

Aeronautics

Matter and Its Interactions PS1

- 3 Plan and conduct an investigation to compare the structure of substances at the macroscopic scale to infer the strength of electrical forces between particles. AR.PS1.3

Motion and Stability: Forces and Interactions PS2

- 1 Analyze and interpret data to support the claim that Newton's second law of motion describes the mathematical relationship among the mass, acceleration, and net force acting on macroscopic objects. AR.PS2.1
- 2 Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when no net external force acts on the system. AR.PS2.2
- 3 Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.* AR.PS2.3
- 6 Communicate scientific and technical information about why the molecular level of designed materials determines how the material functions.* AR.PS2.6

Energy PS3

- 1 Create a computational model to calculate the change in the 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. AR.PS3.1
- 3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.* AR.PS3.3
- 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. AR.PS3.5

Waves and their Applications in Technology for Information Transfer PS4

- 1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. AR.PS4.1
- 3 Develop an argument for how scientific evidence supports the explanation that electromagnetic radiation can be described either by a wave model or the particle model, and in some situations one model is more useful than the other. AR.PS4.3
- 5 Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.* AR.PS4.5

Engineering Design ETS1

- 1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.** AR.ETS1.1

- 2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.** AR.ETS1.2

- 3 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.** AR.ETS1.3