

Earth System Evolution Storyline – Astronomy

Below are storylines that were designed by Cheryl Mosier, an Earth Science Teacher at Columbine High School in Littleton, Colorado.

Unit is supplemented with: - Space History Project – each student researches and presents information about a specific space mission

Big Idea:

3. Change through time produced Earth, the net result of constancy, gradual changes, and episodic changes over human, geological, and astronomical scales of times and space.
4. Extraterrestrial influences upon Earth include extraterrestrial energy, material, and influences due to Earth's position and motion as a subsystem of an evolving solar system, galaxy, and universe.

	Activity 1 – The History and Scale of the Solar System	Activity 2 – The Earth-Moon System	Activity 3 – Orbits and Effects	Activity 4 – Impact Events and the Earth System	Activity 5 – The Sun and Its Effects on Your Community	Activity 6 – The Electromagnetic Spectrum and Your Community	Activity 7 – Our Community's Place Among the Stars
Key Evidence Learned	- scale model of solar system - calculate distances using AU, parsecs and light years	- lunar phases - tidal forces - types of tides - Moon's origin - appearance of the Moon compared to other solar system bodies	- construct and measure ellipses - eccentricity - Earth's orbit - how a changing orbit could affect climate - orbits of comets and asteroids	- mechanics of an impact event - energy released in a collision - impact events - chances of an impact event	- structure of the Sun - reflection, absorption and scattering - solar wind - space weather - sunspots, solar flares and other phenomenon	- explain the EM spectrum - different instruments used to detect EM - spectral fingerprints - how EM info is used to determine other objects - benefits and hazards	- understand our place in the galaxy - stellar structure and stellar evolution - relationship between brightness and magnitude - other stars affect on Earth
Connection to:	- nebular theory of formation - formation of universe						
Big Idea	- how the universe and solar system formed and has changed over time	- changes of Earth - tides - lunar phases	- orbits of Earth, planets and other objects	- impact events – causes and hazards	- how extraterrestrial energy impacts Earth	- extraterrestrial energy - other objects in the universe	- our place in the galaxy and universe

Real Life and Chapter Challenge	- formation of the universe and solar system	- lunar phases - tides	- possibility of collisions - orbits	- chance of an impact event - how impact events have changed life	- impact of the Sun on our lives, not just by light	- how EM spectrum impacts our lives - objects in the universe	- how our star compares to others in the galaxy and universe
Geosphere	- formation of planets	- formation of the Moon	- collision events	- impact craters - impact hazards			
Hydrosphere	- formation of oceans	- why there is no water on the Moon	- collision events	- impact hazards			
Atmosphere	- formation of air	- why there is no air on the Moon		- impact hazards	- auroras		
Cryosphere							
Biosphere		- astronaut discoveries	- orbit changes	- impact hazards	- hazards of solar radiation	- hazards and benefits of EM radiation	- greater understanding of our universe
State Stand.		4.4.a, 4.4.b	4.4.b			4.4.c, 4.4.e	4.4.d, 4.4.e
Jeffco Stand.		4.4.a, 4.4.b	4.4.b			4.4.c., 4.4.e	4.4.d, 4.4.e
CSAP Frame.	4.4.2.b, 4.4.2.c	4.4.1.b, 4.4.1.c, 4.4.2a	4.4.2.a, 4.4.2.b, 4.4.2.c	4.4.5.c	4.4.4.d	4.4.3.a, 4.4.3.b, 4.4.3.c	4.4.4.a, 4.4.4.b, 4.4.4.c,
Jeffco PE		U 2b, 2c	U 2b, 2c		U 1d, 2a	U 1a, 1b, 3c	U 1c, 1e