Newtons second law

Pupose:

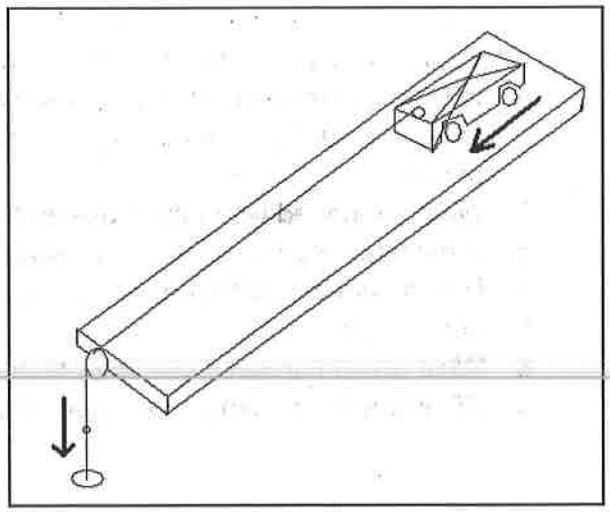
1. To visually see the effect of changing mass has on the acceleration of objects
2. To visually see the effect of changing the force has on the acceleration of objects
3. Reinforce understanding of and working with Newtons second law of motion

Background:

1. Newtons second law of motion
2. F=ma
3. Definitions of Force, Mass and Acceleration
4. The more massive an object, the more force required to accelerate it
5. If more force is applied to an object, then it will accelerate more

Materials needed:

1. Track with pulley
2. String
3. Hanging mass
4. Assorted masses
5. Vehicle
6. Stop watch
7. Data table
8. Triple beam balance
9. Meter stick



Procedure:

Day 1

1. Create data table
    a. 3 trials of 3 different masses of car
    b. 3 trials of 3 different forces
    c. Provide a column/row for time
    d. Provide a column/row to show work in determining accelerations
    e. Provide a spot to record original mass of car

Day 2

1. Attach a string to your car
2. Determine the mass of your car and record
3. Assemble track, make sure to allow 1 meter of travel from the stop to the front of car
4. Run trials being sure to change the mass of the car and then then changing the force acting on the car

Day 3

1. Provide math for determining accelerations
2. Answer conclusion questions

Conclusion questions:

1. What happened to the acceleration when the mass was changed?
2. In looking over your results, can you see any patterns emerging concerning mass that reinforce something discussed in class? Please provide details as to why or why not?
3. What happened to the acceleration when the force was changed?
4. In looking over your results, can you see any patterns emerging concerning applied force that reinforce something discussed in class? Please provide details as to why or why not?
5. What happened when the mass was increased?
6. What happened when the force was increased?
7. Provide a real world example using newtons second law. (class/note examples are not accepted)
8. What would happen if you were to increase the mass by 20x's?
9. What would you expect to happen if the force was increased by 20x's?