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QUESTION 1 ANSWER:

Newton's second law of motion is more quantitative and is used extensively to calculate what happens in situations involving a force.

The acceleration of a system is directly proportional to and in the same direction as the net external force acting on the system, and inversely proportional to its mass. In equation form, Newton's second law of motion is

a = Fnet/m.

This is often written in the more familiar form

Fnet = ma.

When only the magnitude of force and acceleration are considered, this equation is simply

Fnet = ma.

When an object is dropped, it accelerates toward the center of Earth. Newton's second law states that a net force on an object is responsible for its acceleration. If air resistance is negligible, the net force on a falling object is the gravitational force, commonly called its weight w. Weight can be denoted as a vector w because it has a direction; down is, by definition, the direction of gravity, and hence weight is a downward force. The magnitude of weight is denoted as w.

When the net external force on an object is its weight, we say that it is in free-fall. That is, the only force acting on the object is the force of gravity. In the real world, when objects fall downward toward Earth, they are never truly in free-fall because there is always some upward force from the air acting on the object.

QUESTION 2 ANSWER

An **electric field** is the physical field that surrounds each electric charge and exerts force on all other charges in the field, either attracting or repelling them.

A **magnetic field** is a vector field that describes the magnetic influence on moving electric charges, electric currents and magnetized materials. A charge that is moving in a magnetic field experiences a force perpendicular to its own velocity and to the magnetic field.

An **electric current** is a stream of charged particles, such as electrons or ions, moving through an electrical conductor or space. It is measured as the net rate of flow of electric charge past a region. The

moving particles are called charge carriers, which may be one of several types of particles, depending on the conductor.