**FPS – Work and Power Notes**

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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 |
| 1. The mouse is using a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to move the cheese a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; both \_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| 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 |
| 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? |
| 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:   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? |  |
| 1. Frank does 2400 J of work by climbing stairs. If he does this for 100m, how much **force** does he apply? |  |
| 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? |  |
| 1. If it takes you 5 seconds to do 1000 J of work, what is your **power** output? |  |
| 1. A 200N mountain climber scales a 100 meter cliff. How much **work** is done? |  |
| 1. A small motor does 4000j of work in 20 seconds. What is the **power** of the motor? |  |
| 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? |  |
| 1. What is the **distance** you go if you apply 600 N of force and 1200 J of work? |  |
| 1. What is the **work** you do if you use a power of 10 W and it takes you 10 seconds? |  |
| 1. You do 1400 J of work in 90 seconds. What is your **power**? |  |
| 1. How much **time** does it take you to do 1400 J of work if you have a power output of 80 watts? |  |
| 1. Solve for **power** if 90 Joules of work is done in 20 seconds. |  |
| 1. Solve for **work** if a box is pulled with a force of 500N for 5 m. |  |
| 1. A dog jumps 1 meter by applying 10 N. What is the dog’s **work**? |  |

Text in your response to the survey on the board when you are done!