Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class Period \_\_\_\_\_\_\_\_\_\_\_

**Section 2.4: Graphing Motion**

You will make four graphs in this activity. Place graphs for 1a and 1b on the front of the graph paper and 2a and 2b on the back. Don’t forget to answer 1c and 2c on this sheet. Staple this sheet to your graphs and turn in. **Make sure your graph has a title, labels & units on each axis and a best-fit line.**

1. A van travels down the street at a constant speed.

1. Make a distance time graph from the data below. Remember time always goes on the x-axis. Title this graph “**Constant Speed Object - Distance vs. Time**”

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Time (s) | 0 | 2 | 4 | 6 | 8 | 10 | 12 |
| Distance (m) | 0 | 40 | 80 | 120 | 160 | 200 | 240 |

1. Now make a velocity time graph for the same van using the data below. Title this graph “**Constant Speed Object - Velocity vs. Time**”

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Time (s) | 0 | 2 | 4 | 6 | 8 | 10 |
| Velocity (m/s) | 20 | 20 | 20 | 20 | 20 | 20 |

c**.**  Calculate the slope of the best-fit line from 1a. Show work below

 Remember: slope = $\frac{rise}{\begin{array}{c}run\\\end{array}}$ = $\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$.

1. What would be the units for the number you found in 1c? ( Look at the units of the numbers you used.)
2. The slope of a distance vs. time graph equals the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the object.

2. An apple falls from a tree to the ground. Gravity will cause it to accelerate.

a. Make a distance time graph from the data below. Remember time always goes on the x-axis. Title this graph “**Accelerating Object - Distance vs. Time**”

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time(s) | 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 |
| Distance (cm) | 0 | 5 | 20 | 45 | 80 | 125 | 180 | 245 | 320 |

b. Now make a velocity time graph for the apple using the data below. Title this graph “**Accelerating Object - Velocity vs. Time**”

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time (s) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Velocity (m/s) | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |

c. How is the shape of the best fit line in 1a different from the best fit line in 2a.