



Reavis High School

Connections Physical Science Curriculum Snapshot



Unit 1: Laboratory Equipment and Safety Guidelines

5
Days

Students will be able to safely use lab equipment and utilize proper technique. To demonstrate this, students will become familiar with laboratory safety guidelines and safely use laboratory equipment (including beaker, graduated cylinder, thermometer, test tube, test tube rack, graduated cylinder, ring stand, iron ring, funnel, burner, and electronic balance) to carry out procedures during experiments.



Unit 2: Principles and Processes of Scientific Study

5
Days

Students will design and carry out controlled experiments. In doing so, students will collect and analyze qualitative and quantitative data by creating and interpreting graphs (line, bar, and circle) and data tables. In designing experiments, students will differentiate between control and experimental groups as well as understand how to identify sources of error in an experiment so as to avoid bias. Relative to scientific research, students will also understand the words "theory" and "law" as used by all scientists.



Unit 3: Making Measurements and the Metric System

10
Days

Students will learn the basic tools of science and decide the appropriate tool to make measurements including length, mass, volume (liquid and geometric), area, density, time, and temperature. Students will use the metric system and explain why universal standards are important in making measurements in science. Students will also convert between metric units (kilo-milli) using the ladder method.



Unit 4: Matter and its Properties

20
Days

Students will recognize the physical and chemical properties of matter in order to classify substances and mixtures. In describing the properties of solids, liquids, gases, and plasma, students will also distinguish the difference between chemical and physical changes. In understanding the Kinetic Theory of Matter, students will explain how temperature changes affect the energy of particles within a sample of matter to predict how a substance will change its physical form. With regard to chemical changes, students will use the Law of Conservation of Mass to explain how matter is conserved. In studying fluids, students will be able to physically demonstrate Archimede's Principle as well as Boyle's and Charles' Laws.



Unit 5: The Atom and The Periodic Table

10
Days

Students will understand the qualitative and quantitative information presented in the Periodic Table and be able to locate elements and identify their properties based on their period and/or group number. In addition, students will be able to calculate the number of subatomic particles in an atom of an element to build a model.



Unit 6: Chemical Bonding and Formula Writing

20
Days

Using knowledge of valence electrons, students will understand the basics of electron sharing and transfer to differentiate between covalent and ionic bonds. Students will be expected to correctly write and name the formulas of both ionic compounds and covalently-bonded molecules.



Unit 7: Laws of Motion

20
Days

Students will be able to define and solve for the following variables: distance, displacement, speed, average speed, velocity, and acceleration. Students will demonstrate Newton's three laws of motion and apply equations to solve word problems pertaining to force and motion. Students will also relate gravity and friction to motion as well as identify the difference between weight and mass.



Unit 8: Energy Systems

15
Days

Students will identify different forms of energy and be able to explain how energy is conserved as stated in the Law of Conservation of Energy. Students will differentiate between potential and kinetic energy and demonstrate how these forms of energy are converted from one form to the other in a moving body.



Unit 9: How Simple Machines Work

15
Days

Students will identify the six simple machines and be able to calculate the mechanical advantage of each. Students will also be able to calculate the work and power associated with a particular task.



Unit 10: Essential Earth and Space Science Ideas

15
Days

Students will be able to identify the processes that form Earth's landmasses and related geologic structures. Students will explain the theory of the formation of the universe; determine how a star's mass affects its life; explain the significance of a star in red/blue shift; explain the "Big Bang" Theory; explain the seasonal cycle; identify the interactions among the Earth, Moon, and Sun; what kinds of evidence exist to support the theory of continental drift; explain how the zones of volcanoes and earthquakes are related to plate tectonics.



Group Projects

Students will complete four major group projects throughout the school year. This year, they are scale model Lego city; science research project; motorized Lego project; and, constructing a cardboard boat. Students will utilize various technologies and encompass many modalities of learning. Objectives vary and are related to math, English, and science.