8.2 PRESSURE

NAME:
DATE:
BLOCK:

(Refer to pp.290 – 299 of BC Science 8)

The tennis racket applies a force to the ball. The resulting pressure causes the ball to compress.

- Pressure is the amount of force applied over a given area on an object.
- When pressure is applied to matter, compression can result.
- **Compression** is a decrease in volume produced by a force.

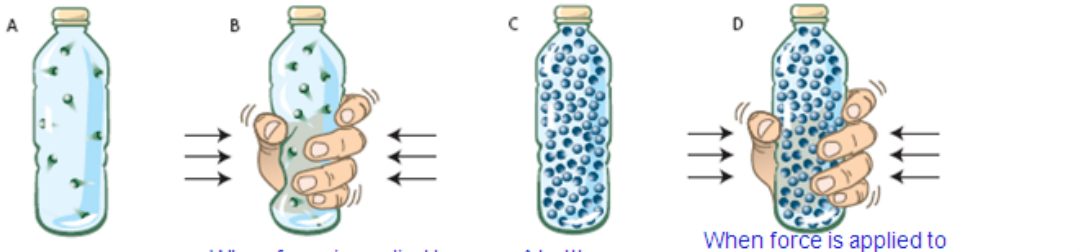
GASES ARE COMPRESSIBLE

This metal can has imploded as the gas inside is cooled.

- A gas can easily be compressed because there is a large amount of space between its particles.
  - Gas that is trapped in a container and heated will increase in pressure.
  - Heat causes the particles to move faster. These fast moving particles bounce off the sides of the container.
  - The increased pressure could cause the container to explode.
- Gas that is trapped in a container and cooled will decrease in pressure.
  - The decreased pressure could cause the container to implode

LIQUIDS AND SOLIDS ARE VERY DIFFICULT TO COMPRESS

- The particles of liquids and solids are already so tightly packed together that squeezing them together is almost impossible.
- Solids and liquids are described as incompressible.



A bottle filled with gas

When force is applied to the bottle, the gas particles move closer together. The gas is compressed into a smaller volume.

A bottle filled with liquid

When force is applied to the bottle, the liquid does not compress. There is no room for the liquid particles to move closer together

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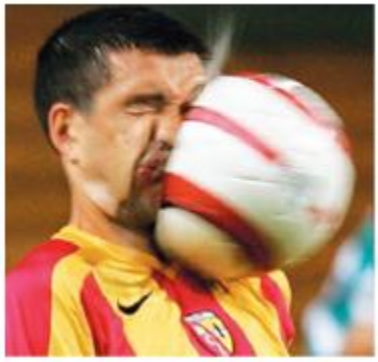
COMPRESSION AND DEFORMATION



The player's face and the ball are temporarily compressed and deformed.

- Solids can appear to be compressed if the "air pockets" in the material are compressed.
  - An example would be squishing (compressing) a marshmallow.
- Solids can also appear to be compressed when they are deformed.
- Deformation means to change shape without being forced into a smaller volume.
  - A ball hitting a solid surface is an example of deformation.

COMPARING PRESSURE

Air pressure can be measured using a simple wet barometer as shown.

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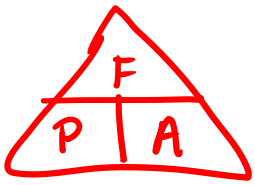
- Pressure depends on both the amount of force and also the area the force acts upon.
- Formula for pressure:

$$pressure(P) = \frac{force(F)}{area(A)}$$



$\frac{N}{m^2}$

- 1 newton (N) of force for every square metre of area (m^2) is called a pascal (Pa).
  - 1000 Pa = 1 kPa

CALCULATING PRESSURE

Since the clown's weight is spread out over many nails, the pressure at each nail is small.

Use the formula to calculate the pressure involved in the following questions. Show your work!!!\

$A = l \times w$

1. An 880 N person stands on a 0.80 m by 1.2 m board. **(920 Pa)**

P =
F = 880N
$A = 0.80m \times 1.2m = 0.96m^2$

$P = \frac{F}{A} = \frac{880N}{0.96m^2} = 916.7\ Pa$

$= 920\ Pa$

2. A 52 000 N car rests on a 3.0 m by 6.0 m platform. **(2900 Pa)**

P =
F = 52000N
$A = 3m \times 6m = 18m^2$

$P = \frac{F}{A} = \frac{52000N}{18m^2} = 2888.9\ Pa$

$= 2900\ Pa$

Assignment:

SUMMARY:

1. 5CQ + summary
2. p. 296 → RC + PP + p. 299 #5, 6