
SQUAMISH RIVERS

Water Address

Grades: K-2

Subject, Science, Language
Arts

Time required: 50 minutes

With 30 minutes prep

Key Concepts:

*All life must have enough
clean water*

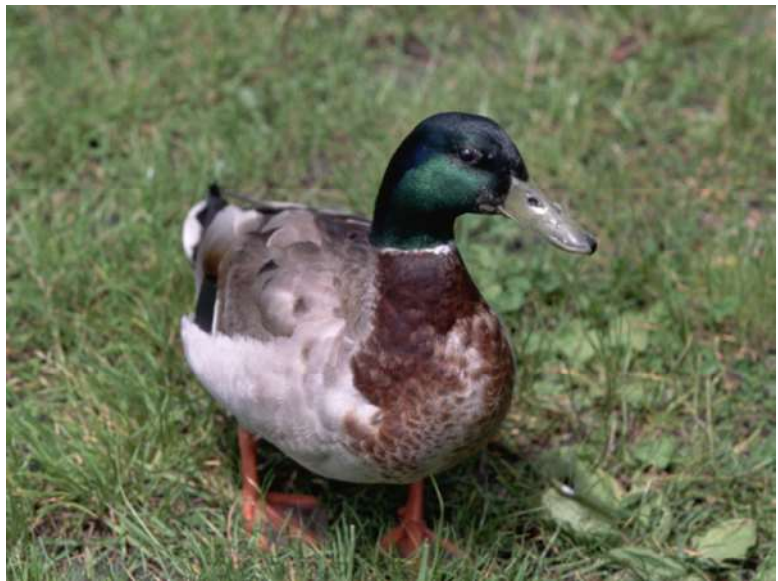
Objectives:

*Students will recognize water
related adaptations of some
plants and animals .*

SQUAMISH RIVERS

Key Words:
adaptation

Skills:
Analysis, discussion, classification,
interpreting, communication, work,
matching



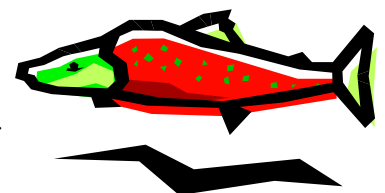
Background:

Living organisms can be found all over Earth's surface. Since three-quarters of Earth is covered with water, many plants and animals live in water environments such as oceans, lakes, and rivers. Other organisms are able to live on land, including deserts, wetlands, mountains, grasslands, etc. To survive in these varying environments, plants, animals, and other living things have special features or adaptations. Developed over time, these adaptations help organisms acquire available nutrients and energy, protect themselves against enemies, and cope with diverse conditions (e.g. arid, aquatic, tropical). Because water covers most of the planet and is essential for life, many adaptations relate to water.

Animals and plants have become suited to live in aquatic environments in many ways. For example, fish have stream-lined bodies and fins to help them maneuver through water. Ducks have webbed feet for swimming and glands that produce a waxy oil for waterproofing feathers. Other organisms have

Materials

- Water Address cards, supplied
- Markers or crayons
- Photos of organisms (optional)



Water Address

Background continued:

developed the means to filter oxygen from water; for example, fish have gills. To live in fast-flowing water, such as a mountains stream, some organisms have modified mouth parts or fins that resemble suction cups, to keep them from being swept downstream. Water lilies anchor themselves on the bottoms of ponds and lakes, but their large leaves float on the surface, gathering light.

Some land animals have adaptations that help them obtain and conserve water. The kangaroo rat, a desert dweller, feeds only on dry seeds. The animal metabolizes proteins and fats in a way that provides all the fresh water it needs. A camel can survive for days or even months without water. This animal gets moisture from its food and retains most of the water that is in its body. Camels do not sweat much and can tolerate an increase in body temperature of 11 degree F. A camel stores water in fat cells through its body.

Plant adaptations for dry conditions include large root systems for collecting water, decreased leaf size, and a thick protective covering that resists water loss. The ribs of the saguaro or giant cactus expand or contract like an accordion for water storage.

Plants and animals also possess adaptations related to cold water. Seals, penguins, and whales have insulation called blubber (a thick layer of oily fat beneath their skin) that keeps their body heat from escaping. Plants in cold environments must adapt to water scarcity, since the water in the soil around their roots is often frozen. The pine needle, a specialized leaf, has a thick, waxy coat and a small surface area to reduce the amount of water loss.

The behaviour pattern of an animal can be a response to the lack or abundance of water. Elk, moose, and deer migrate, sometimes great distances, to avoid heavy snows during winter. Migration patterns of birds correlate with winter and summer seasons. To prevent water loss during the heat of the day, some desert animals seek shade. When water dries up in a pond, certain species of frogs bury themselves in the mud and can hibernate for many years, waiting for the rains to return.

Procedure:

1. Discuss the importance of water to life. What is the longest time student can remember going without water? Inform them that humans can not survive more than three or four days without water.
2. Review the concept of adaptation (the modification over time of the structure, function, or behaviour of a plant or animal which enables it to be better suited to its environment). Ask students to brainstorm about plants or animals that have special water adaptations.
3. Tell students they are going to play a puzzle game in which they must guess an organisms identity and “water address.” Ask them to form groups of three or four.
4. Practice with an example with the whole class by turning over a card and try to identify the animal as a class.
5. Hand out a set of Water Address cards to each group. Instruct students not to look at the cards before the game begins.
6. Have one student in each group to turn over a card and try to name the plant or animal found there and it’s water address. If a student can not answer, the card gets passed along to the next student. When the group believes they have the correct

Water Address

answer, they should verify they have the correct answers (answers are listed on the master card template). The group receives one point per correct answer (e.g. “beaver” lives in “streams or rivers” = 2 points).

7. Continue the game until all the cards have been read.
8. Discuss how adaptations enable organisms to live in their environment. Have students summarize the special features or adaptations that help the organism live in its environment.

Extensions:

1. Students can create a new organism in an environment in the future or in a fictional water environment on a different planet such as “Zork.” Have students draw this new plant or animal and how it lives.

Evaluation:

1. Identify a plant or animal that has water adaptations.
2. Describe how adaptations enable plants and animals to live in different environments such as rivers or deserts.

Community Connections:

1. Bring photos of local animals and plant samples into the classroom and look for adaptations.

Resource:

This activity has been adapted from “Water Address” from Project WET (1996).

Note: Use the following examples to do with the whole class before giving them the other cards to do.

Stinging Nettle:

I have green leaves that look harmless. I can grow up to 3 metres tall in damp, rich soil.

My leaves are covered with brittle hollow hairs that produce formic acid. When you crush me or even lightly brush against me, the hairs break causing the acid to burn your skin. You can get a rash lasting about 30 minutes.

My name comes from how you feel when you get the painful rash.

In the spring, some people like to eat me when I am fresh and young. Cooking destroys the acid so I can be safely eaten.

Polar Bear:

I have wide paws with slightly webbed toes that help me swim. I paddle with my front feet and steer with my hind feet.

On my feet, I have pads with rough surfaces that help stop me from slipping on the ice.

To keep my prey from seeing me, I cover my black nose with my white paw.

My hair is oily and water repellent. On sunny days, my hair traps the sun's heat to keep me warm when I am resting. My hair looks white so I can blend in with the ice and snow.

Barnacle:

I live in the water, but can survive out of water for many hours.

When underwater, I reach out and wave my legs to pull nutrient-filled water into my mouth.

When first born, I move about in the water. When older, I stay in one place by using a special glue to attach myself to a rock, a boat, or a whale.

I make my own limestone house from materials I filter from the water.

Penguin:

My feet are webbed and used for steering.

I wear a matted feather coat that keeps out wind and water.

Blubber helps keep my body heat inside.

I have wings that I use for flippers.

Beaver:

I have dense, oily fur, webbed hind feet and ears and nostrils that close when underwater.

I sink green branches into my pond so I have food in the winter.

I use my wide tail as a paddle.

I build a home in water with sticks, and it has an underwater entrance.

Cactus:

My ridged stems can open to hold a lot of water.

My root system goes out a long ways and is not very deep so I can suck up water quickly.

My thick skin stops me from losing too much water.

I have spiny skin to stop other animals from trying to get my stored water.

Camel:

I am able to drink a lot of water and store it in the fat cells of my body.

I hardly sweat and urinate. I don't pant or breathe quickly so I will not lose too much water from my body.

I can travel without drinking water for up to 30 days. A human can only live without water for 2-4 days.

Fat is stored in my hump. The fat can be used for energy and when that happens, I can use the water that was in the fat.

Salmon:

Where I live, I must always swim to stay in one place.

I lay my eggs in certain parts of a river or stream and cover them with gravel.

I am smooth and slippery, with fins and a large tail.

I breathe using gills, which take oxygen from the water.



