

**REGENTS PHYSICS UNIT PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT ONE	<i>PHYSICS AND THE METHODS OF SCIENCE</i>
ESSENTIAL QUESTION	<i>What are the investigative tools that scientists use to describe physical phenomena?</i>
SCIENTIFIC THINKING / PROCESS SKILLS	<i>Use scientific inquiry, process skills, and technology to complete an experiment and additional study.</i>
CONTENT	<i>Standard 1-M1.1, M2.1, S3.1. Standard 6-3.2, PS 4.1c, PS 5.2c, 2.1 5.1a</i>
ACADEMIC VOCABULARY	<i>Physics, Scientific Method, Hypothesis, Fact, Principle, Law, Principle, Mass, Weight, Volume, Density, Vector, Scalar, Force, Motion, Metric System</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • <i>Explain why physics is the basic science</i> • <i>Outline scientific methods</i> • <i>Distinguish among observations, facts, hypotheses, laws, and principles</i> • <i>Describe circumstances under which a hypothesis or law must be changed or abandoned</i> • <i>Distinguish between the everyday meaning and the scientific meaning of theory and explain why the refinement of theories is a strength in science</i> • <i>Distinguish between a hypothesis that is scientific and one that is not</i> • <i>Distinguish between science and technology</i> • <i>Understand and predict outcomes.</i> • <i>Perform calculations with SI units and Scientific Notation.</i> • <i>Understand the need for accuracy and precision when making measurements and reporting data.</i> • <i>Display and evaluate data using graphs.</i>
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Paper Tower Lab, Measurement Lab,</i> • <i>Vector Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 1 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 1 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #1: Methods of Science</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT TWO	<i>LINEAR MOTION</i>
ESSENTIAL QUESTION	How can we completely describe an object moving in a straight line?
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Analyze linear dimensional motion and illustrate the effect on objects through graphs or calculations.</i>
CONTENT	5.1d, 5.1c, 5.1j, 5.1e, 5.1i, 5.1k, 5.1q, 5.1f, 5.1g, 5.1h, 5.1l, 5.1n, 5.1s, 5.1t, 5.1u, 4.1h, 5.1o, Standard 6-4.2
ACADEMIC VOCABULARY	<i>Net Force, Force, Vector Quantity, Scalar Quantity, Resultant, Mechanical Equilibrium, Support Force (Normal Force), Static Equilibrium, Dynamic Equilibrium, Speed, Velocity, Acceleration, Displacement</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Describe motion with Motion diagrams and incorporating coordinate systems • Develop descriptions of motion using vector and scalar quantities. • Demonstrate first step for solving physics problems. • Represent vector quantities graphically and algebraically. • Determine the sum of vectors graphically & algebraically. • Continue study of average & instantaneous velocity and acceleration. • Use graphs and equations to solve problems involving moving objects, including free falling. • Distinguish between force and net force
CLASS ACTIVITIES	<ul style="list-style-type: none"> • See Lesson Plans [https://sites.google.com/site/jrodphysics/]
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Reaction Time Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • Chapter 2 and 4 of <u>Conceptual Physics</u> by Paul G. Hewitt • Chapter 2 and 3 of <u>Physics Principles and Problems</u> by McGraw Hill • Power Point Presentations • Internet Resources
ASSESSMENTS	<ul style="list-style-type: none"> • Quizzes • Benchmark Exam #2: Linear Motion
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • Projects: Create Poster, Research Paper, etc. • Writing Tasks: Poem, Short Story, Song, etc.

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT THREE	<i>PROJECTILE MOTION</i>
ESSENTIAL QUESTION	How can we completely describe the motion of a projectile?
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Analyze projectile motion and illustrate the effect on objects through graphs or calculations.</i>
CONTENT	5.1d, 5.1c, 5.1j, 5.1e, 5.1i, 5.1k, 5.1q, 5.1f, 5.1g, 5.1h, 5.1l, 5.1n, 5.1s, 5.1t, 5.1u, 4.1h, 5.1o, Standard 6-4.2
ACADEMIC VOCABULARY	<i>Components, Projectile, Resolution, Free Body Diagram</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Distinguish between a vector quantity and a scalar quantity • Recognize that the vertical and horizontal motions of a projectile are independent. • Relate the height, time in the air, and initial vertical velocity of a projectile using its vertical motion, then determine the range. • Explain how to find the resultant of two perpendicular vectors • Describe how the components of a vector affect each other • Describe the components of projectile motion • Describe the downward motion of a horizontally launched projectile. • Describe how far below an imaginary straight-line path a projectile falls. • Use equations to solve problems involving projectile motion
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Projectile Motion Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 5 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 6 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #3: Projectile Motion</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT FOUR	<i>NEWTON'S LAWS OF MOTION (October 15, 2012-October 30, 2012)</i>
ESSENTIAL QUESTION	How can we completely describe the motion and interaction of objects in terms of Newton's Laws of Motion?
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Analyze motion and forces and illustrate their effect on objects.</i>
CONTENT	5.1d, 5.1c, 5.1j, 5.1e, 5.1i, 5.1k, 5.1q, 5.1f, 5.1g, 5.1h, 5.1l, 5.1n, 5.1s, 5.1t, 5.1u, 4.1h, 5.1o, Standard 6-4.2
ACADEMIC VOCABULARY	<i>Net Force, Force, Vector Quantity, Scalar Quantity, Resultant, Mechanical Equilibrium, Support Force (Normal Force), Friction, Inertia, Newton, Speed, Velocity, Acceleration, Displacement, Components, Projectile, Resolution, Free Body Diagram, Momentum, Impulse, Inelastic Collision, Elastic Collision, Law of Conservation of Momentum</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • State Newton's Three Laws of Motion • Describe the relationship between mass and inertia • Describe the effect of friction on stationary and on moving objects • Use Newton's Law's of Motion to solve motion problems. • Distinguish between Kinetic and Static Friction Force. • Determine the net Force of an object. • Describe the difference between friction force, applied force, normal force and the applied force.
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Friction Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 2,6 and 7 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 4 and 5 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #4: Newton Laws of Motion</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT FIVE	<i>MOMENTUM</i>
ESSENTIAL QUESTION	How can we completely describe the motion and interaction of objects in terms of velocity, acceleration and momentum?
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Explain the Law of Conservation of Energy in relation to momentum, power and impulse.</i>
CONTENT	5.1d, 5.1c, 5.1j, 5.1e, 5.1i, 5.1k, 5.1q, 5.1f, 5.1g, 5.1h, 5.1l, 5.1n, 5.1s, 5.1t, 5.1u, 4.1h, 5.1o, Standard 6-4.2
ACADEMIC VOCABULARY	<i>Momentum, Impulse, Inelastic Collision, Elastic Collision, Law of Conservation of Momentum</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Define momentum. • Define impulse, and relate it to momentum. • Give examples of how both size of the force and the length of time interval affect the change in momentum. • Explain why impulses are greater when an object bounces than when an object simply comes to a complete stop. • State the law of conservation of momentum. • Distinguish between an elastic collision and an inelastic collision. • Describe momentum and impulse and apply to the interaction of objects. • Relate Newton's Third Law of Motion to conservation of momentum.
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Internet Resources.</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 8 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 9 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #5: Momentum</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT SIX	<i>CIRCULAR MOTION AND UNIVERSAL GRAVITATION</i>
ESSENTIAL QUESTION	How can we completely describe the motion of an object moving in a circle?
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Explain the connections between centripetal motion and the universal Law of gravitation.</i>
CONTENT	5.1d, 5.1c, 5.1j, 5.1e, 5.1i, 5.1k, 5.1q, 5.1f, 5.1g, 5.1h, 5.1l, 5.1n, 5.1s, 5.1t, 5.1u, 4.1h, 5.1o, Standard 6-4.2
ACADEMIC VOCABULARY	<i>Law of universal gravitation, universal gravitation constant, inverse-square law, gravitational field, weightlessness, black hole, satellite, period, ellipse, escape speed, axis, rotation, revolution, centripetal force, centripetal acceleration, centrifugal force</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Describe the two types of circular motion. • Describe the relationship among tangential speed, rotational speed, and radial distance • Describe the factors that affect the centripetal force acting on an object. • Explain the “centrifugal-force effect.” • Explain why centrifugal force is not considered a true force. • Explain Newton’s reasoning about the apple falling from the tree. • Explain why the moon doesn’t hit Earth. • Explain how Newton’s theory confirmed the Copernican theory of the solar system • Describe what Newton discovered about gravity. • Describe how the force of gravity changes with distance. • Describe the motion of a satellite in a circular orbit. • State Kepler’s three laws of planetary motion. • Solve problems dealing with circular motion. • Learn the nature of gravitational force. • Describe the orbits of planets and satellites using Law of Universal Gravitation.
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Circular Motion Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 10, 13 and 14 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 6,7 and 8 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #6: Circular Motion and Gravitation</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT SEVEN	<i>WORK AND ENERGY</i>
ESSENTIAL QUESTION	<i>How can we completely describe the motion and interaction of objects in terms of energy?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Interpret data to explain the relationship between work, power and energy</i>
CONTENT	<i>5.1p, 5.1r, 4.1a, 4.1c, 4.1d, 4.1e, 4.1g, 4.1h, 4.1j, 4.1i, 5.3f, 5.3j, 5.1m, 4.1d, 4.1b, 4.1f</i>
ACADEMIC VOCABULARY	<i>Kinetic energy, gravitational potential energy, elastic potential energy, work energy theorem, Power, Joule, Watt, Conservation of energy, elastic collision, inelastic collision, thermal energy, Mechanical energy, Efficiency, Mechanical advantage</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • <i>Recognize that work and power describe how energy moves through the environment.</i> • <i>State the law of conservation of energy</i> • <i>Interpret and provide examples of how energy can be converted from gravitational potential energy to kinetic energy and vice versa.</i> • <i>Describe both conceptually and quantitatively how work can be expressed as a change in mechanical energy</i> • <i>Calculate the force of a spring and show how this is related to the potential energy of a spring.</i> • <i>Describe how work and kinetic energy are related</i> • <i>Solve problems involving the rate of doing work.</i> • <i>State the work-energy theorem.</i> • <i>Describe both conceptually and quantitatively the concept of power as work per unit time</i>
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Power Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 9 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 11 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #7: Work and Energy</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT EIGHT	<i>Electrostatics</i>
ESSENTIAL QUESTION	<i>What causes charge to build up in thundercloud, and how does it discharge in the form of a spectacular thunderbolt?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Explain the connections between charges, electric circuits and electrostatic system</i>
CONTENT	5.1t, 5.3b, 5.3f, 5.1s, 5.1u, 4.1l, 4.1n, 4.1a, 4.1b, 4.1j, 4.1l, 4.1m, 4.1n, 4.1o, 4.1p, 4.1k
ACADEMIC VOCABULARY	<i>Electrostatics, Electrical Forces, Charge, Conservation of Charge, Coulomb's Law, Coulomb, Conductor, Insulator, Semiconductor, Induced, Induction, Grounding, Electrically Polarized, neutral, elementary charge.</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Demonstrate that charged objects exert forces, both attractive and repulsive • Recognize that charging is the separation, not the creation, of electric charges. • Describe the difference between conductors and insulators. • Describe the fundamental rule at the base of all electric phenomena • Explain how an object becomes electrically charged. • Describe Coulomb's Law • Distinguish between a good conductor and a good insulator • Describe two ways electric charges can be transferred. • Describe what happens when a charged object is placed near a conducting surface. • Describe what happens when an insulator is in the presence of a charged object. • To investigate how electricity is conducted through liquids and gases. • To examine the evidence leading to the discovery that there is a natural unit of electric charge equal to the quantity on the electron. • To study the evidence that supports the law of conservation of electric charge and learn to apply that law
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Electroscope Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 32 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 20 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #8: Electrostatics</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT NINE	<i>ELECTRIC FIELDS & ELECTRIC POTENTIAL</i>
ESSENTIAL QUESTION	<i>How can we describe the space surrounding a charged object?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Explain the connections between charges, electric circuits and electrostatic system</i>
CONTENT	<i>5.1t, 5.3b, 5.3f, 5.1s, 5.1u, 4.1l, 4.1n, 4.1a, 4.1b, 4.1j, 4.1l, 4.1m, 4.1n, 4.1o, 4.1p, 4.1k</i>
ACADEMIC VOCABULARY	<i>Electric Field, Electrical Potential Energy, Electric Potential, Volt, Voltage, Capacitor, Potential Difference</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Define an electric field • Solve problems relating to charge, electric fields, and forces. • Diagram electric field lines. • Describe how to measure the strength of an electric field at different points. • Describe how electric fields are represented by vectors and by electric field lines. • Describe how objects can be completely shielded from electric fields. • Explain why a charged object is considered to have electrical potential energy. • Distinguish between electrical potential energy and electric potential. • Describe how electrical energy can be stored.
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Electrostatics Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 33 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 21 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #9: Electric Fields</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT TEN	<i>ELECTRIC CURRENT & OHM'S LAW</i>
ESSENTIAL QUESTION	<i>What are the relationships between voltage, current and resistance in an electric circuit?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Explain the connections between charges, potential difference and circuit resistance.</i>
CONTENT	<i>5.1t, 5.3b, 5.3f, 5.1s, 5.1u, 4.1l, 4.1n, 4.1a, 4.1b, 4.1j, 4.1l, 4.1m, 4.1n, 4.1o, 4.1p, 4.1k</i>
ACADEMIC VOCABULARY	<i>Potential Difference, Electric Current, Ampere, Voltage Source, Electric Resistance, Superconductor, Ohm, Ohm's Law, Direct Current, Alternating Current, Diode, Electric Power, Resistor, Parallel connection, Series connection, Conventional Current, Electron Current</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Describe conditions that create current in an electric current • Explain Ohm's Law • Design closed circuits • Differentiate between power and energy in an electric circuit. • Solve problems involving the use and cost of electric energy. Describe the flow of electric charge • Describe what is happening inside a current-carrying wire. • Describe how a battery works • Give examples of voltage sources • Describe the factors that affect the resistance of a wire. • Explain the causes of electric shock • Distinguish between DC and AC • Describe the drift speed of conduction electrons in a circuit • Relate electric power used by a device to current and voltage.
CLASS ACTIVITIES	<ul style="list-style-type: none"> • See Lesson Plans [https://sites.google.com/site/jrodphysics/]
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • Lemon Battery Lab • Ohm's Law Lab
MATERIAL RESOURCES	<ul style="list-style-type: none"> • Chapter 34 of <i>Conceptual Physics</i> by Paul G. Hewitt • Chapter 22 of <i>Physics Principles and Problems</i> by McGraw Hill • Power Point Presentations • Internet Resources
ASSESSMENTS	<ul style="list-style-type: none"> • Quizzes • Benchmark Exam #10: Electric Currents
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • Projects: Create Poster, Research Paper, etc. • Writing Tasks: Poem, Short Story, Song, etc.

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT ELEVEN	<i>ELECTRIC CIRCUITS</i>
ESSENTIAL QUESTION	<i>How do relationships among current, potential difference, and resistance compare in series and parallel circuits?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Distinguish between series and parallel circuits.</i>
CONTENT	<i>5.1t, 5.3b, 5.3f, 5.1s, 5.1u, 4.1l, 4.1n, 4.1a, 4.1b, 4.1j, 4.1l, 4.1m, 4.1n, 4.1o, 4.1p, 4.1k</i>
ACADEMIC VOCABULARY	<i>Circuit, Series Circuit, Parallel Circuit, Schematic Diagram, Voltage divider, Equivalent Resistance</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Solve problems involving current, potential difference and resistance. • Diagram simple electric circuits. • Distinguish between parallel and series circuits and series-parallel combinations and solve problems dealing with them. • Explain the function of fuses circuit breakers, and ground fault interrupters, and describe ammeters and voltmeters. • Describe the configuration of a working circuit. • Explain how current can be turned on or off in a circuit, and how electrical devices can be connected in a circuit. • Determine the equivalent resistance of circuits having two or more resistors. • Explain the cause and prevention of overloading household circuits.
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Parallel Circuit Lab, Series Circuit Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 35 <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 23 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #12: Electric Circuits</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT TWELVE	<i>MAGNETIC FIELDS</i>
ESSENTIAL QUESTION	<i>How can we describe a magnetic field?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Explain and illustrate the relationship between the motion of electrons and magnetism</i>
CONTENT	5.1t, 5.3b, 5.3f, 5.1s, 5.1u, 4.1l, 4.1n, 4.1a, 4.1b, 4.1j, 4.1l, 4.1m, 4.1n, 4.1o, 4.1p, 4.1k
ACADEMIC VOCABULARY	<i>Magnetic Pole, Magnetic Field, Magnetic Domain, Electromagnet, solenoid, First Right hand rule, Second Right hand rule, Third Right hand Rule</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Describe the properties of magnets and the origin of magnetism in materials • Relate magnetism to electric charge and electricity. • Explain how magnetic poles affect each other. • Describe the magnetic field in the space around a magnet. • Describe how magnetic fields are produced. • Describe how to make a permanent magnet. • Describe the magnetic field produced by a current-carrying wire. • Describe how a magnetic field exerts a force on a charged particle in the field. • Describe how current is affected by a magnetic field. • Describe how a galvanometer and a motor work. • Suggest a possible cause for Earth's magnetic field. • Determine the direction of the force on a moving charge when it is exposed to a magnetic field. • Describe the magnetic field produced by a current-carrying wire. • Determine the direction of the force on a current-carrying wire when it is exposed to a magnetic field. • Understand that the strength of the magnetic field is related to the distance between the field lines
CLASS ACTIVITIES	<ul style="list-style-type: none"> • See Lesson Plans [https://sites.google.com/site/jrodphysics/]
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Magnetism Lab</i> • <i>Electromagnet Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • Chapter 36 of <i>Conceptual Physics</i> by Paul G. Hewitt • Chapter 24 of <i>Physics Principles and Problems</i> by McGraw Hill • Power Point Presentations • Internet Resources
ASSESSMENTS	<ul style="list-style-type: none"> • Quizzes • Benchmark Exam #13: Magnetic Fields
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**REGENTS PHYSICS CURRICULUM PLAN
TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT THIRTEEN	<i>ELECTROMAGNETIC INDUCTION</i>
ESSENTIAL QUESTION	<i>How are electricity and magnetism related?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Explain and illustrate the relationship between electricity and magnetism</i>
CONTENT	<i>5.1t, 5.3b, 5.3f, 5.1s, 5.1u, 4.1l, 4.1n, 4.1a, 4.1b, 4.1j, 4.1l, 4.1m, 4.1n, 4.1o, 4.1p, 4.1k</i>
ACADEMIC VOCABULARY	<i>Fourth Right hand Rule, Lenz's Law, Electric generator, Electromagnetic induction, Electromotive Force, Faraday's Law, Transformer</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Describe how changing magnetic fields can generate electric current and potential difference. • Apply this phenomenon to the construction of generators and transformers. • Learn how combined electric and magnetic fields can be used to find the masses of electrons, atoms, and molecules. • Explain how electromagnetic waves are created, travel through empty space and are detected. <ul style="list-style-type: none"> • Describe how voltage is induced in a coil of wire. • State and explain Faraday's Law. • Describe how a generator works. • Describe how a magnetic field affects a moving charge. • Describe how a transformer works. • Explain how an electric current creates a magnetic field. • Describe electromagnetic waves.
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Faraday's Law Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 37 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 24 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #14: Electromagnetic Induction</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

**TUCKAHOE HIGH SCHOOL
MR. RODRIGUEZ**

UNIT FOURTEEN	<i>WAVES & SOUND</i>
ESSENTIAL QUESTION	<i>How do waves transfer energy?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Explain the transfer of energy by demonstrating wave characteristics and behavior</i>
CONTENT	4.3a, 4.3b, 4.3c, 4.3h, 4.3d, 4.3e, 4.3f, 4.3m, 4.3n, 4.3h, 4.3i, 4.3j, 4.3l, 4.3k, 4.1b, 4.1k, 4.3g
ACADEMIC VOCABULARY	<i>Crest, Trough, Amplitude, Wavelength, Frequency, Hertz, Transverse Wave, Longitudinal Wave, Interference Pattern, Constructive Interference, Destructive Interference, Out of phase, In Phase, Standing wave, Node, Antinodes, Doppler Effect, Blue Shift, Red Shift, Shock wave, Sonic Boom, Bow Wave, Vibration, Period, Wave, Simple Harmonic Motion, Electromagnetic Wave, Pitch, Resonance, Beats, Forced Vibration, Natural Frequency.</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Describe the force on an elastic spring. • Determine the energy in an elastic spring. • Compare simple harmonic motion and the motion of a pendulum. • Describe wave behavior and discuss its practical significance. • Identify some application of the Doppler effect. • Describe sound in terms of wave properties and behavior. • Describe the wave nature of light and some phenomena that reveal this nature. • Learn how light changes direction and speed when it travels through different materials. • Learn how interference and diffraction patterns demonstrate that light behaves like a wave. • Solve problems involving the speed of light.
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Pendulum Lab</i> • <i>Hooke's Law Lab</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 25, 26 and 27 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 14 and 15 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #8: Waves</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>

MR. RODRIGUEZ

UNIT FIFTEEN	<i>MODERN PHYSICS</i>
ESSENTIAL QUESTION	<i>Is light a particle or a wave?</i>
SCIENTIFIC THINKING/ PROCESS SKILLS	<i>Provide evidence for the particle and wave nature of electrons.</i>
CONTENT	<i>5.3e, 5.3a, 5.3c, 5.3d, 5.3h, 4.1b, 5.3b, 5.3f, 5.3g, 5.3i, 5.3j</i>
ACADEMIC VOCABULARY	<i>Quantum, Photon, Planck's Constant, Quantum mechanics, Quantum physics,</i>
Major Understanding: Students will be able to	<ul style="list-style-type: none"> • Describe the structure of the nuclear atom • Explain the spectrum emitted by a hot body • Explain the photoelectric and Compton effects • Solve problems involving that de Broglie wavelength of particles. • Solve problems involving the photoelectric effects • Understand that light behaves like particles having momentum and energy. • Learn about how quantum theory led to the modern atomic model. • Describe the components of a nucleus and how radioactive decay affects these components. • Describe the Standard Model of matter and explain the role of force carriers
CLASS ACTIVITIES	<ul style="list-style-type: none"> • <i>See Lesson Plans [https://sites.google.com/site/jrodphysics/]</i>
LABORATORY ACTIVITIES & DEMONSTRATIONS	<ul style="list-style-type: none"> • <i>Modeling the Photoelectric effect (pg. 738 Glencoe Science Physics)</i>
MATERIAL RESOURCES	<ul style="list-style-type: none"> • <i>Chapter 38 of <u>Conceptual Physics</u> by Paul G. Hewitt</i> • <i>Chapter 27,28 and 30 of <u>Physics Principles and Problems</u> by McGraw Hill</i> • <i>Power Point Presentations</i> • <i>Internet Resources</i>
ASSESSMENTS	<ul style="list-style-type: none"> • <i>Quizzes</i> • <i>Benchmark Exam #15: Modern Physics</i>
DEPARTMENTAL ASSESSMENTS	<ul style="list-style-type: none"> • <i>Projects: Create Poster, Research Paper, etc.</i> • <i>Writing Tasks: Poem, Short Story, Song, etc.</i>