

Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Science	Course:	Science 8 (Earth Science)	Unit 2 Title:	Astronomy	Grade Level(s):	8
Assessed Trimester:	Trimester 2	Pacing:	2-5 weeks	Date Created:	6/11/2012	Last Revision Date:	6/23/2014

Course Understandings: *Students will understand that:*

- The Earth is dependent on the Sun as an energy source, which influences interactions, patterns, and cycles on Earth.
- Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun and impact life on Earth.
- Many cultures and groups have been and continue to be involved in advancements in engineering, exploration, and inquiry.
- Scientific investigations involve asking testable questions. Different kinds of questions suggest different scientific investigations and findings of current investigations will guide future investigations.
- Scientific inquiry is a way of processing information about their world through the interactions among technology, engineering, and mathematics.

DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals	
Benchmark: 8.3.2.1.1: Explain how the combination of the Earth's tilted axis and revolution around the Sun causes the progression of seasons. 8.3.3.1.5: Use the predictability of the motions of the Earth, Sun, and moon to explain day length, the phases of the moon, and eclipses. 8.1.3.2.1: Describe examples of important contributions to the advancement of science, engineering, and technology made by individuals representing different groups and cultures at different times in history. 8.1.3.3.2: Understand that scientific knowledge is always changing as new technologies and information enhance observations and analysis of data. <i>For example:</i> Analyze how new telescopes have provided new information about the universe. 8.3.3.1.1: Recognize that the Sun is a medium-sized star, one of billions of stars in the Milky Way galaxy, and the closest star to Earth. 8.3.3.1.2: Describe how gravity and inertia keep most objects in the solar system in regular and predictable motion. 8.3.3.1.3: Recognize that gravity exists between any two objects and describe how the mass and distance between objects affects the force of gravity. 8.3.3.1.4: Compare and contrast the sizes, locations, and compositions of the planets and moons in our solar system. 8.1.3.3.3: Provide examples of how advances in technology have impacted how people live, work, and interact.	
Transfer	
Students will be able to independently use their learning to: (product, high order reasoning) • Model complex ideas and systems. • Describe our place in the Universe and how the universe affects us. • Understand that science is a dynamic field and that with new technology comes new information, with new information comes change in understanding.	
Meaning	
Unit Understanding(s): Students will understand that: • The relative position and motions of the Earth, Moon and Sun create patterns observed in the phases, eclipses, tides and seasons. • In a universe of billions of galaxies, we are in a galaxy of billions of stars, and Earth is just one planet in our solar system. • The Earth, Moon and Sun interact in ways that affect our planet in fundamental ways.	Essential Question(s): Students will keep considering: • Why do we see differences in the appearance and movements of the Sun and Moon from Earth? • How does the force of gravity affect all matter in the universe?

Acquisition	
Knowledge - Students will: • Students will recognize that the Earth is tilted on its axis. (8.3.2.1.1) • Students will know that the Earth revolves around the sun and takes about one year to complete one revolution. (8.3.2.1.1) • Students will recognize that the Sun is a medium sized star composed of multiple layers producing energy by fusion. (8.3.3.1.1) • Students will recognize that the Sun is one of billions of stars in the Milky Way Galaxy. (8.3.3.1.1) • Students will know that the Sun is the closest star to Earth. (8.3.3.1.1) • Students will know that the solar system is sun centered (heliocentric). (8.3.3.1.1) • Students will understand that orbits have predictable and regular motion. (8.3.3.1.2) • Students will recognize that gravitational force exists between any two objects. (8.3.3.1.3) • Students will describe how the masses of the objects and distance between them affect the force. (8.3.3.1.3) • Students will understand that one day is about one rotation of the Earth on its axis. (8.3.3.1.5) • Students will understand that one year is about one revolution of the Earth around the sun. (8.3.3.1.5) • Students will explain and name moon phases. (8.3.3.1.5) **Riverside Scientific Technology may be used. • Students will describe examples of important contributions to the advancement of science, engineering and technology made by individuals representing different groups and cultures at different times in history. (8.1.3.2.1) • Students will understand how Copernicus and Galileo contributed to our understanding of the heliocentric model of the solar system. (8.1.3.2.1) • Students will understand that scientific knowledge is always changing as new technologies and information enhance observations and analysis of data. (8.1.3.3.2) • Students will explain how advances in technology have impacted how people live, work, and interact. (8.1.3.3.3)	Reasoning - Students will: • Students will distinguish between indirect and direct rays (angle of solar radiation). (8.3.2.1.1) • Students will analyze how indirect and direct rays (angle of solar radiation) contribute to the changing of the seasons. (8.3.2.1.1) • Students will interpret a diagram showing Earth’s tilt and revolution around the sun. (8.3.2.1.1) • Students may compare and contrast Earth’s weather at various positions within its orbit using computer simulations. (8.3.2.1.1) • Students will compare and contrast inner planets and outer planets in terms of size, location and composition. (8.3.3.1.4) • Students will compare and contrast solar and lunar eclipses. (8.3.3.1.5) • Students will describe how advances in technology have impacted how people live, work, and interact. (8.1.3.3.3) • Students will analyze an example of changing technology that enhances science. (8.1.3.3.2) Skills - Students will: • Students may use measurements of planetary size or distance. (8.3.3.1.4) • Students will observe polar orbit animation using computer technology, such as Riverside Scientific Technology or Google Earth to predict day length, moon phases, and eclipses. (8.3.3.1.5)

Common Misunderstandings • Earth is larger than the Sun • Astrology is the same thing as Astronomy • There is no gravity in space • Changing distance between the Earth and Sun causes the changes in season • All stars are the same distance from Earth • The Sun is not the same thing as a star • The Moon can only be seen at night • The solar system only contains the Sun, the planets, and the Moon	Essential new vocabulary • Galaxy • Star • Astronomical Unit • Heliocentric • Geocentric • Galileo • Copernicus • Orbit • Rotation • Revolution • Axis • Waxing • Waning • Gibbous Moon • Crescent Moon • Quarter Moon • Full Moon • New Moon • Solar eclipse • Lunar eclipse
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