AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.1.3.1

Diffusion

Past-paper questions

Tier	**Foundation**
Question groups	**2**
Available paper years	**2019–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.1.3.1 Diffusion

Question 01

June 2019 | 8464/B/1F | Original Q2

0 2 A single-celled organism has a large surface area to volume ratio.

0 2 . 1 How does oxygen enter a single-celled organism?

[1 mark]

Tick (✓) **one** box.

- Active transport ☐
- Diffusion ☐
- Osmosis ☐

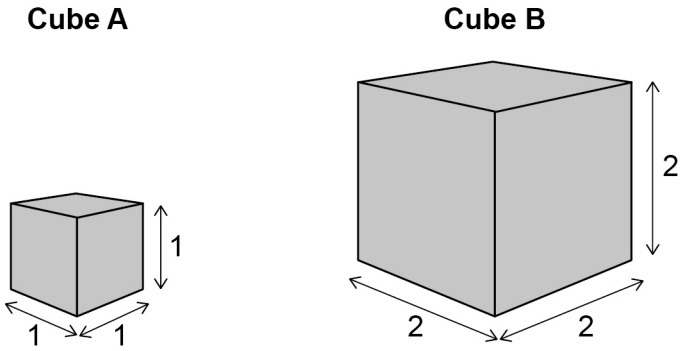
4.1.3.1 Diffusion

Question 01 · continued

Figure 3 shows two cubes.

The surface area to volume ratio for cube **A** is 6:1

Figure 3



0 2 . 2 Calculate the surface area to volume ratio of cube **B**.

[4 marks]

Surface area of one face of cube **B** _____

_____

Surface area of one face = _____

Total surface area of cube **B** _____

_____

Total surface area = _____

Volume of cube **B** _____

_____

Volume = _____

Surface area to volume ratio = _____ : _____

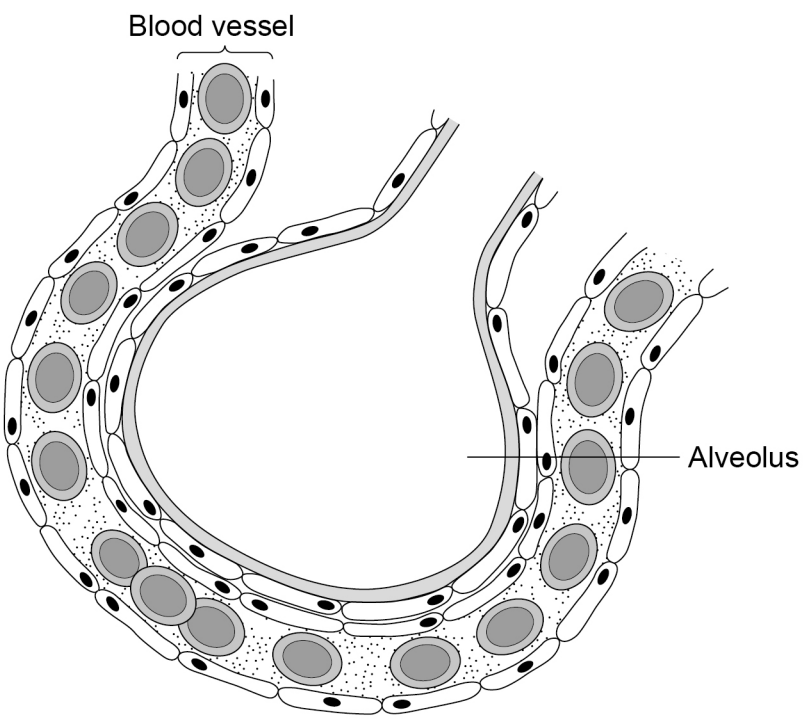
4.1.3.1 Diffusion

Question 01 · continued

Multicellular organisms have exchange surfaces to absorb substances.

Figure 4 shows part of the exchange surface in the lungs.

Figure 4



0 2 . 3 Oxygen passes from the alveolus into the blood.

Name the part of the blood that carries the most oxygen.

[1 mark]

0 2 . 4 Name the gas that passes out of the blood into the alveolus.

[1 mark]

4.1.3.1 Diffusion

Question 01 · continued

0 2 . 5 Alveoli provide a large surface area for gas exchange.

Give **two** other ways the lungs are adapted for efficient gas exchange.

[2 marks]

1 _____

_____

2 _____

_____

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Turn over for the next question

4.1.3.1 Diffusion

Question 02

0 3 A student investigated the effect of concentration of salt solution on the mass of potato cubes.

This is the method used.

1. Cut a piece of potato into four cubes.
2. Record the mass of each cube.
3. Put each cube into a different beaker.
4. Pour a different concentration of salt solution into each beaker.
5. After 1 hour, remove each cube.
6. Record the mass of each cube.

0 3 . 1 Suggest **two** improvements to the investigation.

[2 marks]

1 _____

_____

2 _____

_____

Question 3 continues on the next page

The student improved the investigation.

Table 3 shows the results.

Table 3

Concentration of salt solution in mol/dm^3	Mass of potato cube at the start in grams	Mass of potato cube after one hour in grams	Change in mass in grams
0.0	30.6	30.7	+0.1
0.5	30.8	30.8	0.0
1.0	30.8	30.7	–0.1
2.0	30.5	30.3	–0.2

0 3 . 2 What was the concentration of the solution inside the potato cells?

[1 mark]

Tick (✓) **one** box.

- 0.0 mol/dm^3 ☐
- 0.5 mol/dm^3 ☐
- 1.0 mol/dm^3 ☐
- 2.0 mol/dm^3 ☐

4.1.3.1 Diffusion

Question 02 · continued

0 3 . 3 Changes in mass of the potato cubes are due to water moving into and out of the cells.

What is the name of the process that allows water to move into and out of cells?

[1 mark]

Tick (✓) **one** box.

Active transport ☐

Osmosis ☐

Respiration ☐

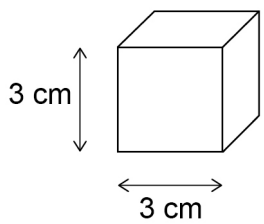
Question 3 continues on the next page

4.1.3.1 Diffusion

Question 02 · continued

0 3 . 4 **Figure 7** shows one of the potato cubes.

Figure 7



Calculate the surface area of the potato cube.

Give the unit.

[3 marks]

Surface area = _____ Unit _____

0 3 . 5 The student then investigated the effect of **surface area** on the change in mass of a piece of potato.

Describe how the student could increase the surface area of the piece of potato shown in **Figure 7**.

[1 mark]

4.1.3.1 Diffusion

Question 02 · continued

Potatoes contain varying amounts of carbohydrates and proteins.

Starch and sugar are different types of carbohydrate.

0 3 . 6 Draw **one** line from each carbohydrate to the chemical used to test for the carbohydrate.

[2 marks]

Carbohydrate	Chemical used for test
Starch	Benedict's reagent
Sugar	Biuret reagent
	Ethanol
	Iodine solution

0 3 . 7 A potato was tested for protein, sugar and starch.

Table 4 shows the results.

Table 4

	Test for protein	Test for sugar	Test for starch
Result	Blue	Red	Blue-black

Which substances were found in the potato?

[1 mark]

Tick (✓) **one** box.

Protein and starch ☐

Protein and sugar ☐

Sugar and starch ☐

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