



You and How Things Work

In this world, students learn about physics, chemistry, and associated topics, like heat, light, sound, electricity, and magnetism. Your students will also explore the properties and characteristics of matter and be introduced to scientific practices.

Grades K-1

Grade 5

Grade 2

Grade 6

Grade 3

Grade 7

Grade 4

Grade 8

You and How Things Work - Curriculum Guide

Grades K-1					
Curriculum Themes:	Properties of an Object		Properties of Energy		Position & Force
Theme Topics:	how to recognize and describe physical properties; states of matter; making scientific observations and predictions		types of energy and how they act on different substances; characteristics of heat, light, and sound		ways to locate objects by describing their positions; types of forces; how a force can affect an object's position
Key Terms:	property, size, temperature, color, shape, matter, gas, liquid, solid, material, observe, predict		energy, heat, light, sound, vibration, pitch, wave, melt, freeze		position, location, motion, rest, force, push, pull, direction, balance, stable, pattern, magnetism, attract, repel
Additional Learning: Vocabulary Skill & Drill	• Comprehensive multiple-choice quiz with vocabulary drawn from the How Things Work curriculum				
Additional Learning: Math Skill & Drill	• Counting Numbers: skip counting with whole numbers	• Counting Money: identifying and counting coins	• Solving Equations: arithmetic (addition, subtraction)		• Shapes: 2D and 3D Shapes

Grade 2

Curriculum Themes:	Properties of an Object	Properties of Energy	Position & Force
Theme Topics:	how to recognize and describe physical properties; states of matter; making scientific observations and predictions	types of energy and how they act on different substances; characteristics of heat, light, and sound	ways to locate objects by describing their positions; types of forces; how a force can affect an object's position
Key Terms:	property, size, temperature, color, shape, matter, gas, liquid, solid, material, observe, predict	energy, heat, light, sound, vibration, pitch, wave, melt, freeze	position, location, motion, rest, force, push, pull, direction, balance, stable, pattern, magnetism, attract, repel
Additional Learning: Vocabulary Skill & Drill	• Comprehensive multiple-choice quiz with vocabulary drawn from the How Things Work curriculum		
Additional Learning: Math Skill & Drill	• Counting Numbers: skip counting with whole numbers	• Counting Money: identifying and counting coins	• Solving Equations: arithmetic (addition, subtraction, multiplication, division) • Shapes: 2D and 3D shapes, shapes of everyday objects, symmetrical vs. asymmetrical

Grade 3				
Curriculum Themes:	Properties of an Object		Properties of Energy	Position & Force
Theme Topics:	identifying states of matter and their properties; making scientific observations; different types of measurements		characteristics of heat, light & sound; how heat, light & sound energy act on different materials; introduction to kinetic and potential energy	the relationship between force and motion; examples of different pushing and pulling forces; introduction to simple machines
Key Terms:	opaque, translucent, transparent, shadow, compare, contrast, matter, particle, identify, observe, volume, weight		heat, thermal, light, sound, electricity, current, static, vibration, wave	magnetism, attract, repel, voltage, motion, rotate, axis, speed, direction, friction, balance, counterbalance, stable, gravity
Additional Learning: Vocabulary Skill & Drill	Comprehensive multiple-choice quiz with vocabulary drawn from the How Things Work curriculum			
Additional Learning: Math Skill & Drill	Counting Numbers: skip counting with whole numbers	Counting Money: identifying and counting coins and bills	Solving Equations: arithmetic (addition, subtraction, multiplication, division)	Shapes: 2D and 3D shapes, shapes of everyday objects, symmetry, identifying triangles, identifying lines

Grade 4

Curriculum Themes:	Properties of an Object		Properties of Energy	Position & Force
Theme Topics:	identifying states of matter and their properties; how the characteristics of an object can affect its ability to transfer energy; physical and chemical changes; steps of the scientific process; different types of measurements		characteristics of heat, light & sound; how heat, light & sound energy act on different materials; introduction to kinetic and potential energy; types of electricity and introduction to electrical circuits	the relationship between force and motion; properties of magnetism and how magnetic forces act on different objects; types of simple machines and identifying everyday examples of them
Key Terms:	opaque, translucent, transparent, insulator, conductor, hypothesis, experiment, compare, contrast, identify, observe, volume, weight, density		heat, thermal, light, sound, electricity, current, static, vibration, wave, circuit	magnetic field, electromagnet, voltage, motion, rotate, axis, speed, direction, friction, balance, counterbalance, stable, gravity, lever, pulley, inclined plane, wheel and axle, wedge, screw
Additional Learning: Vocabulary Skill & Drill	• Comprehensive multiple-choice quiz with vocabulary drawn from the How Things Work curriculum			
Additional Learning: Math Skill & Drill	• Counting Numbers: skip counting with whole numbers and decimals	• Counting Money: identifying and counting coins and bills	• Solving Equations: arithmetic and algebra (addition, subtraction, multiplication, division)	• Shapes: 2D and 3D shapes; triangles and quadrilaterals; identifying lines; symmetry

Grade 5

Curriculum Themes:	Properties of an Object	Properties of Energy	Position & Force
Theme Topics:	identifying states of matter and their properties; the composition of matter and structure of an atom; properties of solvents, solutes & solutions and everyday examples; how to read the periodic table; characteristics of different elements	how energy can be transferred and converted; movement and properties of thermal, sound, and light waves; visible light and characteristics of the electromagnetic spectrum; types of light and light sources	the relationship between force, mass, and motion; scientific methods of observing and measuring motion; identifying different types of motion; understanding simple machines and how they function
Key Terms:	atom, mass, density, volume, temperature, reversible, irreversible, proton, neutron, electron, element, compound, molecule, mixture, metal, nonmetal, metalloid	medium, reflection, refraction, absorb, convert, transfer, conduction, convection, radiation, vibration, pitch, frequency, wavelength, crest, trough, ray, incandescent, bioluminescence	momentum, resistance, friction, velocity, speed, acceleration, deceleration, horizontal, vertical, projectile, inertia, fulcrum, lever, pulley, inclined plane, wheel and axle, wedge, screw
Additional Learning: Vocabulary Skill & Drill	Comprehensive multiple-choice quiz with vocabulary drawn from the How Things Work curriculum		
Additional Learning: Math Skill & Drill	Counting Numbers: skip counting with whole numbers and decimals	Counting Money: identifying and counting coins and bills	Solving Equations: arithmetic and algebra (addition, subtraction, multiplication, division) Shapes: 2D and 3D shapes; triangles and quadrilaterals; identifying lines; symmetry

Grade 6

Curriculum Themes:	Properties of an Object	Properties of Energy	Position & Force
Theme Topics:	identifying states of matter and their properties; the composition of matter and structure of an atom; properties of solvents, solutes & solutions and everyday examples; how to read the periodic table; characteristics of different elements	how energy can be transferred and converted; movement and properties of thermal, sound, and light waves; visible light and characteristics of the electromagnetic spectrum; types of light and light sources	the relationship between force, mass, and motion; scientific methods of observing and measuring motion; identifying different types of motion; understanding simple machines and how they function
Key Terms:	atom, mass, density, volume, temperature, reversible, irreversible, proton, neutron, electron, element, compound, molecule, mixture, metal, nonmetal, metalloid	medium, reflection, refraction, absorb, convert, transfer, conduction, convection, radiation, vibration, pitch, frequency, wavelength, crest, trough, ray, incandescent, bioluminescence	momentum, resistance, friction, velocity, speed, acceleration, deceleration, horizontal, vertical, projectile, inertia, fulcrum, lever, pulley, inclined plane, wheel and axle, wedge, screw
Additional Learning: Vocabulary Skill & Drill	Comprehensive multiple-choice quiz with vocabulary drawn from the How Things Work curriculum		
Additional Learning: Math Skill & Drill	Counting Numbers: skip counting with whole numbers and decimals	Counting Money: identifying and counting coins and bills	Solving Equations: arithmetic and algebra (addition, subtraction, multiplication, division) Shapes: 2D and 3D shapes; triangles and quadrilaterals; identifying lines; symmetry

Grade 7

Curriculum Themes:	Properties of an Object	Properties of Energy	Position & Force
Theme Topics:	the structure of an atom; characteristics of protons, neutrons & electrons; types of reversible and irreversible changes; identifying states of matter and their properties; the pH scale and examples of acidic, basic, and neutral compounds; the periodic table and characteristics of elements in different groups	how energy can be transferred and converted; the three laws of thermodynamics; types of electricity and electrical circuits; properties of light and the electromagnetic spectrum; how to measure light and sound waves; types of mechanical energy (potential vs. kinetic)	the relationship between force and motion; introduction to the laws of motion; examples of contact and non-contact forces; identifying simple machines and how they affect the force required to do work
Key Terms:	atom, molecule, element, compound, particle, proton, neutron, electron, ion, anion, cation, nucleus, temperature, boiling point, freezing point, condensation point, melting point, absolute zero, acidic, basic, neutral	convert, transfer, conduct, transformer, renewable, nonrenewable, battery, terminal, circuit, reflection, refraction, ray, incidence, magnify, diminish, distort, invert, frequency, wavelength, crest, trough, amplitude	momentum, resistance, velocity, speed, acceleration, balance, equilibrium, inertia, buoyancy, gravity, magnetism, friction, collision, dynamic, static, projectile, fulcrum, lever, pulley, inclined plane, wheel and axle, wedge, screw
Additional Learning: Vocabulary Skill & Drill	Comprehensive multiple-choice quiz with vocabulary drawn from the How Things Work curriculum		
Additional Learning: Math Skill & Drill	Counting Numbers: skip counting with whole numbers and decimals	Counting Money: identifying and counting coins and bills	Solving Equations: arithmetic and algebra (addition, subtraction, multiplication, division) Shapes: 2D and 3D shapes; triangles and quadrilaterals; identifying lines; symmetry

Grade 8				
Curriculum Themes:	Properties of an Object		Properties of Energy	Position & Force
Theme Topics:	the structure of an atom; characteristics of protons, neutrons & electrons; types of reversible and irreversible changes; identifying states of matter and their properties; the pH scale and examples of acidic, basic, and neutral compounds; the periodic table and characteristics of elements in different groups		how energy can be transferred and converted; the three laws of thermodynamics; types of electricity and electrical circuits; properties of light and the electromagnetic spectrum; how to measure light and sound waves; types of mechanical energy (potential vs. kinetic)	the relationship between force and motion; introduction to the laws of motion; examples of contact and non-contact forces; identifying simple machines and how they affect the force required to do work
Key Terms:	atom, molecule, element, compound, particle, proton, neutron, electron, ion, anion, cation, nucleus, temperature, boiling point, freezing point, condensation point, melting point, absolute zero, acidic, basic, neutral		convert, transfer, conduct, transformer, renewable, nonrenewable, battery, terminal, circuit, reflection, refraction, ray, incidence, magnify, diminish, distort, invert, frequency, wavelength, crest, trough, amplitude	momentum, resistance, velocity, speed, acceleration, balance, equilibrium, inertia, buoyancy, gravity, magnetism, friction, collision, dynamic, static, projectile, fulcrum, lever, pulley, inclined plane, wheel and axle, wedge, screw
Additional Learning: Vocabulary Skill & Drill	Comprehensive multiple-choice quiz with vocabulary drawn from the How Things Work curriculum			
Additional Learning: Math Skill & Drill	Counting Numbers: skip counting with whole numbers and decimals	Counting Money: identifying and counting coins and bills	Solving Equations: arithmetic and algebra (addition, subtraction, multiplication, division)	Shapes: 2D and 3D shapes; triangles and quadrilaterals; identifying lines; symmetry