

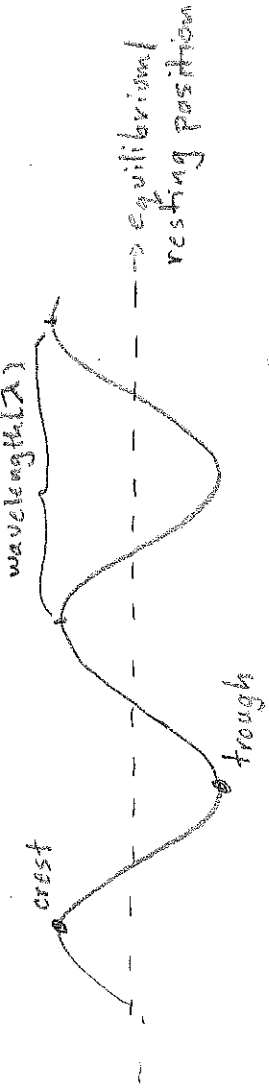
Chapter 4 REVIEW TEST Perception of Light and Sound

Name: KEY Grp: _____

Part A: Multiple Choice

- 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.
- The lowest energy colour of visible light is:
a) blue b) green c) red d) violet
- Sound is a:
 a) longitudinal mechanical wave.
b) longitudinal electromagnetic wave.
c) transverse electromagnetic wave.
d) transverse mechanical wave.
- 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

Part B: Short answers:

- Sketch a transverse wave and label its amplitude, crest, trough and wavelength (λ). (4 marks)

- Explain what determines the amplitude of a longitudinal wave. (1 mark)
How high or low from the equilibrium line.
- What determines the colour of visible light? (1 mark)
Its wavelength.
- What determines the brightness of visible light? (1 mark)
Its amplitude.
- What are the units of measure for sound intensity? (1 mark)
Decibels
- 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: imaging for medical diagnostics
- b) Ultraviolet: uv lamps for sterilizing medical equipment or verifying
- c) Infrared: heat sensitive thermal imaging camera

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

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

$$f = \frac{2\,400\,000 \text{ cycles}}{60 \text{ sec}} = 40\,000 \text{ Hz}$$

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

No. Human hearing max range is 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)

Virtual, upright, Same size.

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)

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

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

Myopia - image is formed in front of the retina
- correction: diverging lens

Hyperopia - image formed behind the retina
- correction: converging lens

13. 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!