

**Chapter 4 REVIEW TEST Perception of Light and Sound**

Name: KEY Grp: \_\_\_\_\_

**Part A: Multiple Choice**

1. The energy found in an electromagnetic wave is higher when:

- a) The frequency is higher and the wavelength is shorter.
- b) The frequency is higher and the wavelength is longer.
- c) The frequency is lower and the wavelength is shorter.
- d) The frequency is lower and the wavelength is longer.

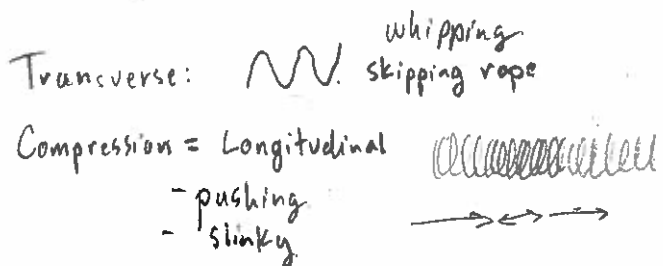


2. The lowest energy colour of visible light is:

- a) blue
- b) green
- c) red
- d) violet

3. Sound is a:

- a) longitudinal mechanical wave.
- b) longitudinal electromagnetic wave.
- c) transverse electromagnetic wave.
- d) transverse mechanical wave.



Always on Exam!

4. If music from an amplifier is increased from 30 dB to 60 dB, how much louder is the music?

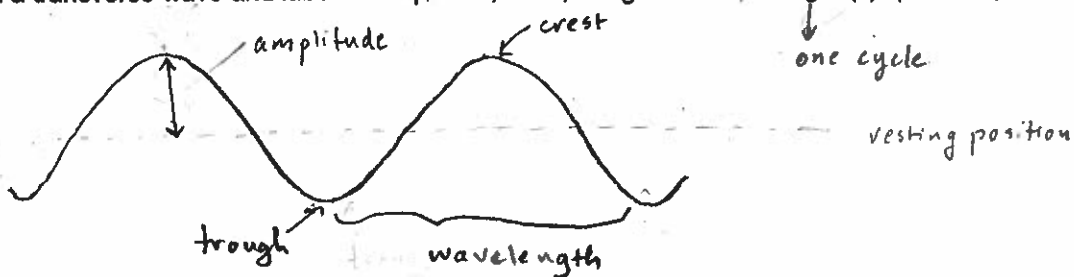
- a) twice as loud
- b) three times louder
- c) 30 times louder
- d) 1000 times louder

$$30 \quad 40 \quad 50 \quad 60$$

$$10 \times 10 \times 10 = 1000$$

**Part B: Short answers:**

1. Sketch a transverse wave and label its amplitude, crest, trough and wavelength ( $\lambda$ ). (4 marks)



2. Explain what determines the amplitude of a longitudinal wave. (1 mark)

Distance b/w two consecutive compressions.

3. What determines the colour of visible light? (1 mark)

Wavelength.

4. What determines the brightness of visible light? (1 mark)

Intensity

5. What are the units of measure for sound intensity? (1 mark)

dB decibels

6. What are the units for measuring a sound's frequency or pitch? (1 mark)

Hertz

7. Give a technical application for each of the following electromagnetic waves: (3 marks)

- a) Ultrasound: seeing image of a baby / medical imaging / dog whistles  
 b) Ultraviolet: black lights, sterilize medical equipment, beauty industry tanning / nails  
 c) Infrared: terrarium heat lamp, military - thermal imaging cameras  
space observation satellites

8. A dog whistle vibrates 2 400 000 times in a minute:

a) Calculate the frequency of the dog whistle. (3 marks)

$$f = \frac{\text{cycles}}{\text{second}} \quad f = \frac{2400000}{60} = 40000 \text{ Hz} = 40 \text{ kHz}$$

b) Can we hear the dog whistle? Explain. (2 marks)

No - too high  
Humans hear up to 20000 Hz

9. What phenomenon does a bat use to hunt or an aircraft carrier's sonar use? (1 mark)

echolocation

10. Give the three characteristic features of an image produced by reflection in a mirror. (3 marks)

Same size, distance, <sup>image is</sup> reversed ("across y axis").  
upright image

11. Diffuse reflection reflects light from (an uneven or smooth surface) reflecting parallel light rays in (a parallel way or many directions) and (does or does not) produce a clear image. (3 marks)

light that hits a non-reflective surface

②. What causes the vision defects of myopia (nearsightedness) and hyperopia (farsightedness)?

\* Include the type of lens that corrects each. (6 marks)

EXAM favorite

---



---



---



---

12. Draw the images produced by the following lenses when an object is placed in their field. Use two of the three possible rays to find each image. Include whether the image is real or virtual. (6 marks each)

YOU NEED TO BE ABLE TO DO THESE FROM MEMORY!

USE A RULER!

Hyperopia = farsightedness

Myopia = nearsightedness

