Explain that below the ground, plants have <b>roots</b> in the soil, that's why we can just pick plants easily. The long part that emerges above the ground is called a <b>stem</b>. The stem usually has <b>leaves</b>. Many plants bear <b>flowers</b> and <b>fruits</b>.</p> <p>If no plant is available, they can draw a flower, small plant or tree and label each part.</p>  <p>Source: <a href="https://www.greenandvibrant.com/parts-of-a-plant">https://www.greenandvibrant.com/parts-of-a-plant</a></p>	

15 minutes	<p>Learners will now explore the functions of each part. They will reflect on how plants, like all living things, eat and breathe. Ask the learner – how do you think plants eat? Breathe? What parts do you think help them do these things?</p> <p>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 <b>roots and stem</b>! Learners will do the following experiment to see how plant roots absorb water:</p> <ul style="list-style-type: none"> <li>Place 3 clear plastic or glass cups next to each other in a line</li> <li>Add water to the first and last cup, leaving the middle cup empty</li> <li>Bring two long pieces of paper towels and twist them to create a long thick piece</li> <li>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:</li> </ul>  <ul style="list-style-type: none"> <li>If you have different food coloring or a 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.</li> <li>Wait for 3 hours then come back to it. What do you think will happen?</li> <li>You will observe that the center cup has filled up with water from the other cups! This is how plant <b>roots</b> collect nutrients from the soil and deliver it to the plant for the <b>stem</b> to then take it upward.</li> </ul>
10 minutes	<p>Learners can also think of the stability function of a root and how it allows the plant to stay firm in the ground. They can draw a tree and cut it out. They will then try to make it stand. They will notice that the tree falls because there is nothing attaching it to the ground. If they 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>Plants breathe through their leaves. Learners will do an experiment to observe plant <b>respiration</b> or breathing:</p>

	10 minutes	<ul style="list-style-type: none"> <li>Place 2-3 fresh leaves of any plant in a glass bowl, preferably shallow</li> <li>Add lukewarm water to the bowl and submerge the leaves just below the surface. Make sure they stay in this position</li> <li>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.</li> </ul> <p>The learner will write down or draw some of the functions of different plant parts. If learners cannot write yet, they can draw a plant leaf and air to illustrate the breathing function of leaves, for example. Learners can compare some of the functions to those performed by human body parts. For example, they will draw a leaf and human nose to illustrate the parts that allow humans and plants to breathe; feet and roots can also be compared.</p>
3	10 minutes	<p>Learners will be introduced to plant life cycles and understand some of the uses of plants for humans</p> <p>Learners will imagine what the life cycle of a plant looks like. Prompts:</p> <ul style="list-style-type: none"> <li>Where do plants come from? How do we grow plants, for example, a flower?</li> <li>Explain that plants start out as seeds, then grow to plants gradually over time, and then they wilt or die. The life cycle of a flower is as follows: <b>seed -&gt; sprout (seed with some roots coming out) -&gt; plant (stem with leaves) -&gt; flower</b>. If this is too advanced, learners will be told that the stages are seed -&gt; small plant -&gt; tree.</li> <li>Learners will look in their kitchen for different seeds and compare their size. This is how plants start out.</li> </ul>
	10 minutes	<p>Optional: Learners can try to grow their 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.</p>
	5 minutes	<p>Learners will enact the process of plant development by laying down in 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, and finally tilting forward or the side to represent wilting or the end of the life cycle. They can extend their arms gradually to represent the stem developing branches</p>
	20 minutes	<p>Learners will create a labeled plant life cycle from seed to plant similar to the example below:</p> <ul style="list-style-type: none"> <li>Draw four stages of plant life for a flower – seed, sprout, plant, flower</li> <li>Color and cut out these drawings using a pair of scissors</li> <li>Draw four big boxes and label them 1-4. These should be big enough to put the drawings inside</li> </ul>

- 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

Example:



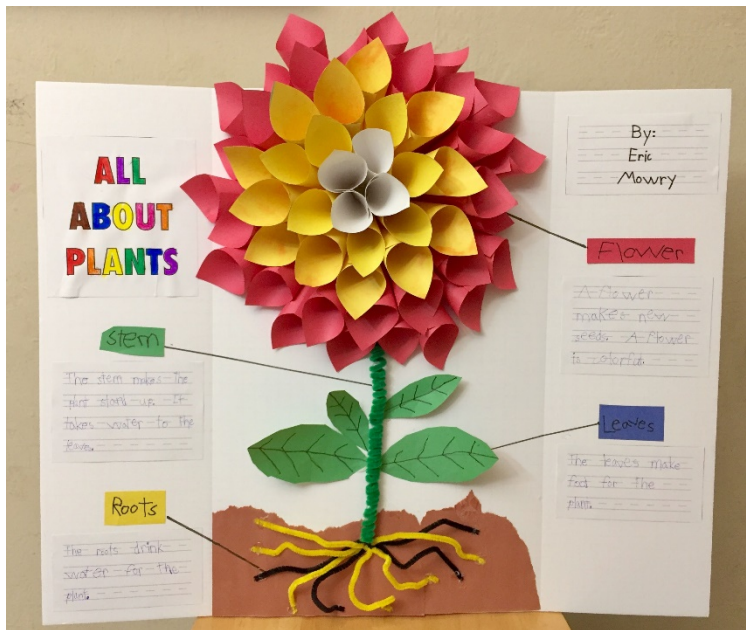
Source: <http://cleverlearner.com/science/images/life-cycle-of-a-plant-preschool-worksheet.pdf>


If this is too challenging, learners can simply draw three a diagram with stages of plant life – seed, small plant, tree or seed to flower for an even simpler diagram.

Learners will now think of some of the uses of plants in our lives. The learner will create the following table in their notebooks to see how plants are used in our daily lives. Learners can use the help of an adult in completing the table. They will write the plant in one column and its use in the other. An example has been done:

Plant	Use
Orange	Eating

4 Learners will create their own plant model and share it with their family

	<p>20 minutes</p> <p>20-30 minutes</p>	<p>Learners can create a typical plant like a flower or design their own plant. They can first draw a few flowers they like, then think about how to design their own flower. For their own plant, Learners will think of the following:</p> <ul style="list-style-type: none"> <li>• A creative name for their plant</li> <li>• How the plant eats</li> <li>• Whether the plant has a flower or just leaves</li> <li>• The colors of each part</li> <li>• The kind of environment or country the plant grows in</li> </ul> <p>Learners will then 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>Learners will write one word under each label to illustrate the function of each part. For example, they can write breathing next to the leaves.</p> <p>Source: <a href="https://www.pinterest.com/pin/348395721166351529/">https://www.pinterest.com/pin/348395721166351529/</a></p> <p>Optional: did you know that some of the fruits and vegetables we eat come from different parts of plant? Carrots are actually roots and grow under the ground! Learners can create an edible flower model with the help of an adult to show we eat different parts of plants. Learners will look in their kitchen for examples of vegetables and fruits that come from different parts of plants or they can purchase some of these next time they go grocery shopping. Suggestions:</p> <ul style="list-style-type: none"> <li>• Flower: broccoli, cauliflower, artichoke, strawberries</li> <li>• Stem: celery, asparagus, spring onions</li> </ul>
	<p>30 minutes</p>	

	10 minutes	<ul style="list-style-type: none"> <li>Leaves: spinach, lettuce, kale, rocca/arugula</li> <li>Root: sweet potatoes, carrots, ginger, beetroot</li> </ul> <p>The learner will 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. The learner may even include seeds such as pumpkin seeds, pistachios, walnuts, or cashew nuts:</p>  <p>Source : <a href="https://www.pinterest.com/pin/27232772726599701/">https://www.pinterest.com/pin/27232772726599701/</a></p> <p>Learners will share their model(s) with their families</p>
Assessment Criteria:		<ul style="list-style-type: none"> <li>- Accurately labeled plant parts figure</li> <li>- Accurately labeled plant life cycle figure</li> <li>- Critical thinking in identifying plant uses in daily life</li> <li>- Creative and labeled 3D or 2D plant model</li> <li>- Reflection on the differences between different types of plants</li> </ul>

Learning outcomes:	<ul style="list-style-type: none"> <li>- Understanding how the plants are living things</li> <li>- Understanding the different parts of a plant and listing some of their functions</li> <li>- Understanding the general life cycle of a plant</li> <li>- Understanding some of the uses of plants in daily life</li> </ul>
Required previous learning:	Ability to read and write at Kindergarten level
Inspiration:	<a href="#">How do plants breathe activity for kids</a> <a href="#">Magical Color Transfer</a>
Additional enrichment activities:	<ul style="list-style-type: none"> <li>- 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.</li> </ul>









	<p>- 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.</p>
Modifications for simplification	<p>Learners can limit the activities to a labeled figure of plant parts and write a few words to signify the different uses humans have for plants and finally designing their own plant.</p>

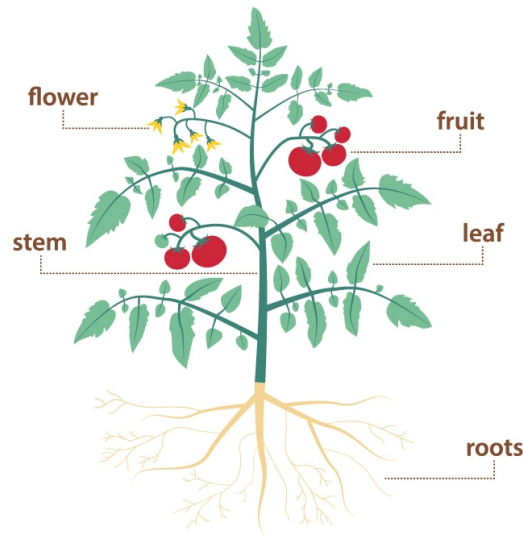


## Ages 8 to 10 (Level 2)

<b>Description:</b>	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.
<b>Leading question:</b>	Can you design your own plant?
<b>Age group:</b>	8-10
<b>Subjects:</b>	Science
<b>Total time required:</b>	5.8 hours over 5 days
<b>Self-guided / Supervised activity:</b>	Medium supervision
<b>Resources required:</b>	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)

Day	Time	Activity and Description							
1		Learners will understand the characteristics of living things and how plants adapt to their environment.							
	15 minutes	Learners will explore their surroundings and look for examples of living and non-living things from their homes or neighborhood. They will write a list of 10 living and 10 non-living things, e.g. living – dog, non-living – book. Learners can be given prompts to encourage them to understand that plants are living things. For example, point to a houseplant, tree, bush etc. and ask the learner whether that is a living or non-living thing.							
	20 minutes	Explain that everything in life can be classified as living and non-living, and that living things have certain characteristics: <ul style="list-style-type: none"><li>• They move</li><li>• They breathe</li><li>• They are sensitive, which means they respond to changes around them</li><li>• They grow</li><li>• They reproduce</li><li>• They eat</li><li>• They get rid of waste</li></ul>							
	20 minutes	Learners will create the following table in their notebooks and give examples of how living things demonstrate all these characteristics. Encourage learners to use examples from the plant kingdom. <table><tr><td>Characteristic</td><td>Living thing example</td></tr><tr><td>Moving</td><td>e.g. sunflowers moving with the sun</td></tr><tr><td>Breathing</td><td>e.g. humans breathing air</td></tr><tr><td></td><td></td></tr></table>	Characteristic	Living thing example	Moving	e.g. sunflowers moving with the sun	Breathing	e.g. humans breathing air	
Characteristic	Living thing example								
Moving	e.g. sunflowers moving with the sun								
Breathing	e.g. humans breathing air								

	15 minutes	<p>Learners will reflect on the different types of plants they know and list some of them, making sure to diversify examples to include trees, flowers, vegetables etc.</p> <p>Learners will then draw some plants they are familiar with from their own city or country, as well as examples of other plant that grow in at least 3 other different environments. Learners can see appendix 1 for examples. Example:</p> <table border="1"><thead><tr><th>Plant</th><th>Environment</th></tr></thead><tbody><tr><td></td><td></td></tr></tbody></table> <p>Note: if this is too challenging, learners can simply create a “map” of all the trees or plants around them.</p> <p>Numeracy extension:</p> <ul style="list-style-type: none"><li>• If there are only 2 parks in a city and each have 32 trees, how many trees does the city have in total?</li><li>• A forest has 100 trees. The local furniture factory cuts down 3 trees then plants 5 trees in this forest. How many trees does the forest now have?</li><li>• If you have \$40 and flowers cost \$2 each, how many flowers can you buy for your mother?</li></ul>	Plant	Environment		
Plant	Environment					
						
2	20 minutes	<p>Learners will identify the main parts of a plant and understand how plants change with time.</p> <p>Learners will look for a plant outside or inside their homes. Learners can pull it out of the soil gently to look at the roots and then place it back gently. Explain that below the ground, plants have <b>roots</b> in the soil, that’s why we can just pick plants easily. The long part that emerges above the ground is called a <b>stem</b>. The stem usually has <b>leaves</b>. Many plants bear <b>flowers</b> and <b>fruits</b>.</p> <p>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>

15  
minutes

Learners will now explore the functions of each part. They will reflect on how plants, like all living things, eat and breathe. Ask the learner – 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**! Learners will do the following experiment to see how plant roots absorb water:

- 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:



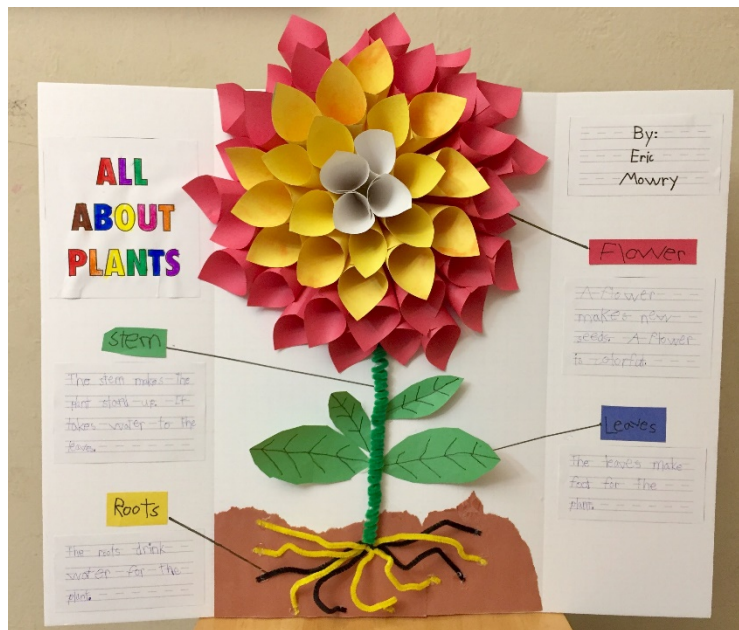
	10 minutes	<ul style="list-style-type: none"> <li>If you have different food coloring or a colored liquids, you can pour them in the first and last cup to see a cool color change effect in the end result. You can also color or paint the two paper towels blue and yellow to see how the colors mix.</li> <li>Wait for 3 hours then come back to it. What do you think will happen?</li> <li>You will observe that the center cup has filled up with water from the other cups! This is how plant <b>roots</b> collect nutrients from the soil and deliver it to the plant for the <b>stem</b> to then take it upward.</li> </ul> <p>Learners can also think of the stability function of a root and how it allows the plant to stay firm in the ground. They can draw a tree and cut it out. They will then try to make it stand. They will notice that the tree falls because there is nothing attaching it to the ground. If they tape a toothpick or small stick behind it and then stick it in a carboard 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>Plants breathe through their leaves. Learners will do an experiment to observe plant <b>respiration</b> or breathing:</p> <ul style="list-style-type: none"> <li>Place 2-3 fresh leaves of any plant in a glass bowl, preferably shallow</li> <li>Add lukewarm water to the bowl and submerge the leaves just below the surface. Make sure they stay in this position</li> <li>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.</li> </ul> <p>To recap:</p> <ul style="list-style-type: none"> <li>Roots provide stability and collect nutrients from the soil</li> <li>The stem transports nutrients upward from the root to the rest of the plant</li> <li>Leaves use sunlight and the nutrients collected by the root and transported by the stem to make food for the plant (in the form of glucose, which is a type of sugar like the one we eat)</li> </ul>															
	10 minutes	<p>The learner will write down or draw some of the functions of different plant parts and compare them to human body parts responsible for those functions.</p> <table border="1"> <thead> <tr> <th>Function</th><th>Plant part</th><th>Human body part</th></tr> </thead> <tbody> <tr> <td>e.g Breathing</td><td>Leaves</td><td>Lungs, nose</td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td></tr> </tbody> </table>	Function	Plant part	Human body part	e.g Breathing	Leaves	Lungs, nose									
Function	Plant part	Human body part															
e.g Breathing	Leaves	Lungs, nose															
3	10 minutes	<p>Learners will be introduced to plant life cycles and understand some of the uses of plants for humans</p> <p>Learners will imagine what the life cycle of a plant looks like. Prompts:</p>															

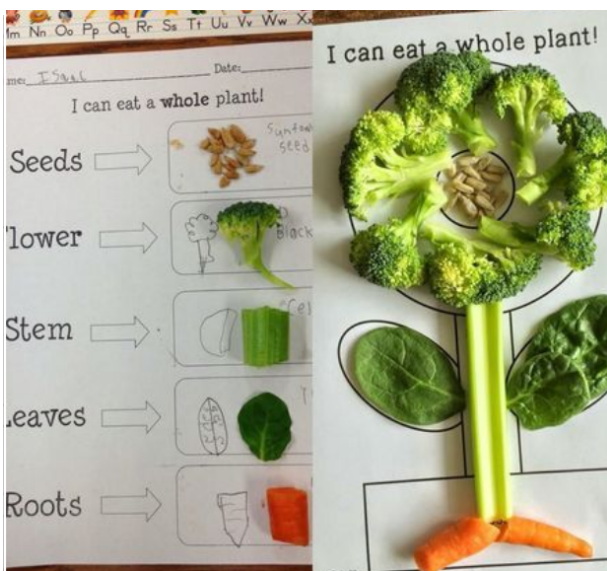
		<ul style="list-style-type: none"> <li>Where do plants come from? How do we grow plants, for example, a flower?</li> <li>After a plant grows out of the soil, what happens to it? How long does it stay in that form?</li> <li>How does a plant change with time?</li> <li>Explain that plants start out as seeds, then grow to plants gradually over time, and then they wilt or die. We call plants growing from seeds <b>germination or sprouting</b>. The life cycle of a flower is as follows: <b>seed -&gt; root comes out of seed -&gt; seedling grows out of the ground -&gt; stem and leaves grow -&gt; flowers grow -&gt; flowers make fruits/vegetables and seeds</b></li> </ul>
5 minutes		<p>Learners will enact the life cycle of any plant of their choice by lying down in 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, and finally tilting forward or the side to represent wilting or the end of the life cycle. They can extend their arms gradually to represent the stem developing branches</p>
20 minutes		<p>Learners will create a labeled plant life cycle from seed to plant:</p> <ul style="list-style-type: none"> <li>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</li> <li>Color and cut out these drawings using a pair of scissors</li> <li>Draw four big boxes and label them 1-4. These should be big enough to put the drawings inside</li> <li>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</li> <li>Next to each box, write a sentence about this stage of a plant's life</li> </ul> <div data-bbox="418 1297 954 1711" data-label="Diagram"> </div> <p>Source: <a href="https://www.tes.com/lessons/RabEFf_WxRBnw/life-cycle-of-a-bean">https://www.tes.com/lessons/RabEFf_WxRBnw/life-cycle-of-a-bean</a></p> <p>Note: Learners can choose to simply draw a labeled diagram of the life cycle of any plant of their choice.</p>

	20 minutes	<p>Learners will observe the life cycle of a plant firsthand! They will try to grow their own plants by sprouting pea or bean seeds in a jar and observe growth over 2 weeks:</p> <ul style="list-style-type: none"> <li>• Bring a glass jar, some paper towels/cotton, water and a seed of a plant like mung, beans or peas</li> <li>• Fill the jar with wet paper towels or tissue paper but make sure that the jar itself is not filled with too much water</li> <li>• Push the seeds down between the tissues and bring it to the side of the jar so you can have a clear view of how it grows</li> <li>• What do you think will happen? Observe how after two weeks, roots start to come out and how the seeds grow into a plant!</li> </ul>  <p>Source: <a href="https://littlebinsforlittlehands.com/seed-jar-science-experiment-kids/">https://littlebinsforlittlehands.com/seed-jar-science-experiment-kids/</a></p> <p>Note: learners may also plant the seeds in soil if that is available</p>
	20 minutes	<p>Learners will now think of some of the uses of plants in our lives. The learner will write a paragraph or poem about how plants are used in our daily lives – from when we wake up to when we go to bed. Learners can walk around the house for inspiration and use the help of an adult in understanding the different ways we use plants. Some of the many uses of plants are:</p> <ul style="list-style-type: none"> <li>• Breathing – plants make the air we breathe!</li> <li>• Eating – we eat fruits and vegetables, which are plants</li> <li>• Clothing – cotton in our clothes comes from plants</li> </ul>
	4	<p>Learners will learn desertification and the role of plants in protecting the soil</p>
	10 minutes	<p>Explain that <b>desertification</b> is the loss of green areas of land and expansion of desert area. Many factors contribute to desertification including overgrazing (when animals eat all the plants), droughts, and deforestation (when plants are cut in forests without replacing them). When these things happen, a natural process called <b>soil erosion</b> is accelerated. Soil erosion is the removal of the top layer of the soil.</p>
	10 minutes	<p>Learners can think of the different ways soil erodes naturally and write a list of 3-5 points. For example, soil drifting with rain, human cutting trees (deforestation) etc.</p>

30 minutes	<p>Learners will do an experiment to demonstrate deforestation and soil erosion:</p> <ul style="list-style-type: none"> <li>• Cut one side of three large plastic bottles vertically leaving the neck intact so that the bottles can serve as a horizontal container</li> <li>• Cut three smaller water bottles and set aside their bottom half or use three small lightweight plastic bowls or paper/plastic cups. Tape, staple or tie a string so that these pieces can be held like small buckets</li> <li>• Flip the large bottles on a table and fill the first and second one with soil. Add a thick layer of dead or fresh leaves to one of these bottles and leave the other one with just soil.</li> <li>• Place a plant with its soil in the last bottle. You can use a home potted plant or take a plant from outside your house making sure that you do not pull it by the root and take part of its soil with it</li> <li>• Now you should have three large bottles cut open from one side with only soil in one bottle, soil and leaves in another bottle, and a plant with soil in the last.</li> <li>• Hang the small bowls or buckets by their string on the neck of each bottle as shown below</li> <li>• Pour water from a container into each bottle and watch what comes out. Write your observations in your notebook.</li> <li>• You will notice that the water from the first bottle is filled with soil, while that from the one with leaves has very little soil, and the one with plants is clear!</li> <li>• Why do you think this happened? This is because plant roots hold and protect the soil from erosion. Do you see how the roots are entangled in the soil when you lifted the plant up? When <b>desertification</b> happens, <b>soil erosion</b> happens at a very fast rate because plants are not there to protect it!</li> </ul> <div data-bbox="410 1249 1101 1701" data-label="Image"> </div> <p>Source: <a href="https://www.youtube.com/watch?v=im4HVXMG168">https://www.youtube.com/watch?v=im4HVXMG168</a></p> <p>Note: Learners can simplify this activity by placing a potted plant or rooted plant with soil in a container temporarily and poking a hole in the container. They can then pour water through the container to see how clear water comes out, which</p>
------------	--



	20 minutes	<p>indicates that roots hold the soil together and do not allow water to wash it away. They will compare this with a container that has only soil and notice how a lot of the soil comes out with the water, which is similar to how soil erosion through rainfall occurs.</p> <p>The learner will draw a before and after image of a forest where desertification has occurred. He or she will also write a paragraph about what should be done to reverse the damage to this area. For example, planting more trees.</p>
5	10 minutes	<p>Learners will design their own plant! They can create a typical plant like a flower or design their own imaginary plant with special characteristics! Learners will think of the following:</p> <ul style="list-style-type: none"> <li>• A creative name for their plant</li> <li>• How the plant eats</li> <li>• Whether the plant has a flower or just leaves</li> <li>• The colors of each part</li> <li>• The kind of environment or country the plant grows in</li> </ul>
	20-30 minutes	<p>Learners will then either draw and color the plant or create 3D models such as the following. Learners will label the model and write 2 sentences about each part of the plant describing its function:</p>  <p>Source: <a href="https://www.pinterest.com/pin/348395721166351529/">https://www.pinterest.com/pin/348395721166351529/</a></p>
	30 minutes	<p>Optional : did you know that some of the fruits and vegetables we eat come from different parts of plant? Carrots are actually the roots and grow under the ground! Learners can create an edible flower model with the help of an adult to show we eat different parts of plants. Learners will look in their kitchen for examples of</p>

		<p>vegetables and fruits that come from different parts of plants or they can purchase some of these next time they go grocery shopping. Suggestions:</p> <ul style="list-style-type: none"> <li>• Flower: broccoli, cauliflower, artichoke, strawberries</li> <li>• Stem: celery, asparagus, spring onions</li> <li>• Leaves: spinach, lettuce, kale, rocca/arugula</li> <li>• Root: sweet potatoes, carrots, ginger, beetroot</li> </ul> <p>The learner will 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. The learner may even include seeds such as pumpkin seeds, pistachios, walnuts, or cashew nuts:</p>  <p>Source : <a href="https://www.pinterest.com/pin/27232772726599701/">https://www.pinterest.com/pin/27232772726599701/</a></p>
10 minutes		Learners will share their model(s) with their families and quiz them on plant facts!
Assessment Criteria:	<ul style="list-style-type: none"> <li>- Accurately labeled plant parts figure</li> <li>- Accurately labeled plant life cycle figure</li> <li>- List of plant uses in daily life</li> <li>- Creative and labeled 3D or 2D plant model</li> </ul>	







Learning outcomes:	<ul style="list-style-type: none"> <li>- Understanding the different parts of a plant and listing some of their functions compared to human body parts</li> <li>- Understanding the general life cycle of a plant</li> <li>- Understanding some of the uses of plants in daily life</li> <li>- Understanding the causes of desertification and the role of plants</li> </ul>
Required previous learning:	
Inspiration:	<a href="#">How do plants breathe activity for kids</a> <a href="#">Magical Color Transfer</a>

Additional enrichment activities:	<ul style="list-style-type: none"> <li>- 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.</li> <li>- Learners can observe the cycle of reproduction of flowering plants by cutting open a selection of fruits and examining the seeds. They can also plant seeds and observe their germination and growth.</li> </ul>
Modifications for simplification	Learners can limit the activities to one essay containing a labeled figure of plant parts, the functions of all these parts and some different uses humans have for plants.

### Ages 11 to 14 (Level 3)

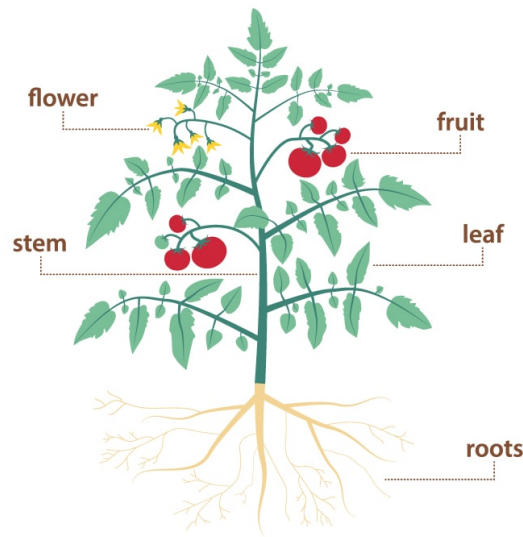
<b>Description:</b>	Learners will explore the plant kingdom and learn about the importance of plants in our lives through different experiments and activities that will illustrate how plants behave and some of their characteristics.
<b>Leading question:</b>	Can you design your own plant?
<b>Age group:</b>	11-14
<b>Subjects:</b>	Science
<b>Total time required:</b>	7 hours over 5 days
<b>Self-guided / Supervised activity:</b>	Low supervision
<b>Resources required:</b>	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)

Day	Time	Activity and Description					
1		Learners will understand the characteristics of living things and how plants adapt to their environment.					
	10 minutes	Learners will explore their surroundings and look for examples of living and non-living things from their homes or neighborhood. They will write a list of 10 living and 10 non-living things, e.g. living – dog, non-living – book. Learners can be given prompts to encourage them to understand that plants are living things. For example, point to a houseplant, tree, bush etc. and ask the learner whether that is a living or non-living thing.					
	20 minutes	Explain that everything in life can be classified as living and non-living, and 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"> <li>• They move</li> <li>• They breathe</li> <li>• They are sensitive</li> <li>• They grow</li> <li>• They reproduce</li> <li>• They eat</li> <li>• They get rid of waste</li> </ul>					
	10 minutes	Learners will create the following table in their notebooks and give examples of how living things demonstrate all these characteristics from both plantae and animalia. <table border="1" data-bbox="412 1724 1344 1871"> <tr> <th>Characteristic</th><th>Kingdom Plantae example</th><th>Kingdom Animalia example</th></tr> <tr> <td>Moving</td><td>e.g. sunflowers moving with the sun</td><td>human walking</td></tr> </table>	Characteristic	Kingdom Plantae example	Kingdom Animalia example	Moving	e.g. sunflowers moving with the sun
Characteristic	Kingdom Plantae example	Kingdom Animalia example					
Moving	e.g. sunflowers moving with the sun	human walking					

		<table> <tr> <td>Breathing</td><td>e.g. tree leaves breathing</td><td>dog breathing</td></tr> <tr> <td></td><td></td><td></td></tr> </table> <p>Learners will reflect on how different plants adapted to their environments and list or draw some examples of these. They will think about what helps plants survive in different climates and environments. For example, plants that grow in harsh climates with little rainfall need less water to survive because they store the little rainfall they do get for later use. They can compare it to how different animals adapt to their environments. For example, camels store water to cope with the harsh desert climate with little rainfall, just like a cactus does! There are many examples of adaptation in nature. For example, some plants attract bees for pollination (which helps them reproduce) through their scent. Others like the Venus Flytrap eat insects because there aren't enough nutrients in the soil in the places it grows!</p> <p>Learners will then draw some plants they are familiar with from their own surroundings, as well as examples of other plant that grow in at least 3 other different environments. Learners can see appendix 1 for examples of some adaptations and then identify and draw the plants that have these adaptations. Example:</p> <table> <tr> <th>Plant</th><th>Environment</th><th>Adaptation</th></tr> <tr> <td></td><td></td><td>Can store water</td></tr> <tr> <td></td><td></td><td></td></tr> </table>	Breathing	e.g. tree leaves breathing	dog breathing				Plant	Environment	Adaptation			Can store water			
Breathing	e.g. tree leaves breathing	dog breathing															
Plant	Environment	Adaptation															
		Can store water															
	20 minutes																
	15 minutes	<p>Numeracy extension:</p> <ul style="list-style-type: none"> <li>A furniture factory cuts down 3 trees per month and plants 5 in the same forest. If the forest had 100 trees at the beginning of January, how many trees will it have by the end of that month?</li> <li>If you have \$40 and flowers cost \$2.5 each, how many flowers can you buy for your mother?</li> <li>Advanced option: Mariam wants to make a wooden pot for her plants that is 30 cm<sup>3</sup>. If she makes the height 5 cm and the length 2 cm, how wide should she make her pot? (hint: volume of a rectangular prism is length x width x height. Here, the volume is 30 cubic centimeters and you are given the height and length. Find the width using the formula volume = l x w x h)</li> </ul>															
2	20 minutes	<p>Learners will identify the main parts of a plant and understand their functions.</p> <p>Learners will look for a small plant outside or inside their homes and pull it or raise it gently so that they can return it to the soil after the activity. They will identify the roots, stem, leaves, flower, and fruit. Explain that <b>roots</b> anchor the plant, which is</p>															

why we cannot just pick plants easily. This protects plants from flying away by strong winds. They also collect water and nutrients from the soil. The **stem** is responsible for transporting nutrients collected by the roots upward to the rest of the plant. The **leaves** are responsible for respiration or breathing. Many plants bear **flowers** and **fruits**.

If no plant is available, learners can draw a flower, small plant or tree from their imagination or any printed or visual source, making sure to label each part.




Source: <https://www.greenandvibrant.com/parts-of-a-plant>

15  
minutes

Learners will now explore the functions of each part. They will reflect on how plants, like all living things, eat and breathe. Ask the learner – how do you think plants eat? Breathe? What parts do you think help them do these things?

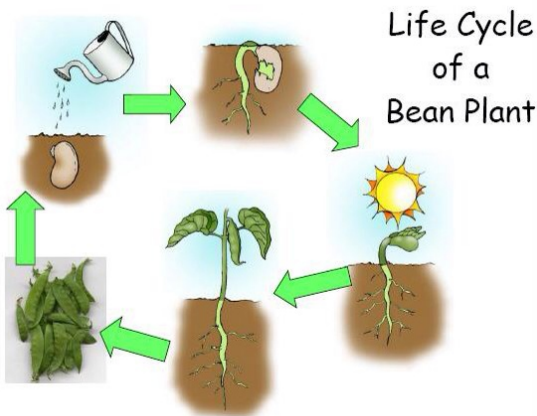
Plants need sunlight and water to live and eat. They use the sun's energy to make their own food, but they also eat through their **roots and stem**! Learners will do the following experiment to see how plant roots absorb water:


- 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:

		
	10 minutes	<ul style="list-style-type: none"> <li>• If you have different food coloring or a 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.</li> <li>• Wait for 3 hours then come back to it. What do you think will happen?</li> <li>• You will observe that the center cup has filled up with water from the other cups! This is how plant <b>roots</b> collect nutrients from the soil and deliver it to the plant for the <b>stem</b> to then take it upward.</li> </ul> <p>Learners can also think of the stability function of a root and how it allows the plant to stay firm in the ground. They can draw a tree and cut it out. They will then try to make it stand. They will notice that the tree falls because there is nothing attaching it to the ground. If they tape a toothpick or small stick behind it and then stick it in a carboard 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>
	10 minutes	<p>Learners can do an experiment to observe how the <b>stem</b> transports water and nutrients upward:</p> <ul style="list-style-type: none"> <li>• Place a lettuce leaf in a cup filled with colored liquid like orange juice (or add food coloring or powders like beetroot, paprika etc. to water).</li> <li>• Observe how the leaf turns into the color of the liquid after 2-3 hours.</li> <li>• Learners can try to provide their own explanation for why we observe this change – how does the stem transport nutrients to the rest of the plant?</li> <li>• If possible, explain that this is possible because of the <b>xylem</b> and <b>phloem</b> cells within the stem of a flowering plant, which are like tubes that transport moisture and nutrients from the root upward to the rest of the plant.</li> </ul>
	15 minutes	<p>Plants breathe through their leaves. Learners will do an experiment to observe plant <b>respiration</b> or breathing and waste removal:</p> <ul style="list-style-type: none"> <li>• Place 2-3 fresh leaves of any plant in a glass bowl, preferably shallow</li> <li>• Add lukewarm or hot water to the bowl and submerge the leaves just below the surface. Make sure they stay in this position</li> <li>• 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</li> </ul>



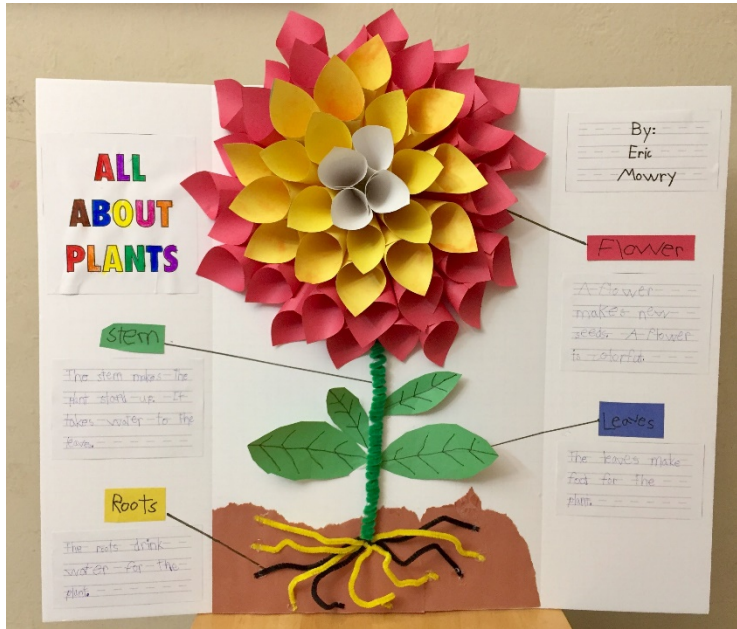
	10 minutes	<p>closer to the leaves. The bubbles indicate that plants produced oxygen from breathing.</p> <ul style="list-style-type: none"> <li>Learners can try to write a few sentences explaining their own understanding for what they observe – how do plants breathe?</li> <li>If possible, explain that there are small pores like your facial pores on the surface of leaves called the stomata. These are responsible for regulating gas exchange in plants. They take in carbon dioxide and release oxygen (seen in the experiment as bubbles) as a “waste” byproduct of photosynthesis</li> </ul> <p>This experiment also demonstrates the process by which plants make their food – or <b>photosynthesis</b> – where they take in carbon dioxide, water, and light, and create glucose and oxygen. The bubbles formed represent the oxygen created.</p> <p>Optional: Learners can draw a diagram of photosynthesis in nature showing the natural sources of light, water, and carbon dioxide and writing an equation that shows that carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) give glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>) and oxygen (O<sub>2</sub>).</p> <p>To recap:</p> <ul style="list-style-type: none"> <li>Roots provide stability and collect nutrients from the soil</li> <li>The stem transports nutrients upward from the root to the rest of the plant through the xylem and phloem cells that are present inside of it</li> <li>Leaves use sunlight and the nutrients collected by the root and transported by the stem to make food for the plant (in the form of glucose, which is a type of sugar like the one we eat). Leaves control the respiration function through their pores (stomata) and other parts present inside their cells</li> </ul>															
	10 minutes	<p>The learner will write down some of the functions of different plant parts and compare them to human body parts responsible for those functions.</p> <table border="1"> <thead> <tr> <th>Function</th><th>Plant parts</th><th>Human body part</th></tr> </thead> <tbody> <tr> <td>e.g Breathing</td><td>Leaves, stomata</td><td>Lungs, nose</td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td></tr> </tbody> </table>	Function	Plant parts	Human body part	e.g Breathing	Leaves, stomata	Lungs, nose									
Function	Plant parts	Human body part															
e.g Breathing	Leaves, stomata	Lungs, nose															
	15 minutes	<p>The learner will write a paragraph on the following prompt in the <b>first person</b>: “Imagine you are a plant that grows in a forest or jungle/rainforest. Describe what you might look like and what each one of your parts might be doing to protect you on a particularly rainy day.”</p>															
3	20 minutes	<p>Learners will be introduced to plant life cycles and understand some of the uses of plants for humans</p> <p>Learners will imagine what the life cycle of a plant looks like. Prompts:</p>															

	20 minutes	<ul style="list-style-type: none"> <li>Where do plants come from? How do we grow plants, for example, a flower?</li> <li>After a plant grows out of the soil, what happens to it? How long does it stay in that form?</li> <li>How does a plant change with time?</li> <li>Explain that plants start out as seeds, then grow to plants gradually over time, and then they wilt or die. We call plants growing from seeds <b>germination or sprouting</b>. The life cycle of a flower is as follows: <b>seed -&gt; root comes out of seed -&gt; seedling grows out of the ground -&gt; stem and leaves grow -&gt; flowers grow -&gt; flowers make fruits/vegetables and seeds</b></li> </ul> <p>Learners will create a labeled plant life cycle from seed to plant:</p> <ul style="list-style-type: none"> <li>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</li> <li>Color and cut out these drawings using a pair of scissors</li> <li>Draw four big boxes and label them 1-4. These should be big enough to put the drawings inside</li> <li>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</li> <li>Next to each box, write a sentence about this stage of a plant's life</li> </ul> <div data-bbox="423 1087 956 1499">  </div> <p>Source: <a href="https://www.tes.com/lessons/RabEFf_WxRBnw/life-cycle-of-a-bean">https://www.tes.com/lessons/RabEFf_WxRBnw/life-cycle-of-a-bean</a></p>
	20 minutes	<p>Learners will observe the life cycle of a plant firsthand! They will try to grow their own plants by sprouting pea or bean seeds in a jar and observe growth over 2 weeks:</p> <ul style="list-style-type: none"> <li>Bring a glass jar, some paper towels, water and a seed of a plant like beans or peas</li> <li>Fill the jar with wet paper towels or tissue paper but make sure that the jar itself is not filled with too much water</li> </ul>

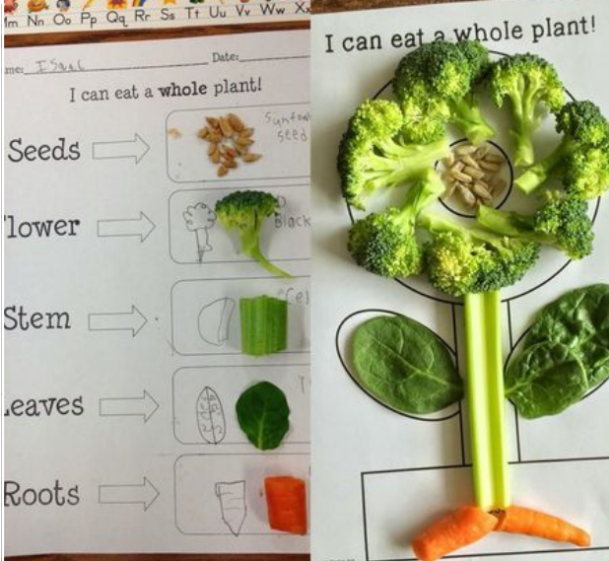
		<ul style="list-style-type: none"> <li>• Push the seeds down between the tissues and bring it to the side of the jar so you can have a clear view of how it grows</li> <li>• What do you think will happen? Observe how after two weeks, roots start to come out and how the seeds grow into a plant!</li> <li>• Create a table and enter your daily observations on how you see the seed changing.</li> <li>• Learners can experiment with 3 different set ups to see what plants need to grow. They will create the same set up in a different jar and in another jar, they will place dry paper towels so that they have 3 separate jars. They will then place one of the jars with wet paper towels and the jar with dry paper towels in the sun or next to a source of light, and leave one of the jars with wet paper towels in a dark place. Learners will check back in 1-2 weeks to see the progress of the seeds. They will find that the jar with water which was placed in the sun/light was the only one that grew a sprout, which means that water and light are necessary for plant growth.</li> <li>• Write a paragraph about what plants need to grow</li> </ul>  <p>Source: <a href="https://littlebinsforlittlehands.com/seed-jar-science-experiment-kids/">https://littlebinsforlittlehands.com/seed-jar-science-experiment-kids/</a></p>
	20 minutes	<p>Learners will now think of some of the uses of plants in our lives. The learner will write a paragraph or poem about how plants are used in our daily lives – from when we wake up to when we go to bed. Learners can walk around the house for inspiration and use the help of an adult in understanding the different ways we use plants. Some of the many uses of plants are:</p> <ul style="list-style-type: none"> <li>• Breathing – plants make the air we breathe!</li> <li>• Eating – we eat fruits and vegetables, which are plants</li> <li>• Clothing – cotton in our clothes comes from plants</li> </ul>
4	10 minutes	<p>Learners will learn desertification and the role of plants in protecting the soil</p> <p>Explain that <b>desertification</b> is the loss of green areas of land and expansion of desert area. Many factors contribute to desertification including overgrazing (when animals eat all the plants), droughts, and deforestation (when plants are cut in forests without replacing them). When these things happen, a natural process called <b>soil erosion</b> is accelerated. Soil erosion is the removal of the top layer of the soil.</p>
	10 minutes	<p>Learners can think of the different ways soil erodes naturally and write a list of 3-5 points. For example, soil drifting with rain, human cutting trees (deforestation) etc.</p>

30 minutes	<p>Learners will do an experiment to demonstrate deforestation and soil erosion:</p> <ul style="list-style-type: none"> <li>• Cut one side of three large plastic bottles vertically leaving the neck intact so that the bottles can serve as a horizontal container</li> <li>• Cut three smaller water bottles and set aside their bottom half or use three small lightweight plastic bowls or paper/plastic cups. Tape, staple or tie a string so that these pieces can be held like small buckets</li> <li>• Flip the large bottles on a table and fill the first and second one with soil. Add a thick layer of dead or fresh leaves to one of these bottles and leave the other one with just soil.</li> <li>• Place a plant with its soil in the last bottle. You can use a home potted plant or take a plant from outside your house making sure that you do not pull it by the root and take part of its soil with it</li> <li>• Now you should have three large bottles cut open from one side with only soil in one bottle, soil and leaves in another bottle, and a plant with soil in the last.</li> <li>• Hang the small bowls or buckets by their string on the neck of each bottle as shown below</li> <li>• Pour water from a container into each bottle and watch what comes out. Write your observations in your notebook.</li> <li>• You will notice that the water from the first bottle is filled with soil, while that from the one with leaves has very little soil, and the one with plants is clear!</li> <li>• Why do you think this happened? This is because plant roots hold and protect the soil from erosion. Do you see how the roots are entangled in the soil when you lifted the plant up? When <b>desertification</b> happens, <b>soil erosion</b> happens at a very fast rate because plants are not there to protect it!</li> </ul> <div data-bbox="410 1249 1101 1701" data-label="Image"> </div> <p>Source: <a href="https://www.youtube.com/watch?v=im4HVXMG168">https://www.youtube.com/watch?v=im4HVXMG168</a></p> <p>Note: Learners can simplify this activity by placing a potted plant or rooted plant with soil in a container temporarily and poking a hole in the container. They can then pour water through the container to see how clear water comes out, which</p>
------------	--

	20 minutes	<p>indicates that roots hold the soil together and do not allow water to wash it away. They will compare this with a container that has only soil and notice how a lot of the soil comes out with the water, which is similar to how soil erosion through rainfall occurs.</p> <p>The learner will draw a before and after image of a forest where desertification has occurred. He or she will also write a paragraph about what should be done to reverse the damage to this area. For example, planting more trees.</p>																									
5	40 minutes	<p>Learners will learn about how plant cells absorb water through osmosis and explore the phenomenon of desertification through two cool experiments.</p> <p>Learners will conduct the <a href="#">following experiment</a> to learn about the mechanism that allows plant roots to absorb water from the soil – <b>osmosis</b>.</p> <p>Definition: <b>Osmosis</b> is the movement of water from a region of high concentration to a region of low concentration through a semi-permeable membrane (surface or material that is somewhat porous, but not totally porous).</p> <p>Keep in mind that High water concentration refers to how much of the liquid is pure water. Saltwater has lower concentration of water compared to pure/distilled water because some part of it is salt and the other is water.</p> <p>The outer layer of potato pieces will serve as our semi-permeable membrane</p> <ul style="list-style-type: none"><li>• Peel and cut a potato into 8 strips of identical size and weight almost the size of French fries (6 cm long). Measure them using a ruler to make sure they are all the same length and width.</li><li>• Prepare 4 solutions: i) a bowl with water with no salt; ii) using one gram of salt (1/4<sup>th</sup> of a teaspoon) and 100 ml of water (1 tablespoon short of half a cup); iii) 3 grams of salt for 100 ml of water and iv) 5 grams of salt for 100 ml of water (if learners do not have the ability to measure, they can just prepare one cup of water with a tiny pinch of salt and the second will have two pinches of salt and the third will have three pinches of salt)</li><li>• Place two potato strips into each solution and two in a container with just water</li><li>• Let the potato strips sit for 20-30 minutes. What do you think will happen? Write down your hypothesis.</li><li>• Create the following table to record your observations:</li></ul> <table><tr><th>Salt concentration</th><th>Initial length</th><th>Final length</th><th>Difference</th><th>% change</th></tr><tr><td>0 grams</td><td>6 cm</td><td></td><td></td><td></td></tr><tr><td>1 gram</td><td>6 cm</td><td></td><td></td><td></td></tr><tr><td>3 grams</td><td>6 cm</td><td></td><td></td><td></td></tr><tr><td>5 grams</td><td>6 cm</td><td></td><td></td><td></td></tr></table>	Salt concentration	Initial length	Final length	Difference	% change	0 grams	6 cm				1 gram	6 cm				3 grams	6 cm				5 grams	6 cm			
Salt concentration	Initial length	Final length	Difference	% change																							
0 grams	6 cm																										
1 gram	6 cm																										
3 grams	6 cm																										
5 grams	6 cm																										

		<ul style="list-style-type: none"> <li>Expected result: water moves from a place of high concentration to one with lower water concentration. Therefore, you can expect to find that in solutions with low salt concentration (and therefore higher water concentration), there is more water OUTSIDE of the potato, so water will move inside the potato by osmosis and increase the size of the strips, which will swell up. In solutions with high salt concentration and less water concentration, the opposite is true. There is more water INSIDE the potato than in the salt solution outside of it (because some of the saltwater molecules are occupied by salt – it is not pure water), so water will move out of the potato, resulting in the shrinking of the size of the strips.</li> <li>To calculate the percentage change:  <math display="block">\frac{(\text{final length} - \text{initial length})}{\text{initial length}} * 100</math> </li> </ul>
10 minutes	Learners will design their own plant! They can create a typical plant like a flower or design their own imaginary plant with special characteristics! Learners will think of the following:	<ul style="list-style-type: none"> <li>A creative name for their plant</li> <li>How the plant eats</li> <li>Whether the plant has a flower or just leaves</li> <li>The colors of each part</li> <li>The kind of environment or country the plant grows in</li> </ul>
20-30 minutes	Learners will then either draw and color the plant or create 3D models such as the following. Learners will label the model and write a paragraph about each part of the plant describing its function in details:	 <p>The image shows a 3D paper model of a flower. The flower has a yellow center and pink outer petals. It has a green stem with two green leaves and yellow roots. The model is placed on a piece of paper with handwritten labels and descriptions for each part:</p> <ul style="list-style-type: none"> <li><b>Flower:</b> A flower makes new seeds. A flower is colorful.</li> <li><b>Leaves:</b> The leaves make food for the plant.</li> <li><b>Stem:</b> The stem makes the plant stand up. It takes water to the flower.</li> <li><b>Roots:</b> The roots drink water for the plant.</li> </ul> <p>On the left side of the paper, it says "ALL ABOUT PLANTS". On the right side, it says "By: Eric Mowry".</p>



	<p>30 minutes</p>	<p>Source: <a href="https://www.pinterest.com/pin/348395721166351529/">https://www.pinterest.com/pin/348395721166351529/</a></p> <p>Optional : did you know that some of the fruits and vegetables we eat come from different parts of plant? Potatoes are actually the roots and grow under the ground! Learners can create an edible flower model with the help of an adult to show we eat different parts of plants. Learners will look in their kitchen for examples of vegetables and fruits that come from different parts of plants or they can purchase some of these next time they go grocery shopping. Suggestions:</p> <ul style="list-style-type: none"> <li>• Flower: broccoli, cauliflower, artichoke, strawberries</li> <li>• Stem: celery, asparagus, spring onions</li> <li>• Leaves: spinach, lettuce, kale, rocca/arugula</li> <li>• Root: sweet potatoes, carrots, ginger, beetroot</li> </ul> <p>The learner will 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. The learner may even include seeds such as pumpkin seeds, pistachios, walnuts, or cashew nuts:</p>  <p>Source : <a href="https://www.pinterest.com/pin/27232772726599701/">https://www.pinterest.com/pin/27232772726599701/</a></p>
<p>10 minutes</p>		<p>Learners will share their model(s) with their families and quiz them on plant facts!</p>
<p>Assessment Criteria:</p>	<ul style="list-style-type: none"> <li>- Perseverance, critical thinking and precision in conducting experiments</li> <li>- Accurately labeled plant parts figure</li> <li>- Accurate and creative photosynthesis diagram</li> <li>- Accurately labeled plant life cycle figure</li> <li>- Creatively think of the uses of plant uses in daily life</li> <li>- Creative and labeled 3D or 2D plant model</li> </ul>	
<p>Learning outcomes:</p>	<ul style="list-style-type: none"> <li>- Understanding the different parts of a plant and listing some of their functions compared to human body parts</li> </ul>	



	<ul style="list-style-type: none"> <li>- Understanding the general life cycle of a plant</li> <li>- Understanding some of the uses of plants in daily life</li> <li>- Understanding of the role of osmosis in transport in plants</li> <li>- Understanding of the role of plants in desertification</li> </ul>
Required previous learning:	
Inspiration:	<ul style="list-style-type: none"> <li>- <a href="#">How do plants breathe activity for kids</a></li> <li>- <a href="#">Magical Color Transfer</a></li> <li>- <a href="#">Osmosis in Potato Strips - Bio Lab</a></li> </ul>
Additional enrichment activities:	<ul style="list-style-type: none"> <li>- Learners can observe the cycle of reproduction of flowering plants by cutting open a selection of fruits and examining the seeds. They can also plant seeds and observe their germination and growth.</li> <li>- Learners can calculate the average change in size from the potato strip osmosis experiment and present it in a graph. They can take the average of the two strips per container.</li> <li>- Learners can write a paragraph about what will happen if they drank a gallon of seawater or saltwater using their knowledge of osmosis.</li> </ul>
Modifications for simplification	Learners can focus on writing one essay containing a labeled figure of plant parts, the functions of all these parts and some different uses humans have for plants.

## APPENDIX



Source: <https://sites.google.com/site/plantadaptations2ndgrade/>

## Plant ADaptation MatChing

- A. Lives in hot Deserts & stores water in its stem.
- B. Lives in areas where there is a lot of rainfall. Leaves are large to Collect sunlight and have a waxy layer (cuticle) to help water drip off leaves.
- C. Lives in windy areas. Stems are soft so they Can Bend and not Break.
- D. Lives in areas with Different seasons. Some trees lose their leaves in the fall/winter to Protect from freezing weather.
- E. Lives in areas with Cold winters. Most of the trees have needles instead of leaves to lose less water.
- F. Lives in water so the Plants have little to no roots.



Source: <https://www.thinglink.com/scene/730790365904240642>