Name:

Science Class:

Teacher:

Hand in day:

Y8 Science
Term 2 Homework Booklet
Physics

	Hand in Date	Parents Signature
Waves		
Homework 1		
Homework 2		
Homework 3		
Homework 4		
Homework 5		

Waves Homework 1:

Learn the spellings and definitions of the key words below…

Key Word	Definition
Amplitude	The maximum distance a point on a wave moves (measured in metres).
Dispersion	The process of splitting white light up into a spectrum of colours.
Frequency	The number of waves passing a point each second (measured in hertz).
Longitudinal Wave	The particles vibrate in the same direction as the wave is travelling.
Pitch	How high or low the sound is.
Spectrum	A continuum of colour (wavelengths) formed when a beam of white light is dispersed.
Transmit	Pass through
Transverse Wave	The particles or fields vibrate at right angles to the direction the wave is travelling.
Wave	Transfers energy from place to place without transferring matter.

Test

1.

2.

3.

4.

5.

6.

7.

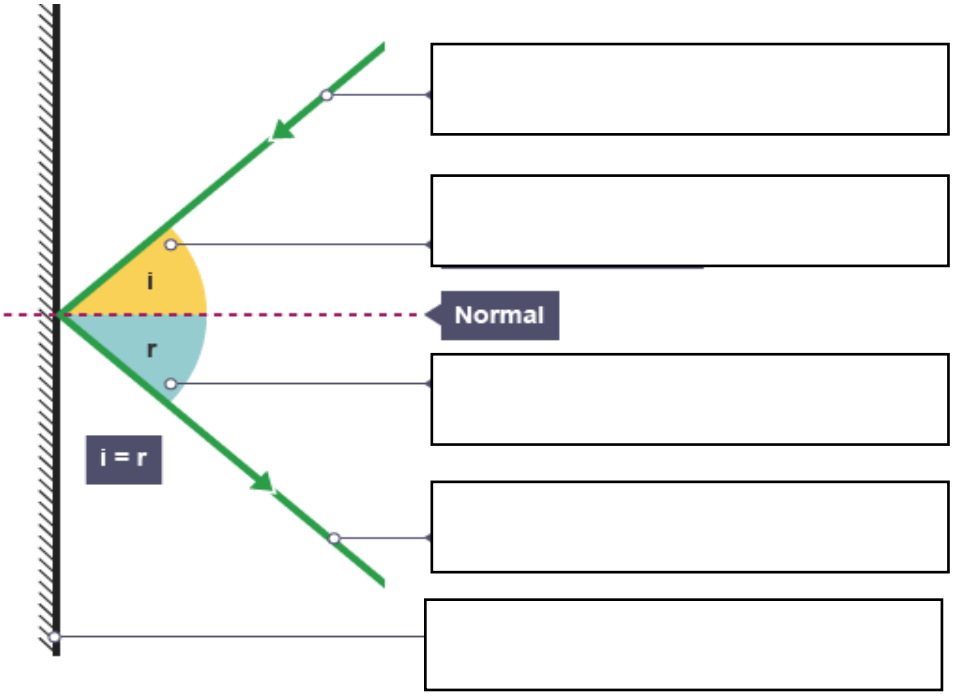
8.

9.

10.

Waves Homework 2:

Fill in the missing labels…



Now fill in the missing words…

<u>The law of reflection</u>

When light reaches a m_____, it r_____ off the surface of the mirror:

- the i_____ ray is the light going towards the mirror
- the _____ ray is the light coming away from the mirror

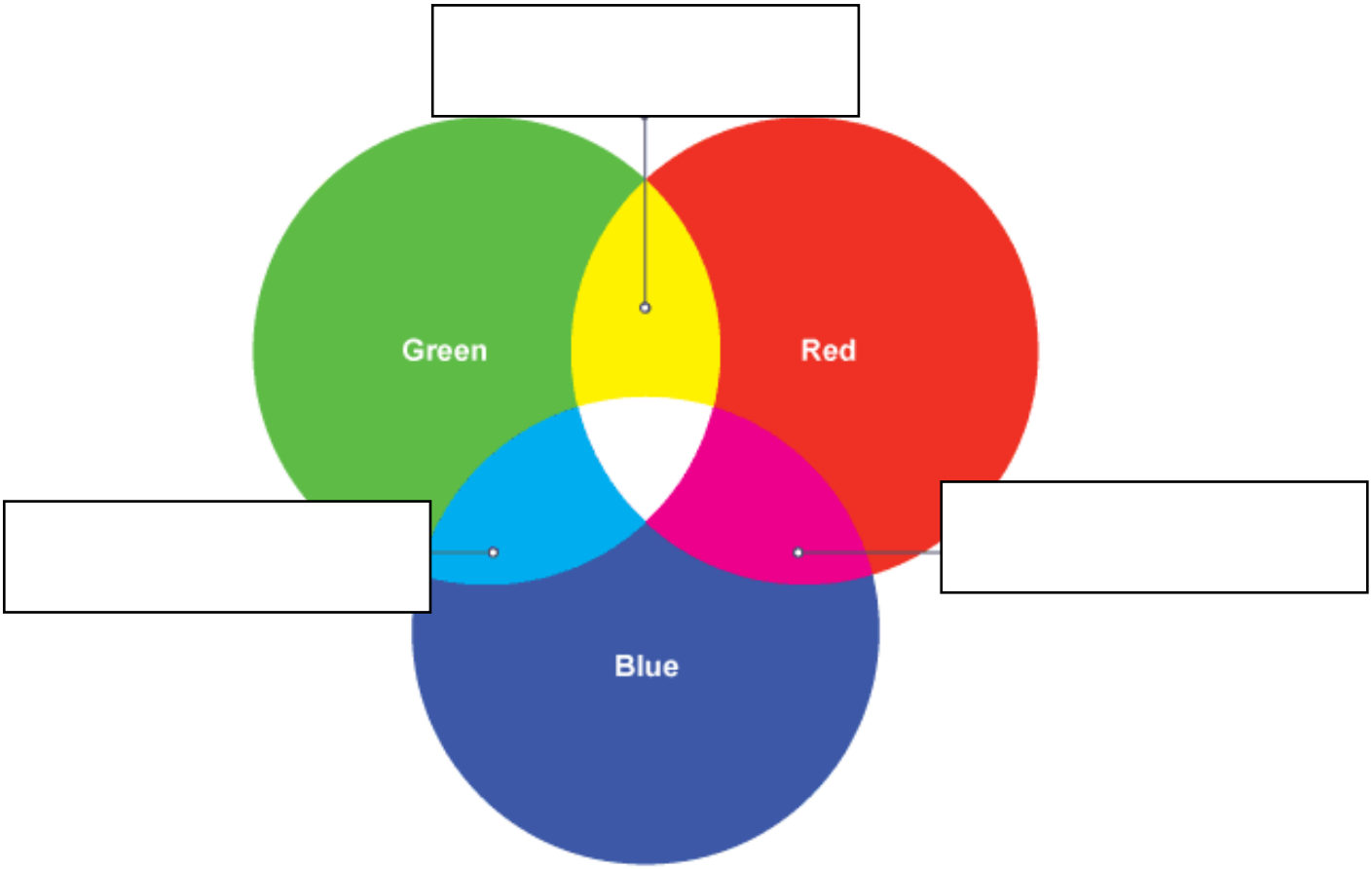
In the ray diagram:

- the hatched vertical line on the right represents the_____
- the dashed line is called the n_____, drawn at 90° to the surface of the mirror
- the angle of incidence, i, is the angle between the normal and i_____ray
- the angle of r_____, r, is the angle between the normal and reflected ray

The law of r_____ states that the angle of incidence equals the angle of r_____ (i = r).

Waves Homework 3:

Fill in the missing labels…



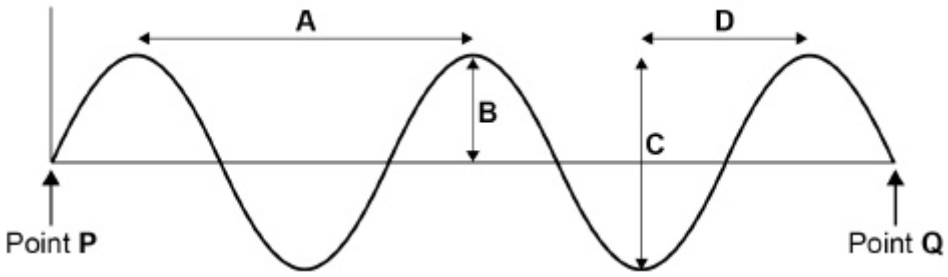
Now complete the table…

	White paper	Red apple	Green apple
Colours(s) that the object can reflect	All		Green only
Appearance of object in white light	White (no colours absorbed)	Red (all colours absorbed except red)	
Appearance of object in red light		Red	Black (no green light to reflect)
Appearance of object in green light	Green (only green light to reflect)	Black (no red light to reflect)	
Appearance of object in blue light		Black (no red light to reflect)	

Waves Homework 4:

Q1.

The diagram shows a wave.



(a) Which arrow shows the amplitude of the wave?

Tick **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

(1)

(b) Which arrow shows the wavelength of the wave?

Tick **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

(1)

(c) What type of wave is sound?

Tick **one** box.

Electromagnetic ☐

Longitudinal ☐

Transverse ☐

(1)

Two students carried out an experiment to determine the speed of sound.

This is the method used.

1. Student A stands 100 m away from Student B.
2. Student A bangs two blocks of wood together making a loud sound.
3. Student B starts a stopclock when he sees the blocks of wood bang together.
4. Student B stops the stopclock when he hears the sound and records the time.
5. The students repeat steps 2–4 several times.

The students calculated the speed of sound from their results.

(d) Suggest the most likely source of error in the experiment.

_____

_____

(1)

(e) A student compares the properties of visible light waves and radio waves.

Which **two** properties are the same for both visible light waves **and** radio waves?

Tick **two** boxes.

Both are transverse waves	☐
Both can travel through a vacuum	☐
Both have the same amplitude	☐
Both have the same frequency	☐
Both have the same wavelength	☐

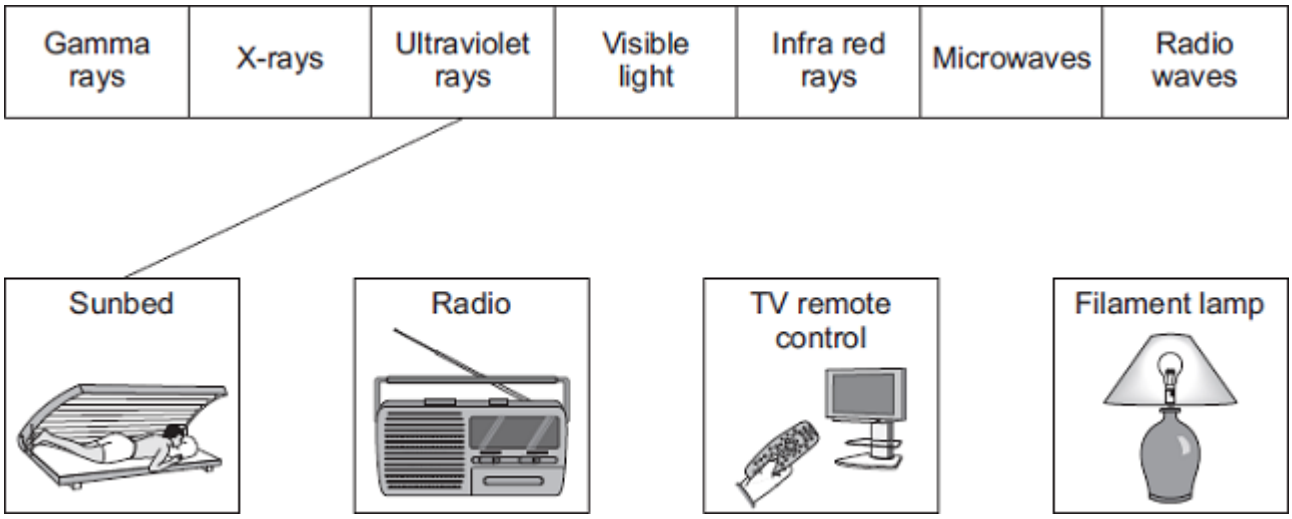
(2)

(Total 6 marks)

Q2.

(a) The diagram shows the electromagnetic spectrum.
The pictures show four devices that use electromagnetic waves. Each device uses a different type of electromagnetic wave.

Draw a line from each device to the type of electromagnetic wave that it uses. One has been done for you.

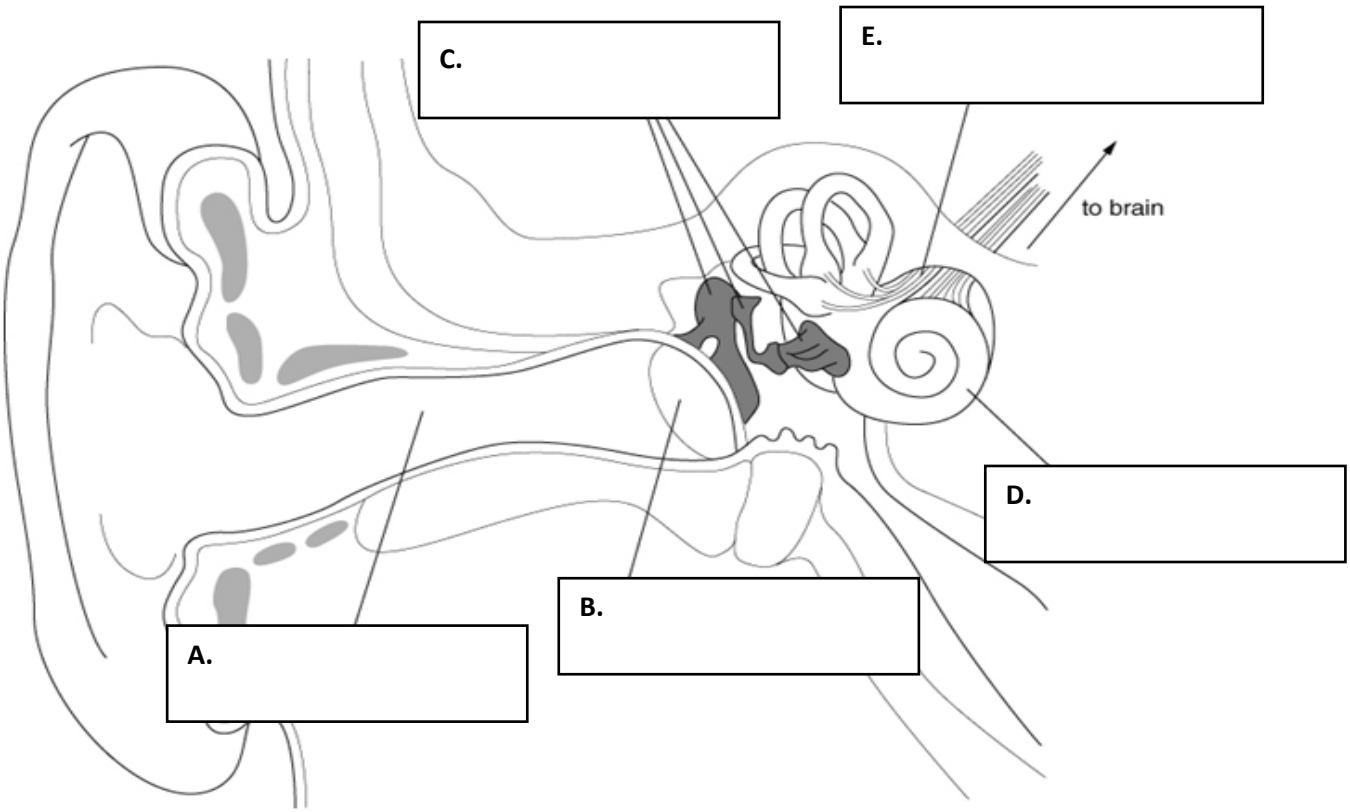


(3)

(Total 3 marks)

Waves Homework 5:

Label the diagram of the ear.



Now answer the exam question…

Table 1 shows the hearing ranges for some different species of animal.

Table 1

Species of animal	Approximate hearing range in Hz
Bat	20–120 000
Cat	45–64 000
Chicken	125–2000
Porpoise	75–150 000

(a) Use the data in **Table 1** to answer the questions.

(i) Which species of animal can hear the highest frequency?

.....

(1)

(ii) Which species of animal has the smallest frequency range?

.....

(1)

(b) (i) What is the average hearing range for healthy young humans?

.....Hz

(1)

(ii) Human hearing is sensitive to a range of loudness. The units of loudness are decibels (dB).

Table 2 shows the loudness of some sounds.

Table 2

Sound	Loudness in dB
Busy road traffic	70
Disco (at the front)	110
Normal talking	60
Personal stereo (loud)	100
Vacuum cleaner	80
Whisper	20

Sounds up to 80 dB cause no damage to hearing, no matter how long you listen to the sound. They are described as ‘safe sounds’.

Which sounds in **Table 2** are considered ‘safe’?

.....

.....

(2)

(c) Damage to hearing also depends on how much time you listen to the sound each day.

The maximum time that does not cause damage to hearing is shown in **Table 3**.

Table 3

Sound loudness in dB	Time limit for exposure
Up to 80	No limit
85	8 hours
90	4 hours
95	2 hours
100	1 hour
105	30 minutes
110	15 minutes
115	7.5 minutes
120	3.75 minutes

(i) Describe the pattern shown in **Table 3** for increasing loudness from 85 dB.

.....

.....

.....

.....

(2)

(ii) Use data from **Table 2** and **Table 3** to give the maximum time you should listen to a loud personal stereo each day.

.....

(1)

(Total 8 marks)