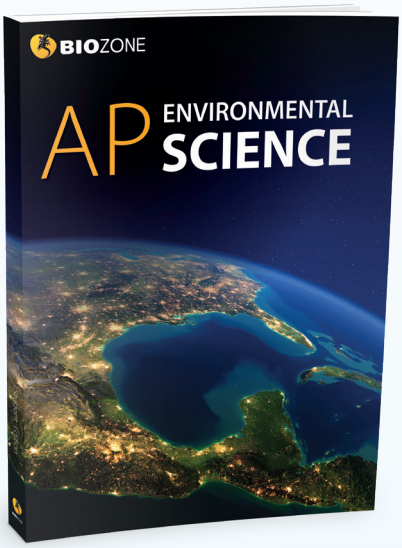
AP Environmental Science



BIOZONE's new AP Environmental Science is a dedicated title to address the new APES CED. Using current case studies and data, **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.

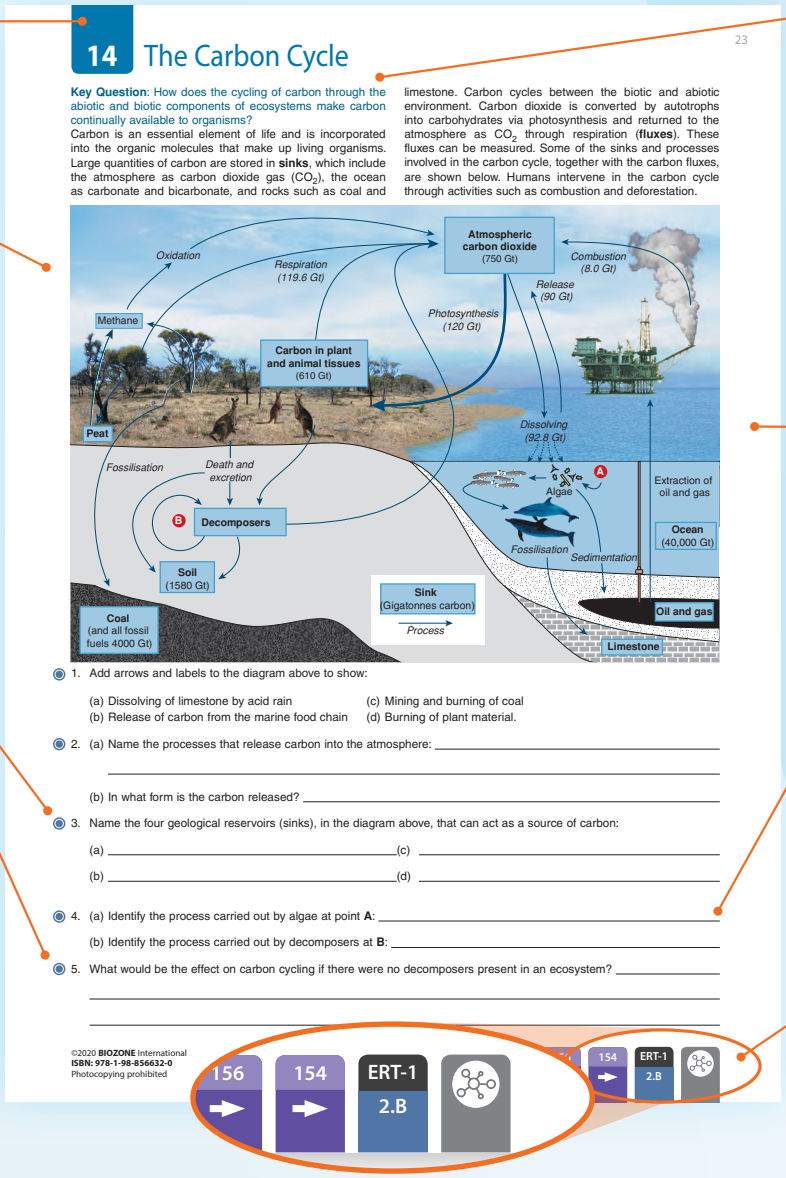
Activity Page

Activity number
Activities are numbered to make navigation through the book easier.

Comprehensive diagrams
provide an engaging, highly visual delivery of the important information.

Data driven activities
Answering questions based on the analysis and interpretation of real world data develops core skills in evidence-based reasoning and logical thinking. Communicating these analyses effectively builds skills in literacy.

Critical thinking questions
A direct questioning style helps students to easily identify what is being asked. A wide range of tasks, including free response, data analysis and presentation, and interpretation and evaluation of evidence, scaffold student learning to build confidence and competence.



14 The Carbon Cycle

23

Key Question: How does the cycling of carbon through the abiotic and biotic components of ecosystems make carbon continually 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 the atmosphere as carbon dioxide gas (CO_2), the ocean as carbonate and bicarbonate, and rocks such as coal and limestone. Carbon cycles between the biotic and abiotic environment. Carbon dioxide is converted by autotrophs into carbohydrates via photosynthesis and returned to the atmosphere as CO_2 through respiration (**fluxes**). These fluxes can be measured. Some of the sinks and processes involved in the carbon cycle, together with the carbon fluxes, are shown below. Humans intervene in the carbon cycle through activities such as combustion and deforestation.

Atmospheric carbon dioxide (750 Gt)
Oxidation
Respiration (119.6 Gt)
Combustion (8.0 Gt)
Release (90 Gt)
Photosynthesis (120 Gt)
Methane
Carbon in plant and animal tissues (610 Gt)
Peat
Dissolving (92.8 Gt)
Fossilisation
Death and excretion
Algae
Extraction of oil and gas
Decomposers
Ocean (40,000 Gt)
Fossilisation
Sedimentation
Soil (1580 Gt)
Sink (Gigatonnes carbon)
Process
Coal (and all fossil fuels 4000 Gt)
Oil and gas
Limestone

1. Add arrows and labels to the diagram above to show:
   (a) Dissolving of limestone by acid rain
   (b) Release of carbon from the marine food chain
   (c) Mining and burning of coal
   (d) Burning of plant material.
2. (a) Name the processes that release carbon into the atmosphere: _____
   (b) In what form is the carbon released? _____
3. Name the four geological reservoirs (sinks), in the diagram above, that can act as a source of carbon:
   (a) _____ (c) _____
   (b) _____ (d) _____
4. (a) Identify the process carried out by algae at point **A**: _____
   (b) Identify the process carried out by decomposers at **B**: _____
5. What would be the effect on carbon cycling if there were no decomposers present in an ecosystem? _____

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156 154 ERT-1 2.B

Key question
Each activity has a key question summarizing its primary focus. It helps students to understand where the activity's emphasis lies.

Content organization
Logically organized content makes it easier for students to access and engage with the information.

Write-on answers
Students write their answers directly onto the page. This becomes their record of work and helps them when it is time to review for tests and exams.

Activity coding system
Tab codes indicate online support via BIOZONE's Resource Hub and identify the key science practices and big ideas that spiral across topics and units.