Physics 140 Discovery Room #1

1.1 inertia, vectors; **1.2** Newton's 2nd law, projectile motion; **1.3** adding vectors

Name_____ Date/Time_____

Table Cloth and Dishes

Pull the tablecloth from underneath the dishes without disturbing them.
Hint: Pull quickly downward.

1. Why don't the dishes move/fall? Can you think of a physics concept that might explain this?

2. What if instead the cloth we used a wool tablecloth? Would the tablecloth "trick" still work?

Flying Peanuts

Turn the fan off and throw a (styrofoam) peanut across the face of it (sideways). Put a vector (arrow) on the floor to represent the velocity of the peanut.

Now turn the fan on high, hold the peanut right in front of the center of the fan, and let it go. Put another vector on the floor to represent the velocity of the peanut.

1. Draw a picture of the fan and your vectors below. Draw the sum of the two vectors.

Next, throw the peanut across the face of the fan with the fan on high. Put a vector on the floor to represent the velocity of the peanut. Do the arrows on the floor match your drawing?

(over)

Godzilla Forgot His Seatbelt

Push Godzilla on the cart.

1. Explain what happened to Godzilla using a physics concept.

2. How does this relate to wearing a seatbelt in the car?

Quarters and Ruler

Perform the quarter drop.

1. Do they hit at the same time? Why or why not?

2. Describe the horizontal and vertical motion of each quarter. Think about each quarter's horizontal and vertical components of acceleration and velocity. Are they the same or different?

Cart Accelerometer

Push the cart quickly starting from rest.

1. Explain the tennis ball's motion. What does this tell you about the cart's movement?

Push the cart at a constant speed (as well as you can ☺) and suddenly stop the cart.

2. Explain the tennis ball's motion. What does this tell you about the cart's movement?

Using the margins of this sheet of paper, write down a question regarding a topic, concept, or example you do not understand from this week in PHYS140.