

## Organization and Content

1. Foundations
  - a. Science as a source of models that explain how the world works rather than settled truth
  - b. Science as a help to obey the creation mandate by exercising dominion in the earth and in so doing, to glorify God and love our fellow man
  - c. Christian and secular definitions of science
  - d. Structure of scientific knowledge
  - e. Methodologies of science
  - f. The nature of matter, including the particle model of matter, the classification of matter, and changes matter undergoes
  - g. Scientific measuring
  - h. Metric system
  - i. Accuracy and precision in measurement
  - j. Significant digits
  - k. Problem-solving
  - l. Scientific notation
2. Mechanics
  - a. Describing motion
  - b. Frames of reference
  - c. Newton's laws of motion
  - d. Gravity
  - e. Free-fall
  - f. Momentum
  - g. Kinetic and potential energy
  - h. Energy transformations and conservation
  - i. Mechanical work, levers and other simple machines
  - j. Law of moments and efficiency
  - k. Fluid mechanics including basic hydraulic theory
  - l. Charles's and Boyle's gas laws
  - m. Thermodynamics—thermal energy, temperature, and heat
3. Electromagnetism
  - a. Static electricity
  - b. Electric fields
  - c. Measuring and storing charges
  - d. Electric current and Ohm's Law
  - e. Batteries
  - f. Electrical safety
  - g. Magnets and magnetism
  - h. Geomagnetism
  - i. AC and DC generators
  - j. Transformers
  - k. Electromagnets and their uses

4. Periodic Phenomena
  - a. Description of periodic motion
  - b. Pendulums
  - c. Waves and wave phenomena
  - d. Sound and its properties
  - e. Infrasound and ultrasound
  - f. The human voice and hearing
  - g. Applications of sound
  - h. Bands of the electromagnetic spectrum
  - i. Radiofrequency technology
  - j. The properties of visible light, the nature of color
  - k. Reflection and mirrors
  - l. Refraction and lenses
5. The Structure of Matter
  - a. Historical development of the atomic model, structure of the atom
  - b. Electron structure of the atom
  - c. Radiation and nuclear changes
  - d. Origin of the periodic table
  - e. Elements and their symbols
  - f. Classification of the elements
  - g. Periodic trends
6. Introduction to Chemistry
  - a. Electronegativity and valence electron structure
  - b. Covalent, ionic, and metallic bonds
  - c. Compounds classified according to bond-type
  - d. Chemical formulas and equations
  - e. Oxidation numbers
  - f. Types of chemical reactions
  - g. Classifying mixtures
  - h. Solutions and the solution process
  - i. Measuring concentration
  - j. Acids, bases
  - k. Salts from acid-base reactions
  - l. pH system and measurement

### **Laboratory**

1. Demonstration, observation, and selected activities