Name:_____ Period:_____ Date:_____

Mass Transit Proposal

Directions: Answer the following questions before you begin the activity.

1. An object is in _____ when its distance from another object is changing.

2. A _____ is a place or an object that is used for comparison to see if an object is in motion.

3. Describe how you can measure the distance an object has moved.

_____

_____

_____

_____

4. Explain how you know an object is in motion.

_____

_____

_____

_____

Directions: Using only the materials that were given to you, your team must design a vehicle that will transport mass across the room in the shortest possible time.

Sketch your plan below:

Get your teacher's initials once you have finalized your plan. _____

Setup your vehicle and observe how it travels. Record your observations below (How can you improve on your design, did you notice any problems?)

_____

_____

_____

_____

4. What were some of the observations other groups made?

_____

_____

_____

_____

After making any changes to your vehicle, test and record your data below in the table for 3 trials.

Trial Number	Time (X-Axis)	Distance (Y-Axis)
1		
2		
3		

What was your speed for trial 1(Show your calculations in the space provided)? _____

For trial 2 (Show your calculations in the space provided)?   _____

For trial 3 (Show your calculations in the space provided)??   _____
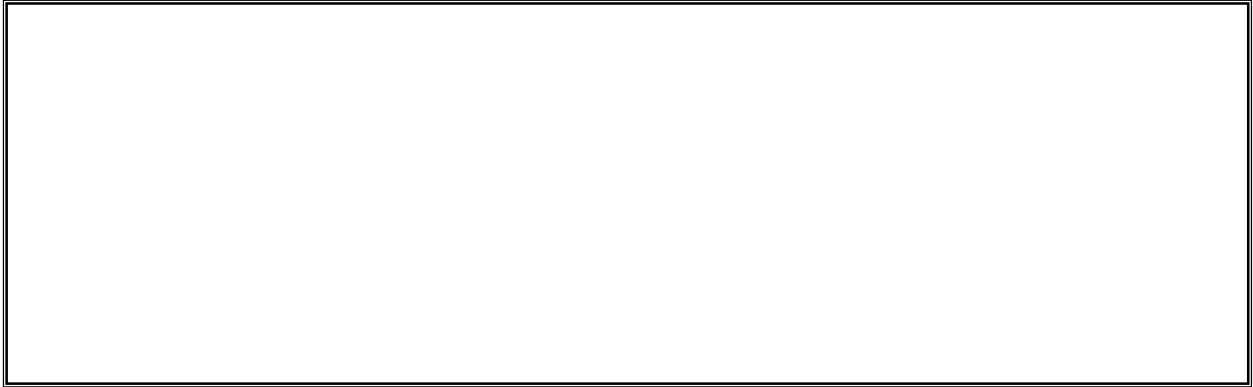
What caused your vehicle to move? How can you describe it?
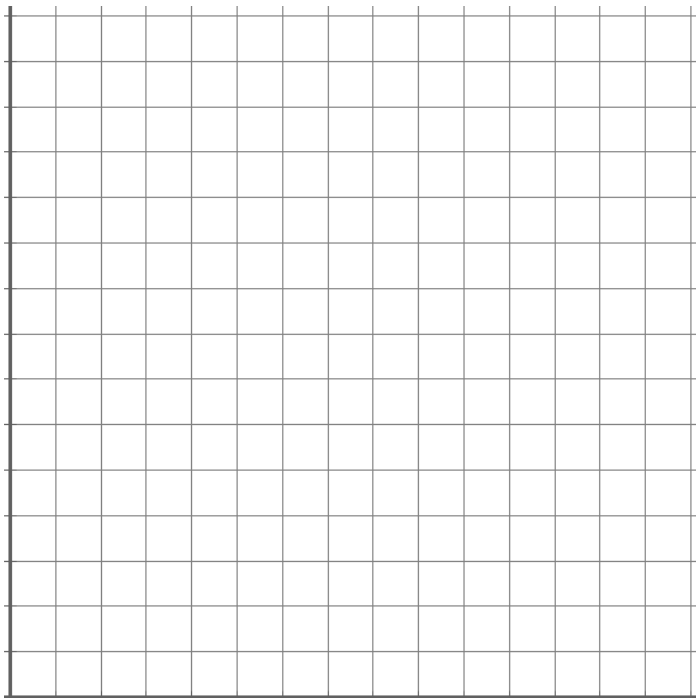
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_____

_____

_____

Draw a Free body diagram to represent the forces acting on your balloon when it was **stationary**.

Draw a free body diagram to represent the forces acting on your vehicle when it was **moving**.

Graph the data for the 3 trials recorded.

8. How could you make the zip-line more efficient? (How can you make the object travel farther or faster?)

_____

_____

_____

_____

9. Besides measuring distance, what other factors of motion can you measure that would help to describe motion?

_____

_____

_____

_____

10. Suppose you are riding in a car. Describe your motion relative to a car that is traveling in the same direction and the same speed.
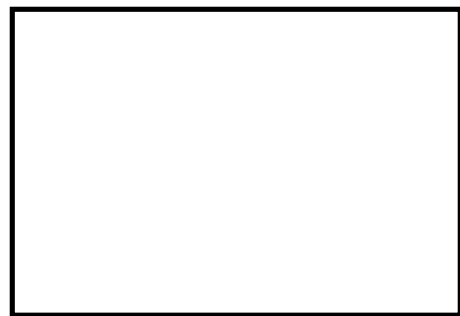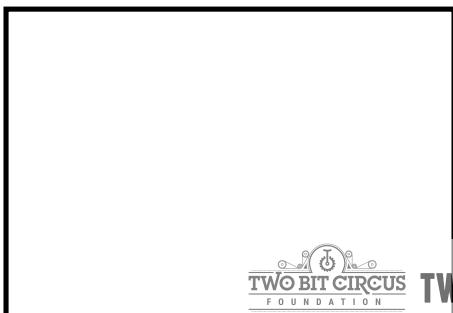
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Draw a free body diagram for a hot wheels car being pushed with 10N of force:

Draw a free body diagram of a student doing push-ups:

Draw a free body diagram of a book resting on a desk:

Draw a free body diagram of a balloon floating upward with a force of 30 N: