

Island Grown Schools Seed Unit

Unit Title: Seeds

Grade: K-5

Essential Question(s): Where do seeds come from? / Do all plants have seeds? / What do seeds need to thrive?

Connections to IGS Enduring Understandings:	Knowledge
<ol style="list-style-type: none"> 1. Appreciate the farming profession 2. Recognize difference between the industrial food system and localized food systems 3. Understand the connection between healthy soil, healthy plants, and healthy people 4. Know that everyone can grow food 5. Feel confident in making healthy food choices 	<p>Unit Enduring Understandings:</p> <ol style="list-style-type: none"> 1. Students will understand the interconnectedness of plants, animals and humans 2. Students will understand the importance of seed saving 3. Students will understand where our food comes from <p>Students will know:</p> <ol style="list-style-type: none"> 1. All plants grow in order to reproduce, primarily through seeds 2. There are more than 300,000 different seeds in the world, and they all have different needs 3. Seed saving is crucial to a sustainable community 4. The life cycles of plants vary tremendously 5. Every living thing depends on plants
Connections to MA Frameworks/Common Core:	Skills
<p>Science: PreK-2 Earth and Space (ES) and Life Science (LS) including:</p> <p>ES 1. Recognize that water, rocks, soil, and living organisms are found on the earth's surface.</p> <p>LS 1. Recognize that animals (including humans) and plants are living things that grow, reproduce, and need food, air, and water.</p> <p>LS 2. Differentiate between living and nonliving things. Group both living and nonliving things according to the characteristics that they share.</p> <p>LS 3. Recognize that plants and animals have life cycles, and</p>	<p>Students will be able to:</p> <ol style="list-style-type: none"> A. Identify the parts of a seed B. Recognize different stages of plant growth C. Provide various seeds with adequate sunlight and water and nutrients to grow D. Determine what kinds/parts of seeds, sprouts, and full grown plants are edible E. Appreciate the different ways humans use plants F. Discover and save seeds in the garden, to be planted during the next planting season

that life cycles vary for different living things.

LS 4. Describe ways in which many plants and animals closely resemble their parents in observed appearance.

LS 7. Recognize changes in appearance that animals and plants go through as the seasons change.

LS 8. Identify the ways in which an organism's habitat provides for its basic needs (plants require air, water, nutrients, and light; animals require food, water, air, and shelter).

Science: 3-5 Life Science (LS) including:

LS 2. Identify the structures in plants (leaves, roots, flowers, stem, bark, wood) that are responsible for food production, support, water transport, reproduction, growth, and protection.

LS 3. Recognize that plants and animals go through predictable life cycles that include birth, growth, development, reproduction, and death.

LS 9. Recognize plant behaviors

LS 11. Describe how energy derived from the sun is used by plants to produce sugars and is transferred within a food chain from producers to consumers to decomposers.

Math (M): Counting and Cardinality (CC); Measurement and Data (MD); Operations and Algebraic Thinking (OA)

Language Arts (LA): fiction, nonfiction, types of writing

Stage 2: Evidence

Performance Tasks(s): <i>Specific activities we create for students, to engage in learning concepts...</i>	Evaluative Criteria
<ul style="list-style-type: none"> * <i>Journalling</i> * <i>Sprouting experiments</i> * <i>Taste tests (seeds, sprouts, shoots, roots, leafs, flowers)</i> * <i>Worksheets (labeling, observations)</i> * <i>Games (“Seed, Root, Flower, Fruit”)</i> * <i>Planting in the school garden</i> 	<ul style="list-style-type: none"> * Students are able to effectively communicate their learning through writing and drawing in their journals * Students are able to use their knowledge of plant needs to provide a sufficient sprouting environment * Students are able to distinguish between edible and non-edible parts of the plants, and explain the differences between the tastes/roles of different plant parts * Students are able to track the appropriate life cycles of various plants by acting out parts in the game * Students are able to utilize their knowledge of seeds in the planting and maintenance of the school garden
<p>Non-activity based evidence: <i>Educators will be able to assess student learning by...</i></p> <ul style="list-style-type: none"> * <i>KWL Sheet</i> * <i>“I wonder” questions</i> * <i>Student behavior/food choices</i> * <i>Discussions</i> * <i>Feedback from families, parents</i> 	<ul style="list-style-type: none"> * Students are able to identify places where they have gained knowledge, and questions they still have in this subject * Students use the framework of “I wonder” questions to compile deeper thinking into the subject of seeds throughout the year * Students make food choices based on their experiences growing, tasting, and learning about different seeds * Students, with the teacher or with fellow students, engage in discussion about seeds, plants, and the essential questions from the classroom * Families/parents engage with the material as a result of the students bringing their own thoughts and questions home from school.

Stage 3: Learning Plan

Code (link to IGS Enduring Understandings, Standards)	Learning Events: <i>Specific steps students will take in this unit, with and without IGS coordinator, in chronological order</i>	Notes to support learning event success:
LA LA LS 1 LS 1, 4 OA LS 2 LS 1, 3 CC LS 4, 7 F IGS EU 2 LS 8	<u>Fall: Seed Saving</u> - Students create nature journals * Intro to vegetables and the school garden with “Harvest Blanket” activity, and/or create a Vegetable Alphabet. Discuss the questions, “What is a vegetable?”, “What are its parts?” - Where do seeds come from?: Record “I wonder” questions/create KWL sheet as a class, and individually in journals * Seed dissection: explore the seeds within the vegetables (in pairs, cut open vegetables for students and allow them to discover (or not discover) the seeds * “Are seeds alive?” Cover crop activity in the garden * Seed saving in school garden using Inquiry-Based Learning “Why is it important to save seeds?”, “Who/what else uses seeds?” * Dig up potatoes, discuss how potatoes grow - Plant garlic, discuss the parts of the garlic; plant cover crop (buckwheat) - Apple Pressing: “Where do apples come from?”	* From <i>Project Seasons</i> , pg. 3 * Use one of each type of plant (fruit, flower, leaf, root) ** Sunflower observations for Kindergarteners * Seeds to save: lettuce, kale, beans, greens, pumpkins, sunflowers. ** Students can create their own seed packets with folded paper envelopes to save for Spring * Based on the seed dissection, students should understand that the potatoes and garlic are seeds
IGS EU 4 LS 8 LS 7 MD IGS EU 4, 5 LS 2 (3-5) LS 3 IGS EU 5 IGS EU 1 LS 8 IGS EU 3 LS 7 LS	<u>Winter: Understanding the Life Cycle</u> * “Meet Little Sprout” activity – introduce parts of a seed - Dissect a lima bean (soaked overnight) * Sprouting activity: in seed flats; in plastic bags “Can seeds grow without soil?” - Observations of growth, measurements, predictions - Drawing and labeling parts of the seed, sprout, shoot * Taste testing seeds, sprouts, shoots, Seed Trail Mix - Play “Seed, Root, Leaf, Stem/Shoot, Flower, Fruit” or any variation - Where does chocolate come from? Students trace chocolate from seed to bar * Where does milk come from? Why do cows produce milk? * Make birdfeeders, using seeds we are planting, sprouting, eating	* From <i>Project Seasons</i> , pg. 212 * Living vs nonliving: place seeds and rocks in plastic bag, watch and compare how they change * Edible seeds: sunflower, pumpkin, sesame, peanuts (in the shell) Edible sprouts: sunflower, broccoli, kale, radish, alfalfa, arugula, beets Edible shoots: peas ** Make “Six Seed Trail Mix”, from <i>A Growing Classroom</i> * Field trip to Grey Barn (see below) * Use students’ milk cartons, and decorate with nature
LS 3	<u>Spring: Planting Seeds in the Garden</u> - Germination tests in paper towel * DIY pots out of newspaper for seedlings, and using vermicompost from	* See the IGS Curriculum Unit on “Soil” for more about worms and

<p>LS 7 SS IGS EU 4 IGS EU 1, 2, 3, 4, 5 MD IGS EU 1, 2, 5</p>	<p>worm bin, start seeds in greenhouse. Discuss weather, temperature, and the effects on plants. - Observations of seedlings in greenhouse as temperature increases * Seed sorting activity * Seed Life Cycle Puzzle: a circular puzzle that displays the stages of plant growth - Make seed balls to plant around the island - Plant in the school garden * "Theme Beds": plant parts; literary themes; cultural/geographic themes; companion planting; patterns; meal theme - Harvest plants for school cafeteria - Weigh harvested produce, track amount of school-grown food</p> <p style="text-align: center;">FIELD TRIPS</p> <p>Grey Barn: grass-fed animals, where milk/meat/cheese comes from, seed sprouting</p>	<p>compost * Plant marigold seeds in February for Mother's Day * From <i>A Growing Classroom</i> * Either pre-made by the teacher, or students make one themselves as a math exercise to explore diameter, radius, etc. * Three Sisters Garden; pizza bed; salsa bed; "Tops and Bottoms" bed; etc. * Crop plan is crucial for timing</p>
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Materials:

- Harvest Blanket: blanket, vegetables, crayons, clipboards, and paper/journal
- Little Sprout: backpack, water bottle, snack bag, hat, raincoat, index cards, marker, tape
- Seeds (for dissecting, sprouting, tasting, planting)
- Vegetable Dissection: spoons, paper towels, small cups, magnifying glasses, knife, cutting boards
- Newspaper strips for DIY pots and a wooden pot maker OR small (5.5 oz) juice cans
- Sprouting activities: seeding flats, ziploc bags, paper towels, watering cans, seeds, sticker labels
- For Plant Life Cycle Puzzle: Cardboard or card stock paper, crayons, ruler, scissors
- Seed balls: seeds, clay/soil mixture, watering can, tupperware container

Resources:**Books:**

Project Seasons, Shelburne Farms
A Growing Classroom, by Roberta Jaffe and Gary Appel (Life Lab, UCSC)
A Handful of Seeds, by Occidental Arts and Ecology Center
The Carrot Seed, by Ruth Krauss
I'm a Seed, by Jean Marzollo
From Flower to Fruit, by Anne Ophelia Dowden
Dandelion Adventures, by L. Patricia Kite and Anca Hariton
A Fruit is a Suitcase for Seeds, Jean Richards and Anca Hariton
The Tiny Seed, by Eric Carle
Seeds Grow, by Angela Shelf Medearis
Life as a Sunflower, by Victoria Parker
Sunflowers, by Gail Saunders-Smith
This is the Sunflower, by Lola M. Schaefer
From Apple to Zucchini: Eating our Way through the Alphabet, by Lois Elhert

Articles:**Community resource people:**

Eric and Molly Glasgow, Grey Barn, Chilmark

Websites:

Great overview of plant classification:

<http://www.factmonster.com/ipka/A0932480.html>

Facts about seeds:

http://www.globio.org/glossopedia/article.aspx?art_id=30

Movies:

Climbing bean time lapse:

<http://www.youtube.com/watch?v=G2RuVxdr0mA>

Other involved organizations:

Polly Hill Arboretum