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AUSTRALIA & NEW ZEALAND

OXFORD *is* SCIENCE FOR EVERY WESTERN AUSTRALIAN CLASSROOM

- 3 series
- 3 approaches
- 3 ways to achieve



OXFORD *is* SCIENCE

YEAR 7

YEAR 8

OXFORD SCIENCE

Western Australian Curriculum

- Written for the Western Australian Curriculum
- a concept-development approach
- every two-page unit forms a complete lesson with homework
- clear, simple language



AMAZING SCIENCE

- Written for the Australian Curriculum
- a high-engagement approach
- embedded literacy support
- magazine format



oxford big ideas australian curriculum science

- Written for the Australian Curriculum
- an inquiry-based approach
- deep, transferrable understandings and skills
- opportunities for extension



- 3 series
- 3 approaches
- 3 ways to achieve

YEAR 9



YEAR 10



COMPONENTS AT EACH YEAR LEVEL

- Student Book - 248 pages
- obook assess - ebook, interactives, videos, quizzes
- Teacher obook assess - teacher notes, answers, worksheets, EAL support, assessments and tests
- Australian Curriculum edition also available



- Student Book - 176 pages
- obook assess - ebook, interactives, videos, quizzes
- Teacher obook assess - teacher notes, answers, worksheets, EAL support, additional experiments, assessments and tests



- Student Book - 288 pages
- obook assess - ebook, interactives, videos, quizzes
- Workbook - scaffolded homework activities
- Teacher Kit + obook assess - print and digital teacher notes, answers, worksheets, assessments and tests



OXFORD SCIENCE

Oxford Science (Western Australian Curriculum) is a complete science package with a focus on clear and precise concept development – helping you save time and supporting your students to achieve more. Every two-page unit is a neatly packaged lesson containing carefully crafted explanations, stunning visuals, differentiated questions and links to a valuable bank of experiments at the end of the book. See your whole year of teaching in front of you spread by spread, concept by concept. *Oxford Science* brings a new level of instructional elegance to secondary science and is further enhanced by obook assess resources, including worksheets, tests, answers, interactives, videos and teaching plans.

Units are uniquely engineered into double-page spreads: one concept, one spread, one lesson. Learning starts right from the unit heading!

Each unit begins with a carefully crafted summary of the concept.

Spreads are linked to one or more experiments, challenges or skills tasks.

Students explore concepts progressively encouraging incremental learning and, by the end of the chapter, complete understanding.

Chapter-opening concept maps plot the learning pathway for students, unit by unit, concept by concept. Save time by using the unit headings to structure your teaching plan.



Accessible language and appropriately levelled content for differentiated learning provide access points for struggling students and enough depth to keep advanced students going.

Check your learning questions allow students to consolidate their understanding. Bloom's taxonomy is used to differentiate questions and homework tasks are available on every spread.

Every chapter begins with a 'What if?' feature that encourages student-directed questioning and inquiry. As the series progresses, students discover that their own 'What if...?' questions are actually testable hypotheses.



Save time and achieve more – one concept, one spread, one lesson

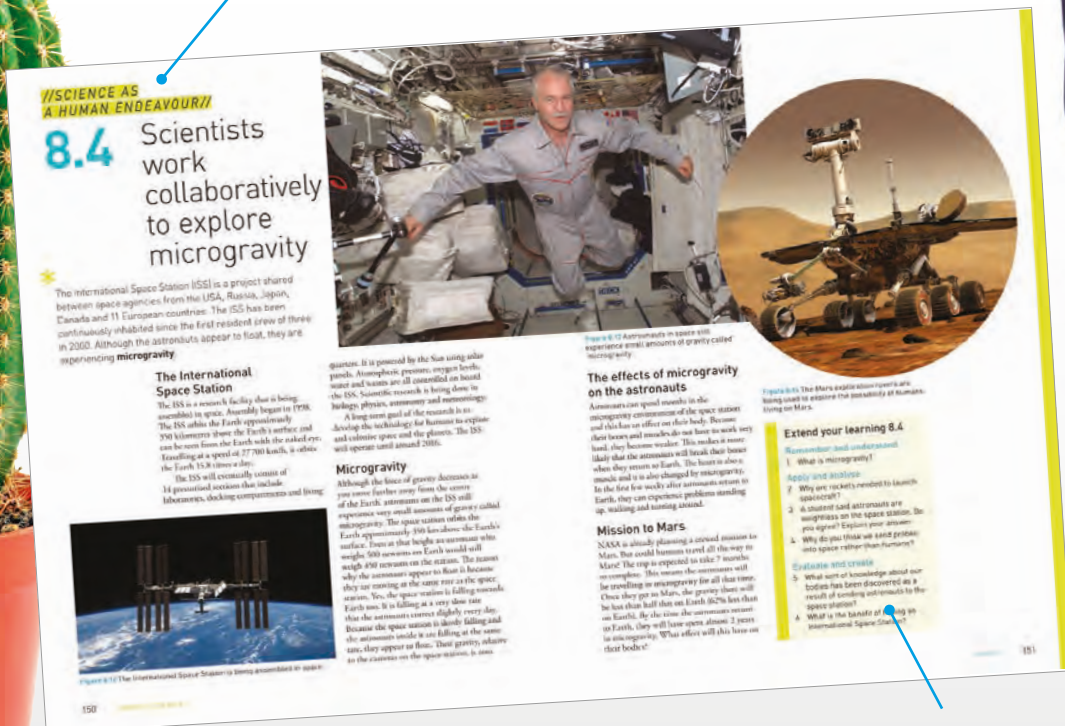


Experiments, challenges and skills tasks are organised at the end of the book rather than being confined to a double-page spread, allowing for increased instructional elegance.



Science skills are always taught as a practical task, not theory.

//SCIENCE AS A HUMAN ENDEAVOUR// spreads make strong links to real-world applications.



Extend your learning questions can be used as homework tasks or as an extended project.



AMAZING SCIENCE

Amazing Science has been created for today's science classroom. It delivers a simple, highly visual learning experience designed to fuel student engagement. Short, magazine-style units of work ignite a sense of awe and wonder, prompting students to ask questions and look further. Clear, simple language and literacy support on every page engage even the most reluctant learners. At each level, Student Books are supported by obook assess resources, including worksheets, tests, answers, interactives, videos and teaching plans. Open students' minds to the amazing world of science!

Self-contained units with clear headings and activities help students easily navigate content.

CHECK IT OUT

activities on each spread test student understanding and comprehension.

Key learning points are identified in an introduction at the start of each unit.

AT HOME IN THE DESERT

Life in a desert biome is difficult. Desert plants and animals experience hot days and cold nights, and shortages of water and food. Over time, native plants and animals have adapted to life in the harsh desert environment.

Percent points feed mainly on native plants. These rodents burrow below the soil and flourish under these conditions. They wear in the harshness of desert times.

The perentie is a large monitor lizard. It can swallow a whole snake in one go and can survive a year without eating.

The fat-tailed dunnart can store fat in its caudal adipose tail - a clever adaptation to survive a season of drought.

The kangaroo has spread its long, powerful hind legs and tail to help it hop. It can move up to 2000 metres. Kangaroo hares are also found in the desert. They are smaller than kangaroos and have long ears. They are also found in the desert.

The desert is home to many unique plants and animals. These animals have adapted to life in the harsh desert environment.

CHECK IT OUT!

- What conditions do desert animals face?
- Give three examples of animals that shelter from sunlight.
- Give three plant adaptations to desert life.
- Describe one animal adaptation to desert life. Draw a picture of a desert animal and label its adaptations to life in the desert.

LOOK IT UP

features define key scientific terms that are bolded on each spread.

Visual learners are drawn to high-impact images and diagrams, then encouraged to read captions in order to consolidate understanding.

THE AMAZING STOMACH OF A COW

Unlike humans, cows have a four-compartment stomach to help them digest and process food. Each of the four compartments plays an important role.

1 Oesophagus
Goes in, chewed and swallowed down the oesophagus to the rumen.

2 Rumen
The food enters the first compartment of the stomach called the rumen. Here, the grass is softened by fluids before it moves to the second part of the stomach.

3 Reticulum
The rumen is the second compartment of the stomach where the grass is again softened and clumps together to make small lumps called cuds.

4 Each cud is then regurgitated (vomited) back to the mouth where the cow can now chew it quickly and easily. This is why cows always appear to be chewing.

5 Omasum
The chewed cud travels into the omasum, the third stomach compartment. The omasum has many folds of tissue that look like a partly open book. Here, the cud is pressed and further reduced in size.

6 Abomasum
The cud then travels to the abomasum, the fourth stomach compartment. This is often called the true stomach because it performs like a human stomach. The abomasum breaks the food down into **protein**, **vitamins**, simple **carbohydrates**, **fats** and **amino acids**.

7 Small intestine
The small intestine is the main site for absorption of important chemicals.

8 Large intestine
The large intestine absorbs, in circles, and conserves water. It also absorbs minerals.

Udder
The udder contains the milk in cows that have given birth to a calf. It takes up to 70 hours for a cow to trim grass into milk. For every litre of milk a cow makes, more than 400 litres of blood must travel around her udder to deliver the nutrients from the grass. Australian dairy cows produce about 1.5 litres of milk a day.

A cow's mouth
Cows have fewer teeth than other animals. In the front of the mouth, **incisor** teeth (cutting teeth) occur only on the bottom jaw. Instead of the top incisors, that humans have, a cow has a hard, leathery dental pad. A cow uses its tongue to grab a clump of grass and then bites it with its incisor teeth. Molar teeth in the back of the mouth grind the plant material into small pieces as the cow chews in a side-to-side motion. As the cow chews, its saliva mix with the food before it passes down the **oesophagus** into the four-compartment stomach.

LOOK IT UP

amino acid a small compound that makes up a protein

carbohydrate class of compound containing carbon, hydrogen and oxygen atoms

protein large, complex molecule, plus many critical roles in the body, made of amino acids

ruminant mammal that chews cud (regurgitates) from its four-compartment stomach to further break down the cellulose, which is difficult to digest

CHECK IT OUT!

- How is the stomach of a cow different to yours?
- Which other animals have a similar digestive system to a cow? What is this group of animals called?
- Describe the purpose of a cow's incisor and molar teeth.
- Why does a cow always appear to be chewing, even when it isn't eating grass?
- Which of the four compartments in a cow's stomach is known as the true stomach? What job does it do?

Simple, clear diagrams help students understand important scientific concepts.

Inspire curiosity, wonder and questioning – because science is amazing!

Step-by-step instructional photographs scaffold learning and aid visual literacy.

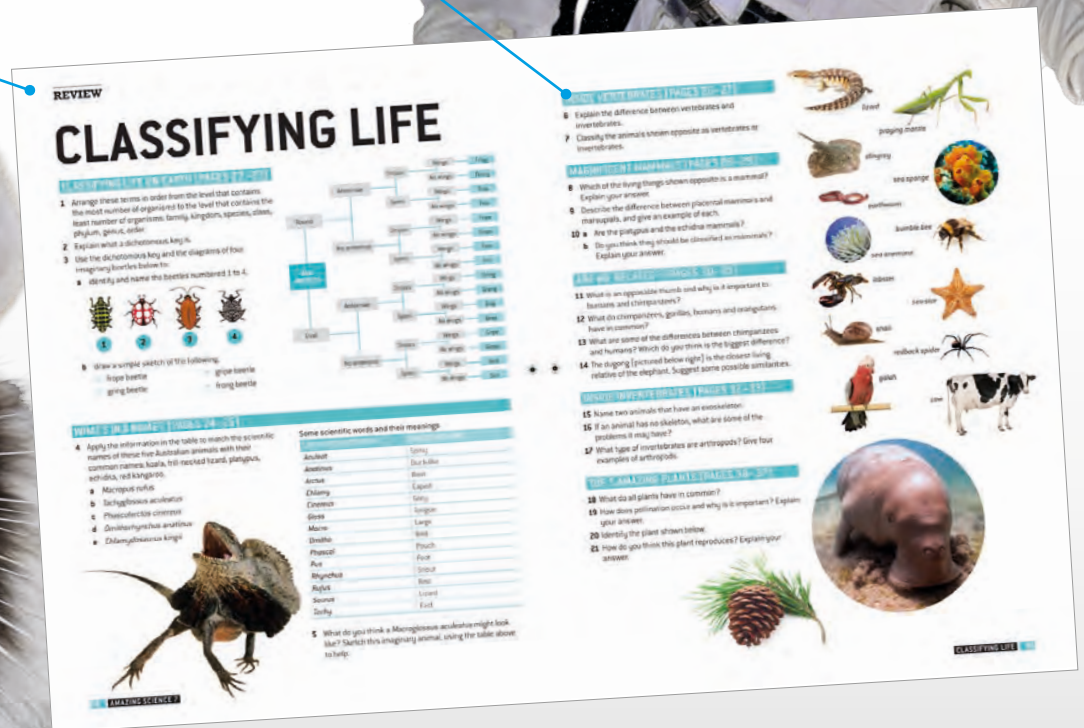
Each Student Book contains a careful selection of core experiments proven to work in the classroom. Many more experiment worksheets are provided on [obook assess](#).



Questions and tasks are organised according to each unit of work in the chapter and provide complete coverage during assessment.

REVIEW

tasks at the end of every chapter consolidate and extend learning.



Oxford Big Ideas Science delivers deep understanding through inquiry-based learning. Students discover the 'big ideas' of science by working through activities designed to deeply embed concepts. Each Student Book uses the six overarching ideas from the Australian Curriculum: Science to connect content across the different disciplines of science. The series seamlessly covers the general capabilities and cross-curriculum priorities.

Each chapter is designed to visually and creatively engage students with beautiful artwork, case studies and source material.



Spectacular and current photographs bring science to life.



Chapter openers introduce key inquiry questions and are designed to spark interest and elicit prior knowledge.



Discovering Ideas tasks allow students to discover science themselves, before they have all the answers.

Content is designed for depth of learning. Concepts are revisited with increasing levels of complexity so that students gain a rich understanding of key concepts.

Build deep, transferable understanding and skills

Overarching Ideas tasks appear in every chapter and use the big ideas from the Australian Curriculum: Science to integrate and connect the disciplines of science.

Examining skeletons

Aim
To examine the skeletal structures of three marine organisms.

Materials
1 fish (whole)
1 prawn
1 squid
newspaper
dissecting board
dissecting kit
pair of vinyl or latex gloves

Method

- 1 Observe the external features of the fish.
- 2 Carefully cut the fish in half lengthways so you can see the internal skeleton.
- 3 Observe the skeleton of the fish.
- 4 Feel the outside of the prawn and then peel it.
- 5 Cut the prawn in half and observe the insides.
- 6 Feel the outside of the squid and then cut it in half.
- 7 Observe the inside of the squid.

Results
Draw labelled diagrams of each specimen's skeleton.

Discussion

- 1 Consider the fish.
 - a Where is the skeleton of the fish located?
 - b What is this type of skeleton called?
- 2 Consider the prawn.
 - a Where is the skeleton of the prawn located?
 - b What is this type of skeleton called?
- 3 Does the squid have a skeleton?
- 4 In which group of animals (vertebrate or invertebrate) would you place each of the organisms observed? Why?
- 5 What are you, a vertebrate or an invertebrate?

Conclusion
What types of skeleton are possible?

UNIT 2.3 • WHERE DO I FIT IN? 69

Step-by-step instructional photography models correct skills and techniques.

Uranium mining in Kakadu

Matter and energy
Kakadu National Park in the Northern Territory is on the World Heritage List for its natural and cultural values. It supports four river systems and a large number of species found nowhere else on Earth. Indigenous Australians have lived in and around Kakadu for thousands of years. Large deposits of uranium are located within the park. Uranium is used as a fuel for power stations. This resource is mined and exported, bringing in large amounts of money for the Australian Government. The mining has been controversial over the years because of the impact on the landscape, objections from Indigenous groups about the native title of the land, and the dangers of nuclear power, nuclear weapons and uranium mining itself.

1 What uranium mines are located within Kakadu?
2 What issues have those mines had?
3 What are the potential dangers of uranium mining and nuclear power?
4 How is energy released from the uranium in a nuclear power station?
5 Carry out research to find out approximately how much energy can be released from one tonne of uranium. Compare this to coal and comment on your findings.

Fig 6.25 The Ranger uranium mine in Kakadu National Park.

Resource issues

Use the Internet to investigate an environmental issue you feel passionate about that has had an effect on the Earth's resources, such as pollution of waterways or the effects of mining.

- What are the different sides to the topic?
- Why is your topic an issue?
- What is your opinion on the issue?
- How would you gather support for 'your side'?
- Would you protest? If so, how?
- What are the dangers of protesting?
- What would you see as an acceptable outcome?

What do you know about uranium?

- 1 If you watch *The Simpsons*, write a story about something that went wrong at the Springfield nuclear power plant.
- 2 Where in Australia are our uranium resources found (see Fig. 6.5 on page 189)?
- 3 Why do you think Australia has not turned to nuclear power yet?
- 4 What does radioactive mean?
- 5 How can radiation be harmful?
- 6 How is a nuclear power station different from a coal-fired power station? How are they similar?
- 7 What happens in nuclear fission?

UNIT 6.2 • DO WE HAVE ENOUGH ENERGY RESOURCES? 199

How is life on Earth organised?

active it lays in the sun, but when it is hot but outside it hides in a burrow until the heat has passed.

One fascinating thing that the thorny devil can do is drink water with its feet! It places its feet in a puddle and water moves up by capillary action along grooves in its skin to the corner of its mouth.

Mammals are rarely seen during the day in Uluru-Kata Tjuta National Park. Most are nocturnal and come out in the evening, avoiding the heat of the daytime desert. The most abundant groups of mammals are the marsupials (see Fig. 2.42 on page 70) and the monotremes.

Marsupials, such as the bilby, give birth to underdeveloped young but protect them by having a pouch where further development can occur. The pouch is similar to that of a kangaroo; however, it is a backward-opening pouch. When the young are fully developed they can leave the pouch and survive the harsh climate.

1 Follow the link on the eBook to find out about the kind of environment that the Anangu lived in and how they ate to survive. List at least five animals and five plants that they ate.

2 The early explorers left this environment because they couldn't survive. Why did they struggle to find food here?

3 In a group of four, use a large sheet of paper to create two collages on the one sheet, one showing living things and one showing non-living things you would expect to find in Uluru-Kata Tjuta National Park. One pair creates the 'living' collage and the other pair creates the 'non-living' collage.

4 Why do you think the Anangu devised a system of classification for the natural habitats around them?

5 Find out what 'capillary action' (in relation to water) means.

6 Follow the link on the eBook to investigate the mammals, reptiles, birds and invertebrates found in the Uluru-Kata Tjuta National Park. Make a list of five for each category. Classify each one into its correct group.

7 One of the classes of vertebrate is Amphibia. What characteristics of amphibians would make it difficult for them to live in and environments? What other animal classes would struggle to survive in and environments?

8 Why do you think the bilby's pouch is rear-facing?

9 Discuss why monotremes would find it difficult to breed in and environments.

10 Follow the link on the eBook to investigate which mammals can be found in Australia's arid environments. Classify each of these mammals as marsupials, monotremes or marsupials. List any specific Latin double names given for each animal (genus and species).

Have you ever visited Uluru or Kata Tjuta (the Olgas)? This area is part of Australia's arid zone, a region that receives less than 250 millimetres of rainfall per year. Australia is the second driest continent in the world. Despite the harsh climate, this area is home to hundreds of different organisms.

When early European explorers first visited this region in the 1870s they were confronted with a harsh landscape. Their initial aim was to find a route for the overland telegraph line from Adelaide to the Top End and to set up pastures for sheep and cattle grazing, and beef.

However, the traditional owners of the land, a group of Anangu Aboriginal people, had lived on this land for thousands of years and understood it well. They lived a nomadic life, travelling in small family groups and surviving by hunting wildlife and gathering food from the land.

The Anangu knew where to find food to survive and, more importantly, which areas were the best for hunting and gathering. The Anangu classified their environment to help them locate the precious food. They used these names:

- Pitj**—rocky areas, gorges, stony slopes. Animals, come to this area to find shelter and water.
- Pati**—open woodland. After fire rains this area has an abundance of grass, which the kangaroo eat. Honey ants build their nests in this area.
- Piti**—spinifex plains, low areas between domes. This is the best place to gather seeds to eat.

Reptiles are particularly suited to this environment. The thorny devil, like all reptiles, uses the environment to regulate its temperature. When it wants to become

Fig 2.52 Arid habitat.

Fig 2.53 Kangaroo.

Fig 2.54 Reptiles.

CHAPTER 2 • SORTING OUT BIODIVERSITY 81

Connecting Ideas activities encourage students to transfer and connect what they have learned in each chapter to areas of interest or personal experience, making learning fun and meaningful.



Oxford's premium digital resources for secondary school students and teachers are designed to help tailor learning pathways and deliver results. For information about products and purchasing visit oup.com.au

obook

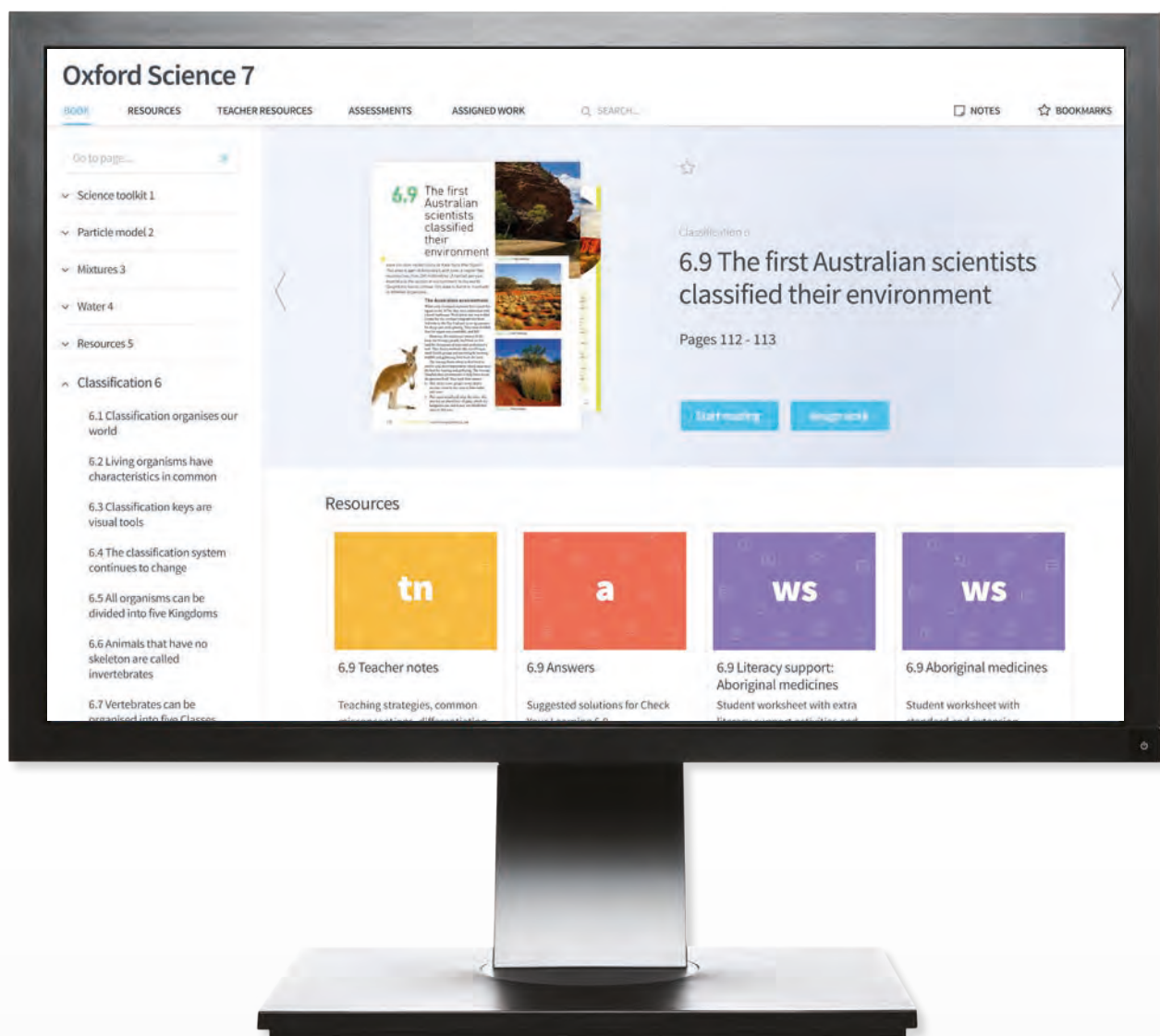
obook provides an interactive electronic version of the student book in an easy-to-read format. It features multimedia links, interactive learning objects, videos, note-taking, highlighting and bookmarking tools, and live question blocks. obook is compatible with laptops, iPads, tablets and IWBs, and also offers page view (in flipbook format) that can be used offline.



assess

assess is an indispensable online assessment tool. Explicitly mapped to the Western Australian Curriculum, it drives student progress through tailored instruction. Teachers can track the status of assignments, monitor progress with auto-marking **assessments**, or construct customised tests from the **testbank** using varied question levels and question types. Forget about any ongoing fees – **assess** is FREE with every **obook**, with NO reactivation fees!

Innovative digital resources and assessment



Teacher **obook** **assess**

Practical and targeted teacher support is provided in digital format via **Teacher obook assess**. **obook** provides teachers with **access** to the Student Book together with added extras like teaching programs, lesson ideas, worksheets, class tests and answers to all activities in the Student Book. **assess** offers the ability to assign interactive quizzes and tests, gather results and monitor student performance.

Teacher obook assess now also offers Dashboard view – an online lesson control centre, allowing teachers to instantly preview, access and assign resources like videos, interactives, worksheets and tests to students.

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