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| 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 | | |

Waves Homework 1:

Read the following passage and answer the questions below

Waves transfer energy from one place to another (without transferring matter)

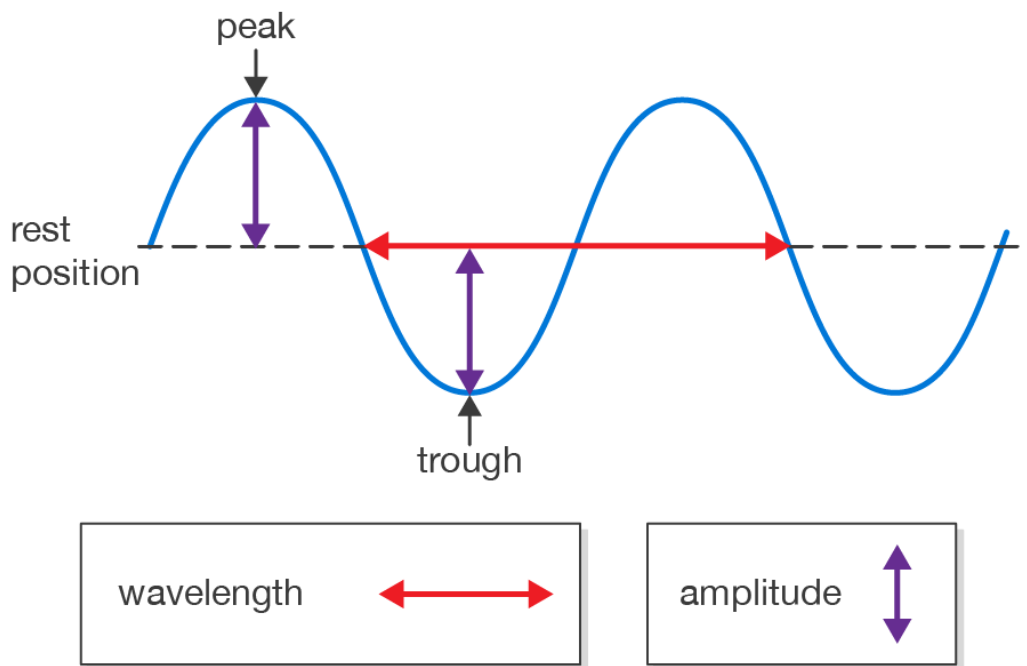
There are 2 groups of waves; longitudinal and transverse

In transverse waves the particles vibrate at right angles to the direction the wave is travelling.

Examples of transverse waves are: waves on the surface of water, light, a Mexican wave, vibrations on a guitar string, seismic S-waves

We use special terms to describe the different parts of a transverse wave.

- Amplitude is the maximum distance a point on a wave moves from its undisturbed position (measured in m)
- The wavelength of a wave is the distance from a point on one wave to the equivalent point on the next wave (measured in m)
- The frequency is the number of waves passing a point each second, measured in hertz (Hz)



Questions

- What do waves transfer from one place to another?
- What are the two groups of waves called?
- Give 3 examples of transverse waves?

(d) Match up the key word with the correct definition

Amplitude

The distance from a point on one wave to the equivalent point on the next wave

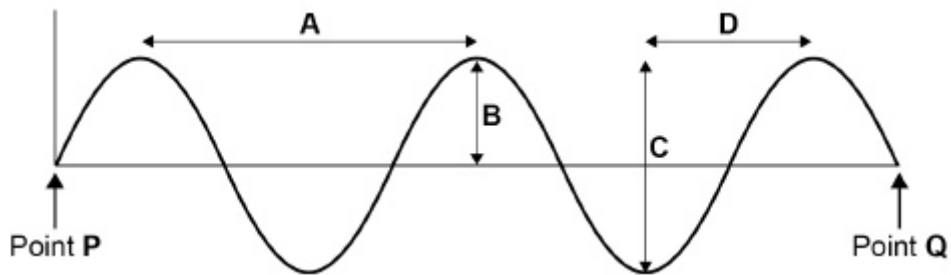
Wavelength

The number of waves passing a point each second, measured in hertz (Hz)

Frequency

The maximum distance a point on a wave moves from its undisturbed position

The diagram below shows a wave.



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

Tick **one** box.

A B C D

(1)

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

Tick **one** box.

A B C D

(1)

(iii) How many waves are between points P and Q?

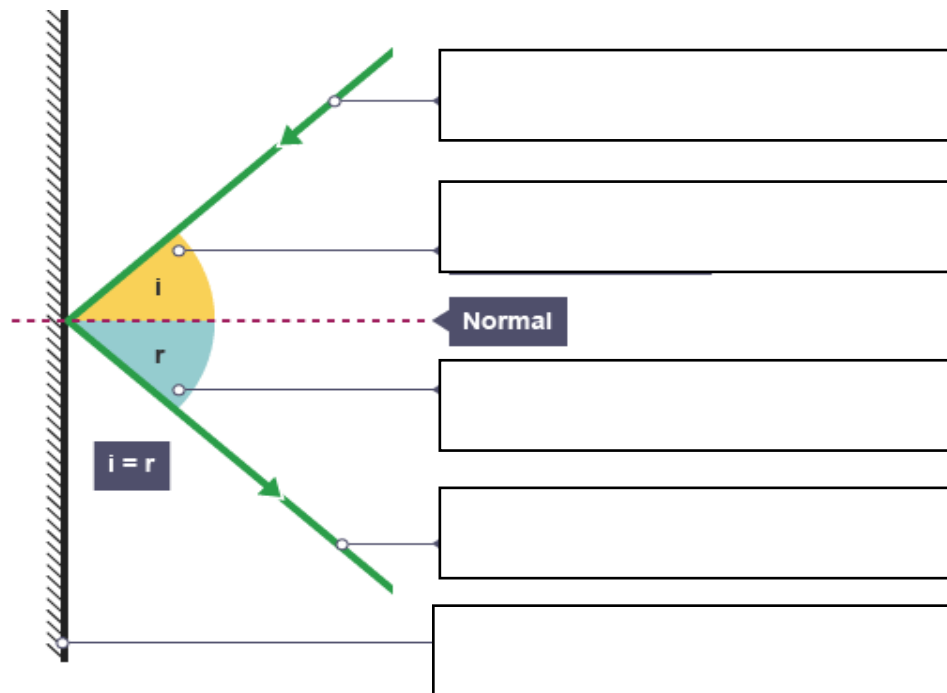
Tick **one** box.

1 2 3 4

(1)

Waves Homework 2:

Fill in the missing labels...



Now fill in the missing words...

The law of reflection

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

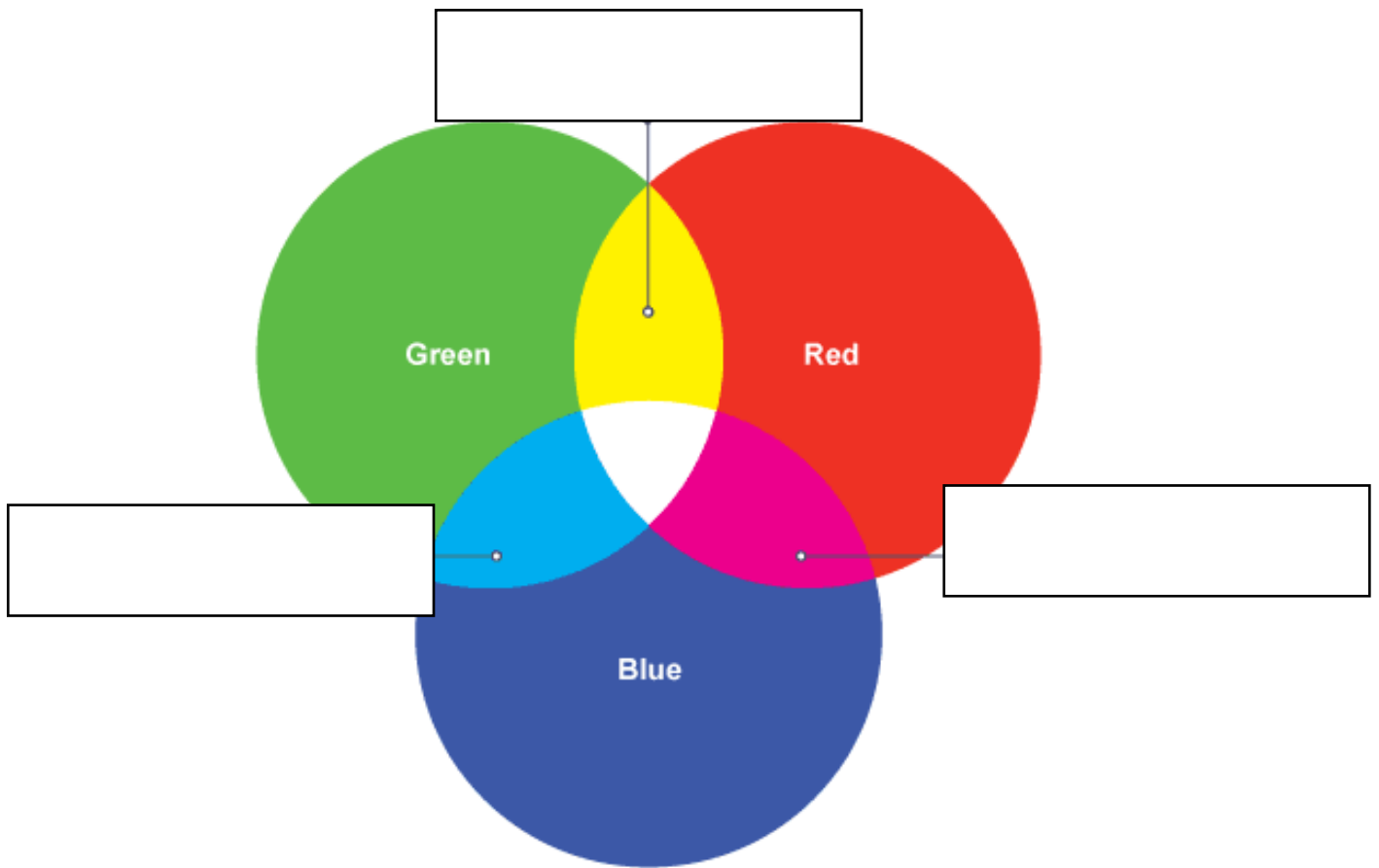
In the ray diagram:

- 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...

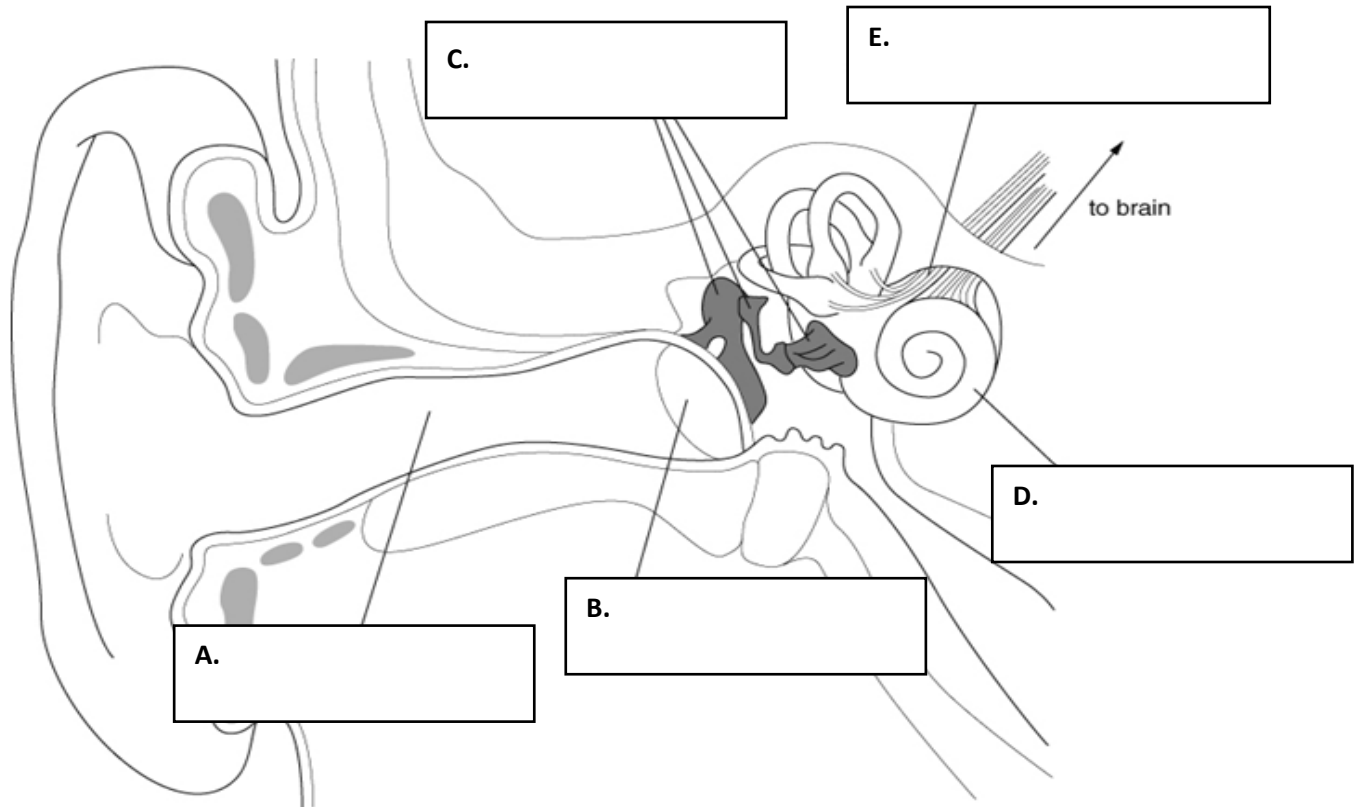


Now complete the table...

| | 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:

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)