Student Worksheet

Substance Pressure

Year VIII/ 2nd Semester



Name : .....

Class :.....

Author :
Siti Nafrista
State University of Surabaya

LIVEWORKSHEETS

Learning Objective

Students can identify the pressure of substances (solid, liquid and gas) and its application in everyday life

Instructions for filling out the worksheet

1) Pray before doing the tasks in this worksheet.
2) Read this worksheet carefully.
3) Complete this worksheet correctly and thoroughly.
4) If you have difficulty carrying out activities, you can ask the teacher
5) Enjoy your work with joy and happiness.



LIVEWORKSHEETS

Short Material

Pressure of solids



Picture 1. Hydraulic car wash equipment
(Source : Tokopedia.com)

Have you ever been to a car wash? If you go to the car wash, you will find The hydraulic pump is capable of lifting the car very much heavy. Do you know how the tool works? so that it can lift the car is it very heavy? Did you know that the pump The hydraulics utilize the principle of substance pressure liquid or gas pressure to lift the car? So that know more deeply, let's study this chapter with full of enthusiasm!

Pressure is defined as the force acting perpendicular to a plane divided by the area of that plane. The concept of pressure is the same as the distribution of force on a surface area. So, if the style is given. The greater the pressure on an object (F), the greater the resulting pressure. Conversely, the larger the surface area of an object, the smaller the pressure generated.

Mathematically, a quantity pressure can be written in the following equation.

$$p = \frac{F}{A}$$

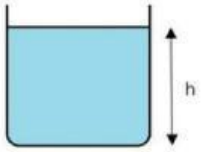
with:
P = Pressure (N/m2 which is also called the pascal unit (Pa))
F = Force (newton)
A = Field area (m2)

LIVEWORKSHEETS

Liquid pressure

1. Hydrostatic pressure

The higher the liquid in the container, the heavier the liquid, so the more the amount of pressure exerted by a liquid at the bottom of a container. In other words on The deeper the position from the surface, the greater the hydrostatic pressure feels bigger (Kusrini, 2020).



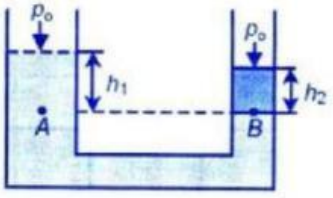
And the hydrostatic pressure is formulated as follows:

$$P_h = \rho_f.g.h$$

With :
Ph = hydrostatic pressure (Pa)
ρf = fluid density (kg/m3)
g = gravity (m/s2)

2. Law of Hydrostatics

Basic laws of hydrostatics "all points are located at the same depth then the pressure the hydrostatics are the same."



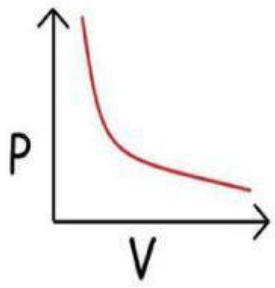
So all points that lie on a flat plane in one type of liquid have the same pressure, this is known as the basic law of hydrostatics and this pressure is called hydrostatic pressure.
Phydrostatic at point A = P hydrostatic at point B

Pressure in gaseous substances

1.Boyle's Law

Boyle's Law states that at constant temperature, the volume of an ideal gas will be inversely proportional to its pressure. In other words, if the pressure in an ideal gas increases, the volume will decrease, and conversely, if the pressure decreases, the volume will increase (Aminoto,Rahma and Neneng, 2020).

LIVEWORKSHEETS



$P_1V_1 = P_2V_2$

V ↑ P ↓

With :
P1 and V1: initial pressure and volume of gas,
P2 and V2: pressure and volume after change.

Search Keyword

A	Y	W	R	J	A	N	W	L	X	L	V	J	L	P
G	B	N	O	Z	R	C	L	E	L	C	Z	A	B	S
R	Q	W	E	I	R	P	D	Q	O	F	C	G	I	D
O	D	M	J	D	F	N	N	O	G	S	Z	W	D	M
R	H	E	V	H	J	W	Z	D	A	K	P	C	X	M
Y	O	D	P	M	P	V	T	P	S	G	G	A	G	R
U	R	Z	C	Y	Q	J	R	E	X	V	C	T	K	F
X	G	E	J	L	F	E	D	D	X	X	Q	V	V	X
U	W	O	A	C	A	E	P	S	F	M	U	S	C	M
F	Y	L	D	S	M	D	H	N	S	H	Z	C	C	Q
U	E	A	S	I	D	D	E	W	X	R	Q	A	X	Q
Q	Q	U	H	Y	D	R	O	S	T	A	T	I	C	F
K	R	C	T	H	W	I	B	G	R	B	N	Y	F	Q
E	R	Y	I	A	C	T	V	Q	I	S	F	I	C	H
A	G	E	W	I	B	Z	Y	E	Y	E	I	G	R	X

A.Look for terms related to the material "Pressure of Substances"
B.Mark the terms with a highlighter or other tool
C.Rewrite the terms below

1.
2.
3.
4.

LIVEWORKSHEETS

Activity 1

Observe and Understand the Following Problems!



Picture 1. The ground is muddy
(Source : astramotor.com)



Picture 2. Boots
(Source : bebeli.bekasikab.go.id)



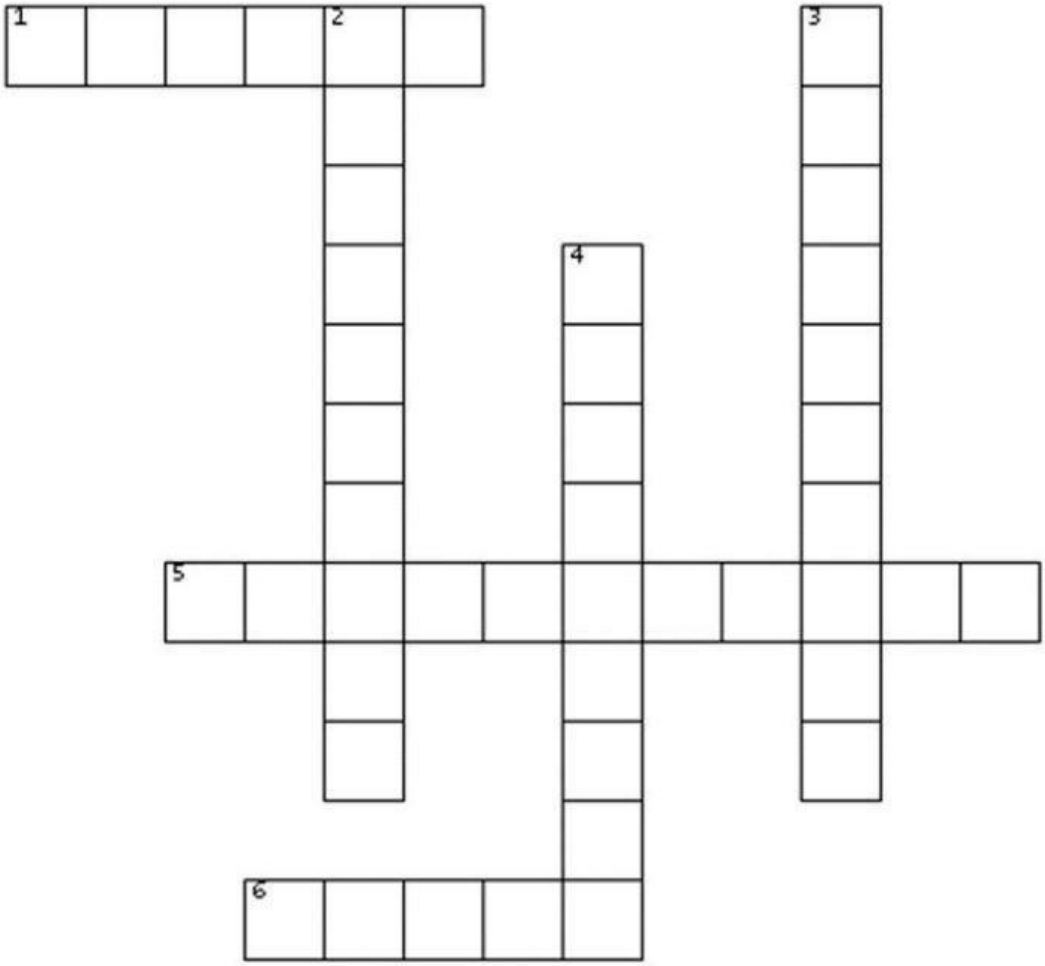
Picture 3. High Heels
(Source : wikipedia.com)

During the rainy season you often find roads that are muddy due to the rain, making it more difficult for us to cross these roads. If you want to pass through a muddy road. Which shoes will you wear, boots or high heels? Give your reasons!

LIVEWORKSHEETS

Activity 2

Crossword Puzzle



ACROSS

1. The International Units for pressure is

5. Fluid law

6. The basic law in thermodynamics that describes the relationship between pressure (P) and volume (V) of an ideal gas at constant temperature.

DOWN

2. The law which states "Every object submerged in a fluid will experience a buoyant force whose magnitude is equal to the weight of the fluid displaced by the object."

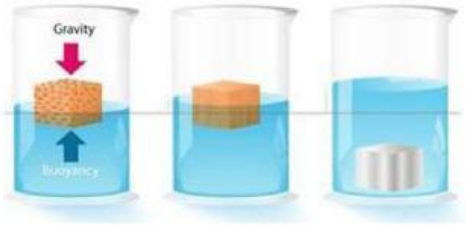
3. Tools for measuring blood pressure

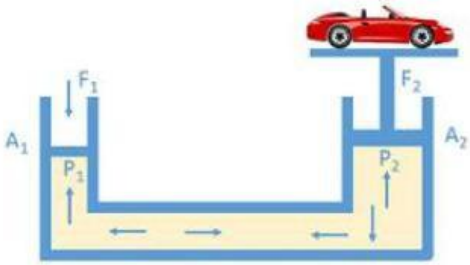
4. The number of forces acting on a surface area

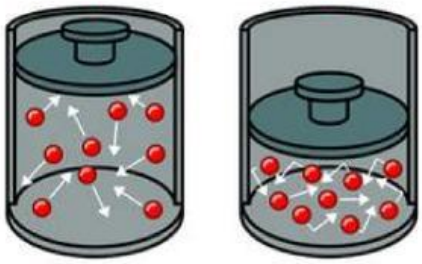
LIVEWORKSHEETS

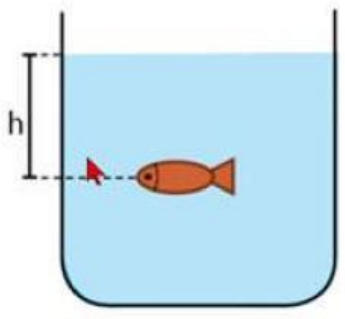
Activity 3

Draw a line to match the image with the name of the applicable law









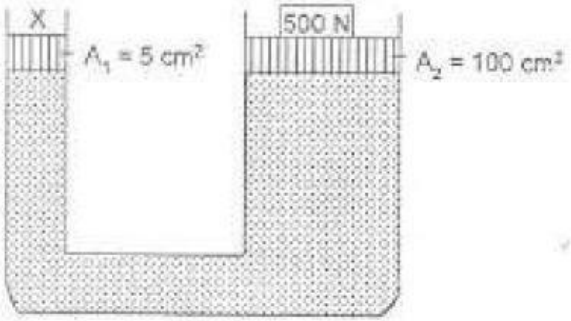
- **Pascal's Law**
- **Boyle's Law**
- **Hydrostatic Preassure**
- **Archimedes Principle**

LIVEWORKSHEETS

Activity 4

Do the following questions carefully and thoroughly!

1. **Look at the following picture of the U-shaped hydraulic tool! The weight of the X block on the small tube so that the hydraulic tool remains balanced is...**



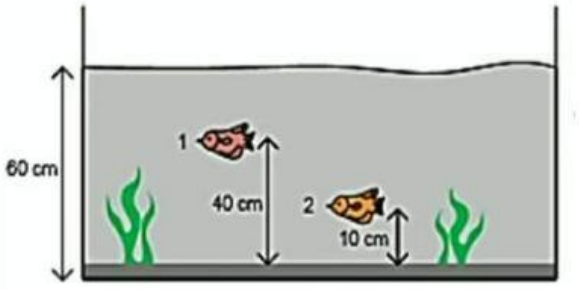
LIVEWORKSHEETS

2. An object is weighed in air at 12 N but when weighed in water it turns out to only weigh 8 N. If ρair = 1 gr/cm3 and g = 10 m/s2, determine the volume of the object!

LIVEWORKSHEETS

3. If a gas that satisfies Boyle's law is halved, its pressure is doubled. This is because... (Explain your reasons for using the related formula)

4. Two fish are in an aquarium with a water density of 1g/cm3, as shown in the picture below. The ratio of the hydrostatic pressure experienced by fish 1 and fish 2 is...



LIVEWORKSHEETS



LIVEWORKSHEETS

Bibliography

Aminoto, Tugiyo, Rahma Dani and Neneng Lestari. (2020). Penerapan Inovasi Termometer Gas Sebagai Media Pembelajaran Fisika di SMAN 3 dan SMAN 5 Sungai Penuh. *Jurnal Karya Abdi,* 4(1) : 54-62

Kusrini. (2020). *Modul Pembelajaran SMA Fisika.* Direktorat SMA : Direktorat Jenderal PAUD, DIKDAS, dan DIKMEN.

Zubaidah, Siti et al. (2017). *Ilmu Pengetahuan Alam untuk SMP/MTs Kelas VII Semester 2.* Kementrian Pendidikan dan Kebudayaan Republik Indonesia.

LIVEWORKSHEETS

GOOD LUCK



LIVEWORKSHEETS