About the Garden Lessons

Grow Eat Learn
Nourish Nova Scotia

Over the course of the Garden Lessons, we will walk educators and young gardeners through the process of starting a garden from planning to harvest to putting the garden to bed for the winter. Inside, you will find activity guides, curriculum connections, and tips and strategies for successful school gardening.

Printable worksheets accompany each lesson and can be compiled into a single Garden Journal to practice record-keeping and support future growing success. This hands-on series of Garden Lessons will support educators, youth leaders and students to start and tend to a garden project. These lessons were originally adapted from the Nova Scotia School Garden Resource Guide (2014).

Getting youth in the garden offers them opportunities to shape their food system, learn healthy food choices and connect with nature, all while building resiliency in a changing climate and having fun along the way.

Goals of Lessons

- Grow food and engage in hands-on learning
- Gain food literacy skills
- Demonstrate connections between the food web and climate action
- Support youth well-being and connection to the more-than-human world

Gardening & Climate Action

Adapting to climate change is critical for our food system. Through gardening, students participate in the food web. They learn about food production and its interdependence with plants, animals and weather.

Look for these **climate action icons** in Grow Eat Learn resources to learn more about the connections between gardening and the climate!

Habitat Creation & Biodiversity

Waste Reduction & Circular Systems

Growing & Processing Food

Water Stewardship

Soil Stewardship

Climate Justice

Garden Lesson 2

Starting Seeds Indoors

Introduction

Complete this activity between March and May.
Lesson 2 will guide youth to create an indoor nursery to start and care for seedlings. Working with seeds is an opportunity for students and youth to deepen their understanding of where food comes. In this lesson, students explore the nature of seeds and how to plant and care for them as well as learn the skill of starting seeds and tending to plants.

NS Curriculum Outcomes

Grade 1 Social Studies

- Learners will implement age-appropriate actions for responsible behaviour in caring for the environment.

Grade 3 Science

Soil Studies:

- Investigate the properties of soil and how water interacts with soil.
- Students are able to use language to describe the soil.
- Students are able to measure amounts of soil and water.
- Students are able to carry out their investigations and record their results over a period of time.

Plant Studies:

- Investigate factors that affect plant growth.
- Investigate how various plant parts change over the life cycle.
- Students are able to sort seeds using one or more attributes.
- Students are able to describe the various attributes of their seeds.
- Students are able to grow plants from seed, and record their growth over a period of time.

Grade 4 Science

- Students are able determine the impact that various amounts of light have on plants.
- Students are able to record their findings and share to the class.

Grade 5 Mathematics

- Show that 10 millimetres is equivalent to one centimetre, using concrete materials.

Skills

Science

Question, Observe, Record, Identify, Monitor

Mathematics

Measure, Compare, Calculate

Social Studies

Read, Write, Describe

Visual Arts

Design, Create, Draw

Climate Connections

Water Stewardship

By tending to seeds, students learn how important water is to seed germination and to growing a healthy seedling.

Growing & Processing Food

Starting seeds is the first step in growing food in the garden. Learning to grow food is a resiliency skill and sharing food strengthens communities.

Soil Stewardship

By keeping soil moist and healthy, students learn the importance of caring for soil to grow food.

2.1 Create an indoor sun map

1. In the garden journal, use the Indoor Sun Map worksheet for this activity.

2. In the beginning these plants are too small and delicate to go outside. We will start by choosing an indoor space for the seedlings to grow. Plants need a lot of sun, so in order to pick a good spot for them to live indoors, we will create a Sun Map.

3. Have students observe this space for an entire day. Make note of:

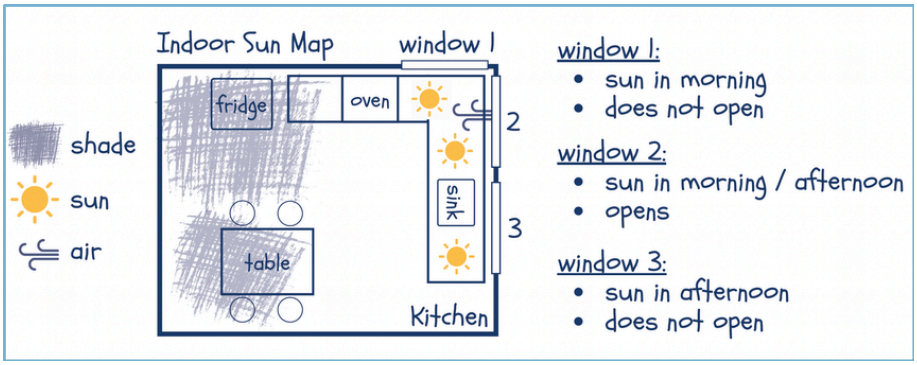
   a. Which spots are sunny in the morning? Afternoon?
   b. Which spots feel warm?
   c. Which spots have good air flow from a nearby window or door?

4. Use the template provided to map the classroom, including any relevant details (like furniture and windows). Using a ruler can make it easier to keep your map looking neat and tidy.

5. Based on the observations from Step 3, fill in the sunny and shady spots on the map with colours, pictures or shading. Add as many details as would be helpful.

6. Using this Sun Map, decide where the seedlings will grow. Most plants need at least six hours of direct sunlight, so consider that as well when choosing the perfect spot. In the example below, the counter-top in front of "Window 2" appears to be the best spot. This spot is sunny all day and the window can be opened to allow air to flow through. If class gets less than 6 hours of sunlight, source a grow light.

2.1 Example



Tips and Tools

Plants need sunlight, water, nutrients, room to grow, and air. They need to breathe for the same reasons we do. Wherever the seedlings are grown, they should ideally get a little bit of airflow. If using a plastic seed tray dome, make sure to remove for a few hours each day to promote airflow and prevent mold growth.

2.1 Materials

- Garden Journal
- Pencil and pen
- Coloured pencils or crayons
- Ruler

Start 6–8 weeks before transplanting to garden:

- Tomatoes
- Peppers
- Basil

Start 4–6 weeks before transplanting to garden:

- Cucumbers
- Squash & Zucchini
- Pumpkins

2.2 Seed exploration

1. Distribute Seed Exploration worksheets (2.2) and packages of seeds to students or put them in separate cups if you want students to guess which foods the seeds are from. Save the seed packets.

2. Observe and discuss the seeds asking:

   a. What do the seeds look like? Think about the colour, shape and size.

   b. What do the seeds feel like? Think about the texture.

   c. If using multiple seed varieties, do the different types of seeds share any characteristics with each other or are they very different? Where do these plants originate from?

3. Next, for each type of seed:

   a. Using the worksheet, draw a picture of the seed and a picture of what the seed will grow into.

   b. Write a list of 3-4 characteristics of each seed, including any listed above (colour, shape, size, texture) or any others you can think of.

4. Read the back of each seed package. For each type of seed, also write down:

   a. How many days until a sprout should appear ("days to sprout")?

   b. How many days until the vegetables can be harvested ("days until first harvest")?

5. Using a calendar to count the days, determine the date you can harvest your vegetables by adding the number of "days until first harvest" to your planting date (today).

2.2 Example

Zucchini

Zucchini seeds are:
- light brown
- smooth
- pointy on one end and round on the other

Days until sprout: 7–14 days
Days until harvest: 35–55 days
Planted on: April 14
Harvest between: May 17 – June 6

Tips and Tools

2.2 Materials

- Seed package(s)
  - Beans, peppers, tomatoes, and zucchini are good for beginners. For variety, choose two or three vegetables.
- Garden Journal
- Pencil or pen

Nourish Resource Features

Farm to School Snack How It Grows Video Series

Use this resource to run a Garden Salsa session using ingredients from the salsa garden.

2.3 Plant seeds

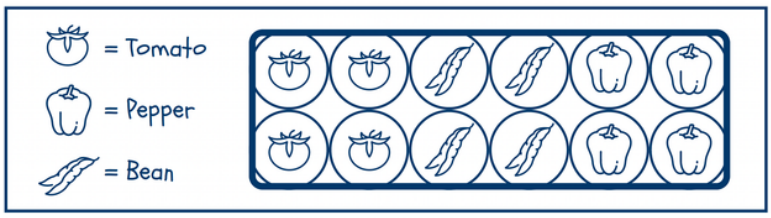
1. Add soil to a container big enough to add and mix in water. Moderately water the soil, mixing it in as you go until the soil is moist to the touch.

Optional: Mix a small amount of coffee grounds or compost with the soil. This will provide nutrients to help the seeds grow.

2. Fill the seed trays with moist soil and bury multiple seeds per plug. Try to have at least 2-4 plugs for each type of seed. Check the back of each seed package to find out how deep to bury the seeds. This is another good moment to integrate measurement or involve a short ruler.

3. On the "Seeds" page of the garden journal, draw a diagram of the seed tray and label where each seed is growing using words, numbers or drawings. Track sprout growth using the provided chart on worksheet 2.4.

2.3 Example



4. Check moisture daily by gently touching the soil and observing the seedlings. Water if it looks and feels dry times per day until the soil is moist but not soaked.

Optional: Use a spray bottle to water seeds evenly and prevent over-watering. Make sure the soil is moistened all the way through if using a spray bottle. OR create a self-watering tray (great for weekends and breaks) from activity 2.5.

5. Covering the tray with plastic helps keep the soil moist in a very dry space, acting as a mini-greenhouse. Remove the cover for an hour per day to allow air circulation and prevent mold growth. A plastic seed tray dome is optimal and can deter rodents.

6. Once sprouted, keep the seed tray on a sunny windowsill. Try to find a window where the seeds will enjoy 6-8 hours of direct sunlight. Activity 2.1 will help determine if the window is sunny enough or if a grow light may be necessary.

Tips and Tools

For most annual flowers and vegetables, plant seeds at a depth of about 1/4 to 1/2 inch below the soil surface. Larger seeds should be planted at a depth of **2 times** their diameter.

Smaller seeds should be planted closer to the surface.

Some seeds never sprout, and that's okay! There are many reasons why this can happen, so don't be discouraged if there are fewer successful sprouts than expected.

2.3 Materials

- Seed starting plugs and waterproof tray
- Seed package(s)
- Potting soil
- Garden Worksheet
- Clear plastic covering
  - ex. Cling wrap, clear plastic bag or a plastic seed tray dome.

Optional:

- Try using recycled containers, such as takeout containers, in place of a store-bought tray.
- Coffee grounds or compost
- Spray bottle for watering

2.4 Track sprout growth

1. Use Garden Worksheet 2.4 to have students track sprout growth of the seedlings.

2. For each plant, record the day that it sprouts (when the plant emerges from the soil). Dispose of loose plastic covering once the first sprout appears to allow room to grow.

3. Measure sprouts with a ruler or measuring tape twice per week, about every 3-4 days, and record the height of the plants as they grow.

4. When the seedlings are 2-3 weeks old, they can be ready to transplant into larger individual pots. Refer to Garden Lesson 3 for instructions on next phases (planting!) and corresponding activities. If planning to pot up seedlings, consider using recycled containers instead of plant pots (such as ice cream tubs, pop bottles or old toys), be sure to save them in advance and create drainage holes.

2.4 Example

	Zucchini 1		Pepper 1		Pepper 2	
Sprout Date	April 23					
	Height	Date	Height	Date	Height	Date
	3 mm	April 27				
	7 mm	April 30				

Tips and Tools

Place soaked seeds in a small ziplock bag and watch them sprout as a parallel experiment to seeding in soil.

2.4 Materials

- Garden journal
- Pencil or pen
- Ruler or measuring tape

Nourish Resource Features

Grow Your Own Microgreens

Winter Sowing Activity Guide

Check out these two alternate seed activities

2.5 Create a self-watering seed tray

1. To create a self-watering (wicking) tray for seedlings, you will need to source a rigid material you can cut to create an insert that will fit inside your bottom tray. If using a standard seed tray, you can modify a second tray as the insert.

2. If using a second seed tray, cut a slit (approximately 2-4 mm wide) for the towel to slip down through along the short sides (both ends) of the tray. If using a rigid plastic (like a corrugated plastic sheet), cut it to fit inside your bottom tray with room for the fabric to hang over at each short side.

3. Measure the height of the mason jar rings (or alternative water proof riser). Cut the towel or fabric the width of the seed tray and cut the length of the seed tray plus the height of the risers (mason jar rings or other material).

4. Fill the bottom tray (now the water reservoir) with water up to the top of the risers.

5. Lay the towel in the tray with the cut ends or over top of the rigid plastic material. Make sure the excess ends of fabric are pushed through the slit or over the edge of the rigid plastic material so that they hang straight down into the water reservoir.

5. Place the smaller seed plug inserts (where your seeds are planted) directly on top of the soaked fabric ensuring that the holes in the bottom of the seed plugs are making contact with the wet fabric.

6. Place the smaller seed plug inserts (where your seeds are planted) directly on top of the soaked fabric ensuring that the holes in the bottom of the seed plugs are making contact with the wet fabric.

7. You can use this self-watering tray all the time or just on weekends or periods when seedlings cannot be tended to daily. Check water reservoir daily to ensure it isn't dry.

Additional Resources

How does a seed become a plant (video)
https://www.youtube.com/watch?v=tkFPyue5X3Q

What is seed germination? (video)
https://www.youtube.com/watch?v=JSe_VUMymjo

Plant Life Cycle Stages from Seed to Plant? (video)
https://www.youtube.com/watch?v=JSe_VUMymjo

Bean Time Lapse- 25 days- Soil Cross Section? (video)
https://www.youtube.com/watch?v=JSe_VUMymjo

Tips and Tools

2.5 Materials

- An extra seed tray or a rigid, waterproof material cut to fit inside the seed tray
- Towel or cotton fabric, slightly larger than the seed tray (used is great)
- 5 mason jar rings or 5 waterproof risers at least 1.5 cm and up to 4 cm tall

Click for next lesson:
Garden Lesson 3: Planting a Garden

2.1 Create an indoor sun map

Sun Map Legend:

shade

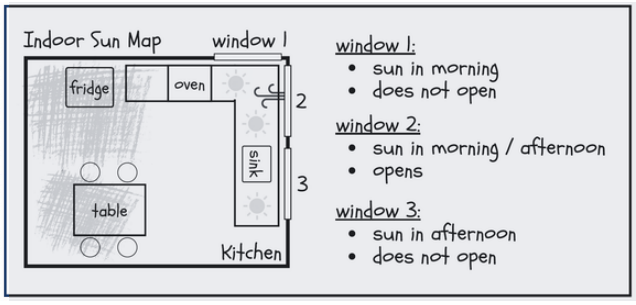
sun

air

My Name: **Class:**

Draw a map of this space, including any details like furniture and windows. Using a ruler can make it easier to keep your map looking neat and tidy. Based on what you've observed, fill in the sunny and shady spots on the map with colours, pictures or shading. Add as many details as would be helpful. Add directions North, South, East and West.

Example Sun Map:



Reflection Questions:

1. Where is the best place for the seedlings to live while they grow in your class?
2. What direction are the windows facing?
3. How many hours of sunlight does the class get?

2.1 Create an indoor sun map (continued)

Observe the space for an entire day. Make note of:

a. **Which spots are sunny in the morning? Afternoon?**

b. **Which spots feel warm?**

c. **Which spots have good air flow from a nearby window or door?**

d. **What direction do each of the windows face (N, S, E, W)?**

e. **Where is the best place for the plants to live?**

Thoughts & Notes

2.2.1 Seed exploration

Instructions

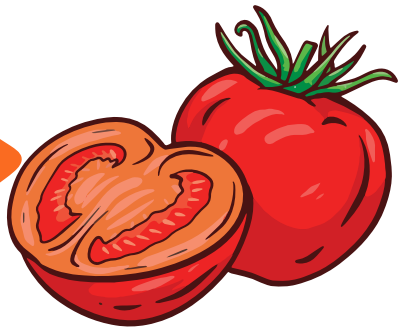
1. **Open a seed package and look at the seeds.**

2. **For each type of seed:** Write the name of the plant of the seed packet you chose.
Draw a picture of the seed and a picture of what the seed will grow into.

Tomato Seed

grows into

Tomato Plant



_____ Seed

grows into

_____ Plant

_____ Seed

grows into

_____ Plant

2.2.2 Seed exploration

1. Look at the information on the seed pack.
2. Open a seed package and look at the seeds.
3. For each type of seed:

Step 1. Write the name of the plant of the seed packet you chose.
Draw a picture of the seed and a picture of what the seed will grow into.

2. Write a list of 3-4 characteristics of each seed, including any listed above (colour, shape, size, texture) or any others you can think of.

Seed

grows into

Plant

Seed Characteristics

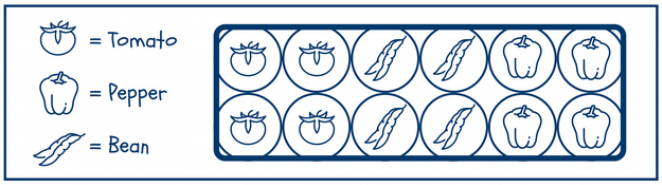
4. a. How many days until a sprout should appear?

4. b. How many days until harvest?

2.3 Seed tray map

Map the seed tray below to draw the seeds you're planting using words, numbers or drawings.

2.3 Example



2.4 Track sprout growth

2.4 Example

	Zucchini 1		Pepper 1		Pepper 2	
Sprout Date	April 23					
	Height	Date	Height	Date	Height	Date
	3 mm	April 27				
	7 mm	April 30				

Plant Name						
Sprout Date						
	Height	Date	Height	Date	Height	Date