Physics Syllabus

Unit 1: Energy, Force and Work

Day 1:	Orientation and Beginning Activities
Day 2-3:	Lab 1-1: What is Physics
Day 4:	Lab 1-2: Properties of Matter/Changes in Matter
Day 5:	Lab 1-3
	Lecture 1-1: Forms of Energy
Day 6:	Lecture 1-2: Sources of Energy
	Lecture 1-3: Transferring Energy
Day 7:	Lecture 1-4
Day 8:	Lab 1-4: Elastic and Kinetic Energy
Day 9:	Post-Lab on Lab 1-4
Day 10:	Lecture 1-5a
Day 11:	Lab 1-5: Work and Energy
Day 12:	Lab 1-6: Inertia and Force
Day 13:	Lab 1-7
	Lecture 1-5b
Day 14:	Lab 1-8: Mass and Acceleration
Day 15:	Lab 1-9: Force, Mass, and Acceleration
Day 16:	Lab 1-10: Force and Acceleration
Day 17:	Lab 1-11: Action and Reaction
Day 18:	Essays
Day 19:	Student Presentations
Day 20-23:	Performance Assessment: Balloon Car
Day 24:	Give Assessment #1

Unit 2: Force, Acceleration, and Velocity

Day 1:	Lecture 2-1: Energy and Motion
	Lab 2-1
Day 2:	Lecture 2-2: Energy and Forces in Uniformly Accelerated Motion
	Lab 2-2: Force, Energy, and Acceleration
Day 3:	Lab 2-3: Interpreting Graphs
Day 4:	Lecture 2-3: Describing Motion: Words, Tables, Graphs and Equations
Day 5-6	Lab 2-4: Creating Graphs
Day 7:	Lab 2-5: Graphing Relationships
Day 8-9:	Do Lab 2-6: The Paper Helicopter
	Lecture 2-4: Linear and Rotational Motion
Day 10-11:	Do Lab 2-7: Ramp and Ball: Uniform Motion
	Lecture 2-5: Describing Uniform Motion
Day 12-13:	Lab 2-8: Ramp and Ball: Uniformly Accelerated Motion
	Graphic Organizer
Day 14:	Lecture 2-6: Describing Accelerated Motion
Day 15:	Lab 2-9: Constant Speed in a Straight Line
Day 16:	Lab 2-10: Linear and Rotational Kinetic Energy
Day 17:	Lab 2-11: Graphing Uniform Motion
Day 18:	Lab 2-12: Graphing Uniformly Accelerated Motion
Day 19-20:	Lab 2-13: Acceleration of a Falling Ball
Day 21-22:	Lab 2-14: Bouncing a Ball
	Lecture 2-7: Elastic Potential Energy
Day 23:	Lab 2-15: Elasticity
Day 24:	Lab 2-16: Force and Uniform Motion
Day 25:	Lecture 2-8
Day 26-27:	Lab 2-17: Force and Accelerated Motion
Day 28-29:	Lab 2-18: Mass and Accelerated Motion
	Lecture 2-9: Newton's Second Law
Day 30-33:	Lab 2-19: Graphs of Uniformly Accelerated Motion
Day 34:	Lab 2-20: Equations of Uniformly Accelerated Motion
Day 35-36:	Lecture 2-10: Projectile Motion
Day 37-38:	Lab 2-21, Mousetrap Catapult
Day 39-41:	Lab 2-22: Launching Horizontal Projectiles
	Lab 2-23: Projectile Motion
Day 42:	Lecture 2-11: Horizontal Projectile Motion
	Lab 2-24: Range of Projectiles
Day 43-44:	Lab 2-25: Launching Projectiles at an Angle
Day 45-46:	Lab 2-26: Constant Velocity on an Inclined Plane
	Lab 2-27: Accelerated Motion on an Inclined Plane
Day 47:	Give Assessment #2

Unit 3: Conservation Laws: Energy and Momentum

Day 1:	Lecture 3-1: Energy Transformations and Conservation of Energy
	Lab 3-1: Conservation of Energy
Day 2:	Lecture 3-2: Collisions: Elastic and Inelastic
	Do Lab 3-2: Conservation of Kinetic Energy
Day 3:	Lecture 3-3: Momentum and Impulse
	Do Lab 3-3: Momentum, Impulse, Force, and Acceleration
Day 4:	Lecture 3-4: The Big Picture
Day 5:	Lab 3-5: The Big Picture: Adding Motion
Day 6:	Lab 3-6: The Big Picture: Adding Energy
Day 7-8:	Lab 3-7: Collisions with High Bounce Balls
Day 9-10:	Lab 3-8: Collisions with Different Materials
Day 11:	Lab 3-9: Impulse-Momentum Theorem
Day 12:	Lecture 3-5: Conservation of Momentum
	Lab 3-10: Conservation of Momentum
Day 13-14:	Lab 3-11: Work, Force, and Energy in Simple Machines
Day 15:	Lecture 3-6: Mechanical Advantage: Making Work Easier
	Lab 3-12: Mechanical Advantage in Simple Machines
Day 16-17:	Lab 3-13: Work and Power in Simple Machines
Day 18:	Lecture 3-7: Work and Power
	Lab 3-14: Work and Power in Simple Machines
Day 19-20:	Lab 3-15: Work and Efficiency in Simple Machines
Day 21:	Lecture 3-7: Efficiency
	Lab 3-16: Efficiency
Day 22-26:	Performance Assessment: Roller Coasters
	Lab 3-17: Potential + Kinetic Energy for a Falling Body
	Lab 3-18: Potential + Kinetic Energy for a Rolling Body
	Lab 3-19: Kinetic Energy Needed to “Loop the Loop”
	Lab 3-20: Fall Paths
Day 27:	Give Assessment #3

Unit 4: Heat and Matter

Day 1-2:	Lab 4-1: Radiation
Day 3-4:	Do Lab 4-2: Conduction
Day 4-6:	Do Lab 4-3: Convection
Day 7:	Lecture 4-2: Radiation, Conduction, Convection
Day 8:	Lab 4-4: Temperature and Temperature Scales
Day 9-10:	Lab 4-5: Heat Insulators
Day 11:	Lab 4-6: Heat and Temperature
	Lecture 4-1: Temperature and Matter
	Lecture 4-4: Heat Capacity
Day 12:	Lab 4-7: Heat and Work
Day 13:	Lab 4-8: Entropy
	Lab 4-9: Latent Heat
Day 14-15:	Lab 4-10: Heating Water
Day 16-17:	Lab 4-11: Heating and Cooling Curves
Day 18:	Assessment #4

Unit 5: Periodic Motions: Vibrations and Waves

Day 1:	Lecture 5-1: Properties of Vibrations and Waves
	Lecture 5-2: Examples of Vibrations and Waves
Day 2-3:	Lab 5-1: Hooke's Law
Day 4-5:	Lecture 5-4: Elasticity
	Lab 5-2: Mass on a Spring
Day 6-7:	Lab 5-3: The Pendulum
	Lecture 5-3: Periodic Motion: Vibrations
Day 8-9:	Lab 5-4: Periodic Motion: Period and Frequency
	Lab 5-5: Circular Motion
Day 10:	Lab 5-6: Energy in Periodic Motion
	Lecture 5-5: Comparing Waves and Vibrations
Day 11-12:	Lab 5-7: Wavelength and Velocity
Day 13:	Lecture 5-6: Wave Velocity in a Medium
	Lab 5-8: Wavelength and Wave Velocity
Day 14-16:	Lab 5-9: Wave Transmission and Reflection
	Lecture 5-7: Wave Interactions with Boundaries
	Lab 5-10: Waves at a Boundary
Day 17-19:	Lab 5-11: Standing Waves and Resonance
	Lecture 5-8: Superposition
	Lab 5-12: Interactions of Waves
Day 20-21:	Lab 5-13: Focal Length
	Lab 5-15: Magnification
Day 22-23:	Lab 5-14: Images: Erect and Inverted, Real and Virtual
Day 24:	Lecture 5-9: Focusing on Light
	Lab 5-16: Tracing Light
Day 25:	Lecture 5-10: Bending Light
	Lab 5-17: Refraction of Light
Day 26-27:	Lab 5-18: Diffraction of Light
Day 28-29:	Lab 5-19: The Colors of Light
Day 30:	Lab 5-20: The Colors of Pigment
	Lecture 5-11: Seeing Light
	Lecture 5-12: The Electromagnetic Spectrum
	Lab 5-21: Radiation
Day 31:	Lecture 5-13: Speed of Sound
	Lecture 5-14: The Doppler Effect
Days 32-34:	Performance Assessment
	Lab 5-22: Speed of Sound in Air
	Lab 5-23: Resonance of Sound
Day 30:	Assessment #5

Unit 6: Fields: Electrical, Magnetic and Gravitational

Day 1:	Lecture 6-1: Properties of Fields
	Lecture 6-2: Examples of Fields
Day 2:	Lab 6-1: Gravitational Potential Energy
	Lab 6-2: Satellite Orbits
Day 3:	Lecture 6-3: Electric Fields
	Lab 6-3: Electric Fields
Day 4-5:	Lab 6-4: Mapping Electric Fields
	Lab 6-5: Electric and Magnetic Fields
	Lecture 6-6: Power in a Field
Day 6-7:	Lab 6-6: Flow in a Gravitational Field
Day 8-9:	Lab 6-7: Flow in an Electrical Field
	Lecture 6-4: Magnitude and Direction of Electric and Magnetic Fields
Day 10:	Lecture 6-5: Flow in a Field
	Lab 6-8: Electromagnetic Flow
Day 11-12:	Lab 6-9: The Flashlight
	Lecture 6-7: Series Circuits
Day 13-14:	Lab 6-10: Holiday Lights
	Lecture 6-8: Parallel Circuits
	Lecture 6-9: Watts and Ohm's Laws
Day 16-17:	Lab 6-11: The Electromagnet
Day 18-19:	Lab 6-12: Motors and Generators
Day 20-21:	Lab 6-13: Electromagnetic Field Detector
Day 22-24:	Lecture 6-10: Overview of Modern Physics
	Lecture 6-11: The Quantum Hypothesis
	Lecture 6-12: Two Theories of Light
	Lecture 6-13: Emission Spectrum of the Atom
Day 25:	Assessment #6