

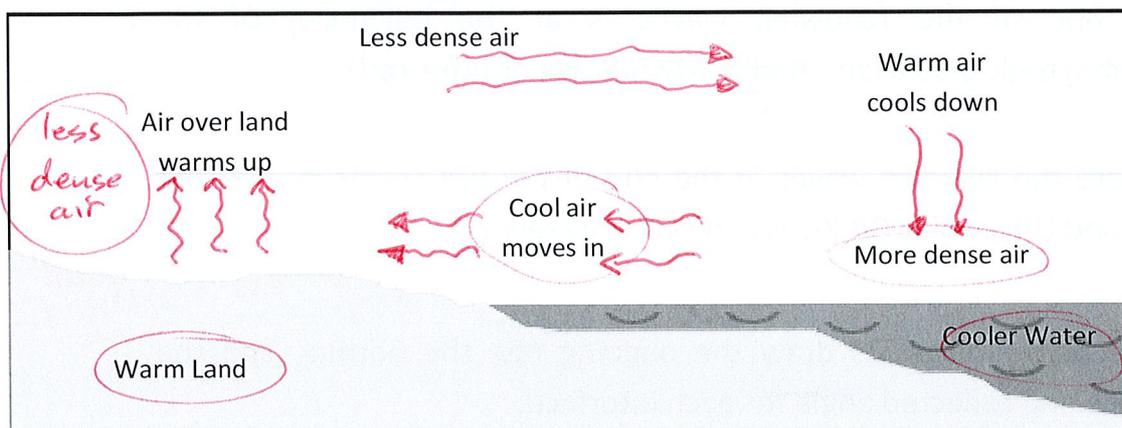
Year 9 Revision: Heat, Light and Sound

HEAT

- In the table below write one of the 3 methods of heat transfer that best fits the description. Choose from CONDUCTION / CONVECTION / RADIATION.

METHOD	DESCRIPTION
CONDUCTION	Occurs only in solids
RADIATION	Is the heat transfer we receive from the sun
CONVECTION	Occurs in Fluids (liquids and gases)
RADIATION	Is called Infra-red radiation which our skin detects as heat
RADIATION	No particles (medium) are need for this type of heat transfer
CONVECTION	Occurs when particles can move from a hot area to a cold area.
CONDUCTION	Is used for cooking on a stove top
RADIATION	Is absorbed more by darker colours (especially cars)
CONVECTION	Is the method of heat transfer utilised to heat (and cool) our houses and building

- On the below diagram draw the process of convection with the arrows showing the movement of air:



- Do particles move faster or slower when heated?

Faster - higher temperatures means more kinetic energy, means more movement (Kinetic energy = moving)

- Does heat flow from warm to cold objects or from cold to warm objects?

heat flows from hotter objects at higher temperature to less hot objects which are at a lower temp.

5. Define the term insulator and name two.

*Insulator - poor conductor of thermal energy (heat)
eg air, wool, wood.*

6. What form of heat transfer does not require a medium?

Radiation - can travel through space (a vacuum)

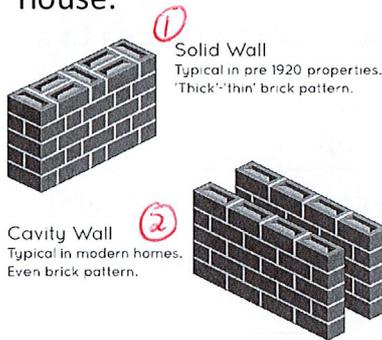
7. What type of heat transfer occurs in air and water?

Convection - occurs in fluids such as gases and liquids.

8. What type of heat transfer occurs when objects are touching?

Conduction - only occurs when particles contact each other - solids mainly.

9. Out of the below two pictures select which wall would better insulate your home, identify what the insulator is and explain how it is insulating the house:



Answer (2) is "most" correct, but marks

mainly allocated for justifying your answer.

** Conduction occurs in (1) as it is a solid wall. If bricks are poor conductors (good insulators) this will insulate house well.*

*Same. * Conduction also occurs in (2) in bricks.*

Air is used as an insulator between bricks. However air can move in convection currents.

(2) is very effective if air is "trapped" in place by wall. insulation

LIGHT

10. Which one of the following waves is at the beginning of the Electromagnetic Spectrum - Radio, Microwave or infra-red?

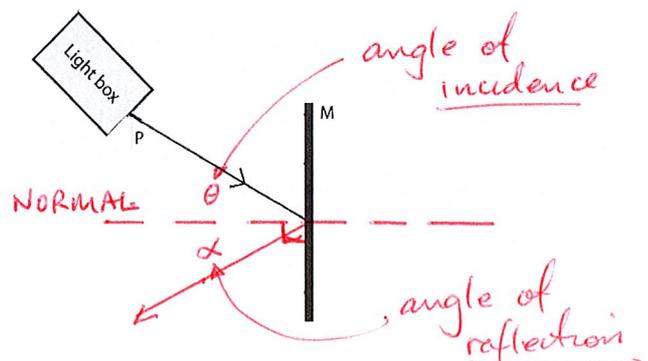
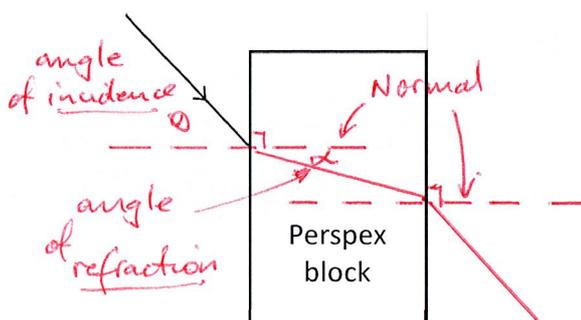
↑

11. What are the last two waves at the end of the EM Spectrum - Either Visible and Ultraviolet **OR** X-rays and Gamma rays?

↑

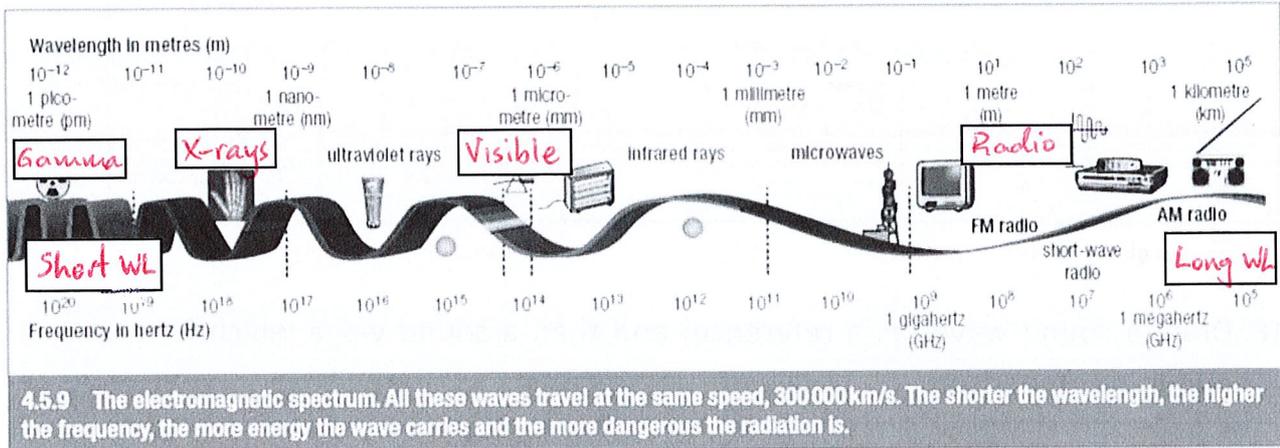
Technically there is no "beginning" or "end". There is only wavelength or frequency

12. On the below diagrams draw the ongoing ray, the normal, and the incidence and reflected angle for each interface:



13. On the electromagnetic spectrum below fill in the missing labels from the list:

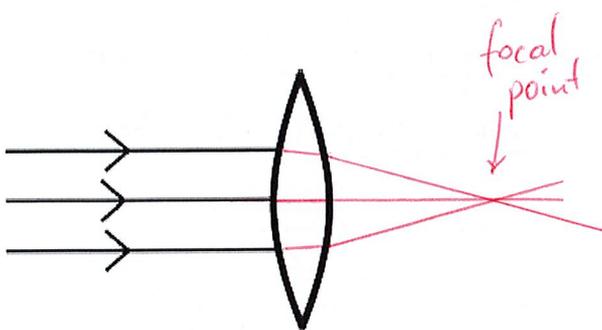
- A. X-rays B. Visible Light C. Long wave length
 D. Gamma rays E. Short wave length F. Radio waves



14. How do glasses correct vision?

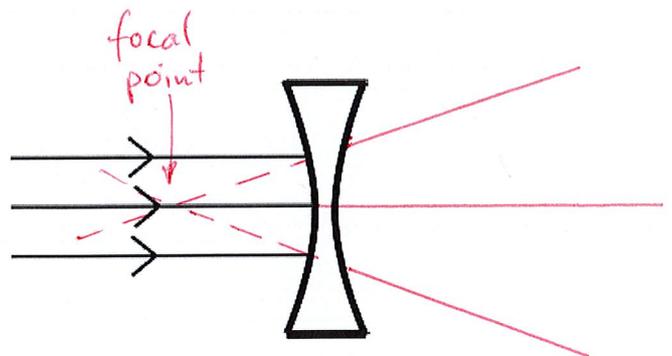
The lenses in glasses bend the light before it enters the eyes. This can help people who's own lens in the eye cannot bend the light enough to make a clear image on the retina. Concave glasses help people with long vision (far objects). Convex glasses help people with short vision (close objects).

15. On the diagrams below draw the ongoing ray and the focus point for each lens:



Biconvex Lens

↪ converges light



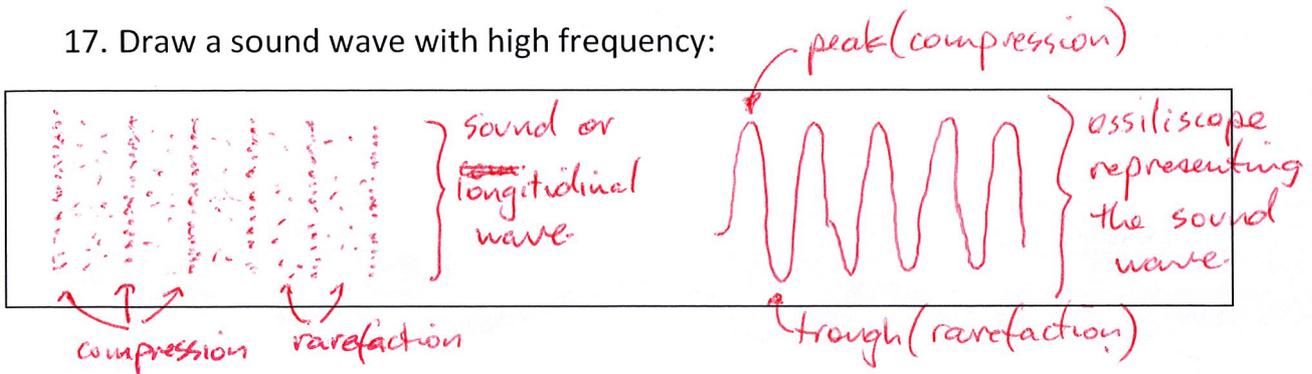
Biconcave Lens

↪ diverges light

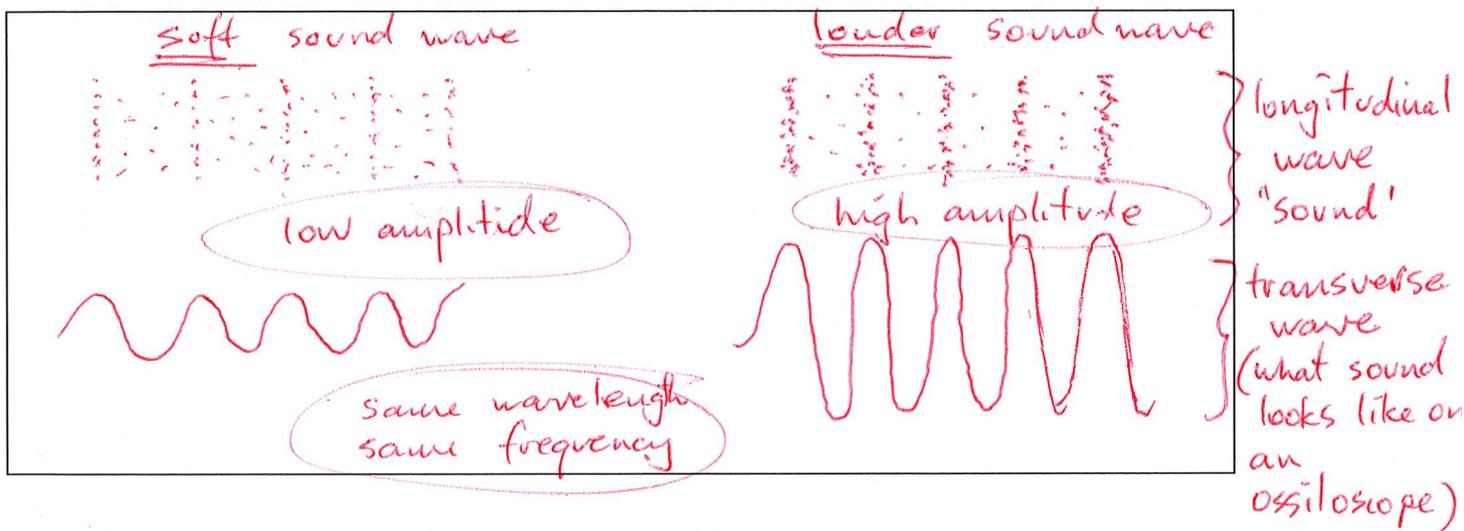
SOUND

16. True or False. A high frequency sound will have a high pitch?

17. Draw a sound wave with high frequency:

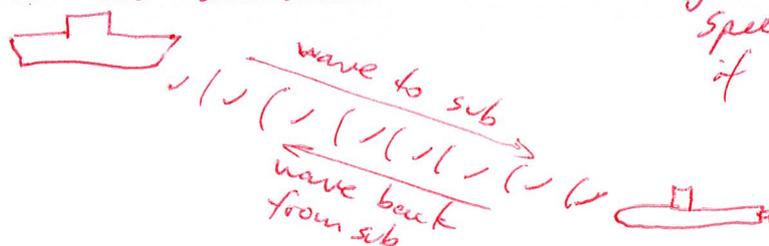


18. Draw a sound wave (as a reference) and then a sound wave which is louder in comparison.



19. Describe sonar and how it is used to locate objects.

In Sonar a sound wave is emitted and then detected if it returns. A returning sound wave indicates the sound has bounced back, off an object. ~~If the~~ Multiply the speed of sound by the time it took, and divide by two (to allow for sound travelling to the object and then back - sound covered the distance twice), then this is the distance to the object.



Speed of light in water 1500m/s
 if time = 40 secs,
 distance to sub = $\frac{1500 \times 40}{2}$
 = 30km
 (30000m)