Calculating Work Worksheet

Name_____   Date_____

Show all work to receive credit.

1. A tugboat pulls a ship with a constant net horizontal force of 5000 N and causes the ship to move through the harbor. How much work is done on the ship if it moves a distance of 3 km?

2. If 2.0 J of work is done in raising a 180 g apple, how far is it lifted?
   1000g = 1 kg

3. A 45N girl sits on a 8N bench. How much work is done on the bench? Remember that work = force x distance. What is the work?

4. A boy lifts a 2 kg dragon 2 meters above the ground. How much work did the boy do on the dragon? Hint: F=mg

5. Which of the following is having work done on it? (Circle all that apply.)
   - **a.** a grocery bag as you lift it up
   - **b.** a tug of war that is evenly matched
   - **c.** a crate as you push it along the floor
   - **d.** a friction force on a speeding car skidding to a stop

6. Suppose you want to calculate how much work it takes to lift a 160 N barbell. Besides the mass of the barbell, what other information do you need to know?
   a. the shape of the weights
   b. how high the barbell is being lifted
   c. the strength of the person doing the lifting
   d. None of the above

7. In the equation for work, F is the_____ applied to the object and d is the _____ through which the force is applied.

8. If you are in a car that is being pushed up a hill at an angle of 10 ° for 56.0 m with a force of 1500 N what is the "work" done on the car?

9. A crane does work of 13,500 J with a force of 5200 N to lift a beam. How far can the beam be lifted (in meters)?

10. A 600 kg great white shark is lurking below an observation cage. His movement is being studied from a series of motion sensors below the boat. The shark leisurely charges the cage, strikes it and makes the cage rattle. Later, the shark returns for another run at the cage. The shark strikes the cage with 12,800 N of force. The shark traveled for 10 m in making its run. The cage is designed to withstand 124,500 N-m of "work" before it breaks. Should the man in the cage be worried? Explain.