



Science Benchmark Achievements Elementary Science

Ages 8-12

The First Day: Light and Physics

Objectives at this age:

Begin student-created science textbooks for light and physics

Discover the why and how behind God's creations

Introduction to basic science concepts and vocabulary

Introduction to famous scientists including Albert Einstein, Isaac Newton, Galileo

Galilei, Lord Kelvin, Michael Faraday, Nicolaus Copernicus

Beginning at age 8, children will begin creating a science textbook for each of the scientific disciplines. Even though the textbooks will not be completed until their senior years, students are encouraged to prepare a physics journal at this age to begin recording and illustrating their discoveries.

Light and Physics

- Reflecting light
- The colors in light
- Primary colors
- Reflecting and absorbing colors
- The light you do not see (infrared and ultraviolet light)
- Terms: Opaque, transparent, translucent
- Refraction and magnification
- Lenses: magnifying glass, telescope, camera
- Energy: Light and energy
- Physics and Motion: Newton's First Law of Motion - Inertia
- Physics and Motion: Newton's Second Law of Motion – Force, speed, direction
- Concept of speed: $\text{Speed} = \text{Distance}/\text{Time}$
- Concept of work: $\text{Work} = \text{Force} \times \text{Distance}$
- Concept of power: $\text{Power} = \text{Work}/\text{Time}$
- Physics and Motion: Newton's Third Law of Motion – Equal and opposite reactions
- Physics and Energy: Friction
- Physics: Gravity
- Physics: Potential and Kinetic Energy

- Physics: Simple machines
- Six simple machines (inclined and twisting planes, wedges, levers, pulleys, wheels and axles, and gears)
- Physics: Power (wind, water, atomic, nuclear, fossil fuels, mechanical motion)
- Physics: Chemical and Electrical energy
- Physics: Thermal energy
- The laws of thermodynamics
- Convection and conduction
- Insulators
- Combustion
- Thermometers: Fahrenheit, Celsius, Kelvin
- Physics: The law of energy conservation
- Physics: Magnetism and Electromagnets
- North and south poles
- Electrifying magnets
- Sound: Sound waves and speed
- Sound: Vibration and pitch
- Sound: How sound travels through different substances
- Electricity: Static electricity
- Electricity: Electrical currents
- Electricity: Electrical circuits – open and closed
- Electricity: Power plants
- Electricity: Conductors and Insulators
- Electricity: Rules for safety