

**Speed Inquiry Lab**

<u>Role</u>	<u>Description</u>	<u>Name</u>
<b>Leader</b>	Makes sure everyone is on task and participating; helps group make final decisions	
<b>Recorder</b>	Writes down data and shares at end of lab	
<b>Runner</b>	Gets materials and communicates with teacher	
<b>Cleaner</b>	Returns all materials, throws away trash, and makes sure work space is clean	

**Objective:** You and your partner(s) will design an experiment that measures speed of an object. The object must reach a higher speed with each trial. You may not push the object.

**Directions:** Using the materials below, design an experiment that causes the speed of an object to increase when tested in 3 trials. Each trial will be run 3 times. You will have the option of using a \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_ to experiment with in this lab. In addition, you will have access to meter sticks, stopwatches, tape measures, protractors, and other resources in the classroom.

**\*\*The differences you apply to your setup for each trial must be measurable and uniform!\*\***

**\*\*\*Challenge - Can you do this without building a ramp?\*\*\***

**Test Object:** \_\_\_\_\_

**Hypothesis:** (Write in the form of "If \_\_\_\_\_, then \_\_\_\_\_.")

\_\_\_\_\_

**Materials:**

\_\_\_\_\_

**Procedure:** (Write your procedure so that someone else could duplicate your experiment.)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

**Observations:**

1. Draw a labeled diagram of how you set up your experiment. Where is the start/finish, what materials did you use, how is each trial different?

2. Record the data from your experiment below. Round to the nearest hundredth!

Trial	Distance (cm)	Time (seconds)	Speed (cm/sec)	Speed Average (cm/sec)
1 - 1 <sup>st</sup> run				
1 - 2 <sup>nd</sup> run				
1 - 3 <sup>rd</sup> run				
2 - 1 <sup>st</sup> run				
2 - 2 <sup>nd</sup> run				
2 - 3 <sup>rd</sup> run				
3 - 1 <sup>st</sup> run				
3 - 2 <sup>nd</sup> run				
3 - 3 <sup>rd</sup> run				

3. Graph your speed for each run. Use a histogram (bar graph with touching bars)!

Make sure to:

Give your graph an appropriate title.

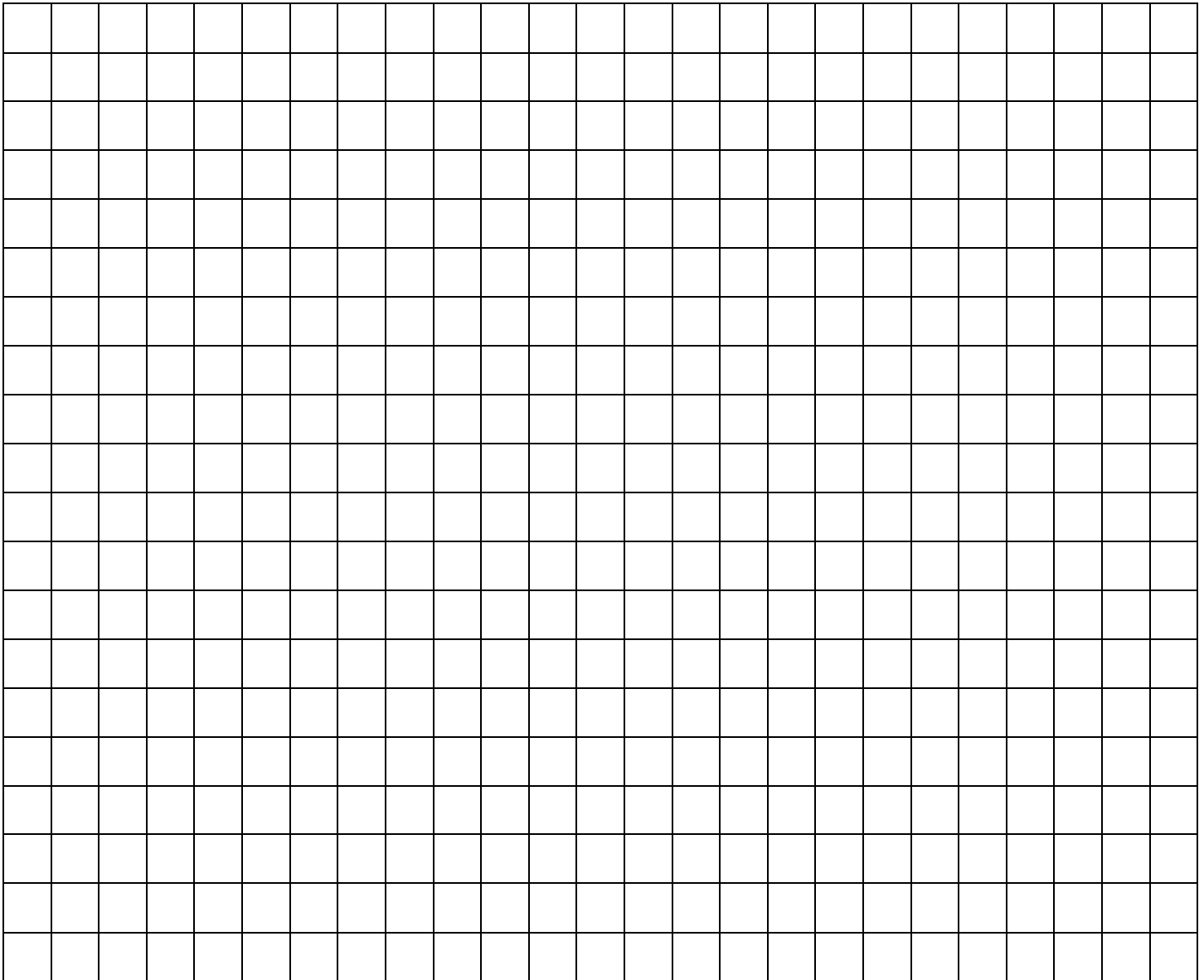
Label each axis.

Leave spaces between the bars for different trials.

Color-code the trials and make a key.

USE A RULER!

Title \_\_\_\_\_



**Conclusions: Answer in complete sentences.**

1. Was your hypothesis correct? Why or why not?
2. Did you have any runs that didn't support your hypothesis? Why or why not?
3. What two factors must you know about any object to calculate its speed?
4. What would you do differently next time?
5. What could you have done during your experiment to slow the speed of the object from beginning to end?
6. Explain why the speed you calculated today was *average* speed and not *constant* speed. Draw a diagram of your setup to help support your answer.

**CLASSROOM COPY - WRITE ON YOUR OWN PAPER!**

**Lab Skills Assessment - Speed Inquiry Lab**

1. What was your independent variable?
  - a. Size of object
  - b. Speed of object
  - c. Height that you released object
  - d. Time object was observed
2. What was your dependent variable?
  - a. Size of object
  - b. Speed of object
  - c. Height that you released object
  - d. Time object was observed
3. What factors should be included in the control variables?
  - a. Test object, Test surface
  - b. Speed of object, Time object was measured
  - c. Height that you released object, Test 9. object
  - d. Speed of object, Height that you released object
4. What two factors are needed to calculate the speed of an object?
  - a. Distance and mass
  - b. Distance and position
  - c. Time and distance
  - d. Time and mass
5. What objective you were practicing with this lab?
  - a. Measuring distance
  - b. Measuring time
  - c. Measuring speed
  - d. Measuring mass
6. What factor increased the speed of the object?
  - a. Moving down an increased incline
  - b. Moving down a decreased incline
  - c. Moving without an incline
  - d. Moving up an increased incline
7. What does speed measure?
  - a. Change in time over a distance
  - b. Change in distance from a position
  - c. Change in height over time
  - d. Change in position over time
8. What should have happened with trials 2 and 3?
  - a. The time should have increased
  - b. The distance should have increased
  - c. The distance should have decreased
  - d. The speed should have increased
9. What could you have done to make it easier to record the time?
  - a. Decrease the distance that you allowed the object to move
  - b. Increase the distance that you allowed the object to move
  - c. Increase the speed the object moved
  - d. Measure in a larger unit of time (minutes, hours, etc.)
10. If you were not allowed to push or pull the object to get it to move, which force would you use?
  - a. Gravity
  - b. Friction
  - c. Acceleration
  - d. Speed