

# On-Level Physics

## Velocity

This unit will allow each student to:

- a. gain a better understanding of the concepts of speed and velocity as well as describing them through the use of graphs
- b. continue making proper scientific measurements and calculations (K-U-E-S)
- c. define and properly use all vocabulary
- d. properly apply all terms in describing/explaining real world examples
- e. relate these concepts her/his daily activities and behaviors
- f. teach someone else the concepts discussed
- g. practice proper laboratory safety

This will be accomplished by each student that is able to:

1. recognize and relate SI and USCS units of time, distance, displacement, speed, and velocity
2. recognize a time, distance, displacement, speed, and velocity by the units only
3. describe a moving object with relation to a frame of reference
4. distinguish between distance and displacement
5. distinguish between speed and velocity
6. distinguish between *change in*, *average*, and *constant*: speed and velocity
7. describe the motions of an object with a constant speed but changing velocity
8. interpret (a) distance v. time, (b) position v. time, (c) speed v. time, and (d) velocity v. time graphs
9. construct (a) distance v. time, (b) position v. time, (c) speed v. time, and (d) velocity v. time graphs from given data
10. collect necessary data from a given scenario to construct a position v. time and a velocity v. time graph
11. perform calculations using proper problem solving techniques (K-U-E-S) to determine (a) speed, time, or distance and (b) velocity, displacement, or time
12. experimentally determine various speeds and velocities

### Textbook Reference – Physics: Principles and Problems

### Chapter 2 – Representing Motion

**Key Terms** – *write the definitions of the boldface terms on your own paper, definitions are available at [theteterszone.net](http://theteterszone.net)*

**frame of reference, distance, time, direction, position, rate, speed, instantaneous speed, average speed, constant speed, displacement, velocity, vector, scalar, magnitude**

Daily Grade: Daily questions/homework/review sheet

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## Speed and Velocity Review

Answer each question as completely as possible.

- A. Why is motion considered relative, and what does that mean?
- B. What object is the usual frame of reference for motion here on the earth?
- C. Explain how a boulder at rest on the ground can actually be moving at the same time.
- D. Define speed. What is the difference between instantaneous and average speed?
- E. What is the equation for speed? What are some possible units for speed?
- F. Differentiate between speed and velocity.
- G. Define constant velocity. When does an object have constant velocity?
- H. What is the average speed of a car that travels 200 miles in 2 hours?
- I. Sketch a position v. time graph representing the motion of a dog: (a) first with a constant positive velocity, (b) then at rest, and (c) finally a constant negative velocity.
- J. Describe in words the motion of the object in the following graph:

