

**Northwestern Middle School  
Science Assessment Map**

**Grade: 8**

**Date Reviewed: December 2009**

ESSENTIAL INDICATORS		SUPPORTING INDICATORS	
<b>QUARTER ONE: ASTRONOMY</b>			
ES 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.	ES 3	Compare the orbits and composition of comets and asteroids with that of Earth.
ES 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.	ES 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).
ES 8	Name and describe tools used to study the universe (e.g., telescopes, probes, satellites and spacecraft).	ES 5	Explain that the universe consists of billions of galaxies that are classified by shape.
SI 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).	ES 6	Explain interstellar distances are measured in light years (e.g., the nearest star beyond the sun is 4.3 light years away).
PS 1	Describe how the change in the position (motion) of an object is always judged and described in comparison to a reference point.	ES 7	Examine the life cycle of a star and predict the next likely stage of a star.
PS 2	Explain that motion describes the change in the position of an object (characterized by a speed and direction) as time changes.	SI 1	Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations.
SWK 2	Explain why it is important to examine data objectively and not let bias affect observations.	SI 2	Describe the concepts of sample size and control and explain how these affect scientific investigations.
		SI 4	Apply appropriate math skills to interpret quantitative data (e.g., mean, median and mode).
		PS 3	Explain that an unbalanced force acting on an object

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			changes that object's speed and/or direction.
		PS 4	Demonstrate that waves transfer energy.
		PS 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).
		ST 1	Examine how science and technology have advanced through the contributions of many different people, cultures and times in history.
		SWK 1	Identify the difference between description (e.g., observation and summary) and explanation (e.g., inference, prediction, significance and importance).

**KEY Vocabulary:** electromagnetic spectrum, fusion, reference point, tilt, gravity, relative, mass, energy, wave, seasons, bias, inference prediction, velocity, comets, asteroids, meteor, meteorite, meteoroid, galaxies, magnetic reversal, nuclear reaction

**Essential Understandings: What every student must know**

1. We study the universe in many ways. These include tools like telescopes and satellites.
2. We can use information from satellites and telescopes to learn more about other stars and planets in the universe.
3. There is a force in the universe called gravity. Gravity holds things together.

**Key Concepts and Indicators**

1. Our sun's gravity keeps all the planets in our solar system in their orbits around the sun.
2. An object may change positions based on the observer's reference point. The reference point is the location of the observer's view.

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3. Students will construct and analysis data to objectively make written conclusions.

**Vocabulary**

Asteroid, Atmosphere, comet, Composition, convection, Core, Cycle, Eclipse, Electric field, Electromagnetic radiation, Electro-magnetic spectrum, Element, Energy, Force, Frame of reference, Galaxy, Gas, Gravity, Infrared radiation, Interstellar, Ion, Isotope, Magnetic reversal, Mass, Matter, Meteor, Meteoroid, Metric system, Milky way, Model, Moon cycle, Motion, Nuclear, Nuclear reaction, Observe, Orbit, Oxidation, Particle, Pattern, Periodic table, Phenomenon, Pitch, Planet, Radiation, Reference point, Reflection, Refraction, Repel, Rotation, Sound waves, Star, Survival, Technology, Theory, Tides, Tool, Velocity, Wave, wavelength

**Assessments**

*Formative*

*Summative*

**Enrichment Opportunities**

**Expand discussion and projects that challenge the imagination. Explore the unknown.**

**Intervention Strategies**

Work on key terms and essential learnings

**Co-Teaching Methods**

Pair up with Math to understand vastness of information; History for past scientists and aircraft; and Language Arts for imagination usage.

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**Resources**

Astronomy Text, International Space Station Video

**Pacing**

First nine weeks of the year – helps with a moon observation project because the sky is clear in the fall.

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QUARTER TWO: HEREDITY			
LS 1	Describe that asexual reproduction limits the spread of detrimental characteristics through a species and allows for genetic continuity.	LS 2	Recognize that in sexual reproduction new combinations of traits are produced which may increase or decrease an organism's chances for survival.
LS 5	Investigate how an organism adapted to a particular environment may become extinct if the environment, as shown by the fossil record, changes.	LS 3	Explain how variations in structure, behavior or physiology allow some organisms to enhance their reproductive success and survival in a particular environment.
ST 4	Evaluate the overall effectiveness of a product design or solution.	LS 4	Explain that diversity of species is developed through gradual processes over many generations (e.g., fossil record).
		ST 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).

**Vocabulary:** homeostasis, mitochondria, adapted, genetic, detrimental, constraints, qualitative, quantitative, traits

**Essential Understandings: What every student must know**

1. Specialized basic functions of cell structures between plants and animals, organs and organ systems.
2. Inherited traits between parents and offspring impact the survival of a species.
3. Photosynthesis transfer energy to support life.

**Resources:** Cells & Heredity

**Pacing:** Four week review and reteach

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<b>QUARTER THREE: EARTH</b>			
ES 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.	ES 10	Explain that most major geological events (e.g., earthquakes, volcanic eruptions, hot spots and mountain building) result from plate motion.
ES 14	Explain that folding, faulting and uplifting can rearrange the rock layers so the youngest is not always found on top.	ES 11	Use models to analyze the size and shape of Earth, its surface and its interior (e.g., globes, topographic maps, satellite images).
		ES 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.
		ES 13	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).
		ES 15	Illustrate how the three primary types of plate boundaries (transform, divergent and convergent) cause different landforms (e.g., mountains, volcanoes and ocean trenches).
		ST 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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**Vocabulary:** igneous, metamorphic, sedimentary, transform, divergent, convergent, trenches, mass, tectonic plates, faulting, uplift, hot spots, topography, thermal, constructive, deformation, deposition, sediment

**Essential Understandings: What every student must know**

1. The interior of the Earth has several layers.
2. The surface of the Earth has various landforms, which continuously change.
3. The earth's history is viewed through the rock layers. The youngest layer is on top.

**Key Concepts and Indicators**

1. Earthquakes and volcanic eruptions result from the thermal energy produced from Earth's interior and the movement of tectonics plates.
2. Rock layers can be weathered and rearranged over time.

**Assessments**

*Formative*

*Summative*

**Enrichment Opportunities**

**Intervention Strategies**

Modeling

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**Co-Teaching Methods**

Research history and non-fictional stories.

**Resources**

Earth's Changing Surface and Earth's Interior

**Pacing**

Second nine weeks – may carry over to third nine weeks. Start with the Earth's Changing Surface.



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QUARTER FOUR: Test Prep and 6 <sup>th</sup> /7 <sup>th</sup> review	