

## Description

Students plan and map garden beds, using information about growth requirements for each plant.

## Objective

To combine several math and science skills to create a garden design, including research, mapping and drawing to scale.

## Background

Refer to Chapter 1 on plant needs and site preparation.

## Groundwork

- From the list of cool season or warm season vegetables, ask students to vote on what plants to grow in the garden.
- Make a list and tally the votes on the board.

## Exploration

1. Ask: “When plants grow, do they all look the same? What are some differences? What are some plant needs we should consider when planning our garden?” (Space, sunlight, water, time.) “How can we find out specific needs of each type of plant?” (Seed catalog, packets, gardening books.) “To make a map of our garden plan, what information do we need?”
2. As a group, agree to a common scale for mapping on graph paper.
3. Divide class into five groups, and prepare to role play the spacing needs of plants. Have each group gather in a small space, each huddled in a ball, and ask them to stretch out slowly to their full height.
4. Ask: “How do they feel? Do they think they could each get enough food and water?” Ask them to turn to the sun. Do they think they would get enough sunlight? Now, ask every student to position themselves with “enough” space. Notice that each student chose a different amount of space: plants have the same preferences, depending on the type of plant.
5. Distribute to each group the vegetable planting guides, graph paper, pencils, straight edges, and a list of plants to be grown. Explain that each group will work on one part of the problem. Later, representatives from each group will get together to compare information and make a map.

*Group 1* will draw the size and shape of the garden to scale on the graph paper, orienting it to the compass directions and showing all the permanent features, such as trees and buildings.

*Group 2* will create a list of the plants to be grown according to height. They should first make a bar graph with the plant height on the y-axis and the plant name on the x-axis and use the graph to create their list. Seed packets and catalogues may be used as a reference.



### Time:

**Groundwork: Variable**

**Exploration: 40 minutes**

**Making connections: Ongoing**

### Materials:

- Vegetable planting information from reference chapter
- List of plants to be grown
- Seed packets and catalogs
- Graph paper
- Ruler
- Magnetic compass


## Standards At-A-Glance

### Next Generation Sunshine Standards Met:

SC.1.N.1.1, SC.2.N.1.1, SC.3.N.1.1, SC.4.N.1.1, SC.1.N.1.2, SC.1.N.1.3, SC.3.N.1.3, SS.1.E.1.1, SS.1.E.1.2, SS.1.E.1.3, SS.1.E.1.4, SC.2.L.16.1, SC.2.L.17.1, SC.2.L.17.2, SC.3.N.1.3, SC.3.N.1.6, SC.3.P.8.3, SC.4.N.1.4, SC.4.N.1.5, SC.4.P.8.1, SC.5.N.1.1, SC.5.N.1.2, SC.5.N.1.6, SC.6.N.1.5, LAFS.1.SL.1.1, LAFS.1.W.3.8, LAFS.2.W.3.7, LAFS.2.W.3.8, LAFS.4.W.3.8, LAFS.4.RI.3.7, MAFS.1.OA.1.1, MAFS.1.OA.1.2, MAFS.1.MD.3.4, MAFS.2.OA.1.1, MAFS.2.MD.1.1, MAFS.2.MD.1.2, MAFS.2.MD.1.3, MAFS.3.MD.3.6, MAFS.3.MD.3.7, MAFS.3.MD.4.8, MAFS.3.G.1.2, MAFS.4.OA.1.1, MAFS.4.M.D.1.2, MAFS.4.M.D.1.3

### Next Generation Science Standards:

1-LS1-1, 1-ESS1-1, 1-ESS1-2, 3-LS1-1, 3-5-ETS1-13, 5-ETS1-2



**Group 3** will create a list of compatible plants to be grown by filling out three columns: Name of plant, sunlight needed, and water needed.

**Group 4** will list the space requirements of each type of plant, using the vegetable planting guides and information on seed packets. They will indicate on graph paper the space requirements by shading the number of square inches or feet needed by mature plants.

**Group 5** will analyze last year's garden to make sure the plants are rotated in this year's garden. Using the list of last year's plants and the Plant Rotation information, they will construct a rough map and will recommend which plants may best be grown in each bed this year.

**Compiler group:** A representative from each group will meet to create a single garden map. Students should have fun advocating the needs of each plant in making decisions. Have them present their results to the rest of the class in an imaginative way.

### Enrichment

1. Ask: "What would be the outcome if we simply scattered seeds randomly in the garden? What is the difference between a garden and a natural field?"
2. Make a clay model of the garden, or draw a poster to share with others in the school of what was planted.
3. Collect a pizza recipe from each student's family, and create a pizza garden cookbook for the class.

### Extensions for Middle and High School students

1. Calculate the height of any trees in the garden by figuring the proportion of student shadow to tree shadow.
2. Determine how tall garden trees will be when students graduate. Draw a futuristic picture of the garden in 10, 20 and 30 years.
3. Find out about National Arbor Day in your area, and plan an event to share your knowledge of trees and gardening.

# Inch by Inch, Row by Row

## Sample Pre-Post Assessment

1. A tomato plant needs two feet of space. How many tomato plants can fit in an eight-foot-by-10-foot square?
2. What is one main ingredient of pizza that does not grow well in Florida?
3. Circle the plants in the same plant family:
  - a. Basil
  - b. Tomato
  - c. Onion
  - d. Pepper
4. If your pizza garden has a 10-foot diameter, how long is the three-foot walkway going from one side to the other? \_\_\_\_\_
5. How can a gardener keep weeds out of the pizza garden if he or she does not want to use herbicide?