Eighth Grade Science Indicators
Class Summary

Eighth Grade																											
	Assessment		**Type of Intervention**																								
Earth and Space Standard																											
Describe how the positions and motions of the objects																											
in the universe cause predictable and cyclic events.																											
1. Describe how objects in the solar system are in																											
regular and predictable motions that explain such																											
phenomena as days, years, seasons, eclipses, tides																											
and moon cycles.																											
2. Explain that gravitational force is the dominant																											
force determining motions in the solar system and																											
in particular keeps the planets in orbit around the																											
sun.																											
3. Compare the orbits and composition of comets																											
and asteroids with that of Earth.																											
4. Describe the effect that asteroids or meteoroids have																											
when moving through space and sometimes entering																											
planetary atmospheres (e.g., meteor-"shooting star"																											
and meteorite).																											
Explain that the universe if composed of vast amounts																											
of matter, most of which is at incomprehensible																											
distances and held together by gravitational force.																											
Describe how the universe is studied by the use of																											
equipment such as telescopes, probes, satellites and																											
spacecraft.																											
5. Explain that the universe consists of billions of																											
galaxies that are classified by shape.																											
6. Explain interstellar distances are measured in light																											
years (e.g., the nearest star beyond the sun is 4.3																											
light-years away).																											

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	Assessment	**Type of Intervention**	
Earth and Space Standard			
Explain that the universe if composed of vast amounts of matter, most of which is at incomprehensible distances and held together by gravitational force. Describe how the universe is studied by the use of equipment such as telescopes, probes, satellites and spacecraft.			
7. Examine the life cycle of a star and predict the next likely stage of a star.			
8. Name and describe tools used to study the universe (e.g., telescopes, probes, satellites and spacecraft).			
Identify that the lithosphere contains rocks and minerals make up rocks. Describe how rocks and minerals are formed and/or classified.			
Describe the processes that contribute to the continuous changing Earth's surface (e.g., earthquakes, volcanic eruptions, erosion, mountain building and lithospheric plate movements).			
9. Describe the interior structure of Earth and Earth's crust as divided into tectonic plates riding on top of the slow moving currents of magma in the mantle.			
10. Explain that most major geological events (e.g., earthquakes, volcanic eruptions, hot spots and mountain building) result from plate motion			

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	Assessment	**Type of Intervention**	
Earth and Space Standard			
Describe the processes that contribute to the continuous changing Earth's surface (e.g., earthquakes, volcanic eruptions, erosion, mountain building and lithospheric plate movements).			
11. Use models to analyze the size and shape of Earth, its surface and its interior (e.g., globes, topographic maps, and satellite image).			
12. Explain that some processes involved in the rock cycle are directly related to thermal energy and forces in the mantle that drive plate motions			
13. Describe how landforms are created through a combination of destructive (e.g., weathering and erosion) and constructive processes (e.g., crystal deformation, volcanic eruptions and deposition of sediment).			
14. Explain that folding, faulting and uplifting can rearrange the rock layers so the youngest is not always found on top.			
15. Illustrate how the three primary types of plate boundaries (transform, divergent and convergent) cause different landforms (e.g., mountains, volcanoes and ocean trenches).			

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	Assessment		**Type of Intervention**																									
Life Standard																												
Explain that the basic functions of organisms are carried out in cells and groups of specialized cells from tissues and organs; the combination of these cells make up multicellular organisms that have a variety of body plans and internal structures.																												
Describe the characteristics of an organism in terms of a combination of inherited traits and recognize reproduction as a characteristic of living organisms essential to the continuation of the species.																												
1. Describe that asexual reproduction limits the spread of detrimental characteristics through a species and allows for genetic continuity.																												
2. Recognize that in sexual reproduction new combinations of traits are produced which may increase or decrease an organism's chances for survival.																												
3. Explain how variations in structure, behavior or physiology allow some organisms to enhance their reproductive success and survival in a particular environment.																												
Explain how energy entering the ecosystem as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment.																												

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	Assessment		**Type of Intervention**																								
Life Standard																											
Explain how extinction of a species occurs when the environment changes and its adaptive characteristics are insufficient to allow survival (as seen in evidence of the fossil record).																											
4. Explain that diversity of species is developed through gradual processes over many generations (e.g., fossil record).																											
5. Investigate how an organism adapted to a particular environment may become extinct if the environment, as shown by the fossil record, changes.																											
Physical Standard																											
Relate uses, properties and chemical processes to the behavior and/or arrangement of the small particles that compose matter.																											
In simple cases, describe the motion of objects and conceptually describe the effects of forces on an object																											
1. Describe how the change in the position (motion) of an object is always judged and described in comparison to a reference point.																											
2. Explain that motion describes the change in the position of an object (characterized by a speed and direction) as time changes.																											
3. Explain that an unbalanced force acting on an object changes that object's speed and/or direction.																											

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	Assessment		**Type of Intervention**																								
Physical Standard																											
Describe renewable and nonrenewable sources of energy (e.g., solar, wind, fossil fuels, biomass, hydroelectricity, geothermal and nuclear energy) and the management of these sources.																											
Describe that energy takes many forms, some forms represent kinetic energy and some forms represent potential energy; and during energy transformations the total amount of energy remains constant.																											
4. Demonstrate that waves transfer energy.																											
5. Demonstrate that vibrations in materials may produce waves that spread away from the source in all directions (e.g., earthquake waves and sound waves).																											
Science and Technology Standard																											
Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life.																											
1. Examine how science and technology have advanced through the contributions of many different people, cultures and times in history.																											
2. Examine how choices regarding the use of technology are influenced by constraints caused by various unavoidable factors (e.g., geographic, location, limited resources, social, political and economic considerations).																											

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Eighth Grade			
	Assessment	**Types of Intervention**	
Science and Technology Standard			
Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety and aesthetics).			
3. Design and build a product or create a solution to a problem given more than two constraints (e.g., limits of cost and time for design and production, supply of materials and environmental effects).			
4. Evaluate the overall effectiveness of a product design or solution.			
Scientific Inquiry Standard			
Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools.			
1. Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations.			
2. Describe the concepts of sample size and control and explain how these affect scientific investigations			
Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions.			
3. Read, construct and interpret data in various forms produced by self and others in both written and oral form (e.g., tables, charts, maps, graphs, diagrams and symbols).			

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	Assessment		**Types of Intervention**																									
Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions.																												
4. Apply appropriate math skills to interpret quantitative data (e.g., mean, median and mode).																												
Scientific Ways of Knowing Standard																												
Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety and aesthetics).																												
5. Design and build a product or create a solution to a problem given one constraint (e.g., limits of cost and time for design and production, supply of materials and environmental effects).																												
Scientific Inquiry Standard																												
Use skills of scientific inquiry processes (e.g., hypothesis, record keeping, description and explanation).																												
1. Identify the difference between description (e.g., observation and summary) and explanation (e.g., inference, prediction, significance and importance).																												
Explain the importance of reproducibility and reduction of bias in scientific methods.																												
2. Explain why it is important to examine data objectively and not let bias affect observations.																												
Give examples of how thinking scientifically is helpful in daily life.																												