

Name _____

Hot Wheels Lab

Introduction: Speed and velocity, while similar, are different. Speed is the distance an object moves divided by the time it took. For example, if a car travels 100 miles in 3 hours its speed is 33.3 miles per hour (mph). Velocity is speed in a given **direction**, for example 50 mph North or 33 meters per second West. An object's speed can be constant while its velocity changes, such as in a car turning or circular motion.

Purpose: To calculate the velocity of Hot Wheels® Cars from different ramp heights.

Procedure:

- 1) There are 6 Hot Wheels® courses throughout the classroom numbered 1-6.
- 2) For each course, you are to take 3 times for your car. average them. and calculate the velocity for each course.
- 3) Collect your data in the table below. Remember to use correct units and "throw away" any data that is inconsistent!

Course #	Time 1 (seconds)	Time 2 (seconds)	Time 3 (seconds)	Time (Average)	Distance m	Velocity m/s
1) 12 cm						
2) 22cm						
3) 32 cm						
4) 42 cm						
5) 52 cm						
6) 52 cm*						

Analysis:

- 1) How fast was your fastest car going? (in m/s)
- 2) What is the difference between speed and velocity?
- 3) How can an object be going at a constant speed, but NOT velocity?
- 4) Courses 5 & 6 both started from 52 cm of height, why was 5 faster?
- 5) What trend did you see in the speed of the cars as starting height increased?
- 6) Why did the cars speed up? What is an increase in velocity called?

7) Complete the problems (show all steps including formula used):

A) What is the speed of a car that moves 339 miles in 6.5 hours?

B) How long would it take a plane to travel around the world (24,800 miles) if its average speed was 612 miles per hour?

8) How fast was your fastest car going in miles per hour? (Hint: 1hr=3600s, 1mi=1609m)

9) How fast was your slowest car going in miles per hour?

10) Create a graph below showing average speed (y-axis) to starting height (x-axis)

