Name _____ JMJ Date _____
Period _____ Physical Science

Pressure Problems Worksheet

$$Pressure = \frac{Force}{Area}$$

Use the formula to solve the following problems. Remember: the unit for Force is the Newton (N); the unit for Area is the square meter (m^2) so the unit for Pressure is $\frac{N}{m^2}$ which we call a Pascal. $OnePascal = \frac{1Newton}{1meter^2}$

1. An object exerts a force of 10 N on an area of 2 square meters. What is the pressure the object exerts on the surface?

2. One Pascal is equal to _____ N per _____ m^2. Our atmosphere exerts a pressure of 101,300 Pascals. What is the force on one square meter of the earth's surface caused by the atmosphere?

3. When you stand up on your feet your feet cover an area of about 0.2 m^2. Your feet push on the ground with a pressure of 50 Pa. What is your weight? (Hint: Weight is a force.)

4. What is the pressure per square meter exerted on the floor by a 10,000 N crate if the bottom of the crate has the dimensions of 1/2 meter by 4 meters?

5. If an object exerts a pressure of 260 N/m^2 and it has an area of 0.2 meters by 12 meters, what is the weight of the object? Hint: weight is a force.

6. A hydraulic lift is used to raise a car. The piston has a surface area of 1 square meter. The pressure needed to lift the car is 200 N per square centimeter. What is the weight of the car? Hint: how many square centimeters are there in one square meter? Hint: solve for force since weight is a force.

7. A statue weighs 1000 N and exerts a pressure of 20,000 N/m^2. How big is the base of the statue in square meters?

8. When you get a shot with a needle the force needed to puncture the skin is 0.5 Newtons. If the area of the tip of the needle is 0.0000001 meters squared what is the pressure needed to puncture the skin?

9. You drop a coin off of a building and in lands flat on the ground. It hits with a pressure of $200N/m^2$. It has a weight of 0.1N. What is the area of the coin?

10. Find the weight of wooden box that covers a $2.5m^2$ area and which exerts a pressure of 500 Pa.