

MAINE SCIENCE AND ENGINEERING STANDARDS

3-PS2 Motion and Stability: Forces and Interactions

3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

Further Explanation: Examples could include an unbalanced force on one side of a ball can make it start moving and balanced forces pushing on a box from both sides will not produce any motion at all. Other examples can be found in a variety of Maine sports from ice skating, curling, skiing to sledding.

Planning and Carrying Out Investigations, Forces and Motion, Types of Interactions, Cause and Effect

3-PS2-2 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

Further Explanation: Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-saw. Other examples include dropping down in a skate park, snowboarding pipes and telemark skiing (slowing down, turns, etc.).

Planning and Carrying out Investigations, Forces and Motion, Patterns

3-PS2-3 Ask questions to determine cause and effect relationships of electrical or magnetic interactions between two objects not in contact with each other.

Further Explanation: Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.

Asking Questions and Defining Problems, Types of Interactions, Cause and Effect

3-PS2-4 Define a simple design problem that can be solved by applying scientific ideas about magnets.

Further Explanation: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other. Other examples include a magnetic latch for a container or device (Apple and magnetic plug for charger).

Asking Questions and Defining Problems, Types of Interactions