

Connecting NGSS and Community and Citizen Science in the School Garden/Campus

Grade	Performance Expectation (NGSS Standard)	Community Science Observation/Collection of Data to Plan Changes to Garden/Campus	Citizen Science Connection
K	K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.	Observations/data collection of animals around campus. What do they need to survive that they receive in the school garden/campus?	https://www.greatsunflower.org/ https://trackalilac.usanpn.org/
	K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.*	Observations/data collection of weather patterns. Data collection of temperature, sky, wind, precipitation over time.	https://www.cocorahs.org/Content.aspx?page=involved
	K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*	How have people changed the school habitat to make it better for kids? How have animals changed the garden to make it better for them?	http://backyardantology.weebly.com/ Ants in your school yard.
1	1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.*	Observations/data collection of how plants/animals on campus use external parts to help them, then –see engineering standard-combined with 1-LS1-1	Use data obtained by participating in Bud Burst, The Great Sunflower Project, Track a Lilac ANtology or The Lost Ladybug Project

	1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.	All about birds.org, local webcam observations of baby chicks.	https://www.audubon.org/conservation/about-great-backyard-bird-count backyardantology.weebly.com
	1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	Observations/data collection of plants in the garden over time. Webcam observations of chicks over time.	http://www.lostladybug.org/ https://trackalilac.usanpn.org/
2	2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.	Students plan (collaboratively), and conduct their own investigation (see DCI) Analyze and interpret the data based on results.	https://budburst.org/ https://trackalilac.usanpn.org/
	2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*	Observations/data collection of seed distribution methods found on campus. Then, 2-LS2-2. See engineering standard.	
	2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.	Observations/data collection of plants and animals found on campus as compared to alternative habitats.	https://www.audubon.org/conservation/about-great-backyard-bird-count
3	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.	Observations/data collection of animal and insect life cycles found on campus.	https://www.audubon.org/conservation/about-great-backyard-bird-count backyardantology.weebly.com
			http://www.birdsleuth.org/ https://ebird.org/home
	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.		http://www.lostladybug.org/

	3-LS4 Biological Evolution: Unity and Diversity (four Performance Expectations- 3-LS4-1 through 3-LS4-4)		https://budburst.org/
	3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. 3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Observations of weather conditions/clouds, etc.	https://www.cocorahs.org/Content.aspx?page=involved Globe Observer: https://www.globe.gov/get-started/globe-observers-citizen-scientists/overview-and-benefits
4	4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.		http://www.birdsleuth.org/ https://ebird.org/home
	4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.		Connections to Ebird, ANToLOGY and/or iNaturalist
	4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*		https://www.inaturalist.org/
5	5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.		Any and all of the above https://budburst.org/ https://trackalilac.usanpn.org/
	5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Decomposition: whatsinyourbackyard.org	https://www.inaturalist.org/ https://whatsinyourbackyard.org/
	5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.		https://journeynorth.org/ https://www.globe.gov/get-started/globe-observers-citizen-scientists/overview-and-benefits
	5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.		Any and all of the above Looking at historical data on Track a Lilac project.

6	<p>Depends on model- integrated or discipline specific</p> <p>MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.</p> <p>MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.</p> <p>MS-ESS3–5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.</p>	<p>Observations of weather conditions/clouds, etc.</p> <p>Signs of global warming, human impact</p>	<p>https://www.cocorahs.org/Content.aspx?page=involved</p> <p>https://www.globe.gov/get-started/globe-observers-citizen-scientists/overview-and-benefits</p> <p>https://www.iseechange.org/</p> <p>https://trackalilac.usanpn.org/ (Looking at historical records over time)</p>
---	---	---	---

Garden Planting Ideas:

Plant	Planting Period	Project
Sunflowers	2 Weeks after last frost (After spring break)	https://www.greatsunflower.org/ Observations in August/September
Lilac	Spring or Fall (fall preferred)	https://trackalilac.usanpn.org/ Observations over the school year.
Milkweed	plant seeds in fall	https://journeynorth.org/monarchs Observations in spring/summer
Yarrow	after last frost	http://www.lostladybug.org
California Sagebrush	spring	https://ebird.org/home