Physics Curriculum

Reading and Writing Standards

Marking Period	Reading Assessments	Writing Assessments
1	Analyze Particle motion diagrams and position vs time graphs	Lab report: how to find the average and instantaneous speed of a runner.
2	Relate, identify and solve problems using kinematic variables.	Draw free-body diagrams showing the magnitude and direction of all forces acting on an object.
3	Identify the relationships between energy, work and power. Students will solve problems involving these variables.	Scientific report on the mousetrap car detailing the simple machines kinematic variables
4	Measure potential energy in a spring and solve problems involving electric force	Design and create a rube goldberg machine

Scoring Rubric for Written Work

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Content Topics and Pacing

Topic	Duration	Guiding Questions	Reading and Writing Assignments
Science Skills (Introduction to Physics)	**13 days**	How do we use the scientific process? How do we use math in science? How do we model scientific phenomena?	Converting measurements Creating a scientific model and answering a prompt using the CER writing method.
Motion in 1D: Representing Motion	**~18 days**	What is Physics? How do we describe motion of an object?	Reading a position vs time graph Creating a particle motion diagram
Motion in 1D: Measuring motion	**~14 days**	How can we use mathematical equations to determine the position, velocity or acceleration of an object?	Reading equations with variables used in physics Creating a velocity vs time graph for a moving object
Free Fall	**~14 days**	Can you find the height that an object falls from? Can you find the height a homemade rocket travels to?	Motion diagram with kinematic variables Finding the height that you can throw a baseball
Forces in 1D	**~15 days**	How can we find the normal force applied to an object using Newton's second law?	Analyze diagram and graphs and solve for the force applied to an object Draw free-body diagrams showing the magnitude and direction of all forces acting on an object
Forces in 2D: Vectors *	**~12 Days**	How can we map the motion of a homemade rocket launched at a 45 degree angle?	Solve for the vertical and horizontal motion of an object Graphing the motion of a rocket in the x and y direction

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Momentum and its Conservation	**~13 Days**	How can we measure the momentum of a moving object?	Finding the displacement object move after collision Collecting and analyzing data from a cart colliding with a brick
Energy, work and simple machines	**~26 days**	How is mechanical advantage used to make efficient cars?	Solving problems for energy and work Collecting and analyzing data from a balloon car
Energy and its Conservation	**~18 days**	How high will a bouncy ball bounce if dropped from a height of 20 meters? 1000 meters?	Measure the elastic potential energy generated from a mousetrap Mousetrap car project
Electricity	**~14 days**	How are charges distributed on different types of materials?	Solve for electric force using coulomb's law Diagram electric field lines
EOY Project	**~10 days**	How can we use projects throughout the year along with other apparatuses to create a rube goldberg machine?	Teamwork in Engineering Design and creating a rube goldberg machine
Astronomy and Kepler's Laws *	**~10 days**	How are Kepler's laws related to universal gravity? How can we calculate the rotational velocity of the Earth?	Finding the orbital velocity and period of a planet Map a solar system given a
Modern Physics and Technology *	**~10 days**	What does a theoretical physicist analyze? What does an experimental physicist analyze?	Theoretical vs Experimental Physicist Reflection of *Interstellar: Theoretical vs Experimental physics*

*These topics can be skipped or adjusted if time does not allow for them