Chapter 4 Review KEY Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per. \_\_

Integrated Science: Physics/Design

1. Define speed.

Speed describes how quickly something moves.

1. What is the formula for speed?

Speed = distance/time

1. What are the units for speed?

The units for speed are distance units over time units.

1. What is the difference between instantaneous speed and average speed?

The average speed is calculated by dividing the total distance of a trip by the time the trip took. The instantaneous speed is the actual speed on object has at any moment.

1. An object travels 30 meters in 5 seconds. What is its speed?

S= d/t

S= 30m/5 sec

S=6 m/s

1. How long would it take a cat to travel 200 meters if its speed was 10 m/s?

t=d/s

t= 200m ÷ 10 m/s

t= 20s

1. What distance could a bird travel in 25 seconds if it was flying at 10 m/s?

d= s x t

d= 10 m/s x 25 s

d = 250 m

1. A train travels 50.0 km in 3.00 hours. What is the average speed of the train? (Be sure and report your answer to the correct number of significant digits.)

S=d/t

S=50.0 km / 3.00 hr

S= 16.6666666 km/hr

The answer must have 3 significant digits, so round the speed to 16.7 km/hr

*(You can find more speed practice problems on page 77 of your textbook.)*

1. Define velocity.

Velocity is a vector quantity that includes both speed and direction.

1. What is the difference between speed and velocity?

Speed just describes how quickly something moves. Velocity describes both how quickly and in what direction something moves.

1. Is velocity a vector? Why or why not?

Velocity is a vector because it has both magnitude and direction.

1. Can velocity change when speed stays constant? Explain.

Yes, if an object is traveling at a constant speed and it changes direction then its velocity will change.

1. Can speed change when velocity stays constant? Explain.

No, if the speed changes then the velocity will also change because speed is a part of velocity.

1. Define acceleration.

Acceleration is the rate of change in velocity

1. What is the equation for determining acceleration?

a = V finish – V start / Time

1. A jogger slows down from 10 m/s to 6 m/s in 10 seconds. What is her acceleration?

a = 6 m/s – 10 m/s ÷ 10 s

a = -0.4 m/s2

1. A boat goes from 3.3 m/s to 11 m/s. in 4.0 seconds. What is the boat’s acceleration? *(Be sure your answer has the correct number of significant digits.)*

a = 11 m/s – 3.3 m/s ÷ 4 s

a = 1.925 m/s2

The answer can only have two significant digits so it should be rounded to 1.9 m/s2

1. A skateboarder traveling at 4.0 meters per second rolls to a stop at the top of a ramp in 2.0 seconds. What is the skateboarder’s acceleration?

a = 0 m/s – 4.0 m/s ÷ 2.0 s

a = -2.0 m/s2

*(You can find more acceleration problems on page 88 of your textbook)*

1. If a racecar driver goes at a constant speed as she rounds a corner, is she accelerating? Explain.

The driver is accelerating because her direction is changing.

1. If a hockey player goes at a constant speed in a straight line, is he accelerating? Explain.

The hockey player is not accelerating because his velocity is not changing.

1. If a marathon runner puts on a burst of speed at the end of a race, is he accelerating? Explain.

The runner is accelerating because his speed is changing.

1. If a cat stops suddenly, is it accelerating? Explain.

The cat is accelerating its speed is changing.

Use the graph to answer the questions 23-29.

1. Which rabbit went the farthest?

Rabbit #2 (red)

1. Which rabbit went the longest amount of time?

All the rabbits went for the same amount of time

1. Which rabbit(s) was/were going at a constant velocity?

Rabbits 2 and 3 (Red and Blue)

1. Which rabbit(s) slowed down?

Rabbit #1 (green)

1. Which rabbit went fastest in the 1st 3 seconds of the race?

Rabbit #1 (green)

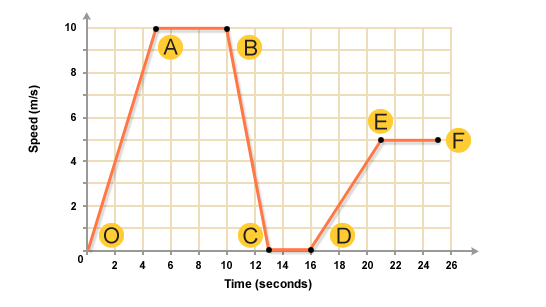
1. Which rabbit(s) went backwards?

None of the rabbits went backwards.

1. Which rabbit(s) was/were accelerating?

Rabbit #1 (green)

Below is a speed vs. time graph that shows the speed of a student walking around the school. Use the graph to answer questions 30 – 34.



1. What part of the graph shows the student speeding up?

O-A

D-E

1. What part of the graph shows the student slowing down?

B-C

1. What part of the graph shows the student stopped?

C-D

1. What part of the graph shows the student going the fastest?

A-B

1. What part of the graph shows the student going at a constant speed?

A-B

C-D

E-F

1. What is the acceleration due to gravity?

9.8 m/s2

1. A rock is in a freefell after being knocked off the edge of a cliff.
   1. How fast will the rock be going in one second?

9.8 m/s

* 1. How fast will the rock be going in two seconds?

19.6 m/s

* 1. How fast will the rock be going in three seconds?

29.4 m/s

* 1. How fast will the rock be going in four seconds?

39.2 m/s