B1 L10 Active transport and exchange surfaces: Exam questions worksheet

AQA GCSE Combined Science: Trilogy (8464) and Biology (8461)
Biology Paper 1 · Topic B1 Cell biology

Name _____ Class _____

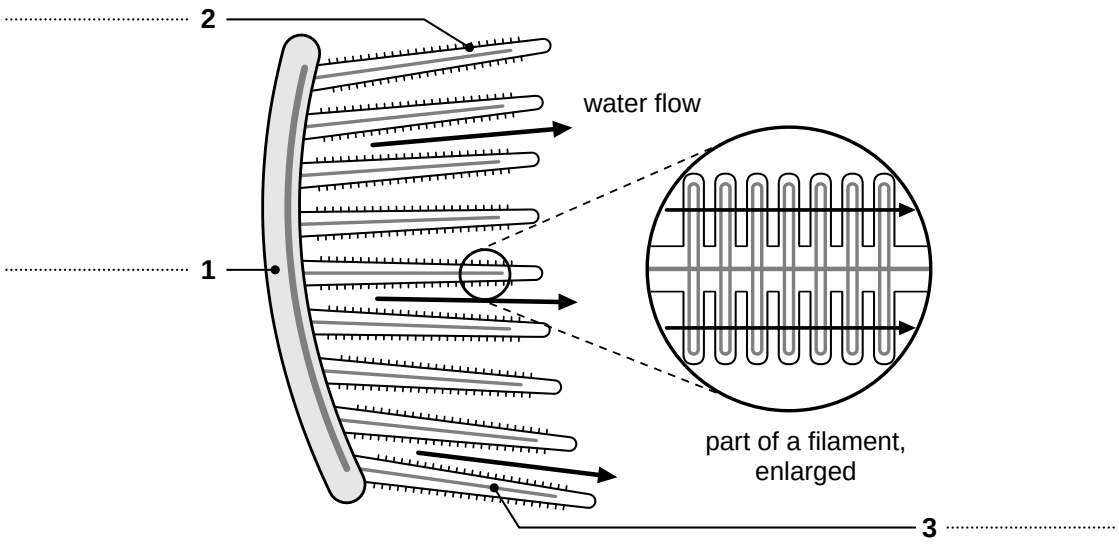
Total: ..... / 20

Instructions
- Answer **all** questions in the spaces provided.
- Use black ink or black ball-point pen.
- The marks for each question are shown in brackets.
- In calculations, show clearly how you work out your answer.
- Time: about 25 minutes.

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0 1 **Figure 1** shows a diagram of part of a fish gill.

Figure 1



0 1 . 1 **Complete Figure 1**. [3 marks]

Choose answers from the box.

blood vessel	gill arch	gill filament	stoma	villus

0 1 . 2 Which feature of the gill filaments gives them a large surface area? [1 mark]

Tick (✓) **one** box.

- They are covered in tiny plates. ☐
- They are deep red. ☐
- They are held by a bony arch. ☐
- They are under a gill cover. ☐

Do not write outside the box

0 2 A teacher made a model to show how size affects diffusion.

She cut three cubes of agar jelly of different sizes, shown in **Figure 2**.

The jelly contained an indicator that is pink in alkali and colourless in acid.

She put the cubes in acid and timed how long each cube took to become colourless all the way through.

Figure 2

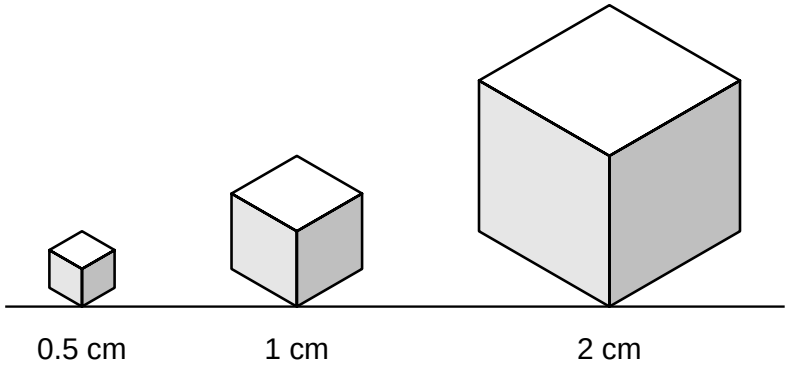


Table 1 shows the results.

Table 1

Side of cube in cm	Surface area in cm²	Volume in cm³	Surface area : volume	Time to become colourless in minutes
0.5	**X**	0.125	**Y**	1.5
1	6	1	6 : 1	6
2	24	8	3 : 1	23

0 2 . 1 **Calculate** the surface area **X** of the 0.5 cm cube. [2 marks]

Use the equation:

surface area of a cube = 6 × side × side

X = ... cm²

0 2 . 2 **Calculate** the surface area to volume ratio **Y** of the 0.5 cm cube. [1 mark]

Give your answer in the form ___ : 1

Y = ... : 1

Do not write outside the box

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0 2 . 3 **Describe** the pattern in **Table 1**. [1 mark]

.....

.....

0 2 . 4 The cubes are a model of organisms of different sizes. [2 marks]

Use **Table 1** to **suggest** why a large organism needs exchange surfaces and a transport system.

.....

.....

.....

0 3 Root hair cells take in nitrate ions from the soil.

Table 2 shows the concentration of nitrate ions in the soil water and in a root hair cell.

Table 2

Where	Concentration of nitrate ions in arbitrary units
soil water	0.5
root hair cell	25

Explain why the root hair cell must use active transport to take in nitrate ions. [2 marks]

Use data from **Table 2**.

.....

.....

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Do not write outside the box

Turn over for the next question

0 4 **Table 3** shows three exchange surfaces. [2 marks]

Complete Table 3.

Tick (✓) the features that each exchange surface has.

The first row has been done for you.

Table 3

Exchange surface	Large surface area	Efficient blood supply	Ventilated
Alveoli in the lungs	✓	✓	✓
Villi in the small intestine			
A leaf			

0 5 Diffusion, osmosis and active transport are three ways that substances move into and out of cells. [6 marks]

Compare diffusion, osmosis and active transport.

Do not write outside the box

END OF QUESTIONS

There are no more questions in this paper. Original practice paper © sciencegcse.co.uk – free to use for non-commercial education. Not an AQA paper.