



2023
CATALOG

A detailed close-up photograph of a blue snake, likely a species of tree snake, coiled on a dark, textured log. The snake's scales are a vibrant blue with darker blue or black markings. Its tongue is flicking out, showing a pinkish-red tip. The background is a soft, out-of-focus green, suggesting a natural habitat.

SCIENCE RESOURCES

GRADES 9-12

About BIOZONE

Inspiring better outcomes for our planet through science education.

BIOZONE has more than 30 years' experience in the development of engaging and effective resources for science teaching and learning.

Our resources are unlike any you've seen before, and a departure from the traditional basal textbook paradigm. We take a 'worktext' approach, combining the very best features of a traditional textbook with an interactive workbook. The resulting hybrid provides well designed, compact lessons that engage students and provide a rigorous, yet accessible, program of work

Our extraordinary suite of resources meets the challenges of teaching today's students, whether they be in a traditional classroom environment, an informal teaching setting or learning remotely.

BIOZONE is renowned for its engaging presentation of content with a strong visual appeal.

Our expert writers bring science to life through the use of real-world examples in both content and assessment. We continually revise and improve on our resources to ensure they remain current and relevant to your needs. Part of this process is engaging with you, as teachers, and valuing your feedback.

By their innovative design, our resources encourage student interaction, using simple investigations and data analysis to engage students in the science around them. Innovative strategies to encourage critical thinking and problem-solving help your students develop the 21st-century skills they need to succeed.

**Pictured: The Milky Way
from Lake Tekapo in New Zealand**
*Image by Graham Holtshausen
on Unsplash*

Cover Image: Indonesian Pit Viper
Trimeresurus Insularis
*Photo by Kúritafsheen
from Adobe Stock*

Our Writing Team



Jill Mellanby MLIS; BSc(hons); PGCE(Sec); Dip. Pub.

Jill began her science career with a degree in biochemistry and, after a short spell in research labs, became a science teacher both in the UK and then New Zealand. She spent many years managing the Royal Society of New Zealand's academic publishing programme of eight science journals which allowed her to hone her project management and editorial skills. She was also a part of the Expert Advice writing team at the Royal Society of New Zealand, producing science pieces for a public audience. She joined the **BIOZONE** team in late 2021 as editor.



Lissa Bainbridge-Smith M.Sc (hons)

Lissa graduated with a Masters in Science (hons) from the University of Waikato. After graduation she worked in industry in a research and development capacity for eight years. Lissa joined **BIOZONE** in 2006 and is hands-on developing new curricula. Lissa has also taught science theory and practical skills to international and ESL students.



Sarah Gaze M.Ed., GradDipT (Sec), B.Sc.

Sarah has 16 years experience as a Science and Chemistry teacher, recently completing MEd. (1st class hons) with a focus on curriculum, science and climate change education. She has a background in educational resource development, academic writing, and art. Sarah has recently joined the **BIOZONE** team at the start of 2022.



Kent Pryor B.Sc, GradDipT (Sec)

Kent has a BSc from Massey University majoring in zoology and ecology and taught secondary school biology and chemistry for 9 years before joining **BIOZONE** as an author in 2009.

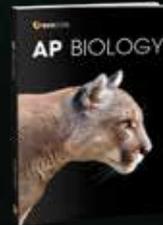
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Pictured: Barn Owl
Tyto alba
 Photo by Bob Brewer
 on Unsplash

What's NEW at BIOZONE

The team at BIOZONE are excited to announce the latest additions to our catalog. We have developed some creative solutions to assist teachers in the classroom and beyond.



AP® Biology (2021 Edition)

BIOZONE's AP® Biology emphasizes the application of knowledge to understanding and analyzing new problems. Its data-driven approach and highly visual format encourage students to engage fully with the principles, ideas, and methodologies

required to understand the natural world. See page 15 for more details.

What's Coming?

Biology for NGSS

BIOZONE's third edition of Biology for NGSS builds on an already successful format. Student engagement is enhanced through the use of full color diagrams and increased opportunities for practical activities. See page 25 for more details



Earth and Space Sciences for NGSS



BIOZONE's second edition of Earth & Space Sciences for NGSS will be in full color. Numerous hands-on activities allow students to explore the NGSS content in a fresh and engaging way. See page 27 for more details.

Love our products and purchase them every year?

We can offer your school discounted prices for multi-year purchases when purchased directly through **BIOZONE**. Contact us for more details sales@thebiozone.com



Teacher Toolkit

BIOZONE's Teacher Toolkit is a suite of products designed to support and boost the delivery of your program, while enhancing student engagement. The resources integrate seamlessly into your teacher workflow, and their flexibility allows them to be customized for meaningful delivery within an integrated classroom.

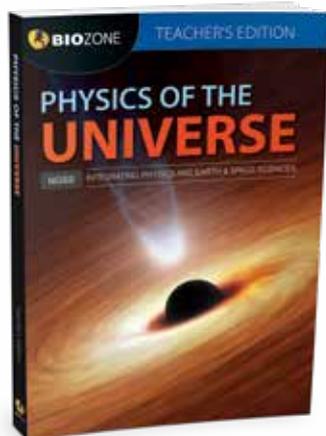
Professional Development Available

Want to know more? Contact our Professional Development Team to find out more about using the Teacher Toolkit to plan lessons, enhance delivery, engage students, and deliver assessments.

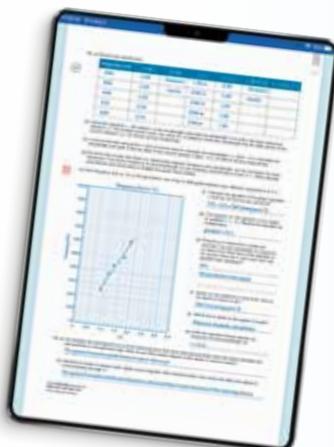
Contact your local sales representative to find out more or book a Professional Development session.
www.theBIOZONE.com/contactus

WHAT OUR TEACHER TOOLKIT INCLUDES:

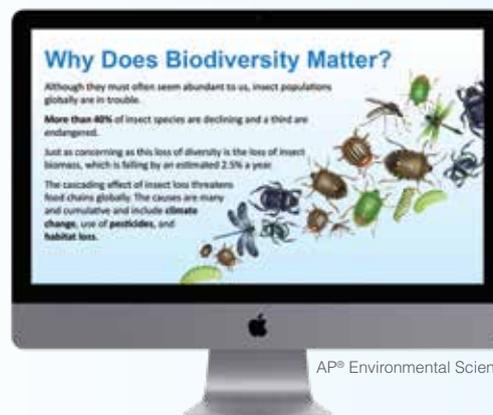
Teacher's Edition (Print)



Teacher's Edition (eBook)



Presentation Slides



AP® Environmental Science

Digital Teacher's Edition



Physical Sciences for NGSS

Physics of the Universe

Question Library

RTF or QT1

Testbank

RTF or QT1

Resource Hub

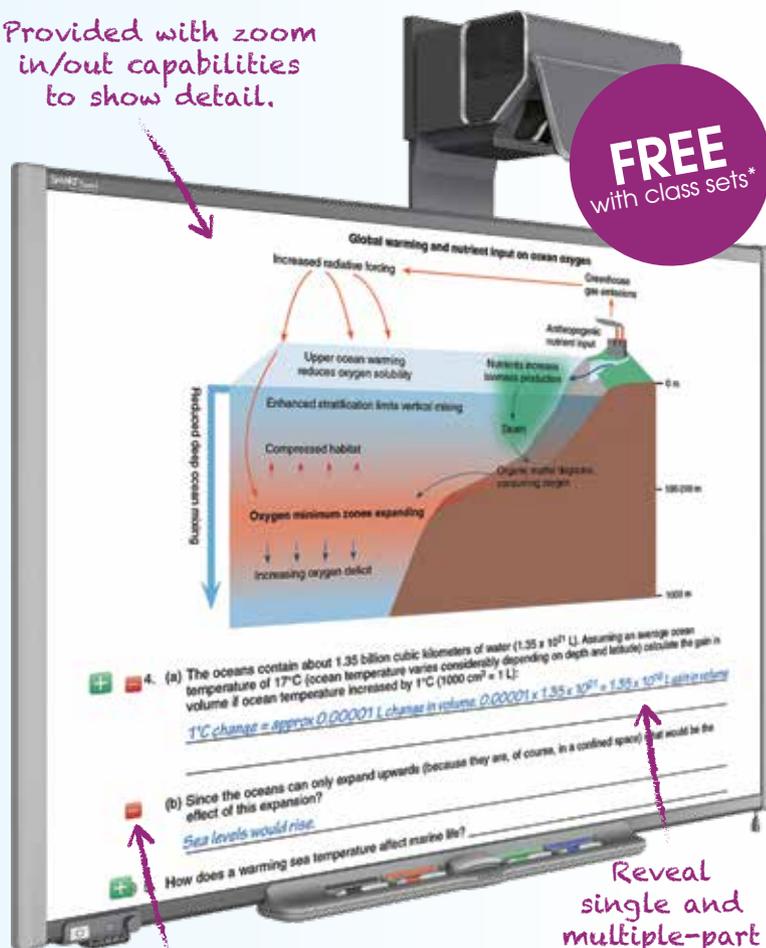


Chemistry in the Earth System

Find out more: theBIOZONE.com

Digital Teacher's Editions

Provided with zoom in/out capabilities to show detail.



FREE
with class sets*

Our Digital Teacher's Editions are available as a digital download and are an ideal teaching companion to the corresponding workbooks and are discounted when purchasing a class set* of the student book.

Display the pages on an interactive whiteboard just as they appear in the students' own print version of the books. Use the display to introduce the activity, focus the students on the relevant information, and streamline review and feedback.

KEY FEATURES

- Ideally suited for use with an interactive whiteboard, although they will also work with a digital projector.
- The digital versions of the Student Workbooks and Model Answers are **non-printable PDF files**.
- Display answers on-screen: reveal single and multiple-part answers with the click of a button.
- Excel® spreadsheets are provided for all activities in the books containing data sets.

AVAILABLE TITLES

- AP Biology (2021)
- AP Environmental Science
- Earth and Space Sciences for NGSS (2016)
- Biology for NGSS (2016)
- Physical Sciences for NGSS
- Chemistry in the Earth System
- Physics of the Universe
- The Living Earth
- IB Biology
- CIE Biology 1
- CIE Biology 2
- Senior Biology 1
- Senior Biology 2

Display and hide answers on-screen using the digital versions of the workbooks.

Reveal single and multiple-part answers.

*License: A class set is 20+ copies of the printed Student Edition. This product is Digital Rights Managed.

Adobe Acrobat Reader is required

Full conditions can be viewed at: www.thebiozone.com/faqconditionsfuse

Find out more: the **BIOZONE**.com/TDE

Resource Hub

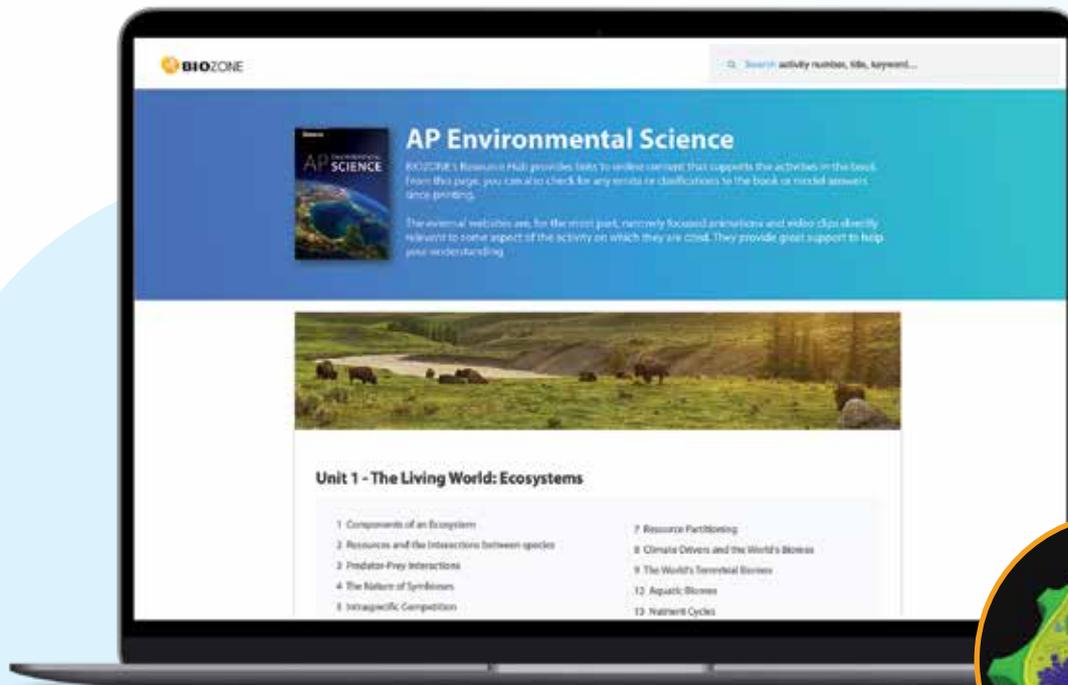
The Resource Hub is a curated library of links to third-party online resources such as **video clips**, **simulations**, and original source material (teacher reference). Additional material includes access to interactive **BIOZONE 3D models** and fully **editable spreadsheets** to support some data modelling activities.

To access **BIOZONE's** Resource Hub, find the appropriate link in the front of your book.

Find out more: **BIOZONE**hub.com



Videos



Interactive 3D Models



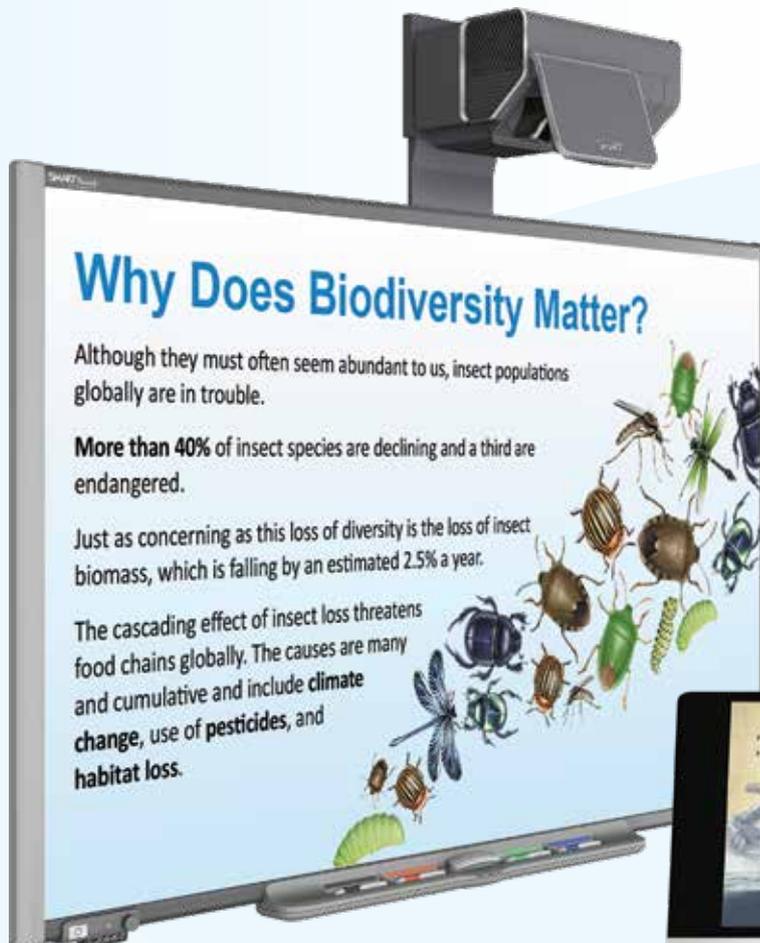
3D Plant Cell
Some 3D models are annotated, zoom in/out, and rotate

Presentation Slides

Previously known as Presentation Media. Available as a digital download.

Our Presentation Slides provide an exciting collection of **PowerPoint / Keynote** files that **can be used for a lecture-style presentation through video conferencing or in class.**

The download contains **fully-editable** slide show presentations to enhance your lessons.



Example: AP® Environmental Science

AVAILABLE TITLES

1. Genes and Inheritance
2. Evolution
3. Human Evolution
4. Ecology
5. Cell Biology and Biochemistry
6. Health and Disease
7. Environmental Science
8. Anatomy and Physiology
9. AP® Environmental Science
10. AP® Biology (Available Mid-2022)
11. Chemistry in the Earth System
12. Physics of the Universe
13. The Living Earth
14. Physical Sciences for NGSS
15. Biology for NGSS
16. Earth and Space Sciences for NGSS
17. IB Biology



Example: Physical Sciences



Example: Earth and Space Sciences

Presentation Slide Bundles

A cost-effective way to purchase BIOZONE's Presentation Slide titles comprising thousands of slides of information.

	Genetics and Evolution Bundle (3 Titles)	Super Bundle (6 Titles)	The Complete Collection Bundle (All 8 Titles)
Titles Included <i>(see numbering left)</i>	1-3	1-6	1-8
Number of slides	872	2188	4013
Genes & Inheritance	✓	✓	✓
Evolution	✓	✓	✓
Human Evolution	✓	✓	✓
Ecology		✓	✓
Cell Biology & Biochemistry		✓	✓
Health & Disease		✓	✓
Environmental Science			✓
Anatomy & Physiology			✓

Download Price List
www.theBIOZONE.com/price-list

Questions? sales@thebiozone.com

What people are saying about our products...

“I am loving these texts and the way that they facilitate learning for students!”

– Matt, Remington USD

“Andy (my colleague) and I were looking through the content online yesterday and were blown away! It matches the CED of AP Bio so well! You guys did a great job.”

– Mark, Rockwood Summit High School

“My students find the examples very interesting and relevant. They are often different than the classic examples we are used to seeing. They find success with the methodology that BIOZONE is built on, with the focus on collaboration and building understanding.”

– Cindi, Teacher

“Great resource for teachers, convenient to prepare simple and effective lessons. Excellent graphics and quality”

– Cornelia, AP Environmental Science Teacher

The Many Benefits of BIOZONE’s Resources

A departure from the traditional basal textbook paradigm, instead taking a ‘worktext’ approach. Students write their answers directly into the book, thereby forming a ‘record of work’.

Compact lessons engage students in learning and provide a rigorous, yet accessible, program of work.

Engaging presentation of content with visually appealing, high quality photographs, and explanatory illustrations.

Activities encourage student interaction and inquiry through simple ‘hands-on’ opportunities, real-world case studies, and data analysis.

Resource suites are self-contained; there is no requirement for additional purchases or expensive kits.

Titles are available in both print and digital formats.

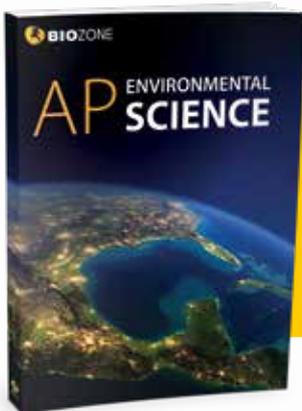
BIOZONE’s resources offer a cost effective solution for all budgets.

We continually revise and improve our resources to ensure they remain current and relevant to your needs.

Our expert writers bring science to life through the use of everyday, real-life examples in both content and assessment.

Remote Learning

BIOZONE understands how hard it has been for you and your students to teach and learn remotely. Poor access to broadband, extra support, and learners being left behind are some of the current concerns of remote teaching.

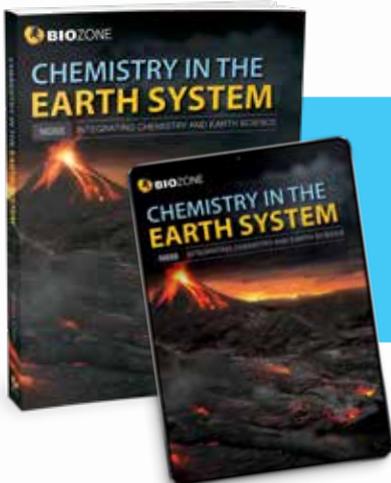


Print

Students write their answers directly into the spaces provided in their **BIOZONE** print book - forming an important 'Record of Work'. If the teacher wants to grade or review student work remotely, students may be asked to write their answers into the school's own LMS. A great solution for no, or limited, broadband access.

eBooks

BIOZONE's eBooks provide the same content as the print books, with ready-made lessons in a digital format. The text-to-speech functionality assists teachers who have neurally diverse students. Our eBooks function on both tablets and computers.



Hybrid Solutions

In a virtual classroom, it's difficult to monitor students who need extra support. Use a combination of both print and digital versions of the same **BIOZONE** book to provide your students with a rich and varied learning experience.

eBook LITE

Affordable Option

This version of our eBooks provides a low-cost solution for district budgets that are under pressure. eBook LITE provides an excellent addition to the print book for those looking for a low-cost digital option. See the full function list in the comparison table on page 11.



eBook Teacher's Edition

The Teacher's Edition contains all the features of the eBook PLUS, with the exception that the student answering online feature is missing. In its place are the suggested answers provided by the publisher.

Designed to replicate our printed Teachers' Editions in a digital format. Teachers' eBooks are compatible with both eBook LITE and PLUS Student Editions.

25. (a) Record your results here:

Frequency (Hz)	L1 (m)	L2
256	0.33	Staw
364	0.23	res
440	0.20	
512	0.16	
625	0.14	

(b) Using the equation $\lambda = 4L$ (where λ is the wavelength for L1. This formula works if only one v column labeled L1. Do this for all your freq

(c) A second formula using both L1 and L2 can be used. We know from earlier that there is a relationship between frequency (f) and wavelength. This means frequency (f) and wavelength are inversely proportional and will produce a straight line graph.

(d) Plot frequency (Hz) vs $1/\lambda$, on the grid below.

eBook PLUS

Full-Feature Option

This full-featured version of our eBooks provides all the functions of the eBook LITE version, PLUS the interactive components and **student answering online**. Student answers may form a 'record of work' and you may choose to grade a selection of activities. See the full function list in the Comparison Table on page 5.



Resources Hub



Offline Resources

1 Components of an Ecosystem

Key Question What makes up an ecosystem and how do its components interact?

An ecosystem is a community of living organisms and the physical (non-living) components of their environment. The community (the living components of the ecosystem) is built made up of a number of populations, these living organisms of the same species living in the same geographical area. The type and availability of resources such as water in the environment determine species distribution and survival and are an important influence on how different species interact.

BIOTIC FACTORS	ABIOTIC FACTORS		
The living organisms in the environment, including their interactions, e.g. an ecosystem, predators or symbiosis.	Hydrosphere (water)	Atmosphere (air)	Geosphere (rock/soil)
<ul style="list-style-type: none">PlantsAnimalsMicroorganismsFungiProtists (e.g. algae, protozoans)	<ul style="list-style-type: none">Dissolved nutrientspHSalinityDissolved oxygenHumidityTemperature	<ul style="list-style-type: none">Wind speedWind directionHumidityLight Intensity/qualityTranspirationTemperature	<ul style="list-style-type: none">Nutrient availabilitySoil moisturepHCompactionTemperatureDepth

Ecosystems are natural units made up of a community of living organisms (biotic factors) and the physical conditions (abiotic factors) in an area. Abiotic factors include non-living factors associated with the geosphere, hydrosphere, and atmosphere (climate). The living organisms and their activities, e.g. its predators, competitors etc, make up the biotic factors of an ecosystem. The interactions of living organisms with each other and with the physical environment help determine an ecosystem's features. The components of an ecosystem are linked to each other (and to other ecosystems) through nutrient cycles and energy flows.

1. Distinguish clearly between a community and an ecosystem.

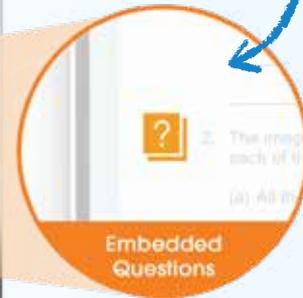
2. Describe three abiotic factors in Yellowstone National Park. From the following list, select the abiotic factors with the most of the following characteristics: Sparse, variable, commonly distributed, ubiquitous.

(a) Soil fertility present? (b) All the organisms present?

(ii) The entire National Park. (c) The air.

3. An ecosystem provides resources to its community of living organisms, including food, water, and habitat. In addition, an ecosystem provides essential services such as nutrient recycling and climate regulation. How do you think the availability of resources might influence the distribution and abundance of species present, and affect how different species interact?

Students answer questions online to be viewed or graded by their teacher.



Embedded Questions

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Get the BIOZONE eBooks Reader App

Our eBook Reader App allows each eBook to be downloaded to the device for offline access (minimize bandwidth required at home). However, interactive elements, such as questions and homework, still require internet connection to function.

Our eBooks Reader App is available for use on tablets and desktop/laptop computers.



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	School Managed Licenses			Personal Licenses
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Assignable Student Work:	Homework, custom questions, and custom assessments			-
Grading and Reporting:	Grading and exportable performance reports available			-
Roster Management:	Integrations available for ClassLink, Clever, and OneRoster. Manual process through a .csv upload is also available			-
Single Sign-On Integrations:	ClassLink and Clever			-
Learning Management System Integrations:	Any Learning Management System through LTI connection			-
On-boarding Setup:	Online Training, Setup and Integration support			-
Offline Access:	Downloadable content through the BIOZONE Reader App			Downloadable content through the BIOZONE Reader App
User Types:	School Managed Student, Teacher, and Admin users			Self-Managed Individual Users
Technical Support:	In-App Knowledge Base and Technical Support			In-App Knowledge Base and Technical Support
Minimum Order:	Must be purchased as a class set (at least 20)			Purchased Individually
How to Purchase:	Contact our sales team at: sales@thebiozone.com			Purchase from: store.biozone.com/us

FREE 30 day trial of our School Managed eBooks

With our 30 day FREE trials you get to try out all available school-managed eBooks for your selected title. You can compare our eBook PLUS, LITE, and Teachers' Edition eBooks (if they are available for purchase).

Compare BIOZONE's eBooks

	School Managed Licenses			Personal Licenses
	eBook LITE	eBook PLUS	eBook Teacher's Edition	eBook LITE
Embedded Publisher Questions: Students can answer questions online	-	✓	-	-
Additional Teacher & Student Offline Resources: Activities that require graphing, drawing, model making, Offline PDFs, and spreadsheets	-	✓	-	-
Embedded Resource Hub: Links to YouTube videos, web links, spreadsheets, 3D models, & online simulations	-	✓	✓	-
Answers in Place: See all of the suggested answers for each activity	-	-	✓	-
User Notes, Drawing and Mark-up Tools	✓	✓	✓	✓
Disability Support: Read Aloud (Text-to-Speech)* English only	✓	✓	✓	✓
Selected Text: Colour highlight, dictionary definition, access Google search, access Wikipedia lookup	✓	✓	✓	✓

Need Technical Support?

BIOZONE offers several methods of support to help guide you through the eBooks platform

Knowledge Base

Check out our Knowledge Base with articles, short video tutorials and FAQ that you can use to quickly answer any questions and troubleshoot your issues.

👍 ebookshelp.thebiozone.com

Training Platform

We created a set of videos designed for first-time users that will walk you through the eBooks platform and its features.

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Technical Support

Our helpful IT support team are always happy to help with your queries. We supply dedicated support and reply within 24 hours.

👤 support@thebiozone.com

BIOZONE World

*We have listened
and are improving
the way teachers
deliver our material,
and how students
consume it...*



*Be one of the first users of BIOZONE World
during the next school year (2022-2023)**

With your support and your ongoing feedback, we will be putting teachers' needs at the forefront of the many new innovations we are developing within **BIOZONE World**.

As the first users of **BIOZONE World** during the next school year, you will be the pioneers of the latest EdTech platform that has been developed for teachers, by teachers.

**Not all features listed will be available immediately, however users will gain access automatically as we develop the platform.*

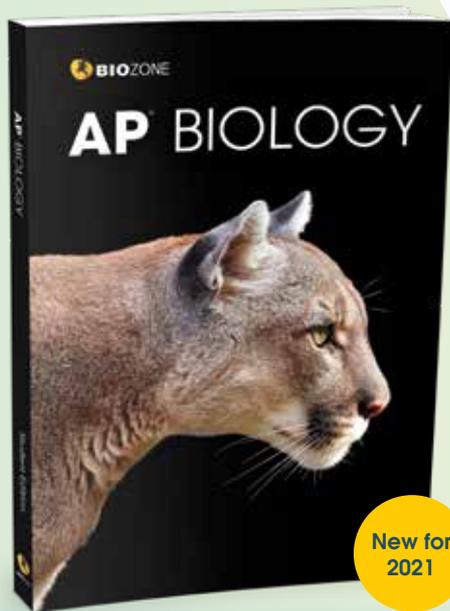
Register your interest: [theBIOZONE.com /world](https://theBIOZONE.com/world)

Everything in one place

New innovative digital platform based on teacher & student feedback.



Register your interest: [theBIOZONE.com/world](https://www.theBIOZONE.com/world)



Student Edition (Print)

Digital Formats



eBook LITE



eBook PLUS

Teacher Support Material



Teacher's Edition (eBook)



Teacher's Edition (Print)



Digital Teacher's Edition (Download)



Classroom Guide (Download)

Student Support Material



Resource Hub

Download Price List

www.theBIOZONE.com/price-list

AP[®] Biology Student Edition

BIOZONE's new title for AP[®] Biology is the third edition of this popular resource. Now in full color and one comprehensive volume, it has been completely revised to address the 2020 AP[®] Biology CED. This title expertly balances breadth of content with depth of understanding, employing a wide variety of activities to develop the student's skills in key science practices. In keeping with the approach of the new CED, AP[®] Biology deemphasizes the traditional approach of content coverage to focus on inquiry, critical thinking, and enduring understanding of key concepts. Clear presentation, a highly visual approach, and integration of relevant and engaging illustrative examples readies students for college level courses, developing the essential inquiry and reasoning skills they will need as 21st century scientists.

BIOZONE's AP[®] Biology emphasizes the application of knowledge to understanding and analyzing new problems. It follows the CED's structure, providing an easily-navigable program that comprehensively addresses the two essential components of the course framework: science practices and course content. Its data-driven approach and highly visual format encourage students to engage fully with the principles, ideas, and methodologies required to understand the natural world.

Features

- Chapter introductions provide a summary of required content and skills, encapsulating the essential knowledge statements.
- Key questions provide the focus for each activity.
- Student Support for Investigations: Activities providing support for specific aspects of each of the 13 investigations are integrated in context throughout.
- The big ideas and science practices spiral across topics and units.
- Through inquiry and data analysis, students develop enduring understanding of key concepts in biology and an appreciation for the role of science in solving modern-day problems.
- Concept and science practice codes help students make important connections across the whole program.
- **Personal Progress Checks** (at the conclusion of each of the 8 units) provide opportunity for formative assessment and prepare students for their AP[®] exam.

* ALL prices exclude sales tax and shipping.

** Discount pricing is for purchases of over 20 copies of a single title directly from BIOZONE.

Teacher support materials are for teacher purchase only and will not be sold to students. Teacher's Editions can only be purchased when ordering a class set of 20+ student editions of the same title.



Use our eBooks on a tablet
OR computer

7 Protein Shape is Related to its Function

Key Question: How does a protein's three-dimensional shape relate to its function? As we have seen, a protein may consist of one polypeptide chain, or several polypeptide chains linked together. Hydrogen bonds between amino acids cause the polypeptide chain to form its **secondary structure**, either an alpha or a beta pleated sheet. A polypeptide's three-dimensional shape is determined by the bonds formed between amino acids, and by the protein's tertiary structure, and its quaternary structure.

The shape of a protein reflects its biological role

Active site formed by the precise configuration of the protein

Channel proteins
Proteins that help to form channels in the plasma membrane possess hydrophilic R groups on the membrane and polar R groups on the inside of the channel. Hydrophilic membranes and ions see them as a path through them. Channel proteins are found in nearly all cells and many organisms.

Enzymes
Enzymes are globular proteins that catalyze reactions. They are specific to their substrates and their tertiary structure. The active site of the enzyme is where the substrate binds and the reaction can occur. The specificity of the reaction is determined by the interactions of amino acid R groups. Denaturation of the active site and exposure of a hole of function, protein denaturation, is common to all cells and many organisms.

Sub-unit proteins
Many proteins, e.g. insulin and hemoglobin, consist of two or more sub-units in a complex, evolutionary structure. Often in association with a metal ion. Active insulin is formed by two polypeptide chains stabilized by disulfide bonds between neighboring cysteine residues. Insulin dimers diffuse uptake to cells.

Protein denaturation
When the chemical bonds holding a protein together are broken the protein can no longer hold its three-dimensional shape. This process is called **denaturation**, and the protein usually loses its ability to carry out its biological function.

There are many causes of denaturation including exposure to heat or pH outside of the protein's optimum range. The main protein in egg white is albumin. It has a clear, thick form appearance in raw egg (left) which becomes transparent as the albumin protein and S becomes insoluble, changing together to form a thick white substance (far right).

1. Using the example of insulin, explain how interactions between R groups stabilize the protein's structure?

2. Why do channel proteins often fold with non-polar R groups to the channel's exterior and polar R groups to its interior?

3. Why does denaturation often result in the loss of protein functionality?

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RESOURCE HUB

Additional enrichment for both striving and gifted/talented students. The hub provides links to third-party online resources such as weblinks, spreadsheets, and video clips. You also gain access to our collection of 3D models.

FREE for purchasers

8 Comparing Fibrous and Globular Proteins

Key Question: How do the structure and properties of globular and fibrous proteins reflect their contrasting roles? Globular and fibrous proteins differ in their structure and function. Globular proteins form one level of the main broad functional groups of proteins (the others being membrane proteins and dispersed proteins such as casin).

Globular proteins
The shape of globular proteins is a function of their tertiary structure. Some proteins (e.g. insulin and tubulin) are globular and soluble in water, but polypeptide to form long, stiff fibrils.

Properties of globular proteins

- ▶ Easily water soluble
- ▶ Tertiary structure critical to function
- ▶ Polypeptide chains fold into a spherical shape

Functions of globular proteins

- ▶ Catalytic, e.g. enzymes
- ▶ Respiratory, e.g. hemoglobin (haem)
- ▶ Transport, e.g. hemoglobin
- ▶ Protective, e.g. immunoglobulins (antibodies)
- ▶ Structural (skeletal), e.g. actin and tubulin monomers (cytoskeletal elements)

Insulin
Insulin is a large hormone molecule. It is a large polypeptide chain consisting of two polypeptide chains held together by two disulfide bonds.

Myoglobin
Myoglobin is a large polypeptide chain. It is a heme protein. It consists of a large subunit and a heme group.

Hemoglobin
Hemoglobin is a red blood cell protein. It is a heme protein. It consists of four polypeptide chains (two alpha and two beta) and four heme groups.

1. How are globular proteins involved in the functioning of organisms? Use examples to help illustrate your answer:

2. (a) Explain how the shape and properties of a globular protein relate to its functional role:

(b) How would its function be affected by a change in tertiary structure?

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AP Biology

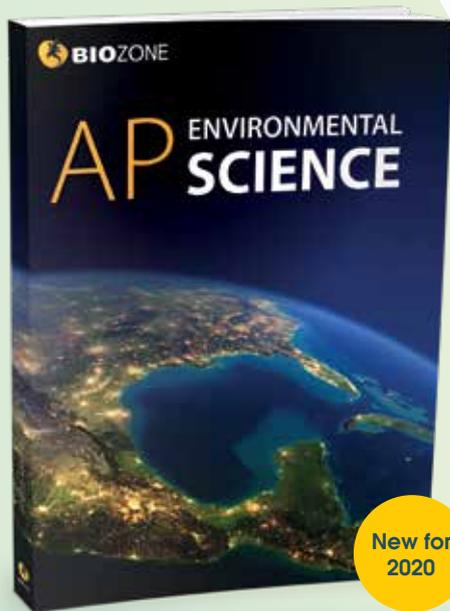
Unit 1 - Chemistry of Life

- 1. Water in Living Systems
- 2. The Structure and Function of Cells
- 3. Metabolism
- 4. Photosynthesis
- 5. Cellular Respiration and Energy
- 6. Cellular Homeostasis
- 7. Cellular Signaling
- 8. Cellular Growth and Division
- 9. Cellular Differentiation
- 10. The Development and Evolution of Organisms
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BIOZONE's AP Environmental Science emphasizes the application of knowledge to understanding the Earth's systems and identifying and analyzing environmental problems and their solutions. This easily navigated resource addresses the two essential components of the course framework: science practices and course content. Its interdisciplinary approach and highly visual format encourage students to engage fully with the principles, ideas, and methodologies required to understand the natural world.

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- Chapter introductions provide a summary of required content, encapsulating the essential knowledge statements matched point for point.
- Key questions provide the focus for each activity.
- Student inquiry is supported through simple hands-on investigations (lab and field based).
- The big ideas and science practices spiral across topics and units.
- Through current case studies, students identify and analyze natural and human-made environmental problems and evaluate solutions.
- Concept and science practice codes help students make important connections across the whole program.
- **Personal Progress Checks** provide opportunity for formative assessment and prepare students for their AP exam.

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167 Wildfires

Key Question: What is the effect of global wildfires?

The decade 2010 to 2020 saw an unprecedented increase in the number, area, and intensity of forest and bush fires around the world. Forest fires that have been part of natural cycles are becoming more frequent, more severe, and more widespread. In the United States, forest fires have become more frequent, more severe, and more widespread. In the United States, forest fires have become more frequent, more severe, and more widespread. In the United States, forest fires have become more frequent, more severe, and more widespread.

Australian bush fires

- The Australian bush fire season 2019-2020 (also known as the Black Summer) was a period of unusually intense bush fires throughout Australia.
- The fire season normally begins around August, but began earlier in 2019. Major fires peaked between January 2020. An estimated 186,000 square kilometers of bush and cropland was destroyed.
- Australia is particularly prone to intense bush fires but fire frequency and intensity are increasing. Some areas naturally experience more frequent fires, but the world is warming, and fires are becoming more frequent, more severe, and more widespread.
- Fire season normally begins around August, but began earlier in 2019. Major fires peaked between January 2020. An estimated 186,000 square kilometers of bush and cropland was destroyed.



Smoke from Australian bush fires as seen from the ISS

- Australia is particularly prone to intense bush fires but fire frequency and intensity are increasing. Some areas naturally experience more frequent fires, but the world is warming, and fires are becoming more frequent, more severe, and more widespread.
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Kangaroo Island fire



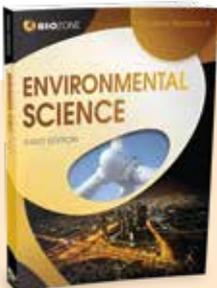
Scopelogrange Mountain fire NSW



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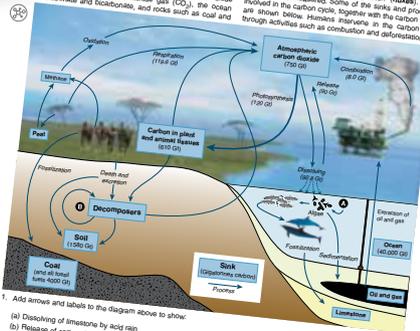
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14 The Carbon Cycle

Key Question: How does the cycling of carbon through the abiotic and biotic components of ecosystems make carbon continuously available to organisms?

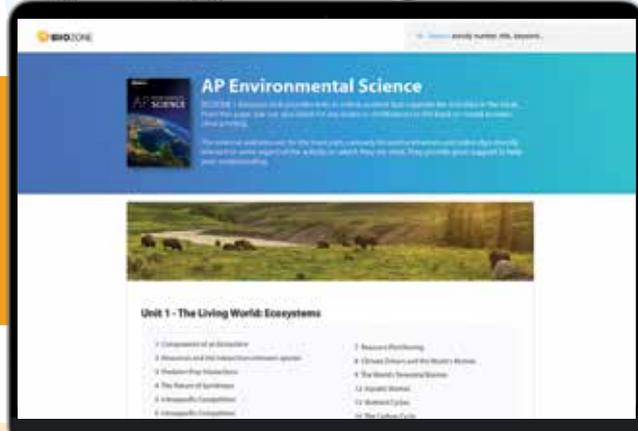
Carbon is an essential element of life and is incorporated into the organic molecules that make up living organisms. Large quantities of carbon are stored in **sinks**, which include as carbonate and bicarbonate, and rocks such as coal and limestone. Carbon cycles between the biotic and abiotic environments. Carbon dioxide is converted by autotrophs into carbohydrates via photosynthesis and returned to the atmosphere as CO_2 through respiration (R_{AT}). These are shown below. Humans contribute to the carbon cycle through activities such as combustion and deforestation.



- Add arrows and labels to the diagram above to show:
 - Dissolving of limestone by acid rain
 - Release of carbon from the marine food chain
 - Mining and burning of coal
 - Burning of peat in peatlands
- Name the processes that release carbon into the atmosphere:
 - _____
 - _____
 - _____
 - _____
- Name the four geological reservoirs (sinks) in the diagram above, that can act as a source of carbon:
 - _____
 - _____
 - _____
 - _____
- Identify the process carried out by plants in the diagram above:
 - _____

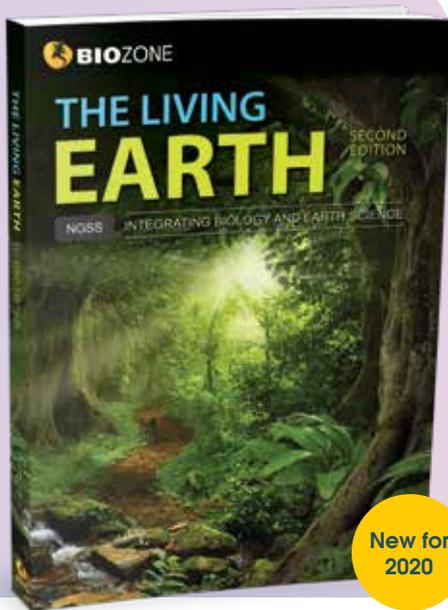
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- **Six Instructional Segments** provide the book's structure, enabling seamless navigation through the program. A reference chapter provides support for science and engineering practices.
- Full integration of the three dimensions of the **CA NGSS** enables students to deepen understanding of **Disciplinary Core Ideas** through their use of **Science and Engineering Practices** and application of **Crosscutting Concepts**.
- Activities provide multiple opportunities for students to use first-hand experience to explain phenomena and develop engineering solutions to solve relevant problems.
- Formative and summative assessments address all three dimensions.
- Proficiency in mathematics and computational thinking are strongly supported.
- The **California Environmental Principles and Concepts** are incorporated throughout.
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66 How Cells Make Proteins

ENGAGE: Go boil your egg!

Eggs are 13% protein. They have a 'native' state and the loss of that native state is called denaturation. What happens when you subject the protein in egg white to heat or chemicals?

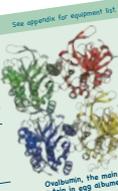


INVESTIGATION 5.3: Protein denaturation

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

1. Crack open an egg separating the yolk from the white. Place the white in a 250 mL beaker that is about half full of water. Heat the water until it is nearly boiling. Record what the egg white looks like before and after boiling.

2. Place about 100 mL of isopropyl alcohol (propen-2-ol or rubbing alcohol) into a 250 mL beaker. Crack open an egg separating the yolk from the white and place the white in the beaker. Stir the egg slowly and record the result.



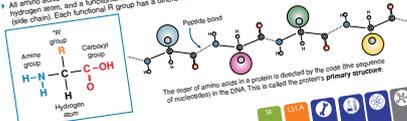
Ovalbumin, the main protein in egg albumin

- What did the heat and the alcohol do to the egg white protein?
 - Which one had the greatest effect on the egg when?
 - Can you think of another common way egg whites are denatured? Describe it.
- Look at the complex shape of a molecule of ovalbumin, the main protein in egg white. What do you think might be happening to the molecule when it is heated, mixed with alcohol, or beaten?

EXPLORE: Proteins are made of amino acids

Proteins are large molecules made up of many smaller units called amino acids. The amino acids are joined together by peptide bonds (between the amine and carboxyl groups). A chain of amino acids is therefore called a polypeptide. The sequence of amino acids in a protein is determined by the order of nucleotides in DNA.

All amino acids have a common structure (below left) with an amine group (blue), a carboxyl group (red), hydrogen atoms, and a functional or 'R' group (orange). Each type of amino acid has a different functional 'R' group (side chain). Each functional 'R' group has a different chemical property.



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The Digital Teacher's Edition includes suggested answers on each page in an interactive show/hide format, making it suitable for use with an interactive whiteboard.

EXPLAIN: Circulation and gas exchange

In humans and other vertebrates, the gas exchange (respiratory) system and circulatory system interact to supply oxygen and remove carbon dioxide from the body.

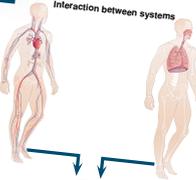
Circulatory system

Function

Delivers oxygen (O₂) and nutrients to all cells and tissues. Removes carbon dioxide (CO₂) and other waste products of metabolism. CO₂ is transported to the lungs.

- Components
- Heart
 - Blood vessels
 - Arteries
 - Veins
 - Capillaries
 - Blood

Interaction between systems

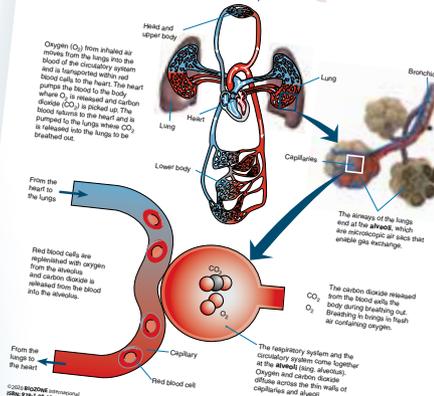


Gas exchange system

Function

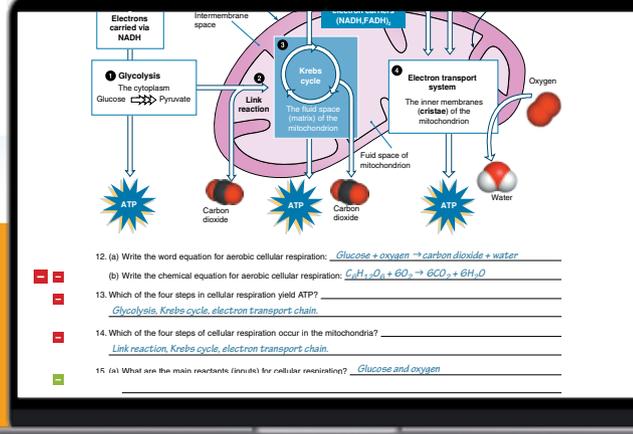
Provides facilities for gas exchange. Moves fresh air into the body and stale air out.

- Components
- Arteries
 - Larynx
 - Trachea
 - Lungs
 - Bronchi
 - Bronchioles
 - Alveoli
 - Diaphragm



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12. (a) Write the word equation for aerobic cellular respiration: $\text{Glucose} + \text{oxygen} \rightarrow \text{carbon dioxide} + \text{water}$

(b) Write the chemical equation for aerobic cellular respiration: $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$

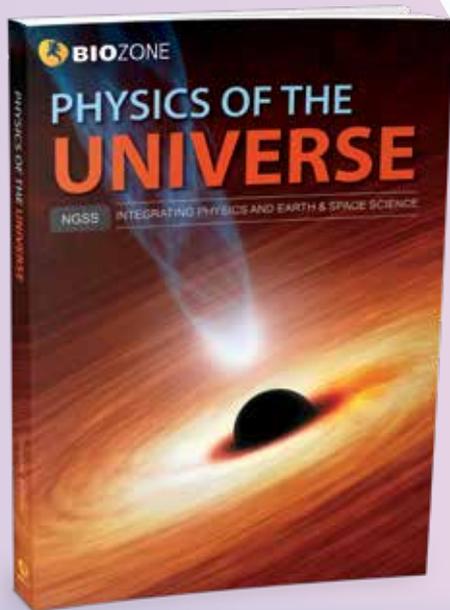
13. Which of the four steps in cellular respiration yield ATP?

Glycolysis, Krebs cycle, electron transport chain.

14. Which of the four steps of cellular respiration occur in the mitochondria?

Link reaction, Krebs cycle, electron transport chain.

15. (a) What are the main reactants (inputs) for cellular respiration? *Glucose and oxygen*



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Physics of the Universe Student Edition

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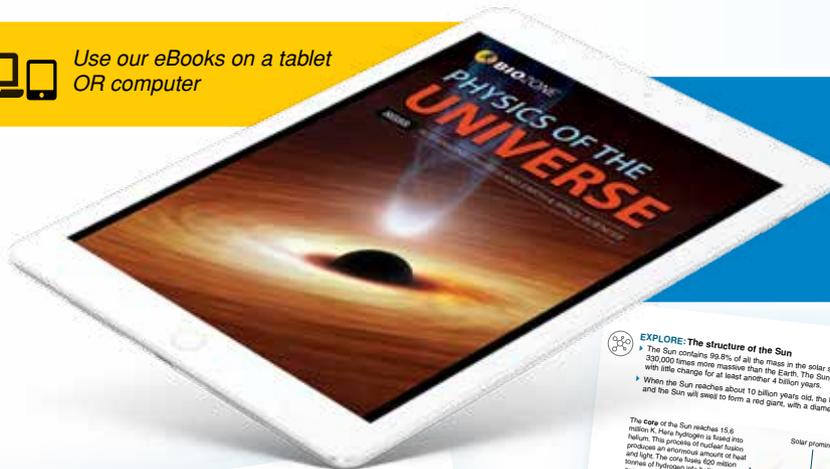
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46 The Sun

ENGAGE: Stardust

Almost all elements we know are formed in stars. The very lightest, hydrogen and helium, were formed during the Big Bang at the beginning of the universe. The very heaviest natural elements, apart from small amounts produced artificially by human technology, are formed during a supernova when massive stars collapse or explode near the end of their life cycle.



- Pepper often say "We are born of the stars". As a group discuss what you think this means. Summarize your thoughts below:
- Edward Robert Harrison was a British astronomer. One of his best known quotes is "Hydrogen is a light, odorless gas, which, given enough time, turns into people". In groups discuss what he means by this. Summarize your ideas below:

EXPLORE: Just how big is the Sun?

The Sun is a massive object. It has about 99.8% of the mass of the solar system in it. Imagining its true size can be difficult given there's clearly nothing on Earth even remotely that large.

INVESTIGATION 6.1: Measuring the diameter of the Sun

- Set up a pinhole camera by using a pin to punch a small hole through piece of aluminum foil. The foil can be held flat by taping it to a cardboard frame.
- In a sunny place, hold the aluminum foil up to the Sun allowing light to pass through the pin hole onto a sheet of paper. Move the paper back and forth until a sharp image of the Sun is formed (this image may be quite small).
- Measure the distance between the pinhole and paper where the image formed. Measure the diameter of the Sun's image.



The two triangles in the diagram above are geometrically similar. Therefore all corresponding sides are in the same ratio. This means the ratio of the $AB:AC$ is equal to the ratio of $DE:EC$. The distance AC is 150 million km. Therefore:

$$\frac{AB \text{ km}}{150,000,000 \text{ km}} = \frac{DE \text{ cm}}{EC \text{ cm}}$$

or

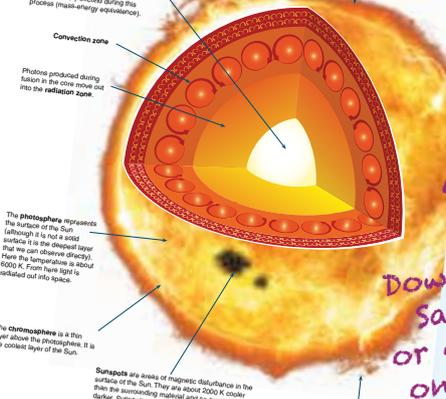
$$\frac{\text{Diameter of Sun (km)}}{150,000,000 \text{ km}} = \frac{\text{Diameter of image (cm)}}{\text{Distance from pinhole to image (cm)}}$$



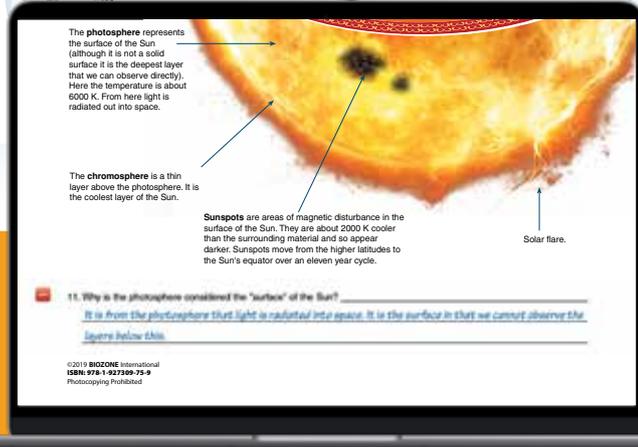
EXPLORE: The structure of the Sun

The Sun contains 99.8% of all the mass in the solar system. It has a diameter of 1,392,000 km and is more than 330,000 times more massive than the Earth. The Sun formed about 4.5 billion years ago and will continue to shine with little change for at least another 4 billion years.

When the Sun reaches about 10 billion years old, the hydrogen in its core will be exhausted. The core will shrink and the Sun will swell to form a red giant, with a diameter reaching out to the orbit of the Earth.

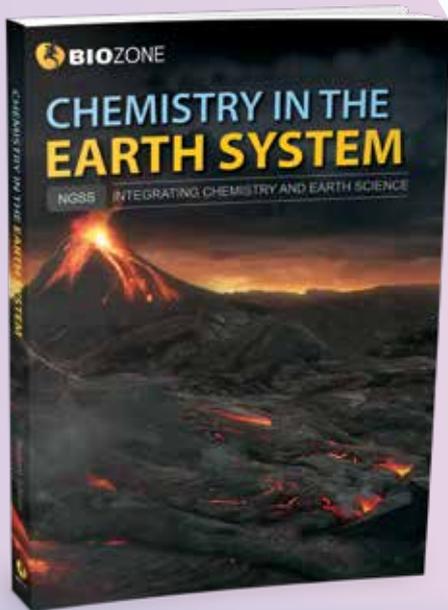


- Why is the photosphere considered the "surface" of the Sun?



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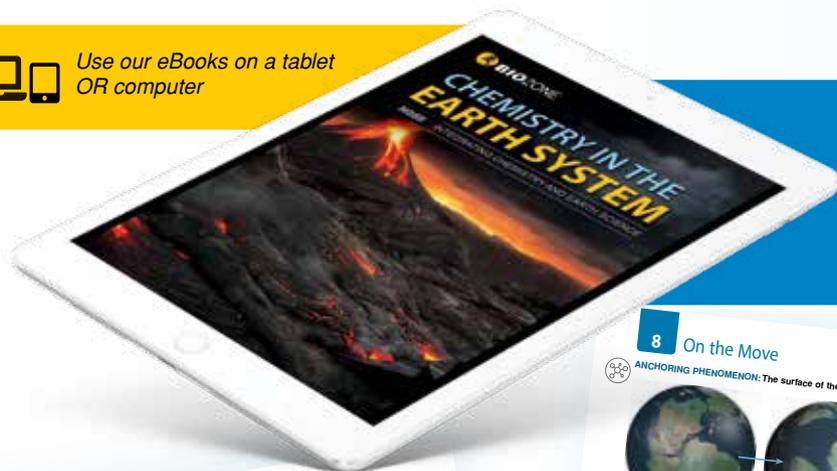
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9 Energy

ENGAGE: There she blows!

The photograph right shows an eruption of lava from Mauna Ulu, a volcanic cone on the island of Hawaii. The lava bubbling from the vent is glowing red hot whereas lava that emerged earlier has cooled and appears black. Where has the energy in the lava come from? Why does the lava from Mauna Ulu have a temperature greater than 1000°C? Why does the lava from a basaltic vent emerge at a basaltic vent? What causes the lava to cool?



- Have you ever seen volcanic activity of any sort? If so, describe it: _____
- Water boils at 100°C. Think about how long it takes a kettle to boil a liter of water. Compare this to the volume of lava produced during the eruption of Mauna Ulu which covers an area of 44 km², and the energy that must have been required to produce that amount of lava. What does this tell you about the energy stored in the Earth?

EXPLORE: Energy

Energy is a property of an object that allows it to do work. It may be transferred between objects and systems and transformed into different forms but it can not be created or destroyed. The amount of energy in a closed system is the same before and after a transformation. Energy is measured in Joules (J).

One simple way of measuring the energy in a system of energy transferred between objects is to measure the temperature or change in temperature. A thermometer measures the average energy of molecular motion in an object. It is also important in determining the amount of energy in a system. The amount of substance in an object (its mass) is also important in determining the amount of energy stored in it. In a 1 liter of water at 30°C, even though their temperatures are the same.

- Develop an understanding of energy and, in particular, how much energy is used or stored by certain objects or systems. Research the equivalent use of 10,000 J by the following five objects or substances:
 - How long it takes a 100 W light bulb to use 10,000 J of electrical energy: _____
 - How much 10,000 J will raise the temperature of 1 liter of water by in °C: _____
 - What volume of gasoline stores 10,000 J of energy: _____
 - What mass of table sugar (sucrose) stores 10,000 J of kinetic energy: _____
 - The speed in meters per second (m/s) of a 145 g baseball that has 10,000 J of kinetic energy: _____
- List four different "types" of energy that are commonly used in everyday language: _____
- A cup of hot water cools down over time. Where do you think the energy that was in the water went? _____



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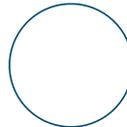
8 On the Move

ANCHORING PHENOMENON: The surface of the Earth is constantly moving



The image on the far right shows Earth as we know it today. The image on the left shows the Earth as we understand it looked during the early Jurassic period about 180 million years ago, based on a variety of evidence collected over the last hundred years. The continents have separated and rejoined many times over the billions of years of Earth's history. Continental drift describes the movement of the continents over the surface of the Earth. There is still a lot we do not understand about how this occurs, but clearly it involves massive energy sources beneath the Earth.

- Write down five things that you know (or think you know) about continental drift in the space below:
 - _____
 - _____
 - _____
 - _____
 - _____
- Discuss your ideas with other people in your class. Do they have different ideas to yours? Can they add to your current knowledge? Summarise any ideas you had not already thought of: _____
- The circle below represents a cross section of the Earth. Fill in the circle with what you think the Earth looks like in cross section. Add labels to your diagram.



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30 Energy and Chemical Reactions

ENGAGE: Heating things up

You may have heard of or even seen a thermite reaction (shown right). A thermite reaction occurs between a metal powder and a metal oxide. This reaction often produces an enormous amount of heat and must be done with extreme care.

The reaction can be written simply as: $M_x + M_2O \rightarrow M_2O + M_x$

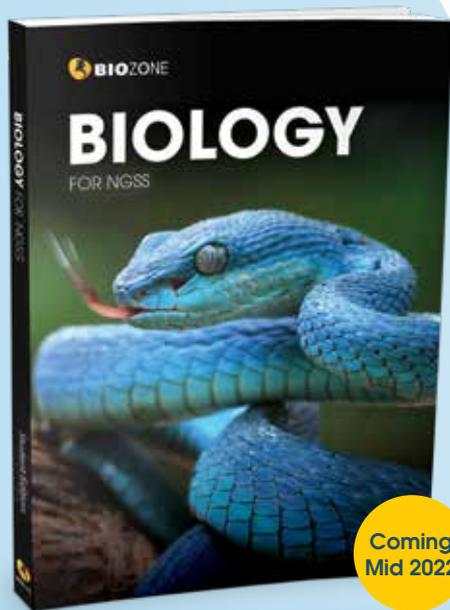
- A number of reactions that produce heat have been mentioned in this book so far. Write down those that you can remember and at least two others that produce heat: _____

The combustion of any substance is a magnesium fuel: _____

- When a reaction releases energy would the temperature of the surrounding environment increase or decrease?
Increase
- When a reaction uses energy would the temperature of the surrounding environment increase or decrease?
Decrease

(a) In the thermite reaction shown above, where is the heat coming from? The heat is coming from the formation of new, more stable bonds in the products that contain less energy (which is released)





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Biology for NGSS Student Edition

Biology for NGSS has been specifically written to meet the requirements of the **Next Generation Science Standards (NGSS)** for high school **Life Sciences (HS-LS)**. Users of this truly NGSS-aligned resource can be assured that the three dimensions (Disciplinary Core Ideas, Science and Engineering Practices, and Crosscutting Concepts) form the basis of each activity.

Structured on the Disciplinary Core Ideas of the NGSS framework, this title provides a flexible approach to delivering NGSS. BIOZONE'S high-quality infographics and inquiry-driven pedagogical approach inspires students to be curious about the scientific world. Our unique, interactive worktext approach encourages direct interaction with the content, allowing students to record their answers within the context of the stimulus material and form a record of work for quick and easy revision.

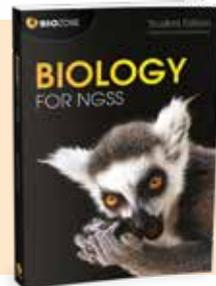
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We understand the challenges of delivering NGSS within a **differentiated classroom**. BIOZONE's **Teacher Toolkit** is a suite of meaningful delivery and assessment tools empowering teachers to deliver NGSS to students of all abilities. Use the Teacher Toolkit to plan lessons, enhance content delivery, engage students and deliver assessments.

See page 2 for more details about our Teacher Toolkit

Features include: full color, updated content, increased number of practical investigations, equipment list, enhanced teacher coding.

Coming soon: Pacing guide, Spanish glossary



Replaces earlier edition
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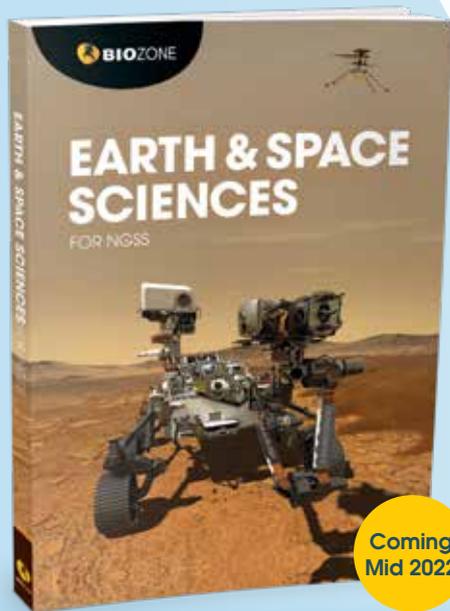
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Structured on the Disciplinary Core Ideas of the NGSS framework, this title provides a flexible approach to delivering NGSS. **BIOZONE'S** high-quality, infographics and inquiry-driven pedagogical approach inspires students to be curious about the scientific world. Our unique, interactive worktext approach encourages direct interaction with the content, allowing students to record their answers within the context of the stimulus material and form a record of work for quick and easy revision.

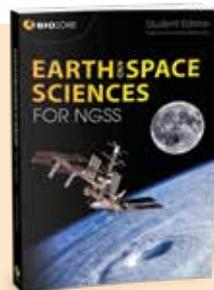
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See [page 2](#) for more details about our Teacher Toolkit

Features include: *full color, updated content, increased number of practical investigations, equipment list, enhanced teacher coding.*

Coming soon: *Pacing guide, Spanish glossary*



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52 Information from Probe Missions

Key Idea: Information from a large number of space probes has helped us understand the earliest history of Earth.

Comets

Comets are chunks of frozen rock, dust, water, and gas that move through the solar system in highly eccentric orbits. Short-term comets originate in the Kuiper belt whereas long-term comets originate in the Oort cloud. Passing by the Sun causes them to heat up, vaporize the water, dust, and gas, and creating a long tail that always points away from the Sun. Comets represent material from the early solar system. Eight space probes have carried out missions to nearby comets.



Comet McNaught (also known as the Great Comet of 2007) as seen from New Zealand just before sunset.

Rosetta

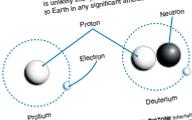
The Rosetta space probe was launched by the ESA in 2004. It made a gravity assist from Mars, and by way of the comets 2867 Šteins and 21 Lutzka, Rosetta then entered orbit around comet 67P/Churyumov-Gerasimenko in August 2014. The Rosetta space probe reached comet 67P and orbited it for 2 years.



Philae failed to land correctly. It bounced along the surface of the comet and came to rest in a dark valley where it eventually ran out of batteries.

Comet 67P/Churyumov-Gerasimenko orbits the Sun every 6.46 years at a perihelion of 1.2 AU and an aphelion of 5.4 AU. It is 4.3 km long by 4.1 km wide.

Detecting water: Hydrogen atoms can be found as both a single proton with an electron (protium) or as a proton and neutron with an electron (deuterium). Deuterium is heavier than protium and reacts (electrolysis) in Earth's oceans in very rare (0.015%) of all hydrogen. In Earth's oceans, there is about one atom of deuterium in 6420 of hydrogen. Changes in this ratio in water molecules in comets or asteroids can help us understand the origin of Earth's water.



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DIGITAL TEACHER'S EDITION

The Digital Teacher's Edition includes suggested answers on each page in an interactive show/hide format, making it suitable for use with an interactive whiteboard.

59 Structure of the Earth

Key Question: What are the characteristics of each of the Earth's layers?

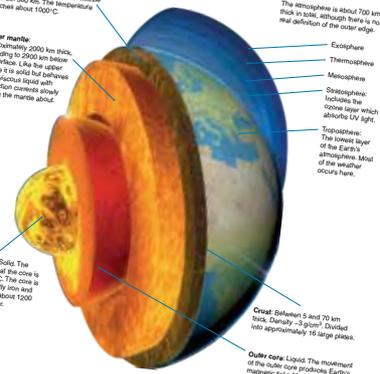
The Earth is layered due to the density of different materials in it. The Earth's crust has a density of about 3 g/cm³ while the core has a density of about 12 g/cm³. Movement of convection currents in the mantle shifts the plates of the Earth's crust, while movement of the outer core produces the Earth's magnetic field.

Upper mantle: Solid layer about 400 km thick with a transition layer between the upper and lower mantle of about 300 km. The temperature reaches about 1000°C.

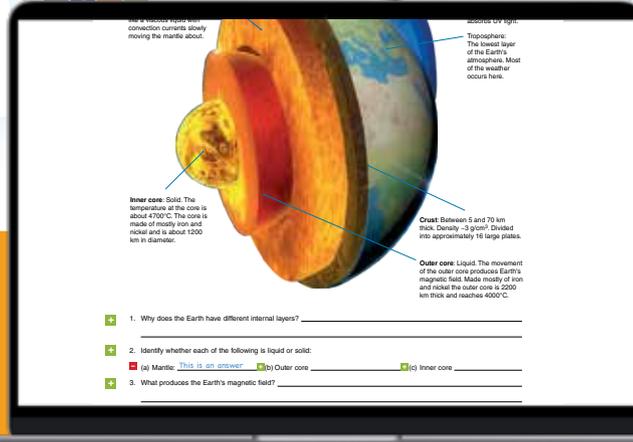
Lower mantle: Approximately 2000 km thick, extending to 2900 km below the surface. Like the upper mantle it is solid but behaves like a viscous liquid with moving the mantle about.

Inner core: Solid. The temperature at the core is about 4700°C. The core is made of mostly iron and nickel and is about 1200 km in diameter.

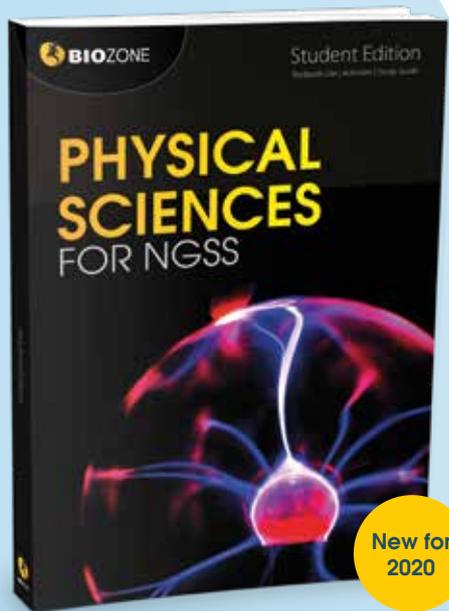
The atmosphere is about 700 km thick in total, although there is no real definition of the outer edge.



- Why does the Earth have different internal layers?
- Identify whether each of the following is liquid or solid.
 - Mantle: _____
 - Outer core: _____
 - Inner core: _____
- What produces the Earth's magnetic field?



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Physical Sciences for NGSS Student Edition

Physical Sciences for NGSS has been specifically written to meet the requirements of the Next Generation Science Standards (NGSS) for high school Physical Sciences (HS-PS). It encompasses all three dimensions of the standards (science and engineering practices, crosscutting concepts, and disciplinary core ideas), addressing the program content through a wide range of engaging student-focused activities and investigations.

Through completion of these activities, students build a sound understanding of science and engineering practices, recognize and understand the concepts that link all domains of science, and build the knowledge base required to integrate the three dimensions of the standards to meet the program's performance expectations.

Benefits

The Disciplinary Core Ideas (DCIs) provide the structural framework for the book, dividing it into four sections. Each chapter comprises a range of activities designed and sequenced to scaffold learning using a 5Es instructional approach. Specific performance expectations are identified and addressed within each chapter and assessed through specific activities including, but not restricted to, specifically designed, three-dimensional summative assessments.

Science and Engineering Practices are fully integrated throughout with activities to develop skills in practical investigation, collaboration, analyzing and interpreting data, developing and using models, and constructing explanations from evidence. A supporting introductory chapter acts as a reference and provides students with additional opportunities to practice the mathematical and inquiry-based skills required at this level.

Crosscutting concepts are fully integrated and identified throughout, allowing students to make connections between the core themes in science across different topics.

Nature of Science: Students develop an understanding of the nature of science through incorporation of its basic principles into activities. The teacher's edition provides teacher guidance on this aspect.

Engineering Design: The Engineering Design component of NGSS has been incorporated as appropriate through activities that engage the student in designing and evaluating solutions to real world problems. This aspect of the standards provides an exciting opportunity for students to apply their knowledge in a creative way, with due consideration to social and environmental concerns.

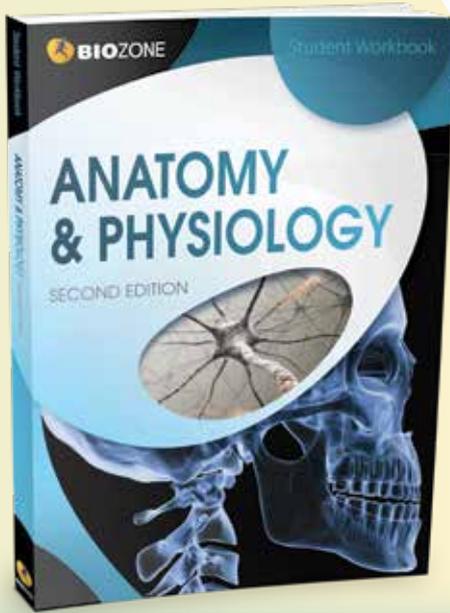
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Anatomy and Physiology Student Edition

BIOZONE's Anatomy and Physiology Student Workbook explores the essentials of human structure and function through engaging, generously illustrated write-on activities.

Homeostasis provides the unifying theme throughout the workbook and key interactions between body systems are indicated using annotated introductory figures.

Using key examples, students are encouraged to explore each body system within the contexts of disease, medicine and technology, aging, and exercise. The result is a rounded exploration of the functioning human.

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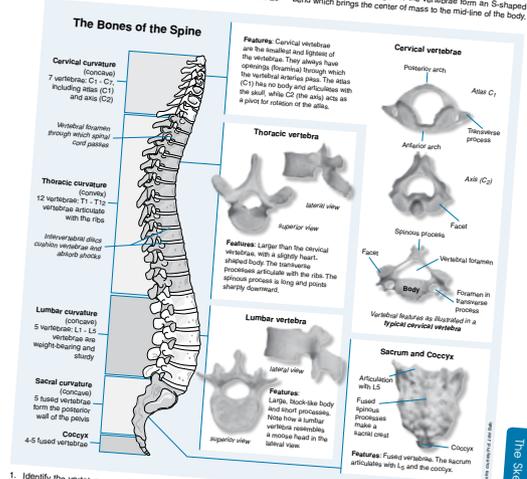
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The Bones of the Spine

The spine supports the skull and shoulder girdle and transmits the weight of the upper body to the lower limbs. It also forms a protective tube for the spinal cord. The spine is formed from 26 bones, separated and connected by discs of cartilage called the **intervertebral discs**. Together the vertebrae form the S-shaped band which brings the center of mass to the mid-line of the body.



- Identify the vertebrae associated with each of the following features:
 - Functional role in bearing much of the spinal load: _____
 - Articulate with the ribs. Vertebral body is heart shaped (highlight this on the diagram): _____
 - Articulates with the skull and lacks a vertebral body: _____
 - Typically has a small body and foramina (openings) in the transverse processes: _____
 - Forms the posterior wall of the bony pelvis: _____
- Suggest a function of the S-shape of the spine: _____
- At birth, the spine consists of 33 bones, 9 more than an adult. What happens to these extra bones? _____

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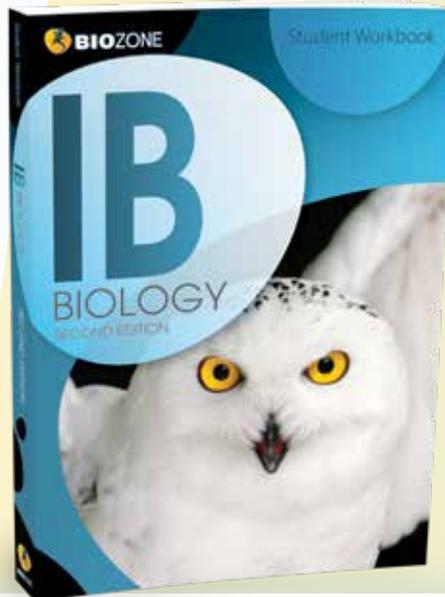
Related activities: The Human Skeleton
 Weblinks: The Vertebral Column

RA 2

IB Biology Student Edition

The second edition of BIOZONE's popular student workbook for IB Biology provides the core and AHL content in a single, comprehensive volume. The workbook's structure accommodates both integrated and spiral approaches to the course, with core material for both SL and HL material clearly identified and easily located.

Each chapter is prefaced with clear learning objectives based on the Understandings, Skills, and Applications central to the IB Diploma Program for Biology. Objectives and content to address Theory of Knowledge and International-mindedness are integrated throughout.



104 **79 Eukaryotic Chromosome Structure**

Key Idea: Eukaryotic DNA is located in the cell nucleus. A DNA molecule is very long. It must be wound up to fit into the cell's nucleus. Eukaryotes package their DNA as discrete linear chromosomes. The number of chromosomes varies from species to species. The way the DNA is packaged changes during the life cycle of the cell, but classic chromosome structures (below) appear during metaphase of mitosis.

In eukaryotes, chromosomes are located in the nucleus.

The DNA strand wraps around packaging proteins called histone proteins. When the DNA is wrapped up, it takes up less space than if it was spread out.

When DNA is wrapped around histone proteins, it forms a protein and DNA complex called chromatin.

Genes on a chromosome can only be expressed when the DNA is unwound.

DNA has a double helix structure.

DNA is made up of many building blocks called nucleotides joined together.

1. Where is the DNA located in eukaryotes? _____
2. Why does DNA need to be packaged up to fit inside a cell nucleus? _____
3. How do histone proteins help in the coiling of DNA? _____
4. What is the difference between an exon and an intron? _____

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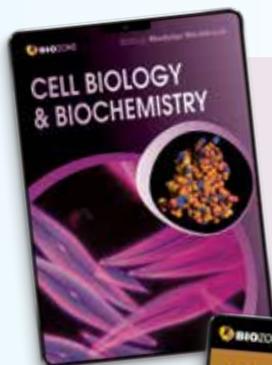
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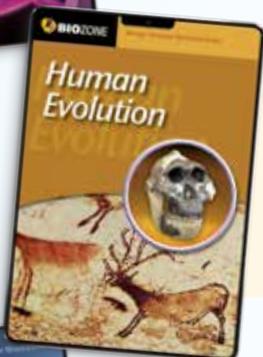


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Cell Biology & Biochemistry

Challenging concepts are presented clearly and in a way that is accessible even to those with a limited background in chemistry. Cell Biology & Biochemistry covers the structure, function, and study of cells and their components and is an ideal support volume for a wide range of courses in life sciences.



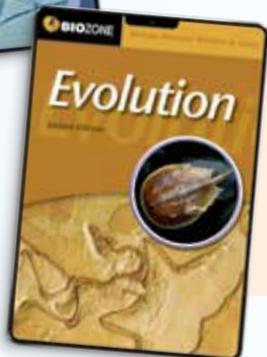
Human Evolution

A comprehensive treatment of human origins; one of biology's most controversial and rapidly changing topics. With an engaging treatment of primate biology, and full up-to-date coverage of both human physical and cultural evolution, Human Evolution is the perfect supplement for both biology and anthropology students.



Microbiology & Biotechnology

This compact but thorough supplement provides objectives and activities through which students can explore aspects of microbial diversity and modern biotechnology, including genetic engineering, cloning, and genome research.

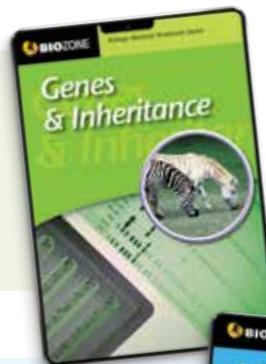


Evolution

A fresh approach to teaching evolutionary principles at this level. Students are invited to explore and critically evaluate the wealth of evidence for our current understanding of evolution through a variety of engaging and thought-provoking activities.

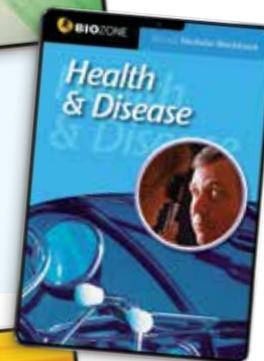
Genes & Inheritance

A seamless integration of fundamental concepts and new information, Genes & Inheritance offers students ample opportunity to both consolidate and extend their knowledge in the rapidly developing areas of molecular genetics and heredity.



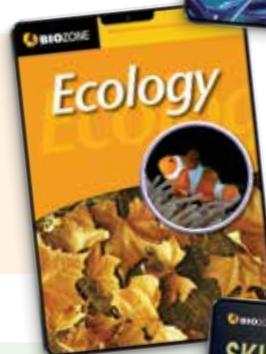
Health & Disease

The ideal companion for students of the life sciences. Health & Disease provides comprehensive coverage of human health, human disease, and the role of modern medicine in treating and preventing health disorders.



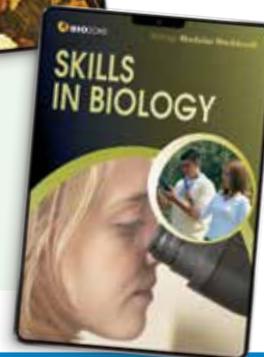
Ecology

Explore fundamental concepts in ecology, from the nature of ecosystems and the basics of ecosystem structure and function, to the complex relationships within and between species and between humans and their environment.



Skills in Biology

An essential supplement for all biology students, Skills in Biology provides clear guidelines for planning and executing biological investigations in both the laboratory and the field. Comprehensive coverage of data handling and analysis is also provided.



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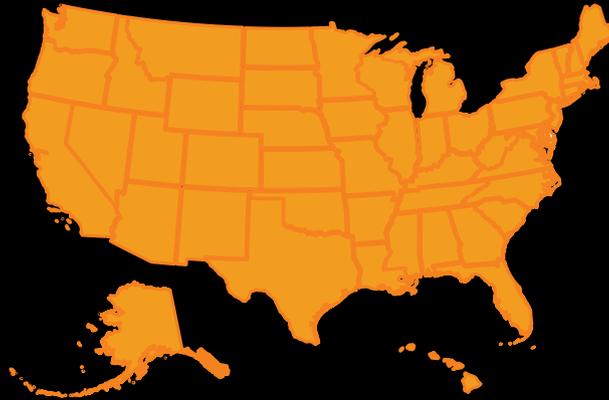
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