CONSCIOUS COMMUTING

As you ride to GREAT AMERICA, be conscious of some of the PHYSICS that occurs to you along the way

A. Starting Up

THINGS TO MEASURE:
As you pull away from the school or from a stop light, find the time it takes to go from stopped to 20 miles per hour. You may have to get someone up front to help on this.

t = _____ sec

THINGS TO CALCULATE: Show Equations used and your substitutions.

1. Convert 20 mph to m/s. (1.0 mph = 0.44 m/s)

   v = _____

2. Find the acceleration of the bus in m/s^2.

   a = _____

3. Using your mass in kilograms, calculate the average force on you as the bus starts up. (1 kg of mass weighs 2.2 lbs)

   F = _____

4. How does this compare to the force gravity normally exerts on you (your weight in newtons)?

   Circle One: More Less

   Force calculated / Weight = _____ g's

THINGS TO NOTICE AS YOU RIDE:

5. As you start up, which way do you FEEL thrown, forward or backward?

6. If someone were watching from the side of the road, what would that person see happening to you in relation to the bus?

7. If someone were watching from the side of the road, what would that person see happening to you in relation to the ground?

8. How can you explain the difference between what **you feel** as the bus starts up and what **the observer** sees? (You may want to use the concept of FRAME OF REFERENCE.)

CONSCIOUS COMMUTING, PART II

B. Going at a Constant Speed

THINGS TO NOTICE

9. Describe the sensation while going at a constant speed. Do you feel as if you are moving? Why or why not? (Try to ignore the effects of road noise.)

10. Do any forces act on you in the direction you are moving? Explain what is happening in terms of the principle of inertia.

C. Rounding Curves

THINGS TO NOTICE:

11. If your eyes are closed, how can you tell when the bus is going around a curve? Try it and report what you notice. (Do NOT fall asleep!)

12. As the bus rounds a curve, concentrate on a tree or a building that would have been STRAIGHT AHEAD. See if you can sense that you are TRYING TO GO STRAIGHT but are being pulled into the curve by a centripetal force.

13. What is supplying the centripetal force, the seat, your seatmate, the wall, the arm of the seat, or some combination?

14. How does this change when the curve is tighter or the bus is going faster?

15. Write a few sentences about this experience. How does it connect with what happens on the rides at Great America?

16. BONUS: Devise a method for estimating the centripetal force on you as you round a curve? (One possibility is to use keys on a string and ....)