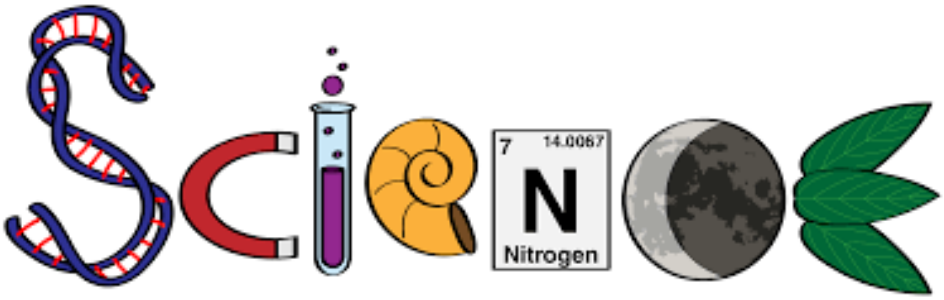
Meopham School



HOMEWORK BOOKLET

P6

Wave Properties **Match and Draw**

Homework 1

Draw **one** line from each key word to the correct definition.

amplitude	Transverse waves that transfer energy from the source of the waves to an absorber.
compression	The maximum displacement of a point on a wave away from its undisturbed position.
electromagnetic waves	A region of high pressure due to particles being close together.
frequency	A wave with oscillations parallel to the direction of energy transfer, e.g. sound waves.
longitudinal wave	The time taken for a wave to complete one vibrational cycle.
period	The number of waves passing a point each second, measured in hertz (Hz).
rarefaction	The change in direction of a wave due to the change in velocity when moving from one medium to another.
refraction	A wave with oscillations perpendicular to the direction of energy transfer, e.g. electromagnetic waves.
transverse wave	A region of low pressure in a longitudinal wave due to particles being spread further apart.
wave speed	The distance from a point on one wave to the equivalent point on the adjacent wave.
wavelength	The speed at which energy is transferred through a medium, measured in metres per second (m/s).

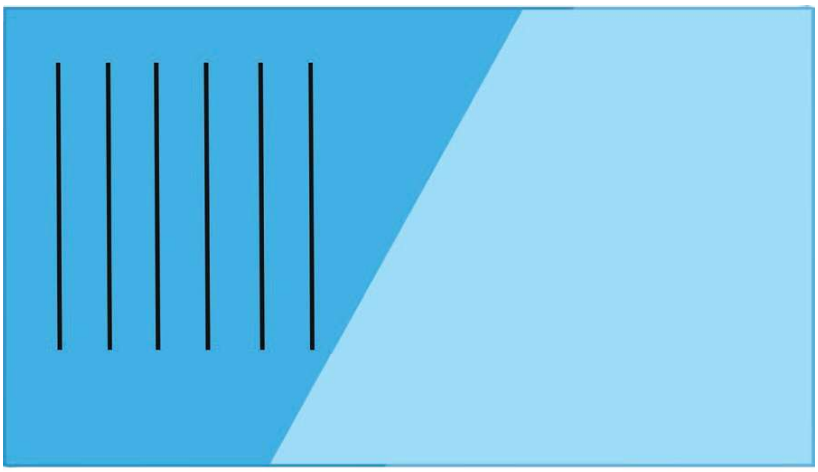
Investigating Waves in a Ripple Tank

Homework 1

Exam Style Questions

1. A group of students were using a ripple tank to observe the behaviour of waves in a fluid.

   The diagram shows the equipment they used.



1(a) On the diagram, draw the wave fronts to show how the wave is refracted as it passes from the shallow area of the tank into the deeper area of the tank. **[2 marks]**

1(b) Two students share their ideas about the properties of the waves generated in the ripple tank

Student A says "the wave moves the water from one end of the tank to the other."
Student B says "the wave transfers energy, but the actual water does not move."

Describe how you might investigate which statement is correct. **[2 marks]**

1(c) What type of wave is being produced in the ripple tank? **[1 marks]**

Total for question 1 **[5]**

2(a) The students use a stopwatch and count the number of waves that pass a specific point for 30 seconds.

They count 63 waves.

Calculate the frequency of the waves. Show your working. **[2 marks]**

2(b) If the wavelength of the wave is 0.4 m, calculate the wave speed.

Show your working. **[2 marks]**

Total for question 2 **[5]**

3. The students measured the wavelength of the ripples using a metre ruler. They measured the waves very quickly, making estimations.

Explain how the use of a stroboscope could improve their measurements.

You should include:

- explanation of the technique;
- justification of apparatus as a more suitable choice. **[6 marks]**

Total for question 3 **[6]**

Homework 2

Electromagnetic Spectrum **Match and Draw**

Draw **one** line to match each type of electromagnetic wave to the correct description.

radio waves	Low frequency waves used for satellite communications and cooking food.
microwaves	Used for energy-efficient lamps and sun tanning. It can cause skin to age prematurely and increase the risk of skin cancer.
infrared	Electromagnetic waves with the longest wavelengths, used for television and radio communications.
visible light	The portion of the electromagnetic spectrum that our eyes can detect. It is used for fibre optic communications.
ultraviolet	Used for electrical heaters, cooking food and infrared cameras.
X-rays	Electromagnetic waves with the shortest wavelengths, used for medical imaging and treatments. They can cause the mutation of genes and cancer.
gamma rays	High frequency waves used for medical imaging and treatments. They can cause the mutation of genes and cancer.

Investigating Infrared Radiation
Exam Style Questions

Homework 2

Pupils wanted to find out which container emitted the most infrared radiation and decided to complete the following experiment. They had two identical containers, one painted silver and the other black. They followed the method shown below:

1. Each container was filled with 100cm^3 of hot water.
2. The lids were sealed and the temperature of the water was taken and recorded every minute over a 10-minute period.

Results

Silver container											
times (mins)	0	1	2	3	4	5	6	7	8	9	10
Temperature (°C)	70	65	62	60	58	55	54	51	50	48	47

Black container											
times (mins)	0	1	2	3	4	5	6	7	8	9	10
Temperature (°C)	70	65	60	57	54	50	48	44	43	41	38

1(a) Using graph paper, plot these results using one set of axes. **[4 marks]**

1(b) Do your results support the hypothesis Dark surfaces are better emitters of infrared radiation than light surfaces? Explain your answer using examples from the results. **[3 marks]**

Homework 2

2. What were the variables in this experiment? **[3 marks]**

- The independent variable was...

- The dependent variable was...

- A control variable was...

3. The teacher suggested that the pupils compared their results with others in the class. Explain why this was a good idea. **[3 marks]**

4. The inside and outside surfaces of an oven are usually light coloured and shiny. Explain why. **[2 marks]**