Acceleration lab

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Purpose: To observe various types of acceleration and create multiple models to represent acceleration (graphs, motion maps, and written descriptions).

**Observations: Write 2 observations of the motion shown in each demonstration**

Situation 1: Object rolling down a ramp

1)

2)

Situation 2: Object pushed on a flat surface and then allowed to roll to a stop.

1)

2)

Situation 3: Object pushed up a ramp and allowed to roll back down.

1)

2)

INVESTIGATION QUESTION: What do the graphical and motion map models look like for each of the 3 situations?

**Procedure**:

ROLES: Timer/caller, position marker, recorder of data, measurer(s),

1. Use a skinny book, or two, to prop up one of the whiteboard ramps, so that it is inclined.
2. Place your “frictionless” car on the ramp. Be careful with it….$45 each if you break it.
3. Consider your start position for the car to be 0 position. Up the ramp will be the positive direction, and down the ramp will be negative direction.
4. Push the car or release as described in each of the 3 situations. Practice a few times before gathering data.
5. Mark your car’s position on your board for each of the motions at a 6 different times during its motion (or more, preferably). You will do only 1 trial for each of the Situations (it would be difficult to make the exact same push each time, so we wont take averages like in the buggy lab). Use your phone to mark lap times for each mark.
6. If you take data for a trial that your group agrees is a “bad trial”, you have permission in this lab to throw out your data and retake it.
7. Create the graph and motion map for each set of data based on your data.

**Situation 1:** Object rolling down a ramp  
  
Data Table for Situation 1

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| Time (s) |  |  |  |  |  |  |  |  |  |
| Position (cm) |  |  |  |  |  |  |  |  |  |

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Written Description of Motion

**Situation 2:** Object pushed on a flat surface and then allowed to roll to a stop.  
  
Data Table for Situation 2

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| Time (s) |  |  |  |  |  |  |  |  |  |
| Position (cm) |  |  |  |  |  |  |  |  |  |

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Written Description of Motion:



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**Situation 3:** Object pushed up a ramp and allowed to roll back down.  
  
Data Table for Situation 3

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| Time (s) |  |  |  |  |  |  |  |  |  |
| Position (cm) |  |  |  |  |  |  |  |  |  |

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Written Description of Motion: