

**PHYSICAL SCIENCE (EALR 4)**

**Energy: Transfer, Transformation, and Conservation (PS3)  
Interaction of Energy & Matter**

**PS3D:** Visible light from the Sun is made up of a mixture of all colors of light. To see an object, light emitted or reflected by that object must enter the eye.

**PS3F:** Energy can be *transferred* from one place to another through *waves*. *Waves* include vibrations in materials. Sound and earthquake *waves* are examples. These and other *waves* move at different speeds in different materials.

**EARTH SCIENCE (EALR 4)**

**Earth & Space (ES1)  
The Solar System**

**ES1A:** The Moon's monthly cycle of phases can be explained by its changing relative position as it *orbits* Earth.  
An *eclipse* of the Moon occurs when the Moon enters Earth's shadow.

An *eclipse* of the Sun occurs when the *Moon* is between the Earth and Sun, and the Moon's shadow falls on the Earth.

**ES1B:** Earth is the third planet from the sun in a *system* that includes the Moon, the Sun, seven other major *planets* and their *moons*, and smaller objects, such as *asteroids*, *plutoids*, and *comets*. These bodies differ in many *characteristics* (e.g., size, composition, relative position).

**ES1C:** Most objects in the *Solar System* are in regular and predictable *motion*.

These *motions explain* such *phenomena* as the day, the year, *phases of the moon*, and *eclipses*.

**ES1D:** *Gravity* is the *force* that keeps planets in *orbit* around the Sun and governs the rest of the *motion* in the *Solar System*.  
*Gravity* alone holds us to the Earth's surface.

**ES1E:** Our Sun is one of hundreds of billions of stars in the *Milky Way galaxy*. Many of these stars have planets *orbiting* around them.  
The Milky Way galaxy is one of hundreds of billions of galaxies in the universe.

**LIFE SCIENCE (EALR 4)**

**Structure & Function of Living Systems (LS1)  
From Cells to Organisms**

**LS1A:** All *organisms* are composed of cells, which carry on the many *functions* needed to sustain life.

**LS1B:** One-celled *organisms* must contain parts to carry out all life *functions*.

**LS1D:** Both plant and animal cells must carry on life *functions*, so they have parts in *common*, such as *nuclei*, *cytoplasm*, *cell membranes*, and *mitochondria*. But plants have specialized cell parts, such as *chloroplasts* and *cell walls*, because they are *producers*.

**LS1E:** In classifying *organisms*, scientists *consider* both internal and external structures and behaviors.

**INQUIRY (EALR 2)**

**Questioning and Investigation (INQ)**

**INQA Question:** Scientific inquiry involves asking and answering questions and comparing the answer with what scientists already know about the world.

**INQB Investigate:** Different kinds of *questions* suggest different kinds of scientific investigations.

**INQC Investigate:** Collecting, analyzing, and displaying data are essential aspects of all investigations.

**INQD Investigate:** For an *experiment* to be valid, all (*controlled*) *variables* must be kept the same whenever possible, except for the *manipulated (independent) variable* being tested, and the *responding (dependent) variable* being measured and recorded. If a *variable* cannot be *controlled*, it must be reported and accounted for.

**INQE Model:** *Models* are used to represent objects, events, systems and processes. *Models* can be used to test *hypotheses* and better understand *phenomena*, but they have limitations.

**INQF Explain:** It is important to distinguish between the results of a particular investigation and general conclusions drawn from these results.

**INQG Communicate Clearly:** Scientific reports should enable another investigator to repeat the study to check the results.

**INQH Intellectual Honesty:** *Science* advances through openness to new *ideas*, honesty, and legitimate *skepticism*. Asking thoughtful *questions*, querying other scientists' explanations, and evaluating one's own thinking in response to the *ideas* of others are abilities of scientific *inquiry*.

**INQI Consider Ethics:** Scientists and engineers have ethical codes governing animal *experiments*, research in natural *ecosystems*, and studies that involve human subjects.

**APPLICATION (EALR 3)**

**Science, Technology and Solving Problems 6-8APP A-H**