**Phenomenal Science Unit 3.4 *Sticking Together***

|  |
| --- |
| **Unit 3.4: Sticking Together****Unit GOALS** |
|  **Established Goals:** | **Transfer:** |
| DCI:  **LS2.D: Social Interactions and Group Behavior*** Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size *(Note: Moved from K–2)*. **(3-LS2-1)**

 **LS3.B: Variation of Traits*** The environment also affects the traits that an organism develops. (**3-LS3-2)**

**LS4.B: Natural Selection*** [Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. **(3-LS4-2)**](http://www.nap.edu/openbook.php?record_id=13165&page=163)

 **LS4.D: Biodiversity and Humans*** Populations live in a variety of habitats, and change in those habitats affects the organisms living there. **(3-LS4-4)**

 **\*\*\*LS2.C: Ecosystem Dynamics, Functioning, and Resilience*** When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.***(secondary to 3-LS4-4)***

    | **Performance Expectations:** Students who demonstrate understanding can . . . **3-LS2-1** Construct an argument that some animals form groups that help members survive.**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-LS4-4** 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. \* \*\*\* - Integrates traditional science content with engineering. \*\*- Allow for local, regional, or Michigan specific contexts or examples in teaching and assessment. |
| SEP: **1. Asking questions and defining problems** 2. Developing and using models 3. Planning and carrying out investigations 4. Analyzing and interpreting data 5. Using mathematics and computational thinking **6. Constructing explanations and designing solutions** **7. Engaging in argument from evidence** 8. Obtaining, evaluating, and communicating information  | CCC: 1. 1.  Patterns
2. **2.  Cause and Effect:  Mechanism and Explanation**
3. 3.  Scale, Proportion, and Quantity
4. 4.  Systems and System Models
5. 5.  Energy and Matter:  Flows, cycles, and conservation
6. **6.  Structure and Function**
7. **7.  Stability and Change**
 |
| **Possible Naive Conceptions:** | **Meaning:** |
| * All severe environmental changes are negative.
* Individual plants or animals change their traits to “adapt”.
* Daily definition of “adapt” to mean adjust vs. scientific definition of adaptations

  | **Essential Question(s): Students will consider . . .**  * How do the traits and characteristics of organisms (plants and animals) help them survive in their environment?

  | **Understandings: Students will understand that . .** .(This is a conceptual foundation for studying the content area and is  deliberately framed as declarative sentences that present major curriculum generalizations and recurrent ideas.) Students will understand… The behavioral characteristics of animals and the physical characteristics of all plants and animals help them survive in their environment. Plants and animals may adapt to survive changes in the environment. Some animals form and participate in groups, a behavior which helps members of the group survive.   Plant and animal traits and their variations may be influenced by the environment. Some organisms survive well, others less well, and some cannot survive at all in a particular habitat.      |
| **Expected Prior Knowledge:** | **Acquisitions: (IC Level Performance Expectations)** |
| Prior PEs – F*ind this in the bottom boxes of PE pages and list them here.* K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.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-ESS3-1 Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.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. \* 1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. 1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.2-LS2-1 Plan and conduct an investigation to determine if plants need sunlight and water to grow.2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. 2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.  “We might presume . . .” (This is your best judgement about what your students’ prior knowledge might be and which knowledge is relevant.) | **Students will know ...** * Many animals live in groups which help them to survive. Groups vary in size and can help animals obtain food, defend themselves, and cope with changes.
* Some traits organisms develop are affected by their environment.
* Sometimes differing individual characteristics among members of a species provide advantages in survival, finding mates, and reproduction.
* Organisms are affected by changes in their habitats, and there are many different habitats.
* When environmental changes cause changes in physical characteristics,  in different temperatures, and in resource availability, organisms may respond in variety of ways: some organisms survive and reproduce, some organisms move to new locations, new organisms may move into the changed environment, and some organisms may not survive.

   **Students will be able to . . .**  * identify and argue from evidence why some animals live in groups, and explain how animals benefit from living in groups.
* construct explanations for why the environment affects the traits of some organisms. (Cause and effect)
* demonstrate their understanding of how members of some species are able to survive better than others (finding mates and reproducing), based on differences in their individual characteristics.
* Identify and explain that organisms live in many different habitats and that organisms are affected by changes in their habitats.
* ask questions and construct explanations regarding how changes within an environment cause organisms to respond in different ways (stay, move out, move in, or die).

  |
| **Focus Questions:** | **Conceptual Flow/Teacher Background:** |
|   Why do some animals form groups that help members survive? What do plants and animals need to change in order to survive when their environment they live in changes? Why do variations in characteristics among individuals of the same species provide advantages in surviving, finding mates, and reproducing?   |  Plant and animal traits and their variations may be influenced by the environment or by genetic factors, or by both.  Organisms have characteristics that can be similar or different. Some animals may survive longer because they live in groups helping them to find food, defend themselves, and adjust to change. Young animals are very much like their parents and also resemble other animals of the same kind. Plants also are very much like their parents and resemble other plants of the same kind.  Many characteristics of organisms are inherited from their parents and some characteristics result from individuals’ interactions with the environment, which can range from their diet to their learning. Variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. External environmental factors can also influence and modify individuals’ specific development, appearance, behavior, and likelihood of producing offspring.  Differences in where they live or in the food they consume may cause organisms that are related to end up looking or behaving differently.  Some animals participate and form groups, a behavior which helps members of the group  survive by being able to protect themselves, obtain food, and/or cope with change.  Some kinds of animals do not typically participate in groups.   Some organisms survive well, less well, or cannot survive at all in a particular habitat. Therefore, when an environment changes in ways which cause significant temperature variance, physical differences, or a decline in available resources necessary to meet the needs of the plants or animals, some will adapt, some will move to new locations, and some will die. In addition, an organism which had previously survived elsewhere may move into a new environment which has changed to meet the needs of that organism.   |