

LINN MURDOCH INNOVATION MIDDLE SCHOOL
7/8 Science Project
2007-2008

Project/Unit Title	Biology
Description	<p>In this project students will investigate the nature of life on Earth. Students will investigate the origins of life and develop an understanding of how organisms are continually evolving. They will explore how humans and plants survive on a large scale and compare and contrast how they work on a cellular level. As students look at life through different lenses, they will develop an understanding of the hierarchal organization of life. By applying their knowledge of plant and human systems, students will study heritable traits and genetics and apply their knowledge to plants in their classrooms, thus allowing them to build a deep understanding of genetics and heredity. The students will use their understanding of genetic inheritance and ecosystems to draw connections between the classification of organisms and the evolution of these organisms within New England natural environments. Finally, the students will strengthen and develop their skills of inquiry as they design and carry out their own independent projects relating to the broad field of biology.</p> <p>Essential Questions: What is life? How does life survive? How does life change over time? How do biologists study life?</p>
Developers	Katharine Hinkle, Sue Jensen
Standards	<p>Classify organisms into the currently recognized kingdoms according to characteristics that they share. Be familiar with organisms from each kingdom.</p> <p>Recognize that all organisms are composed of cells, and that many organisms are single-celled (unicellular), e.g., bacteria, yeast. In these single-celled organisms, one cell must carry out all of the basic functions of life.</p> <p>Compare and contrast plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuoles).</p> <p>Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function is similar in all living organisms.</p> <p>Describe the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.</p> <p>Identify the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control, and coordination) and describe ways that these systems interact with each other.</p> <p>Recognize that every organism requires a set of instructions that specifies its traits. These instructions are stored in the organism's chromosomes. Heredity is the passage of these instructions from one generation to another.</p> <p>Recognize that hereditary information is contained in genes located in the</p>

	<p>chromosomes of each cell. A human cell contains about 30,000 different genes on 23 different chromosomes.</p> <p>Compare sexual reproduction (offspring inherit half of their genes from each parent) with asexual reproduction (offspring is an identical copy of the parent's cell).</p> <p>Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.</p> <p>Recognize that evidence drawn from geology, fossils, and comparative anatomy provides the basis of the theory of evolution.</p> <p>Relate the extinction of species to a mismatch of adaptation and the environment.</p> <p>Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.</p> <p>Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.</p>
Student Role	Field biologist, lab researcher, explorer, observer, analyzer, thinker, writer, presenter, teacher, and expert.
Major Rubriced Pieces (products) or Assessments (quizzes and tests)	<ul style="list-style-type: none"> • Body Systems Public Health Brochure • Fast Plants Genetics Lab Report • Classification Journal • Independent Project Technical Poster and Presentation • Quizzes—MCAS open response style questions and in class challenge problems
MMS Outcomes	<p>Community Membership: Students will work on being good community members during collaborative group work and lab work.</p> <p>Self-Direction: Students will be required to plan their time well to meet individual and group work deadlines, particularly with the independent project.</p> <p>Problem Solving: Students will collect data on their plant growth and their independent project topics. They will be expect to solve problems when they arise and look to one another for assistance with difficult tasks.</p> <p>Effective Communication: On numerous occasions, students will be expected to share information with the class by presenting research findings or topic ideas for approval. They also will be expected to share their ideas and answers questions as part of class discussion on a regular basis.</p>
Systems Thinking Connection(s)	Students will study both plant and animal body systems and connect how there is a complex balance at work that sustains life.
Technology Connection(s)	Students will use PowerPoint poster templates on the computers to produce a technical poster. They also will use a wiki page and computers for other projects.
Community Connection(s)	The students will work in the wetlands around school to understand the life that exists around them. They will present their independent research work to the larger community during Science Night.
Creative Arts Connection(s)	Students will keep detailed scientific drawings of their plants throughout the quarter. They also will produce graphical brochures and 3-dimensional cell parts.
Timeline	Quarter 3 and 4