BIOLOGY YEAR 11 - MODULE 2 - LESSON 10

Gas Exchange in Animals

Use this worksheet after reading the lesson to practise the key ideas and prove you can meet the success criteria.

Name _____

Date _____

Class _____

1. Key Ideas

Single-celled organisms can exchange gases directly across their surface. Large multicellular animals cannot. This lesson explains why exchange surfaces are needed, what makes them efficient, and how insects, fish and mammals solve the same problem in different ways.

- Explain why multicellular animals need specialised gas exchange surfaces
- Investigate exchange surfaces in animals

2. Success Criteria

By the end, you should be able to:

- Explain why multicellular animals need specialised gas exchange surfaces
- Describe the features shared by efficient exchange surfaces
- Apply surface area to volume ratio and diffusion distance to animal gas exchange

3. Key Terms

explains why exchange surfaces
needed, what makes them efficient, and how insects, fish and mammals solve the same problem in different ways

and maintained concentration gradient
core HSC recall and explanation points

This
commonly tested as a structure-function question linked to body size

Students
often asked to compare insects with vertebrates

The key point
that oxygen travels directly to tissues through tracheoles rather than through the circulatory fluid

principle that diffusion rate
proportional to surface area and concentration gradient, and inversely proportional to membrane thickness

4. Activity: Build the Lesson Map

Use the lesson to complete the table. Keep answers brief but specific.

Prompt	Your answer
Main concept	
Important example	
Common mistake to avoid	
How this links to the next lesson	

5. Short Answer Questions

1. Explain this lesson goal in your own words: "Explain why multicellular animals need specialised gas exchange surfaces". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "Describe the features shared by efficient exchange surfaces". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Gas Exchange in Animals: "Apply surface area to volume ratio and diffusion distance to animal gas exchange".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Gas Exchange in Animals but does not use evidence or reasoning.

Improve the answer by writing a stronger response that uses accurate terminology, a relevant example and a clear explanation.

7. Multiple Choice

1. What is the best first step when answering a question about Gas Exchange in Animals?

- [ ] A. Identify the key concept being tested
- [ ] B. Write every fact from memory
- [ ] C. Ignore the command word
- [ ] D. Skip examples and evidence

2. Which answer would show stronger understanding of Gas Exchange in Animals?

- [ ] A. An answer with accurate terms and reasoning
- [ ] B. A copied definition only
- [ ] C. A single-word response
- [ ] D. An answer with no example

3. What should you do if a question asks you to explain?

- [ ] A. Link the idea to a reason or cause
- [ ] B. List unrelated facts
- [ ] C. Only draw a diagram
- [ ] D. Write the shortest possible answer

8. Success Criteria Proof

Finish with evidence that you can do each success criterion.

SUCCESS CRITERION 1

Prove that you can: Explain why multicellular animals need specialised gas exchange surfaces

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Describe the features shared by efficient exchange surfaces

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Apply surface area to volume ratio and diffusion distance to animal gas exchange

BAND 5 4 MARKS

One thing I still need help with: