**DATA SHEET**

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

## Prediction

1. What happens to an object when you apply a net force to it?
2. What happens to the motion of an object if it has a constant mass but you change the magnitude of the net force on it?
3. Paste the velocity-time graph of your data showing the four runs with fits.
4. Data Table 1

|  |  |
| --- | --- |
| **Item** | **Mass (kg)** |
| Run #1: Total mass of a paper clip and one quarter(m1): |  |
| Run #2: Total mass of a paper clip and two quarters(m2): |  |
| Run #3: Total mass of a paper clip and three quarters(m3): |  |
| Run #4: Total mass of a paper clip and four quarters (m4): |  |

1. Data Table 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Run** | **Abelow (m/s2)** | **Aabove (m/s2)** | **aaverage (m/s2)** | **mhanger (kg)** | **Mcart (kg)** |
| **#1** |  |  |  |  |  |
| **#2** |  |  |  |  |  |
| **#3** |  |  |  |  |  |
| **#4** |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  | **average** | **Mcart (kg)=** |  |

6. Measure the mass of the cart using a scale and record that mass here.

Mscale = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Compare the average cart mass with Mscale by calculating a percent difference. Show your work

**Questions**

1. Why did the slope change at $\left|\vec{v}\right|=0 $for each run?
2. For runs #2, #3, #4, what did you observe about the slope of the Linear Fit as the net force increased?
3. What are the units for the slope for each graph? Explain.
4. What happens to an object’s acceleration if the net force applied to the object is increased but the object’s mass remains constant?