Physics 11
M. Lam

Ramp Lab

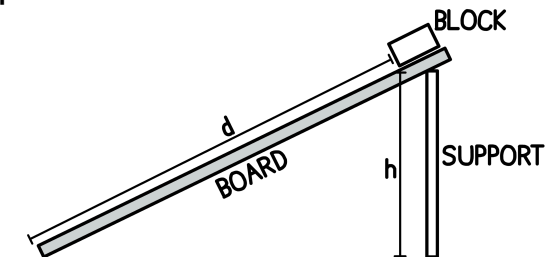**Objective**
Determine the amount of energy converted into heat in a real system

Equipment   **Apparatus**
ramp with support
wooden block
stopwatch
meter stick
electronic balance

Experimental Method

1. Construct the apparatus above.

2. Mark a starting point at the top of the ramp at which you will place the bottom corner of your block. Record the mass of the block, the height at which the block is released, and the distance travelled.

    Mass m: _____   Height h: _____   Distance d: _____

3. Calculate the initial energy the block has at the top of the ramp.

4. What percent of the initial energy do you think will be lost due to friction? Use this prediction to estimate the energy converted into heat (this should be the result of a calculation using your predicted percentage).

    Predicted percentage of energy lost: _____ %

    Predicted heat energy: _____ J

5. Use the conservation of energy along with your predicted heat energy to estimate the speed of the block when it reaches the bottom of the ramp.

6. Release the block from the top of the ramp and record the time it takes to reach the bottom. Repeat this at least five times. Record these times below.

Time (s)					
Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Average

Analysis and Discussion

1. Determine the speed of the block at the bottom of the ramp.

2. Is the actual speed of the block calculated above greater or less than the predicted speed? Use this to evaluate your prediction for the percentage of energy lost.

    The actual speed of the block is _____ than the predicted speed.
    greater/less

    My prediction for energy loss was too _____.
    high/low

3. Determine the energy transformed to heat.

4. What percentage of energy was lost due to friction?

5. Determine the force of friction.