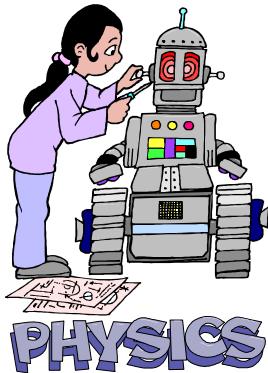


Science 9-Physics Worksheet 3-2—Work and Mechanical Advantage



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Name _____

Due Date _____

Show Me Hand In

Correct and Hand In Again By _____

1. Give the formula used to find **WORK**

2. In this formula, the unit for **force** is _____, the unit for **distance** is _____ and the unit for work is _____.

3. 60 N of force is used to move an object a distance of 4.0 meters. Calculate the amount of work done. Show your work. Include proper units in your answer.

Answer _____

4. An 800 N person is lifted a distance of 75 cm. Calculate the amount of work done in Joules. Show your work. Include proper units in your answer.

Answer _____

5. A person has a mass of 60 kg.
 - a. Calculate the **gravitational force** on the person. _____ N

 - b. Calculate the amount of Work done if the person is lifted straight up a distance of 12 m. Show your work. Include proper units in your answer.

Answer _____

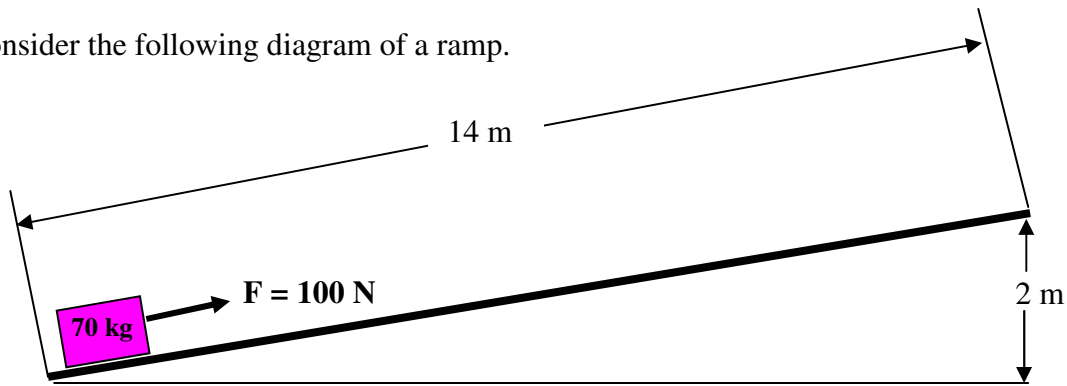
6. A force of 500 N is used to pull an object up an inclined plane. In order to move the object, the total amount of work done was 1500 Joules. Calculate the **distance** the object was moved. Show your work. Include proper units in your answer.

Answer _____

7. Calculate the amount of **work** done when a 70 kg person is lifted a vertical distance of 1.2 meters. (Don't forget to convert mass to force of gravity first). Show your work. Include proper units in your answer.

Answer _____

8. Consider the following diagram of a ramp.



- a. Calculate the **force of gravity** on the 70 kg object.. _____ N
- b. Calculate the **work** which would be done to raise the 70 kg mass straight up a vertical distance of 2 meters. (That is, without using the ramp.)

Answer _____ J

- c. Calculate the **work** done when the object is moved 14 meters up the ramp using a force of 100 N.

Answer _____ J

- d. What is the advantage of using a ramp like this to move an object up instead of lifting it straight up?

9. Write the formula used to calculate **Mechanical Advantage** (MA)
10. **Load** force means the force _____
11. **Effort** force means the force _____
12. It takes 100 N to pull an object up an inclined plane. The gravitational force on the object is 600 N.
What is the load force in this case? _____N
What is the effort force in this case? _____N

Calculate the **Mechanical Advantage** (MA)

Answer _____

13. A person has a mass of 80 kg. It takes a force of 150 N to pull that person up using a system of pulleys.
- a. Calculate the **gravitational force** on the person. _____N
- b. Calculate the Mechanical Advantage (MA) of the pulley system. Show all your work.

Answer _____

14. The mechanical advantage of a lever is 6. How much **force** needs to be exerted on the lever to lift an object with a gravitational force of 320 N? Show all your work.

Answer _____

15. It takes 130 N to push a 52 kg object up an inclined plane. Calculate the **Mechanical Advantage** of the inclined plane. Show all your work.

Answer _____