

Physics Syllabus

RCAS Policies/Procedures

Students will be required to follow all RCAS policies and procedures. To view the RCAS High School Student Handbook, click [handbook](#).

Course Description

Physics emphasizes the laws governing the workings of the Universe from the smallest subatomic scales to transgalactic scales. Topics will include: kinematics, dynamics, gravitation, momentum, energy, oscillations, light, and an introduction to electricity, magnetism, and modern physics.

Grading

Points shall be awarded for assignments including tests, labs, projects, and other classwork. Points are awarded and collected cumulatively through the year.

Textbook

Walker, James. *Physics*. USA, Pearson, 2014.

Reading

N/A

Optional Reading

N/A

Instructional Resources

- Khan Academy
- Physics Classroom

Essential Questions

- How does a free-body diagram help me solve problems?
- Why is equilibrium important in everyday life?
- Why is adding vectors different than just adding two numbers?
- What is energy conservation?
- How does power relate to energy?
- How do engineers design systems?
- How do patent examiners check to see if a device is feasible?
- What causes optical phenomena?
- What happens when waves encounter each other?
- Why does current “flow”?
- Why do electronics get hot?
- What could you do with \$1 worth of electricity?
- Student can describe three ways to add charge to an object.

Essential Learning Intentions

- HS-PS2-1 Analyze data to support the claim that Newton's Second Law of Motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration (SEP: 4; DCI: PS2.A; CCC: Cause/Effect).
- HS-PS2-2 Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system. (SEP: 5; DCI: PS2.A, CCC: Cause/Effect)
- HS-PS3-1 Create a computational model to calculate the change in energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known (SEP: 5, DCI: PS3.1, PS3.B; CCC: Systems)
- HS-PS4-1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. (SEP: 5; DCI: PS4.1; CCC: Cause/Effect)
- HS-PS3-5 Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction (SEP: 2; DCI: PS3.C; CCC: Cause/Effect).