Force and Motion Study Guide Answers

1. Speed is the change in position in relation to time or distance divided by time. Acceleration is the change in velocity to increase or decrease speed.
2. Speed is calculated this way: dividing distance by time.
3. Mass is the amount of molecules in an object and weight is the pull of gravity on those molecules. Mass times the pull of gravity equals weight.
4. Increase friction – rough surfaces, rubber, gravel, and carpet

Decrease friction – smooth surfaces, soap, oil, water, and grease

1. Lubrication decreases friction and makes them easier to move.
2. The book will hit first because the piece of paper is more affected by air resistance (drag) which slows down the paper more than the book.
3. The paper will fall through the air molecules faster because there is less surface area to be slowed down by the air resistance.
4. Balanced unbalanced
5. The bike will accelerate quicker because it has less mass, which means it has less inertia and will be easier to move.
6. Because the bus has the most mass and the most inertia, it will roll the furthest because it does not want to change what it is already doing.
7. Inertia is a property because forces are pushes or pulls. Inertia is the tendency of an object to do what it is already doing, not a push or pull.
8. Forward force when the club hits the ball. Gravity pulling the ball down, air resistance slowing the ball down, friction between the ball and the grass slowing it down, and finally gravity as the ball falls into the hole. The bottom of the cup stops the motion completely.
9. Potential energy is energy that is stored up and ready to use. Kinetic energy is energy in motion. A rock sitting on top of a hill has potential energy. A rock rolling down the hill has kinetic energy.

1)I would have to use an outside unbalanced force to move it back to my friend. I would kick it using the muscle force in my leg to move it back to my friend.

2)Because of inertia, my body wants to continue in a straight line. When my grandfather turns left, my body continues to go straight. This makes me lean to the right until my body is forced back straight by my muscles or the car door.

1. Acceleration is a change in velocity to increase or decrease speed.
2. Her velocity changes because her direction and speed change. Velocity deals with speed and direction.
3. To change the direction of an object you need an outside unbalanced force.
4. Mass, force, and speed
5. They hit each other with an equal and opposite force. Because the baseball has less mass, it will fly in the opposite direction.
6. They hit each other with the same force. The object with the least mass will move further in the opposite direction than the object with the greater mass.
7. An object changes its distance in relationship to time when it accelerates. It can either speed up or slow down.
8. Gravity depends on the mass of the objects and their distance from one another.
9. Gravitational force is an invisible force that pulls objects to the center of other objects.
10. Gravitational pull is stronger between the sun and earth than it is between the earth and the moon because the sun is so massive. This counteracts the extreme distance between the sun and earth.

True or False

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