

Motion-Force-Gravity Study Guide

Name: _____

Section: _____

The Law of Universal Gravitation states that the gravitational force is related to mass and distance. More specifically the force is directly proportional to the mass of the objects, and inversely proportional to the square of the distance between the masses.

When multiple forces are acting on an object in the same dimension, the resultant force can be obtained by adding the forces which are in the same direction, and subtracting the forces if they are in opposite directions. For instance, the resultant of a 3N force going north and a 5N force going north is _____ N going north. But, the resultant of a 5N force going north and a 3N force going south is _____ N going north.

The SI unit for speed and velocity is m/s.

The SI unit for acceleration is m/s^2

The SI unit for force is _____

When you push on a block to try and slide it across the floor, but it does not move, the force resisting you is static friction.

All projectiles accelerate vertically downward, since the force of gravity is directed vertically downward. Examples of projectiles are thrown baseballs, golf balls moving through the air, kicked soccer balls in the air, but not objects sliding across the floor.

Neglecting air resistance, also known as air drag, all objects when dropped from the same height, will hit the ground at the same time, since they all fall at the same rate regardless of their mass.

Orbital motion, which is a type of projectile motion, is a combination of forward motion (horizontal) and free fall (vertical motion due to gravity).

The more mass an object has, the more inertia it has. A 2 kg mass has more inertia than a 1 kg mass.

The reason astronauts experience weightlessness while in orbit is due to the fact that the astronauts and the spaceship are in free fall together.

Motion is the change in position relative to a reference point.

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Speed is the distance an object moves divided by the time in which the motion took place.

Velocity is speed of an object in a particular direction

Acceleration is the rate of velocity change over time.

A force is a push or a pull on an object, which is needed to change an object's motion.

Net Force is the combination of all forces acting on an object.

Balanced force is a combined force that does NOT cause a change in motion.

An unbalanced force does cause a change in motion.

Gravity is the force of attraction between objects that is due to their masses and the distance between them. Gravity is the force that holds objects to the Earth's surface.

Weight is the measure of the gravitational force exerted on an object.

Mass is the amount of matter in an object.

Know path of orbiting spacecraft compared to path spacecraft would take if there were no gravity.

Draw sketch from sketch on white board: