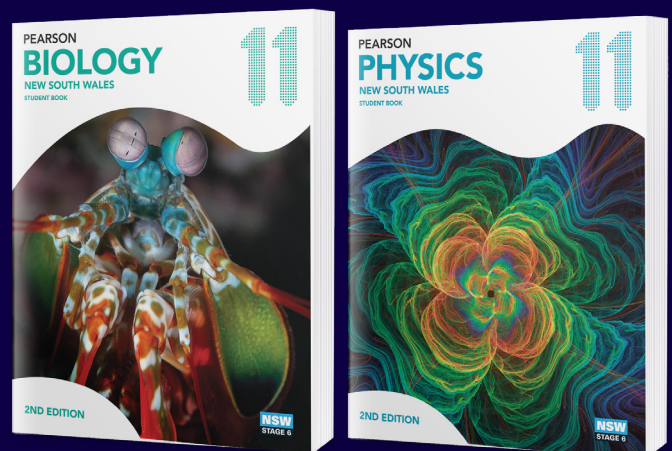




**NEW**

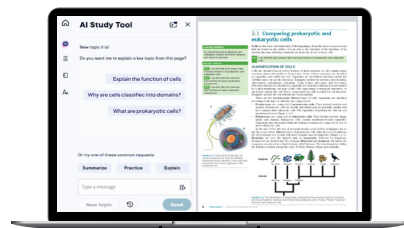
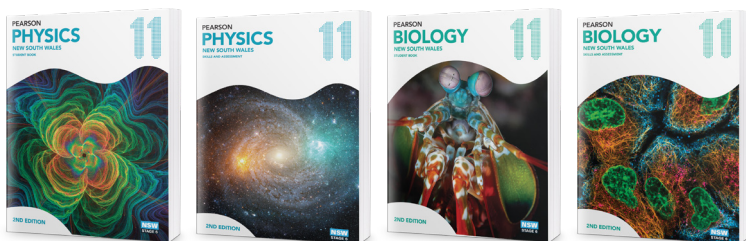
# Pearson Senior Science NSW 2nd Edition

- Fully aligned to the NESA Biology, Physics and Chemistry 11–12 syllabuses (2025).
- Bold new editions built on what you already trust, strengthened by insights from practising NSW educators.
- Everything you need to move to the new curriculum and prepare your students for exam success.



**The leading science series in  
NSW is back for the new syllabus!**

# The science series NSW teachers trust, updated for the new 11–12 (2025) syllabuses



## Sample teaching program

The Pearson Biology 11 New South Wales series meets and comprehensively covers the outcomes and content for Year 11 in the HSC Biology 1-2 syllabus (2025). This sample teaching program maps the syllabus outcomes and content week by week to all Pearson Biology components and resources. You may wish to use this document as the basis for developing your personalised teaching plan.

**Practical activity resources:** The practical activities included in the eBook are also provided in a fully certified format within the Skills and Assessment book.

Unit	Module	Learning Intention	Knowledge content	Skills	Practical Activity	Assessment
Unit 1	Module 1.1	Understand the importance of cells as the basis of life	Cells are the basic structural and functional units of life. They are the smallest units of structure and function that can perform all the processes of life.	Identify and compare the structure and function of prokaryotic and eukaryotic cells.	Micrograph 1.1.1: Eukaryotic cell structure and function	Practical Activity 1.1.1: Eukaryotic cell structure and function
	Module 1.2	Comparing prokaryotic and eukaryotic cells	Prokaryotic cells are smaller than eukaryotic cells. They lack a nucleus and other membrane-bound organelles. Eukaryotic cells have a nucleus and other membrane-bound organelles.	Identify and compare the structure and function of prokaryotic and eukaryotic cells.	Micrograph 1.2.1: Prokaryotic cell structure and function	Practical Activity 1.2.1: Comparing prokaryotic and eukaryotic cells
	Module 1.3	Cellular transport	Cells are surrounded by a cell membrane that controls the movement of substances in and out of the cell. The cell membrane is a phospholipid bilayer with embedded proteins.	Identify and compare the structure and function of the cell membrane.	Micrograph 1.3.1: Cellular transport	Practical Activity 1.3.1: Cellular transport

**Teacher support** provides a reliable foundation, with syllabus grids, teaching guidance, worked solutions, ready-made tests and digital reporting to support confident planning and delivery.

## 2.1 Comparing prokaryotic and eukaryotic cells

**Learning intention:** To understand how prokaryotic and eukaryotic cells compare and relate to function.

**Success criteria:**

- SC1 can identify and compare the structure and function of prokaryotic and eukaryotic cells.
- SC2 can describe the structure and function of major prokaryotic components.
- SC3 can describe the structure and function of major eukaryotic components.

**CLASSIFICATION OF CELL**  
Cells are classified based on the presence of a nucleus. Prokaryotic cells are simpler than eukaryotic cells. Eukaryotic cells are more complex than prokaryotic cells. Prokaryotes are composed of a single cell. Eukaryotes are composed of many cells. The study of cells is called cytology. The study of the structure and function of cells is called cell biology.

**CHAPTER 02 Cell structures and functions**

This chapter examines the importance of cells as the basic units of life on Earth. You will compare the different cellular structures of prokaryotic and eukaryotic cells by investigating various cell types and their organelles and cell structures. Considering these components of plant and animal cells will enable you to determine the function of specific cells. A range of techniques used to examine and understand cell structures and functions, such as the electron microscope and synchrotron, will also be explored.

**Learning intentions:**

- To understand how prokaryotic and eukaryotic cellular structures compare and relate to function 2.1.
- To understand structural and functional differences between plant and animal cells 2.2.
- To understand how microscopy developments have advanced knowledge of cell structure and function 2.3.
- To be able to prepare a real resource and identify the organelles, cell wall and nucleus 2.4.
- To be able to calculate the size of specialised cells using a micrograph and field of view equation 2.4.2.

**Worked examples** break complex concepts into manageable steps, helping students build understanding before applying their learning in practice and exam-style questions.

### Worked example 2.3.1

#### CALCULATING CELL SIZE

You set up a microscope with an ocular lens magnification of 10x and an objective lens magnification of 40x. Looking down the microscope, you see the field of view in Figure 2.3.3.

**a Calculate the total magnification and identify the diameter of the field of view.**

Thinking	Working
Identify the ocular lens magnification.	Ocular lens magnification = 10x
Identify the objective lens magnification.	Objective lens magnification = 40x
Calculate the total magnification = ocular lens magnification x objective lens magnification.	Total magnification = 10 x 40 = 400x
Identify the diameter of the field of view.	450 μm refer to table 2.3.1 on previous page.

**b Calculate the length of the cells.**

Thinking	Working
Identify how many cells span the field of view.	3
Calculate the length of each cell: field of view (μm) ÷ number of cells	450 μm ÷ 3 cells = 150 μm (length of each cell)

#### Worked example: Try yourself 2.3.1

#### CALCULATING CELL SIZE

You set up a microscope with an ocular lens magnification of 10x and an objective lens magnification of 10x. Looking down the microscope, you count 11 cells across the field of view.

**a Calculate the total magnification and identify the diameter of the field of view.**

**b Calculate the length of the cells.**

## BIOFILE

Both plant and animal cells are eukaryotes, meaning they have a nucleus, mitochondria, endoplasmic reticulum, Golgi body and ribosomes. Can a plant sit down to eat a meal, or an animal use sunlight to build glucose? The answer, of course, is no. There are structural differences within each type of cell because of the differences in the cells' functions.

Among their differences, plant cells have chloroplasts for photosynthesis, and a large central vacuole that maintains turgor and is used for storage (Figure 2.2.3). While plants cannot eat a meal because they have no digestive system, they do build glucose in photosynthesis, for use in the energy making process, cellular respiration.

Animal cells lack chloroplasts. They have a digestive system that enables them to eat a meal and process the nutrients. Glucose from digestion is then used in the energy making process, cellular respiration, so animal cells do not need chloroplasts for photosynthesis.

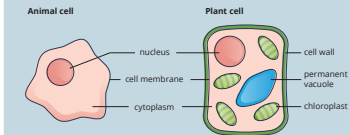


FIGURE 2.2.3 Structures in plant cells that are different to animal cells.

**Applied examples** encourage students to connect scientific concepts to the real-world, building relevance and curiosity while supporting deeper understanding.

**Learning intentions and success criteria** clearly show students what they are learning, why it matters and how success is measured, with topics sequenced to meet NSW syllabus requirements.

## FOCUS AREA 1 • REVIEW

### REVIEW QUESTIONS

#### Cells as the basis of life

#### Multiple choice (1 mark each)

- Which of the following is an example of a eukaryotic cell?
  - A fungal cell
  - B bacterium
  - C enzyme
  - D virus
- Which of the following features distinguishes archaea from bacteria?
  - A the structure of lipids in the cell membrane
  - B the presence of a nucleus
  - C the presence of membrane-bound organelles
  - D the presence of a cell wall
- Which of the following would not be visible using a light microscope?
  - A nucleus
  - B chloroplast
  - C vacuole
  - D ribosome
- Which of the following lists contains organelles that are found in both animal and plant cells?
  - A mitochondria, nucleolus and chloroplasts
  - B mitochondria, Golgi apparatus and chloroplasts
  - C mitochondria, Golgi apparatus and nuclei
  - D ribosomes, chloroplasts and nuclei
- The image below shows *Staphylococcus aureus* cells (a bacteria species known as golden staph) being engulfed by a white blood cell. The round bacterial cells (cocci) are coloured orange in this image to represent their actual colour. Identify the type of microscope that was used to produce this image.
  - A confocal microscope used laser light sections to produce a 3D image.
  - B A scanning electron microscope (SEM) was used to look at surface features of whole cell specimens.
  - C A transmission electron microscope (TEM) was used to look at a thin section at very high resolution.
  - D A light microscope and computer program were used to create a fluorescent light micrograph (FLM).
- The length of the observing and draws an amoeba to scale. The length of the amoeba is 100 μm. What is the magnification of the drawing?
  - A ×0.001
  - B ×1
  - C ×100
  - D ×1000
- Identify organelle A in the electron micrograph below. The view on the right shows the organelle at a higher magnification.
  - A mitochondrion
  - B rough endoplasmic reticulum
  - C nucleus
  - D chloroplast

**Review and practice** sections provide differentiated questions, alongside exam-style focus area questions to deepen understanding and higher-order thinking.

# We've kept what you said works and strengthened what matters most:

**Clear structure from first lesson to final assessment:** A clear learning sequence, so teachers always know what comes next and how each lesson aligns to the syllabus. Lessons prioritise understanding before moving into practice and application.

**Built for explicit teaching:** Our approach simplifies complex concepts into manageable, intuitive building blocks, setting learners up for confident, rigorous application.

**Understanding before exam practice:** Students build knowledge and skills before tackling exam-style questions. Assessment preparation is introduced gradually, helping students develop confidence without unnecessary pressure.

**Designed for real NSW classrooms:** Developed with Prime Minister's Prize-winning educator Matt Dodds and expert NSW teachers, this series provides a trusted, ready-to-use foundation that reduces planning time and empowers confident teaching.

**Chapter 1 Online prior knowledge assessment**

Classify the characteristics of different microscopes.

Characteristics	Light microscope	Stereo microscope	Electron microscope
Types of specimen			

magnification up to 1000 times  
  magnification up to 100 times  
  2D image  
  3D image  
 chromosomes within a plant cell  
  light passes through the specimen  
  uses beams of electrons  
  hair strand  
 image is black and white  
  provides view of the surface  
  very thin blood smear  
  magnification up to one million times  
 eye dissection  
  sliced cross-section of a leaf

**Chapter 2 Online prior knowledge assessment**

Question view

Students	Score	1	2	3	4	5
Sarah-Jane	20%					
Ashley	20%					
Michael	60%					
Sarah	100%					
Dorian	40%					
Marin	100%					

**Digital assessments** within the eBook with clear reporting give teachers insight into student progress, supporting informed teaching decisions without adding to workload.

**Write-in workbooks** include scaffolded practicals, depth study guidance, concept summaries and exam-style questions to support revision, practice, application and exam preparation.

**AI Study Tool**

Do you want me to explain a key topic from this page?

Explain the function of cells

Why are cells classified into domains?

What are prokaryotic cells?

Or try one of these common requests:

Summarize Practice Explain

Type a message

New topic Send

**2.1 Comparing prokaryotic and eukaryotic cells**

**CLASSIFICATION OF CELLS**

Prokaryotes are simple in structure and lack a nucleus. They are found in all domains of life. Eukaryotes are more complex and have a nucleus. They are found in the domains of Eukarya and Archaea.

**AI study tools** support independent practice and revision within the eBook, offering instant feedback and explanations from safe curriculum-aligned Pearson content.

**FOCUS AREA 1 • EXAM-STYLE QUESTIONS**

**Multiple choice (1 mark each)**

1. In a 100m race at the school swimming sports, Kent completes four laps of the 25 metre pool in 72 minutes. Which of the following statements about the magnitude of his speed and velocity is correct?

**Question 4 (2 marks)**

A sports car takes 6 s to accelerate uniformly from rest to a speed of 20 m s<sup>-1</sup>. It then maintains this velocity for 14 s before decelerating uniformly to a stop in a distance of 100 m.

**Practical Activity 1.3**

**Newton's second law, part 2**

**INTRODUCTION**

According to Newton's second law,  $F = ma$ . If a force  $F$  is applied to an object of mass  $m$ , the object will accelerate with acceleration  $a$ . In this experiment, you will investigate how the net force acting on a trolley affects its acceleration.

**METHOD**

- Level the track by adjusting the leveling feet until a trolley placed on the track does not move (if any leveling feet are unlevelled, it should be leveling).
- Use the balance to find the mass of the trolley and record the value in the space provided under 'Data and analysis'.
- Attach the pulley to the end of the track as shown in the diagram. Attach a string to the end of the trolley and place the trolley on the track. The mass hanger should be added and the string and mass hanger should be hung over the end of the track. The string should be parallel to the track and the string should be parallel to the track.
- Place the trolley against the end stop of the pulley and the end of the track, and record the final position of the trolley.
- Measure the time  $t$  taken for the trolley to travel from rest to the pulley and position, and repeat at least 3 times. Record these values in the table provided.
- Increase the mass of the trolley and repeat the procedure.

**DIAGRAMS AND IMAGES IN QUESTIONS**

In biology, many questions will use diagrams as part of the stimulus material. Scientific diagrams use specific conventions to represent objects and events. These must be carefully considered before answering the question(s).

**Sample question F**

**Question 26 (3 marks)**

Enzymes are present in the body to catalyse biochemical reactions. The diagram below shows one model of interaction between enzyme and substrate.

**1 Note any conventions used in diagram.** In this case, abbreviations are used: S1 and S2 for the substrate, E for the enzyme and P for the product of the reaction. (These are also emphasised with the use of different colours.) Two-way arrows indicate that the reactions are reversible.

**2 Highlight important information.** Here, the shape of the enzyme changes in step 1. The product is a combination of substrate 1 and substrate 2.

**3 Consider question requirements.** The verb deduce implies that some reasoning is required in the answer.

**Student has referenced the diagram in their answer and added a brief explanation to achieve the second mark.**

**Student has referenced the diagram and briefly explained how they deduced the answer.**

**Building Exam Skills** sections guide students through different question types, with advice and annotations that build assessment-confidence over time.

# A connected print and digital program

All components work together to keep teaching learning and assessment aligned across the course.

## Pearson Senior Science New South Wales 2nd edition

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9780655723905	Student book and eBook + Assessment	\$100.00
9780655724025	eBook + Assessment	\$65.00
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Coming in 2027: Year 12 Biology and Physics; Year 11 and 12 Chemistry.

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### Meet series consultant, Matt Dodds

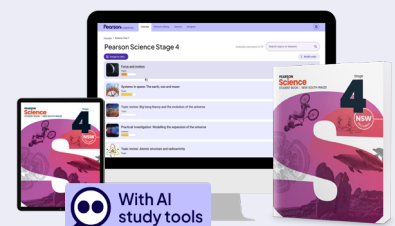
Physics and Biology teacher at Glen Innes High School 2025 Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools.

  @sciencewithmat

**“A well-constructed teacher resource is like having someone in your corner to support you.”**

Working with a trusted author team of leading Australian educators, practising NSW teachers and assessment experts, Matt's insight strengthens the real-world practicality of the resources, ensuring lessons are intuitive to teach, inspire curiosity and support better learning outcomes.

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