**FPS – Work and Power Notes**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period\_\_\_\_\_\_\_\_\_\_

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| I can… |
| *Define work and power.**Calculate work and power.**Identify examples of work and power.* |

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| Work and Power Notes |
| ***Bellwork***: Write down three examples of what you think **work** is. |
| 1. ***What is work?***
* In science, the definition of work is:
* Both the \_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_ of the object are in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ direction.
1. Work or not?

 - a teacher lecturing her class YES / NO* A mouse pushing a piece of cheese with its nose across the floor YES / NO
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| 1. The mouse is using a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to move the cheese a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
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| 1.
2. What’s work?
* A scientist delivers a speech to an audience of his peers. YES / NO
* A body builder lifts 350 pouds above his head. YES / NO
* A mother carries her baby from room to room. YES / NO
* A father pushes a baby in a carriage. YES / NO
* A woman carries a 50 kg grocery bag to her car. YES / NO
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| 1. Formula for work
* The unit of force is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The unit of distance is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The unit of work is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* A Newton-meter is equal to one ***joule***.
* Unit for work is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
1. The Joule
* Named after British Physicist \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
1. Let’s practice calculating work. (W = F x d)
* If a man pushes a concrete block 10 meters with a force of 20 N, how much work has he done?
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| 1. Power

-What do you think makes something ***powerful***?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* Measure of how \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ work is done.
* Amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ per unit of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Formula:
* The unit of power is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

http://66.39.52.159/ddavis/DavisD/3PowerTri.bmp* Unit named after Scottish inventor \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Invented the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
1. Watts – used to measure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and other small appliances. Your electric bill is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
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| ***Practice Problems*** |
| http://66.39.52.159/ddavis/DavisD/3PowerTri.bmphttp://66.39.52.159/ddavis/DavisD/3PowerTri.bmpLet’s calculate work and power. Use these formulas:$$Work\left(Joules\right)=Force \left(Newtons\right)×distance (meters)$$$$Power\left(Watt\right)=\frac{Work \left(Joules\right)}{time (s)}$$1. Solve for **work** if a box is pulled with a force of 500N for 5 m.
2. Solve for **distance** is if 2 Joules of work is done with 4 N of force.
3. Solve for **power** if 90 Joules of work is done in 20 seconds.
4. Solve for **time** if 20 Joules of work is done with a power of 6 watts.

***Try the others on your own, and get a teacher’s initial to check them! Don’t forget UNITS!*** |
| 1. Amy uses 20N of force to push a lawn mower 10 meters. How much **work** does she do?

 | Teacher Initial |
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| 1. Joe balances a coin using 1 N of force and lifting it 0.20 meters. How much **work** does he do?

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| 1. Frank does 2400 J of work by climbing stairs. If he does this for 100m, how much **force** does he apply?
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| 1. How much **power** do you need to do if you pull a sled if you want to use 60 J of work in 5 seconds?

 | Teacher Initial |
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| 1. How much **work** does an elephant do while moving a wagon 20 meters with 200 N of force?

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| 1. If it takes you 5 seconds to do 1000 J of work, what is your **power** output?

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| 1. A 200N mountain climber scales a 100 meter cliff. How much **work** is done?
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| 1. A small motor does 4000j of work in 20 seconds. What is the **power** of the motor?
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| 1. A woman runs a race using a power output of 500 W and applying 6000 J of work. How long does it take her?
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| 1. What is the **distance** you go if you apply 600 N of force and 1200 J of work?
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| 1. What is the **work** you do if you use a power of 10 W and it takes you 10 seconds?
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| 1. You do 1400 J of work in 90 seconds. What is your **power**?
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| 1. How much **time** does it take you to do 1400 J of work if you have a power output of 80 watts?
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| 1. Solve for **power** if 90 Joules of work is done in 20 seconds.
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| 1. Solve for **work** if a box is pulled with a force of 500N for 5 m.
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| 1. A dog jumps 1 meter by applying 10 N. What is the dog’s **work**?
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Text in your response to the survey on the board when you are done!