DNDA STEAM Lessons 2024-2025

FREE Developmental Domains-Lessons focused on environmental education, arts and hands-on learning, and stewardship action for PreK-5th grade students.
Funded in part by ArtsWA.

Ready to Book a lesson? Email jules@dnda.org!

The 2024-2025 DNDA STEAM Lessons are arts-based environmental education for PreK-5th grades. Students will use hands-on learning to form and deepen understandings through nature connection, investigations, drawing, mapping, engineering, creation, and collaboration.

Lessons can also be facilitated as a one-off experience, or to pick and choose which work for you/your class(es)/context. All STEAM Lessons can be adapted and modified as needed or wanted for student(s) and Educator(s) goals.

Within the overall lessons, there are different topics and themes of learning. All the lessons could be indoor or outdoor. An outdoor lesson typically will be done as walking field trips to locations like the Delridge Wetland Classroom or to closeby greenspaces or in the school outdoor area(s).

DNDA STEAM - Content Overview

STEAM Lesson Skills

Incorporating environmental and garden education programs enhances both students' personal and inter-personal well-being and learning experiences. Additionally, nature-based STEAM education promotes a holistic understanding of, connection to, and care for the environment.

Integration of Skills across Ages/Grades:

- **Critical Thinking:** Problem-solving in garden set up, design, and maintenance. Building student knowledge of complexity present in the connected/interconnected relationship between people, plants, animals, and space. Students also engage with environmental justice challenges such as urbanization, pollution, and climate change – and work to solve those.
- **Collaboration:** Working in groups to learn, plan, and care for and about the garden and each other.
- **Environmental Stewardship:** Developing a sense of responsibility for nature and sustainability.

- ★ **Personal Well-Being:** forming relationships and connection to and familiarity with Teachers/Staff/Peers and outdoor space(s). Connection outdoors is also correlated with increased health benefits such as reduced stress, higher test scores, and more emotional regulation.

Science and Engineering Practices Present

Planning and Carrying Out Investigations: Planning and carrying out investigations based on exploration and observations to answer questions is a foundational developmental and science practice. Progresses to students doing simple investigations to support explanations and/or designing solutions to problems/challenges noticed in exploration and observation(s).

Art and/or Engineering to Develop and Expand Knowledge Using Models and Designs

- ★ We use modeling and using/developing models to represent or express prior knowledge, concrete events, and learned information represented through a new/different medium(s). Art/model making shows up in making diagrams, drawings, physical replicas, dioramas, dramatization, informational signs, recipes, and/or a storyboard. Model-making is based on evidence, observations, and previous knowledge to represent a proposed challenge (ie creating a recipe with seasonal crops; creating a model of a flower and pollinator interaction/adaptations before and/or after a lesson).

Math Standards Present

- ★ **Measurement and Data**:
  - Collecting data during lessons, measuring growth and seasonal changes, and analyzing patterns (e.g., what seeds look similar/different; which flowers attract more pollinators).
- ★ **Geometry**:
  - Identifying shapes in nature (flower shapes, patterns in plant growth).

Language and Literacy Standards Present

- ★ **Reading**:
  - Engaging with texts about pollination, edible and medicinal plants, plants/animals/decomposers present in the garden, life cycles of animals and plants, and the importance of different types of crops.
- ★ **Writing**:
  - Keeping a journal of observations. Additionally, writing and creating stories/posters/signs/recipes.
- ★ **Communication/Discussion**:
  - Participate in and engage with conversations about topics and texts with peers and adults, building on others' ideas and expressing their own clearly.
  - Follow agreed upon rules for discussions and carry out assigned roles
  - Pose and respond to specific questions that relate to/contribute to the discussion and elaborate on the remarks of others

Social Studies (C3) Standards

- ★ **Community Awareness**: Learning about local ecosystems and the role of community gardens.
- ★ **Cultural Practices**: Exploring how different cultures use plants and gardens.

Health and Physical Education Standards

- ★ **Nutrition Education**: Understanding the importance of growing and eating healthy foods.
- ★ **Physical Activity**: Engaging in hands-on gardening activities that promote physical fitness.

Art Standards

- ★ **Creative Expression**: Using natural materials for art projects and understanding the aesthetics of nature.

Garden-Based Education

Seed & Soil Scientists: We will explore questions like: What are seeds and soil and what do they look like/feel like? How do seeds travel? What kinds of environments/habitats do seeds and plants need to grow? We will also learn what seeds need to grow and how to plant seeds. Finally, we will learn about Bugs, Slugs, Snails, Worms and the connections between plants and pollinators!

Roots, Shoots, Fruits!: In these lessons, we will cover crop rotation for plants, life cycles in the garden, and habitats and adaptations of plants! We will explore questions like: What do plants need to grow? How can we design a garden bed during the seasons? What plants grow well together? How do plants grow over time? What can we do to help plants and animals thrive in the garden? How do animal and plant adaptations connect to each other?

Create and Make: Gardens are also a place to get creative! In Create and Make, we'll do Garden Mapping where we take observations of Seasons and Weather (Date, sun exposure, temperature). We will also design planting plants, including making signs in our garden showcasing who is there and what we've learned in our other two lesson series! Finally, students will be a part of creating with plants through making art from plants (paints, prints, structures), medicinal plant connection (teas, salves, tinctures), and cooking projects with foraged items.

STEAM Education

Watershed Lessons: Students will explore how water moves and collects in a watershed, and the connections between animals, plants, water, and energy in our environment. Students will explore the connections / interconnections between animals, plants, water, and stormwater in our environment.

> Objectives: Students will be able to ● have familiarity with the concept and definition of a watershed; ● use models to test and explain how water moves and collects in different environments; and ● understand how animals, plants, water, place, and energy interact; and ● use model to demonstrate that all life is connected and interconneted in our watershed communities.

Plant and Animal Learning (PALs) LESSONS: Students will explore native plants and animals, ; learn to identify local flora and fauna; learn about plant and animal habitats, and understand the connection of plants and animals to our environment and our watersheds. Students will also learn more about plant and animal life cycles, and the adaptations that plants and animals have that enable them to survive and thrive.

> Objectives: Students will be able to ● define the word environment, watershed, habitat, and adaptation ; and ● use visuals and models to explain how animals, plants, and energy interact ; and ● use model to connect that all life is connected in our watershed communities; and ● understand the roles of producers, consumers, and decomposers in energy/life chain ; and ● use models and visuals to explain animal adaptations enable species to survive and thrive in their habitats ; and ● use models to explain and explore plant adaptations and plant parts.

Ecosystem Lessons: Students will explore the role of ecosystems (focusing on riparian zones and wetlands) in our environment, know the basic characteristics of the riparian and wetland zones and, use models and visuals to learn more about and describe the hydrology of wetlands.

> Objectives: Students will be able to ● have familiarity with the concept and definition of words wetland, transition, and upland; ● use visual and models to explain wetland zones; and ● use model to connect that certain plants/animals are adapted to survive and thrive in their respective zone(s) of watershed communities; and ● understand the roles of a wetland to our watershed

Salmon Specialists: Students will explore the role of animals in our environment, focusing on the role of salmon. Students will use models and visuals to learn more about and describe salmon anatomy and adaptations; and how salmon interconnect to the cycle of life here on Coast Salish Land. Students will use models and visuals to learn more about and describe how water, water quality, plants, and human impact have shaped watershed habitat(s). Students will investigating how water quality, water temperature, and who lives in the water shape our impacts between humans and our multi-species world.

Objectives: Students will be able to ●use visual and models to explain salmon anatomy and adaptations ; and ● know at least three types of salmon found in Coast Salish land and ; ● understand salmon need certain habitats to survive and thrive in their watershed communities, and ; ● understand the roles a changing landscape on salmon and other life within our watershed, and; ● have familiarity with the concept and definition of the word(s) salmon, water quality, restoration, stormwater, and; ● use models and visuals to understand and describe how water, water quality, restoration, salmon, and human impacts connect and interconnect ; ● understand water quality and water temperature are important to maintain for their ability to sustain surviving and thriving for multi-species Beings.

Shaping Multi-species Futures: Students will use signs, models, and visuals to learn more about and describe how water, water quality, plants, and human impact have shaped our habitat. Students will be designing and building signs and models which mitigates impacts between humans and our multi-species world.

Objectives: Students will be able to ● have familiarity with the concept and definition of the word(s) restoration, green stormwater infrastructure, indigenous futurisms, solarpunk, and ; ● use visual and models to explain how water, water quality, restoration, and human impacts connect and interconnect ; and ● use prior knowledge and research to build a model of a community within our watershed.

Teaching Strategies Gold/High Scope Curriculum for PreK

- **Social-Emotional –** engaging with peers, collaborating, forming relationships and familiarity with Teachers/Staff/Peers
- **Literacy** – writing/expressing ideas and knowledge; book/written word connection (ex: engaging with texts about plants, animals, and other related garden contexts and content)
- **Cognitive** – planning investigations; sustaining interest; recalling information; using previous knowledge to apply to new situations; classification skills
- **Physical** – using fine and gross motor skills during lessons and in garden/space maintenance
- **Math** – recognizing patterns; shape identification/recognition; measuring/collecting/exhibiting data; counting and quantifying
- **Language** – use communication to express ideas, adds on observations/thoughts to discussions, builds vocabulary and complex words and sentences

NGSS/Common Core/ELA/C3 Curriculum for Grades K-5th

NGSS:

- **LS2.A: Interdependent Relationships in Ecosystems:** Plants depend on animals for pollination or to move their seeds around. Plants depend on water and light to grow. ***Example:* 2-LS2-2** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants / Plan and conduct an investigation to determine the amount of sunlight and water different plants need to grow.
- **K-3 LS1-1** Use observations to describe patterns of what plants and animals (including humans) need to survive.
- **K-5 ESS2-2.** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
- **K-5 ESS3-1.** Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live
- **LS4.D: Biodiversity and Humans:** There are many different kinds of living things in any area, and they exist in different places on land and in water. ***Example:* K-5-LS4-1** Make observations of plants and animals to compare the diversity of life in different habitats.
- **ETS1.B Developing Possible Solution:** Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. ***Example:* K-5-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

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