Name _____ Date _____ Period _____ Page _____

Newton's Laws Webquest

Part 1

Explain each of Newton's three laws:

A. Law of Inertia

_____

_____

B. Law of Force and Acceleration

_____

_____

C. Law of Action/Reaction

_____

_____

Part 2

1. I can investigate and apply Newton's Laws to vehicle restraints.
    a. Go to http://regentsprep.org/Regents/physics/phys01/accident/default.htm
    b. Choose one of the eight videos and observe Newton's Laws in relation to car crashes.
    c. Describe all the ways that Newton's Laws can apply in a car crash.

    d. Compare and contrast the results of a crash while the passengers are **not** wearing seat belts and while they are wearing seat belts.

2. I can investigate and apply Newton's Laws to sports activities.
   a. Go to http://www.exploratorium.edu/baseball/scientificslugger.html The Scientific Slugger.
   b. Read and fill in the blanks:

      The distance a baseball travels depends on _____ primary factors: the _____ at which the ball leaves the bat, and how _____ the ball is hit. The _____ of the ball depends on both the speed of the _____ and the speed of the _____.

      Gravity is always pulling _____ on the ball. If you hit the ball straight up, it spends quite a bit of time in the air, but doesn't travel far from home plate. If you hit the ball horizontally, as in a line drive, the ball moves away from home plate at maximum velocity, but quickly hits the ground because of _____ -- still not very far from home plate. To maximize your hitting _____, you need to have both a high horizontal _____ AND you need to keep the ball in the air for a _____ time. You can do this by hitting the ball at an _____ angle.

   c. Try to hit a home run. Change one variable at a time. Record each of your variables below.

Type of pitch	Pitch speed	Angle of the ball	Bat speed	Distance	Result? (homerun or not?)

3. I can investigate and apply Newton's Laws to amusement park rides.
    a. Go to http://www.learner.org/interactives/parkphysics Amusement Park Physics
    b. Read and answer the questions:
        i. What activities are more dangerous than riding an amusement park ride?

        _____

        ii. What drives the motion of a roller coaster?

        _____

        iii. Name the three types of wheels on a roller coaster car.

        _____

        iv. Compare and contrast wooden vs. steel roller coasters:

    c. Click the icon in the text that says 'Design a Roller Coaster'
        i. List the constants for the experiment

        _____

        ii. Click 'begin'
            1. Height of first hill _____
            2. Slope of the hill _____
            3. Exit path _____
            4. Height of the second hill _____
            5. Shape of the loop _____
        iii. Did your roller coaster pass the safety test? _____
        iv. Did your roller coaster pass the fun test? _____

4. Investigate and apply Newton's Laws to tectonic activities
   a. Go to http://www.jclahr.com/science/earth_science/animate/
   b. At the bottom of the page, click on the link for the Quicktime video. Play the video and answer the questions.
      i. Which of Newton's laws applies to the rock that gets stuck while the plate is subducting into the mantle? _____
      ii. Which law causes the land to bulge up above the subducting plate? _____
      iii. Which law causes tsunamis to occur when earthquakes take place in the water? _____
      iv. Explain the energy transformations involved when the plate subducts and creates an earthquake.

      _____

      _____

      _____

      _____

5. Investigate and apply Newton's Laws to rocket launches
   a. Go to http://www.sciencenetlinks.com/interactives/gravity.html and click 'start'
   b. You will have five different missions – to dock the rocket at the orbiting space station. For each trial, change the amount of thrust and the angle of the launch. Press the launch button to test your variables. Record variables for successful launches below:

Round	Thrust	Angle
1		
2		
3		
4		
5		