Physics 140 Discovery Room #3

1.3 gravitational potential energy; **2.2** kinetic energy; **2.3** linear momentum, impulse, collisions, angular momentum

Name_____ Date/Time_____

Super/clay ball with cars

Collide the clay ball with the car by putting the car against the stop on the ramp, pulling the ball back to the bar, and releasing. Just let the ball go…do not push or pull on it.

1. Why did the car move? What did the ball exchange with the car?

Now repeat with the super ball.

2. What changed about the car? What changed about the ball's motion after the collision? How does this explain the car's behavior?

3. (a) What has kinetic and gravitational potential energy before the collision? (b) After the collision? (c) At the moment the car's motion reverses?

Two identical marbles and foam

Hold the two marbles at the same height, one over the foam and one over the floor.

1. Describe the energy of the two marbles as you hold them.

Drop both marbles.

2. Immediately after you drop them, what is the momentum of each marble?

3. Which imparts the most force to the floor?

(over)

4. What is the total change in momentum for each marble? How is impulse demonstrated in this experiment?

Different Weights on Rotating Stool

Sit on the stool and hold the two weights close to your body. Push with your feet and start spinning.

1. As you spin, move your arms away from your body. What happens? Can you think of explanation?

2. Then pull your arms close to your body again. What happens?

3. Can you think of examples where you have seen this effect?

Rotating Stool with Bicycle Wheel

Sit on the stool, hold the bicycle wheel horizontal and start it spinning. Then move the bicycle wheel to a vertical position.

1. How does the angular momentum of the bicycle wheel change?

2. How does your angular momentum change? Why does your angular momentum change?

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.