WORK: An Introduction

**Show your formulas, your work, and your units!**

1. What is work?
2. How are work, force, and distance related?
3. What are the two different units that represent work?
4. What must be true of the force and the motion for work to be done?
5. Draw me a situation where work IS being done. Use arrows to indicate the forces and the motion. Label the arrows.
6. Draw me a situation where work IS NOT being done. Use arrows to indicate the forces and the motion. Label the arrows.
7. A 600N person lifts his 100N carry-on bag upward a distance of 1 meter. They then walk 100 meters towards the terminal. Which of the following situations is true?
   1. The traveler did work ONLY when he lifted the bag.
   2. The traveler did work ONLY when he carried the bag to the terminal.
   3. The traveler did work BOTH when he lifted the bag and when he carried the bag to the terminal.
8. You did 170 joules of work lifting a 140N backpack. How high did you lift that backpack?
9. A woman lifts her 100N child up 1 meter and carries her for a distance of 50meters to her bedroom. How much work did this woman do?
10. You pull your sled through the snow a distance of 500 meters with a force of 200 newtons. How much work did you do?
11. An ant sits on the back of a mouse. The mouse carries the ant across the floor for a distance of 10 meters. Was there work done by the mouse? Explain why or why not.
12. A crane does 62,500 joules of work to lift a boulder a distance of 25 meters. How much did the boulder weigh? *(Hint: the weight of an object is a force)*
13. You lift a 45 N bag of mulch 1.2 meters and carry it a distance of 10 meters to the garden. How much work was done.
14. A 455N gymnast jumps upward a distance of 1.5 meters to reach the uneven l bars. How much work did she do before she even began her routine?