

Physics

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.

Textbook: Walker, James. Physics. USA, Pearson, 2014

Required Resources:

“Limited Choice” Resources: (students will be asked to choose at least one title from this list)

Student Choice:

Will student be asked to choose additional reading material from the classroom or school library?

No

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)