



YES Prep North Central
Course: 7th Grade MST
Instructors:
Year: 2009-2010



Unit 1: Science Safety, Experimental Design, The Cell

YES Expectations	Daily Objectives (SWBAT...)
Demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards.	SWBAT distinguish between safe and unsafe lab practices and defend their answers. SWBAT explain actions that should NOT be taken without direction SWBAT define ethical treatment and provide explanations of how to ethically treat living organisms SWBAT identify and state appropriate field investigation behaviors.
Practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials	SWBAT identify appropriate use of lab materials SWBAT accurately measure lab materials to reduce waste. SWBAT identify how best to dispose of materials (Which would a scientist reuse? Which should be disposed of? Which should be recycled?)
Use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher	SBAT identify and accurately describe/demonstrate how to use safety equipment, and know where the safety equipment is located
Identify the basic characteristics of organisms including prokaryotic or eukaryotic, unicellular or multi-cellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms.	SWBAT define the characteristics of a living organism (composed of cells, require energy, reproduce, respond to stimuli, evolve and adapt, maintain homeostasis) SWBAT justify if substances are living or non-living based on characteristics.
Recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life.	SWBAT paraphrase the cell theory and use it to construct a definition of cells. SWBAT classify living things as comprised of cells and therefore follow the cell theory. SWBAT articulate that cells are the building blocks of life.
Compare the functions of a cell to the functions of organisms such as waste removal.	SWBAT distinguish between prokaryotic and eukaryotic cells; unicellular and multi-celled organisms – simple vs. complex SWBAT identify cells as living because the extract energy from food, use



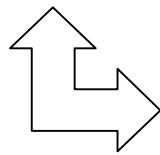
	energy and raw materials to build necessary substances, exchange gases, and remove waste.
PROCESS SKILLS	SWBAT successfully view slides using a microscope SWBAT prepare and view a wet mount slide SWBAT identify parts and functions of a microscope SWBAT create detailed, labeled drawings of items viewed with the microscope
Differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole	SWBAT identify, define and articulate the function of: cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast and vacuole. SWBAT connect the shape of each organelle to its function. SWBAT compare the needs of the cell with that of a larger living organism – how are those needs/functions similar to that of the cell? What organelles of the cell allow for those functions to occur?
Recognize how large molecules are broken down into smaller molecules such as carbohydrates can be broken down into sugars.	SWBAT connect the body’s digestion of food as the breakdown of macromolecules into “building blocks” of energy that are small enough for the cell to use (this is how cells receive their energy)
Recognize that radiant energy from the Sun is transformed into chemical energy through the process of photosynthesis.	SWBAT deduce that plants as producers that TRANSFER sun energy into chemical energy that the plant can use SWBAT relate that producers use the energy from sunlight to produce sugars and carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms. SWBAT diagram the process of photosynthesis. SWBAT judge that chloroplasts are essential for photosynthesis because they contain chlorophyll, which absorbs light for photosynthesis.

MYP Objectives

- SWBAT recognize and recall scientific information.
- SWBAT define the problem or research question to be tested by a scientific investigation.
- SWBAT draw conclusions supported by scientific explanations and a reasoned interpretation of the analysis of the data.

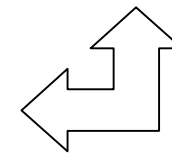


Area of Interaction	Enduring Understandings
<ul style="list-style-type: none"> Health and Social Education 	<ul style="list-style-type: none"> <i>Cells are the basic unit of structure and function in living organisms.</i> <i>The scientific method is used so that data can be used and compared globally.</i> <i>Cells perform the same functions as a living organism.</i>
Approaches to Learning	
<ul style="list-style-type: none"> Test-taking strategies (talk to entire GL team) 	



Unit Essential Question

How would we function without systems?



Summative Assessment		
Type of Assessment	Objectives Tested	MYP Assessment Criteria
<ul style="list-style-type: none"> Traditional Assessment 	<p>SWBAT define the characteristics of a living organism (see VOCAB)</p> <p>SWBAT justify if substances are living or not living based on characteristics.</p> <p>SWBAT paraphrase the cell theory and use it to construct a definition of cells. SWBAT classify living things as comprised of cells and therefore follow the cell theory.</p> <p>SWBAT articulate that cells are the building blocks of life, much like legos can build a car.</p> <p>SWBAT identify cells as living because they <i>extract energy from food, use energy and raw materials to build necessary substances, exchange gases, and remove waste.</i></p> <p>SWBAT identify, define and articulate the function of: cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;</p> <p>SWBAT connect the shape or structure of each organelle to its function</p> <p>SWBAT compare needs of the cell with that of a larger living organism—what are the basic needs of an organism—how are those needs/functions similar to that of the cell? What organelles of the cell allow for those functions to occur?</p>	<ul style="list-style-type: none"> Scientific Inquiry Knowledge and understanding of science



	<p>SWBAT connect the body's digestion of food as the breakdown of macromolecules into "building blocks" of energy that are small enough for the cell to use (this is how cells receive their energy)</p> <p>SWBAT deduce that plants as producers that TRANSFER sun energy into chemical energy that the plant can use</p> <p>SWBAT relate that producers (plants that contain chlorophyll) use the energy from sunlight to produce sugars (glucose) (and oxygen as a by-product) 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>SWBAT diagram the process of photosynthesis.</p> <p>SWBAT judge that chloroplasts are essential for photosynthesis because they contain chlorophyll, which absorbs light for photosynthesis.</p>	
<p>Lab Practical</p>	<p>SWBAT successfully view slides using a microscope or stereo scope (depending on your campus)</p> <p>SWBAT prepare and view a wet mount slide</p> <p>SWBAT identify the parts and functions of a microscope</p> <p>SWBAT create detailed, labeled drawings of items viewed with the microscope</p> <p>SWBAT distinguish between prokaryotic and eukaryotic cells; unicellular and multicellular organisms—simple vs complex organisms.</p> <p>SWBAT distinguish between safe and unsafe lab practices and defend their answers.</p> <p>SWBAT demonstrate safe lab and field practices AT ALL TIMES</p> <p>SWBAT: Explain actions that should NOT be taken without direction (pouring unknown chemicals down a drain or on the ground, eating left over materials, leaving the lab a mess, not telling a teacher of broken glass or spilled materials)</p> <p>SWBAT select and demonstrate appropriate field investigation behaviors</p> <p>SWBAT: identify appropriate use of lab materials</p> <p>SWBAT: select the best way to dispose of materials—which materials (should we) would scientists reuse?</p> <p>Which should be disposed of? Which should be recycled?</p> <p>SWBAT: identify and accurately describe/demonstrate how to use safety equipment, and know where the safety equipment is located.</p> <p>SWBAT decide which type of equipment is best suited for the situation.</p> <p>SWBAT: identify and define variables, constants, and controls in an experiment</p> <p>SWBAT create lab reports that exhibit well written hypothesis, procedures, graphs and tables, and conclusions that are supported by data and connect to previously/currently learned data.</p>	



<p>■ Project</p>	<p>Debate on the ethical nature of stem-cell research. SWBAT: defines “ethical treatment” and provides explanations of how to ethically treat living organisms</p>	
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Resources

<http://www.biologycorner.com/> a good resource for activities and lessons
http://www.ric.edu/faculty/ptiskus/Six_Kingdoms/Index.htm an easy to understand website on the kingdoms, with pictures.
<http://www.powersof10.com/> a website with links to a movie about relative size and relationship—from microscopic to cosmic scale
<http://www.biologycorner.com/worksheets/cellrap.html> a most amazing animal cell rap
http://www.biology.arizona.edu/cell_bio/cell_bio.html a tutorial site on cells and cell theory
<http://biology.arizona.edu/sciconn/lessons2/lessons.html> a link to middle school bio lesson plans
<http://www.bio.miami.edu/~cmallery/150/unity/cell.text.htm> a history of cell theory
<http://www.teachersdomain.org/resource/tdc02.sci.life.stru.singlecell/> (requires free login) a great introductory video and background info on single celled organisms
Carolina biological supply has a large variety of unicellular live samples, including **Amoeba, Paramecium, and Euglena Review Set, Living.**
http://www.csun.edu/scied/7-microscopy/micro_tutorial/index.html microscope tutorial, very detailed, wet mount tutorial, includes videos
<http://www.biologycorner.com/bio1/microscope.html> how to use a microscope—very basic
www.cellsalive.com an interactive, detailed website with MANY examples of cells and cell information
<http://www.schooltr.com/index.html> a website with very innovative microscope inventions and life science activities
<http://www.microbeworld.org/microbes/protista/> information on protists and protozoa
<http://www.nih.gov/about/researchresultsforthepublic/CellFactSheet.pdf> information on cell malfunctions and diseases—useful for social contexts of cell use
<http://www.biology4kids.com/map.html> Great source of information on the cell and organelles
http://www.marketplaceforthemind.state.pa.us/m4m/lib/m4m/documents/labs/Human_Cheek_Cells.pdf cheek cell labs
<http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookPS.html> photosynthesis pictures and information
<http://bioenergy.asu.edu/photosyn/education/learn.html> a list of links about photosynthesis
http://www.biologycorner.com/worksheets/photosynthesis_rate.html a simple photosynthesis lab,



Vocabulary

Waste disposal	Theory	Mitochondrion
Hazards	Plant Cells	Chloroplast
Precautions	Animal Cells	Vacuole
Ethical Treatment	Slide	Cyto-relating to cells
Field Investigations	Cover slips	Chloro-green
Recycle	Magnification	-plasm/t – living matter, growth
Reuse	Stage	Carbohydrates
Dispose	Objectives	Proteins
Goggles	Diaphragm	Sugars
Eye Wash	Coarse adjustment knob	Fats
Fire blanket	Fine adjustment knob	Photosynthesis
Fire extinguisher	Light source	Chlorophyll
Movement (phototropism, geotropism)	Amoebas	Chloroplasts
Reproduction	Protists	Carbon Dioxide
Sensitivity (response to environment)	Uni – one	Oxygen
Cells	Multi-many	Chemical Energy
Eukaryotic	Eu-true	Producers
Prokaryotic	Pro-before	Glucose
Unicellular	-karyo – cell	Stomata
Multicellular	Cell membrane	Photo-light
Nutrition	Cell wall	-synthesis – to make or form
Excretion	Nucleus	
Respiration	Cytoplasm	
Growth		

Monday	Tuesday	Wednesday	Thursday	Friday
		12 Rules, Procedures	13 Get to know you	14 Goals
17 SWBAT distinguish between safe and unsafe lab practices and defend their answers. SWBAT explain actions	18 SWBAT identify appropriate use of lab materials SWBAT accurately measure lab materials to	19 SWBAT define ethical treatment and provide explanations of how to ethically treat living organisms	20 SWBAT define ethical treatment and provide explanations of how to ethically treat living organisms	21 Quiz – encompassing all bolded objectives



<p>that should NOT be taken without direction SWBAT identify and state appropriate field investigation behaviors. SBAT identify and accurately describe/demonstrate how to use safety equipment, and know where the safety equipment is located</p>	<p>reduce waste. SWBAT identify how best to dispose of materials (Which would a scientist reuse? Which should be disposed of? Which should be recycled?)</p>			
<p>24 SWBAT define the characteristics of a living organism (composed of cells, require energy, reproduce, respond to stimuli, evolve and adapt, maintain homeostasis) SWBAT justify if substances are living or non-living based on characteristics.</p>	<p>25 SWBAT paraphrase the cell theory and use it to construct a definition of cells.</p>	<p>26</p>	<p>27 SWBAT classify living things as comprised of cells and therefore follow the cell theory. SWBAT articulate that cells are the building blocks of life.</p>	<p>28 Quiz – encompassing all bolded objectives.</p>
<p>31 SWBAT successfully view slides using a microscope SWBAT prepare and view a wet mount slide SWBAT identify parts and functions of a microscope SWBAT create detailed, labeled drawings of items viewed with the microscope SWBAT distinguish between prokaryotic and</p>	<p>1 SWBAT successfully view slides using a microscope SWBAT prepare and view a wet mount slide SWBAT identify parts and functions of a microscope SWBAT create detailed, labeled drawings of items viewed with the microscope SWBAT distinguish between prokaryotic and</p>	<p>2 MATH DAY</p>	<p>3 SWBAT identify, define and articulate the function of: cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast and vacuole. SWBAT connect the shape of each organelle to its function.</p>	<p>4 SWBAT identify, define and articulate the function of: cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast and vacuole. SWBAT connect the shape of each organelle to its function.</p>



eukaryotic cells; unicellular and multicelled organisms – simple vs. complex	eukaryotic cells; unicellular and multicelled organisms – simple vs. complex			
7 SWBAT identify, define and articulate the function of: cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast and vacuole. SWBAT connect the shape of each organelle to its function.	8 Quiz (lab-based?)	9 SWBAT deduce that plants as producers that TRANSFER sun energy into chemical energy that the plant can use	10 SWBAT relate that producers use the energy from sunlight to produce sugars and carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.	11 SWBAT diagram the process of photosynthesis. SWBAT judge that chloroplasts are essential for photosynthesis because they contain chlorophyll, which absorbs light for photosynthesis.
14 Quiz over photosynthesis	15 Review	16 Review	17 Lab-based test	18 Unit Test

