**Adaptation and Behavior**

**Lesson #8:** **How Living Things Respond to Changes in the Environment**

**Time Frame:** 60 minutes

**Learning Standards:**

*Science*

Life Science: Plant (and Animal) Structures and Functions

1. Give examples of how changes in the environment (drought, cold) have caused some plants and animals to die or move to new locations (migration).
2. Give examples of how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystem.

*English / Language Arts*

Nonfiction

1. 13.13 Identify and use knowledge of common textual features.
2. 13.14 Identify and use knowledge of common graphic features.

**Student will be able to:**

1. Read an article about extinction and migration, discuss the main ideas, and answer analysis questions about what happens to living things when the environment changes.

**Resources and Materials:**

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| **Item** | **Amount** |
| Science journals |  |
| Article: How Changes in the Environment Can Cause Animal and Plant Extinction and Migration | 25 (in bin) |
| Sample Food Web | 1 (in binder) |
| Set of index cards with animal information | 1 set with 20 cards (in binder) |

**Focus Activity:** Ask the students to answer the following questions in their science notebooks. What happens to a living thing if its environment becomes very different? For example, what might happen to a polar bear if the temperature in the arctic became very warm? What might happen to a frog if there was a drought and the lake it lived in dried out?

**Introduction:** Introduce the ideas of extinction and migration and relate these ideas to a class discussion of the focus activity. Be sure to differentiate between permanent migration (the point of this lesson) and the seasonal migration of animals like birds and butterflies.

**Activity:**

1. Write extinction and migration on the board. Discuss these terms as a class and then provide definitions for each term with diagrams.

*Extinction*: disappearance of a type of living thing (Teacher Note: individuals do not go extinct, species or populations go extinct)

*Migration*: to move from one type of place to another

1. Pass out a copy of the pamphlet about extinction and migration to the class. Depending on skill levels you may read the article and examine the figure together as a class, ask the students to work in groups to read the article, or ask students to read the article individually. Either way, students should write questions, ideas, and unknown vocabulary as they read (if you are reading as a class this may happen as you read together).
2. Discuss the main points, figures, and student questions, ideas, and vocabulary words as a class. Ask the students questions about the text and how it relates to adaptation and changes in environment.
3. Either individually or in small groups ask students to complete all (or some) of the analysis questions below. The questions can be posted on the board. Ask students to write their responses in their science notebooks.
   1. Which types of living things would be the first to migrate back to land that was recently covered by a glacier? Why? Describe the order of the other types of living things that would migrate next.
   2. Why did the land dinosaurs go extinct? Do dinosaurs need sunlight to survive? Explain.
   3. Why are frogs and toads going extinct in the Costa Rican cloud forest?
   4. What might happen to a wetland habitat in Massachusetts if it is full of purple loosestrife? What will happen to the other types of plants? What will happen to the animals? Explain.
   5. Explain how a change in temperature could cause a living thing to go extinct (die) or migrate to a new location.
4. Discuss the analysis questions as a class.

**Extension Activity:**

1. Introduction: In any environment, animals are dependent upon other animals and plants for food. If an animal’s food source goes extinct, then that animal will also go extinct because of the lack of food.
2. Look at and discuss the sample food web as a class.
3. Pass out one index card to each student. The front of the index card will say what animal/plant the student will act out, and the back of the index card will say what animals/plants the student can eat.
4. All the students will be “alive” before each scenario.
5. Decide on a part of the room where all the “extinct” animals have to go.
6. Read the scenario, and then have students locate at least one of their food sources. If they cannot locate a food source, then they “go extinct”.

**Scenario #1:** Farmers use extremely potent pesticides to kill all the insects in the area. Now, there are no more insects. (Insects are extinct).

What dies: toads, skunks, birds

Take-away: the depletion of one food source can affect multiple animals

**Scenario #2:** The growing season was very cloudy and cold, so none of the nut trees produced any nuts. (Nuts are extinct).

What dies: mice, deer

Take-away: the depletion of one food source usually affects primary consumers more than higher tier consumers

**Scenario #3:** Rabbit hunters migrate into the area. They are really good rabbit hunters, so after a few months, all the rabbits are dead. (Rabbits are extinct).

What dies: only the rabbit dies

Take-away: red foxes and wolves have more than one food source, so they are not affected by the extinction of rabbits in the ecosystem

**Scenario #4:** The forest is completely cut down in order to build a six-lane highway. All the blossoms, nuts, bark, and leaves are gone. (Trees are extinct).

What dies: everything

Take-away: deforestation is a significant problem in many ecosystems

**Follow-up Questions:**

1. What can the animals do to adapt to their new environment?

Possible answers: migrate, adapt to a new food source

1. What would it take to make the bears die?

**Challenge Question:** If prey goes extinct, then predators will soon go extinct because they have nothing to eat. What might happen to the population of the prey if its predator goes extinct?

**Closure:** If animals and plants are adapted to a certain type of environment and that environment changes in a big way what happens? Why are cockroaches so successful at living in any environment? Why might cockroaches be able to survive a change in the environment that might kill other living things?

**Assessment:** Science notebooks responses, reading notes, class discussions and questions, answers to the analysis questions from the extinction and migration pamphlet





**Sample Food Web**

