Average Speed of a Constant Velocity Vehicle Lab

The purpose of this lab is to calculate the speed of a constant velocity vehicle (CVV), to develop skills in precision and accuracy, data collection and calculations related to average speed. A constant velocity vehicle is a car that mechanically maintains the same speed, and can be ordered from a science supplies catalog.

Primary Learning Outcome
Students will understand the concept of speed and how to calculate average speed, and they will understand the importance of accuracy in data collection.

Assessed GPS
SCSh3
SCSh4
SCSh5
SPS8
SP1

Total Time
Varies with distance and number of trials chosen, but allow 1hour for this format to discuss and conduct the trials, and do calculations.

Materials per group
Data table (attached)
Stopwatch
CVV
Meter stick
Masking tape

Procedure
- Place a piece of tape on the carpet- this is the starting line. Determine and measure the experimental distance and mark the finish line with tape.
- Start the car behind the starting line. Time begins as car crosses front of tape and ends when car crosses front of finish line tape.
- Do 3 practice runs to make sure timing is accurate and precise.
- Record time data, and repeat for each trial.
- Calculate the speed for each trial and the average speed of all three trials.
- Complete the calculations on the data sheet.

Assessment
Students can be graded based off their answers on the data sheet where they have to perform the calculations in two directions. The concepts of speed and acceleration can be clarified further after the lab, and similar problems put on a unit test.

Name_____   Car #_____

Average Speed Data Table

Trial	Distance cm	Time s	Speed cm/s
1			
2			
3			

1) Calculate the speed of the vehicle for each of the 3 trials. Record your answers in the table.

2) Find the average speed of the 3 speeds you found in #1. Show your work.

3) What observations did you make about the results between the three trials?

4) Using the Average Speed found in #2, predict how long it should take for the vehicle to go 300cm (show all four steps). Use the equation s=d/t and solve for t.

5) Repeat the experiment using the same car. This time do 1 trial for a distance of 300cm.

     Record the time: _____sec. This is your experimental (predicted) time.

6) Find the % Experimental Error between the experimental time and the actual time.

     Experimental time = _____(see #5)
         Accepted time = _____(see #4)

     Formula: $\dfrac{|\text{experimental time - accepted time}|}{\text{accepted time}}$ x100 =_____