

UNIT OF STUDY

Title: Cycles of Life	Subject/Course: Biology	Length: 9 weeks
Topic: Molecules and Cells	Grade: 9-12	Designer: LouAnn Howell
UNIT GOALS AND EXPECTATIONS		
<p>IMPORTANT CONCEPTS/UNDERSTANDINGS: Living systems at all levels of organization demonstrate the complementary nature of structure and function.</p> <p>All organisms are composed of cells. Some organisms are single cells others are multi-cellular.</p>	<p>ESSENTIAL QUESTIONS:</p> <p>What is the structure and function of the major organic molecules found in living systems?</p> <p>What are the properties of water and its significance for life?</p> <p>What is the role of energy in chemical reactions of living systems?</p> <p>How are prokaryotes and eukaryotes alike and how are they different?</p> <p>How are animal and plant cells different and how are they alike?</p> <p>What are the functions of autotrophs and heterotrophs?</p> <p>What is the structure and function of mitochondria and chloroplasts?</p> <p>How are aerobic and anaerobic respiration alike and how are they different?</p>	
<p>STUDENT LEARNING EXPECTATIONS:</p> <p>MC.1.B.1 Describe the structure and function of the major organic molecules found in living systems: carbohydrates, proteins, enzymes, lipids, nucleic acids.</p> <p>MC.1.B.3 Investigate the properties and importance of water and its significance for life.</p> <p>MC.1.B.5 Explain the role of energy in chemical reactions of living systems.</p> <p>MC.2.B.1 Construct a hierarchy of life from cells to ecosystems.</p> <p>MC.2.B.2 Compare and contrast prokaryotes and eukaryotes.</p> <p>MC.2.B.4 Relate the function of the plasma (cell membrane) to its structure.</p> <p>MC.2.B.5 Compare and contrast the structures of an animal cell to a plant cell.</p> <p>MC.2.B.6 Compare and contrast the functions of autotrophs and heterotrophs.</p> <p>MC.2B.11 Discuss homeostasis using thermoregulation as an example.</p> <p>MC.3.B.1 Compare and contrast the structure and function of mitochondria and chloroplasts.</p> <p>MC.3.B.3 Compare and contrast aerobic and anaerobic respiration: Lactic acid fermentation, alcoholic fermentation</p>		
<p>SPECIFIC DECLARATIVE KNOWLEDGE – What I know</p> <p>Know that living systems demonstrate the complementary nature of structure and function.</p> <p>Understand important levels of organization for structure and function include cells, organs, tissues, organ systems, whole organisms, and ecosystems.</p> <p>Understand all organisms are composed of cells.</p> <p>Understand cells are the fundamental unit of life.</p> <p>Understand most organisms are single cells; other organisms, including humans, are multi-cellular.</p> <p>Understand cells carry on the many functions needed to sustain life.</p>	<p>SPECIFIC PROCEDURAL KNOWLEDGE – What I need to do</p> <p>Group foods as starches, fats, and proteins.</p> <p>Represent how all living things use water.</p> <p>Determine which drink, water, soda or sports drinks will hydrate the body better and tell why.</p> <p>Sort and classify cold-blooded versus warm-blooded animals.</p> <p>Sequence the progression of life.</p> <p>Develop and identify models of a cell with and without a nucleus.</p> <p>Demonstrate the function of the cell membrane by using common materials. (fish net, colander, slotted spoon, window screen)</p> <p>Determine consumers and producers in a system.</p> <p>Identify and sort cold-blooded and warm- blooded organisms.</p> <p>Observe an illustration of how cells can use energy.</p> <p>Indicate the flow of energy.</p>	

UNIT ASSESSMENTS (Include tasks related to Dimensions 3 and 4 and Bloom's Taxonomy)	
<p>Students are given a page with pictures of foods. Students must label what types of food each is example is in (carbohydrates, fats, proteins and nucleic acids)</p> <p>T Chart with an example of a cold- blooded and warm- blooded animal labeled on it . Students will list characteristics of each.</p>	
Traditional Assessments: Test Quizzes	Other Evidence of Learning: Notebook entries Observations of Labs

ACTIVITIES AND LEARNING EXPERIENCES	Resources
Use magazine pictures, food, internet pictures to sort and classify groups, food groups/pyramid.	Media sources
Discuss properties of water...see how many drops of water you can place on a penny, float a paperclip in water (adhesion and cohesion and surface tension) Dissolve salt, sugar and oil in water and discuss findings. Using a sports drink, soda, and water read the story about how and why sports drinks were created, Students will predict which drink will hydrate the body better and why.	Effects of Sports Drinks
Discuss how long humans can go with out food versus water. Make estimations and compare them.	NASA website
Identify cold and warm blooded animals by the use of pictures or picture symbols to sort and classify.	AGFC
Arrange pictures to depict progression of life (seed to plant).	edHelper
Plant a seed and document how it grows into a plant.	
Observe cells using internet website and a microscope (onion skin). Observations will be recorded on a lab sheet.	Cells Alive website
Using a mesh laundry bag to demonstrate a cell membrane. Discuss other day to day examples to demonstrate this concept. e.g. tea bags, coffee filters,	
Observe plant and animal cells through a microscope and record findings on a lab sheet.	Cells Alive website
Take an egg shell off with vinegar. Place egg in colored water and leave for a couple of days. Cut the egg open to see if the yoke is colored.	
Compare a person and an apple tree. The tree produces and the person consumes the apple.	Ecology
Students will demonstrate how physical activity affects the body by completing a checklist before and after the activity that includes temperature, sweating, pulse, rate of breathing, skin color, thirst, etc. Students will write a comparison of two check lists.	Unitedstreaming

<p>The class will observe an illustration of how cells can use energy by using a flashlight/radio and battery. Label the parts... the battery represents the mitochondria when the battery is placed in the flashlight/radio, turn on and you have energy, which is the powerhouse (mitochondria)</p> <p>Students will record practical applications of cellular respiration by watching a video on how to make cheese and recording findings on a listening sheet.</p> <p>By constructing a Venn diagram students will compare cellular respiration and photosynthesis</p> <p>Create a Venn diagram to compare and contrast the plant and animal cell.</p> <p>Observe anaerobic and aerobic cellular respiration and complete T- chart.</p>	<p>Unitedstreaming</p> <p>Unitedstreaming</p> <p>Cells Alive website</p> <p>Cells Alive website</p>
<p style="text-align: center;">Career Connections</p> <p>Plant pathologist Developmental biologist Lab technician</p>	