



# Animal Biodiversity

Teacher Resource - Elementary School (Cycle 1)

Biology

Redpath Museum

# Interactions with the environment

## ► Adaptation

- This is a process that allows an organism to live and increase its chance of survival in its environment.
- Adaptation can be in the form of a physical trait. The body of the organism changes to make it more efficient in its environment.

## ► 1. Physical Adaptations

- a. Adapting to cold
  - Terrestrial animals evolved a thick fur layer, to insulate their warm bodies from the cold air.
  - Aquatic animals evolved a thick layer of blubber, below their skin, which protects their bodies from the cold water surrounding it



The muskox has very thick fur to survive the cold winters of the Canadian Arctic



The narwhal has a thick blubber layer under its skin, allowing it to thrive in the cold Arctic Ocean<sup>1</sup>

# Interactions with the environment

## ► 1. Physical adaptations

### ► b. Moving in water

- Fish can move in water because of their fins, specially designed for such movement.
- Some birds such as ducks and gulls have webbed feet, which are also designed for movement in water, better than regular bird feet.

### ► c. Living in the ground

- Some animals live in the soil itself, and have special features to dig and burrow themselves into the ground. Animals such as the woodchuck or the striped skunk have specialized claws to dig in the soil.



The fins of the northern pike allows it to move with speed and precision in water<sup>3</sup>



The webbed feet of this puffin increase the efficiency of its movement when in water<sup>4</sup>



The large claws of the woodchuck allows it to dig its burrow in the ground<sup>5</sup>

# Interactions with the environment

- ▶ Adaptation can also be in the form of behavior. It is then the comportment of the organisms that allows them to live in their environment
- ▶ 2. Behavioral adaptations
  - ▶ a. Migration
    - ▶ Animals migrate when they seasonally travel long-distances to reach an environment that better fits their needs at that specific time.
    - ▶ The species “switches” between two environments, as the seasons affect the resource availability for the animal of interest.
    - ▶ Migration is performed by all vertebrate groups, and even invertebrates such as insects and crustaceans.



The Arctic tern, the animal with the longest migration route, traveling from the Arctic to Antarctica every year<sup>2</sup>



Migrating monarch butterflies, traveling throughout North America to reach their winter environment in Mexico<sup>3</sup>

# Interactions with the environment

## ▶ 2. Behavioral adaptations

### ▶ b. Hibernation

- ▶ Some mammals will escape the harshness of winters by sleeping through the said seasons.
- ▶ Hibernation is a state of inactivity, composed by a reduction in metabolic activities, such as heart rate, respiration and digestion.
- ▶ Hibernation requires ingestion of a lot of food prior to hibernating, to have sufficient amounts of energy to survive through the winter.
- ▶ This adaptation is performed by mammals such as bears, bats and rodents, and also by reptiles and amphibians (known as “brumation”).



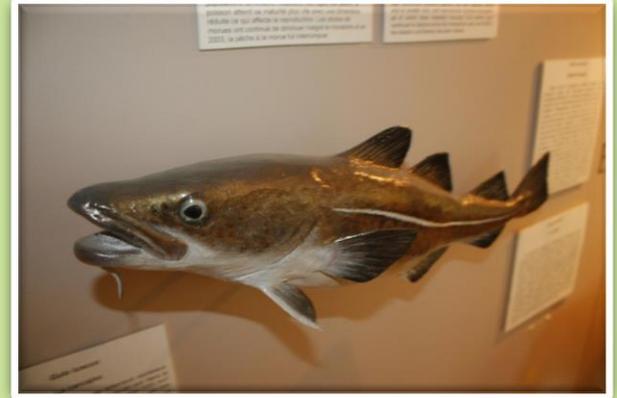
Hibernating Arctic Ground Squirrel<sup>4</sup>



Hibernating Black Bear<sup>5</sup>

# Use of Living Things for Consumption

- ▶ Animal consumption
  - ▶ Animals are consumed in a variety of ways. The most obvious one is as food. All kinds of animals are eaten by different cultures around the world.
    - ▶ The flesh of mammals, fish, molluscs and crustaceans are consumed throughout the globe and insects, and worms are eaten whole in particular cultures. Even echinoderms such as sea urchins are consumed, generally their gonads.
  - ▶ The skin of animals is also greatly used. The fur of mammals, the scales of reptiles and the feathers of birds are all used to make clothing or clothing accessories.
  - ▶ Animals are used by man in many other various ways, such as domestic pets or parts as decorative ornaments (ivory and feathers).



The Atlantic cod in the Redpath museum, a which greatly over consumed for its flesh, to a point where it almost went extinct.



A polar bear skin, used for clothing or ornament, as well as a narwhal tusk, also an ornament, both in the Redpath museum