

Pecos High School
11-12 Physics
1st Six Weeks Syllabus

Student Expectations: The students will develop an understanding of the scientific method, accuracy and precision. The students will make calculations using significant figures.

August 24 - 28: Lab:

Measurement Lab

Vocabulary:

Physics

Scientific method

Model

System

Hypothesis

Controlled experiment

SI Units

Accuracy

Precision

Significant figures

Student Expectations: Students will understand, calculate, and graph average velocity.

August 31 – September 4:

Lab: Distance and average speed

Vocabulary:

Displacement

Velocity

Average velocity

Instantaneous velocity

Student Expectations: Students will understand, calculate and graph average acceleration.

September 8 - 11:

Lab: Acceleration = Velocity/time

Vocabulary:

Acceleration

Average acceleration

Direction

Magnitude

Student Expectations: Students will understand and calculate free fall velocity.

September 14 - 18:

Lab: Free fall speed; Bomb's Away

Vocabulary:

Free fall

Acceleration due to gravity

Student Expectations: Students will understand and calculate scalars, vectors, and resultants.

September 21 - 25:

Lab: Finding resultant magnitude and direction

Vocabulary:

Scalar

Vector

Resultant

Components

Student Expectations: Review for 1st Six Week's Test. Students will understand projectile motion, and relative motion.

September 28 – October 2:

Lab: Velocity of a Projectile

Vocabulary:

Projectile motion

Parabolic trajectories

Relative motion

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11-12 Physics
2nd Six Weeks Syllabus

Student Expectations: Students will know, understand, make calculations with and conduct lab experiments using Newton's First Law of Motion.

October 5 - 9: Lab:

Lab: Matchbox Magic

Vocabulary:

Force

Newton

Contact forces

Field forces

Force diagrams

Newton's first law of motion

Inertia

Net external force

Student Expectations: Students will know, understand, make calculations with and conduct lab experiments using Newton's Second and Third Laws of Motion.

October 12 - 16:

Lab: Collision

Vocabulary:

Newton's second Law

Newton's third law

Action-reaction pair

Student Expectations: Students will understand and conduct labs with friction.

October 19 - 23:

Lab: Overcoming Friction

Vocabulary:

Weight

Normal force

Static friction

Kinetic friction

Coefficient of friction

Air resistance

Student Expectations: Students will understand and conduct labs using the Law of Conservation of Energy.

October 26 - 30:

Lab: Exploring Work and Energy

Vocabulary:

Work

Kinetic energy

Potential energy

Gravitational potential energy

Elastic potential energy

Mechanical energy

Power

Conservation of energy

Student Expectations: Students will understand and conduct labs using the Law of Conservation of Momentum.

November 2 - 8:

Lab: Conservation of Momentum

Vocabulary:

Momentum

Impulse

Law of Conservation of momentum

Perfectly inelastic

Elastic collision

Student Expectations: Review for 2nd Six Week's Test. Students will understand and conduct labs with rotational motion.

November 9 - 13:

Lab: Circular Motion

Vocabulary:

Rotational motion

Radians

Angular displacement

Angular speed

Angular acceleration

Tangential speeds

Tangential acceleration

Centripetal acceleration

Gravitational force

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3rd Six Weeks Syllabus

Student Expectations: Students will understand Thermal equilibrium.

November 16 – 20 and the 23:

Lab: Temperature and Internal heat

Internal energy

Thermal equilibrium

Heat

Calorimetry

Phase changes

Heat of vaporization

Latent heat

Heat of fusion

Thermal conduction

Student Expectations: Students will understand the first law of thermodynamics and entropy.

November 30 – December 4:

Activity: The first law of thermodynamics

System

Environment

Isovolumetric

Isothermal process

Adiabatic

Cyclic process

Efficiency

Entropy

Student Expectations: Students will understand simple harmonic motion.

December 7 - 11:

Lab: Energy of a pendulum

Hooke's Law

Simple harmonic motion

Amplitude

Frequency

Period

Medium

Mechanical waves

Pulse wave

Periodic wave

Transverse wave

Crest

Trough

Wavelength

Longitudinal wave

Constructive interference

Destructive interference

Standing wave

Nodes

Antinodes

Student Expectations:

December 14 - 18: Students will understand resonance and sound.

Lab: Resonance and the nature of sound

Compression

Rarefaction

Pitch

Doppler effect

Decibel level

Resonance

Fundamental frequency

Student Expectations: Students will understand the behavior of light and reflections.

January 4 - 8:

Lab: light and mirrors

Lab: curved mirrors

Lab: polarization of sunlight

Harmonic series

Timbre

Beat

intensity

Angle of incidence

Angle of reflection

Concave spherical mirror

Convex spherical mirror

Student Expectations: Review for Semester Test. Students will understand the nature of Electromagnetic waves.

January 11 - 15:

Activity: Electromagnetic waves

Electromagnetic wave

Linear polarization

Real image

Reflection

Virtual image

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11-12 Physics
4th Six Weeks Syllabus

<p><u>Student Expectations:</u> Students will understand refraction, dispersion, index of refraction.</p> <p><u>January 19 - 22:</u> Lab: refraction and lenses</p> <p>Chromatic aberration Critical angle Dispersion Index of refraction Lens refraction Total internal reflection</p>
<p><u>Student Expectations:</u> Students will understand diffraction and be able to use a laser in a lab safely.</p> <p><u>January 25 - 29:</u> Lab: diffraction</p> <p>Coherence Diffraction Laser Order number Path difference Resolving power</p>
<p><u>Student Expectations:</u> Students will understand how an electric field works. Students will understand charges and electrostatics.</p> <p><u>February 1 - 5:</u> Lab: charges and electrostatics</p> <p>Conductor Electric field Electric field lines Induction insulator</p>
<p><u>Student Expectations:</u> Students will understand the relationship between capacitance and electrical energy.</p> <p><u>February 8 - 12:</u> Lab: capacitance and electrical energy</p> <p>Capacitance Electric potential Electrical potential energy Potential difference</p>
<p><u>Student Expectations:</u> Students will understand the relationship between current and resistance.</p> <p><u>February 16 - 19:</u> Lab: current and resistance</p> <p>Current Drift velocity Resistance superconductor</p>
<p><u>Student Expectations:</u> Review for 4th 6 weeks test. Students will understand the relationship between current, resistance, and voltage (Ohm's Law)</p> <p><u>February 22 - 26:</u> Lab: energy use in home appliances</p> <p>Current Drift velocity Resistance</p>

superconductor

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5th Six Weeks Syllabus

Student Expectations: Students will build series and parallel circuits. Students will calculate and measure current, voltage, and resistance in a circuit.

March 1 - 5: Lab: Exploring circuit elements

Electric circuit
Emf
Parallel
Schematic diagram
series

Student Expectations: Students will understand a magnetic field and the relationship to magnetism and electricity.

March 8 - 12: Lab: resistors in series and in parallel

Domain
Magnetic field
solenoid

Student Expectations: Students will build an electromagnet. Students will calculate the force on a current carrying conductor.

March 22 - 26: Lab: electromagnetism

Lab: magnetic field of a conducting wire
Domain
Magnetic field
solenoid

Student Expectations: Students will understand the difference between alternating current and direct current. Students will understand the concept of electromagnetic induction.

March 29 – April 1: Lab: Electricity and magnetism

Lab: electromagnetic induction
Alternating current
Back emf
Electromagnetic induction
Generator
Mutual inductance
Rms current
Self-induction
Transformer

Student Expectations: Students will understand the photoelectric effect and the ultraviolet catastrophe.

April 5 - 9: Lab: The photoelectric effect

Absorption spectrum
Blackbody radiation
Compton shift
Emission spectrum
Photoelectric effect
Photon
ultraviolet catastrophe
uncertainty principle
work function

Student Expectations: Review for 5th 6 weeks test. Students will understand the photoelectric effect and the ultraviolet catastrophe.

April 12 - 16:

Absorption spectrum

Blackbody radiation

Compton shift

Emission spectrum

Photoelectric effect

Photon

ultraviolet catastrophe

uncertainty principle

work function

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6th Six Weeks Syllabus

Student Expectations: Students will understand the relationship between resistors and diodes. Students will understand valence electrons in their excited state.

April 19 - 23: Lab: resistors and diodes

Band
Diode
Doping
Excited state
Ground state
Hole
Transistor
Valence electrons

Student Expectations: Students will understand Half-life and strong force.

April 26 - 30: Lab: Half Life

Activity: Binding Energy
Binding energy
Half-life
Isotope
Strong force

Student Expectations: Students will understand Nuclear decay and will make calculations based on half-life.

May 3 - 7: Activity: Nuclear Decay

Activity: Measuring Nuclear decay
Ground state
Hole
Transistor
Valence electrons
Binding energy
Half-life
Isotope
Strong force

Student Expectations: Students will understand circular motion. Students will understand how gravitational force and centripetal acceleration keep the moon orbiting the earth.

May 10 - 14: Lab: circular motion

Angular acceleration
Angular displacement
Angular speed
Centripetal acceleration
Gravitational force
Radian
Rotational motion
Tangential acceleration
Tangential speed

Student Expectations: Students will calculate angular acceleration. Students will understand centripetal acceleration.

May 17 - 21: Activity: Angular acceleration

Angular acceleration
Angular displacement

Angular speed
Centripetal acceleration
Gravitational force
Radian
Rotational motion
Tangential acceleration
Tangential speed

Student Expectations: Prepare for Semester Exam. Students will do activities with angular momentum and torque.

May 24 - 28: Lab: finding the center of mass experimentally

Activity: Torque

Angular momentum

Center of mass

Lever arm

Moment of inertia

Rotational kinetic energy

torque