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Science Unit: Exploring Biodiversity

Lesson #3: Needs of Living Things

Lesson Summary:

In this lesson, students will think about the basic needs of animals. They will compare their needs with the needs of other animals. They will observe barnacles feeding and look at the effect of different temperature on feeding rates. Finally, students will be entrusted with providing these basic needs to sea monkeys and they can watch them grow over the following weeks.

Grade level: Grade K-2

Duration of lesson: 30-45 minutes

School Year: 2015/2016

Developed for: Collingwood Neighborhood School, Vancouver School District

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Learning Objectives

1. Understand the basic needs of animals and how these are similar between species.
2. Discover some behaviours that often go unseen by using good observation skills.
3. Make observations and begin to make hypothesis.

Materials

- Barnacles on small rocks (in ocean water)
- Brine shrimp (sea monkeys) and food
- Empty cups and syringes to help aerate water
- Small fish tank
- Magnifying glasses
- Clear plastic cups
- Cooler with sea water to keep barnacles in (with aerator)
- Cool and warm sea water

Safety Notes

Barnacles and brine shrimp are living animals. Ensure that they have adequate aeration in the water and adequate food supply. When the lesson is over, return barnacles to collection site.

Background Information

Barnacles

A growing problem in society is people having a disconnect with the nature that surrounds them. In this lesson, the goal is to have students bridge these gaps and start to understand how humans are similar to other animals. Barnacles are one of the most abundant and widespread species on our local shorelines, but are often overlooked. They seemingly have little in common with humans, but like all animals still require some of the same basic elements to survive.



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Barnacles should be out of their natural environment for as short of time as possible (i.e., they can be collected the night before and returned after the lesson). They should be kept in ocean water with an aeration pump on at all times.

Brine Shrimp

Students will also be given brine shrimp (commonly known as sea monkeys) to raise. Students will learn to keep sea monkeys alive. They need to be fed once a week and every few days, the water will need to be aerated. Encourage the students to ask questions as they start to think critically and observe the natural world.

Brine shrimp go through a very simple lifecycle: Cyst → Larvae → Malting → Adult → Riding Pairs → Female with cysts → Eggs. With magnifying glasses and with the naked eye, many of these stages will be visible to the students as they care for their sea monkeys.

Vocabulary

Word	Brief definition
Barnacles	A small marine crustacean with an external shell, which attaches itself permanently to a variety of surfaces.
Cirri	The modified foot of a barnacle used for feeding.
Plankton	Very small, microscopic plants and animals that inhabit the oceans and are at the bottom of marine food chains.
Shelter	A place that offer protection from predators and/or the environment.
Predators	Animals higher on the food chain that feed upon other animals.
Species	.A group of animals or plants that are the same type and mate with one another.

Lesson Detail

Introduction

There are many different types of animals, yet despite so many different characteristics, all animals share some basic needs: food, water, shelter/protection, sunlight, air etc. Even species don't look alive, still need to perform these basic functions – they just do so in a different manner. Students will observe how animals respond to their environment and use these basic necessities of life.

Activity 1: What do we need to live?

Purpose of Activity: To identify the basic needs of life shared by animals.

Methods and Instructions:

1. Show the students a picture of a house (ideally a cut out one where you can see all the rooms).
2. Ask the students what they need to do every day to live: Sleep, Eat, Move/exercise, breath, go outside etc.
3. Ask the students what they need to do these things: A house or shelter for protection, food, air, water etc.
4. Discuss how animals need the same things – even if it doesn't look like it.



Activity 2: Barnacles need food too!

Purpose of Activity: Observe barnacles feeding and predict what will happen with a change in water temperature.

Methods and Instructions:

1. Place a few barnacles on a rock into a clear plastic cup filled with seawater.
2. Students can use magnifying glasses to watch barnacles and see if they will be feeding.
3. Adjust the water temperature, observe if this change the behavior.
4. Have students draw the barnacles they are watching and label the cirri they use for feeding.

Activity 3: Introducing Sea Monkeys

Purpose of Activity: To have students consider the basic needs of animals and put those into practice by caring for a colony of Brine Shrimp.

Methods and Instructions:

1. Introduce the brine shrimp. We will talk more about them in the next class.
2. Review the basic needs of animals. Students will ensure they provide shrimp with these necessities:
 - a. Feed them once a week.
 - b. Make sure they are near sunlight, but won't get hot.
 - c. They have a nice shelter in the tank, but they need air.
 - d. To aerate the water, pour some back and forth between two empty bottles every few days.
3. Each day, as a class, try to summarize some observations of the brine shrimp. A data sheet to make these observations can be left in the classroom. We will check in during each visit to see what is changing.

Activity 4: Lifecycles of Sea Monkeys

Purpose of Activity: To identify the different life stages of sea monkeys (do this activity after sea monkeys have hatched and students have had a chance to observe them).

Methods and Instructions:

1. Talk to the students about any changes they have seen in their sea monkeys.
2. Draw links to humans or other animals that change their appearance throughout their different life stages.
3. Introduce the 6 life stages of sea monkeys. Have students complete their worksheet by gluing different lifecycle pictures onto the cycle diagram. Help the students label each life stage.



Closure Discussion

1. What do all animals need to survive? (Food, oxygen, protection from predators...)
2. How are barnacles and brine shrimp like us?
3. How are they different?
4. What questions do you have about barnacles and brine shrimp?

References

Brine Shrimp Lifecycle: <http://learn.genetics.utah.edu/content/gsl/artemia/>

Caring for Brine Shrimp:

<http://www.brineshrimpdirect.com/c123/what-guidelines-culturing-brine-shrimp-c119.html>

<http://www.petplace.com/article/fish/general/feeding-nutrition-of-fish/how-to-raise-brine-shrimp>

