

# DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard A: Research and Inquiry</b>										
A.1	Recognize we express our love for God through our care of plants, animals, and the environment and all of creation is God’s gift to us	I	D	D	D	M	R	R	R	R
A.2	Explore, describe, and make observations about the natural environment as explored through the senses	I	D	D	D	M	R	R	R	R
A.3	Pose questions regarding a variety of organisms and everyday events that can be answered through observations	I	D	D	D	D	D	D	D	D
A.4	Formulate stable questions and explanations			I	D	D	D	D	D	M
A.5	Recognize different kinds of questions suggest different kinds of scientific investigations (collecting specimens; experiments; making models; natural observations)				I	D	D	D	D	M
A.6	Plan and conduct a simple investigation to answer a question	I	D	D	D	D	M			
A.7	Design and conduct a valid experiment					I	D	D	D	M
A.8	Describe how independent/dependent variables, control of constants, and multiple trials contribute to the design of a valid experiment						I	D	D	M
A.9	Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of the experiment						I	D	D	M
A.10	Recognize investigations involve systematic observations, carefully collected evidence, logical reasoning, and imagination in developing hypotheses and explanations rather than a fixed “scientific method”						I	D	D	M
A.11	Make observations using simple tools (magnifiers, hand lenses, magnets, equal arm balances, thermometers)	I	D	D	M	R				

I – Introduce  
D- Develop

M-Master  
R-Reinforce

1 [ ] Grade Level

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard A: Research and Inquiry</b>										
A.12	Make observations using more complex tools (metric rulers, balances, graduated cylinders, spring scales)				I	D	D	M	R	R
A.13	Use a variety of tools to gather data (microscopes, magnets, metric rulers, graduated cylinders, spring scales, stopwatches)						I	D	D	M
A.14	Measure length and mass using non-standard units [k] and standard units [1-2]	I	D	M						
A.15	Measure length to the nearest centimeter; mass using grams; temperature using degrees Celsius; volume using liters [3]; volume to the nearest milliliter; force to the nearest newton [4-5]; time to the nearest second [6-8]				I	D	D	D	D	M
A.16	Compare amounts/measurements	I	D	D	D	D	D	D	D	M
A.17	Judge whether measurements and computations of quantities are reasonable		I	D	D	D	M	R	R	R
A.18	Calculate the range and mean of a set of data							I	D	D
A.19	Use observations as support for reasonable conclusions	I	D	M	R					
A.20	Interpret simple graphs of data	I	D	D	M					
A.21	Interpret advanced graphs of data					I	D	D	D	M
A.22	Use quantitative and qualitative data as support for reasonable conclusions				I	D	D	D	D	D
A.23	Compare conclusions with prior knowledge	I	D	D	D	D	D	D	D	D
A.24	Analyze whether evidence supports proposed conclusions				I	D	D	D	D	D
A.25	Analyze whether evidence (data) and scientific principles support proposed conclusions						I	D	D	D
A.26	Determine the possible effect of errors in observations, measurements and calculations on the formulation of conclusions						I	D	D	D

I – Introduce  
D- Develop

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# DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard A: Research and Inquiry</b>										
A.27	Communicate observations using words, pictures, and numbers	I	D	M						
A.28	Communicate simple procedures and results of investigations through oral presentations; models; drawings; data tables; and writings				I	D	D	D	D	M
A.29	Understand the process of testing, revising, and occasional discarding of scientific knowledge never ends							I	D	D
A.30	Describe how some matters cannot be examined in a scientific manner (matters of faith) or should not be examined (ethical reasons)								I	D
A.31	Understand scientific knowledge is shared through a strong commitment to the process of peer review and publication in order to keep scientists within the bounds of ethical behavior								I	D
<b>Standard B: Life Science</b>										
B.1	Identify the needs of most animals (air, water, food, shelter)	I	D	D	M					
B.2	Identify the needs of most plants (air, water, light, nutrients, temperature)		I	D	M	R				
B.3	Recognize when plants/animals are portrayed with unrealistic characteristics in stories	I	D	M						
B.4	Predict and investigate the growth of plants when growing conditions are altered	I	D	D	M					
B.5	Identify and sequence life cycles (birth, growth, reproduction, and death) of animals		I	D	D	M				
B.6	Record observations on the life cycles of different animals		I	D	D	M				
B.7	Describe processes necessary to the survival of organisms (energy use, reproduction, response to stimuli, exchange of gases, waste elimination)							I	D	D

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[ ] Grade Level

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard B: Life Science</b>										
B.8	Describe how plants use sun energy to produce food and oxygen through photosynthesis							I	D	D
B.9	Describe photosynthesis as a chemical change with reactants and products that takes place in the presence of light and chlorophyll								I	D
B.10	Describe how oxygen is needed by all cells of most organisms for the release of energy from nutrient molecules							I	D	D
B.11	Describe the importance of the transport and exchange of oxygen and carbon dioxide to the survival of the organism							I	D	D
B.12	Recognize all organisms are composed of cells, the fundamental units of life, which carry on all life processes							I	D	D
B.13	Observe and compare the structures/behaviors of a variety of different plants and animals	I	D	D	M					
B.14	Identify and compare the physical features of plants (stem, leaves, flowers, seeds, roots)		I	D	D	M				
B.15	Identify and compare the physical structures of a variety of animals (sensory organs, beaks, appendages, body covering)		I	D	D	M				
B.16	Identify the relationship between the physical structures of plants and the function of those structures (absorption of water, absorption of light energy, support, reproduction)		I	D	D	M				
B.17	Identify the relationship between the physical structure of animals and the function of those structures (food and water consumption, movement, reproduction)		I	D	D	M				
B.18	Distinguish between plants and animals based on observable structures and behaviors		I	D	D	M				

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard B: Life Science</b>										
B.19	Explain how similarities are the basis for classification of plants and animals						I	D	D	D
B.20	Distinguish between plants (which use sunlight to make their own food) and animals (which must consume energy-rich food)						I	D	M	R
B.21	Classify animals as vertebrates or invertebrates						I	D	M	R
B.22	Classify vertebrate animals into classes based on their characteristics						I	D	M	R
B.23	Identify plants or animals using single dichotomous keys						I	D	M	R
B.24	Explain most organisms on Earth are unicellular while other organisms are multicellular							I, D	M	R
B.25	Identify examples of unicellular and multicellular organisms							I, D	M	R
B.26	Compare the following plant and animal cell structures: cell membrane, nucleus, cell wall, chloroplast, and cytoplasm							I, D	M	R
B.27	Define chloroplast as the cell structure where food is produced in plants and some unicellular organisms							I, D	M	R
B.28	Describe how the cell membrane helps regulate the transfer of materials in and out of the cell							I	D	M
B.29	Identify the function of the chloroplast during photosynthesis								I	D
B.30	Illustrate the path of water and nutrients as they move through the transport system of a plant				I	D	M	R	R	R
B.31	Compare the major organ systems that perform similar functions for animals belonging to different vertebrate classes							I	D	D

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard B: Life Science</b>										
B.32	Identify and give examples of each level of organization (cell, tissue, organ, organ system) in multicellular organisms							I	D	D
B.33	Explain the interaction between the circulatory and digestive systems as nutrients are processed, passed into the blood stream, and transported in and out of the cell							I	D	D
B.34	Compare the processes of mechanical and chemical digestion, and their role in providing materials necessary for survival of the organism							I	D	D
B.35	Identify the importance of the transport and exchange of nutrients and waste molecules to the survival of the cell and organism							I	D	D
B.36	Explain the interactions between the circulatory and respiratory systems in exchanging oxygen and carbon dioxide between cells and the atmosphere							I	D	D
B.37	Explain the interactions between the nervous and muscular systems when an organism responds to a stimulus							I	D	D
B.38	Predict the response the body may take to maintain internal balance during an environmental change (shivering when cold, adrenaline rush when frightened)							I	D	D
B.39	Explain the cause and effect of diseases (cancer, diabetes, hypertension) on the human body							I, D	M	R
B.40	Relate some common diseases (colds, chicken pox, strep throat) to the organisms that cause them (bacteria, viruses, fungi)							I, D	M	R
B.41	Differentiate between infectious and noninfectious diseases							I, D	M	R

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard B: Life Science</b>										
B.42	Explain the role of antibiotics and vaccines in the treatment and prevention of diseases							I, D	M	R
B.43	Identify and relate the similarities/differences among animal parents and their offspring	I	D	M						
B.44	Identify and relate the similarities/differences between plants and their offspring			I	D	M				
B.45	Identify examples of asexual reproduction							I	D	D
B.46	Compare the processes of asexual and sexual reproduction, including the type and number of cells involved and the number of gene sets passed from parents to offspring							I	D	D
B.47	Compare the reproductive mechanisms of classes of vertebrates (internal vs. external fertilization)							I	D	D
B.48	Describe how flowering plants reproduce asexually							I	D	D
B.49	Identify chromosomes as cellular structures that occur in pairs that carry hereditary information in units called genes							I	D	D
B.50	Recognize and describe how when asexual reproduction occurs, the same genetic information found in the parent cell is copied and passed on to each new daughter cell							I	D	D
B.51	Recognize and describe how when sexual reproduction occurs, genetic information found in both parent cells is passed on and combined to form the genetic code for the new organism							I	D	D
B.52	Recognize and describe when asexual reproduction occurs, the daughter cell is identical to the parent cell							I	D	D

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard B: Life Science</b>										
B.53	Recognize and describe when sexual reproduction occurs, the offspring is not identical to either parent due to the combination of the genetic codes found in each cell							I	D	D
B.54	Describe how the seasons affect the behavior of plants and animals	I	D	D	M					
B.55	Describe how the seasons affect the everyday life of humans (clothing, activities, shelter)	I	D	D	M					
B.56	Identify ways people depend on plants and animals for food, clothing, shelter		I	D	M					
B.57	Identify the ways a specific organism may interact with other organisms or the environment (pollination, shelter, seed dispersal, camouflage, migration, hibernation)					I	D	D	M	R
B.58	Describe how different environments support the life of different plants and animals					I	D	D	M	R
B.59	Identify biotic factors and abiotic factors that make up the ecosystem							I	D	D
B.60	Identify populations within a community in competition with one another for resources							I	D	D
B.61	Identify the factors that affect the number and types of organisms an ecosystem can support (predators, quantity of light and water)					I	D	D	D	D
B.62	Predict the possible effects of changes in the number and types of organisms in an ecosystem on the populations of other organisms within that ecosystem					I	D	D	D	D
B.63	Describe beneficial and harmful activities of humans and explain how these activities affect organisms within an ecosystem.					I	D	D	D	D

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# DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS	K	1	2	3	4	5	6	7	8	
<b>Standard B: Life Science</b>										
B.64	Predict the impact of a natural environmental change (forest fire, flood, earthquake) on the organisms in an ecosystem							I	D	D
B.65	Explain the beneficial or detrimental impact that some organisms (viruses, bacteria, fungi) may have on other organisms (diseases, antibiotics, fermentation)									I
B.66	Classify populations of organisms as producers or consumers by the role they serve in the ecosystem				I	D	D	M		
B.67	Differentiate between the types of consumers (herbivores, carnivores, omnivores, detritivores)					I	D	M		
B.68	Sequence the flow of energy through a food chain beginning with the Sun				I	D	M	R		
B.69	Predict the possible effects of removing an organism from the food chain				I	D	M	R		
B.70	Categorize organisms as predator or prey in a given ecosystem					I	D	M		
B.71	Diagram the transfer of energy in an aquatic food web and a land food web with references to producers, consumers, decomposers, scavengers, and predator/prey relationships							I	D	D
B.72	Classify unicellular and multicellular organisms as producers, consumers, and decomposers by the role they serve in the ecosystem							I	D	D
B.73	Illustrate the oxygen/carbon dioxide cycles (including photosynthesis and cell respiration)								I	D
B.74	Describe the processes involved in the recycling of matter in the oxygen/carbon dioxide cycles								I	D
B.75	Compare and contrast common fossils found in Missouri to organisms present on Earth today						I, D	M		

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard B: Life Science</b>										
B.76	Identify fossils as evidence some types of extinct organisms have similarities and differences with organisms living today							I	D	D
B.77	Identify specialized structures and describe how they help plants survive in their environment (needles, thorns, waxy leaves)				I	D	M	R		
B.78	Identify specialized structures and senses and describe how they help animals survive in their environments (fur, beaks, whiskers, appendages)				I	D	M	R		
B.79	Identify internal cues (hunger) and external cues (temperature) that cause organisms to behave in certain ways (hunting, migration, hibernation)				I	D	M			
B.80	Predict which plant or animal will be able to survive in a specific environment based on its special structures or behaviors					I	D	M		
B.81	Relate examples of adaptations within a species to its ability to survive in a specific environment (hollow bones/flight; hollow hair/insulation; seeds/food)						I	D	M	
B.82	Predict how certain adaptations, such as body structure, behavior, or coloration may offer a survival advantage to an organism							I	D	M
<b>Standard C: Physical Science</b>										
C.1	Describe an object’s position relative to another object (above, below, in front of, behind)	I	D	M						
C.2	Describe an object’s motion as straight, circular, vibrating, zigzag, stopping, starting, and falling		I	D	M					
C.3	Understand motion by noting changes in the position of objects		I	D	M					
C.4	Identify ways (push, pull) to cause some objects to move by touching them	I	D	M						

I – Introduce  
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## DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.5	Identify how magnets cause some objects to move without touching them	I	D	M						
C.6	Compare how magnets attract and repel a variety of objects		I	D, M						
C.7	Predict the effects of static electricity on the motion of objects (attract or repel)					I	D	D	M	
C.8	Describe Earth's gravity as a force that pulls objects on or near the Earth toward the Earth without touching the object			I	D, M	R	R			
C.9	Identify the force (push, pull) required to do work (move an object)		I	D	M					
C.10	Compare the speeds (faster, slower) of two moving objects		I	D	M					
C.11	Describe ways to change the motion of an object (slower, faster, farther, change directions, stop)		I	D	D	M				
C.12	Describe the direction and amount of force (direction of push/pull, strong/weak) needed to change an object's motion		I	D	M					
C.13	Classify different kinds of motion (straight line, projectile, curved, vibrating)					I	D	D	M	
C.14	Describe that a change in motion is the result of an unbalanced force acting upon an object			I	D	M				
C.15	Explain why balanced forces do not affect an object's motion					I	D	D	M	
C.16	Describe how unbalanced forces acting on an object changes its speed and/or direction of motion					I	D	D	M	
C.17	Explain when forces (including gravity, friction, magnetic, push or pull) are balanced, objects are at rest or their motion remains constant								I	D

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R-Reinforce

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## DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.18	Compare the effects of balanced and unbalanced forces (including magnetic, gravity, friction, push or pull) on an object's motion								I	D
C.19	Describe and compare forces (measured by a spring scale in newtons) applied to objects in a single line					I	D	D	M	
C.20	Measure (non standard units) and compare the force (push or pull) required to overcome friction and move an object over different surfaces		I	D	M					
C.21	Describe how friction affects the amount of force needed to move objects over different surfaces or through different media					I	D	D	M	
C.22	Compare the forces (measured by a spring scale in newtons) required to overcome friction and move an object over different surfaces					I	D	D	M	
C.23	Identify the types of forces acting on an object in motion, at rest, floating/sinking (type of force, direction, amount of force in newtons)						I	D	D	M
C.24	Identify the forces acting on a load and use a spring scale to measure the weight (resistance force) of the load						I	D	D	M
C.25	Determine the gravitational pull of the Earth on an object (weight) using a spring scale						I	D	D	M
C.26	Explain that every object exerts a gravitational force of attraction on every other object								I	D
C.27	Recognize an object's weight is a measure of the gravitational force of a planet/moon acting on that object								I	D
C.28	Describe the circular motion of a moving object as the result of a force acting toward the center								I, D	M

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## DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.29	Compare the amount of gravitational force acting between objects, which is dependent upon their masses and the distance between them								I	D
C.30	Describe an object's motion in terms of distance and time					I	D	D	M	R
C.31	Compare the distances traveled by heavier/lighter objects after applying the same amount of force (push/pull) in the same direction			I	D	M				
C.32	Describe and compare the distances traveled by objects with the same mass after applying different amounts of force in the same direction			I	D	M				
C.33	Predict how the change in speed of an object is affected by the amount of force applied to an object and the mass of the object					I	D	D	M	
C.34	Given an object in motion, calculate its speed (distance/time)								I, D	M
C.35	Explain the difference between velocity and acceleration								I, D	M
C.36	Interpret a line graph representing an object's motion in terms of speed using metric units								I, D	M
C.37	Explain how the acceleration of a moving object is affected by the amount of net force applied and the mass of the object								I, D	M
C.38	Compare and describe the amount of force (more, less, or same push/pull) needed to raise an object to a given height, with or without using inclined planes (ramps) of different slopes			I, D	M	R				
C.39	Compare and describe the amount of force needed to raise an object to a given height, with or without using levers			I, D	M	R				

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## DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.40	Apply the use of an inclined plane (ramp) and/or lever to different real life situations in which objects are raised			I, D	M	R				
C.41	Explain how work can be done on an object (force applied and distance moved)					I, D	D	M	R	
C.42	Identify the simple machines in common tools and household items					I, D	D	M	R	
C.43	Compare the measure of effort force (measured using a spring scale) needed to lift a load without the use of simple machines					I, D	D	M	R	
C.44	Describe how simple machines change the amount of effort force and/or direction of force					I, D	D	M	R	
C.45	Recognize examples of work being done on an object (force applied and distance moved in the direction of the applied force) with and without the use of simple machines								I, D	M
C.46	Calculate the amount of work done when a force is applied to an object over a distance ( $W=F \times d$ )								I, D	M
C.47	Explain how simple machines affect the amount of effort force, distance through which a force is applied, and direction of force while doing work								I, D	M
C.48	Evaluate simple machine designs to determine which design requires the least amount of effort force and explain why								I, D	M
C.49	Determine the physical properties of objects (size, shape, color, mass) by using the senses, simple tools, and nonstandard measures (bigger/smaller, more/less)	I	D	M	R					
C.50	Sort objects based on observable physical properties (size, material, color, shape, mass)	I	D	M						

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.51	Identify materials (cloth, paper, wood, rock, metal) that make up an object and some of the physical properties (color, texture, sound, odor, taste, flexibility) of the materials	I	D	M	R					
C.52	Classify objects as a single material or a mixture		I	D	M					
C.53	Measure the mass of objects (more/less) and order according to mass		I	D	M					
C.54	Use an equal arm balance and a variety of objects to illustrate arrangements in which the beam is balanced		I	D	M					
C.55	Describe and compare the masses of various objects to the nearest gram using balances				I	D	M	R		
C.56	Describe and compare the volume of objects using a graduated cylinder					I	D	M		
C.57	Identify situations where no two objects can occupy the same space at the same time (water level rises when an object is placed in water)					I, D	M			
C.58	Classify types of materials (water, salt, sugar, iron filings) into “like” substances or mixtures by using their characteristic properties					I, D	M			
C.59	Classify the types of matter in an object into pure substances or mixtures using their physical properties						I	D	M	R
C.60	Describe and compare the volume of objects or substances using a graduated cylinder (direct) or using displacement methods (indirect)							I, D	D	M
C.61	Identify elements and compounds as pure substances that have characteristic properties								I	D
C.62	Describe the physical and chemical properties of pure substances using senses, tools, and measurements								I	D

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## DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.63	Observe and compare how mixtures are made by combining solids			I	D	M				
C.64	Identify water as a solvent that dissolves materials				I	D	M			
C.65	Observe and describe how mixtures are made by combining solids and liquids				I	D	M	R		
C.66	Distinguish between the components in a mixture/solution (trail mix, salad, soil, salt water)				I	D	M	R		
C.67	Describe the properties of each component in a mixture/solution and their distinguishing properties					I	D	M	R	
C.68	Describe ways to separate the components of a mixture by their physical properties (sorting, magnets, screening) [3-5]; (evaporation, filtration, boiling, chromatography) [5-8]				I	D	D	D	D	M
C.69	Recognize over 100 known elements exist which may be combined in nature or by man to produce compounds that make up the living and nonliving substances in the environment								I	D
C.70	Predict how various solids behave (dissolve, settle, float) when mixed with water				I	D	D	M		
C.71	Describe evidence (diffusion of food coloring in water, oil spreading on the surface of water) that supports the theory matter is composed of small particles in constant, random motion							I	D	M
C.72	Identify the three states of matter (solid, liquid, or gas) and compare the observable physical properties of each				I	D	D	D	M	
C.73	Identify everyday substances as solid, liquid, or gas				I	D	D	D	M	

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.74	Classify matter as a solid, a liquid, or a gas as it exists at room temperature, using physical properties						I	D	D	M
C.75	Observe and identify that water evaporates			I	D	M				
C.76	Measure and compare the temperature of water when it exists as a solid to its temperature as a liquid				I	D, M				
C.77	Investigate and observe that water can change from a liquid to a solid and back again as the result of temperature changes				I	D, M				
C.78	Describe the physical changes in the properties of water (shape, volume) when frozen or melted				I	D, M				
C.79	Predict and investigate the effect of heat on objects and materials				I	D	M			
C.80	Predict the effect of heat on the physical properties of water as it changes to and from a solid, liquid, or gas					I	D	M		
C.81	Describe the relationship between volume changes and temperature changes as it relates to the properties of water							I	D	D
C.82	Describe the relationship between temperature and the movement of atmospheric gases							I	D	D
C.83	Use the kinetic theory model to illustrate and account for the physical properties of a solid, liquid, or gas in terms of the arrangement and motion of molecules in a substance								I	D
C.84	Use the kinetic theory model to explain changes in the volume, shape, and viscosity of materials in response to temperature changes during a phase change									I

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.85	Predict the effect of energy transfer on the physical properties of a substance as it changes to or from a solid, liquid, or gas									I
C.86	Observe the total mass of a material remains constant whether in parts or in a different state					I	D	M	R	R
C.87	Observe the mass of water remains constant as it changes state (evidenced in a closed container)						I	D	M	
C.88	Explain that the amount of matter stays constant while being recycled through the water cycle							I	D	M
C.89	Explain the amount of matter remains constant while being recycled through food chains/webs							I	D	M
C.90	Identify and classify changes in matter as chemical and/or physical						I	D	D	D
C.91	Use models to demonstrate that matter is made up of atoms in different arrangements, states of motion, and combinations							I	D	D
C.92	Demonstrate and provide evidence that mass is conserved during a physical change							I	D	M
C.93	Provide evidence mass is conserved during a chemical change in a closed system (vinegar and baking soda; mold growing in a closed container; steel wool rusting)							I	D	M
C.94	Identify chemical changes (rusting, burning, decomposition, baking) in common objects as a result of interactions with sources of energy or other matter that form new substance with different characteristic properties						I	D	D	D
C.95	Identify physical changes in common objects and describe the processes which caused the change (weathering, erosion, dissolving)						I	D	D	D

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.96	Identify the sounds and their source of vibrations in everyday life and recognize the ear as the receiver of the vibrations	I	D, M							
C.97	Compare different sounds (loudness, pitch, rhythm)	I	D	M						
C.98	Describe how the ear receives the sound by ear drum vibrations		I	D	M					
C.99	Identify air, water, and solids as mediums that sound can travel through			I	D	M				
C.100	Describe how sound energy is transferred by wave-like disturbances from the source through a medium			I	D	M				
C.101	Describe ways to change the pitch of a sound (size, length, thickness, tension of the source) and the loudness of a sound (increasing or decreasing the force causing the vibrations)			I	D	M	R			
C.102	Describe how changes in energy cause changes in the loudness and pitch of a sound				I	D	M	R		
C.103	Predict how the properties of the medium (air, water, rock, empty space) affect the speed of different types of mechanical waves (earthquake, sound)				I	D	M			
C.104	Identify sources of visible light (flame, flint, lightning, stars)		I	D	M					
C.105	Observe light being transferred from the source to the receiver (eye) through space		I	D	M					
C.106	Observe and explain how objects (moon, mirror, furniture) can only be seen when light is reflected/emitted from that object to the receiver			I	D	M	R			
C.107	Identify the three things (light source, object, and a surface) necessary to produce a shadow				I	D	M			

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## DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.108	Observe and explain light being transferred from the source to the eye through space in straight lines					I	D	M		
C.109	Describe evidence that visible light travels in a straight line, using tools such as pinhole viewers, ray boxes, laser pointers					I	D	M	R	
C.110	Compare the reflection of visible light by various surfaces (mirror, moon, dull surfaces)					I	D	M	R	
C.111	Compare the refraction of visible light passing through transparent and translucent materials							I	D	M
C.112	Predict how different surfaces and lenses (concave, convex) affect the behavior of visible light rays and the resulting image							I	D	M
C.113	Identify the source of energy that causes an increase in the temperature of an object (sun, flame, light bulb)		I	D, M						
C.114	Compare the temperature of hot and cold objects using a simple thermometer		I	D, M						
C.115	Describe the change in temperature of an object as warmer or cooler		I	D, M						
C.116	Identify the sources of thermal energy (sun, fire, body) that can cause solids to change to liquids and liquids to change to gas				I	D	M			
C.117	Identify thermal energy as the random motion of molecules or atoms within a substance							I	D	M
C.118	Use the kinetic theory model to explain changes in the temperature of a material							I	D	M
C.119	Explain how thermal energy is transferred as heat for warmer objects to cooler objects until both reach the same temperature (equilibrium)							I	D	M

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## DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.120	Identify the materials that transfer energy by conduction, convection, and/or radiation and classify examples of each							I	D	M
C.121	Describe how heat is transferred by conduction, convection, and/or radiation and classify examples of each							I	D	M
C.122	Classify common materials (wood, foam, foil, soil) as conductors/insulators of thermal energy							I	D	M
C.123	Describe the interactions (repel, attract) of like and unlike charges (magnetic, static electricity, electrical)								I	D
C.124	Construct and diagram a complete electronic circuit using a source (battery), means of transfer (wires), and receiver (resistance bulbs, motors, fans)					I	D	D	M	
C.125	Observe and describe the evidence of energy transfer in a closed series circuit (lit bulb, moving motor, fan)					I	D	D	M	
C.126	Identify the evidence of energy transformations (temperature change, light, sound, motion, and magnetic effects) that occur in electrical circuits					I	D	D	M	R
C.127	Classify materials as conductors or insulators of electricity when placed within a circuit (wood, pencil lead, plastic, glass, air)					I	D	D	M	R
C.128	Identify the different energy transformations that occur between different systems (chemical energy in a battery converted to electricity in a circuit converted to light and heat from a bulb)								I	D
C.129	Identify that during an energy transformation, heat is often transferred from one object (system) to another because of a difference in temperature								I	D

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard C: Physical Science</b>										
C.130	Recognize and describe how energy is not lost but conserved as it is transferred and transformed								I	D
C.131	Describe the effects of resistance (number of receivers), amount of voltage (number of energy sources), and kind of transfer materials on the current being transferred through a circuit (brightness of light, speed of motor)								I	D
C.132	Diagram and distinguish between complete series and parallel circuits and identify advantages/disadvantages of each								I	D
C.133	Recognize and describe how chemical energy is stored in chemical compounds (energy stored and released from food molecules, batteries, nitrogen explosives, fireworks, organic fuels)									I
C.134	Identify the evidence of different energy transformations (explosion of light, heat, and sound, temperature change, electrical charge) that may occur as chemical energy is released during a chemical reaction									I
C.135	Identify sunlight as a basic need of most plants	I	D	M	R					
C.136	Identify the Sun as the primary source of light and food energy for organisms on the Earth			I	D	M				
C.137	Identify the Sun as the primary source of energy for temperature change on Earth						I, D	M		
C.138	Identify solar radiation as the primary source of energy for weather phenomena							I	D	M
C.139	Recognize and describe how energy from the Sun is transferred to Earth in a range of wavelengths and energy levels, including visible light, infrared radiation, and ultraviolet radiation							I	D	M

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# DIOCESE OF JEFFERSON CITY CURRICULUM GUIDE

SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.1	Compare sand, soil, and rock samples	I	D	D	M					
D.2	Observe and describe ways humans use Earth’s materials (soil, rocks, minerals) in daily life		I	D	M					
D.3	Observe and describe the physical properties (odor, color, appearance, size, texture, absorption of water) and different components (sand, clay, rocks, worms, plant roots) of soils			I	D	M				
D.4	Observe and describe the breakdown of plant and animal material into soil through decomposition (decay, composting, digestion)			I	D	D	M			
D.5	Observe and describe the physical properties of rocks (size, shape, color, presence of fossils)			I	D	D	M			
D.6	Compare the physical properties of assorted rocks to each other			I	D	D	M			
D.7	Describe the components of soil and other factors that influence soil texture, fertility, and resistance to erosion (plant roots and debris, bacteria, fungi, worms, rodents)				I	D	M			
D.8	Explain the types of fossils and the processes by which they are formed (replacement, mold and cast, preservation, trace)					I	D	D	M	
D.9	Use fossil evidence to make inferences about changes on Earth and in its environment (superposition of rock layers, similarities between fossils in different geographic locations, fossils of seashells)							I	D	M
D.10	Describe the properties used to classify minerals (texture, odor, luster, hardness, crystal shape, streak, reaction to magnets, and acids)						I	D	D	M
D.11	Describe the methods used to identify the distinguishing properties of minerals						I	D	D	M

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.12	Differentiate between minerals and rocks (which are composed of different kinds of minerals)						I	D	D	M
D.13	Classify rocks as sedimentary, igneous, or metamorphic								I	D
D.14	Develop an understanding of the Earth’s main components (atmosphere, hydrosphere, and lithosphere) and use this understanding to frame questions about the shape and location of continents and ocean basins							I	D	M
D.15	Observe and identify examples of slow changes in the Earth’s surface and surface materials (rock, soil layers) due to processes such as decay, freezing, thawing, breaking, or wearing away by running water or wind			I	D	M				
D.16	Relate the type of landform or body of water to the process by which it was formed					I	D	M		
D.17	Describe how weathering agents (water, wind, chemical, temperature, plants) cause changes that create and/or change Earth’s surface materials, landforms, and bodies of water					I	D	D	D	M
D.18	Describe how erosion processes (action of gravity, waves, wind, rivers, glaciers) cause changes that create and change Earth’s surface materials, landforms, and bodies of water					I	D	D	D	M
D.19	Explain how the formation of sedimentary rocks depends on weathering and erosion							I	D	M
D.20	Make inferences about the formation of sedimentary rocks from their physical properties (layering and the presence of sedimentary rocks depends on weathering and erosion)							I	D	M

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.21	Describe how the Earth’s surface and surface materials can change abruptly through the activity of floods, landslides, volcanoes							I	D	M
D.22	Identify events (earthquakes, volcanic eruptions) and the landforms created by them on the Earth’s surface that occur at different plate boundaries							I	D	M
D.23	Explain convection currents result from uneven heating inside the mantle causing the melting of rock materials, convection of magma, eruption of magma, and movement of crustal plates									I
D.24	Explain how rock layers are often affected by the folding, breaking, and uplifting of rock layers due to plate motion									I
D.25	Describe how movement of crustal plates can cause earthquakes and volcanic eruptions that result in mountain building and trench formation									I
D.26	Explain how heating and cooling in the mantle layer leads to the formation of metamorphic rocks and some igneous rocks									I
D.27	Make inferences about the formation of igneous and metamorphic rocks from their physical properties									I
D.28	Explain and diagram the external and internal processes of the rock cycle (weathering and erosion, sedimentation, compaction, heating, recrystallization, resurfacing)									I
D.29	Describe the methods used to estimate geological time and the age of the Earth (techniques used to date rocks and rock layers, presence of fossils)									I

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.30	Use rock and fossil evidence to make inferences about the age, history, and changing life forms of the Earth (similarities between fossils in different geographic locations, similarities between fossils and organisms present today, fossils of organisms indicating changes in climate, fossils of extinct organisms)									I
D.31	Observe and describe ways water, both as a solid and liquid, is used in every day activities at different times of the year		I	D	M					
D.32	Describe clouds and precipitation as forms of water				I	D	M			
D.33	Classify major bodies of surface water (rivers, lakes, oceans, glaciers) as fresh or salt water, flowing or stationary, large or small, solid or liquid, surface or groundwater					I	D	M		
D.34	Identify the properties of water that make it an essential component of the Earth system (its ability to act as a solvent, its ability to remain as a liquid at most Earth temperatures)					I	D	M		
D.35	Describe and trace the path of water as it cycles through the hydrosphere, geosphere, and atmosphere (the water cycle)						I	D	D	M
D.36	Identify the different forms water can take (snow, sleet, rain, fog, clouds, dew) as it moves through the water cycle						I	D	D	M
D.37	Relate the different forms water can take as it moves through the water cycle to atmospheric conditions (temperature, pressure, wind direction and speed, humidity) at a given geographic location								I	D

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.38	Explain how thermal energy is transferred throughout the water cycle by the processes of convection, conduction, and radiation								I	D
D.39	Explain how major bodies of water are natural resources for human activity (food, recreation, habitat, irrigation, solvents, transportation)	I	D	D	D	D	M	R	R	R
D.40	Describe how human needs/activities (irrigation damming of rivers, waste management, sources of drinking water) have affected the quality of major bodies of fresh water						I	D	D	D
D.41	Propose solutions to problems related to water quality/availability caused by human activity						I	D	D	D
D.42	Relate the comparative amounts of fresh water and salt water on Earth to the availability of water as a resource for living organisms and human activity							I	D	D
D.43	Describe the effect of human activities (landfills, use of fertilizers and herbicides, farming, septic systems) on the quality of water							I	D	D
D.44	Observe, measure and record daily weather data throughout the year (cloud cover, temperature, precipitation, wind speed by using wind socks, thermometers, rain gauges)	I	D	M	R					
D.45	Observe and describe the general weather conditions that occur during each season	I	D	M	R					
D.46	Compare temperatures in different locations (inside, outside, in the sun or shade)	I	D	M	R					
D.47	Compare weather data observed at different times throughout the year (hot vs. cold; windy vs. calm; cloudy vs. clear)	I	D	M	R					

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.48	Identify patterns indicating relationships between observed weather data and weather phenomena (temperature and types of precipitation; clouds and amounts of precipitation)		I	D, M	R					
D.49	Identify and use appropriate tools (thermometer, anemometer, wind vane, rain gauge, satellite images, weather maps) to collect weather data				I	D	M			
D.50	Identify and summarize relationships between weather data (temperature and time of day; cloud cover and temperature; wind direction and temperature) collected over a period of time						I	D	D	M
D.51	Define/observe wind as moving air that is felt	I	D, M							
D.52	Identify air as a substance that surrounds us, taking up space and moves around us as wind			I	D, M					
D.53	Recognize the atmosphere is composed of a mixture of gases, water, and minute particles					I	D	M		
D.54	Describe the composition of the Earth's atmosphere (mixture of gases, water and minute particles) and how it circulates as air masses								I	D
D.55	Explain how the difference in surface temperature, due to the different heating and cooling rates of water and soil, affect the temperature and movement of the air above								I	D
D.56	Identify weather conditions associated with cold fronts and warm fronts								I	D
D.57	Describe characteristics of air masses and predict their effect on the weather in a given location								I	D
D.58	Identify factors that affect weather patterns in a particular region (proximity to large bodies of water, latitude, altitude, prevailing wind currents, mountain ranges)								I	D

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.59	Collect and interpret weather data (cloud cover, precipitation, wind speed and direction) from weather instruments and maps to explain present day weather and to predict next day's weather								I	D
D.60	Describe how significant changes in temperature and barometric pressure may cause dramatic weather phenomena (severe thunderstorms, tornadoes, hurricanes)								I	D
D.61	Differentiate between weather and climate								I	D
D.62	Identify factors that affect climate (latitude, altitude, prevailing wind currents, amount of solar radiation)								I	D
D.63	Identify the ways humans affect the erosion and deposition of Earth's materials (clearing land, planting vegetation, paving land, construction of new buildings)					I	D	D	D	M
D.64	Propose ways to solve simple environmental problems (recycling, composting, decrease soil erosion) that result from human activity			I	D	D	D	D	D	M
D.65	Analyze the ways humans affect the erosion and deposition of soil and rock (clearing of land, planting vegetation, paving land) and propose possible solutions					I	D	D	D	M
D.66	Distinguish between renewable (geothermal, hydroelectric) and non-renewable (fossil fuel) energy sources								I	D
D.67	Observe and describe the presence of the Sun, Moon, clouds, and stars in the sky	I	D	D	M					
D.68	Observe there are more stars in the sky than anyone can count and that they are scattered unevenly and vary in brightness	I	D	M						

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.69	Describe our Sun as a star because it provides light energy to the solar system		I	D	M					
D.70	Explain that stars are separated from one another by vast and different distances, which causes stars to appear smaller than the Sun		I	D	M					
D.71	Compare the distance light travels from the Sun to the Earth to the distance light travels from other stars to Earth using light years						I	D	D	M
D.72	Observe and identify the Moon as a reflection of light				I	D	M			
D.73	Observe and identify the Earth as one of several planets within a solar system that orbits the Sun				I	D	M			
D.74	Observe and identify that the Moon orbits the Earth in about a month					I, D	M			
D.75	Identify that planets look like stars and appear to move across the sky among the stars					I, D	M			
D.76	Describe physical features of the planet Earth that allows life to exist (air, water, temperature) and compare these to the physical features of the Sun, the Moon, and other planets					I	D	M	R	
D.77	Compare and contrast the size, composition, atmosphere, and surface of the planets (inner vs. outer) in our solar system and Earth's moon								I	D
D.78	Classify celestial bodies in the solar system into categories: Sun, Moon, planets, and other small bodies (asteroids, comets, meteors) based on physical properties								I	D
D.79	Describe the relative proximity of common celestial bodies (Sun, Moon, planets, comets, meteors, other stars) in the sky to the Earth								I	D

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.80	Describe how the Earth’s placement in the solar system is favorable to sustain life (distance from the Sun, temperature, atmosphere)						I	D	D	M
D.81	Compare Earth’s characteristics that support life with characteristics of other planets considered favorable or unfavorable to life (atmospheric gases, extremely high/low temperatures)						I	D	D	M
D.82	Describe why the Sun is seen only in the daytime and appears to move across the sky from morning to night	I	D	M						
D.83	Illustrate and describe how the Sun appears to move slowly across the sky from east to west during the day		I	D	M					
D.84	Relate the apparent east to west changes in the position of the Sun, other stars, and planets in the sky over the course of a day to the Earth’s counterclockwise rotation about its axis						I	D	D	M
D.85	Describe the yearly pattern observed in the changes in number of hours of sunlight and the time and location of sunrise and sunset, throughout the year						I	D	D	M
D.86	Describe how in the Northern Hemisphere the Sun appears lower in the sky during the winter and higher in the sky during the summer						I	D	D	M
D.87	Describe how the Sun is never directly overhead when observed from North America						I	D	D	M
D.88	Describe how the Sun appears to rise in the Southeast and set in the Southwest in winter, accounting for a short day, and the Sun appears to rise in the Northeast and set in the Northwest, accounting for a long day in summer						I	D	D	M

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.89	Observe that the Moon can be seen sometimes at night and sometimes during the daytime	I	D	M						
D.90	Observe that the Moon appears to change shape over the course of a month	I	D	M						
D.91	Illustrate and describe how the Moon appears to move slowly across the sky from east to west during the day and night				I	D	M			
D.92	Describe the pattern of change in the Moon's appearance relative to time of day and month as it occurs over several months				I	D	M			
D.93	Sequence images of the lit portion of the Moon seen from Earth as the Moon cycles day to day in about a month				I	D	M			
D.94	Observe change in time and location of Moon rise, Moon set, and the Moon's appearance relative to time of day and month over several months and note the pattern in this change						I	D	D	M
D.95	Describe how the Moon rises later each day due to its revolution around the Earth in a counterclockwise direction						I	D	D	M
D.96	Describe how the Moon is in the sky for roughly 12 hours in a 24 hour period						I	D	D	M
D.97	Describe how one half of the Moon faces the Sun causing over half the Moon to be always lit						I	D	D	M
D.98	Describe how the appearance of the Moon seen from Earth changes approximately every 28 days in an observable pattern (moon phases)						I	D	D	M
D.99	Relate the apparent change in the Moon's position in the sky as it appears to move east to west over the course of a day to Earth's counterclockwise rotation about its axis						I	D	D	M

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.100	Observe and describe the characteristics of the four seasons as they cycle through the year	I	D	M						
D.101	Observe and identify there is a day/night cycle every 24 hours			I	D	M	R			
D.102	Describe the changes in length and position of shadows from morning to midday to afternoon				I	D	M			
D.103	Describe how the Sun’s position in the sky changes the length and position of shadows				I	D	M			
D.104	Explain how the Earth rotates every 24 hours					I	D, M			
D.105	Relate changes in the length and position of a shadow to the time of day and apparent position of the Sun in the sky, as determined by the Earth’s rotation						I	D	D	M
D.106	Relate the apparent motion of the Sun, Moon, and stars in the sky to the rotation of the Earth						I	D	D	M
D.107	Illustrate and explain a day as the time it takes a planet to make a full rotation about its axis						I	D	D	M
D.108	Diagram the path (orbital ellipse) the Earth travels as it revolves around the Sun						I	D	D	M
D.109	Illustrate and explain a year as the time it takes a planet to revolve around the Sun						I	D	M	R
D.110	Explain the relationships between a planet’s length of year (period of revolution) and its position in the solar system						I	D	D	M
D.111	Recognize and explain the phases of the moon are due to the relative positions of the Moon with respect to the Earth and Sun						I	D	D	M
D.112	Relate the axial tilt and orbital position of the Earth as it revolves around the Sun to the intensity of sunlight falling on different parts of the Earth during different seasons						I	D	D	M

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard D: Earth and Space</b>										
D.113	Describe how the Earth’s gravity pulls any object on or near the Earth toward it (including natural and artificial satellites)								I	D
D.114	Describe how the planets’ gravitational pull keeps satellites and moons in orbit around them								I	D
D.115	Describe how the Sun’s gravitational pull holds the Earth and other planets in their orbits								I	D
<b>Standard E: Impact of Science, Technology, and Human Activity</b>										
E.1	Observe and identify that some objects occur in nature while others are man made	I	D	D	D	M	R			
E.2	Recognize some objects or materials occur in nature while others have been designed and made by people to solve human problems and enhance the quality of life				I	D	D	M	R	R
E.3	Design and construct a musical instrument using materials (plastic, wood, cardboard, metal) and existing objects (toy wheels, gears, sticks)			I, D		M				
E.4	Design and construct an electrical device, using materials and existing objects					I	D, M			
E.5	Design and construct a machine, using materials and existing objects						I	D	D	M
E.6	Explain how technological improvements developed for space exploration, the military, or medicine have led to the invention of products that may improve lives here on Earth (new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers)							I	D	D
E.7	Describe how tools have helped scientists make better observations	I	D	M						

I – Introduce  
D- Develop

M-Master  
R-Reinforce

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SCIENCE STANDARDS		K	1	2	3	4	5	6	7	8
<b>Standard E: Impact of Science, Technology, and Human Activity</b>										
E.8	Describe how new technologies have helped scientists make better observations, measurements, or equipment for investigations			I	D	D	D	M	R	R
E.9	Identify the link between technological developments and the scientific discoveries made possible through their development (Sonar and the composition of the Earth; Doppler radar and weather conditions; MRI and brain activity)							I	D	D
E.10	Identify how the effects of inventions, technological advances, or technical solutions to problems may be helpful, harmful, or both					I	D	D	D	D
E.11	Research biographical information about various scientists from different backgrounds and describe how their work contributed to science, technology, and human activity				I	D	D	D	D	D
E.12	Describe how scientific explanations have changed over time as a result of new evidence							I	D	D
E.13	Recognize that people alone or in groups are always making discoveries and inventing new ways to solve problems and get work done	I	D	D	D	D	D	D	D	D
E.14	Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member	I	D	D	D	D	D	D	D	D
E.15	Describe ways in which science and society influence one another (societal challenges often inspire questions for scientific research)							I	D	D
E.16	Identify and evaluate the physical, social, economic, and environmental problems that may be overcome using science and technology							I	D	D

I – Introduce  
D- Develop

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R-Reinforce