



Unit Big Ideas/Science Concepts Earth/Space Science

This book supports teachers in grades 3-5 by supplying the science concepts that are included in State Science Standards, National Standards, and the *Next Generation Science Standards (May 2012 Draft: NRC, 2012)*. Below is a description of each Big Idea or science concept for each unit and lesson. The major topics/concepts of Earth/Space Science are used to categorize the units.

Earth/Space Science

a. Water

The water cycle describes the movement of water on, in, and above the Earth. Earth's water is in constant motion and is always changing states, from liquid to vapor to ice and back again. Parts of the water cycle such as evaporation, condensation, and precipitation cause weather. Erosion via water occurs when soil is moved due to heavy rains or melting snow and ice. Water conservation is important, as fresh water is only 2-5% of the total water on Earth. Humans impact water via pollution, use and overuse, plus cause erosion through irrigation and farming practices.

b. Earth

The Earth is dynamic. In order to understand the complexity of the Earth a topic such as composting, returning nutrients back to the soil as a part of the soil cycle, is a good place to start. Earth is dynamic on a different scale in terms of the convection currents, which occur within the Earth and cause earthquakes and volcanoes. The energy of natural disasters can literally change the face of the Earth. The Earth's surface can be studied through topographic maps that illustrate the features of the land using contour lines. The line marked as zero (i.e., 0) is at sea level, and any line with a higher number is that much above sea level.

c. Space

Our understanding of the Earth and its' position in space, the moon, and the stars have changed dramatically over time. The Earth spins on an axis tilted at about 23.5 degrees, so during the summer the Northern Hemisphere gets more sunlight than the Southern Hemisphere and less sunlight during the winter. Viewing the moon from Earth allows us to watch the phases of the moon which completes a 360 degree cycle every 27.32 days. The planets have different properties because they are different distances away from the sun, are different sizes, and are made up of different materials. The stars are gigantic balls of gas, mostly hydrogen gas. There is so much gravity that the gas becomes very dense and hot. Humans have looked at the stars and created myths from the patterns they see in the sky. Our own sun is a star.

Resource: *Ask the Van*, Department of Physics, University of Illinois at Champaign-Urbana