Name _____

Hour _____
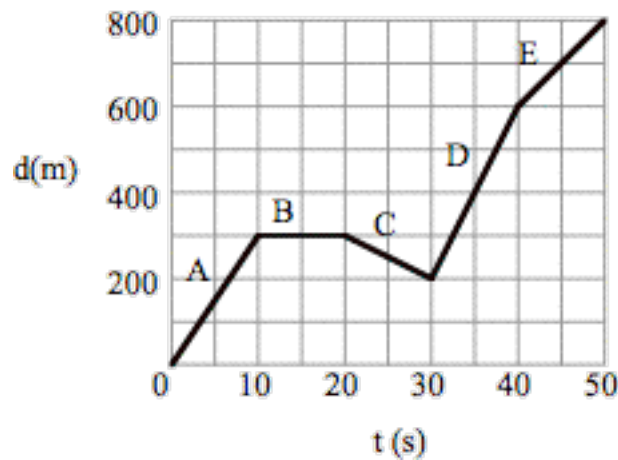
Motion Worksheet

Physical Science

Mr. Pickett

1. One car is traveling west on K-10 towards Lawrence at 85 km/hr. Another car is traveling east towards Olathe at 85 km/hr. Explain why the two cars driving on K-10 at the same speed have different velocities.

2. A car traveling at 85 km/hr on K-10 follows a curve in the highway as it reaches DeSoto. Has the car's velocity changed? Why?

The graph below shows the motion of a truck. Examine this graph carefully to answer questions 3 - 9

3. What is the total displacement of the truck?

4. What is the total time that the truck was moving?

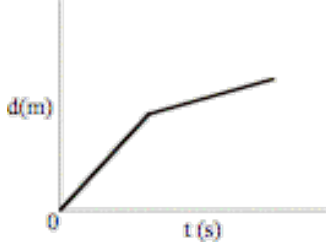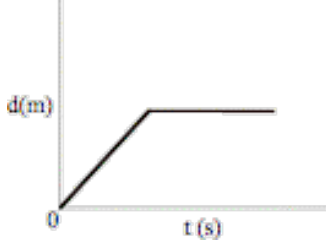How far was the truck from the starting point after:

5. 10 seconds?	7. 40 seconds?
6. 30 seconds?	8. 45 seconds?

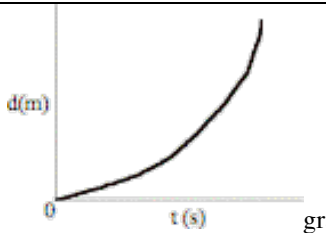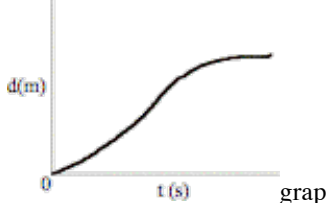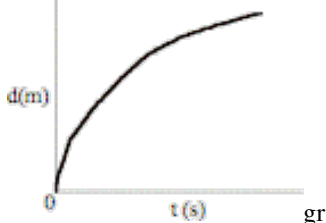9. What was the truck's average speed in its first 10 seconds of motion?

9. Beside each distance *vs*. time graphs, describe the kind of motion that is taking place in each situation.

d(m) ... t (s) graph A	
d(m) ... t (s) graph B	
d(m) ... t (s) graph C	

10. Beside the graph, describe briefly the motion represented by each of these graphs. If the speed is changing, state whether it is increasing or decreasing.

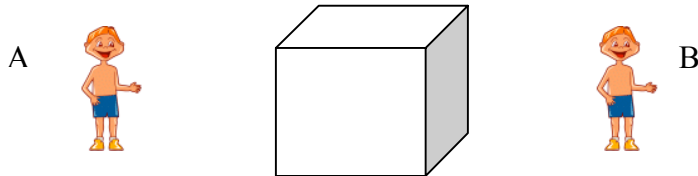|	
d(m) ... t (s) graph A	
d(m) ... t (s) graph B	
d(m) ... t (s) graph C	

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Balanced and Unbalanced Forces   Name _____ Period _____

1. Two boys are pushing a box. Boy A a exerts force of 3000 newtons on the box. Boy B exerts a force of 3000 newtons in the opposite direction.

a. Draw arrows showing the individual and combined forces of the boys in #1.

b. What is the combined force (net force) on the box?   _____

c   Are the forces balanced or unbalanced?   _____

A

B

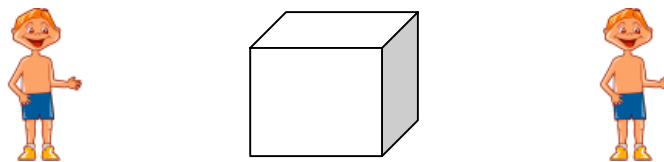d. What will the resulting motion of the box be? _____

2. Now suppose that Boy A exerts a force of 3000 newtons on the box and Boy B exerts a force of 5000 newtons in the opposite direction.

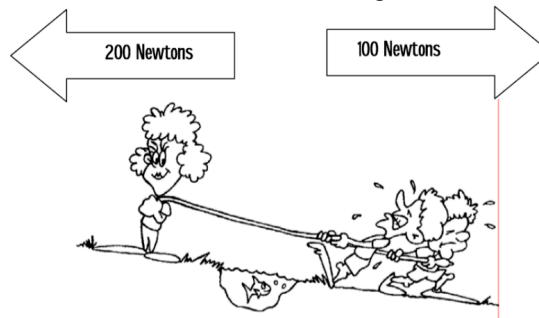a. Draw arrows showing the individual and combined forces of the box in #2.

b. What is the combined force (net force) on the box? _____

c. Are the forces balanced or unbalanced? _____

d. What will the resulting motion of the box be? _____

3. Below is a diagram of a tug-a-war. Circle the correct word to complete the sentences that follow.

200 Newtons   100 Newtons

a. The forces shown are PUSHING/ PULLING forces.
b. The forces shown are acting in the SAME DIRECTION/ OPPOSITE DIRECTIONS.
c. The forces are EQUAL/ NOT EQUAL.
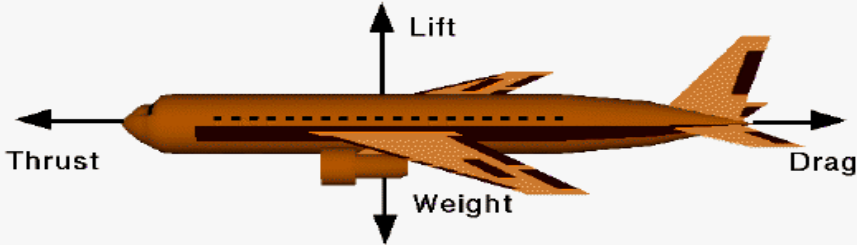d. The forces are BALANCED/ UNBALANCED..
e. Motion is to the RIGHT/ LEFT.

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Below is a diagram that shows the four forces that are acting on an airplane. The table below the diagram explains what happens when one force is greater than the opposing force that it is paired with. (Lift is always paired with weight and thrust is always paired with drag)

Simplified Aircraft Motion
Unbalanced Forces
Glenn Research Center

Lift
Thrust
Drag
Weight

Flight Condition	Effect
Lift > Weight	Plane Rises
Weight > Lift	Plane Falls
Drag > Thrust	Plane Slows
Thrust > Drag	Plane Accelerates

6. An airplane has a weight of 100,000 N and a lift force of 75,000N.

   a. What is the combined force (net force) on the airplane? _____

   b. Are the forces balanced or unbalanced? _____

7. An airplane has a thrusting force of 200,000 N and a drag force of 23,000 N.

   a. What is the combined force (net force) on the airplane? _____

   b. Are the forces balanced or unbalanced? _____