POWER

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

1. What is Power?
2. How are work and power related?
3. What are the units that represent power?
4. A motor does 5,000 joules of work in 20 seconds. What is the power of the motor?
5. A machine does 1,500 joules of work in 30 seconds. What is the power of this machine?
6. A sleigh weights 2,000N and is pulled by a horse a distance of 1.0 km (1,000 meters) in 45 min. What is the power of the horse? (Hint: convert time to seconds)
7. A wagon weights 1,800 N and is pulled by a horse at a speed of 0.40 m/s for 2 seconds. What is the power of the horse?
8. Suppose a force of 100N is used to push an object a distance of 5 meters in 15 seconds. Find the work done and the power done for this situation.
9. A force of 100N is used to move an object a distance of 15 meters with a power of 25 watts. Find the work done and the time it takes to do the work.
10. If a small machine does 2,500 joules of work on an object to move it a distance of 100 meters in 10 seconds, what is the force needed to do the work? What is the power of the machine doing the work?
11. A machine uses a force of 200N to do 20,000 joules of work in 20 seconds. Find the distance the object moved and the power of the machine. (Hint: a joule is the same as a Newton\*meter)
12. *If you get this, you are right where you need to be…*

An 8kg soccer ball starts at rest and is kicked 31.5 meters until it reaches a final velocity of 21m/s in 3 seconds. Assuming that the soccer ball was kicked with a force of 56N (and ignoring any outside friction or air resistance forces), what is the power with which the soccer ball moved?