**FPS – Work and Power stations**

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| I can… |
| *Define work and power.*  *Calculate time, distance, force, power, and work.* |

In your groups, complete each section below. Each person in your group must be the recorder at least once. Write their name in the box for each section. You must all work together to complete each section. *Get Ms. Perry’s initials in the box to move on*.

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| ***Section 1- Recorder Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** |
| What is the difference between work and power? Give a specific example for EACH. |
| Give a specific example of two things doing the same WORK but one is more POWERFUL. |
| Write the derived and renamed units for both work and power. |
| Give an example of something that **is work** and something that is **not work**. |

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| ***Section 2- Recorder Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** |
| A deflated hot-air balloon weighs a total of 8000 N. Filled with hot air, the balloon rises to a height of 1000 m. How much work is accomplished by the hot air? |
| A rope is thrown over a beam, and one end is tied to a 198 kg bundle of lumber. You pull the free end of the rope 2 m up with a force of 498 N to lift the bundle up off of the ground. How much work was done? |
| What is the force necessary for an engine to do 632 J of work over 30 meters? |
| A horse can do 3100 J of work by applying 600 N of force to the carriage it is pulling. How far can it pull the carriage? |

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| ***Section 3- Recorder Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** |
| Cheryl is a young girl climbing up a 3 m flight of 10 stairs. She is essentially “carrying” herself up the stairs, and her weight is 50 N. What is the total work done? What is the work done per step? |
| Cheryl climbs the stairs in 3 seconds. How much power does she have? |
| How much work does Cheryl do if she has a power of 4.5 watts and she takes 30 minutes to exercise? |
| How long does it take Cheryl to cut the grass if her lawnmower has 400 watts of power and she needs to do 16,000 J of work? |

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| ***Section 4- Recorder Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** |
| Cheryl’s weight is still 50 N and she wants to hang a painting. She must apply 10 N of force to lift the painting up over her head to hang it on the wall. She lifts the painting 0.5 m up, and it takes her 0.75 seconds to do so. Showing all your work, solve for Power. (Hint: find the work done first.) |
| Cheryl and her friend James are playing in a parking lot while their parents shop. Cheryl’s friend James weighs 49 N and wants to push Cheryl in a shopping cart which weighs 38 N across the parking lot. The parking lot is 62 meters long, and it takes James 3 minutes to push her all the way across. Showing all your work, how powerful is James? (Hint: find work done first.) |