

# Lab: Speed Inquiry

## Instructions

Design an investigation to analyze the rate of motion (speed) of a ball bearing on a horizontal track. You will communicate this investigation to your teacher in form of a formal lab report which must include a title and heading and the following labeled sections: **Question, Background Information, Hypothesis, Materials, Safety, Procedure, Data Table, Data Manipulation (Graph), Data Analysis, Conclusion and Error Analysis.** Refer to your “Scientific Inquiry” notes for help on how to design the investigation and see the “Lab Write-up Format” handout for specifics on how to organize and write each section of your lab report. Important considerations and hints are given below (read carefully):

- Important:** Don't start the lab until you have determined the two variables you will be investigating. To figure this out, ask yourself, “What two variables influence speed?” If you take a moment to write down the equation for speed, you will find your answer.
- Important:** You will find it easiest to treat distance as your independent variable as you design and conduct your experiment. When you go to graph, however, treat time as your independent variable and thus put it on the x-axis. Always put time on the x-axis in this class.
- Important:** Since speed is not one of your variables for this lab, you must do your best to hold it constant. So, don't start your ball bearing from rest when making your measurements. Instead, get it up to your desired speed first and then start your trial and take your measurement once it is moving at a constant speed.
- Important:** To control for the same force on the ball each time you roll it, keep tube angle and length controlled.
- Important:** Include multiple trials, averages of those trials, and 6 conditions. Do not write on the track (though you may place tape on it)!
- Important:** Be sure to include in your conclusion the speed of the ball as determined by analysis of your graph.
- Hint:** To avoid confounding variables, keep the ball on the track for all conditions.
- Hint:** Place a stop (book, foot, etc...) at the end of the track and plug the local drain so as to avoid losing/damaging ball.