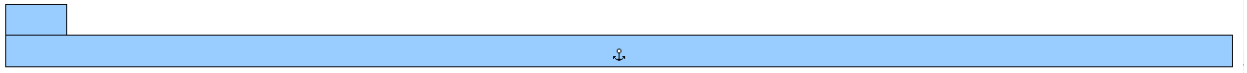
CP Physics – Ramp Acceleration Lab #2 (Added Friction) – IP2005 **Mr. Coté**

Using Interactive Physics 2005, build a simple model like the one shown below.



Make the "floor" 20m long, and make the block 1m long. Set the mass of the block to 1kg. Set the static friction coefficient to 0.3, and the kinetic friction coefficient to 0.2. Now apply a force of 10 N to the right to the block, but don't run the simulation yet. Use your knowledge of physics to predict how long it will take the block to reach the other end of the floor. Next, run the simulation to see how good your prediction was. Show your calculations below.

1) What was your predicted time? _____
2) What was your simulated time? _____

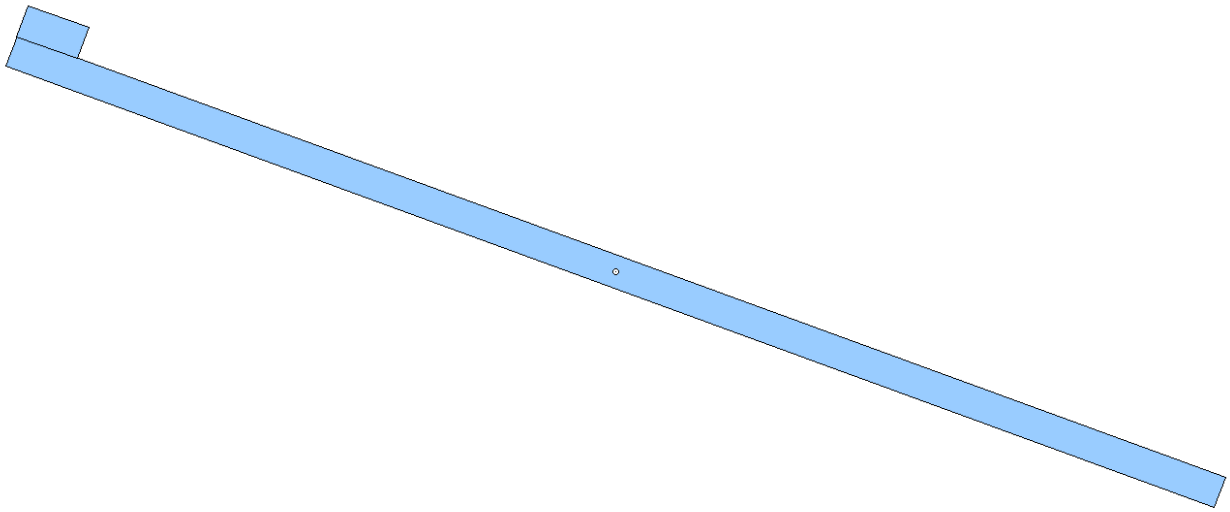
3) Explain any differences.

Now change the mass of the block to 5kg, and repeat the steps above, predicting the time it will take the block to reach the end, and then simulating it with IP2005. Show your calculations below.

4) What was your predicted time? _____
5) What was your simulated time? _____

6) Explain any differences.

Now, modify the simulation to look like this:



Remove the applied force, and set the ramp to an angle of 20 degrees above horizontal. Reset the mass of the block to 1kg. Once again, set the static and kinetic friction coefficients to 0.3 and 0.2 respectively. Calculate how long it will take the block to reach the end of the ramp. Then run the simulation to see how good your prediction was. Show your calculations below.

7) What was your predicted time? _____
8) What was your simulated time? _____

9) Explain any differences.

Now, change the mass of the block to 5kg, and rerun the simulation. Do you notice any changes? If so, explain why the simulation changed? If you saw no changes, explain why?