

Exploration Education Intermediate Physical Science (Grades 5-8)

Class description:

This hands-on class encompasses the general principles of physical science. Using the text and lab activities, students study forces, machines, motion, energy, electricity, magnetism, sound, light. Students will also study general chemistry concepts including the structure of matter, the periodic table, chemical bonds and reactions, mixtures and compounds. Throughout this course, students discover the relationship between science and daily life. The students will gain a firm understanding of the scientific method as they work through the experiments.

Learning Materials: Main Curriculum:
Exploration Education Intermediate Physical Science

POSSIBLE Supplemental materials:
Elenco Snap Circuits Green: Alternative Energy Kit
Naked Eggs and Flying Potatoes Science Experiments
Educational Insights Geosafari Motorized Solar System
Volcano Making Kit

Learning Goals/Performance Objectives: 1.1.1 Understand how to use physical and chemical properties to sort and identify substances.

1.1.3 Understand sound waves, water waves, and light waves using wave properties, including amplitude, wavelength, and speed. Understand wave behaviors, including reflection, refraction, transmission, and absorption.

1.1.4 Understand that energy is a property of matter, objects, and systems and comes in many forms (i.e., heat [thermal] energy, sound energy, light energy, electrical energy, kinetic energy, potential energy, and chemical energy).

1.2.2 Understand how various factors affect energy transfers and that energy can be transformed from one form of energy to another.

1.2.3 Understand that all matter is made of particles called atoms and that atoms may combine to form molecules and that atoms and molecules can form mixtures.

2.1.2 Understand how to plan and conduct scientific investigations.

2.1.3 Apply understanding of how to construct a scientific explanation using evidence and inferential logic.

Learning Activities: The student will complete one full lesson each week, for a total of 36 lessons. Every lesson has an experiment or activity that allows the student to experience and apply the information.

Table of Contents

Section I: Forces & Motion

Ch. 1: Science and Forces

Ch. 2: Forces in our World

Ch. 3: Mass, Inertia, Speed, and Velocity

Ch. 4: Forces in Motion

Ch. 5: Pressure, Density, and Buoyancy

Section II: Machines and Energy

Ch. 6: Measurement, Work, and Power

Ch. 7: Machines

Ch. 8: Compound Machines

Ch. 9: Energy & its forms

Section III: Electricity

Ch. 10: Electricity, Electrons, & Current

Ch. 11: Static Electricity, Conductors, & Insulators

Ch. 12: Circuits & Resistors

Ch. 13: Resistance, Voltage, & Switches
Ch. 14: Fuses & Sources of Electricity
Section IV: Magnetism
Ch. 15: Magnets, Poles, & Fields
Ch. 16: Compasses, Mapping, & Electromagnets
Ch. 17: Magnets, Motors & Generators
Ch. 18: Motors and DC Current
Section V: Chemistry: matter
Ch. 19: Chemistry and Matter
Ch. 20: Mass, Elements, and the Periodic Table
Ch. 21: Molecules & Movement
Ch. 22: Physical and Chemical Properties
Section VI: Mixtures & Compounds
Ch. 23: Mixtures & Molecules
Ch. 24: Compounds, PH & Salts
Ch. 25: Crystals & Chemical Bonds
Ch. 26: Chemical Reactions
Ch. 27: The Results of Reactions
Section VII: Sound
Ch. 28: Sound
Ch. 29: Pitch & Sound Waves
Ch. 30: Speed & Direction of Sound
Ch. 31: Electricity & Sound
Section VIII: Light
Ch. 32: Light & Photons
Ch. 33: Light Sources & their Affects
Ch. 34: Reflecting & Bending Light
Ch. 35: Colors, Prisms, & Types of Light
Ch. 36: Optics

Progress Criteria/Methods of Evaluation: Student will demonstrate comprehension and knowledge by completing follow-up questions after every lesson. Student will also complete experiments or activities. There are vocabulary quizzes and four quarter exams. For successful completion of this course, the student will complete at least 70% of the lessons/goals, at a minimum of 70% accuracy, following the timeline below.

Timeline:

Sept: Lessons 1-4
Oct: Lessons 5-9
Nov: Lessons 10-12
Dec: Lessons 13-15
Jan: Lessons 16-20
Feb: Lessons 21-23
Mar: Lessons 24-27
April: Lessons 28-30
May: Lessons 31-34
June: Lessons 35-36