**Sample Interactive Lecture Demonstration Prediction Sheet**

***Note: This is a sample of interactive demonstrations. They do not represent a coherent sequence. See the tested sequences of demonstrations in the book, Interactive Lecture Demonstrations, available from Wiley.***

**Directions:** This sheet will be collected as a record of your attendance and participation. Print your name at the top. You may write anything you like on the attached *Results* sheet and take it with you.

**Sample Mechanics Demonstration 1:**

A massive (heavy) cart (called Truck) is pushed toward a light cart (called Car ) that isn't moving. Describe in words how ***F***T🡪C (the force of Truck on the Car) compares to ***F***C🡪T (the force of the Car on the Truck) during the collision. Make a rough graph of the forces over time.

**Sample Mechanics Demonstrations 2-4:**

Someone pushes a block on a smooth surface. The block experiences a constant frictional force opposite to its motion. Compare the following two forces in *magnitude and direction,* ***F***H🡪B (the force of the Hand on the Block) and ***F***B🡪H (the force of the Block on the Hand) during each of the three demonstrations described below.

**Demonstration 2:** The block is being pushed at a *constant velocity*. How do ***F***H🡪B and ***F***B🡪H compare?

How does ***F***H🡪B compare to the force of friction? What is the net force *on the block*?

**Demonstration 3:** The block is pushed so that it *speeds up*. How do ***F***H🡪B and ***F***B🡪H compare?

How does ***F***H🡪B compare to the force of friction? What is the net force *on the block?*

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| **Sample Circuits Demonstration 1:**  In the circuit on the right, Bulbs D and E are identical. Assume that the battery has no internal resistance. Initially, switch S is open.  Now switch S is closed.  What happens to the brightness of bulb D?  Compare the brightness of Bulb E to the brightness of Bulb D.  With the switch closed, compare the current through the battery to the current through Bulb E. |  |

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| **Sample Circuits Demonstration 2:**  The circuit on the right consists of capacitor C in series with a bulb (resistance R). The capacitor is initially charged with +Q on the top plate and -Q on the bottom plate. Predict what will happen to the bulb after switch S is closed.    Sketch on the axes to the right the *voltage across the capacitor* *Vc* vs. time after the switch S is closed.  Sketch on the axes to the right the *voltage across the bulb Vb* vs. time after the switch S is closed. |  |

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| Sample Heat and Temperature Demonstration 1: Heat is transferred at a steady rate to a mixture of water and ice at 0°C in a perfectly insulated cup (no heat can leak in or out). After the ice has completely melted, heat is still transferred for awhile. Sketch below your prediction for the graph of the temperature as a function of time. |

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| Sample Heat and Temperature Demonstration 2: Heat is transferred at a steady rate to water initially at 80°C in a perfectly insulated cup (no heat can leak in or out). After the water starts boiling, heat is still transferred for awhile. Sketch below your prediction for the graph of the temperature as a function of time. |