**Adaptation and Behavior**

**Lesson #6:** **Adaptation – Increasing Survival and Reproduction**

**Time Frame:** 30 minutes

**Learning Standards:**

*Science*

Life Science: Plant (and Animal) Structures and Functions

1. Give examples of how inherited characteristics may change over time as adaptations to changes in the environment that enable organisms to survive, e.g., shape of beak or feet, placement of eyes on head, length of neck, shape of teeth, color.

*English / Language Arts*

Writing

1. 19.17 Write a short explanation of a process that includes a topic statement, supporting details, and a conclusion.

**Student will be able to:**

1. Explain how living things become adapted to their environment over time.
2. Analyze squirrel survival and reproduction data and use this evidence to write a paragraph explaining which squirrel is most adapted to its environment.

**Resources and Materials:**

|  |  |
| --- | --- |
| **Item** | **Amount** |
| Science notebooks |  |
| Squirrel chart | (in binder) |
| Squirrel chart student handout | (in binder) |
| Drawing implements | (in classroom) |

**General Teacher Background Information**

Living things that are well adapted to their environment survive and reproduce. Those that are not well adapted don’t survive and reproduce. An **adaptation** is any inherited trait that increasesthe ability of the living things to survive and reproduce.

**Introduction:** Review adaptation ideas from the last two science lessons. Focus on the importance of food as a determination for the development of various traits and strategies for survival, as in the relationship between birds’ beak shapes and their food sources. What is adaptation? Why must adaptations be inherited traits? How do animals become adapted to their environments?

**Focus Activity:** Ask students to think about the different types of dogs in their neighborhood and then answer the following questions in their science notebooks. What would happen if the world suddenly changed, so the only thing that dogs could eat was deer and there was no way for a dog to eat if it wasn’t big or strong enough to catch and kill a deer? Discuss responses as a class and relate to adaptation.

**Activity:**

1. Write the word adaptation on the board and the following definition: an inherited trait that increases the ability of a living thing to survive and reproduce. Underline the words survive and reproduce. Discuss the importance of survival and reproduction and relate to inherited traits. Why does a living thing need to survive a certain length of time in order to pass on an adaptation to their offspring? If an animal has a new adaptation, such as a dog with bigger teeth, but it doesn’t reproduce what happens to this trait?
2. Pass out a handout with a chart showing the inherited characteristics, survival, and reproduction of four female squirrels. Instructor can also post this chart in the front of the class. Discuss the information contained in the chart as a class.
3. Then, ask students to respond in their lab notebooks to the following question. Which squirrel is best adapted to its environment? Explain. Students may work on this individually or in small groups. However, each student will individually write a paragraph explaining their answer. The paragraph should have a topic sentence (main idea), supporting evidence (from the chart), and a final conclusion sentence. Encourage students to use evidence from the chart to back up their ideas.
4. Discuss the squirrel adaptation responses as a class.

**Closure:** Discuss the following ideas and questions as a class. Does the squirrel that is best adapted to its environment always survive and reproduce better? Why or why not? What if an animal lives a long time but never has babies, will its adaptive traits be passed on? How do animals become adapted to their environment? What happens if their environment changes? Have students individually, or in pairs, pick an animal they know well and draw the animal in its natural habitat. List 3 adaptations the animal has to be able to survive in its habitat. Then draw another image of the same animal in a different habitat. List 3 ways the animal would be affected by this change, such as the new adaptations they would need in this new environment and how these traits are adaptive.

**Additional materials:** Here is a short video that describes natural selection using the Peppered Moth: youtube.com/watch?v=LyRA807djLc&noredirect=1

**Assessment:** Science notebooks responses on squirrel adaptation, participation in class discussions

**Squirrels: Which squirrel is most adapted to its environment?**

Below are descriptions of four female squirrels that live in a forested area which is mostly different colors of brown with some green plants. Which squirrel is most adapted to its environment? Record your answer in your science notebook and use evidence from the chart to support your ideas.

**Squirrels Squirrel #1 Squirrel #2 Squirrel #3 Squirrel #4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Color of fur | Brown | Brown with light brown spots | Light brown with cream spots | Cream |
| Age at death | 3 years | 4 years | 6 years | 8 months |
| Number of baby squirrels produced by each female | 9 | 11 | 6 | 0 |
| Top Running speed  (in miles per hour) | 14 miles/hour | 10 miles/hour | 7 miles/hour | 11 miles/hour |

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