

**FPS – Hallway Speed Lab**

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

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| I can… |
| *Solve and interpret speed problems.**Construct and interpret distance vs. time graphs.**Construct and interpret speed vs. time graphs.* |

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| Pre-Lab Questions |
| 1. What is the formula for speed?
2. What are the units for speed?
3. What do you think is the difference between ***instantaneous*** and ***average*** speed?
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| ***Procedure*** |
| 1. The class will be divided into 2 groups (if available), with 1 voluntary ***mover*** and 10 ***timers*** each group.
2. At each 5 m mark in the hallway, one ***timer*** will stand with a stopwatch. When the ***mover*** passes that 5 m mark, each ***timer*** will stop the watch and keep it stopped to record the time.
3. The ***mover*** will start at the 0 m mark and finish at the 50 m mark down the hallway.
4. After two trials have been completed, the groups will come in and report their data on the boards.
5. The second group will repeat steps 2-4.
6. Fill in the data tables provided, make calculations, graph the data, and answer the questions.
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| ***Data Tables*** |
| ***Group 1 data*** Mover name: | Meter mark | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| Time |  |  |  |  |  |  |  |  |  |  |
| ***Group 2 data*** Mover name: | Meter mark | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| Time |  |  |  |  |  |  |  |  |  |  |
| ***Calculations*** |
| 1. Image result for speed triangleFind the ***instantaneous*** speed at each 5m mark using the speed formula or triangle provided.

$Speed= \frac{distance}{time}$ |
| ***Group 1 data*** | Meter mark | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| Instantaneous speed |  |  |  |  |  |  |  |  |  |  |
| ***Group 2 data*** | Meter mark | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| Instantaneous speed |  |  |  |  |  |  |  |  |  |  |
| 1. Find the ***average*** speed using the TOTAL time and the TOTAL distance travelled.

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| Graphing |
| 1. Image result for grid paperGraph the speed on a distance vs. time graph. Put time on the x axis. Title, label, and scale the graph appropriately. Pick either group’s data to graph—you only need to graph one group’s data.
2. Graph the ***instantaneous speed*** of that same group on a speed vs. time graph. Put time on the x-axis. Title, label, and scale the graph appropriately.
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| Analysis & Conclusions |
| 1. What does the data suggest about the **difference** between instantaneous and average speed?
2. Did either mover have the same speed for every 5 meter mark? ***Why or why not***?
3. Looking at the **distance** vs. time graph, describe the changes in speed.
4. Looking at the **speed** vs. time graph, describe the changes in speed.
5. How does the speed vs. time graph represent the data **differently** from the distance vs. time graph?
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***Bonus:*** Record the time it takes you to walk from the 0m mark to the 50 m mark and calculate your average speed.