Class 8 2nd Semester

STUDENT WORKSHEET

VIBRATION AND WAVE

Author:
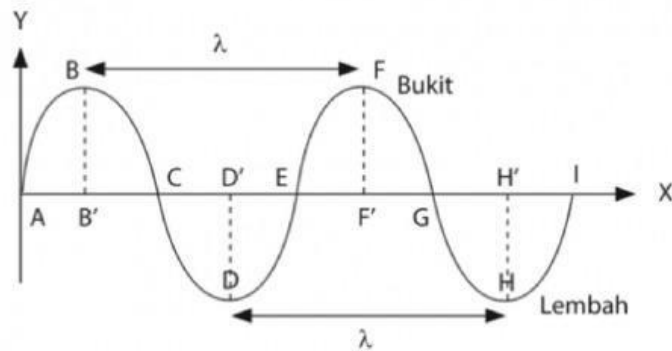Naila Syifani (22030654033)

Name :

Class :

Absence number :

LEARNING OBJECTIVES

1. Students can identify the concepts of vibration and waves
2. Students will be able to understand the quantities in vibrations and waves
3. Students can identify types of waves
4. Students can identify the use of waves in everyday life

INSTRUCTION

1. Before do the student worksheet, pray first
2. Fill in your members identity in the space provided
3. Read the learning objectives and instructions for filling out the student worksheet
4. Understand the material on the student worksheet
5. Answer the questions on the student worksheet seriously
6. If there are any difficult in understanding the questions, you can ask the teacher
7. Present the results of the student worksheet in front of the class

MATERIAL

(Source: Katadata)

Vibration is a periodic movement carried out by a particle at the equilibrium point. Vibration is the basic element of waves (Sirait, 2020). Waves are vibrations that propagate (Nugroho et al, 2022). Based on the direction of propagation, waves are divided into two, including transverse waves and longitudinal waves. Based on the propagation medium, waves are divided into two, namely mechanical waves and electromagnetic waves. Based on their amplitude, waves are divided into two, including traveling waves and stationary waves (Yuberti, 2014). Many applications of waves are found in everyday life, for example to detect fetuses, to heat food in microwaves, sonar systems, and so on. The quantities contained in vibrations and waves include:

1.Frequency (f)

Frequency is the number of waves that can be formed per unit time.

2. Period (T)

Period is the time it takes for a wave to travel one wavelength.

3. Wavelength (λ)

Wavelength is the distance between two adjacent peaks or the distance between two adjacent valleys.

4. Wave propagation speed (v)

Wave propagation speed is the distance the wave travels per unit time.

5. Amplitude (A)

Amplitude is the maximum or minimum height that a wave can reach

MATERIAL

The following are the equations found in waves:

$f = \dfrac{n}{t}$	$T = \dfrac{t}{n}$	$f = \dfrac{1}{T}$	$v = f \times \lambda$	$v = \dfrac{\lambda}{T}$

ACTIVITY I

Do the following questions seriously!

1. Andra is visiting his grandfather's house. In his grandfather's house there were many antiques. One afternoon when Andra was sitting in the living room, Andra heard a sound that sounded like a ticking. Andra looked for the whereabouts of the sound and it turned out that the sound came from grandfather's old clock. Andi looked at the clock. In this clock there is a pendulum that moves back and forth or oscillates. Andra's curiosity increased. He tried to count how many times the pendulum on the clock oscillated during 1 minute. Apparently, the pendulum oscillated 1500 times. How long does it take to achieve one vibration of the pendulum?
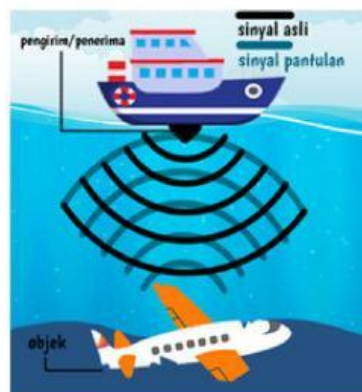It is ..... seconds

(Source: NAQSDNA.com)

2. Mr. Haris is a fisherman. He often fishes at night. One night, he went to the sea to fish. He felt his boat being hit by sea waves so that the boat moved up and down. The distance between two wave crests is 12 meters and the time required to produce 1 wave is 5 seconds. The resulting waves are 3 waves. The speed of propagation produced by these 3 waves is ...... Hz

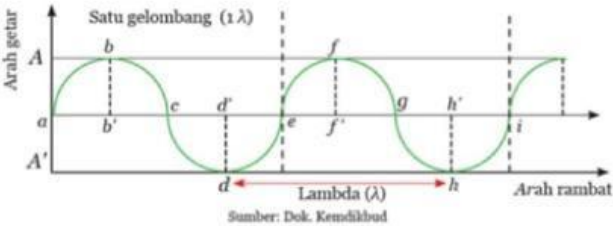3. Look at the picture below and read the following brief description to answer the questions!
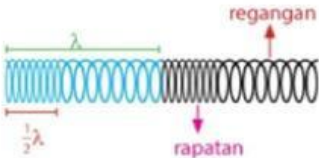

(Source: Primaindisoft.com)

Airplanes are one of air transportation that are not free from the risk of accidents. Airplanes flying in the air can experience accidents due to engine failure or due to external factors such as weather. If a plane has an accident and crashes on the ground, the evacuation process will be easier because the crash location is known. However, it would be different if the plane crashed in the ocean. If a plane crashes in the ocean, a special system is needed that uses waves to detect the crash location so that it can be evacuated immediately. The sistem is a sonar system. What waves are utilized in sonar systems?
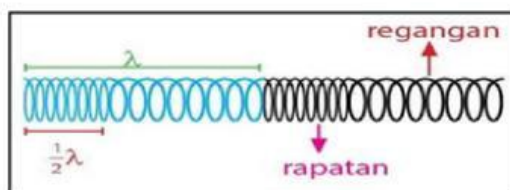
ACTIVITY 2

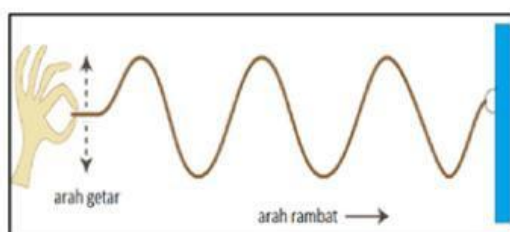Give a check mark (✓) in the true or false column for the following statement!

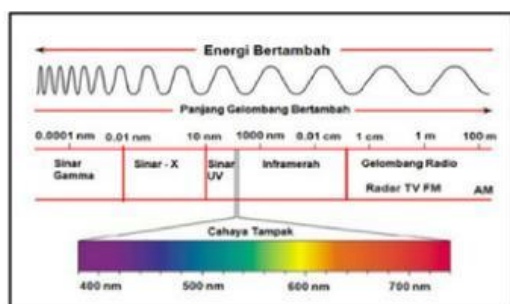| Statement	True	False
b-b' and f-f' are amplitudes		
If 8 vibrations can be produced in 10 seconds, then the vibration period is 0.8 second.		
(Source: Amongguru.com) The image above is a transverse wave image		
(Source: ASDF.ID) The above tool uses electromagnetic waves		

ACTIVITY 2

On the left there are various pictures of waves, while on the right there are wave names. Match (draw a line) the wave image with the appropriate wave name!
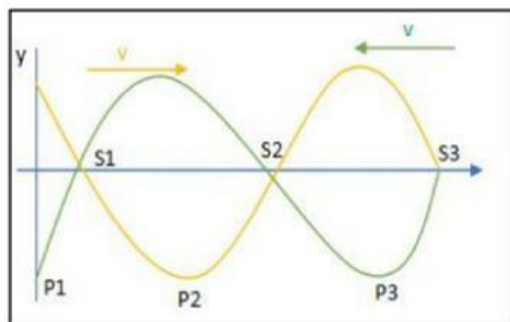

Electromagnetic Wave

Longitudinal Wave

Transversal Wave

Stationary Wave

REFERENCES

Nugroho, G. S., et al. (2022). *Getaran Gelombang Bunyi*. Direktorat Guru dan Tenaga Kependidikan Madrasah.

Sirait, Ratni. (2020). *Fisika Gelombang*. Medan: Universitas Negeri Islam Sumatera Utara.

Yuberti. (2014). *Konsep Materi Fisika Dasar 2*. Bandar Lampung: Anugrah Utama Raharja.