

Review

Summary

4-1: Accelerated Motion

1. According to Newton's second law, a net force acting on an object causes the object to accelerate in the direction of the force. The size of the acceleration depends on the strength of the force and the mass of the object.
2. Near Earth's surface, gravity causes falling objects to accelerate at a rate of 9.8 m/s^2 . Ignoring air resistance, all objects accelerate at this rate, regardless of mass.
3. Air resistance acts in the direction opposite to that in which the object is moving.

4-2: Projectile and Circular Motion

1. Objects thrown or shot through the air are called projectiles. All projectiles have both horizontal and vertical velocities. If air resistance is ignored, the horizontal velocity is constant; the vertical velocity, which is affected by gravity, increases.
2. When an object moves along a circular path, it is accelerated toward the center of the circle.
3. When an object is influenced only by gravity, it is said to be in free-fall. Objects in free-fall can be considered weightless.

4-3: Science and Society: Sending up Satellites

1. Artificial satellites are placed in Earth's orbit for communication, weather-monitoring, scientific, and military purposes.
2. Rockets are used to carry satellites up to the desired orbit height and to then give them the proper orbital velocity.

4-4: Action and Reaction

1. Forces always act in pairs. The forces in an action-reaction pair are always equal in size and opposite in direction.
2. All moving objects have momentum. The momentum of an object is the product of its mass and velocity.
3. The total momentum of a set of objects is conserved unless a net force acts on the set.

Key Science Words

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| a. air resistance | f. momentum |
| b. artificial satellite | g. Newton's second law of motion |
| c. centripetal acceleration | h. Newton's third law of motion |
| d. centripetal force | i. projectile |
| e. law of conservation of momentum | j. terminal velocity |

Reviewing Vocabulary

Match each phrase with the correct term from the list of Key Science Words.

1. deals with action-reaction forces
2. force that opposes the motion of a falling object near Earth's surface
3. an object that is thrown through the air
4. acceleration toward the center of a circle
5. product of an object's mass and velocity
6. describes the effect of a net force on an object
7. causes circular motion
8. achieved when acceleration due to gravity is balanced by air resistance
9. describes the unchanging nature of the total momentum of a set of objects
10. human-made device that orbits Earth