

Curriculum Map

Science 7

Update

June 2008

COURSE: Science 7
GRADE LEVEL: 7

“I” =Introduce “E”= Emphasize “R”= Review

MAIN/GENERAL TOPIC	SUB-TOPIC:	ESSENTIAL QUESTIONS:	WHAT THE STUDENTS WILL KNOW:	WHAT THE STUDENT WILL BE ABLE TO DO:	ASSESSMENTS:	WHEN STUDENT DOES IT:
Science Process Skills (E)	General, Inquiry, and Living environment Science Process skills	What abilities and skills are necessary for a student to do science inquiry?	<ol style="list-style-type: none"> Steps of the scientific method Experimental Design Safety procedures for labs. Safe & accurate use of science equipment Appropriate metric units for measured or calculated values. 	<ol style="list-style-type: none"> Design and conduct a scientific investigation. Communicate scientific procedures and explanations. Use appropriate tools and techniques to gather, analyze, and interpret data. (Performance assessments) Identify questions that can be answered through scientific investigations Use mathematics in all aspects of science inquiry. 	<ol style="list-style-type: none"> Performance activities using: Metric ruler, triple beam balance, thermometer, graduated cylinder, compound light microscope, preparing slide. Guide Reading Chapter 1. Bacteria and Plants text Tests Skills Handbook Lab Metric Conversions Lab Unit Tests Skills Rubric 	September
Kingdoms of Living Things (I, E)	Technology use in Science Organization of Living things, Cells, Prokaryotes, Eukaryotes, Protista, Plants	How are living things both similar to and different from each other and from non-living things?	<ol style="list-style-type: none"> Living things are classified by shared characteristics on a cellular and organism level. In classifying organisms, biologists consider details of internal and external structures. Classification systems are arranged from kingdom to species. Cells carry on many functions needed to sustain life. Some organisms are unicellular; others are multicellular. Living systems at all levels of organization demonstrate the complementary nature of 	<ol style="list-style-type: none"> Classify living things according to an established scheme. Identify structure and function relationships in organisms. Use and develop a Dichotomous Key Use a Taxonomic Key to identify organisms. Recognize scientific names as a part of binomial nomenclature. Compare and contrast the parts of plants and one-celled organisms. 	<ol style="list-style-type: none"> Leaf Project Cell Chapter worksheets Short Story Discussion/ Journal- "Contagion" Lab and Web quest – Diseases Unit Tests Text Critiques Rubric Thinkfinity Activities <ol style="list-style-type: none"> The Cell as a System Microbes 2: Louis Pasteur - 	October

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			structure and function.		A Microbe Discoverer	
Kingdoms of Living Things (E,R)	Prokaryotes, Eukaryotes, Protista, Plants, Fungi,	How is the continuity of life sustained through reproduction and development?	<ol style="list-style-type: none"> 1. Regulation and behavior- all organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment. 2. Living things are composed of cells. Cells provide structure and carry on major functions to sustain life. Cells are usually microscopic in size. 3. Disease is a breakdown in structures or functions of an organism. Some diseases are the result of intrinsic failures in the system. Others are the result of damage by infections by other organisms. 4. Reproduction is a characteristic of all living systems; some organism reproduce asexually. Other organisms reproduce sexually. 	<ol style="list-style-type: none"> 1. Observe and describe cell division at the microscopic level and its macroscopic effects. 2. Compare and contrast the parts of plant and animal cells. 3. Compare and contrast the kingdoms of unicellular organisms. 4. Describe how disease may be caused by unicellular organisms; describe transmission mode, signs and symptoms of a particular disease. 5. Explain how reproduction of a particular organism influences disease and prevention. 	<ol style="list-style-type: none"> 1. Lab and Web quest – Virus, Bacteria, Diseases 2. WISE Project-How Do You Think Someone Can Get a Disease? 3. Lab – Microscope use 4. Lab Organelles 5. Unit tests. 6. Guided reading 7. Graphic organizers evaluations 8. Rubric 9. Thinkfinity- Mitosis 	November-December
Kingdoms of Living Things (I)	Protista, Plants, Fungi	How are living things both similar to and different from each other and from non-living things?	<ol style="list-style-type: none"> 1. Many plants have roots, stems, leaves, and reproductive structures. These organized groups of tissues are responsible for a plant's activities. 2. Living things are classified by shared characteristics on a cellular and organism level. In 	<ol style="list-style-type: none"> 1. Observe, sketch, and label plant parts, protista, and fungal examples. 2. Differentiate between unicellular and multicellular organisms. 3. Differentiate between cells, tissues, and organs. 	<ol style="list-style-type: none"> 1. Labs- Protozoans, Mushroom. 2. 3-D Model of a plant or animal cell. 3. Create a travel brochure depicting a cell as a tourist stop. 4. Sketch observations 	December

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			classifying organisms, biologists consider details of internal and external structures.		of plant lab. 5. Quizzes. 6. Chapter Tests 7. Rubric 8. Journaling	
	Plants	How is the variety of living specimens able to carry out basic life functions and dynamic equilibrium?	<ol style="list-style-type: none"> 1. All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing environment. 2. Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required for survival. 	<ol style="list-style-type: none"> 1. Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium. 2. Describe the process of photosynthesis in terms of raw materials needed and products generated. 3. Compare photosynthesis and respiration. 4. Identify how organisms obtain needed materials. 	<ol style="list-style-type: none"> 1. Lab- Osmosis and diffusion. Plant observations- life cycle, reproduction. 2. Chapter tests. 3. Quizzes 4. Embedded Assessment 5. Jigsawing 	January
	Plants, Animals	How are the variety of living specimens able to carry out basic life functions and dynamic equilibrium?	<ol style="list-style-type: none"> 1. Organisms respond to internal or environmental stimuli. 2. The survival of an organism depends on its ability to sense and respond to its external environment. 3. An organism's overall body plan and its environment determine the way the organism carries out the processes of respiration and circulation. 	<ol style="list-style-type: none"> 1. Distinguish between needs of the different kingdoms of living things. 2. Identify the range of conditions that meet the needs of organisms. 3. Draw hypothesis about the effect that changes in available materials have on the life processes in plants. 4. Design an experiment from a testable question related to plant life needs. 5. Analyze and critique the experimental design of the basic investigations related to plant needs. 6. Identify the characteristics of the phylums of invertebrates. 	<ol style="list-style-type: none"> 1. Labs- Plant (continued), Mitosis, Invertebrates (Poriferans, Cnidarians, Worms Mollusks, Grasshoppers, Echinoderms) Symmetry. 2. Chapter Quizzes and Tests. 3. Graphic organizer evaluation 4. Animal Webquest 5. Thinkfinity- Coral Bleaching: Making Our Oceans Whiter 	January - February
Environmental Science (I)	Animals, Ecology	How do individual organisms and species change over time? How are living things dependent on each	<ol style="list-style-type: none"> 1. Millions of species of animals, plants, and microorganisms are alive today. 2. Although different species might look dissimilar, the unity among 	<ol style="list-style-type: none"> 1. Describe how changes in the environment can bring about changes in species through mutations, natural selection, adaptation, and extinction. 	<ol style="list-style-type: none"> 1. Labs- Vertebrates (Fishes, Frogs, Reptiles) 2. Bird Project 3. Chapter Quizzes and 	March-April

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		other and their physical environment?	<p>organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes, and the evidence of common ancestry.</p> <p>3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations.</p> <p>4. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations.</p> <p>5. Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment.</p> <p>6. Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.</p> <p>7. Fossils indicate that many organisms that lived long ago are extinct.</p> <p>8. Extinction of species is common; most of the species that have lived on the earth no longer exist.</p>	<p>2. Explain the evidence for evolution from a variety of sources of scientific data.</p> <p>3. Observe and identify common organisms in ecosystems.</p> <p>4. Identify and classify biotic and abiotic factors in an ecosystem.</p> <p>5. Use a drawing or model to explain the carbon, water, and nitrogen cycle.</p> <p>6. Identify the populations of producers, consumers, and decomposers, and the role they play in their communities.</p> <p>7. Recognize photosynthesis as the foundation of virtually all food webs.</p> <p>8. Apply the concepts of food webs and energy pyramids to analyze how energy flows through an ecosystem.</p> <p>9. Generate predictions based on graphically represented data of predator- prey and competition and cooperation between populations.</p>	<p>Tests.</p> <p>4. Complete a given energy pyramid, depict the flow of energy through a food web/ chain.</p> <p>5. Preassessment</p> <p>6. Journaling</p> <p>7. Rubric</p> <p>8. Thinkfinity-Sound the Alarm: Can Frogs Really Tell Us What's Wrong?</p>	
	Ecology	Which human decisions and activities have had a profound impact on the physical and living environment?	<p>1. The environment may contain dangerous levels of substances that are harmful to organisms. Therefore, the good health of environments and individuals require monitoring of soil, air, and water and taking steps to</p>	<p>1. Differentiate between ecosystems and biomes.</p> <p>2. Predict the effect of catastrophic disturbances on ecosystems, communities, populations, or organisms.</p> <p>3. Describe the relationship</p>	<p>1. Labs- Eutrophication, Recycling.</p> <p>2. Local ecosystem project.</p> <p>3. Chapter Quizzes and tests.</p> <p>4. Rubric</p>	April

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			keep them safe 2. Overpopulation by any species degrades the environment due to increased use of resources. Human activities can bring environmental degradation through resource acquisition, urban growth, land- use decisions, and waste disposal. 3. The survival of living things on our planet depends on the conservation and protection of Earth's resources.	between human food harvest and the ecosystem. 4. Describe ways that human activity has altered habitats both positively and negatively. 5. Observe the effect of human interaction in a local ecosystem.	5. Journaling 6. Thinkfinity- Preservation Issues: Competing Interests	
Human Biology (I,E,R)	Systems	What are the major human organ systems, their functions, and interactions?	The human organism has systems for digestion, respiration, reproduction, excretion, control and coordination, movement, and for protection from diseases. These systems interact with one another.	1. Identify the organs that comprise the systems and their functions. 2. Describe the interactions of the systems in the maintenance of homeostasis.	1. Labs- Circulation, Digestion, Muscles 2. Chapter Tests and quizzes. 3. Pre-assessment 4. Rubric 5. Thinkfinity- Coping with Changes	April- May
	Genetics	What are the variety of ways that organisms inherit genetic information that result in continuity of structure and function between parents and offspring?	1. Heredity information is contained in genes composed of materials known as DNA and located in the chromosomes in the cell. 2. Each gene carries a single unit of information. A single inherited trait of an individual can be determined by one pair or many pairs of genes. A human cell contains many thousands of different genes. 3. Mendelian genetics describes the basis of how traits are passed on from generation in all organisms. 4. Some traits are dominant, others recessive. Some traits are inherited by mechanisms other, such as blending. 5. The probability of traits can be determined using models of	1. Recognize the DNA model as a double helix shape. 2. Explain that DNA contains coded instructions that are passed on from one generation to the next. 3. Explain the function of genes and chromosomes. 4. Show variation within a single genetic trait. 5. Recognize factors that can affect the expression of traits. 6. Differentiate between inherited traits and traits that are not inherited. 7. Distinguish between dominant and inherited traits.	1. Complete Punnett square and pedigree chart. 2. Research current topic in genetics. Present research in poster, brochure, etc. 3. Probability activity. 4. Mitosis/ meiosis activity 5. Chapter quizzes and tests. 6. Text critiques 7. Journaling 8. Rubric 9. Thinkfinity- a. Gene Puzzles b. DNA and Endangered Species	May- June

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			genetic inheritance, such as pedigree charts and Punnett squares.	8. Distinguish between genotype and phenotype. 9. Complete Punnett Squares to predict the possible combinations of inherited factors resulting from single traits crosses. 10. Identify aspects of genetic engineering and the Human Genome Project. 11. Differentiate between mitosis and meiosis. 12. Describe the contributions of Rosalind Franklin, Francis Crick, and Maurice Watson.		