**Adaptation and Behavior**

**Lesson #3:** **Introduction to Adaptation**

Adapted from an activity called “Animal Adaptations,” by Lisa Behm, Virginia Zoological Park.

**Time Frame:** 60 minutes, Note: This lesson requires **TWO** instructors

**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.

**Student will be able to:**

1. Describe the adaptations of living things that allow them to survive in a particular environment.
2. Define and explain adaptation.

**Resources and Materials:**

|  |  |
| --- | --- |
| **Item** | **Amount** |
| Science notebooks |  |
| Pictures of arctic and desert habitats | (in binder) |
| Pictures of polar bear and gila monster | (in binder) |
| 5 x 8 index cards | 500 (total) (in bin) |
| Arctic Materials:  White fur  Pillow (with rope)  Tennis racquet  Teeth  Gloves with claws  Sunglasses with eyes  Small white ears | (in bin)  1  1  2  6 (not reusable)  2  1  1 |
| Desert Materials:  Black claws  Tan felt  Sponges  Fat tail  Hat with large eyes  Swimmer’s nose plug  Teeth | (in bin)  10  1  2  1  1  1  6 (not reusable) |
| Clothes pins | 12 (in bin) |
| Safety pins | 20 (in bin) |

**Focus Activity:** Ask the students to answer the following question in their science notebooks. What do animals need to survive? When students are done, ask them to discuss the question in groups. Then, go in a circle getting one response from each group at a time and write the ideas on the board. Possible ideas: food, water, shelter (protection from the environment), and other animals of the same type.

**Introduction:** Introduce the term and concept of habitat (write it on the board above the list made by the students). The type of environment in which an animal lives is called its habitat. Explain that this lesson will explore how different animals are adapted to survive in different habitats.

**Activity:**

1. Set up two stations, one representing an **arctic habitat** and the other representing a **desert habitat**. You will each lead one station.
2. Discuss arctic and desert habitats as a class. (Use the slides provided). What is the environment like in the desert? At the North Pole? What resources are available in each environment? If you had to live in each environment, what would you need to survive?
3. Divide students into two groups. One will begin at the arctic habitat, and the other will begin at the desert habitat. Then the two groups will switch.

**Arctic Habitat**

Work together with the group to make an animal that could survive in an arctic habitat. Ask for one student volunteer to be the animal. Use the box of materials provided to create an animal that is adapted to the arctic.

Ask the students guiding questions as necessary to get ideas about what this animal would need to survive and place the items on the student volunteer.

*Sample Adaptations:*

* + - * What is the temperature like in the arctic? (white faux fur shows the need for warmth) What color is the fur? Why?
      * What else might keep an animal warm (on the inside)? (pillow represents the added fat layers necessary for arctic animals)
      * What would the animal walk on? (racquets like snowshoes demonstrate help for walking on snow)
      * What would this animal eat? (pointy teeth to show that the animal is a carnivore and white paws with claws)
      * Would this animal be awake in the day or at night? (sunglasses with small eyes on the front show that being outside in the warm part of the day is better)
      * What kind of ears might this animal have? (small ears so that they would not lose much heat)

*Discussion:* Explain that animals like polar bears have all of these adaptations. Adaptations are inherited characteristics that make living things better at surviving in a certain type of environment. Ask the group the following question. What would happen to this polar bear if it was transferred to a tropical island? Would the polar bear be adapted to live in this type of environment?

**Desert Habitat**

Work together with the group to make an animal that could survive in a desert habitat. Ask for a different student volunteer to come to the front of the room to be the animal. Use the box of materials provided to create an animal that is adapted to life in a desert.

Ask the students guiding questions as necessary to get ideas about what this animal would need to survive and place the items on the student volunteer.

*Sample Adaptations:*

* + - * What is the temperature like in the desert? How would this animal escape the heat? (claws attached to gloves show that many animal burrow under ground to avoid the sun)
      * How would the animal hide from predators? (tan felt shows camouflage)
      * What resource would be in short supply in the desert? (sponges pinned to the body represent the importance of water conservation)
      * How would the animal store food and water? (a fat tail is used by some animals to store food and water)
      * Would this animal be awake in the night or the day? How would it look around? (large eyes glued on the hat to represent nocturnal behavior, large eyes can see better at night, the hat represents more protection from the sun)
      * How would this animal cope with winds and blowing sand? (swimmer’s nose plug represent that desert animals often have structures to keep sand out of nose, mouth, eyes, and ears)

*Discussion:* Explain that animals like kangaroo rats and Gila monsters have many of these adaptations. Adaptations are inherited characteristics that make living things better at surviving in a certain type of environment. Ask the group the following question. What would happen to this animal if the desert became permanently covered with water? Is this animal adapted to live in a wet environment?

1. Write the word adaptation on the board. Ask students to give definitions, discuss, and then write the definition provided.

**Adaptation:** an inherited trait that increases the ability of a living thing to survive and reproduce

Discuss this definition as a class and relate it to the definitions that the students gave.

1. Pass out the 5 x 8 note cards to each student. Ask the students to fold them into fourths (so that each note card is folded into 4 evenly sized rectangles). Diagram what will go in each square on the board:
   * 1. Word – adaptation
     2. Definition – an inherited trait that increases the ability of a living thing to survive and reproduce
     3. A sentence using the word adaptation
     4. A drawing that represents an adaptation (personalized to each student)
2. Ask each student to complete their 4-square vocabulary for adaptation. Work on furthering understanding with students individually.
3. Collect the cards from each student and save them to be used as a reference and resource throughout the unit. They can also be placed in the student science notebooks.

**Closure:** Are characteristics of the different animals we made today inherited? What would happen if the habitat these animals were used to living in changed? Why do scientists study animal adaptations to make planes and boats? How do animals become adapted to their environment?

**Assessment:** Science notebooks responses, class discussions and questions, adaptation 4-square vocabulary cards

**Artic Materials:**

* White fur
* Pillow
* Tennis racquets
* Teeth
* Gloves with claws
* Sunglasses with eyes
* Small ears

**Desert Materials:**

* Black claws
* Tan felt
* Sponges
* Fat tail
* Large eyes on a hat
* Swimmer’s nose plug







