



*Growing Up Organic operates on traditional and unceded territory of the Algonquins: now known to many as Ottawa, and now home to many from across Turtle Island and beyond.*

Grade 3-4

# Planting the Garden

Mindfulness minute: If it speaks to you, take two minutes with your students before this workshop to slow down and root down with this mindfulness minute.

## **LESSON FOCUS AND GOALS**

Using the map from the previous workshop, students measure out square feet in the garden and plant early crop seeds directly into the soil. We introduce the concept of a 'variety' by planting two varieties of each vegetable in order to compare their differences and similarities as they grow.

## **LEARNING OBJECTIVES**

**Grade 3**

**Science and Technology: Life Systems**

### **OVERALL EXPECTATIONS:**

- 1. Assess ways in which plants have an impact on society and the environment, and ways in which human activity has an impact on plants and plant habitats;
- 2. Investigate similarities and differences in the characteristics of various plants, and ways in which the characteristics of plants relate to the environment in which they grow;
- 3. Demonstrate an understanding that plants grow and change and have distinct characteristics.

### **SPECIFIC EXPECTATIONS:**

- 1.1 -Assess ways in which plants are important to humans and other living things, taking different points of view into consideration, and suggest ways in which humans can protect plants
- 2.2- Observe and compare the parts of a variety of plants (e.g., roots of carrot; stem of broccoli; leaves of lettuce);
- 2.3- Germinate seeds and record similarities and differences as seedlings develop
- 2.6- Use appropriate science and technology vocabulary, including stem, leaf, root, pistil, stamen, flower, adaptation, and germination, in oral and written communication;
- 3.1- Describe the basic needs of plants, including air, water, light, warmth, and space
- 3.2- Identify the major parts of plants, including root, stem, flower, stamen, pistil, leaf, seed, and fruit, and describe how each contributes to the plant's survival within the plant's environment
- 3.3- Describe the changes that different plants undergo in their life cycles (e.g., some plants grow from bulbs to flowers, and when the flowers die off the bulb produces little bulbs that will bloom the next year; some plants grow from germination of a seed to the production of a fruit containing seeds that are then scattered by humans, animals, or the wind so that new plants can grow)

## Mathematics: Number Sense

### OVERALL EXPECTATIONS:

- B1- Demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

### SPECIFIC EXPECTATIONS:

- B1.7 - Represent and solve fair-share problems that focus on determining and using equivalent fractions, including problems that involve halves, fourths, and eighths; thirds and sixths; and fifths and tenths

Mathematics: Geometric and Spatial Reasoning and Measurement

### OVERALL EXPECTATIONS:

- E1- Describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them
- E2- Compare, estimate, and determine measurements in various contexts

### SPECIFIC EXPECTATIONS:

- E1.4 - Give and follow multi step instructions involving movement from one location to another, including distances and half- and quarter-turns
- E2.1 - Use appropriate units of length to estimate, measure, and compare the perimeters of polygons and curved shapes, and construct polygons with a given perimeter
- E2.2 - Explain the relationships between millimetres, centimetres, metres, and kilometres as metric units of length, and use benchmarks for these units to estimate lengths
- 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
- E2.8 - Use appropriate non-standard units to measure area, and explain the effect that gaps and overlaps have on accuracy

## Grade 4

### Science and Technology: Life Systems

### SPECIFIC EXPECTATIONS:

- 2.1- Follow established safety procedures for working with soils and natural materials;
- 3.3- Identify factors (e.g., availability of water or food, amount of light, type of weather) that affect the ability of plants and animals to survive in a specific habitat;
- 3.7- Describe structural adaptations that allow plants and animals to survive in specific habitats

Mathematics: Number Sense and Numeration

### OVERALL EXPECTATIONS:

- B1. Demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life
- B2. Use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

### SPECIFIC EXPECTATIONS:

- B1.4- Represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meanings of the denominator and the numerator
- B1.5- Use drawings and models to represent, compare, and order fractions representing the individual portions that result from two different fair-share scenarios involving any combination of 2, 3, 4, 5, 6, 8, and 10 sharers

## Mathematics: Geometric and Spatial Reasoning and Measurement

### OVERALL EXPECTATIONS:

- E1. Describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them
- E2. Compare, estimate, and determine measurements in various contexts

### SPECIFIC EXPECTATIONS:

- E1.1- Identify geometric properties of rectangles, including the number of right angles, parallel and perpendicular sides, and lines of symmetry
- E1.3 -Describe and perform translations and reflections on a grid, and predict the results of these transformations
- E2.2 -Use metric prefixes to describe the relative size of different metric units, and choose appropriate units and tools to measure length, mass, and capacity
- E2.5 - Use the row and column structure of an array to measure the areas of rectangles and to show that the area of any rectangle can be found by multiplying its side lengths
- E2.6- Apply the formula for the area of a rectangle to find the unknown measurement when given two of the three

## **MATERIALS NEEDED**

Two seed varieties each for each vegetable to be planted in the garden (for a recommended list, see the GUO website), placed back-to-back in a clear Ziploc sandwich bag.

Tape measurer

Twine

Garden Planning Cards

Stapler or staple gun

Sharpie paint markers

Materials for creating garden signs (tiles, large popsicle sticks, smooth rocks, etc.)

Garden map from previous workshop

Veggie Guide worksheets for each student

## **STRUCTURE / ACTIVITY**

### **Part 1: Fractions in the garden**

Have the students work together with pieces of string or twine to re-create the 8 by 3 grid of their map onto the raised bed (or divide the bed into square feet according to the size of your particular garden bed). This can be done by measuring with the tape measure, or by guiding the students in estimating fractions by moving the twine to divide the box equally (start by dividing the bed in half widthwise, then in quarters widthwise, then in thirds lengthwise). Staple the twine to the box frame to keep in place.

Most gardens will look like this:



Ask the students to use the garden planning cards to identify what will be planted in each square by referring to the map.

### **Part 2: Heirloom varieties**

Explain to the students that they will be planting two varieties of each vegetable in the garden. Explain the word variety. Most students will not recognize this word, but will know names of different apple varieties, so this can be a good point of reference.

How many different varieties of apples can you name?

How can we tell one variety from another? (colour, taste, size, shape)

Like apples, the vegetables in our garden come in all different shapes, sizes and flavours – even if we might only see one kind (or “variety”) in the grocery store. In fact, some of the varieties we’ll be planting might be quite rare!

Show examples using the images on the seed packets (purple carrots are a good one; or white radishes). By planting two varieties of each vegetable, we’ll get to observe the differences while they grow.

For each pair of students assign one of the vegetables they will plant in the garden during this session.

Each student chooses one of the two varieties made available to them in the Ziploc bag (remind students that they don’t need to open the bag to identify the varieties!)

Invite students in small groups to plant their seeds in the garden. While students are waiting for their turn to plant, they can work on their Veggie Guide worksheet. Identify the variety planted in each square using the chosen plant markers.