Name _____ Date _____ Period_____

Rubber Band Car Project

Overview: Using the Scientific Method, in groups of 1-3, you will build a car out of household items that runs using a wheel and axel and the power of a rubber band. Key Understandings:

1. **Complete the car with all crucial components**
   - Built from household materials (no toy parts etc.)
   - Powered by rubber bands (no pull back and release)
   - Constructed with at least 2 wheels
2. **The car should move in a forward direction at least <u>100 cm</u> using the rubber band as its source**
3. **Each student needs to complete their written portions of the assignment *individually*. Only the car portion will apply to all group members.**

Score	4	3	2	1
Main concept Questions *Due Friday Sept. 8th*	• All questions answered correctly • All answers are complete sentences	• Most questions answered correctly • Most answers are complete sentences	• Some questions answered correctly • Some answers are complete sentences	• No or few questions answered • No or few answers are complete sentences
Car *Due Sept. 11 and 12*	• All required parts are present • It moves 100 cm or more • Is powered using a rubber band	• All required parts are present • It moves 99 -60 cm • Is powered using a rubber band	• Most required parts are present • It moves 59-15 cm • Is powered using a rubber band	• Few required parts are present • It moves 14-0cm • It is not powered by a rubber band
Data, analysis & graph *Due Friday Sept. 15*	• All questions answered • Graph has all parts labeled • Scales are appropriate • 3 data points are plotted	• Most questions answered • Graph parts are almost all labeled • Scales are appropriate • 3 data points are plotted	• Some questions answered • Graph labels are missing • Scales are inappropriate • 3 data points are plotted	• Few questions answered • Graph labels are missing • Scales are inappropriate • Less than 3 data points are plotted
Conclusion *Due Friday Sept. 15*	• Conclusion shows deep understanding • Well organized • Uses complete sentences, has few spelling or punctuation errors	• Conclusion shows understanding • Mostly well organized • Uses mostly complete sentences, has few spelling or punctuation errors	• Conclusion shows some understanding • Some organization • Uses mostly complete sentences, has some spelling or grammar errors	• Conclusion shows weak understanding • Not well organized • Sentences are incomplete • Spelling errors make it difficult to read
TOTAL POINTS EARNED: _____/16				

Understand your car
Main Concepts
Use your notes or the book to help you answer the following questions in complete sentences.

Book 12.2

1. How is *velocity* different from speed? (p. 249)

_____
_____

2. How is *speed calculated*? (p.250-251)

_____
_____

3. What information will you need to collect to calculate the speed of your car?

_____
_____

Book 12.3 p.253-254

4. What information does a *position vs. time graph* provide?

_____
_____

5. What information would you need if you had to make a position vs. time graph of the motion of your car with three points?

_____
_____

Book 13.1

6. What is a *force*? (p.264)

_____
_____

7. How are forces and motion related? (p.264)

_____
_____

8. What force will ultimately stop your car? (p. 268)

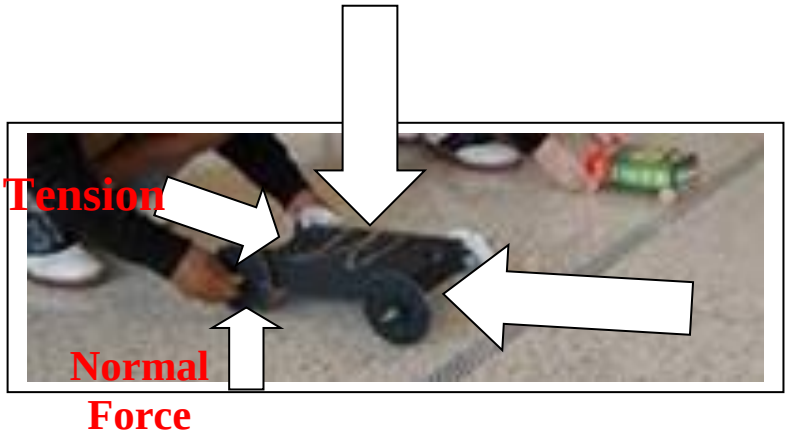
_____

9. How will *friction* help motion of your car? (p.272)

_____

_____

10. Gravity and friction are always affecting us here on earth. Label the force of **gravity** and **friction** acting on the car.



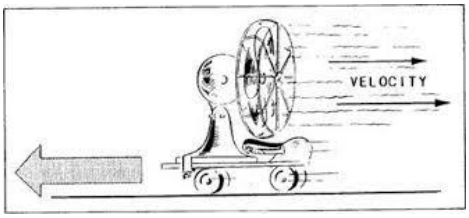
Book 14.1 p.292-293

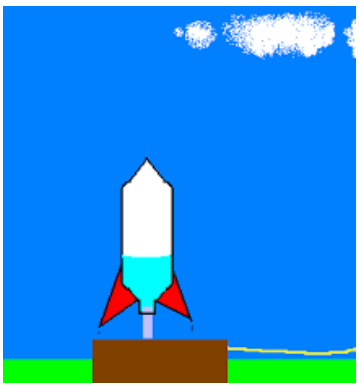
11. What is Newton's third law?

_____

_____

12. For each picture below label the action and reaction force.





13. How does Newton's third Law apply to your rubber band car?

_____

_____

Design your car

Required Materials

- Rubber band
- Axels
- At least 2 wheels

Suggested Materials

- Cardboard or small box for the body
- Bowls, plates, or cans for wheels
- Pencils, skewers or similar item for axels
- Shopping bag to hold car and supplies

1. What are you using for the body of the car?

_____
_____

2. How many wheels will you have? _____

3. What type of wheels do you think will work best?

_____
_____

4. How will you attach the wheels so that they are firmly attached but can still spin?

_____
_____
_____

4. How many rubber bands will you use? How will you connect them if using more than 1? _____

5. How are you going to attach the rubber bands to make the wheels spin?

_____
_____
_____

Draw a picture of your design. Draw the Outside and Inside of the car.