



Stage 3 - Growing Our Ingredients From Seeds

Stage Overview:

This stage covers the Life Systems – Growth and Changes in Plants objectives from the Science & Technology Curriculum. Some cross-curricular connections will be made, most specifically focusing on Math : Number Sense, Patterns & Relationships/ Mathematical Modelling; Data: Literacy; and Special Sense: Measurement (making predictions about a variety of patterns based on real life data).

Students experience growing the plants used in their granola bars to give them a true understanding of their ingredients and an engaging purpose for their plant learning.

Teachers can request a connection with a local farmer who can be their “plant coach ” and field students’ questions about their plants and how best to grow them. This opportunity will be offered on a first-come, first-served basis, depending on availability. To request a plant coach for your class, contact bcurtis@gfo.ca.

Learning Objective:

- Notice that plants have distinct characteristics.
- Identify similarities and differences among the various types of plants grown.
- Understand the basic needs of plants including air, water, light, warmth, and space.
- Explore how plants get energy to live (from the sun) and help other living things get energy (by eating plants).
- Consider different ways plants are grown for food (e.g., greenhouse, farms, orchards).
- Discuss examples of environmental conditions that may threaten plant (and animal) survival.

Materials Needed:

- Seeds (ideally, soybean and oat seeds)
- Compost
- Glass jars or yogurt containers
- Measuring cylinders
- Rulers
- Seed Journal (on per student)
- Investigation Planning worksheet (on per student)

Time Frame: 1 hour

Curriculum Connections: These lesson plans are mapped to curriculum objectives. Find all the details on page 5.

Order FREE seed kits here while supplies last!





Presentation Notes

<p>Slide 3: Recap</p>	<ul style="list-style-type: none"> • Ask students to discuss the questions on the presentation with their business groups to recap their learning from stage 1: Where do Plants Come From? Where do seeds come from?
<p>Slide 4: Growing Plants From Seeds</p>	<ul style="list-style-type: none"> • Explain: We are going to grow our own plant ingredients from seeds so we can see our plant learning coming to life in the classroom. • Explain: Seeds are little packages of life. Inside them is everything needed to make a new plant under the right conditions. • We will keep a journal and conduct an investigation to see which of our plant ingredients will grow fastest and win the great ingredient race!
<p>Slide 5: What do Plants Need?</p>	<ul style="list-style-type: none"> • Explain: Just like humans, plants need certain things to grow and be healthy. Ask the children if they can think of any things plants need. Create a list on the Wonder Wall or a whiteboard.
<p>Slide 6: Light</p>	<ul style="list-style-type: none"> • Talk through the presentation to explain the conditions plants need in more detail: <ul style="list-style-type: none"> • Plants need light to grow and be healthy. • Plants are amazing! They can turn sunlight and water into food in their leaves during a process called photosynthesis.
<p>Slide 7: Photosynthesis</p>	<ul style="list-style-type: none"> • During photosynthesis, plants use sunlight to turn water and carbon dioxide into nutrients to keep them healthy. Photosynthesis also releases oxygen, the gas that humans and animals need to breathe.
<p>Slide 8: Water</p>	<ul style="list-style-type: none"> • Just like us, plants need water. Without the right amount of water, plants cannot grow and be healthy. • At the very start of a plant's life, it needs water to make it start to grow into a little seedling. • Once the seedling has grown some roots, the plant needs water to take up the nutrients out of the soil. Nutrients are the things plants need to grow.
<p>Slide 9: Not Enough Water</p>	<ul style="list-style-type: none"> • Water is very important to farmers. If there is not enough rain, their crops will not grow properly. • Some farmers irrigate (water) their crops during the growing season. Others rely on rainfall to get enough water for their plants to grow. Here in Ontario, most farmers rely on rain.



<p>Slide 10: Too Much Water</p>	<ul style="list-style-type: none"> • Ask students what they think will happen if plants have too much water. • Too much water is also a big problem for farmers. • Flooding or heavy rainfall can affect the health of soil because it washes away some of the soil particles and nutrients that plants need to grow and be healthy. Flooding can also drown plants in the fields so they can not grow.
<p>Slide 11: Temperature</p>	<ul style="list-style-type: none"> • Ask the children to think about how they feel if they get too cold or too hot and what they do about it. • Just like us, plants need a suitable temperature to be healthy. They will not start to grow from seeds if their environment is not the correct temperature.
<p>Slide 12: Grown in Ontario</p>	<ul style="list-style-type: none"> • Explain that different plants need different temperatures, which is why we can grow certain foods in Ontario but not all plants. • Some plants need different conditions such as a different climate. • Some plants need different conditions to survive such as bananas, which need a tropical temperature. • Explain: eating food grown in Ontario is one way we can care for the environment. When food doesn't have to travel very far to reach our plates, it takes less fuel, reducing air pollution.
<p>Slide 13: Nutrients</p>	<ul style="list-style-type: none"> • Plants take their nutrients from the soil so it is very important that farmers keep their soil healthy. We will learn all about this later in the project.
<p>Slide 14: Fair Testing</p>	<ul style="list-style-type: none"> • Use the presentation to discuss the meaning of a fair test and why it is important. • A fair test is a controlled investigation that compares two things. For a test to be fair or well-controlled, we have to make sure that only one thing (called a variable) is changed and everything else is kept the same.
<p>Slide 15: Variable</p>	<ul style="list-style-type: none"> • A variable is anything that can affect the results we are observing or measuring. • In our investigation, we will use two different seeds. This is the variable we are changing. • Then we will treat both of our seeds exactly the same and observe what happens. • Ask students what variables we need to keep the same as we look after our young plants. Possible answers are type of compost, planting depth, amount of water, size of pot, position in classroom (to keep light and temperature constant).
<p>Slide 16: Prediction</p>	<ul style="list-style-type: none"> • Ask students to predict which ingredient they think will grow the fastest/tallest and why.



Slide 17: Planting Your Seeds	<ul style="list-style-type: none">• Model planting each of the ingredient seeds.• Model measuring water accurately and agree on a standard volume of water to give to each seed.• Discuss the best place in the classroom to keep the plants to help them grow.• Educators can order free seed kits to use with this step. While supplies last at https://goodineverygrain.ca/ontario-farming-stemterprise/
Slide 18: Observation Journals	<ul style="list-style-type: none">• As their plants grow, ask students to complete a regular ingredient diary using the activity sheet.• Students should be encouraged to observe their plants closely and draw detailed, labelled diagrams at each stage.• Model measuring length accurately and ask the children to record the height of their plants at each stage.• Use the presentation to teach the appropriate scientific vocabulary to label and describe their diagrams .• Students could also take a photo each day to create a time lapse video of their plants' growth.
Slide 19: Conclusion	<ul style="list-style-type: none">• Once the plants have grown ask the children to consider the questions on the presentation:<ul style="list-style-type: none">• Which ingredient grew fastest?• Which ingredient grew tallest?• What did you notice about the directions that the plants grew?• Was your investigation a fair test?• How could you improve it next time?



Curricular Connections:

Science and Technology

- **A1.2** use a scientific experimentation process and associated skills to conduct investigations.
- **A1.4** follow established health and safety procedures during science and technology investigations, including wearing appropriate protective equipment and clothing and safely using tools, instruments, and materials.
- **A1.5** communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.
- **B2.1** describe the basic needs of plants, including the need for air, water, light, heat, nutrients, and space, and identify environmental conditions that may threaten plant survival.
- **B2.2** identify different parts of plants, including the root, stem, flower, stamen, pistil, leaf, seed, cone, and fruit, and describe how each part contributes to plants' survival within their environment.
- **B2.3** describe changes that different plants undergo in their life cycles.
- **B2.4** describe ways in which a variety of plants adapt and/or react to their environment and to changes in their environment.
- **B2.5** demonstrate an understanding that most plants get energy directly from the sun through the process of photosynthesis, which involves the absorption of carbon dioxide and the release of oxygen.

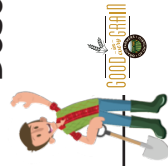
Mathematics

- **C.4** apply the process of mathematical modelling to represent, analyze, make predictions, and provide insight into real-life situations.
- **D1.2** collect data through observations, experiments, and interviews to answer questions of interest that focus on qualitative and quantitative data, and organize the data using frequency tables.
- **D2.1** use mathematical language, including the terms “impossible,” “unlikely,” “equally likely,” “likely,” and “certain” to describe the likelihood of events happening, and use that likelihood to make predictions and informed decision.
- **E2.5** use various units of different sizes to measure the same attribute of a given item, and demonstrate that even though using different-sized units produces a different count, the size of the attribute remains the same.

Seed Journal



<p>Observation 1</p> <p>Date: _____ Plant height: _____ Description: _____</p>	<p>Observation 2</p> <p>Date: _____ Plant height: _____ Description: _____</p>	<p>Observation 3</p> <p>Date: _____ Plant height: _____ Description: _____</p>
<p>Observation 1</p> <p>Date: _____ Plant height: _____ Description: _____</p>	<p>Observation 2</p> <p>Date: _____ Plant height: _____ Description: _____</p>	<p>Observation 3</p> <p>Date: _____ Plant height: _____ Description: _____</p>



Investigation Planning



My research question:

Things I will keep the same:

One thing I will change:

What I will measure:

My prediction:

