Physical Science – Physics Unit 1 Study Guide

**Velocities, Displacement, Motion**

1. What two things must you know to describe the motion of an object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Distance is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is the displacement of a cyclist, who travels 1 mile north, then 1 mile east, and finally 1 mile south? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Define speed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. How do speed and velocity differ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. How do velocities combine 🡪 In opposite directions? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ In the same direction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. A river flows at a velocity of 3 km/h relative to the riverbank. A boat moves upstream at a velocity of 15 km/h relative to the river. What is the velocity of the boat relative to the riverbank? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. The rate at which velocity changes is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. The total distance traveled divided by the total time is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Define velocity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Define acceleration \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. A quantity that has both magnitude and direction is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Friction, Momentum & Gravity**

1. A force is defined as a(n) \_\_\_\_\_\_\_\_\_\_\_ or a(n) \_\_\_\_\_\_\_\_\_\_ that acts on an object.
2. The overall force acting on an object after all the forces are combined is the \_\_\_\_\_\_\_\_\_\_\_\_\_.
3. The movement of an object toward Earth solely because of gravity is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ forces can cause the motion of an object to change.
5. True or False? Earth’s gravity acts downward toward the center of Earth.
6. According to Newton’s second law of motion, acceleration of an object depends upon the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the object and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acting on it.

1. The equal and opposite forces described by Newton’s third law are called \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_ forces.
2. What two factors affect the momentum of a moving object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. A sky diver experiences \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which opposes the force of gravity.
4. A measure of the force of gravity acting on an object is its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Define Terminal velocity; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. The resistance of an object to change in its motion is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Falling objects have different terminal velocity because they have different amounts of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which causes different amounts of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
8. List the types of friction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. Which type of friction produces the most friction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the least? \_\_\_\_\_\_\_\_\_\_\_
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the curved path all object thrown or shot horizontally follow, like a football being kicked, baseball being thrown, or basketball being shot.

**Universal Forces**

1. List the four universal forces. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Objects with like charges \_\_\_\_\_\_\_\_\_\_\_\_\_\_ one another, and objects with opposite charges \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ one another.
3. The gravitational force of attraction between two objects depends on \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force affects all particles in a nucleus and acts only over a short range.
5. A \_\_\_\_\_\_\_\_\_\_\_\_\_ is a substance that takes the shape of its container.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force is a center-directed force that continuously changes the direction of the an object to make it move in a circle.
2. The product of an objects mass and velocity is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which force is the only ones that can both attract and repel? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What attractive force act to keep protons and neutrons together in the nucleus of the atom? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. What type of motion best describes 0 to 5 minutes? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. What best describes the motion from B to C? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_