Accelerated Motion Lab

/14

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Problem: Determine the acceleration of the dynamics cart.

Materials:

* Dynamics Cart
* Ticker Timer
* Ramp

Procedure:

1. Set up the ramp at an angle of approximately 15o angle.
2. Place the puck at the top of the ramp.
3. Set the timer to 1/10 s and press the pedal.
4. Plug in the vacuum pump and release the puck.
5. Measure the distances between the dots on the tape and record in the table.

Observations: (2)

|  |  |  |
| --- | --- | --- |
| Dot | Time (s) | Displacement (cm)  |
| 1 | 0 |  |
| 2 | 0.10 |  |
| 3 | 0.20 |  |
| 4 | 0.30 |  |
| 5 | 0.40 |  |
| 6 | 0.50 |  |
| 7 | 0.60 |  |
| 8 | 0.70 |  |
| 9 | 0.80 |  |
| 10 | 0.90 |  |

1. Sketch a graph of position vs time and identify the shape of the graph. (2)

X: [ , , ]

Y: [ , , ]

Analysis:

1. What function of *t* would have to be graphed to produce a linear position time graph? (1)
2. Using your initial table of values, create a second table of values that will allow you to create a linear graph. (2)

|  |  |  |
| --- | --- | --- |
| Dot |  | Displacement (cm)  |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |

1. Sketch a graph of the data from the table. (2)

X: [ , , ]

Y: [ , , ]

1. Determine the slope of the line of best fit. *Be sure to include the units of the slope*. (1)
2. Using your line of best fit determine the acceleration of the car. *Be sure to include the units!* (3)

