



Sports Content Standards

Grade Three

Physical Sciences

Forces and Motion

3. Identify contact/noncontact forces that affect the motion of an object (e.g., gravity, magnetism, and collision)
4. Predict the changes when an object experiences a force (e.g., a push or pull, weight and friction)

Grade Seven

Physical Sciences

Nature of Energy

2. Describe how an object can have potential energy due to its position or chemical composition and can have kinetic energy due to its motion.

Grade Eight

Physical Sciences

Forces and Motion

1. Describe how the change in the position (motion) of an object is always judged and described in comparison to a reference point.
2. Explain that motion describes the change in the position of an object (characterized by a speed and direction) as time changes.
3. Explain that an unbalanced force acting on an object changes that object's speed and/or direction.

Grade Nine

Physical Sciences

Forces and Motion

21. Demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.
22. Demonstrate that any object does not accelerate (remains at rest or maintains a constant speed and direction of motion) unless an unbalanced (net) force acts on it.
23. Explain the change in motion (acceleration) of an object. Demonstrate that the acceleration is proportional to the net force acting on the object and inversely proportional to the mass of the object. ($F_{\text{net}} = ma$. Note that weight is the gravitational force on a mass.)

24. Demonstrate that whenever one object exerts a force on another, an equal amount of force is exerted back on the first object.

25. Demonstrate the ways in which frictional forces constrain the motion of objects (e.g., a car traveling around a curve, a block on an inclined plane, a person running, an airplane in flight).