BIOLOGY YEAR 11 - MODULE 2 - LESSON 18

Comparing Transport Systems — Plants and 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

Xylem and arteries both carry fluid under pressure. Phloem and veins both return fluid toward the "centre." Capillaries and leaf mesophyll spaces both serve as exchange zones. The parallels are striking — but so are the differences. This lesson puts them side by side.

- Compare xylem vessels with arteries — structure, pressure, and mechanism
- Compare transport in plants and animals — IQ3 synthesis

2. Success Criteria

By the end, you should be able to:

- Compare xylem vessels with arteries — structure, pressure, and mechanism
- Compare phloem with veins — contents, direction, and driving force
- Explain how capillaries and leaf gas exchange surfaces share functional design

3. Key Terms

The parallels
striking — but so are the differences

Xylem and arteries
structurally and functionally identical

xylem
composed of dead cells with lignin walls, driven by passive transpiration pull; arteries contain living cells with elast

But the physics
fundamentally different: xylem operates under

the water column
being pulled), while arteries operate under

Death
essential for unobstructed bulk flow through the hollow lumen

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. 6. Compare the structure and function of xylem vessels and arteries. Describe two structural differences and explain how each difference reflects the different physical conditions in each vessel.

BAND 3 4 MARKS

2. 7. Explain why xylem transport requires no metabolic energy expenditure at the vessel itself, while animal blood circulation requires continuous cardiac output.

BAND 4 3 MARKS

3. 8. Identify one structural similarity between leaf mesophyll air spaces (gas exchange in plants) and pulmonary alveoli (gas exchange in animals). Explain how this shared feature increases the rate of gas exchange in both organisms, referring to Fick's law.

BAND 5 3 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Comparing Transport Systems — Plants and 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 Comparing Transport Systems — Plants and 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 Comparing Transport Systems — Plants and 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: Compare xylem vessels with arteries — structure, pressure, and mechanism

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Compare phloem with veins — contents, direction, and driving force

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Explain how capillaries and leaf gas exchange surfaces share functional design

BAND 5 4 MARKS

One thing I still need help with: