Name

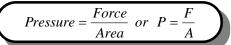
Date

_____ Period ____

Pressure

FLUIDS

Pressure is the force per unit area. The smaller the area on which a force is exerted, the greater the pressure is. This explains why sharp or pointy objects cut into things easily compared to dull objects. Pressure can be calculated with the following equation based on the definition.



The units of pressure are *pascals* (Pa). Since force is measured in newtons (N), and area is measured in meters squared (m^2), a pascal is defined as one newton per meter squared ($1Pa = 1 \frac{N}{m^2}$).

Sample Problems	
	EXAMPLE 2: (Determining pressure when you know the mass instead of
	the weight) An olympic plate with a mass of 20.4 kg has a surface area
	of 0.156 m ² . Calculate the pressure it exerts on the surface where it is
	resting.
$F = 0.0556 \text{ N}$ $A = 0.000462 \text{ m}^2$	Step 1: Determine the weight in Newtons
	$(20.4 \text{ kg}) \times (9.8 \text{ m/s}^2) = 200 \text{ N}$
Step 2: Substitute values into the equation	Step 2: Substitute values into the equation
$P = \frac{F}{A} = \frac{0.0556 N}{0.000462 m^2} = 120 Pa$	$P = \frac{F}{A} = \frac{200N}{0.156m^2} = 1282Pa \approx 1280Pa$
$r = \frac{1}{A} = \frac{1}{0.000462 \text{ m}^2} = 120 \text{ Fa}$	$\frac{1}{A} = \frac{1}{0.156 \text{ m}^2} = 1202 \text{ Fa} \approx 1200 \text{ Fa}$

Answer the questions below based on your reading above and your knowledge of physics.

- 1. What double meaning is used in the cartoon to the right? You don't understand the pressure involved in trying to be a well dressed woman!
- 2. An 80 kg man is wearing a shoe with a 0.010 m² heel. A 55 kg woman wearing high heels has a 0.00050 m² heel. Which one exerts more pressure? Show your work to support your conclusion. (*Note:* Since you are comparing the pressures, the relative result will be the correct even if you assume each individual's total weight is on one heel.)
- 3. A 5.0 kg computer monitor stands on a base with an area of 0.0315 m². How much pressure does it exert?