

2015 Fall School Garden Lessons to Meet Next Generation Science Standards Grade 3

STC curriculum, Plant Growth and Development, teaches plant life cycle, plant parts, bee parts, and pollination.

Below is a table of suggested 3rd grade garden lessons to enhance current curriculum with expanded focus on other life cycles, inheritability of traits, and the effect of environment on traits and adaptation. It also provides real world experiments to test if plant growth is effected by mulch, to fulfill performance expectation of Next Generation Science Standards (NGSS)

LL Science = Life Lab Science Curriculum; GC = Growing Classroom book (also by Life Lab); SGP = School Garden Project of Lane County lessons available on their website NGSS = Next Generation Science Standards

3rd Grade Lessons	Garden Lesson ideas to bolster STC Plant Growth and Development and meet NGSS – Fall 2015		
Lesson # and Date	Lessons	Source	NGSS
1) 9/21-10/2 Inheritance of traits and variation	A) A Warm Place to Grow Pg 108 – plant kale into area with mulch vs. no mulch	Growing Classroom Pg 108	3-5-ETS-1-3 3-LS3-2
	B) Scavenger hunt for parts of plants and relating that to the lifecycle of the plant as Burma Shave Hike.	Growing Classroom Pg 71	3-LS1-1?
	C) Have students taste varieties of tomato or pepper and Utilize the modified worksheet to evaluate plant traits (height, fruit/plant, fruit size, plant health, fruit taste) If they were farmers, which would they grow.....	Based on <u>What's in a Name</u> Pg. 179 Growing Classroom	3-LS3-1 3-LS4-3
2)10/28-10/9 Seed Saving Plant and seed diversity	A) Seed Saving Station 1 – Corn – dry seed	School Garden Project	3-5-ETS-1-3; if planted in spring
	B) Seed Saving Station 2 – Tomatoes – Wet seed	School Garden Project	3-LS1-1
	C) Seed Saving Station 3 - Lettuce Seed or if lettuce is not available collect bean seeds – both Dry seeds	School Garden Project	
3) 10/12-10/23 Plant needs and effect of environment	A) record temperature readings from A Warm Place to Grow pg 108 – make observation of plants	Growing Classroom Pg 108	3-LS3-2 3-5-ETS-1-3
	B) Garden Fruit– taste and discuss nutrients of a garden fruit and review parts of the plant, plant life cycle and inheritance of traits - estimate number of seeds in a garden fruit	Local Lesson	
	C) Plant Needs and their environment – what do plants need to grow well - game	School Garden Project	3-LS1-1
4)10/19-10/23 Garden Animals and flower compatibility	A) Mason Bees life cycle- compared to a honey bee life cycle – learning how to support all bees	Local Lesson	3-LS2-1 3-LS4-4
	B) Match Pollinators with flowers - Game	Garden Classroom	3-LS3-2
	C) Garden animal observations: interview an organism to develop questions you can answer through observation		
5) Wheat and flour	A)Record findings of Warm Place to Grow - Final	Growing Classroom	3-LS3-2
	B) Wheat on the stalk – Threshing wheat -what part of a plant are we collecting?	Local Lesson	
	C) – making flour. Is flour a plant? What kind of nutrients do we find in flour?		

Standard Code	Performance Expectation or Standard Description
3-LS1-1	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death
3-LS2-1	Construct an argument that some animals form groups that help members survive
3-LS3-1	Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms
3-LS3-2	Use evidence to support the explanation that traits can be influenced by the environment
3-LS4-2	Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
3-LS4-3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all
3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
3-5-ETS-1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
3rd Grade Spring lessons	
Date	Summary ideas, questions to ask and theme roundup for all stations (if possible)
1) 9/7-10/1 Design frost protection for plants Garden Introduction Inheritance of traits and variability. A) Warm Place B) life cycle C) tasting difference in traits	<p><u>Traits, Inheritance and Variations of traits</u></p> <p>A) A Warm Place to Grow: What impact does the weather in our area have on local farmers? Are there times of the year when they cannot grow crops? Is there always enough rain to water the crops? Can wind be a problem? How do farmers try to solve these problems? (<i>green houses, not growing all year, irrigation, tree windbreaks</i>) What about early frost? To prepare for cooler temperatures, let's design some ways to protect plants from the cold.</p> <p>B) Explore the garden while on a Burma Shave Hike with questions centered around plant parts in fall and the life cycle of plants. What do you use to make observations? (senses) How do you help your senses tune in to specific observations? One person in the group reads the card aloud, each person answers the question and another writes the answer. Making good observations is an important skill in science.</p> <p>C) Picture a pepper. More than one picture should come to mind. Some are green some are not and some are fat and some are thin. These different types are called varieties. Just as two sisters are similar but different, so there are different varieties of different fruits and vegetables. Do you think some varieties of tomatoes may taste better than others? Would some grow better than others? Would they grow better in our soil than others? Use the lab sheet to find out if certain vegetable varieties are better than others.</p> <p>NGSS: A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. Possible solutions are limited by available materials and resources. Success is determined by desired features of the solution (criteria).</p> <p>How can individuals of the same species and even siblings have different characteristics? Many characteristics are inherited from parents. Other characteristics result from individuals interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment.</p>
2) 9/15/10/15 Seed Saving A) tomatoes or peppers B) Beans	<p><u>Seed Saving – there are many good reasons to save seeds including making sure to maintain special characteristics or traits that do well in our garden.</u></p> <p>A) Seed saving of tomatoes or peppers that were tasted during the previous lesson and selected because of flavor and health and production.</p> <p>B) Beans How are characteristics of one generation passed to the next? How can individuals of</p>

C) Corn	<p>the same species and even siblings have different characteristics? Many characteristics are inherited from parents. Other characteristics result from individuals interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. Reproduction is essential to the continued existence of every kind of organism.</p> <p>B) seed saving beans C) seed saving corn</p>
<p>3) 10/01 – 10/20</p> <p>A) record results of A Warm Place to Grow B) fruit tasting and estimating the number of seeds C) Plant needs game</p>	<p>A) Did temperatures differ between the experimental and control beds? Why or why not? Was there a difference in plant growth between the two beds? Would a farmer be able to use this method of plant protection? What methods do farmers use in our area to protect their plants from frost? Did you observe any other ways mulch affected the plant growth and the soil? B) Math – estimations and multiplication and tasting garden veggies. C) What do all plants need to grow? Water, sun and minerals are required but collected by different parts of the plant. Can students get the right resources when they are different parts of the plant?</p> <p>NGSS: A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. Possible solutions are limited by available materials and resources. Success is determined by desired features of the solution (criteria).</p>
<p>4) 10/10 – 10/30</p> <p>A) Mason Bee introduction B) Flower/Pollinator Game C) Flower Model</p>	<p><u>Pollination</u></p> <p>A) Hear about a different category of Bees – solitary bees. Compare solitary bees to honey bees and the butterfly life cycle. Develop a way to help solitary bee pollinators thrive in our garden. How many different types of bees are there in the world? How does the bee life cycle compare to the butterfly life cycle? Considering the decline of the honey bee populations, how can we help support pollinators in our garden? B) What do you observe when you see insects near flowers? Scientists believe flowers and their pollinators co-evolved. They changed over time to suit one another; they adapted to one another. How does this benefit the flower? The pollinator? Some flowers have more than one pollinator. How does this benefit the flower? C) What is the name of the pollen-bearing, male part of the flower? What is the female part? What part of the flower swells to become the fruit and seeds? How does pollen get to the pistil? List things that would change if there were no more flowers.</p> <p>NGSS: Groups can be collections of equal individuals, hierarchies with dominant members, small families, groups of single or mixed gender, or groups composed of individuals similar in age. Some groups are stable over long periods of time; others are fluid. Some groups assign specialized tasks to each member; in others, all members perform the same or a similar range of functions.</p> <p>How and why do organisms interact with their environment and what are the effects of these interactions? The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.</p>
<p>5) 10/15-10/30</p> <p>A) compare wheat to a variety of other grains B) compare whole grain wheat flour to white flour, make dough and bread sticks</p>	<p><u>Wheat and Grains and Nutrition.</u></p> <p>A) What part of the plant is wheat? Wheat is a type of grass. Do we eat the seed of all types of grass? Is corn a grass? Yes it is actually. Grains derived from plants of the grass family are called cereal grains. Other grains are called pseudo-cereal grains. How can you use tools to get the seed off the plant faster? Let's try some different methods. B) How to make your own dough and bread sticks. What is the difference between white and wheat flour/bread? Which is more nutritious? Why does that matter?</p>

