Science (5th – 8th Grade)
Academic Content & Skills Summary
Peru Elementary School District 124

In an effort to communicate clear academic expectations to students, parents and the local community, Peru Elementary School District 124 provides Academic Content and Skills Summaries from preschool through eighth grade in the areas of mathematics, language arts, science, social studies, technology, art, music and physical education.

Following is a simple summary of what our children should know and be able to do at each grade level in the area of Science. All children can learn, even if not at the same pace or in the same way, and ultimately these general skills and content items are what we will strive to accomplish with the assistance of our parents at home.

Common concepts covered throughout: patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; structure and function; and stability and change.

Common practices covered throughout: asking questions and defining problems; developing and using models; planning and carrying out investigations; analyzing and interpreting data; using mathematics and computational thinking; constructing explanations and designing solutions; engaging in argument from evidence; and obtaining, evaluating, and communicating information.

5th Grade students will:

- Understand that all things have matter
- Observe and understand that when two or more different substances are mixed, a new substance with different properties may be formed
- Identify materials and conduct an investigation to determine the properties of matter - solid, liquid, or gas. Investigate which materials react to acid and iodine.
- Comprehend how different plants and animals get what they need for to survive
- Interpret and explain how different organisms interact with each other in a food web to get the energy they need
- Understand how ecosystems change and that these changes can affect how living things survive and interact with other living things
- Discover that there are four systems - atmosphere, biosphere, hydrosphere, and geosphere. Compare the different earth systems and how they depend/interact with each other
- Comprehend that the sun is the major source of energy that heats the earth and the energy from the sun is what creates weather.
- Create a diagram of the water cycle, paying close attention to how the energy moves through evaporation, condensation, precipitation, and transpiration

6th Grade students will:

- Describe how atoms are building blocks of matter and determine the difference between physical and chemical changes.
- Develop a model that shows conservation of mass with atoms and explain that mass is conserved in a reaction.
- Modify a device to exhibit exothermic or endothermic energy.
- Describe the interaction in the Earth system and explain how human interactions change them.
- Create models to explain the water cycle and how uneven heating causes weather and determines climate.
- Investigate climate change, understand the various factors at play and analysis various forms of climate data over spans of geologic time.
- Demonstrate how living things obtain energy, use energy, and interact with their environment
- Develop models to explain how energy cycles through the ecosystem.
- Look at data to explain predator vs prey relations and dependence on resources.

7th Grade students will:

- Describe the relationship between the amplitude of a wave and the energy in a wave.
- Develop an explanation to describe how waves are reflected, absorbed or transmitted through materials.
- Explain how sound and light waves are integrated within the human body.
- Investigate and describe the structure and function of cells to provide evidence that living things are made of one or many types of different cells.
- Explain how food is broken down through a chemical reaction creating new molecules and provide evidence that body systems are interacting to utilize the energy.
- Analyze cause and effect relationships and develop and use models to show how sensory receptors work within the nervous system (response of sensory receptors).
- Explain how and why living things change over time and explain how mutations to genes may be harmful, beneficial or neutral to an organism.
- Determine the probability of traits being passed down from one generation to the next (parent to offspring) and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
- Explain and develop models that demonstrate how potential and kinetic energy can take different forms but is always conserved.
- Conduct experiments to show forces and predict outcomes using Newton's three laws of motion; while calculating force, friction, gravity, etc.

8th Grade students will:

- Examine the purpose of relative and absolute dating and how they are used to create the geologic time scale.
- Explain how and why the earth is constantly changing and create models that explain the cycling of Earth's materials.
- Analyze and interpret data from fossils and rocks, continental shapes, and seafloor to provide evidence of the plate movement
- Investigate natural hazards and develop plans and technologies to mitigate their effect.
- Explain how structural changes to DNA can lead to mutations and describe how living things change/develop through their lifespan.
- Explain how structures in living things are related to their functions.

8th Grade students will (continued):

- Use scientific evidence to explain how environmental and genetic factors influence the growth of organisms.
- Develop and use models to show and explain anatomical similarities and differences in modern living things.
- Explain how genetic variations in genes increases some individuals' chance for survival.
- Develop a model and determine the scale of different objects in the solar system to explain patterns, describe Earth's place in the universe, and explain the role of gravity in the universe.