

## 8<sup>th</sup> Grade– Science

### **CONTENT: Earth and Space Sciences**

| <b>Skills Based on Academic Content Standards</b>   |
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| 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.   |
| 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.   |
| Compare the orbits and composition of comets and asteroids with that of Earth.  |
| 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 consists of billions of galaxies that are classified by shape.  |
| Explain interstellar distances are measured in light years (e.g., the nearest star beyond the sun is 4.3 light years away).   |
| Examine the life cycle of a star and predict the next likely stage of a star.   |
| Name and describe tools used to study the universe (e.g., telescopes, probes, satellites and spacecraft).   |
| 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.  |
| Explain that most major geological events (e.g., earthquakes, volcanic eruptions, hot spots and mountain building) result from plate motion.  |
| Use models to analyze the size and shape of Earth, its surface and its interior (e.g., globes, topographic maps, satellite images).   |
| Explain that some processes involved in the rock cycle are directly related to thermal energy and forces in the mantle that drive plate motions.  |
| Describe how landforms are created through a combination of destructive (e.g., weathering and erosion) and constructive processes (e.g., crustal deformation, volcanic eruptions and deposition of sediment). |
| Explain that folding, faulting and uplifting can rearrange the rock layers so the youngest is not always found on top.  |
| Illustrate how the three primary types of plate boundaries (transform, divergent and convergent) cause different landforms (e.g., mountains, volcanoes and ocean trenches).                                   |

### **CONTENT: Life Sciences**

| <b>Skills Based on Academic Content Standards</b>  |
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| Describe that asexual reproduction limits the spread of detrimental characteristics through a species and allows for genetic continuity.                         |
| Recognize that in sexual reproduction new combinations of traits are produced which may increase or decrease an organism's chances for survival.                 |
| Explain how variations in structure, behavior or physiology allow some organisms to enhance their reproductive success and survival in a particular environment. |
| Explain that diversity of species is developed through gradual processes over many generations (e.g., fossil record).  |
| Investigate how an organism adapted to a particular environment may become extinct if the environment, as shown by the fossil record, changes.                   |

## **CONTENT: Physical Sciences**

| <b>Skills Based on Academic Content Standards</b>   |
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| Describe how the change in the position (motion) of an object is always judged and described in comparison to a reference point.                        |
| Explain that motion describes the change in the position of an object (characterized by a speed and direction) as time changes.                         |
| Explain that an unbalanced force acting on an object changes that object's speed and/or direction.  |
| Demonstrate that waves transfer energy.   |
| Demonstrate that vibrations in materials may produce waves that spread away from the source in all directions (e.g., earthquake waves and sound waves). |

## **CONTENT: Science and Technology**

| <b>Skills Based on Academic Content Standards</b>  |
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| Examine how science and technology have advanced through the contributions of many different people, cultures and times in history.  |
| 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). |
| 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).                 |
| Evaluate the overall effectiveness of a product design or solution.  |

## **CONTENT: Scientific Inquiry**

| <b>Skills Based on Academic Content Standards</b>   |
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| Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations.   |
| Describe the concepts of sample size and control and explain how these affect scientific investigations.  |
| 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). |
| Apply appropriate math skills to interpret quantitative data (e.g., mean, median and mode).   |

## **CONTENT: Scientific Ways of Knowing**

| <b>Skills Based on Academic Content Standards</b>   |
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| Identify the difference between description (e.g., observation and summary) and explanation (e.g., inference, prediction, significance and importance). |
| Explain why it is important to examine data objectively and not let bias affect observations.   |