Oklahoma Science

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
		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

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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