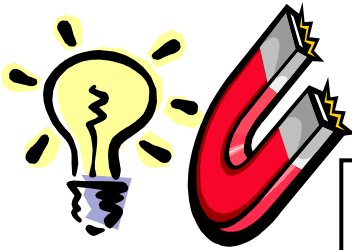


Science 10-Electricity & Magnetism  
Activity 11  
Worksheet on Work, Energy and Power



10

Name _____	
Due Date _____	
Show Me <input type="checkbox"/>	Hand In <input type="checkbox"/>
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**Note:** Help with this worksheet can be found on pages 88-89 in the textbook.

- Write the equation which defines **Work**. (Use “W” for Work, “F” for Force and “d” for Distance. *Include units.*)
  
- A person lifts a 300 N object up a distance of 2.5 meters. How much work did the person do? (*Include units in your answer!*)

Equation:

Solution:

Answer \_\_\_\_\_

- A motor exerts a force of 5000 N to move a cart 100 meters. How much work did the motor do? (*Include units in your answer!*)

Equation:

Solution:

Answer \_\_\_\_\_

4. A person does 600 J of work in order to lift a 300 N rock. How high did the person lift the rock? *(Include units in your answer!)*

Equation:

Solution:

Answer \_\_\_\_\_

5. A machine does 12000 J of work on an object in order to move it 60 meters. What force did the machine exert? *(Include units in your answer!)*

Equation:

Solution:

Answer \_\_\_\_\_

6. A student lifts up a 0.2 N pen, a distance of 20 cm. How much work did the student do? (Don't forget to change cm. to m. first!) *(Include units in your answer!)*

Equation:

Solution:

Answer \_\_\_\_\_

7. Define **energy**. \_\_\_\_\_

\_\_\_\_\_

8. A term used for "stored" energy is \_\_\_\_\_ energy.

9. A person lifts a 400 N weight up a distance of 1.5 meters.

a) How much **work** did the person do on the weight?

Answer \_\_\_\_\_

b) How much **potential energy** does the weight have just after it has been lifted up?

Answer \_\_\_\_\_

c) How much work is the weight capable of doing while it falls back down?

Answer \_\_\_\_\_

10. Write an equation which defines **power**. (See page 89.) Include **units**.

11. Power of **one joule per second** is called a \_\_\_\_\_.

12. A machine moves an object, giving it 6000 J of energy in 30 seconds. What is the **power** of the machine?

Equation:

Solution:

Answer \_\_\_\_\_

13. A 500 N student runs up a 3 meter high flight of stairs in 20 seconds.

a) How much **force** is the student exerting? \_\_\_\_\_ Newtons

b) How much **work** is the student doing? (Include units in your answer!)

Equation:

Solution:

Answer \_\_\_\_\_ Joules

- c) How much **potential energy** does the student gain? (*Include units in your answer!*)

Answer \_\_\_\_\_ Joules

- d) Calculate the **power** the student is exerting. (Use the equation for “Power” in Question 10.)

Equation:

Solution:

Answer \_\_\_\_\_ Watts

14. A 700 N student runs up a 2.5 meter high flight of stairs in 30 seconds.

- a) How much **force** is the student exerting? \_\_\_\_\_ Newtons

- b) How much **work** is the student doing? (*Include units in your answer!*)

Equation:

Solution:

Answer \_\_\_\_\_

- c) How much **potential energy** does the student gain? (*Include units in your answer!*)

Answer \_\_\_\_\_

- d) Calculate the **power** the student is exerting. (Use the equation for “Power” in Question 10.)

Equation:

Solution:

Answer \_\_\_\_\_

15. James can do 30 “reps.”, lifting a 600 N weight up 0.5 m. in 60 seconds. Robert can do 50 reps., lifting a 300 N weight up 0.5 m. in 60 seconds.

- a) Calculate the amount of **energy** James is exerting in 1 “rep”. (Energy exerted is equal to the **work** done.)

Equation:

Solution:

Answer \_\_\_\_\_

- b) Calculate the **total** energy James is using in 60 seconds. (He is doing 30 reps.)

Answer \_\_\_\_\_

- c) Calculate the total **power** output of James.

Equation:

Solution:

Answer \_\_\_\_\_

- d) Calculate the **total energy** exerted by Robert.

Equation:

Solution:

Answer \_\_\_\_\_

- e) Calculate the **power** output of Robert.

Equation:

Solution:

Answer \_\_\_\_\_

- f) Who is more powerful, James or Robert? \_\_\_\_\_

16. Peter can do 30 “reps.”, lifting a 500 N weight up 0.5 m. in 60 seconds. Mary can do 52 reps., lifting a 300 N weight up 0.5 m. in 60 seconds. Calculate who is more powerful, Peter or Mary? Show all you calculations in a logical way.

Answer \_\_\_\_\_