EARTH SCIENCE CONTENT FACTS

The following is a list of facts related to the course of Earth Science. A deep foundation of factual knowledge is important; however, students need to understand facts and ideas in the context of the conceptual framework. This list is not intended to provide a comprehensive review for State and National Assessments. Its purpose is to provide a highlight of the factual material covered in Earth Science. This list is not all inclusive, be sure to check Nevada State Standards and your district syllabi.

ASTRONOMY

- Earth's axis is tilted 23½°, which accounts for the varying amount of daylight and seasons
- The Earth rotates on its axis counterclockwise (from west to east)
- One Earth rotation takes approximately 24 hours (one hour = 15° of rotation)
- Evidence for rotation is the Foucault Pendulum (appears to change direction)
- Most changes in the environment are cyclic (i.e. tides, sunspots, moon phases…)
- The Earth revolves around the sun counterclockwise
- One Earth revolution takes 365.26 days in a slightly elliptical orbit
- All planets orbits are in the shape of an ellipse with the sun at one focus point. (This includes moons, satellites, comets…)
- Earth is **closer** to the sun (perihelion) around **January 3rd or 4th** (winter) and **farther** from the sun (aphelion) around **July 3rd or 4th** (summer)
- The closer a planet is to the sun the greater its orbital velocity
- Summer Solstice occurs on June 21st in the Northern Hemisphere – is the longest day of the year where the vertical rays of the sun are perpendicular to the Tropic of Cancer (23½° North latitude)
- Winter Solstice occurs on December 21st in the Northern Hemisphere – is the shortest day of the year where the vertical rays of the sun are perpendicular to the Tropic of Capricorn (23½° South latitude)
- Equinoxes (equal night and day) occur on September 23rd (Autumnal) and March 21st (Vernal) where the vertical rays from the sun strike the equator, resulting in 12 hours of daylight and 12 hours of darkness everywhere on earth

Earth/Moon Relations

- Half (½) of the Moon's surface is always lit by the sun
- The rate of rotation and rate of revolution are the same for the Moon (which is the reason why we always see the same side!)
- The moon has phases due to the changing position of the moon as it revolves around Earth
- The moon's phases take 29½ days to complete the cycle (about 1 month)
- The moon phases are: (waxing) crescent-quarter-gibbous-full (waning) gibbous-quarter-crescent-new

Sun/Solar System

- Our solar system consists of the sun, nine planets and their moons (satellites), comets, and anything that orbits the sun (the sun's gravity provides the force to hold the solar system together)
- Our solar system is located on one of the outer arms of our Milky Way Galaxy
- Geocentric model – Earth-centered model for the solar system, Ptolemy
- Heliocentric model – Sun-centered model for the solar system, Copernicus
- The sun is massive, containing ~98% of the mass of the solar system and composed mostly of hydrogen with about 10% helium and other trace elements
- The nuclear reaction in the sun's core changes hydrogen to helium and releases tremendous amounts of electromagnetic energy (i.e. light, heat, x-ray…)
- The universe began with a big explosion - "The Big Bang"