

Name:  
General Science

Date:  
Class Color:

**Calculating Speed,  
Distance, Time**

**Directions:** Answer the word problems using the formulas. Make sure to show the work.

Equations:

Speed = Distance/Time      Distance= Speed x Time      Time = Distance/ Speed

Units:

Speed =  $m/s$  (meters per second)      Time= s (seconds)      Distance = m (meters)

1. How fast is a car going if it can go 360 meters in 30 seconds?
2. How much time does a runner who has a speed of  $7 m/s$  take to run 490 meters?
3. How far did baseball go if it had a speed of  $30 m/s$  and was in the air for 12 seconds before it landed?
4. Selena has a top speed of  $5 m/s$ . How long does it take her to run 465 meters?
5. The teacher was able to kick a soccer ball that took 15 seconds to cover 90 meters. What was the ball's speed?
6. How long does it take a pizza delivery van to cover 4000 m, if the vehicle has to go  $25 m/s$ ?
7. Mr. Nappi made Javoy run 1000 meters. How long did it take Javoy if he had a speed of  $2 m/s$ ?
8. Mike threw a paper ball with a speed of  $4 m/s$ . How long did it take to hit Sixto, if Sixto 32 meters away?
9. Jonathan was sent to the office. How far away was he from the office if it took him 45 seconds to get there and he was moving at  $3 m/s$ ?
10. It took Alex 360 seconds to go 18000 meters. What was her speed?

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Calculating Speed,  
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1. How fast is a car going if it can go 360 meters in 30 seconds?

$$S = 360\text{m} / 30\text{ s} = 12 \frac{m}{s}$$

2. How much time does a runner who has a speed of  $7 \frac{m}{s}$  take to run 490 meters?

$$T = 490\text{ m} / 7 \frac{m}{s} = 70\text{ s}$$

3. How far did baseball go if it had a speed of  $30 \frac{m}{s}$  and was in the air for 12 seconds before it landed?

$$D = 30 \frac{m}{s} \times 12\text{ s} = 360\text{ m}$$

4. Selena has a top speed of  $5 \frac{m}{s}$ . How long does it take her to run 465 meters?

$$T = 465\text{ m} / 5 \frac{m}{s} = 93\text{ s}$$

5. The teacher was able to kick a soccer ball that took 15 seconds to cover 90 meters. What was the ball's speed?

$$S = 90\text{ m} / 15\text{ s} = 6 \frac{m}{s}$$

6. How long does it take a pizza delivery van to cover 4000 m, if the vehicle has to go  $25 \frac{m}{s}$ ?

$$T = 4000\text{ m} / 25 \frac{m}{s} = 160\text{ s}$$

7. The P.E. teacher made Javoy run 1000 meters. How long did it take Javoy if he had a speed of  $2 \frac{m}{s}$ ?

$$T = 1000\text{ m} / 2 \frac{m}{s} = 500\text{ s}$$

8. Mike threw a paper ball with a speed of  $4 \frac{m}{s}$ . How long did it take to hit Sixto, if Sixto 32 meters away?

$$T = 32\text{ m} / 4 \frac{m}{s} = 8\text{ s}$$

9. Jonathan was sent to the office. How far away was he from the office if it took him 45 seconds to get there and he was moving at  $3 \frac{m}{s}$ ?

$$D = 3 \frac{m}{s} \times 45 = 135\text{ m}$$

10. It took Alex 360 seconds to go 18000 meters. What was her speed?

$$S = 18000\text{m} / 360\text{ s} = 50 \frac{m}{s}$$

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## Work & Power - With Answers

**Directions:** Solve each word problem by either calculating work or Power. Make sure you use the right units and show all the work.

$$F = m \times a$$

$$W = F \times d$$

$$P = W/t$$

mass is measured in kilograms (kg)

acceleration is measured in meters per second squared ( $m/s^2$ )

force is measured in Newtons (N)

Work is measured in a Joules (J)

Time is measured in seconds (s)

Power measured in watts (W)

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- 1.) How much work is done on a trash can if Mr. Tharson puts a force of 39 Newtons to the left and pulled it 4 meters to the left. How much power did he use if it took him 12 seconds?

$$W = 39 \text{ N} \times 4 \text{ m} = 156 \text{ J}$$

$$P = 156 \text{ J} / 12 \text{ s} = 13 \text{ W}$$

- 2.) A horse pulled a 100 kg sled 75 meters with an acceleration of 2. What was work and power done if the horse took 15 seconds

$$F = 100 \text{ kg} \times 2 \text{ m/s}^2 = 200 \text{ N}$$

$$W = 200 \text{ N} \times 75 \text{ m} = 15,000 \text{ J}$$

$$P = 15,000 \text{ J} / 15 \text{ s} = 1,000 \text{ W}$$

- 3.) How much work is done if Christian puts a force on a basketball up of 50 N, and the basketball goes up 4 meters? What is the power he used if it took him 2 seconds?

$$W = 50 \text{ N} \times 4 \text{ m} = 200 \text{ J}$$

$$P = 200 \text{ J} / 2 \text{ s} = 100 \text{ W}$$

- 4.) Jonathan took the teacher's car for a joy ride. The car has a mass of 1000 kg and went 60 meters. How much work was done if the car had an acceleration of 6  $m/s^2$ . If Jonathan drove it for a minute how much power was used?

$$F = 1000 \text{ kg} \times 6 \text{ m/s}^2 = 6,000 \text{ N}$$

$$W = 6,000 \text{ N} \times 60 \text{ m} = 360,000 \text{ J}$$

$$P = 360,000 \text{ J} / 60 \text{ s} = 6,000 \text{ W}$$

- 5.) Before he can Black Ops, Tyrik has to shovel the snow. How much power does Tyrik use if he uses 1800 N of force, and pushes the snow 10 meters in 1 hour.

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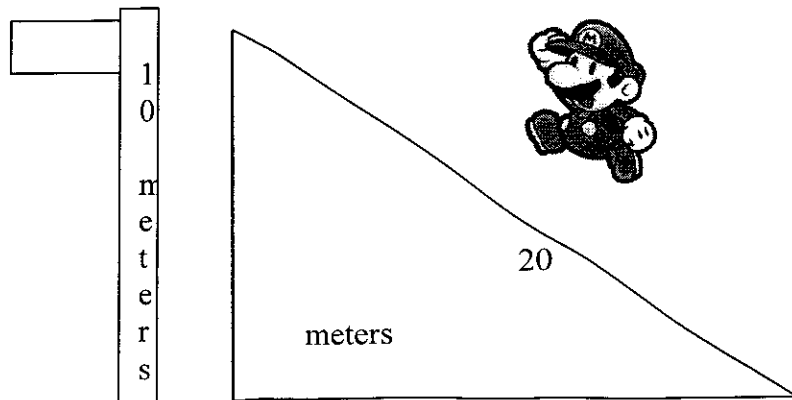
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Machines:  
Work, Advantage & Efficiency With Answers

**Directions:** Calculate how much effort (force) is needed to use, the mechanical advantage, and efficiency of simple machines. Show the work

To touch the top of the 10 m flag pole, it takes **200** J of work. Mario decides to use a 20 m ramp to get to the top of the flag pole.



1.) What is the force needed to climb the top of the flag pole?

$$F = W / d \quad F = 200\text{J} / 10\text{m} \quad F = 20 \text{ N}$$

2.) What is the force needed to get to the top of the flag pole using a ramp?

$$F = W / d \quad F = 200\text{J} / 20\text{m} \quad F = 10 \text{ N}$$

3.) What is the mechanical advantage of using the ramp?

**Mechanical Advantage (inclined plane) equals length / height = 20 m / 10 m = 2**

4.) If it actually takes 250 J of work to climb the ramp to get to the top of the flag pole. How efficient is the ramp?

$$\text{Efficiency} = \text{Output work} / \text{Input work} \times 100 \% \quad 200 \text{ J} / 250 \text{ J} = 80\%$$

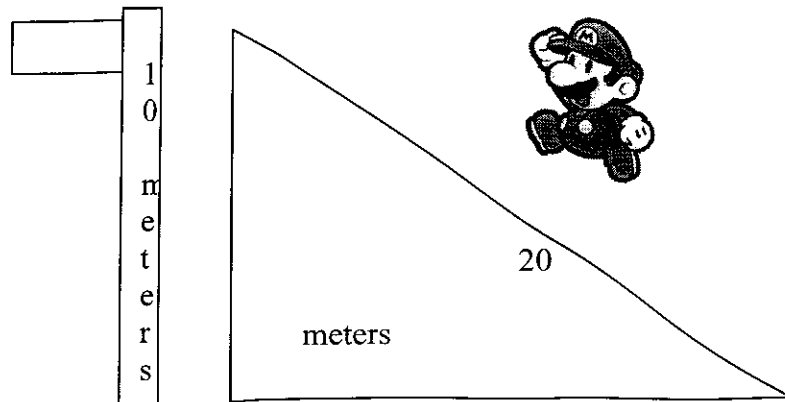
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