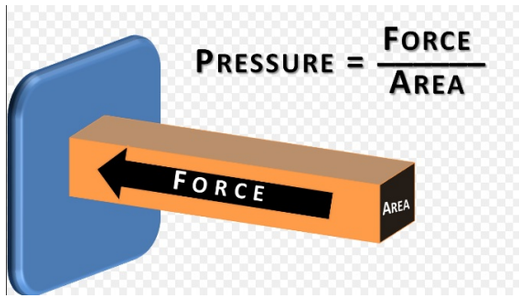
Science 8
Unit 2: FLUIDS
Topic 7: What is a Pressure?

Student Name:_____

Pressure is the amount of force that acts on a given area of an object.

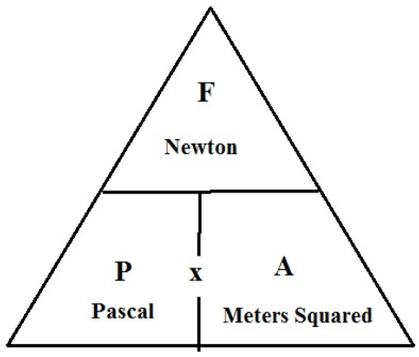


Force is measured in **newtons (N)**

Area is often measured in square metres **(m^2).**

Pressure is newtons per square metre (N/m^2). This unit is also called a **pascal (Pa)**,

Remember how to use the triangle:



Example 1:

An aquarium is filled with water that weighs 10 000 N. If the base of the aquarium has an area of 1.6 m^2, what pressure does the water exert on the base of the aquarium?

Example 2:

If the atmospheric pressure is 101 200 Pa and you are holding out your hand, the atmosphere is exerting a force on your hand. If the area of the palm of your hand is 0.006 m^2, how much force is the atmospheric pressure exerting on the palm of your hand?

Example 3:

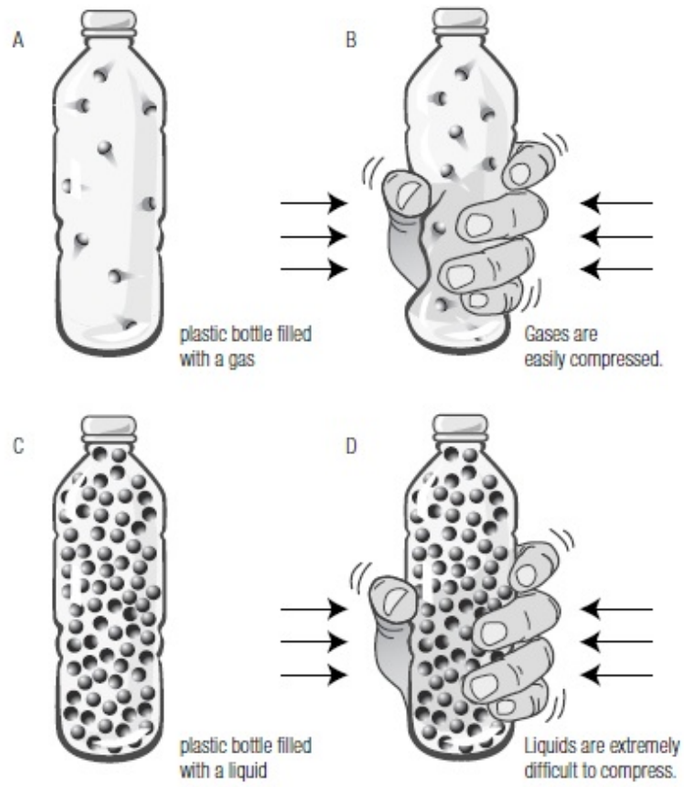
The weight of water in a glass is 4.9 N. If the water is exerting a pressure of 1700 Pa on the bottom of the glass, what is the area of the bottom of the glass?

How Does Pressure Affect Matter?

Compressibility—the ability to be squeezed into a smaller volume, or space.

Gases are compressible because gas particles are so far apart.

Liquids and solids are said to be incompressible because they cannot be squeezed into a smaller volume



PART A: MULTIPLE CHOICE.

Instruction: Circle the correct answer below each question. Also, transfer your answers to the bubble sheet provided.

1. What is pressure?

   (A) The change in volume produced by a force
   (B) The change in mass produced by a force
   (C) The amount of compression placed on an object
   (D) The amount of force that acts on a given area of an object

2. Which of the following formulas properly expresses the calculation for pressure?

   (A) Pressure = Force multiplied by Area
   (B) Pressure = Mass divided by Area
   (C) Pressure = Force divided by Area
   (D) Pressure = Area divided by Force

3. Calculate the amount of pressure exerted by a large wooden crate that weighs 1200 N and has a base with dimensions 4 m by 4 m.

   (A) 0.013 Pa
   (B) 75 Pa
   (C) 150 Pa
   (D) 300 Pa

4. Rhinoceros is weighed on a large 2 m x 2 m scale at the zoo. If the rhinoceros weighs 40 000 N, how much pressure is exerted on the pad beneath the scale?

(A) 404 kPa
(B) 160 kPa
(C) 10 kPa
(D) 100 kPa

5. What will happen to the pressure if the force is decreased?

(A) The pressure will increase
(B) The pressure will also decrease
(C) The pressure will stay the same
(D) It depends on the type of force

6. What is compression?

(A) A decrease in mass produced by a force
(B) An increase in mass produced by a force
(C) A decrease in volume produced by a force
(D) An increase in volume produced by a force

7. What states of matter are not easily compressible?

I. gas
II. solid
III. liquid

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II, and III

8. Why can a gas be easily compressed?

(A) It has no fixed shape
(B) It has no fixed volume
(C) Its particles have a lot of kinetic energy
(D) It has a large amount of space between its particles

9. Which of the following describes what happens to the particles of air inside a bottle as pressure is applied?

(A) The particles will speed up
(B) The particles will slow down
(C) The particles will move farther apart
(D) The particles will move closer together

10. What effect does an air compressor have on particles of air?

(A) The air particles shrink in size.
(B) The air particles move faster.
(C) The air particles are pushed closer together.
(D) The air particles expand.

11. When a force is applied to a substance and the particles cannot be forced closer together the substance is said to be incompressible. What happens to the force?

(A) It changes the volume
(B) It is absorbed by the substance
(C) It is applied throughout the substance
(D) It changes direction

12. When we suck on a straw in a tetrapak juice container, the sides of the container collapse. This happens because ...

(A) We are increasing the pressure inside the container
(B) The atmospheric pressure is collapsing the walls of the container
(C) The pressure inside the container is increased and collapses from the added pressure
(D) We are lowering the strength of the container when we suck on the straw

13. An experiment is performed where hot water is boiled in a can, the can is capped, and the can is then cooled. As a result, the can crushes inward. The can crushed inward because

(A) Air pressure outside the can was greater than the air pressure inside the can.
(B) The air inside the can escaped.
(C) The metal of the can became soft.
(D) Air pressure inside the can was greater than the air pressure outside the can.

14. The atmosphere around the Earth is approximately 160 km thick. It is the force of gravity which keeps it in place. What effect does this layer of air have on us when we hike up a mountain?

(A) It weighs us down a lot less as we climb
(B) It weighs us down a lot more as we climb
(C) It has no effect, because our body is use to it
(D) It has no effect, because our body can adjust to it

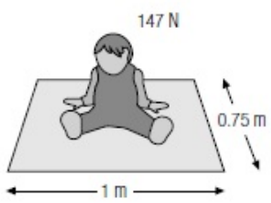
PART B: MATCHING

Match the Unit on the left with the Term that it measures on the right. Each Term may be used as often as necessary.

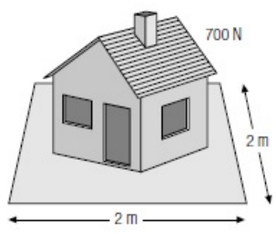
Unit	Term
15. _____ pascal (Pa) 16. _____ newton (N) 17. _____ metre (m) 18. _____ square metre (m^2)	A. area B. force C. length D. pressure

PART C: WRITTEN RESPONSE

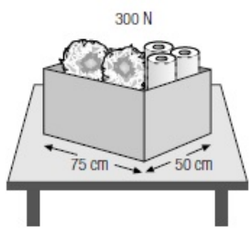
(A)



(B)



(C)



(D)