

Name \_\_\_\_\_

Date \_\_\_\_\_

### **Physics handout.**

#### **Rewrite the definitions we went over**

Newton's law of universal gravitation:

Relative Motion:

#### **Relative motion. ANSWER AS FAST AS YOU CAN**

**Tips: draw the problem out and include arrows. Notice how when the numbers go in the same direction, it forms a minus sign between them, this means subtract velocities.**

You are riding in a bus moving slowly through heavy traffic at 2.0 m/s. You hurry to the front of the bus at 4.0 m/s relative to the bus. What is your speed relative to the street?

Rafi is ghost riding through the neighborhood at a speed of 0.75 m/s. A caterpillar in the wagon is crawling toward the rear of the car at a rate of 2.0 cm/s. What is the caterpillar's velocity relative to the ground?

A boat is rowed directly upriver at a speed of 2.5 m/s relative to the water. Viewers on the shore see that the boat is moving at only 0.5 m/s relative to the shore. What is the speed of the river? Is it moving with or against the boat?

**universal gravitation. GO GO GO**

**Tip: identify the the parts of the formula as you read the problem.**

$$F = g(m_1 * m_2) / d^2$$

Two satellites in space, each with a mass of 2000kg, are 1500m apart from each other. What is the force of gravity?

Ashley and Becky are ready to fight because Ashley was talking smack about Becky and are going to settle the conflict in their middle school cafeteria. If Ashley has a mass of 50kg and Becky has a mass of 60kg and they are 1.8 m apart what is the force of gravity that will eventually lead to Ashley eating the linoleum lunch room floor.

Ashley lost the fight but becky still has to pay the consequences of a middle school fight. If the school's principal is coming at becky with a force of 20 N from 2m away what is the mass of the principal.

