NJ Climate Change Resources

Using Duke Farms information and materials from August's Monarch and Meadow Month is the perfect opportunity to focus on Climate Change and its far-reaching negative impact. NJ Learning Standards can be easily applied and align to all these resources. Although climate change is the most imperative issue facing the globe, there are local solutions and individuals can (and must) take action. Getting your students involved is as important for them as it is for generations to come.

New Jersey has taken the nation's leading role in climate change education by mandating that it is taught through New Jersey's Student Learning Standards in a K-12 multidisciplinary manner including:

- 21st Century Life and Careers
- Comprehensive Health and Physical Education
- Science
- Social Studies
- Technology
- Visual and Performing Arts
- World Languages
- *Appendices in Mathematics and ELA are scheduled for review in 2022*

To see the announcement about this 2021 launch on the official site of New Jersey, click here.

The Virtual Firefly Fest and Monarch and Meadow Month resources, (as well as many other on our Distance Learning Portal) can also complement your other NJSLS. Click here for just a few examples in the area of life science taken from the NJ Model Curriculum.

Kindergarten: *Basic Needs of Living Things* – students develop an understanding of what plants and animals need to survive and the relationship between their needs and where they live. Students compare and contrast what plants and animals need to survive and the relationship between needs of living things and where they live.

- In this story, fireflies are in search of a suitable habitat. Watch here.

Grade 1, Unit 2: *Characteristics of Living Things* - students develop an understanding of how plants and animals use their external parts to help them survive, grow, and meet their needs, as well as how the behaviors of parents and offspring help offspring survive. The understanding that young plants and animals are like, but not exactly the same as their parents is developed.

- The monarch life cycle is pictured, and students can label the sequence. Activity available here.

- The monarch's anatomy as an adult butterfly and as a caterpillar is included with labeling activities. Students can create models. Activity available here.

- This article shows examples of field notebooks and scientific drawings. Activity available here.

Grade 2, Unit 1: *Relationships in Habitats:* In this unit of study, students develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students also compare the diversity of life in different habitats. The crosscutting concepts of *cause and effect* and *structure and function* are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in *planning and carrying out investigations* and *developing and using models*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

- What Makes A Meadow A Meadow defines the meadow habitat. Activity available here.

- What's That in the Meadow provides examples of common plants and animals. Activity available here.

- Any of the articles in the Bee-Friendly Flower series has information about the plant/insect relationship. This one is about Joe-Pye Weed and discusses bees and associated butterflies. Activity available here.

*Look for the August Pollination article just posted on the Distance Learning Portal.

Grade 3, Unit 5: *Continuing the Cycle* - In this unit of study, students develop an understanding of the similarities and differences in organisms' life cycles. In addition, students 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. The crosscutting concepts of *patterns* and *cause and effect* are called out as organizing concepts for these disciplinary core ideas.

- The Monarch Life Cycle with activities. Activity available here.

- The Firefly Life Cycle with activities. Activity available here.

Grade 3, Unit 4: *Traits* and **Grade 7, Unit 6:** *Inheritance and Variation of Traits* – In this unit of study, students acquire an understanding that organisms have different inherited traits and that the environment can also affect the traits that an organism develops. The crosscutting concepts of *patterns* and *cause and effec*t are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency *in analyzing and interpreting data, constructing explanations*, and *designing solutions*.

- Best Beak Ever - There are a variety of food sources and some beaks are more suitable than others to acquire it. Activity available here.

- The Red White and Blue Pollinator Garden demonstrates that pollinators are associated with certain plants. Activity available here.

Grade 3, Unit 5*: Continuing the Cycle* and **Grade 6, Unit 1:** *Growth, Development, and Reproduction of Organisms* - In this unit of study, students develop an understanding of the similarities and differences in organisms' life cycles. In addition, students 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. The crosscutting concepts of *patterns* and *cause and effect* are called out as organizing concepts for these disciplinary core ideas.

- The Monarch Life Cycle with activities. Lesson available here.

- The Firefly Life Cycle with activities. Lesson available here.

Grade 3, Unit 6: *Organisms and the Environment* - In this unit of study, students develop an understanding of the idea that when the environment changes, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. The crosscutting concepts of *cause and effect* and the *interdependence of science, engineering, and technology* are called out as organizing concepts for these disciplinary core ideas.

- The Great Monarch Migration can also be partnered with geography and culture. Game available here.

- Playing the Monarch Migration Game provides information about the route, but also the generations of butterflies. More available here.

- Fireflies are impacted by light pollution and other environmental conditions. Activity available here.

- Firefly conservation with the Xerces Society. Class available here.

Grade 4, Unit 3: *Structures and Functions* - In this unit of study, students develop an understanding that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. The crosscutting concepts of *systems and system models* are called out as organizing concepts for this disciplinary core idea. Students are expected to demonstrate grade-appropriate proficiency *in engaging in argument from evidence*. Students are also expected to use this practice to demonstrate understanding of the core idea.

The Bee Friendly Flower Series, Forgotten Flower Series provide resources about structure and function survival, growth and reproduction. Attached is the first article of each.

- Forgotten Flower-Skunk Cabbage. Lesson available here.

- Bee Friendly Flowers-Milkweed. Lesson available here.

The Bird of the Week series includes videos of prepared bird skulls with labeling activities and guiding questions. This is the first in the series:

- Red Bellied Woodpecker. Activity available here.

Grade 5, Unit 3: *Energy and Matter in Ecosystems* - In this unit of study, students develop an understanding of the idea that plants get the materials they need for growth chiefly from air and water. Using models, students can describe the movement of matter among plants, animals, decomposers, and the environment, and they can explain that energy in animals' food was once energy from the sun. The crosscutting concepts of *energy and matter* and *systems and system models* are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in *developing and using models* and *engaging in argument from evidence.* Students are also expected to use these practices to demonstrate understanding of the core ideas.

- Home for Hummingbird - Sunlight, soil, and other optimum factors. Resources available here.

For Middle School Students

As indicated on the NJ State Department of Education's website, students in grades 6-8 come to understand the natural world in a more scientifically accurate way and understand the nature of science. Click here for the **Rationale for the Middle School Model Curriculum Design.**

The goal of science education curriculum is to produce students who have gained sufficient knowledge of the practices, crosscutting concepts, and core ideas of science and engineering to engage in public discussions on science-related issues, to be critical consumers of scientific information related to their everyday lives, and to continue to learn about science throughout their lives. They should come to appreciate that science and the current scientific understanding of the world are the result of many hundreds of years of creative human endeavor. It is especially important to note that the above goals are for all students, not just those who pursue careers in science, engineering, or technology or those who continue on to higher education (p. 9, NRC, 2012). Given this goal, an integrated science curriculum model should drive the formation of middle school science curriculum because:

- The nature of science is complex and multidisciplinary.
- Learning theory research in science shows expert knowledge base develops better through interdisciplinary connections and not through isolated content.
- Effective research-based practices for curriculum and instruction in science and engineering are supported through this approach.

The materials on the Duke Farms Distance Learning Portal also align with multidisciplinary explorations but can also readily address these state derived science units:

Grade 6

- **Unit 1***: Growth, Development, and Reproduction of Organisms*
- **Unit 2**: *Matter and Energy in Organisms and Ecosystems*
- **Unit 3**: *Interdependent Relationships in Ecosystems*

Grade 7

- **Unit 6**: Inheritance and Variations of Traits
- **Unit 7**: Organization for Matter and Energy Flow in Organisms

Grade 8

- **Unit 2**: *Selection and Adaptation*

For secondary instruction, other content areas, or more ideas and Duke Farms videos for your home-based instructional needs, please contact me at Kreilly@dukefarms.org. There are so many ways that Duke Farms educational resources can serve to enrich and enhance your instruction and discoveries and I look forward to working with you.

Kate Reilly, Manager of Education, Duke Farms