Acceleration and Newton’s Laws Study Guide

1. Acceleration is \_\_\_\_\_\_\_\_the rate at which velocity changes with time\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The formula for acceleration is: Final Velocity – Initial Velocity ÷ Time.
3. In order for an object to be in motion, the forces applied on an object must be \_\_\_Unbalanced\_\_.
4. If an object is balanced, the net force exerted on an object is \_\_\_\_\_\_\_\_ZERO\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. When an object is balanced, the motion of the object does/does not change.
6. When force is applied on an object, the object moves in the same direction as the force.
7. Newton’s 1st Law states An object at rest stays at rest, and an object in motion stays in motion at the same velocity, unless acted upon by an unbalanced force

and is often called the law of \_\_\_\_\_INERTIA\_\_\_\_\_\_\_\_\_\_.

1. Inertia is the resistance of an object to a change in the speed or direction of its motion.

An example of inertia is It’s easier to stop an empty wagon than a wagon full of sand.

1. Newton’s 2nd Law states: Acceleration of an object increases with increased force and decreases with increased mass.

Force = \_\_\_MASS\_\_\_\_\_ x \_\_\_\_ACCELERATION\_\_\_\_\_.

1. Newton’s 3rd Law states: For every action, there is an equal and opposite reaction.

An example of an action/reaction force pair is the jellyfish pushing on the water is the action force, the water pushing back on it is the reaction force

1. Momentum is a measure of mass in motion; the product of its mass and its velocity\_\_\_\_\_\_\_\_\_\_\_\_.

Momentum depends on the object’s \_\_\_Mass\_\_\_\_\_\_\_ and \_\_\_\_\_Velocity\_\_\_\_\_\_.

1. The strength of the gravitational force between two objects depends on the \_\_Mass\_\_\_ (the more \_mass\_\_\_\_\_\_\_\_\_\_ the greater the gravity that is exerted on the other object) and the \_\_\_\_Distance\_\_\_\_\_ (as distance increases, gravity decreases).
2. Acceleration due to Earth’s gravity is called \_\_g\_\_\_\_ and is equal to 9.8 m/s2\_\_\_\_\_ at Earth’s surface. This is calculated by F=\_\_M\_ x\_\_\_\_\_\_G\_\_\_\_\_\_\_\_\_\_\_\_.
3. Two objects with different masses fall \_\_\_\_\_\_\_\_at the same rate\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Friction between two surfaces depends on \_\_\_\_\_\_\_\_Surface type\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_Motion\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_Pressure\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Friction produces what type of energy \_\_\_\_\_heat/thermal\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. An object will eventually stop moving because of the force of \_\_\_\_\_\_\_\_\_\_\_\_friction\_\_\_\_\_\_.
7. Air resistance depends on \_surface area\_\_\_\_\_ and \_\_\_\_speed\_\_\_\_\_\_\_\_\_\_\_.
8. Increased surface area = \_\_\_\_increased\_\_\_\_\_\_ air resistance.
9. Increased speed = \_\_\_\_\_\_\_\_increased\_\_\_\_\_\_\_\_ air resistance.