

Key Science Concepts and Skills	
Activities Summaries	Biology Principles
<p>Activity 1: Diversity in Living Things Students observe a variety of living organisms, as well as preserved slides to introduce them to the incredible diversity in the animal kingdom and to examine the relationship between structure and function.</p>	<ul style="list-style-type: none"> • Structure determines the function • Biodiversity is important to the stability of an ecosystem
<p>Activity 2: Who Eats Whom? This activity introduces students to food chains and food webs to gain a sense of how dependent organisms are to each other.</p>	<ul style="list-style-type: none"> • Food chains and food webs • Producers, consumers, and decomposers • Autotrophs and heterotrophs • Herbivores, carnivores, and omnivores
<p>Activity 3: Energy Flow in Ecosystems Students record and graph the temperatures in three containers of water. One container is left alone while a student puts a moving hand in the second container and a still hand in the third. Students infer from the data that heat is dissipated from the body.</p>	<ul style="list-style-type: none"> • Laws of thermodynamics • Transfer of energy in a food chain • Energy is lost in the form of heat • Pyramids of biomass, of numbers, and of energy • Trophic levels
<p>Activity 4: Factors Affecting Population Size Students compare the growth of a reindeer population on an island near Alaska and the human population. They examine the roles played by carrying capacity, doubling time, and the four rates that determine a population's size – birthrate, death rate, immigration, and emigration.</p>	<ul style="list-style-type: none"> • Carrying capacity • Doubling time • Birthrate, death rate, immigration, and emigration • Open and closed populations
<p>Activity 5: Competition Among Organisms Students observe the difference in the growth of plants when they must compete for space and nutrients. They also observe what happens when different species compete. They then design and carry out an experiment to study competition under different conditions.</p>	<ul style="list-style-type: none"> • Competition • Nonnative species • Invasive species
<p>Activity 6: Succession in Communities Students do a visual scrutiny of a diagram on the changes that occurred along the coastal areas and in the inland areas after two volcanoes erupted on the island of Krakatoa. This activity hones the students' observational skills as they investigate the sequence of changes that take place in succession.</p>	<ul style="list-style-type: none"> • Primary and secondary succession • Pioneer community • Seral communities • Climax community

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<p>Activity 7: The Water Cycle Students conduct an experiment to measure the rate of transpiration as they learn about the water cycle. They also investigate factors that could affect experimental results as well as possible experimental errors.</p>	<ul style="list-style-type: none"> • Water cycle • Evaporation, condensation, precipitation, transpiration
<p>Activity 8: Photosynthesis, Respiration, and the Carbon Cycle This activity shows the role of sunlight in photosynthesis. With the use of the chemical iodine, the students are allowed to figure out whether or not starch is produced. This would lead them to answer whether or not photosynthesis occurred. Using petroleum jelly, they are encouraged to examine what part of the leaf allows for gas exchange – (carbon dioxide is taken in and oxygen is released) which is crucial for photosynthesis and respiration to happen.</p>	<ul style="list-style-type: none"> • Photosynthesis • Respiration • Carbon cycle • Oxygen cycle
<p>Activity 9: The Nitrogen and Phosphorous Cycles Students conduct an experiment to measure the effect of lawn fertilizer and detergent on the growth of algae.</p>	<ul style="list-style-type: none"> • Nitrogen cycle • Phosphorous cycle • Nitrogen fixation • Denitrification