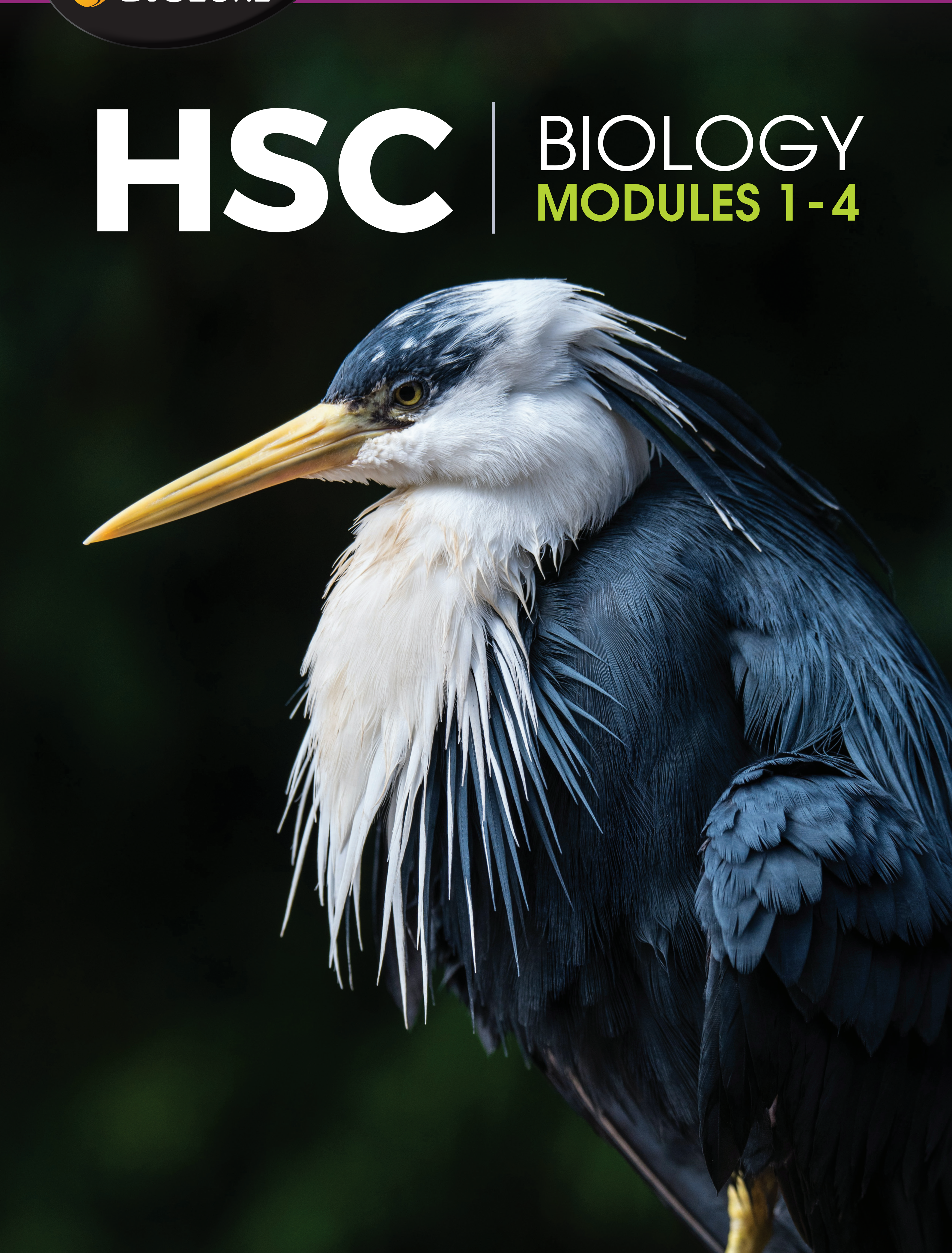
BIOZONE

CLASSROOM GUIDE

HSC | BIOLOGY

MODULES 1-4



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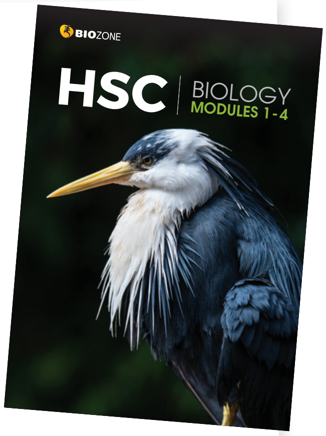

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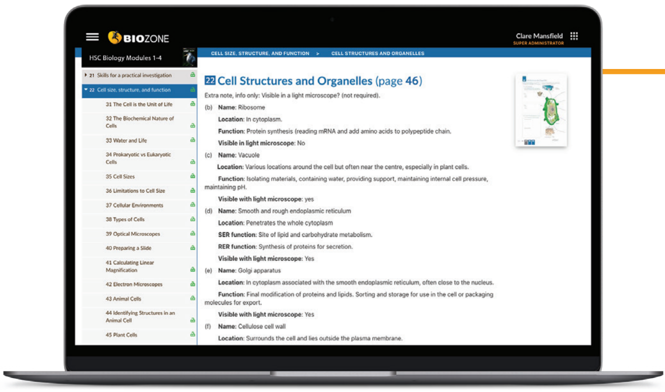
Teacher Support Materials

BIOZONE's *HSC Biology, Modules 1-4* is supported by a suite of resources. These additional resources provide tools to help you teach remotely or in the classroom, provide online answers (which you can share with students for self assessment if you wish), and use interactively to promote class discussion and efficient review. Some features of these supporting resources are described below. Also find out more about the Digital Teacher's Edition on page CG16.



ONLINE MODEL ANSWERS

Online Model Answers provide model answers to each of the activities, including working where appropriate (e.g. calculations).

Online Model Answers are accessible via a login that is unique to your school. Your access as a teacher means you're able to control how much and when students can view individual answers, making it easier for you to support homework and revision. Controlled access to answers promotes deeper understanding and encourages students to be self critical. The online model answers also provide an effective tool to support your students with remote learning.

EBOOK TEACHER EDITION

Our eBooks provide a digital replica of the printed pages for access in or out of the classroom.

The eBook TEACHER'S EDITION has the Classroom Guide and **answers in place** for each activity.

Visit: **biozone.com.au/ebooks** for more information

DIGITAL TEACHER'S EDITION

This teacher's resource features a non-printable PDF Teacher's Edition, with a useful feature allowing you to hide and display the suggested answers. It is ideal for introducing and reviewing activities using an interactive whiteboard. The Digital Teacher's Edition includes an introductory guide to using *HSC Biology, Modules 1-4* in the classroom and online. It is supplied as a direct download.

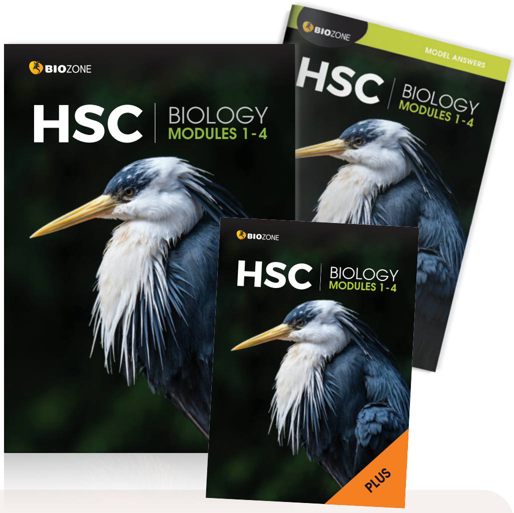
RESOURCE HUB

Be sure to visit **BIOZONE's Resource Hub**, which is fully accessible and free of charge to you and your students. It offers a curated collection of videos, animations, 3D models, and supporting content for the activities in this worktext.

Visit: **www.BIOZONEhub.com** Your code is **HSC11-1-6542**

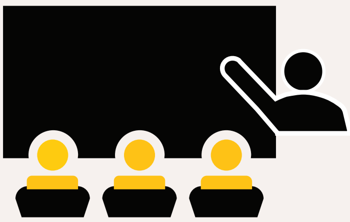
Meeting Key Competencies

We want today's biology students to be self-motivated, lifelong learners, to develop a sound grasp of biological knowledge, to plan and evaluate their work, and to think critically and independently. In developing *HSC Biology*, we have put the aims and structure of the **NSW Biology Stage 6 syllabus** first and foremost. This title fully supports scientific investigation, critical and creative thinking, and individual and collaborative approaches to scientific endeavour. An understanding of ethical behaviours, and acknowledgement of the knowledge and cultures of Aboriginal and Torres Strait Islander peoples, are integral to this title. This guide will highlight some of the strategies BIOZONE has used to meet the aims and scope of the study design.



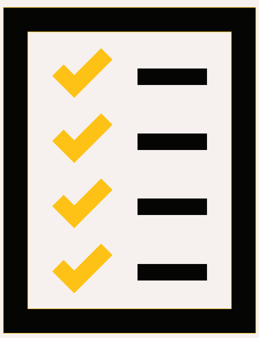
Lesson planning

- The structure of *HSC Biology, Modules 1-4* follows the module structure specified in the **NSW Biology Stage 6 syllabus**. Teachers can be assured that all of the essential components of the syllabus are covered, ensuring easy and efficient lesson planning with no content gaps.
- Use the chapter introductions to assign students work for each lesson.
- Add interest to your lessons by utilising the FREE, curated resources on **BIOZONE's Resource Hub** in your planning. Resources for specific activities are identified on the Resource Hub, saving you time, and extending your range of tools. You can use these to prepare students for upcoming topics, or consolidate understanding after lessons.
- Use the contents pages to help with lesson planning too. A green bullet next to an activity in the contents pages identifies where there is a practical investigation. Incorporate these activities into your schedules.



Teaching

- Teach the content in the order presented in *HSC Biology, Modules 1-4*. This will ensure foundation knowledge is covered before students need to apply the information to more complex topics.
- Have students refer to *Chapter 1: Working Scientifically*, as the need arises, or before attempting an activity that addresses a specific skill (e.g. drawing a line graph). These activities can be assigned as homework, or they can be completed in class.
- Encourage peer-to-peer learning by assigning students into groups of mixed abilities when carrying out group research projects or practical investigations.
- Activities that manipulate data using formulas may be supported by spreadsheets on **BIOZONE's Resource Hub**. You can tailor how you use the spreadsheets and students can analyse the data sets provided (including graphs) to save time.
- Extend students' scientific vocabulary by encouraging them to look up unfamiliar words in the **glossary** (Appendix 1).
- Use the **Digital Teacher's Edition** to introduce an activity and give any direction required. It can be used to review answers in class or on-line quickly and efficiently. Choose when and how you reveal the answers. To promote student discussion, reveal answers only once the students have shared their ideas. Reveal all the answers if you want the students to self mark their own work.

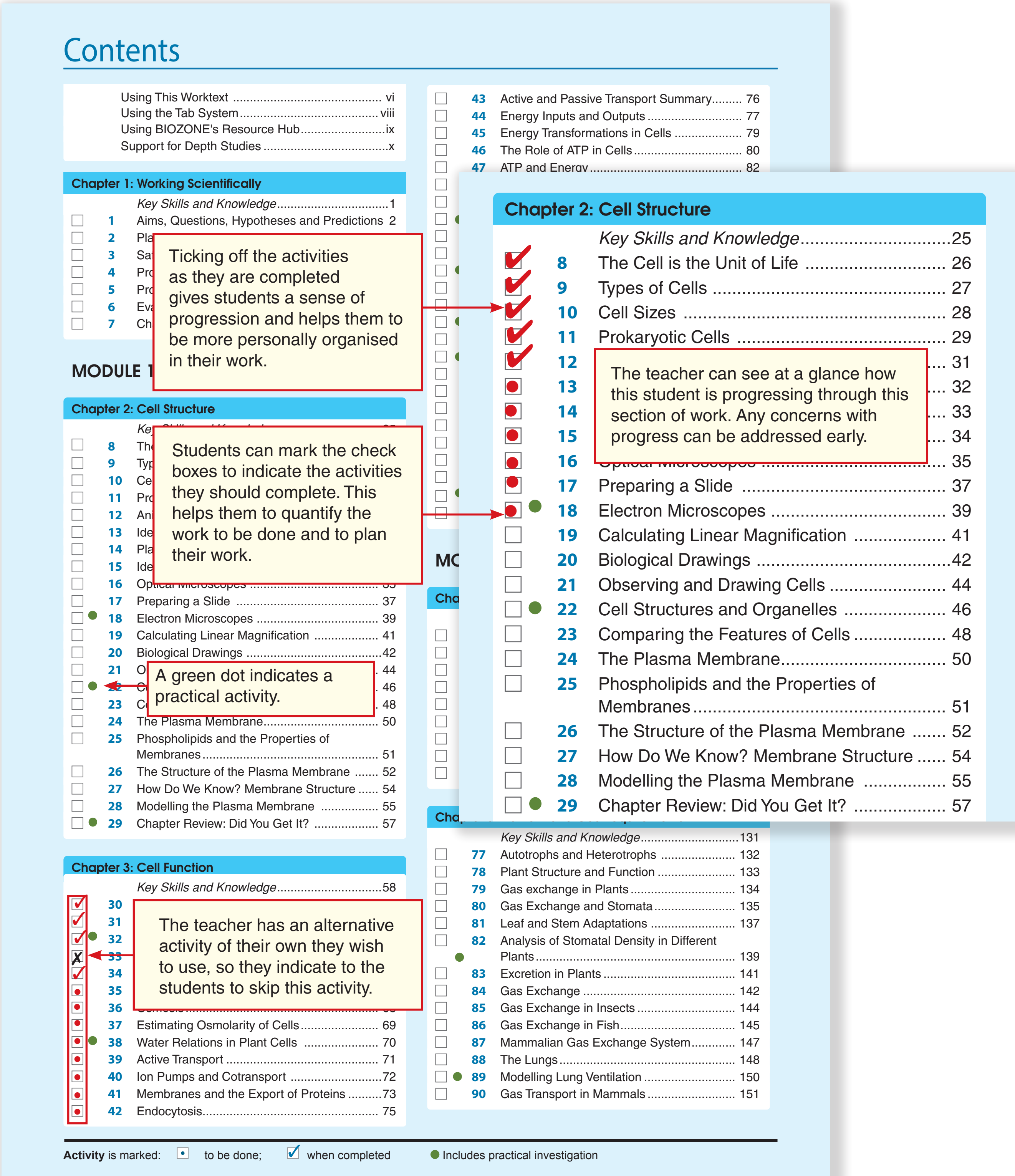


Assessment

- Provide feedback (formative and summative) to students to update them on their progress. This can highlight areas of strength or areas needing work.
- Use formative assessment to identify areas the class needs to revisit before progressing to the next topic or unit. Methods of formative assessment include reviewing student answers on the chapter reviews, observing students carrying out practical work, or evaluating their contribution and understanding in practical work.
- Use the **Synoptic Assessments** at the end of each module to assess student understanding. This could be carried out as a test in class. Alternatively, you can set them as homework or open book assessments if you wish.

The Contents: A Planning Tool

The contents pages are not merely a list of the activities in the book. Encourage your students to use them as a planning tool for their programme of work. Students can identify the activities they need to complete and then tick them off when completed. Teachers can see at a glance how quickly the student is progressing through the assigned material.



Introducing the Content

Each chapter in *HSC Biology Modules 1-4* is prefaced with a one page introduction, providing students with an overview of the chapter content and organisation. Each of the numbered learning outcomes pertains to a point of key knowledge or a skill, and is matched to one or more activities. A list of key terms for the chapter is also included. The comprehensive, but accessible, list of learning outcomes encourages students to approach each topic confidently. Familiarity with the scientific terms used in each topic is implicit in this. Encourage your students to use the glossary (Appendix 1) to expand their scientific vocabulary.

For ease of navigation, chapters are numbered sequentially throughout the book.

The chapter title corresponds to the section heading in each module.

The relevant inquiry question for each chapter is clearly stated. Encourage students to keep this in mind as they work through the content, and try to relate their learning back to it.

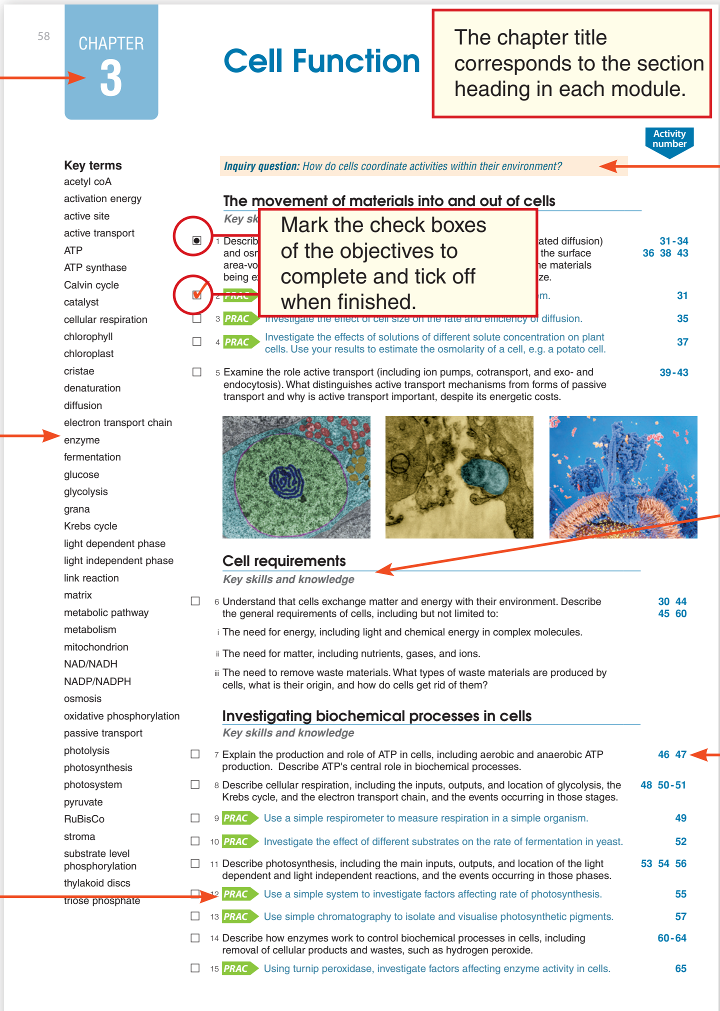
Mark the check boxes of the objectives to complete and tick off when finished.

The list of **key terms** highlights important terms to students. They can look them up in the glossary at the back of the book if they are unsure of what they mean. This encourages use of the correct terms when answering questions and builds scientific literacy.

Key skills and knowledge are drawn from the syllabus. They are purposefully brief, with enough information to provide a framework, but not so much that students are overwhelmed.

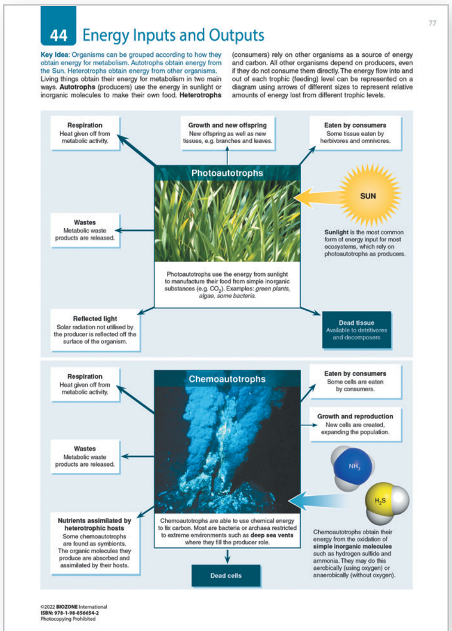
The activities relating to these key knowledge outcomes.

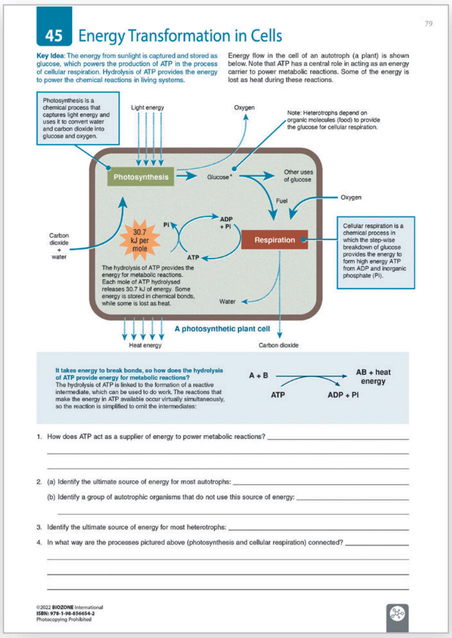
Activities that cover practical skills are identified with a green bookmark and blue text.

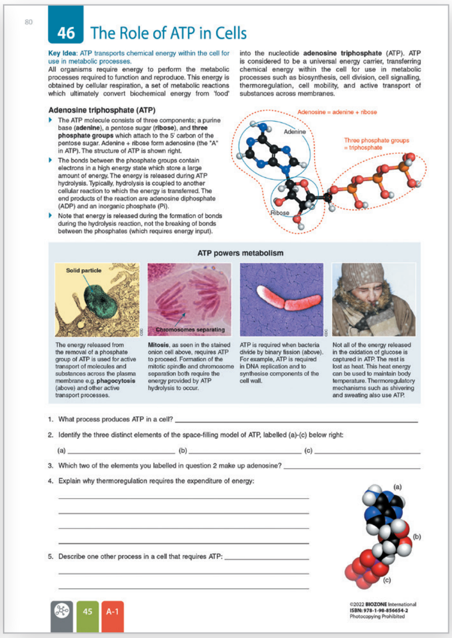


Introduce the concept with a grounding activity

Follow with activities exploring that concept

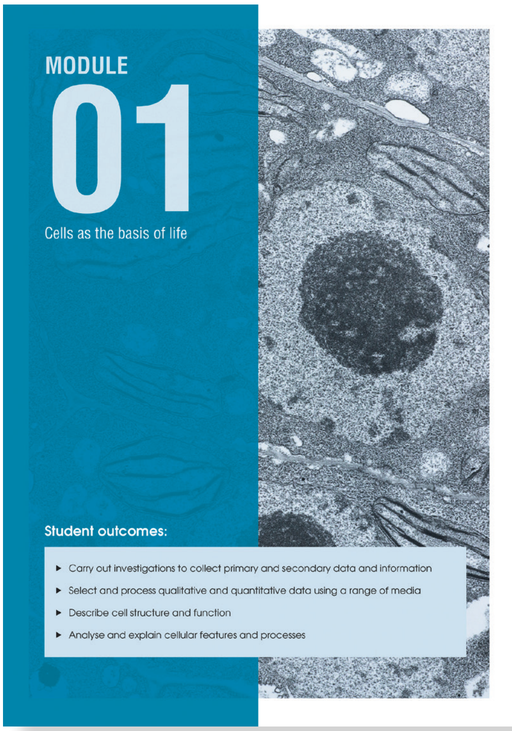


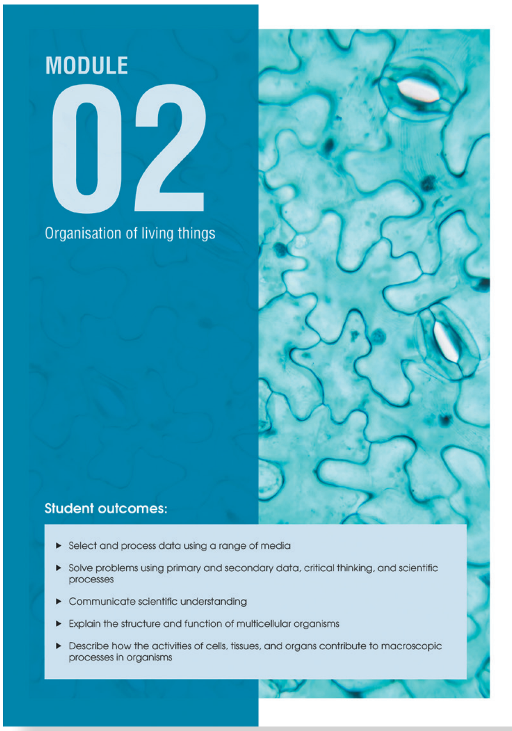


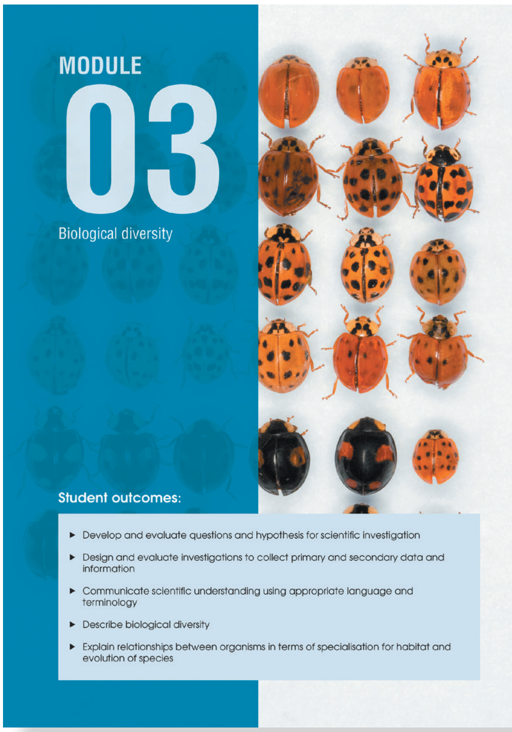


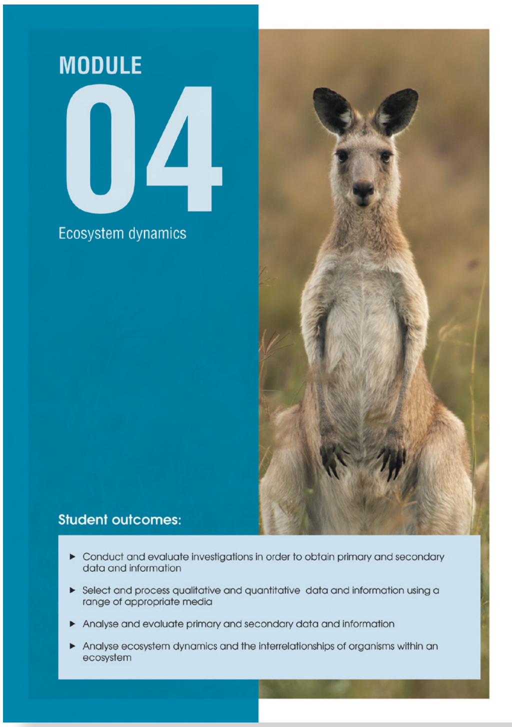
Finding Your Way Around

The content of the *HSC Biology Modules 1-4* is organised into 14 chapters, numbered sequentially and nested within their module (below). Each chapter begins with an introduction and most conclude with a student's self-test of understanding and vocabulary. Inviting, concept-based activities make up the bulk of each chapter, with each activity focussing on the student developing an understanding of a concept, applying that understanding to another scenario, and/or developing an essential skill, such as graphing or data analysis. The tabs for each activity identify the nature of the activity, and identify related material and external supporting resources. These features are explained further on the opposite page.









The module breaks divide the book into four sections covering related material. This structure provides students with a clear indication of where they are in the course. Each unit break summarises the student outcomes covered in each module, so students have a clear idea of what is coming up.

198 Analysing Evidence for Ecosystem Change

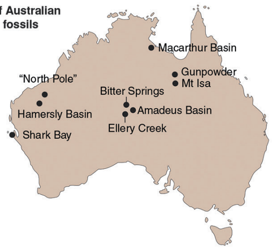
Key Idea: Palaeontological and geological data provides importance evidence of past environmental changes.

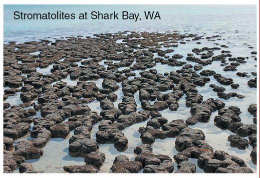
Evidence for past biological and environmental change comes from many sources. Some may be relatively simple to see e.g. different coloured layers in a rock profile (st... Others may require much more in-depth research knowledge to apply, such as analysing gases trapped in ice cores, or radiometrically dating a rock sample.

Comparing living organisms with fossils

- Fossils can provide valuable information about the organisms present and their past environment. The fossils can be compared to similar organisms alive today to give us clues about the past environment. For example, stromatolites are layered rocky structures formed in shallow water by the accumulation of sediment by microbial mats (particularly cyanobacteria). Stromatolites are found today at Shark Bay in Western Australia in shallow highly saline water. Stromatolite fossils have been found in many places around Australia indicating warm shallow seas were present over the early Australian continent. Stromatolites have been dated to 3.5 billion years old.

Locations of Australian stromatolite fossils

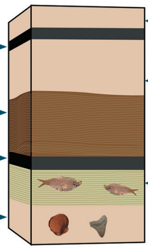




- Cyanobacteria flourished in shallow waters throughout the world until ~1 bya after which their abundance and diversity declined. They were among the first bacteria to split water to produce oxygen during photosynthesis. The newly abundant oxygen reacted with iron ions dissolved in the seawater to form iron oxides that formed sediments on the sea floor producing **banded iron** formations. These are mostly dated between 2.4 and 1.9 billion years old and provide evidence for the rise in Earth's oxygen concentration called the Great Oxidation Event.

Interpreting rock strata

- We have already seen that fossils provide evidence of change over time. Relatively simple fossils are found in deeper rock layers, whereas shallower layers have more complex fossils. While fossils can tell us much about the life and environment at certain times, the rock layers themselves can provide information about the environment. The composition of the rock strata hold clues that can be interpreted to provide information about past environments. The rock strata below illustrate how strata might change over time in a coastal area.



Sedimentary strata, New South Wales

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...allow seas must have covered much of Australia in the distant past? ____________

...ation Event using an internet or literature search. Write a short paragraph on what caused it

...he history of the area around the strata shown at the bottom of the previous page. Justify your ...e in the rocks:

1260.48	33728	456.60
1286.47	35417	467.63
1337.80	38258	488.11
1365.07	39433	423.15
1403.97	41378	443.35
1489.88	46719	469.20
1601.65	53264	491.10
1680.64	58176	538.28
1760.37	63448	468.08
1860.22	71706	470.32
1949.26	78706	480.43
2065.88	89241	493.35

European Project for Ice Coring in Antarctica

ISBN: 978-1-98-856654-2

198 Analysing Evidence fo...

Key Idea: Palaeontological and geological data provides importance evidence of past environmental changes. Evidence for past biological and environmental change comes from many sources. Some may be relatively simple

The **key idea** provides a focus for each activity. It summarises the focus of the activity and provides a clear take-home message for the student.

Annotated diagrams, sometimes including photo panels, explain the content of the page, providing the information necessary to complete the activity.

A **colour-coded tab system** identifies:

- When an activity is supported with content on **BIOZONE's Resource Hub**
- The general capabilities covered within the activity
- The cross-curriculum priorities covered within the activity
- Other syllabus learning areas covered within the activity
- Related content
- Where referral to the relevant appendices is required (glossary term or equipment list)

For a full description of the tabs see page viii of the Student Edition.

Understanding of content is tested through questions, data handling, analysis, prediction, or summary. Students are often required to apply their understanding to a new scenario or make connections to related content. Students must interact with the information on the page in order to complete the activity. It is this interaction that provides the valuable learning experience, reinforcing and explaining the key idea. Students are frequently asked to work in small groups to discuss ideas and formulate responses.

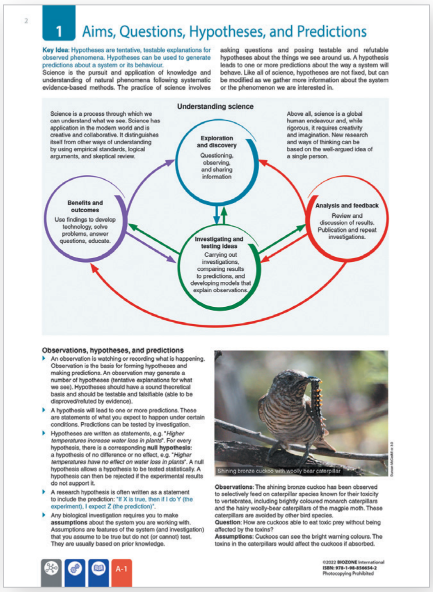
Support for Science Skills and Practical Investigations

The *Working Scientifically Skills* are well supported throughout the worktext. Chapter 1 provides students with a refresher on general science skills they will find useful during their science studies. Throughout the HSC Biology course students practise these skills by applying them in practical situations (opposite). As students work through the content, there are many opportunities for them to develop skills in science practices and apply them within the context of an activity. Regular practise helps students become proficient in using these skills when they encounter them in their assessments.

Working Scientifically: Checklist

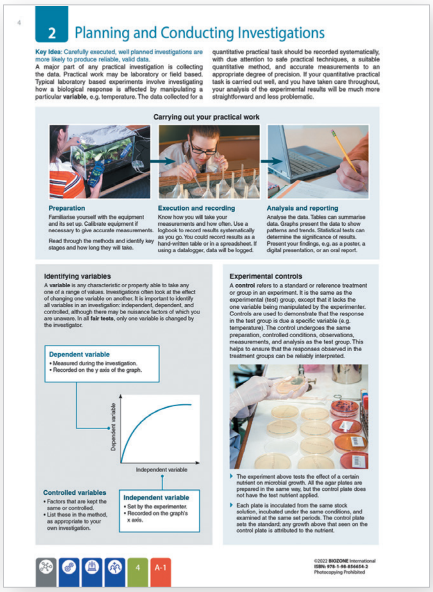
The Chapter 1 introduction provides an overview of the Working Scientifically Skills required in HSC Biology. This checklist will help students ensure they understand the skill requirements.

Aims, questions, hypotheses and predictions



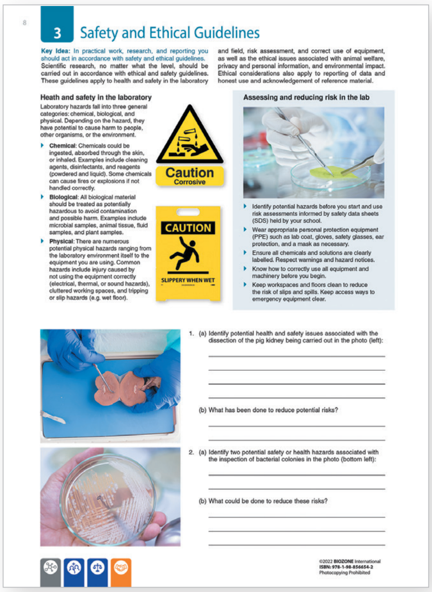
This activity helps students to identify and construct aims and questions for the investigation, formulate hypotheses, and make predictions.

Plan and conduct investigations



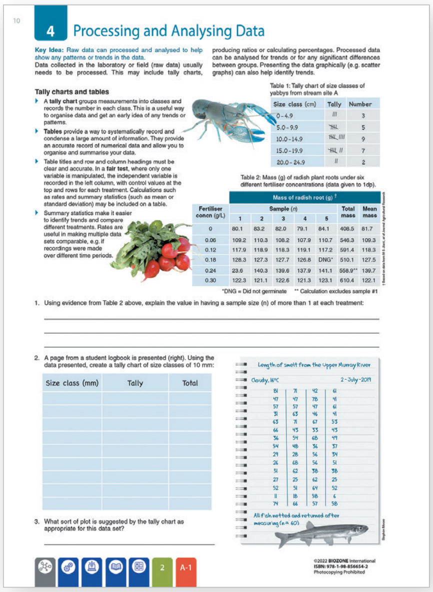
This activity focusses on how to plan and conduct investigations. Information includes selecting equipment, identifying variables, and recording data.

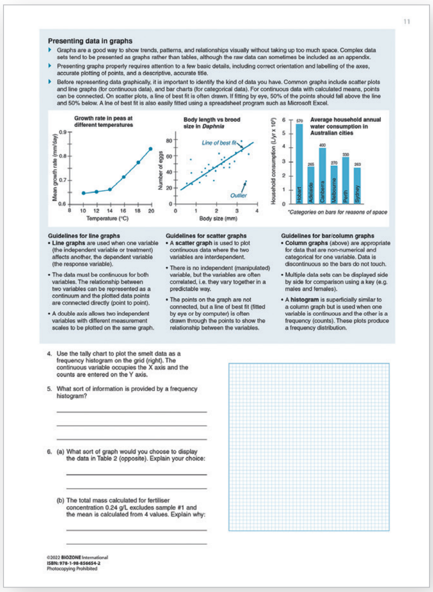
Comply with safety & ethical guidelines



This activity covers basic considerations for ethical science practices, including risk assessment and the importance of honest reporting.

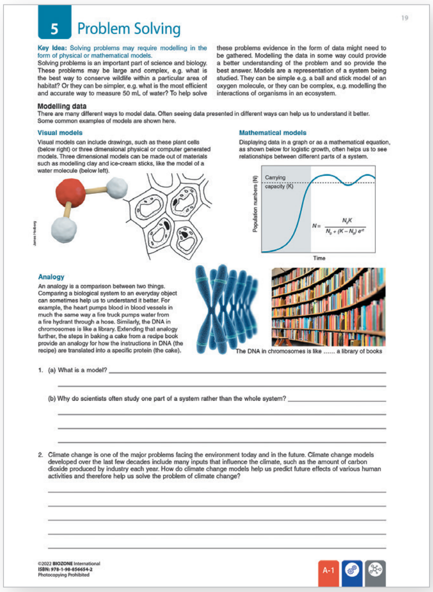
Processing and analysing data





This longer activity covers commonly used data transformation methods students may be asked to carry out during HSC Biology. Information includes how to calculate rates, percentages, ratios, fractions, percentage change, and descriptions of central tendency (mean, median, and mode). Students learn about the reliability of their data, and how to test the reliability of the data themselves using some basic statistical analysis (standard deviation and 95% confidence interval). The value of presenting data in graphs and tables to summarise and identify trends is also covered.

Problem solving

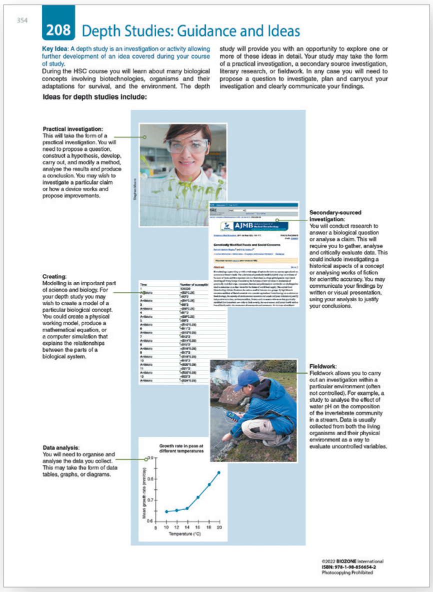


Breaking problems down into smaller components and tackling the more manageable pieces can be a useful strategy for solving complex problems. Models and representations can be used to visualise a problem and help solve problems and predict outcomes.

Evaluating and communicating scientific ideas

This skill requires students to think critically and communicate information to an audience in an appropriate way. Students are introduced to the basic principles here, and have the opportunity to implement them throughout the course and also in their depth study.

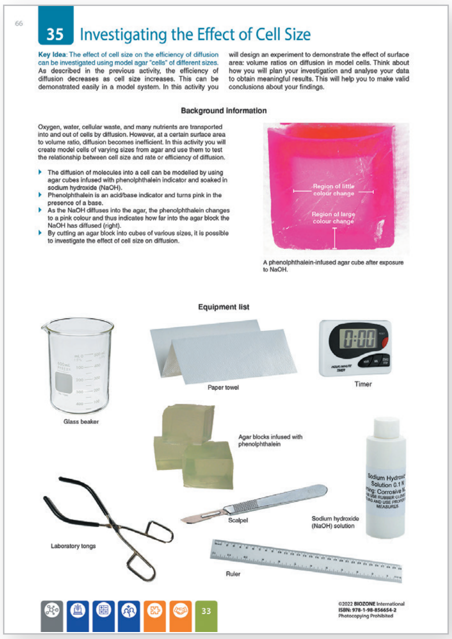
Chapter 14: Depth Studies: Guidance and Ideas



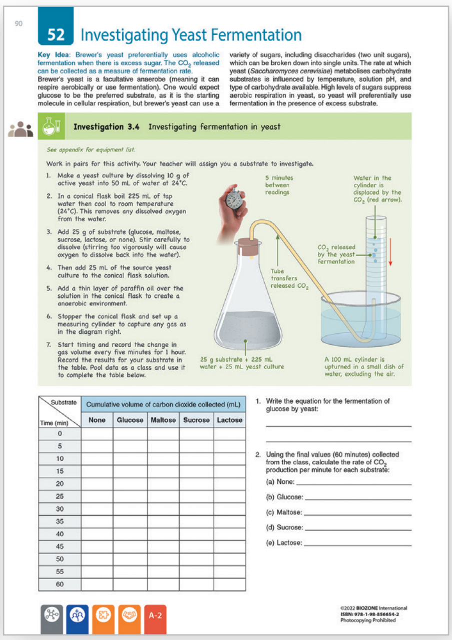
Chapter 14 is dedicated to helping students plan and carry out their depth study. Encourage students to refer to it often as they plan, execute, and report their findings for their chosen topic.

Practical Investigations and activities in Context

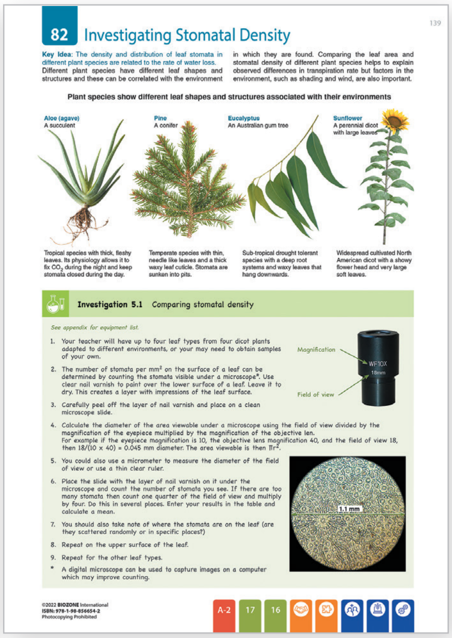
Practical investigations and hands on activities appear in context throughout the book. The practical investigations provide opportunities for students to develop many of their essential science skills. Working in groups promotes collaboration and the development of communication skills. Stronger students can mentor and support those who are less confident, providing benefit for both sets of students. A list of equipment for each investigation is provided in Appendix 2



Some "practical" activities are not investigations in the true sense, but give students a place to develop their skills in planning and designing an experiment.



Almost all investigations require students to use a number of science skills. They encourage collaboration, problem solving and attention to detail, as well as the analysis and evaluation of data.



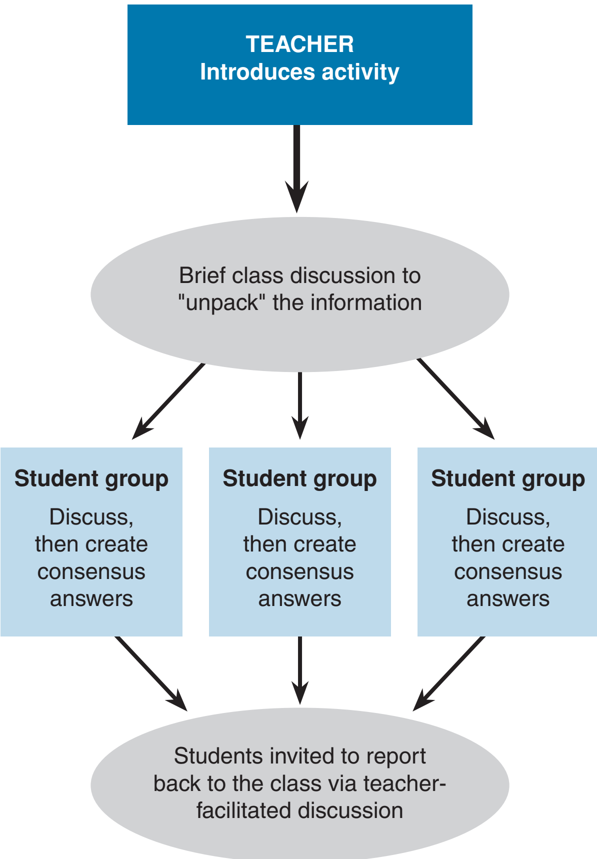
The practical investigations may involve setting up and carrying out an experiment (above), or could involve a paper practical or modelling activity (e.g. making a model of the plasma membrane).

Teaching Strategies for Classroom Use

Achieving effective differentiated instruction in classes is a teaching challenge. Students naturally have mixed abilities, varying backgrounds in the subject, and different language skills. Used effectively, BIOZONE's student books and supporting resources can make teaching a mixed ability class easier. Here, we suggest some approaches for differentiated instruction.

MAKING A START

Regardless of which activity you might be attempting in class, a short introduction to the task by the teacher is a useful orientation for all students. For collaborative work, the teacher can then divide the class into appropriate groups, each with a balance of able and less able students. Depending on the activity, the class may regroup at the end of the lesson for discussion.



Using collaboration to maximise learning outcomes

- The structure of *HSC Biology Modules 1-4* allows for a flexible approach to unpacking the content with your students.
- The content can be delivered in a way to support collaboration, where students work in small groups to share ideas and information to answer and gain a better understanding of a topic, or design a solution to a problem.
- By working together to ask questions and evaluate each other's ideas, students maximise their own and each other's learning opportunities. They are exposed to ideas and perspectives they may not have come up with on their own.
- Collaboration, listening to others, and voicing their own ideas is valuable for supporting English language learners and developing their English and scientific vocabularies.
- Use a short, informal collaborative learning session to get students to exchange ideas about the answer to a question. Alternatively, collaboration may take a more formal role that lasts for a longer period of time (e.g. assign groups to work together for a practical activity, to research an extension question, or design a solution to a problem).

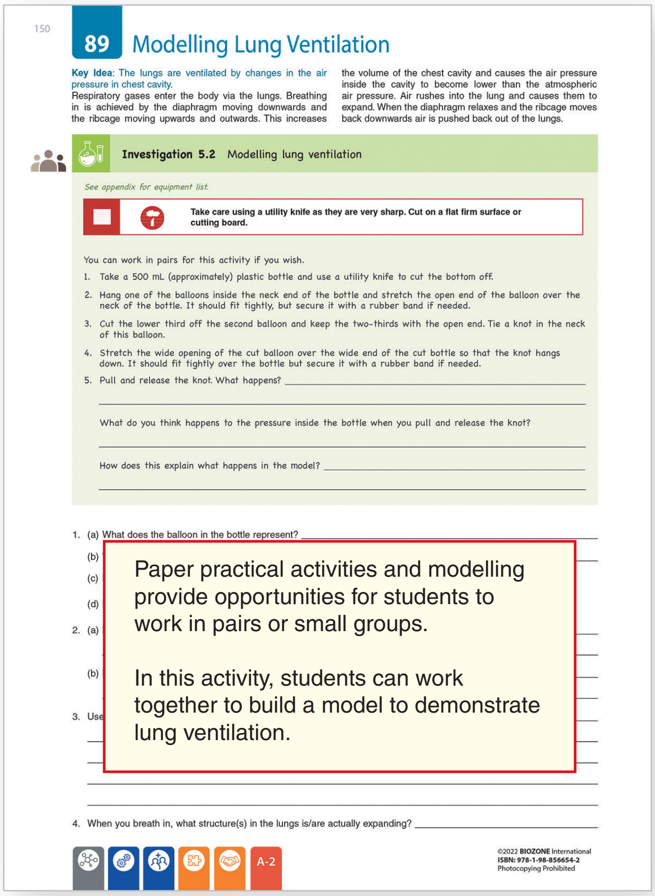
The teacher introduces the topic. They provide structure to the session by providing background information and setting up discussion points and clear objectives. Collaboration is emphasised to encourage participation from the entire group. If necessary, students in a group can be assigned specific tasks.

Students work in small groups so everyone's contribution is heard. They collaborate, share ideas, and engage in discourse. The emphasis is on discussing questions and formulating a consensus answer, not just sharing ideas.

At the end of the session, students report back on their findings. Each student should have enough knowledge to report back on the group's findings. Reporting consists primarily of providing answers to questions, but may involve presenting a report, model, or slide show, or contributing to a debate.

Peer to peer support

- **Peer-to-peer learning** is emphasised throughout the book, and is particularly valuable for more challenging activities in which the content is more complex or the questions require students to draw on several areas of their knowledge to solve a problem.
- **Practical activities, investigations** and **group research projects** are an ideal vehicle for peer-to-peer learning. Students can work together to review and discuss their results, ask and answer questions, and describe phenomena.



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89 Modelling Lung Ventilation

Key Idea: The lungs are ventilated by changes in the air pressure in chest cavity.

Respiratory gases enter the body via the lungs. Breathing in is achieved by the diaphragm moving downwards and the ribcage moving upwards and outwards. This increases the volume of the chest cavity and causes the air pressure inside the cavity to become lower than the atmospheric air pressure. Air rushes into the lung and causes them to expand. When the diaphragm relaxes and the ribcage moves back downwards air is pushed back out of the lungs.

Investigation 5.2 Modelling lung ventilation

See appendix for equipment list.

Take care using a utility knife as they are very sharp. Cut on a flat firm surface or cutting board.

You can work in pairs for this activity if you wish.

1. Take a 500 mL (approximately) plastic bottle and use a utility knife to cut the bottom off.
2. Hang one of the balloons inside the neck end of the bottle and stretch the open end of the balloon over the neck of the bottle. It should fit tightly, but secure it with a rubber band if needed.
3. Cut the lower third off the second balloon and keep the two-thirds with the open end. Tie a knot in the neck of this balloon.
4. Stretch the wide opening of the cut balloon over the wide end of the cut bottle so that the knot hangs down. It should fit tightly over the bottle but secure it with a rubber band if needed.
5. Pull and release the knot. What happens? ______

   What do you think happens to the pressure inside the bottle when you pull and release the knot? ______

   How does this explain what happens in the model? ______

1. (a) What does the balloon in the bottle represent? ______

   (b)

   (c)

   (d)

2. (a)

   (b)

3. Use

4. When you breath in, what structure(s) in the lungs is/are actually expanding? ______

A-2

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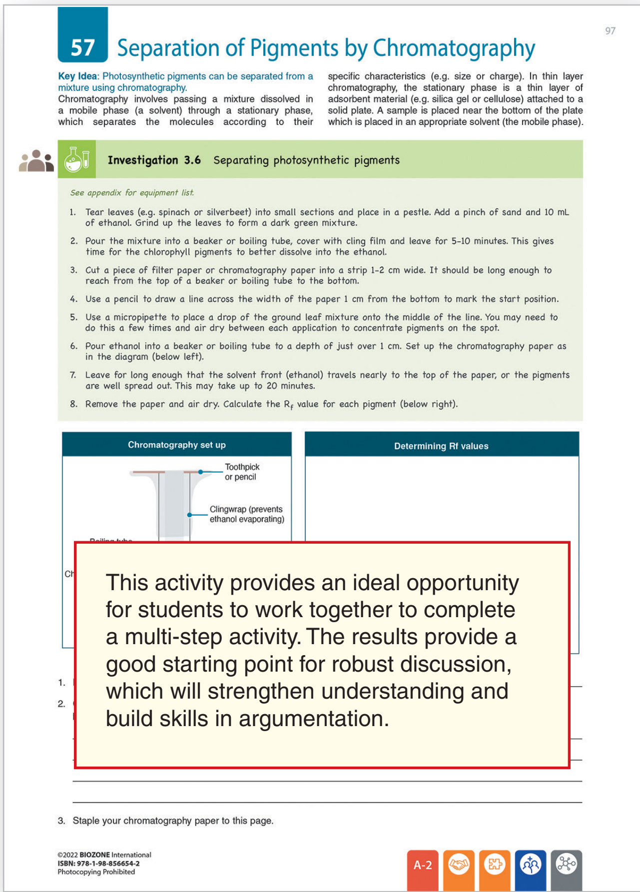
> Paper practical activities and modelling provide opportunities for students to work in pairs or small groups.
>
> In this activity, students can work together to build a model to demonstrate lung ventilation.



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57 Separation of Pigments by Chromatography

Key Idea: Photosynthetic pigments can be separated from a mixture using chromatography.

Chromatography involves passing a mixture dissolved in a mobile phase (a solvent) through a stationary phase, which separates the molecules according to their specific characteristics (e.g. size or charge). In thin layer chromatography, the stationary phase is a thin layer of adsorbent material (e.g. silica gel or cellulose) attached to a solid plate. A sample is placed near the bottom of the plate which is placed in an appropriate solvent (the mobile phase).

Investigation 3.6 Separating photosynthetic pigments

See appendix for equipment list.

1. Tear leaves (e.g. spinach or silverbeet) into small sections and place in a pestle. Add a pinch of sand and 10 mL of ethanol. Grind up the leaves to form a dark green mixture.
2. Pour the mixture into a beaker or boiling tube, cover with cling film and leave for 5-10 minutes. This gives time for the chlorophyll pigments to better dissolve into the ethanol.
3. Cut a piece of filter paper or chromatography paper into a strip 1-2 cm wide. It should be long enough to reach from the top of a beaker or boiling tube to the bottom.
4. Use a pencil to draw a line across the width of the paper 1 cm from the bottom to mark the start position.
5. Use a micropipette to place a drop of the ground leaf mixture onto the middle of the line. You may need to do this a few times and air dry between each application to concentrate pigments on the spot.
6. Pour ethanol into a beaker or boiling tube to a depth of just over 1 cm. Set up the chromatography paper as in the diagram (below left).
7. Leave for long enough that the solvent front (ethanol) travels nearly to the top of the paper, or the pigments are well spread out. This may take up to 20 minutes.
8. Remove the paper and air dry. Calculate the R_f value for each pigment (below right).

1.

2.

3. Staple your chromatography paper to this page.

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A-2

> This activity provides an ideal opportunity for students to work together to complete a multi-step activity. The results provide a good starting point for robust discussion, which will strengthen understanding and build skills in argumentation.

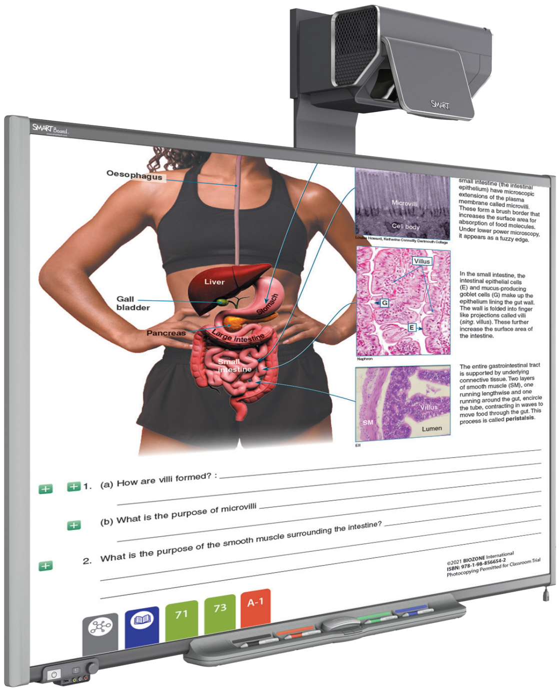
Collaboration and discovery

- BIOZONE's *HSC Biology Modules 1-4* allows for collaboration and discovery. By working together and sharing ideas, students are exposed to different perspectives and levels of knowledge about biological concepts.
- BIOZONE's *HSC Biology Modules 1-4* builds student understanding by providing a range of activities. These include getting students to think about and share what they already know and then build on this knowledge by exploring and explaining phenomena.

Student A is capable. He helps to lead the discussion and records the discussion in a structured way.

Students B and C are also capable but less willing to lead discussion. They will add ideas to the discussion but need a little direction from A to do so.

Student D is less able but gains ideas and understanding from the discussion of students A, B, and C. She may add to the discussion as she gains confidence in the material being studied.



Interactive revision of tasks in class

- The **Digital Teacher's Edition** provides a digital rights managed (DRM) version of the student book as PDF files. It features useful HIDE/SHOW answers, which can be used to review activities in class using a data projector or interactive whiteboard (left).
- Students benefit from the feedback in class, where questions can be addressed, and teachers benefit by having students self-mark their work and receive helpful feedback on their responses.
- This approach is particularly suited to activities with questions requiring a discussion, as students will be able to clarify some aspects of their responses. Stronger students can benefit by contributing to the explanatory feedback and class discussion.

Support for the Depth Study

The depth study is an important and exciting component of the HSC syllabus for students, allowing them to explore in detail a topic which interests them. However, it can also be overwhelming for them as they decide (with your guidance) which topic area to study and how best to carry out their investigation. While teacher input is very important to ensure students choose a suitable topic which meets all of the assessment requirements, we have provided resources to help students plan and carry out their depth study with confidence.

Chapter 14 is dedicated to helping students with their depth study. The material has been designed to get students thinking about their study and what exactly they will need to do to be successful. Topics include:

Choosing a depth study

- What types of studies, projects, or investigations can be used for a depth study?
- What type of study is most appropriate for the topic the student wants to study?
- What are the differences between a primary practical investigation and a secondary-sourced investigation?

Planning a depth study

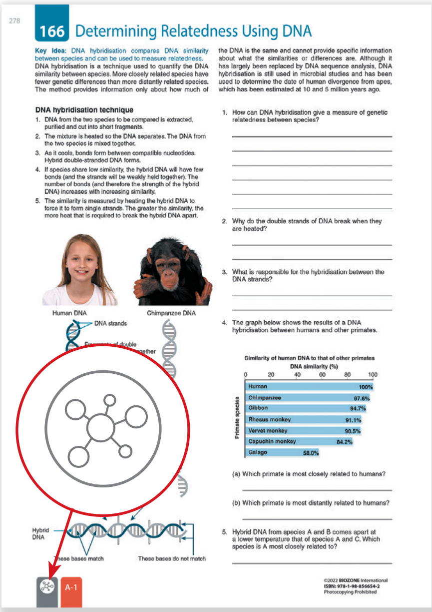
- What does the planning process look like?
- What needs to be considered when planning a depth study?
- What does the student want to find out from their study?
- What type of data should be collected and how will it be analysed?
- What equipment is needed? Is the equipment available?
- Can the study be completed within the time frame?

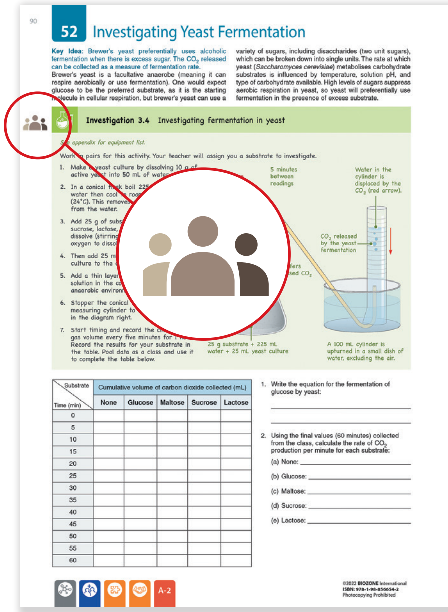
Sharing findings

- What style of communication should be used to share the findings?
- What structure should be used when the student delivers their findings?
- How is the work of others acknowledged?

Differentiated Learning

Tools for differentiated instruction within *HSC Biology Modules 1-4* help teachers to support students all skill levels. BIOZONE's collaborative approach to science inquiry encourages students to share their ideas and knowledge with their peers while reinforcing their own understanding. There are several ways to use *HSC Biology Modules 1-4* in a differentiated classroom:

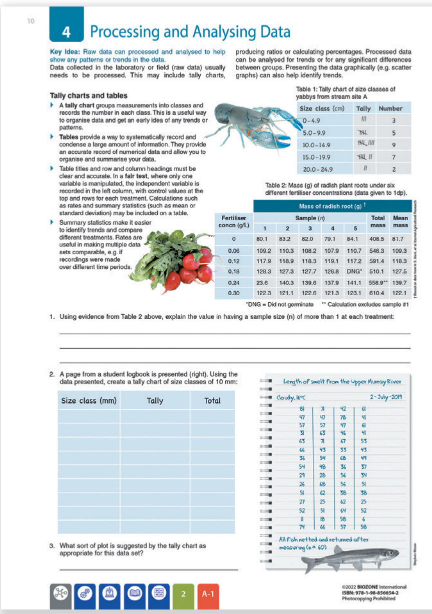


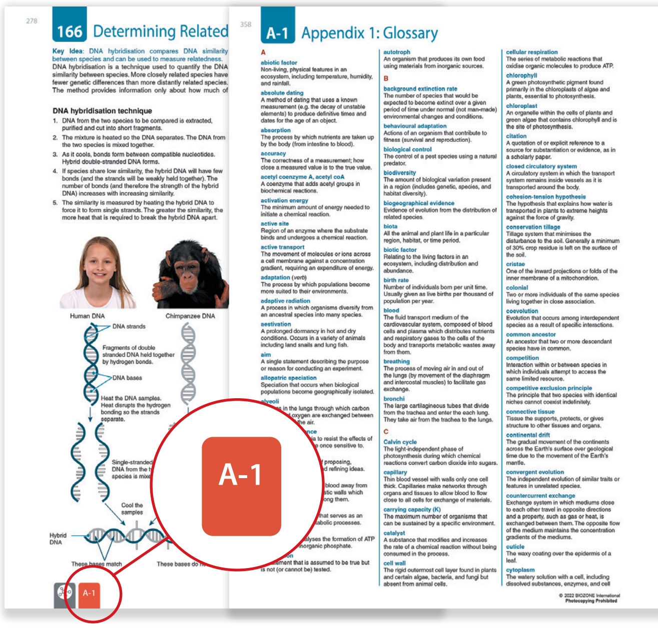


BIOZONE's Resource Hub provides curated content to support the activities in the book. Videos, animations, simulations, and 3D models support students of all abilities, while some resources (interactive spreadsheets, fact sheets, and reference papers) may be used as part of group work or extension.

A grey hub tab at the bottom of the page indicates the activity has online support.

A group symbol indicates where students can work together. Group work provides opportunities for student collaboration and peer-to-peer support to explore the principles and concepts they are engaged with in their course. Working in groups, students can experience the benefits of collaboration in the scientific process of discovery. By speaking and listening, they develop and extend their communication skills and scientific vocabulary.





Students requiring extra support with using the working scientifically skills should be encouraged to refer to Chapter 1 as often as they need to. Building familiarity with these skills will enable students to apply them confidently within the context of the activities.

The list of key terms in the chapter introduction provides students with a list of scientific terms they should be familiar with. Encourage students to refer to the glossary (Appendix 1) when they are unsure about the meaning of a scientific term they are unfamiliar with. A glossary tab at the bottom of a page indicates where a term within the activity has been defined. These strategies build scientific literacy and encourage students to use scientific terms with confidence.

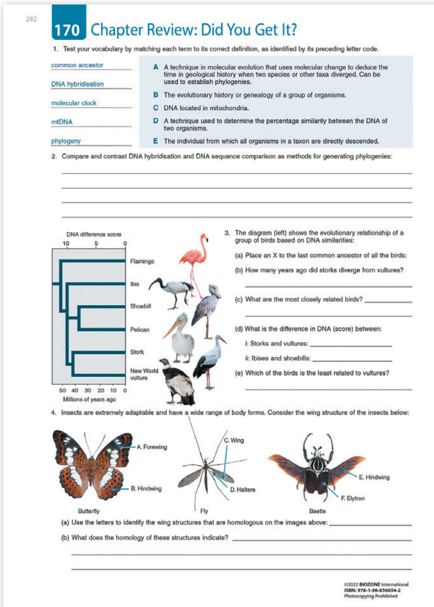
Formative and Summative Assessments

BIOZONE's *HSC Biology Modules 1-4* provides many opportunities to assess your students' progress as they work through the course. The *Contents* check-box list provides a list of activities completed, and the students' own self-tests in the review activities at the end of each chapter provide opportunity to address any misconceptions or lack of understanding. A summary of formative and summative assessments is provided in the tables below. You may also choose to assess practical work as you move through the course.

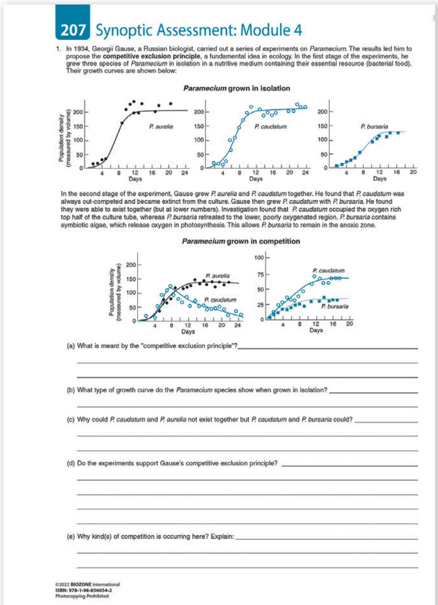
	Module 1: Cells as the Basis of Life	
CHAPTER 1 Working Scientifically No formal assessment required	CHAPTER 2 Cell Structure	CHAPTER 3 Cell Function
FORMATIVE Activity 7. Chapter Review	FORMATIVE Activity 29. Chapter Review	FORMATIVE Activity 66. Chapter Review SUMMATIVE Activity 67. Synoptic Assessment

Module 2: Organisation of Living Things		
CHAPTER 4 Organisation of Cells	CHAPTER 5 Nutrient and Gas Requirements	CHAPTER 6 Transport
FORMATIVE Activity 76. Chapter Review	FORMATIVE Activity 96. Chapter Review	FORMATIVE Activity 115. Chapter Review SUMMATIVE Activity 116. Synoptic Assessment

Module 3: Biological Diversity			
CHAPTER 7 Effects of the Environment on Organisms	CHAPTER 8 Adaptations	CHAPTER 9 Theory of Evolution by Natural Selection	CHAPTER 10 Evolution - The Evidence
FORMATIVE Activity 122. Chapter Review	FORMATIVE Activity 133. Chapter Review	FORMATIVE Activity 150. Chapter Review	FORMATIVE Activity 170. Chapter Review SUMMATIVE Activity 141. Synoptic Assessment



Module 4: Ecosystem Dynamics			
CHAPTER 11 Population Dynamics	CHAPTER 12 Past Ecosystems	CHAPTER 13 Future Ecosystems	CHAPTER 14 Depth Studies: Guidance and Ideas
FORMATIVE Activity 197. Chapter Review	FORMATIVE Activity 202. Chapter Review	FORMATIVE Activity 206. Chapter Review SUMMATIVE Activity 207. Synoptic Assessment	Assessed by teacher



Choosing Activities for Home Study

Many of the book's activities are ideal for homework or as vehicles for a quick formative assessment. End of chapter review activities are ideal as homework. They provide a way to review a topic that has recently been completed, while at the same time facilitating consolidation by presenting the material in a slightly different way. The information for review activities can be found within the chapter, although stronger students may not need to refer back to source material to complete the set work. Generally, homework activities should revise completed topics or provide a basic entry-level introduction.

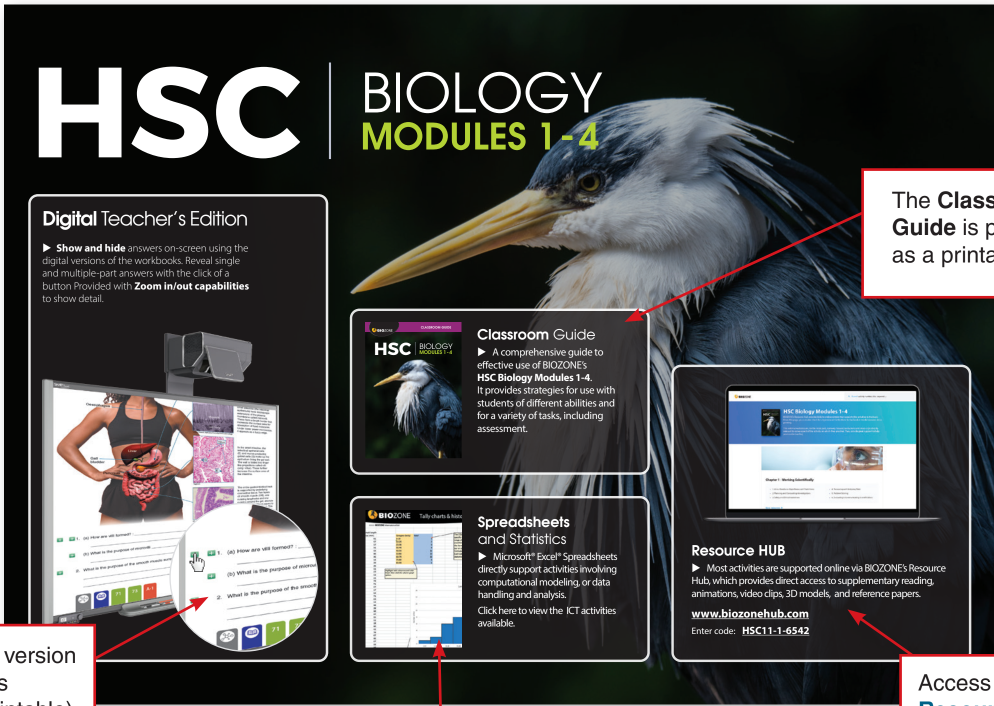
The first few pages of an activity can be useful to set the scene for a chapter. In this activity, students are introduced to the many lines of evidence for evolution. As the progress through the chapter, they analyse specific examples.

Most students will have access to the internet. Sometimes a homework activity might involve the student reviewing the resources on **BIOZONE's Resource Hub** for the next day's activity.

Review activities are ideal as homework because they involve a self-test of the student's own understanding of completed work. In this activity, students apply their understanding of cell function to complete the activity. Such activities allow the teacher to address any misconceptions before formal assessment.

The Digital Teacher's Edition

The *Digital Teacher's Edition* is a DRM product, sold separately, and aimed primarily at extending the pedagogical tools at a teacher's disposal. Many of the features of this resource have been developed in response to requests from teachers.

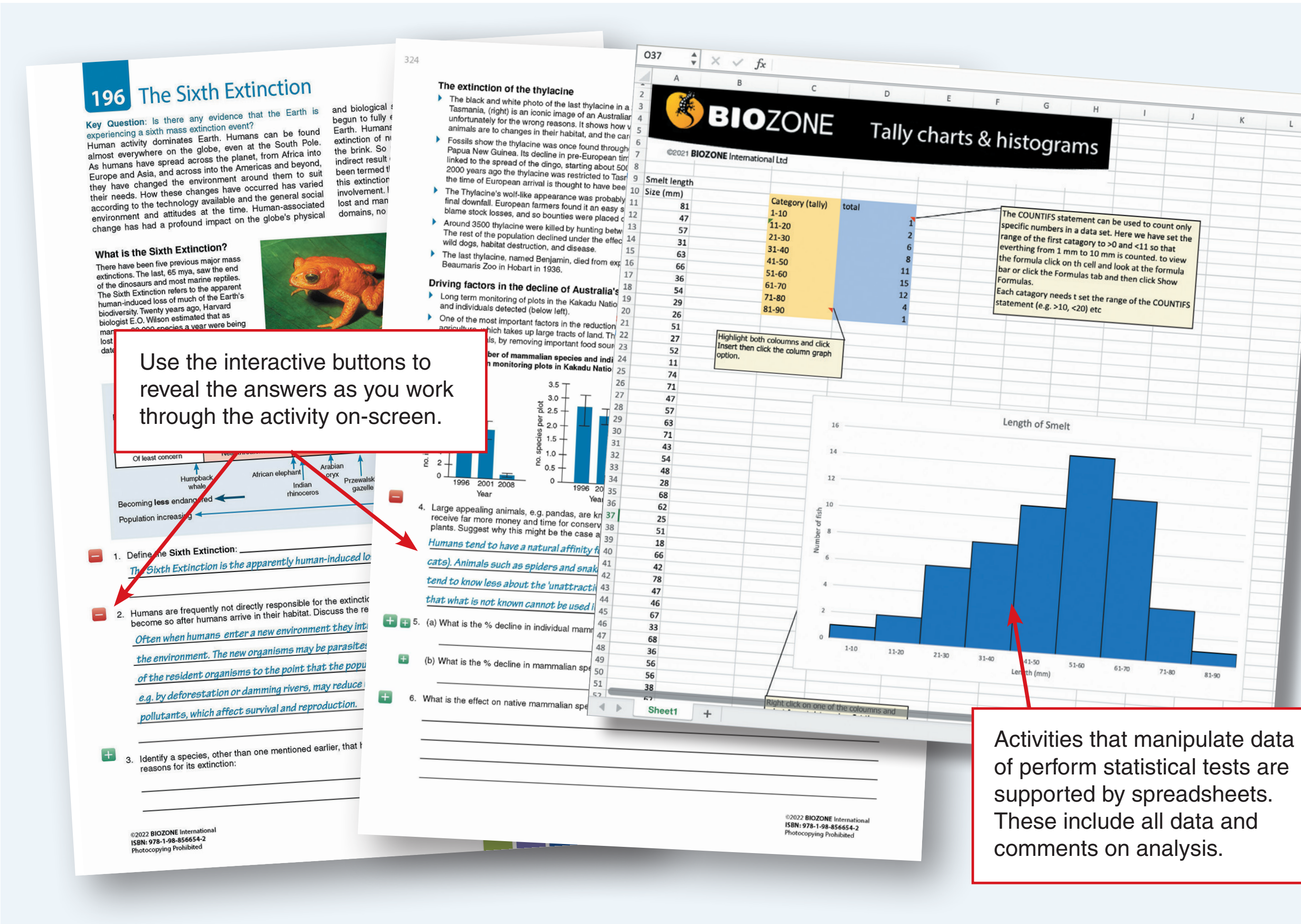


The **Classroom Guide** is provided as a printable PDF.

A digital (PDF) version of the Teacher's Edition (non-printable) is provided. Use the interactive buttons to HIDE or SHOW the answers.

Link to ***Excel***® **spreadsheets** for selected activities with a data analysis or computer modelling component.

Access **BIOZONE's Resource Hub** directly from this link for a range of resources to support the activities.



Use the interactive buttons to reveal the answers as you work through the activity on-screen.

Activities that manipulate data of perform statistical tests are supported by spreadsheets. These include all data and comments on analysis.