

Name:

Edexcel Style

Combined Science GCSE

Waves

(Levels 4–9)

Date:

Time allowed: 50mins

Question	Links to Student Progress Sheet	Score	Total marks Available
1	4.3,4.5		9
2	4.4,4.6		12
3	4.17		11
4	4.11		7
5	4.10		3
6	4.3		8
Total			50

Score	Estimated Grade
47 – 50	9
40 – 46	8
33 – 39	7
28 – 32	6
24 – 27	5
20 – 23	4
0 – 19	U

Please be aware that these grade boundaries are Twinkl's own, and may not be in-line with Edexcel's own.

Area for Improvement:

1. Waves can be transverse or longitudinal.

(a) Describe how transverse and longitudinal waves are different.

(3)

(b) Complete the table below to show whether the waves are transverse or longitudinal. The first one has been done for you.

(4)

Type of Wave	Longitudinal	Transverse
Waves in water		✓
Sound waves		
Electromagnetic waves		
P-waves		
S-waves		

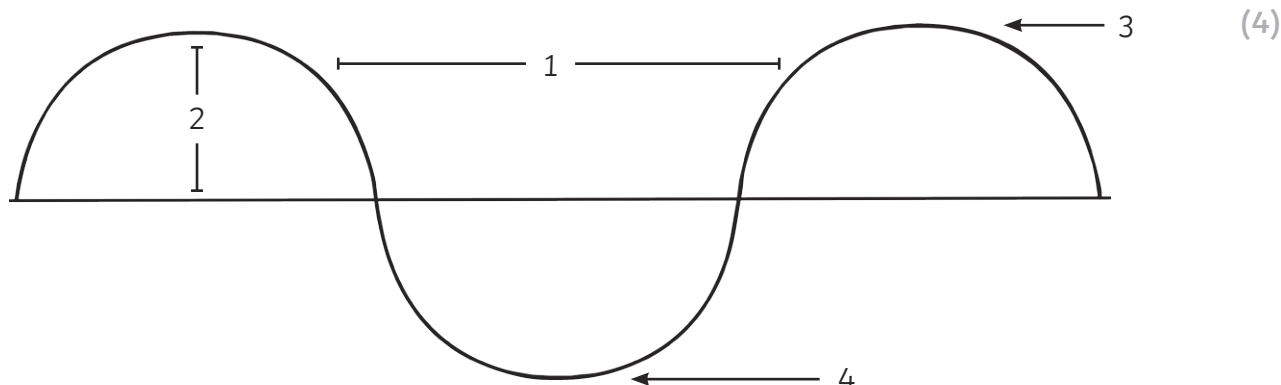
(c) Define the term 'frequency' and state its unit.

(2)

(Total for Question 1 = 9 marks)

2. Below is a diagram of a wave.

(a) Label parts 1-4



1. _____
2. _____
3. _____
4. _____

(b) State the two equations that enable wave speed to be calculated. You must include all units.

(4)

(c) Calculate the wave speed of a wave with a frequency of 5KHz and a wavelength of 50cm.

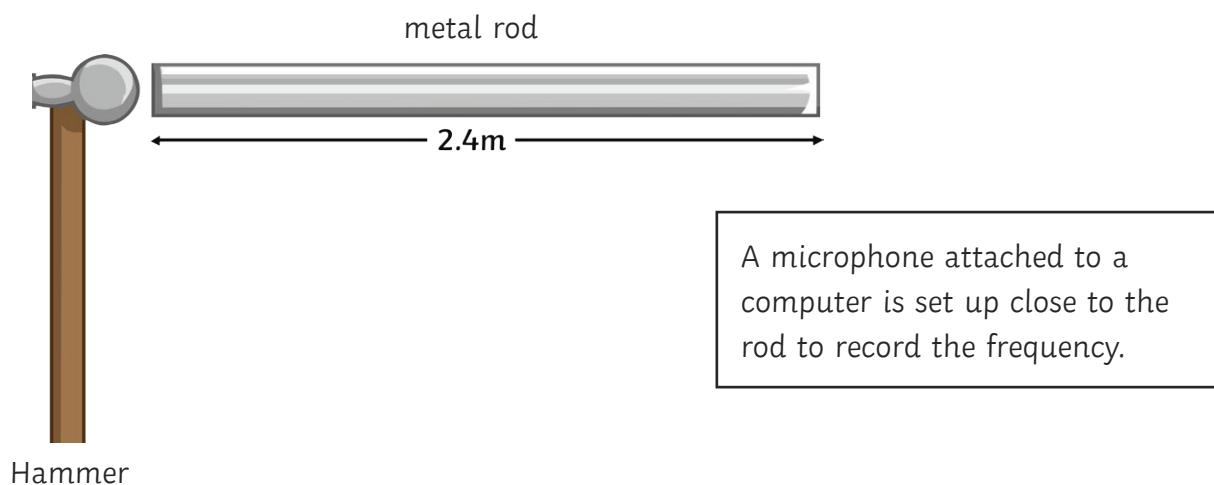
(2)

(d) Calculate the frequency of a wave with a speed of 250m/s and a wavelength of 50m.

(2)

(Total for Question 2 = 12 marks)

3. A group of pupils decided to investigate the speed of waves in solids by measuring the frequency of sound waves produced when objects made from different materials were hit with a hammer. The diagram illustrates how the equipment was set up.



The results are shown below.

Material	Wave Speed
Copper	4600m/s
Aluminium	6320m/s
Lead	1210m/s

- (a) Place a [✓] in the correct box to suggest a suitable way of displaying the results and give a reason for your choice.

line graph

☐

scatter gram

☐

bar graph

☐

box plot

☐

(2)

Reason:

(b) The students decided to repeat the experiment three times for each metal. How was this beneficial to their results?

(3)

(c) The pupils then decided to measure the wavelength of a water wave. Describe the method used to carry out this experiment. (To obtain full marks, you must include an equipment list and at least one safety precaution.)

(6)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

(Total for Question 3 = 11 marks)

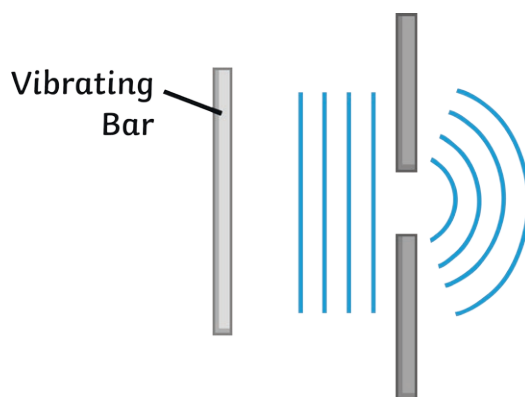
4. (a) When a wave meets a boundary between two materials, three things can happen. What are they?

(3)

(b) Waves can be 'refracted'. Explain this term.

(1)

(c) The diagram below shows waves formed in a ripple tank



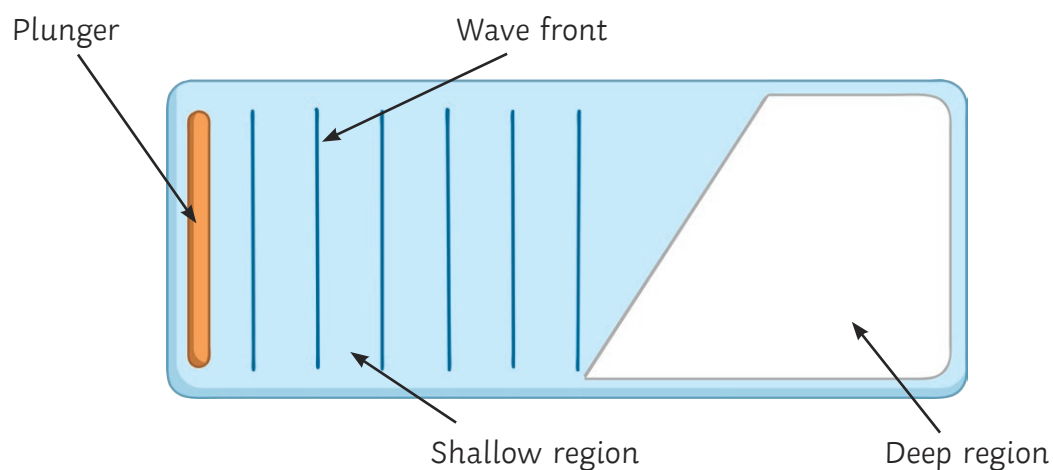
Every four seconds, waves pass through the gap. The waves have a length of 0.024 metres. What is the speed of the water waves in the tank? Remember to show your workings and include all units.

(3)

(Total for Question 4 = 7 marks)

5. (a) On the diagram below, use a line drawing to show how the waves would act as they move from a shallow region towards a deeper region.

(1)



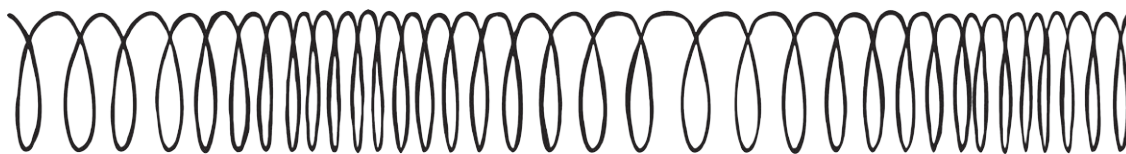
- (b) Explain how the waves act as they move towards the deeper water.

(2)

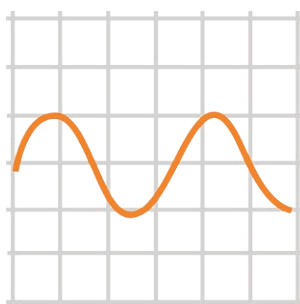
(Total for Question 5 = 3 marks)

6. (a) What type of wave is shown by image A?

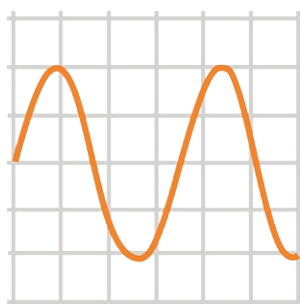
(1)



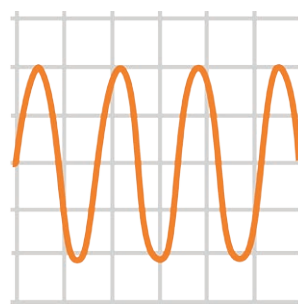
(b) The diagram below shows waves formed in a ripple tank



1



2



3

(i) Which waves have the same amplitude?

(1)

(ii) Which waves have the same frequency?

(1)

(c) What is meant by the 'period' of a wave?

(1)

- (d) A wave has a speed of 0.35m/s and a wavelength of 7.8cm . Calculate its frequency. Remember to show all your working and include the correct units. Give your answer to 2 decimal points.

(4)

(Total for Question 6 = 8 marks)

TOTAL FOR PAPER = 50 MARKS