

Subject Science Grade Level 8 4th 9 weeks

COMPETENCY GOAL 6: The learner will conduct investigations, use models, simulations, and appropriate technologies and information systems to build an understanding of cell theory

Days	Objective	Vocabulary	Essential Questions and Tasks:	Resources
11 3 days	<p>6.01 Describe cell theory:</p> <ul style="list-style-type: none"> All living things are composed of cells. Cells provide structure and carry on major functions to sustain life. Some organisms are single cell; other organisms, including humans, are multi-cellular. Cell function is similar in all living things. <p>Benchmarks:</p> <ul style="list-style-type: none"> Students will be able to state and describe the parts of the cell theory. Students will understand how single celled and multi-celled organisms function to sustain life. 	<p>Cell Microscope (types) Hooke Leeuwenhoek Cell theory Louis Pasteur Spontaneous generation Single cell Multicellular Eukaryotic cell Prokaryotic cell All cell parts</p>	<ul style="list-style-type: none"> What are the essential precepts of the Cell Theory? What is the difference between prokaryotic and eukaryotic cells? Identify the work of Schleden, Schwann, & Virchow as related to cell theory. Classify diagrams or slides of cells as either single, multicellular, plant or animal. Build a cell model. How has technology helped in the development of the cell theory? 	<p>Unit E Chapter 1</p> <p>Support Documents p.3-5 w/Labs and activities p.9-20</p> <p>www.classzone.com virtual tour of cell and cells seen through different microscopes</p> <p>www.scilinks.org MDL031 w/ worksheet on www.cellsalive.com</p> <p>http://www.accessexcellence.org/AE/ATG/data/released/0251-NickHoffman/ 3d cell model w/jell-o</p> <p>http://glencoe.mcgraw-hill.com/sites/0078617898/student_view0/brainpop_movies.html# various short videos on cells</p>
2 days	<p>6.02 Analyze structures, functions, and processes within animal cells for:</p> <ul style="list-style-type: none"> Capture and release of energy. Feedback information. Dispose of wastes. Reproduction. Movement. Specialized needs. 	<p>Metabolism DNA RNA Reproduction Mitochondria Chloroplasts Specialized cells Tissue Organ System</p>	<ul style="list-style-type: none"> What is the structure and function of cell organelles? How do processes such as reproduction, movement, and energy exchange, occur within animal cells? Diagram an animal cell, indicating which structures perform what specific functions. How do specialized cells function within an organism? 	<p>Unit E Chapter 2</p> <p>Support Documents p. 5 w/Labs and activities p. 9-20 & 27</p> <p>http://www.exploratorium.edu/traits/cell_explorer.html demonstrates making energy, proteins, and cell division</p> <p>www.sciencenetlinks.com/lessons.cfm?BenchmarkID=5&DocID=88 Lesson to teach the cell as a</p>

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	Benchmarks: <ul style="list-style-type: none"> Students will be able to identify by structure and function the parts of a cell on a diagram. Students will have an understanding of the processes within a cell. 			system.(contains worksheets)
2 days	6.04 Conclude that animal cells carry on complex chemical processes to balance the needs of the organism. <ul style="list-style-type: none"> Cells grow and divide to produce more cells. Cells take in nutrients to make the energy for the work cells do. Cells take in materials that a cell or an organism needs. Benchmarks: <ul style="list-style-type: none"> Students will be able to describe the chemical processes involved in reproduction and energy conversion in cells. 	Meiosis Mitosis Cytokinesis Chromosomes DNA Respiration Photosynthesis Osmosis Diffusion Passive Transport Active Transport Endocytosis Exocytosis Asexual reproduction Binary fission	<ul style="list-style-type: none"> How do the chemical processes within cells allow them to reproduce? Divide cell processes into categories based on purpose. Describe each process used to take in nutrients or other materials. Diagram each process used for reproduction. By what chemical process does an animal cell produce energy? 	Unit E Chapter 2.3 & 3 Lab-Model Mitosis p 84 Lab manual –Diffusion p 183 Osmosis p 187 Support Documents p 6 w/Labs and activities p22-26 <i>Extraction of DNA lab</i> in Microbiology Support Documents www.classroom.com simulation of cell division visualization of active transport http://www.cellsalive.com/ meiosis and mitosis, photosynthesis
2 days	6.03 Compare life functions of protists: <ul style="list-style-type: none"> Euglena. Amoeba. Paramecium. Volvox. Benchmarks: <ul style="list-style-type: none"> The students will be able to identify protists by their characteristics. Students will understand the life functions of various 	Protists Euglena Amoeba Paramecium Volvox	<ul style="list-style-type: none"> Create a table showing comparisons and contrasts of the characteristics of protists. How do protists get food? What are the three ways protists reproduce? How can protists be grouped based on their shared traits? What diseases are caused by protists? 	Unit E Chapter 5.4 Lab- What lives in a Pond? P153 NC Handbook p. 24 Support Documents p.4-6 w/Labs and activities p20-21 http://www.microscopyu.com/moviegallery/pondscum/index.html Info on protists including ding diseases caused by them http://glencoe.mcgraw-hill.com/sites/0078617898/student_view0/brainpop_movies.html Protist

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	protists.			http://www.microscopy-uk.org.uk/index.html?http://www.microscopy-uk.org.uk/pondip/index.html Click on critter in jar with pond water and learn about it. http://www.fcps.edu/StratfordLandingES/Ecology/mpages/paramecium.htm good pictures
2 days Review, Project and Assessment				
COMPETENCY GOAL 7: The learner will conduct investigations, use models, simulations, and appropriate technologies and information systems to build an understanding of microbiology.				
Days 12	Objective	Vocabulary	Essential Questions and Tasks:	Resources
2 days	7.01 Compare and contrast microbes: <ul style="list-style-type: none"> Size, shape, structure. Whether they are living cells. Benchmarks: <ul style="list-style-type: none"> Students will be able to compare and contrast bacteria and viruses. 	Models Simulations Microbiology Microbes Living vs. nonliving Protists Host cell	<ul style="list-style-type: none"> What are the characteristics of bacteria and archaeobacteria? What is a microbe? What are the major physical and structural characteristics of different types of microbes? Compare/contrast the size, shape, and structure of microbes. Categorize microbes as living or non-living. How are viruses classified? 	Unit E Chapter 5.1 & 5.2 <i>NC Handbook</i> p. 22-23 <i>Support Documents</i> pages not listed <i>w/Labs</i> and activity <i>The Good , the Bad and the Ugly</i> and <i>Create Your Own Microbe</i> www.microbeworld.org/home.htm Various activities and good graphics http://www.nebo.edu/misc/learning_resources/ppt/6-12/microbiology.ppt Good powerpoint www.classzone.com Chapter 5
2 days	7.02 Describe diseases caused by microscopic biological hazards including: <ul style="list-style-type: none"> Viruses. Bacteria. Parasites. Contagions. Mutagens 	Germ Viruses Bacteria Parasites Hazard Contagions Mutagens Protozoa Fungi Algae	<ul style="list-style-type: none"> What are biological hazards? How do pathogens spread infectious disease? What are diseases caused by fungi? What are some diseases caused by microbes? How are various diseases treated? List precautions humans can take to protect themselves from infections and 	Unit E Chapter 5 2 Lab p 144-145 <i>Support Documents</i> pages not listed <i>w/Labs</i> and activities http://medmyst.rice.edu/ “Orientation” goes through pathogens, causes and how to deal with them. Takes time. http://glencoe.mcgraw-

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	Benchmarks: <ul style="list-style-type: none"> Students will describe the role of viruses, bacteria, parasites, contagions, and mutagens in the spread of disease 	Pathogens Disease	mutagens.	http://hill.com/sites/0078617898/student_view0/brainpop_movies.html# bacteria http://www.mos.org/cst/article/339/ Foot and Mouth disease. Also click on Birth of a Superbug and get a good description of bacteria.
2 days	7.03 Analyze data to determine trends or patterns to determine how an infectious disease may spread including: <ul style="list-style-type: none"> Carriers. Vectors. Conditions conducive to disease. Calculate reproductive potential of bacteria. Benchmarks: <ul style="list-style-type: none"> Students will outline the patterns involved in the spread of infectious disease. Students will be able to calculate the reproductive potential of bacteria. 	Center for Disease Control Infectious disease Non-infectious disease Carriers Vectors Quarantine Sanitation Microorganisms STDs	<ul style="list-style-type: none"> What physical conditions are most likely to influence disease transmission? What role do carriers and vectors play in the spread of disease? What is the reproductive potential of bacteria? Compare/contrast infectious and non-infectious diseases in humans and animals. What impact does globalization have on the spreading of diseases such as Ebola and Avian influenza (bird flu)? Given a hypothetical situation, determine how an infectious disease is passed on and what conditions influenced transmission. 	Unit E 5.2 Lab p 147 Extreme Science Tulipomania p 151 <i>Support Documents</i> pages not listed http://serendip.brynmawr.edu/sci_edu/waldron/infectious.html lesson plan on how diseases spread www.classzone.com bacteriophage replication visualization http://www.bam.gov/sub_diseases/diseases_wnv.html West Nile Disease mystery http://www.amnh.org/nationalcenter/infection/index.html <i>Mixed Up Microbe</i> Uses the scientific method to teach about the spread of salmonella www.schoolscience.co.uk/content/4/biology/abpi/immune/immune2.html Quick review of how certain disease get transferred http://science.education.nih.gov/supplements/nih1/diseases/default.htm Emerging and Reemerging Infectious Diseases 9th -12th grade but has good info http://www.biozone.co.nz/HEALTH_AND_DISEASE.html#Infectious_Diseases a lot of info including Insect Vectors of Human Pathogens
2 days	7.04 Evaluate the human attempt to reduce the risk of and treatments for microbial infections including:	Computer modeling Animal models Antiseptics Disinfectants	<ul style="list-style-type: none"> In what ways have humans participated in prevention and control of disease? Identify solutions with anti-microbial properties. 	Unit E Chapter 4.3 Lab p 122-123 <i>Understanding Technological Design</i>

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	<ul style="list-style-type: none">Solutions with anti-microbial properties.Antibiotic treatment.Research. Benchmarks: <ul style="list-style-type: none">Students will evaluate the development of vaccines and antibiotics.	Cell culture Clinical trials Antimicrobial chemicals Mutations DNA Industrial microbiology Pharmaceuticals Vaccines Pasteurization	<ul style="list-style-type: none">How can vaccines and antibodies be compared and contrasted?What role does technology have in reducing biological hazards?How has biotechnology changed the way people live and work?	workbook p23 NC Handbook p. 22-23 Support Documents for 7.03 w/ Labs and activities Check the websites offered there http://www.thirteen.org/edonline/lessons/1900house/b.html Then and Now : the History of Public Health (lesson) http://www.aboutgerms.com/about_agents.html History of antimicrobials and more http://www.cdc.gov/node.do/id/0900f3ec8000e2f3 Centers for Disease Control http://www.greenfacts.org/water-disinfectants/index.htm Makes a case against too many disinfectants . http://www.mos.org/cst-archive/article/1967/ Too many antibiotics
2 days	7.05 Investigate aspects of biotechnology including: <ul style="list-style-type: none">Specific genetic information available.Careers.Economic benefits to North Carolina.Ethical issues.Impact for agriculture. Benchmarks: <ul style="list-style-type: none">Students will recognize ethical issues related to biotechnology.	Biotechnology Genetics GMO's Bioinformatics	<ul style="list-style-type: none">What is biotechnology?How does having genetic information affect how humans deal with disease and other biological hazards?What are some ethical issues related to the use of biotechnology?How is NC involved in the development of biotechnology and what is its effect on the economy?What careers are available in the field of biotechnology?What changes have been made in agriculture as a result of biotechnology?	Unit E p121 NC Handbook p. 28-29 Support Documents pages not available however see activity <i>Bioengineered Rice</i> http://www.gmofoodforthought.com/2005/07/ New rice make \$ for NC http://science.education.nih.gov/LifeWorks.nsf/alpha.htm Careers http://www.childrensmuseum.org/biotech/teachers_unitofstudy.htm biotechnology timeline and Culminating Activity: Agricultural Biotechnology of Tomorrow http://www.harcourtschool.com/articles/video_updates/011/011_160_80.html Bioengineered Crops/

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				http://www.exploratorium.edu/genepool/ETHEX.html Scenarios for debate, discussion, or writing prompt for ethics in biotechnology http://www.peaceco.net/webquest/webquest.htm Should genetically engineered food be considered safe for consumers? Webquest activity http://ific.org/food/biotechnology/index.cfm Benefits of biotechnology and food
2 days Review, Project and Assessment				