



# Fall into Healthy Shapes

## Grade K Standards

MCC.K.G.1, K.G.2; GPS.HEK.1, NGSS.K.ESS3.A

## Time

(2) 45 minute periods over 2 days  
+ harvest 4 – 8 weeks later

## Supplies

**For reading aloud to class:**

- Book such as Pick a Circle, Gather Squares: A Fall Harvest of Shapes by Felicia Sanzari Chernesky

**For “Shape Hunt” – 1 per child of:**

- Clipboards, pencils
- “Shape Hunt in the Garden”

**For planting fall vegetables**

- 1 recycled container per child for planting seeds (yogurt cups, milk cartons, used nursery pots, etc.)
- Sunny window or garden space
- Potting or garden soil
- Scoop or trowel for soil
- Fall vegetable seeds such as radishes, carrots, squash, greens
- 1 craft stick / child to mark plant
- Carrots and radishes for snacks
- Sticky notes ( 4 / child)
- Chart size copy of “How We Like our Garden Goodies” (pg 6)
- Optional: Construction paper, scissors, glue to make containers into different shapes

**For harvest (30-60 days after planting)**

- Wash basins for rinsing veggies

## Garden Connection

Students will be engaged in math activities in a garden setting, plant seeds for fall vegetables, and taste-test fresh vegetables.

## Overview

Students will identify two and three dimensional shapes of different sizes and orientations by planting seeds in differently- shaped containers; going on a ‘shape hunt’; and using positional words to direct others to the shapes they find while playing “I Spy in the Garden.” Students will also learn that vegetables grown in the garden are part of a healthy diet, as they snack on fall vegetables in geometric shapes.

## Guiding Questions

What shapes can we find in the garden?

How can we grow healthy foods grow in the garden?

## Engaging Students

- Read aloud the book: Pick a Circle, Gather Squares: A Fall Harvest of Shapes by Felicia Sanzari Chernesky [http://www.amazon.com/Felicia-Sanzari-Chernesky/e/B00E62Y12Q/ref=ntt\\_athr\\_dp\\_pel\\_1](http://www.amazon.com/Felicia-Sanzari-Chernesky/e/B00E62Y12Q/ref=ntt_athr_dp_pel_1)
- Harvest fall fruits and vegetables from the school garden with students.
- Share a snack of fall veggies such as carrots and radishes, cut into geometric shapes.

## Exploration

Students will go on a ‘Shape Hunt’ and play ‘I Spy in the Garden’ to practice identifying shapes and using positional words. Then they will start seeds indoors, in geometrically-shaped, recycled containers (or plant directly in the garden).

## Explanation

Students will be able to name the shapes they find in the garden, use positional words to direct others to the shapes they see, and identify healthy foods that are grown in a garden.

## Environmental Stewardship

When students plant vegetables in the school garden, they can harvest a row for the hungry and donate produce to a local food bank.

## Evaluation

A rubric is provided to assess student demonstration of proficiency in correctly identifying the shape of objects found in the environment, regardless of orientation; directing others to objects by naming shape and using positional words; identifying a plant grown in the garden as the source of a healthy food.

## Standards

### Georgia Performance Standards in Common Core Math

GPS.MCC.K.G.1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to

GPS.MCC.K.G.2. Correctly name shapes regardless of orientations or overall size

### Georgia Performance Standards in Health

HEK.1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.

A. Name healthy behavior

### Next Generation Science Standards

NGSS.K.ESS3.A: Natural Resources

Living things need water, air, and resources from the land, and they live in places that have the things they need.(K-ESS3-1)

## Background Information

Geometric shapes and patterns appear regularly in nature. By hunting for shapes in the garden, students learn to recognize basic shapes in the environment. Circles, cylinders, spirals, squares, cubes, triangles, pyramids, rectangles can be found in flowers, woodchips, animals, the shape of garden beds, rocks, and so forth. Playing “I Spy in the Garden” introduces the concept of using positional words to describe the location of shaped objects.

Planting tips on starting seeds indoors:

<http://www.gardenbetty.com/2011/03/the-no-brainer-guide-to-starting-seeds-indoors/>

<http://www.hort.vt.edu/HORT6004/network/YouthGardener/Helpsheets/seeds.pdf>

## Teacher Preparation

- See Captain Planet Foundation web site for tips on preparing an organic raised bed garden and the Background Information in this lesson for tips on starting seeds indoors.
- 1 Week before lesson:
  - Ask students to bring in clean recycled containers for planting seeds (e.g. yogurt cups or cardboard drink cartons) and be prepared to name the shape of the container.
  - Poke holes in the bottom of the containers for drainage, and place a tray or saucer under containers.
  - Gather extra containers for students who do not bring one in.
  - Secure the rest of the materials and supplies needed for lesson.
  - Make copies of student lab reports (hand-outs) included in this lesson.
  - Make poster sized copy of “How We Like Our Garden Goodies” to use as a bar chart on which children will vote for veggies they like to taste, with sticky notes.

## PROCEDURES FOR LESSON ACTIVITIES

### Day 1

#### Engagement

##### Reading

- Take the class outside, ask everyone to be seated (on trash bags or place mats, if benches not available), and get a moment of quiet by telling everyone to listen for birds, wind, and other sounds in the garden.
- When everyone is listening, ask the class to recall the Garden Guidelines established in the Sense of Place lesson.
- Read aloud to the class from: Pick a Circle, Gather Squares: A Fall Harvest of Shapes by Felicia Sanzari Chernesky

#### Shape Hunt

- Ask students to name shapes they know and find objects with those same shapes in the environment. Refer back to shapes and objects identified in the book, if necessary.
- Pass out copies of the lab report titled “Shape Hunt in the Garden”
- Review the words for related two-dimensional and three-dimensional shapes, such as circles vs cylinders, squares vs. cubes, and triangles vs (3-sided) pyramids. Compare two and three dimensional objects side by side, if possible.

## Healthy Eating from the Garden

- Let children harvest, wash and eat snacks from garden (if planted in 4 – 6 weeks earlier and ready to be harvested) or bring uncut vegetables to class from the market. Allow students see the vegetables and fruits before and after they have been cut to eat.
- When cutting fruits and vegetables into geometric shapes, note that carambola (star fruit) naturally slices into star-shaped snacks; small grapes are spheres, as opposed to circles sliced from cylindrical squashes, carrots or radishes; melons can be cut into various geometric shapes using cookie cutters, scoops or knives; and students can arrange carrot, celery or broccoli stem sticks to form many other shapes.
- Children do not like everything they taste, but repeated exposure allows students to cultivate a taste for foods they may not like at first. Create a poster-size copy of the attached “How We Like Our Garden Goodies” and provide every student with several sticky notes. After tasting each vegetable, let students place a sticky note in the column above that vegetable if they like it, creating a collective bar graph. When everyone has “voted” for the veggies they like, discuss the class favorites. Let students know that all vegetables are healthy snack choices.
- Working in the garden is a healthy activity because it provides exercise and fresh air. Ask students to name all the garden activities that give them a chance to get exercise. (Possible answers: walking, squatting, hauling, digging).

### Day 2: In the Classroom

#### Exploration: Planting in Geometrically-Shaped Containers

- Show some of the recycled containers brought in for planting, and ask students to identify the shapes.
  - Examples: soup cans= cylinders, old sports ball with top cut off=spheres, milk cartons with tops cut off and other to-go containers = cubes or rectangular prisms, three sided pyramids can be made by surrounding containers with folded card stock or construction paper.
  - Optional: Provide card stock or construction paper and glue so students can create different 3-D shapes by surrounding their containers with folded paper.
- Let students plant seeds in containers for cool-weather crops such as carrots, radishes, beets, turnips, kale, cabbages, collards, kohlrabi, spinach, leaf lettuces, potatoes, sweet potatoes, Swiss chard, snap peas, or greens.
  - Note: indoor container-planting is common in winter so plants can have a head-start before the weather and ground are warm enough to planting outside in the garden. The purpose of the containers in this lesson is to observe three dimensional shapes. Seeds could be directly sown into the garden during fall, as long as tender crops mature before first frost.
  - If seeds are not available, grow veggies from rooting plant parts such as potato eyes, carrot tops, sweet potato slips (sprouts), turnip tops, radish tops, or beet tops. Non-organic vegetables are often treated with chemicals to prevent sprouting, so look for organic vegetables to use as food scraps that can be rooted.
- Poke drainage holes (teacher or adult volunteer only) in bottom of each container before students plant (use a pen, scissors or a nail)
- Let students fill their containers with soil and plant with 3-4 seeds.
- Have each student write his/her name and the type of seed planted on one end of a craft stick (or toothpicks with a taped paper ‘flag’) and place the stick in the soil.
- Students should lightly water containers and place in sunny spot near a window, on a tray or saucer.
- Ask the class to brainstorm what their seeds will need to survive and stay healthy? (sunlight, water, air, nutrients)
- When well established (2 – 3 weeks later) let students transplant seedlings into garden soil, mulch, water, and tend.

### Day 2: In the Garden

#### Explanation: I Spy in the Garden game

- Allow each student to secretly locate a shape in the garden and tell the name of the shape (but not where it is located), e..g. “I spy a cube!” This can be done in pairs or small groups.
- Other students can guess the secret object’s location by asking questions using positional words, i.e. “Is the triangle next to the flowers?” or “Is the triangle in the corner of the garden?” Positional words include: next to, beside, above, beneath, below, at the top, in the corner, on the edge, in the middle, etc.
- Make sure each student has a chance to have a secret object and to guess the location of someone else’s object.
- **Debriefing:** Ask students to recall what they did during this lesson and contribute review questions and answers . . .
  - What seeds did we plant? (list plants that will grow from planted seeds)
  - What shapes did we find in the garden? (list 2 and 3-d shapes with students)
  - What foods from the garden did we taste? (list foods with students)
  - What positional words did we use to ask or tell where secret objects could be found? (above, beside, etc)

- What are some healthy snacks that come from the garden? (raw or lightly-cooked vegetables)
- What else is healthy about gardening? (fresh air, exercise)

### **Environmental Stewardship**

- Encourage the class to consider how they could help hungry people this winter. For example: plant a row for the hungry and take the harvest to a food pantry that accepts perishables. When seedlings are ready for transplant, designate some that the class will grow for themselves to eat and some they will donate to a food pantry in the area, remembering that pledge at harvest time.

### **Evaluation**

- The attached rubric will assist in assessing student proficiency in math and health standards integrated into this lesson.

### **Extensions**

- Students who are not yet proficient in recognizing shapes may benefit from playing an online Sesame Street game, Telly's Shape Garden: <http://pbskids.org/sesame/games/tellys-shape-garden/> Ability to drag and drop items with a mouse is a pre-requisite for this game. An Internet-connected computer is required.
- Photos from the Math2Earth curriculum unit titled "Geometry in Gardens and Parks" can be enlarged so that students with highlighter markers can trace specific shapes when the teacher tells them to search for or count the number of triangles, circles, squares, or rectangles:  
[http://www.math2earth.oriw.eu/publications/18\\_Geometry%20in%20gardens%20and%20parks.pdf](http://www.math2earth.oriw.eu/publications/18_Geometry%20in%20gardens%20and%20parks.pdf)

# Shape Hunt in the Garden

Name: \_\_\_\_\_

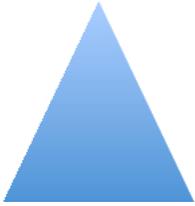
Find something in the garden that looks like each of these shapes.

Draw pictures of the things you find. Write the name of their shapes.

\_\_\_\_\_

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\_\_\_\_\_



**triangle**

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

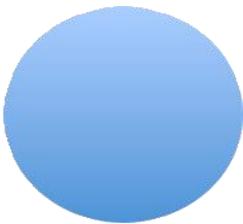


**square**

\_\_\_\_\_

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\_\_\_\_\_



**circle**

\_\_\_\_\_

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\_\_\_\_\_



**trapezoid**



## How We Liked Our Garden Goodies

**Carrots**

**Radishes**

# Assessment for Fall Into Healthy Shapes

Student Name(s): \_\_\_\_\_ Date: \_\_\_\_\_

Level of Mastery  Benchmark or Performance Measure	 <b>EMERGING</b> Not yet proficient 1 point	 <b>COMPETENT</b> Partially proficient 4 points	 <b>PROFICIENT</b> Mastered task @ 80+% 5 points	<b>TOTAL POINTS</b>
<b>Student recognizes and names 2-D and 3-D shapes in the garden, such as square, circle, rectangle, triangle, cube, sphere, cylinder, pyramid, rectangular prism, and cone.</b>	Student recognizes and name shapes in the garden with less than 50% accuracy.	Student recognizes and names 2-D shapes with 100% accuracy and 3-D shapes 50% - 80% accuracy.	Student recognizes and names 2-D shapes with 100% accuracy and 3-D shapes with 80% or better accuracy, regardless of size or orientation.	
<b>Student uses positional words to describe location of objects (I Spy activity)</b>	Student can use some positional words but has difficulty explaining the position of an object relative to another	Student can explain the position of an object using positional words, with 50 – 80% accuracy.	Student can explain the location of one object relative to another, using positional words such as next to, beside, above, beneath, below, at the top, on the edge, in the corner, in the middle	
<b>Student can locate, draw and correctly write the name of shapes in the garden. (Shape Hunt in the Garden activity)</b>	Student can recognize, draw and correctly write the name of at least one shape in the garden.	Student can recognize, draw and correctly write the name of at least two shapes in the garden.	Student can recognize, draw and correctly write the name of three or four shapes in the garden.	
<b>Students can demonstrate healthy behaviors including eating vegetables for snacks and working in the garden.</b>	Student does not taste-test vegetable snacks and does not go outside to the garden.	Students taste-tests at least one healthy vegetable snack, goes on Garden Shape Hunt, and works in the garden	Student taste-tests all vegetable snacks, goes on Garden Shape Hunt, works in the garden, and can identify all of these as healthy behaviors.	

