

Ecology II Sequence

Ecology Nomenclature (EN)

Building Life activity (Experiment 1)

Animal Adaptations Nomenclature (AA)

Lamarck and Darwin Activity (Experiment 2)

Bird Beak adaptations

Bird Feet adaptations

Mammalian Teeth Adaptations

Calculating Biodiversity (experiment 3)

How Does Your Garden Grow? (Experiment 4)

Water Retention (Experiment 5)

Bird Adaptations to Specific Biomes

Population Control Factors Nomenclature (PC)

Degradation of Soil

 Biological

 Chemical

 Physical

Degradation of Soil Activities

Health Factor Activity (Experiment 6)

Defensive Mimicry Nomenclature (DM)

Aggressive Mimicry Nomenclature (AM)

Thames and Kosmos Genetics Kit working with DNA

Introduction to Ecology II

Age

10 – 11 years

Materials

Ecology nomenclature (EN 1-15)

Procedure

1. Remind the children of their previous work with Ecology 1. Review nomenclature of elements of a biome if necessary. (Biome, abiotic substances, decomposers, primary producers, primary consumers, secondary consumers, and tertiary consumers)
2. Introduce the nomenclature in the numbered sequence.
3. Discuss the difference between a biome and an ecosystem. When there is a stable system, there is an ecosystem, which is affected by the geographical location, temperature, and moisture levels. Within that ecosystem, there is flora and fauna.
4. A habitat is a specific place where a plant or animal lives.
5. A population has a group of individuals of the same species living in an area at the same time; within that population there are smaller groups which are known as a community.
6. In order for the ecosystem to be balanced, there must be biocontrol, which can be affected by the endemic, naturalized, or exotic species.
7. Ask the children if they can relate this vocabulary to their school community. What would be the ecosystem? Is it balanced between students and teachers? What would happen if there was a shift in either direction?
8. What is the biocontrol within your school ecosystem? Are there endemic, naturalized, or exotic species?
9. Finally, what happens where there is a disturbance? How does the school ecosystem get back into balance?

Follow Up

Building Life Activity (experiment 1)

Animal Adaptations

Age

10 – 11 years

Materials

Animal Adaptation nomenclature, Lamarck and Darwin activity sheets (experiment 2)

Procedure

1. Adaptations are characteristics that develop over time that allow an organism to survive in its particular niche.
2. These adaptations allow for diversity, which in turn allows for bio-control. Again, this is what allows the ecosystem to be in balance.
3. The characteristics are developed over time due to natural selection.
4. Read the selection on Lamarck and Darwin.
5. Using the giraffe neck cards, sort the cards according to the Lamarck theory and then the Darwin theory on the sequence mats.
6. Fill out the Comparing Theories sheet.

Follow Up

Bird beak adaptations

Bird Beak Adaptations

Age

10 – 11 years

Materials

Nut cracker, awl, syringe, spoon, sieve, tweezers, skewer,

Procedure

1. Tell the children about this true story.
2. One day a mother and her child were looking out the kitchen window and noticed that a bird had built a nest in the tree branches just outside the window.
3. Every day they enjoyed watching the mother add to the nest and were elated when they noticed that one day, there were 4 eggs in the nest.
4. They watched everyday as the mother brooded on her eggs, and were rewarded when the eggs hatched.
5. They continued to watch the progress of the baby birds as they were fed by their mother, but one day, a catastrophe happened.
6. A strong wind came through and threw the nest out of the tree. The mother and child were horrified, and quickly went out the next morning to see if they could rescue the baby birds.
7. They did find the nest, and next to it was only one of the baby birds.
8. Determined to save the baby, they restored it to its nest, without touching it and placed it back in the tree.
9. They watched for 2 days to see if the mother bird would come back; it did not.
10. Finally, the mother and child decided to take the matter into their own hands, and proceeded to go to the pet store and purchase meal worms to feed the baby bird.
11. The bird did not survive, do you know why?
12. Lead the children to understand that each species has adapted to its environment and not all birds eat the same thing.
13. Show the children the tools and ask them how they would be used.
14. Lead the children to realize what type of food each beak would help the bird get.

Follow Up

Bird Beak sorting, Bird feet sorting, Mammalian skull and teeth activity

Calculating Biodiversity

Age

10 – 11 years

Materials

Calculating biodiversity (experiment 3)

Procedure

1. Prepare the bottles with the different items to represent the species.
2. The number of species may be spread randomly among the bottles.
3. Introduce the activity to the children stating that in order to have a balanced ecosystem there needs to be a range of biodiversity.
4. Describe the devastation of Dutch elm disease brought about by a fungus carried by the elm bark beetle.
5. Explain that if there had been more biodiversity in the areas where the elms were infected, there may have been less devastation.
6. Proceed with the experiment. Allow the children to calculate the biodiversity index.

Follow Up

How Does Your Garden Grow? (experiment 4)

Water Retention (experiment 5)

Bird Adaptations to specific biomes

Bird Adaptations to Specific Biomes

Age

10 – 11 years

Materials

Control Charts of birds from different biomes, bird identification book

Procedure

1. Given all that you have learned about adaptations, balanced ecosystems, and biodiversity, let us look at specific biomes to see how birds have adapted to these different areas.
2. Birds are the one class of animal that has been able to adapt to all 9 biomes on the planet.
3. In order for a species to be successful (live and reproduce), it must fulfill certain tasks. What do you think these may be? Have the children brainstorm these tasks. (eat, get water, maintain shelter, reproduce, protect themselves)
4. In order to survive, all birds must get enough heat from their environment. If they get too little, they will freeze. If they get too much, they will die. How do birds regulate their body temperature? How is this affected by their environment? How does their size relate to their environment?
5. Take the control chart for the temperate forest birds and look at the adaptations.
6. What are their beaks like? What are their feet like? What size are they? What is their coloring? What do they feed upon? When do they feed? Where do they build their nests? How many offspring do they produce each year? How do they protect themselves?
7. Using the bird identification book, research the birds on the chart, and answer the previous questions.

Follow Up

Research the rest of the adaptations from the other biomes.

Create a journal from the research to be presented, from the point of view of an ornithologist.

Population Control Factors

Age

10 – 11 years

Materials

Population Control nomenclature (PC) Defensive Mimicry nomenclature (DM)

Aggressive Mimicry nomenclature (AM)

Procedure

1. Bio-control is the natural way that a population is controlled to allow for biodiversity.
2. Introduce the nomenclature and discuss the concepts presented.
3. Do the Health Factor activity (experiment 6)
4. Discuss the necessity for biodiversity.
5. What would happen if there was another type of disturbance, a fire for example? What would happen at that point?
6. Each species protects itself in different ways. What are some of the ways that flora and fauna protect themselves? (Camouflage, venom, poison, flight, body armor, etc.)
7. Present the mimicry nomenclature and discuss the concepts related to adaptation and survival of the species.

Follow Up

Thames and Kosmos genetics lab kit.

Thames and Kosmos

Genetics and DNA

Age

10-11 years

Suggested Sequence

- Isolating genetic material
- Heredity
 - Relatedness
 - Mendel and the rules of heredity
 - How features are passed on to offspring
 - Why parents may be different from the children
- Cells
- Chromosomes
- Decoding the structure of DNA
- Relaying the Codes
- The Age of Genetic Engineering