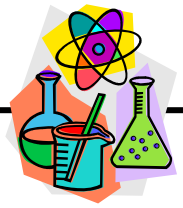
Grade 9 Unit A: Biological Diversity



Natural and Artificial Selection

Natural Selection: The process by which favourable traits that are inheritable become more and more common in a species when individuals are allowed to breed naturally. Natural selection happens because organisms with favourable traits are more likely to survive and reproduce that those with unfavourable traits.

Artificial Selection: The controlled breeding of a species to encourage certain traits over others.

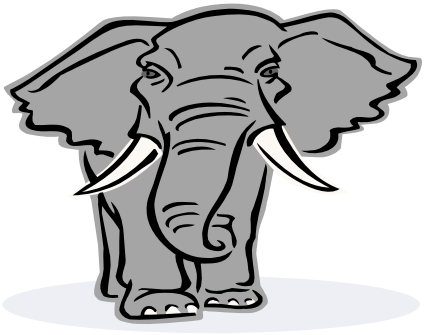
Organisms adapt to their environment over many generations. Changes in genetic codes and/or behaviours are passed on from parents to offspring. These changes allow certain organisms to become more and more successful in their environments.

Example: Thick fur is a genetic adaptation to a cold environment. Hibernation is a behavioural adaptation to a cold environment.

1. Choose an animal or plant and investigate how genetic traits have helped it adapt to its environment.

   Examples:

   - Ducks have webbed feet for swimming.
   - Elephants have large ears to release body heat.
   - Green plants have leaves to produce energy through photosynthesis.

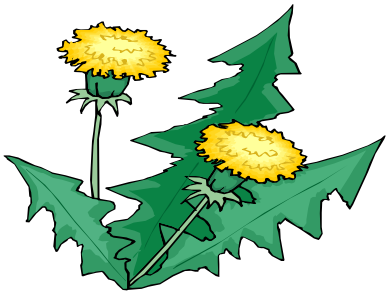


2. Choose an animal or plant and investigate how it has made behavioural adaptations that allow it to survive in its environment.

   Examples:

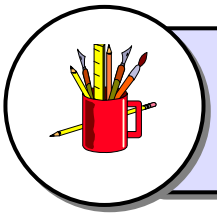
   - Bears hibernate when the climate is cold and food is scarce.
   - Some birds, butterflies and fish migrate to avoid cold temperatures or to follow a food supply.

3. Consider and discuss the following situation with classmates.



   Two types of dandelions grow on a lawn. One type has long stems and grows tall. The other has short stems and the flowers stay close to the ground. If the lawn is cut every two weeks, which type of dandelion will live long enough to reproduce? What will happen to the other plant?

   Hypothesize about what happens to species of plants and animals if they do not adapt to their environment. Give examples.



Use Tools Discussion Notes and Information Summary III.

4. In a group, discuss natural selection and artificial selection. List examples of both and describe the trait and its advantage. For example:

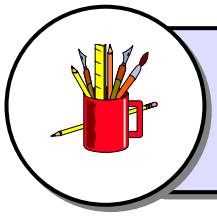
Species	*cows*
Natural or Artificial Selection?	*artificial*
Trait	*ability to produce large quantities of milk*
Advantage	*more efficient for dairy farming*

5. Animal and plant breeders combine genetic material for specific purposes.

   Examples:

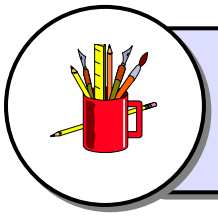
   - cattle for tender meat or large quantities of milk
   - horses for speed or strength for pulling loads
   - roses and orchids for smell, colour and beauty
   - dogs for friendliness or sense of smell.

Interview a breeder or farmer in your area and ask how genetics are used in the business. See Conducting an Interview for tips. Share your findings with the class.



Use Tools Question Organizer I or Question Organizer II, Preparing for Listening I and Listening for Main Ideas.

6. Research and create a report about the inherited traits of Aboriginal populations in various environments. Find pictures of Inuit people living in the high Arctic and pictures of Eastern Woodlands First Nations peoples. Compare their physical features. Discuss the environments they have adapted to.



Use Tools Note Taking I, Information Summary I and Report Planner.

7. How human systems respond to diseases may also be determined by factors of heredity and environment. Look for news stories or medical reports explaining why there are higher rates of diabetes in Aboriginal populations or obesity in North Americans. See the research section of English Language Arts for help.