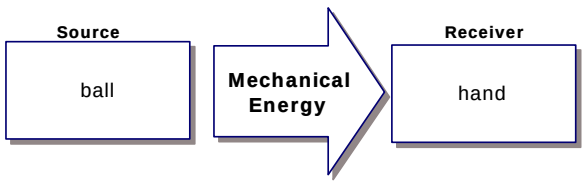
InterActions Unit 2 Chapter 1 Sample Quiz KEY

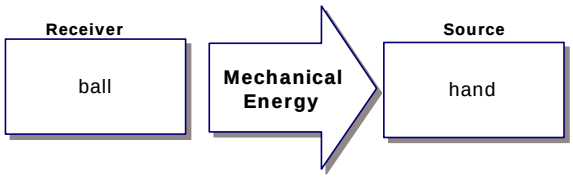
Use your Scientists' Consensus Ideas sheets for assistance.

1. Which of the following energy diagrams describes the interaction between you and the ball you throw.

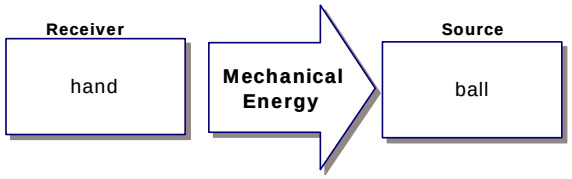
a.



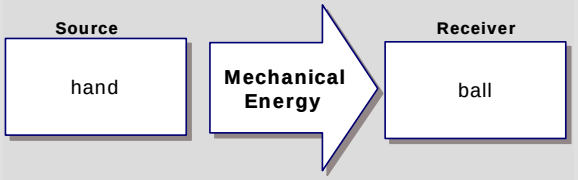
b.



c.



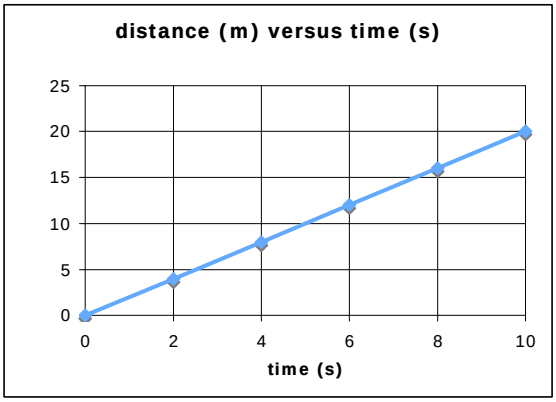
d.



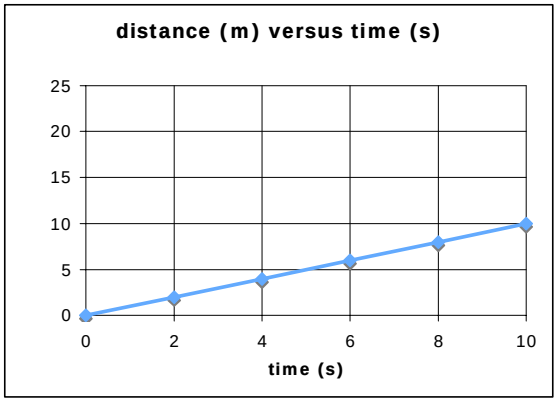
When deciding on the source of energy you should ask where the energy came from. In this case the energy came from the hand and was transferred to the ball. To answer this question you need to know how to describe an interaction with energy diagrams.

Use the images below to answer questions 2 through 4

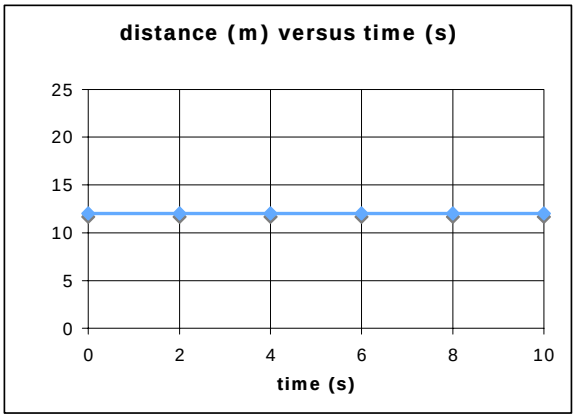
a.



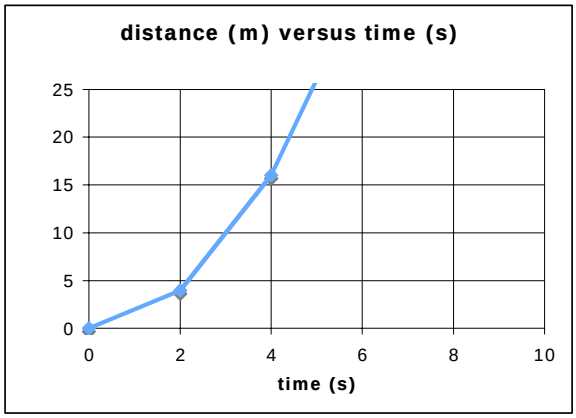
b.



c.



c.



2. Look at the graphs showing distance versus time of a car. Which car has the greatest constant speed?

a.

b.

c.

d.

The speed is equal to the slope of the line. The greater the slope the greater the speed, and for a constant speed the line must be straight. To answer this question you need to understand what distance versus time graphs show.

3. Look at the graphs showing distance versus time of a car. Which car has zero speed?

    a.

    b.

    c.

    d.

    The speed is equal to the slope of the line. if the slope is zero (no change in distance over time) than the speed is zero. To answer this question you need to understand what distance versus time graphs show.

4. Look at the graphs showing distance versus time of a car. Which car is speeding up?

    a.

    b.

    c.

    d.

    The speed is equal to the slope of the line. if the graph is nonlinear (curved) then the slope (and hence the speed) is changing. To answer this question you need to understand what distance versus time graphs show.

5. Sandra rides her bicycle from her house to school. Her speed varies from 0 to 0.28 miles/min. The trip takes her 20 min to travel the 3 mile distance. Sandra's average speed is

    a. 0.14 min/mile

    b. 0.14 miles/min

    c. 0.10 miles/hour

    d. 0.15 min/mile

    e. 0.15 miles/min

    Sandra's average speed is the total distance she travels divided by the total time it takes her or 3 miles/20 min = 0.15 miles/min. To answer this question you need to know how to calculate the average speed and the units of speed.

6. A car is slowing down for a stop sign. It slows down from 14 m/s to a stop over a distance of 40 m in 15 s. What is the car's average speed while it is slowing down?

    a. 0.38 m/s

    b. 0.93 m/s

    c. 2.67 m/s

    d. 7 m/s

    The car's average speed is the total distance it travels divided by the total time it takes or 40 m/15 s = 2.67 m/s. To answer this question you need to know how to calculate the average speed and the units of speed.

7. The acceleration of a car is

    a. its speed and direction

    b. how it is changing its location and its direction

    c. how it is changing its speed and the direction it is moving in

    d. how it is changing its speed and or its direction of motion.

    To answer this question you need to know what acceleration is.

8. Maurice runs track. His race speed varies from 0 to 5 m/s. His average race speed is 4.5 m/s. If Maurice runs the 400 m race, about how much time should it take him?

   a. 44.4 s

   b. 160 s

   c. 88.9 s

   d. 80 s

From the relationship

$$Average\ speed\ =\ \frac{Total\ distance\ traveled}{Total\ time\ of\ travel}$$

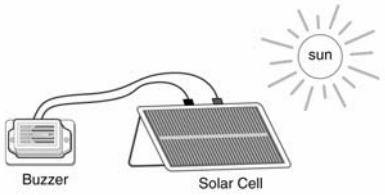
Rearranging we have

$$Total\ time\ of\ travel\ =\ \frac{Total\ distance\ traveled}{Average\ Speed}$$

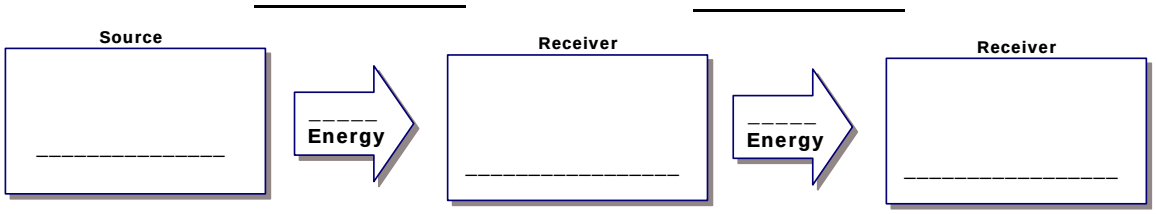
Maurice should take about

$$Total\ time\ of\ travel\ =\ \frac{Total\ distance\ traveled}{Average\ Speed}=\frac{400\ m}{4.5\ m/s}=88.9s$$

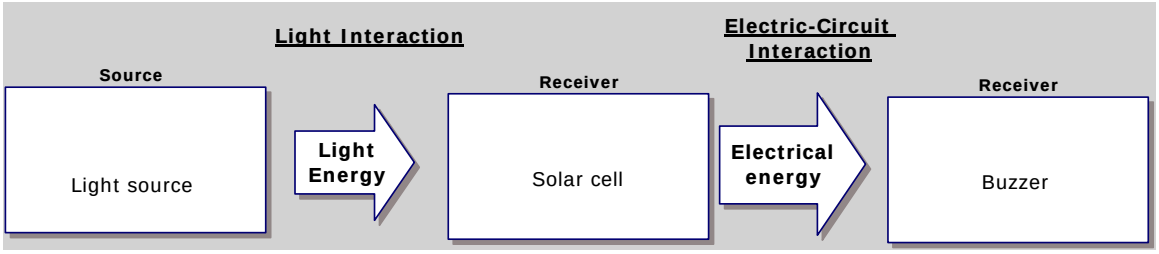
To get a sense of these numbers, Maurice runs a mile in 5.96 minutes, and 400 m is about ¼ of a mile. To answer this question you need to calculate the time of travel given the average speed and the total distance traveled.



9. A light source shines on a solar cell connected in a closed circuit containing a buzzer. Complete the energy diagrams below



Answer:



To answer this test question you need to construct an energy diagram, listing the source, receiver, energy transferred, and type of interaction for a situation you have not analyzed before.