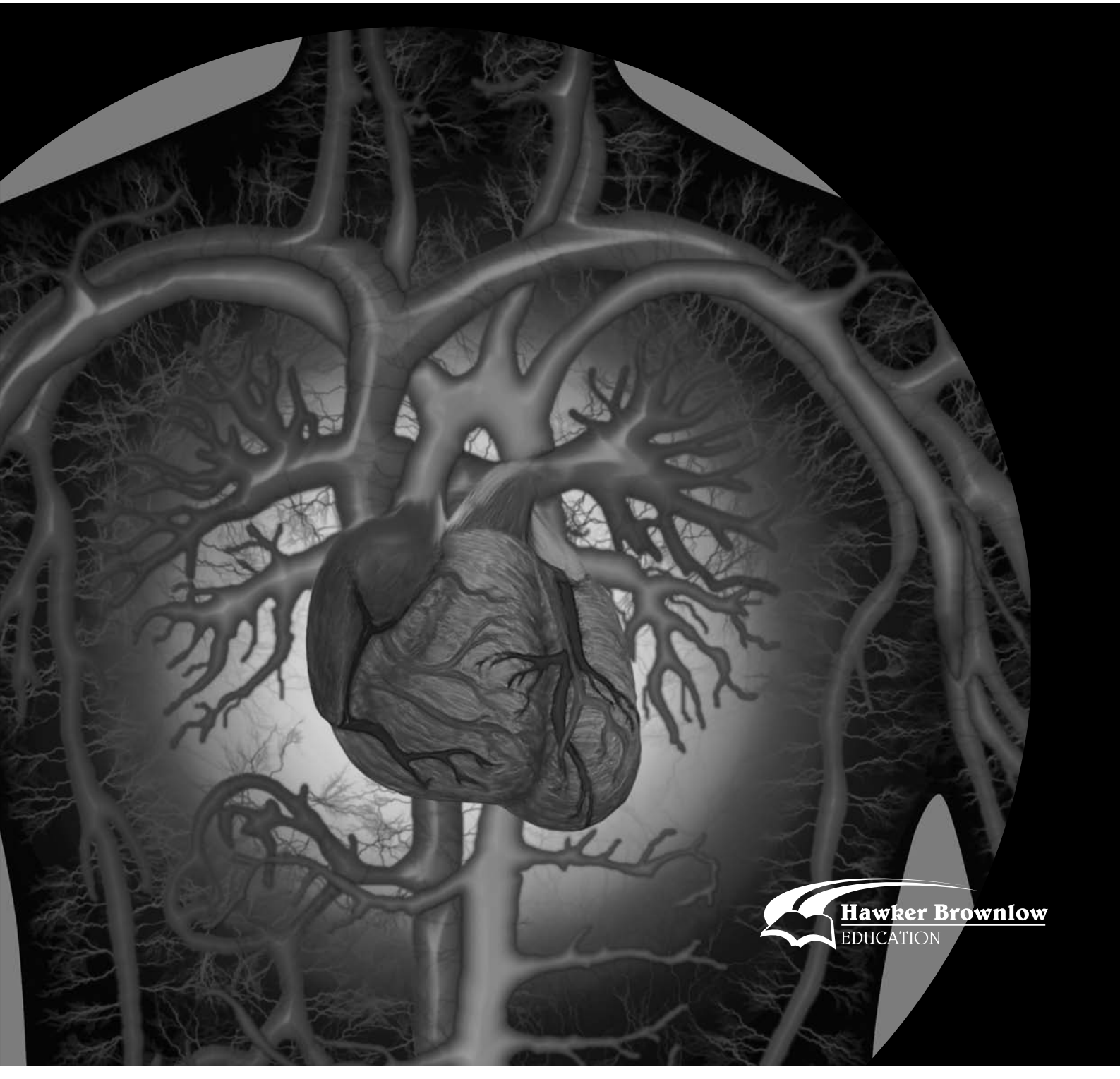
Teacher Guide

Science Passwords

Vocabulary for Science

Life Science



Hawker Brownlow
EDUCATION

Overview

Science Passwords: Vocabulary for Science is designed to build the vocabulary essential to understanding the key concepts students are studying in science. The topic areas and vocabulary words used in ***Science Passwords: Vocabulary for Science*** have been chosen based on the National Education Standards and the science standards developed by individual states. The topics and vocabulary words also align with the basal science textbooks of major publishers.

The ***Science Passwords: Vocabulary for Science*** program consists of eight books, Levels A to H, as well as individual **Earth Science, Life Science** and **Physical Science** books designed for use by older students.

Science Passwords: Vocabulary for Science is recommended for all students who need practice with the vocabulary that will help them succeed in science. These students may include English language learners as well as other striving learners. See pages 9–11 of this teacher guide for vocabulary teaching strategies that will help teachers meet the needs of all their students.

While the lessons in ***Science Passwords: Vocabulary for Science*** are grouped by topic area, each lesson may be taught independently. For a broad introduction to science, teachers may go through the book lesson by lesson. Alternatively, teachers may use only the lessons related to the science topic being taught in class. By providing an overview of year-level-appropriate science topics, ***Science Passwords: Vocabulary for Science*** may also be used to help students prepare and review for standardised tests in science.

The ***Science Passwords: Vocabulary for Science*** student book reading selections are available on an audio CD. The CD is a useful tool to use with English language learners or other students who would benefit from listening to the reading selections multiple times. Auditory learners will find listening to the selections on the CD especially helpful.

Student Books

Science Passwords: Vocabulary for Science student books have been written and designed to provide students with a text that is "considerate", or reader friendly. Three hallmarks of considerate text are: clear text structure, coherent writing and audience appropriateness. ***Science Passwords*** incorporates these characteristics of considerate text into every lesson.

Text Structure

The reading selections in ***Science Passwords*** feature text structures that exhibit clear organisational patterns. In descriptive text, information is given in a logical order of importance. For sequential text, events are presented in the order in which they occur. In cause-and-effect text, the relation between the actions or events is clearly stated.

Coherent Writing

The science concepts and ideas presented in ***Science Passwords*** are clearly stated. An introductory paragraph states the topic of the lesson. All the information in the reading selection connects to the topic. No extraneous material confuses readers. Headings and subheadings highlight the cohesion of each text segment. Transitional words and phrases signal the relation between actions or concepts.

Audience Appropriateness

Although the readability of ***Science Passwords*** reading selections is below year level, the concepts and material in the passages are year-level appropriate. Pre-reading activities activate students' prior knowledge. Activities that follow the reading selection help teachers evaluate student understanding.

Look for these signs of considerate text in the ***Science Passwords*** student books.

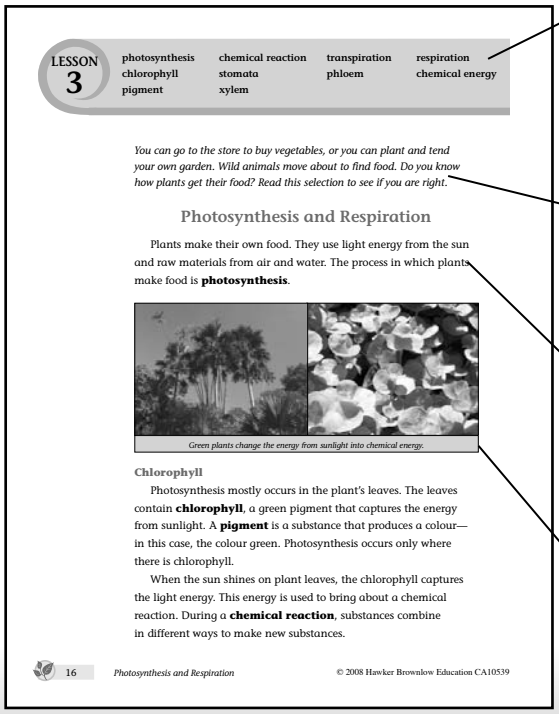
- Short line length for increased readability
- Simple sentence structure
- Paragraphs with clear topic sentences and relevant supporting details
- Introductory subheadings
- Target vocabulary words boldfaced in text
- Definitions of target vocabulary words near the first use of the word
- Simple font
- Clean page layout
- Appropriate, not overwhelming, visuals
- Illustrations support content

Each student book for Earth Science, Life Science, and Physical Science has 15 lessons. Each lesson introduces and practises ten key vocabulary words related to a single science topic.

Features of the Lesson

Each lesson of the student book contains these features:

- Target Vocabulary
- Lesson Opener
- Reading Selection
- Graphics
- Activities A–D
- Word Root
- Write!



LESSON 3

photosynthesis, chlorophyll, pigment, chemical reaction, stomata, xylem, transpiration, phloem, respiration, chemical energy

You can go to the store to buy vegetables, or you can plant and tend your own garden. Wild animals move about to find food. Do you know how plants get their food? Read this selection to see if you are right.

Photosynthesis and Respiration

Plants make their own food. They use light energy from the sun and raw materials from air and water. The process in which plants make food is **photosynthesis**.

Green plants change the energy from sunlight into chemical energy.

Chlorophyll

Photosynthesis mostly occurs in the plant's leaves. The leaves contain **chlorophyll**, a green pigment that captures the energy from sunlight. A **pigment** is a substance that produces a colour—in this case, the colour green. Photosynthesis occurs only where there is chlorophyll.

When the sun shines on plant leaves, the chlorophyll captures the light energy. This energy is used to bring about a chemical reaction. During a **chemical reaction**, substances combine in different ways to make new substances.

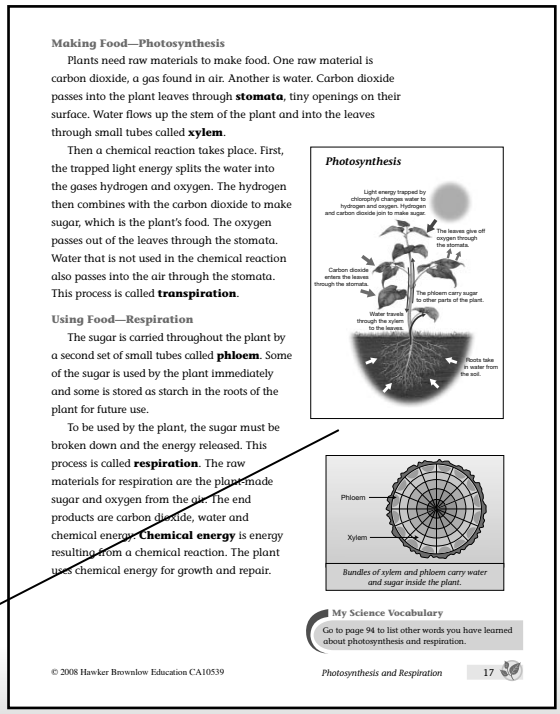
16 *Photosynthesis and Respiration* © 2008 Hawker Brownlow Education CA10539

Target Vocabulary
The ten thematically related target vocabulary words are listed at the beginning of each lesson.

Lesson Opener
Tap students' prior knowledge with this introductory paragraph.

Reading Selection
Reading selections use each target vocabulary word in context.

Graphics
Photos, illustrations, graphs, diagrams and charts expand and enhance meaning.



Making Food—Photosynthesis

Plants need raw materials to make food. One raw material is carbon dioxide, a gas found in air. Another is water. Carbon dioxide passes into the plant leaves through **stomata**, tiny openings on their surface. Water flows up the stem of the plant and into the leaves through small tubes called **xylem**.

Then a chemical reaction takes place. First, the trapped light energy splits the water into the gases hydrogen and oxygen. The hydrogen then combines with the carbon dioxide to make sugar, which is the plant's food. The oxygen passes out of the leaves through the stomata. Water that is not used in the chemical reaction also passes into the air through the stomata. This process is called **transpiration**.

Photosynthesis

Light energy trapped by chlorophyll changes water to hydrogen and oxygen. Hydrogen and carbon dioxide join to make sugar.
The leaves give off oxygen through the stomata.
Carbon dioxide enters the leaves through the stomata.
The phloem carry sugar to other parts of the plant.
Water travels through the xylem to the leaves.
Roots take in water from the soil.

Using Food—Respiration

The sugar is carried throughout the plant by a second set of small tubes called **phloem**. Some of the sugar is used by the plant immediately and some is stored as starch in the roots of the plant for future use.

To be used by the plant, the sugar must be broken down and the energy released. This process is called **respiration**. The raw materials for respiration are the plant-made sugar and oxygen from the air. The end products are carbon dioxide, water and chemical energy. **Chemical energy** is energy resulting from a chemical reaction. The plant uses chemical energy for growth and repair.

Phloem
Xylem

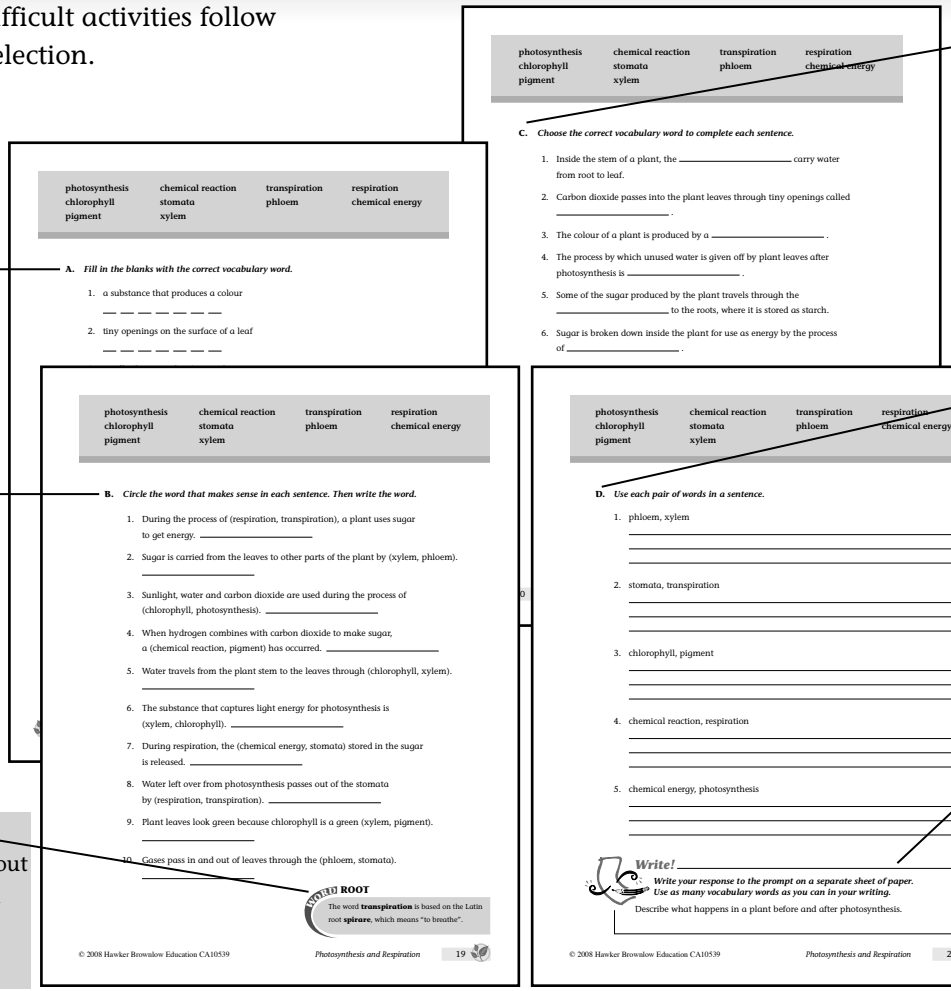
Bundles of xylem and phloem carry water and sugar inside the plant.

My Science Vocabulary

Go to page 94 to list other words you have learned about photosynthesis and respiration.

© 2008 Hawker Brownlow Education CA10539 *Photosynthesis and Respiration* 17

Progressively difficult activities follow each reading selection.



Activity A
Students write target vocabulary words with their meaning.

Activity B
Students choose the target vocabulary word that correctly completes a sentence.

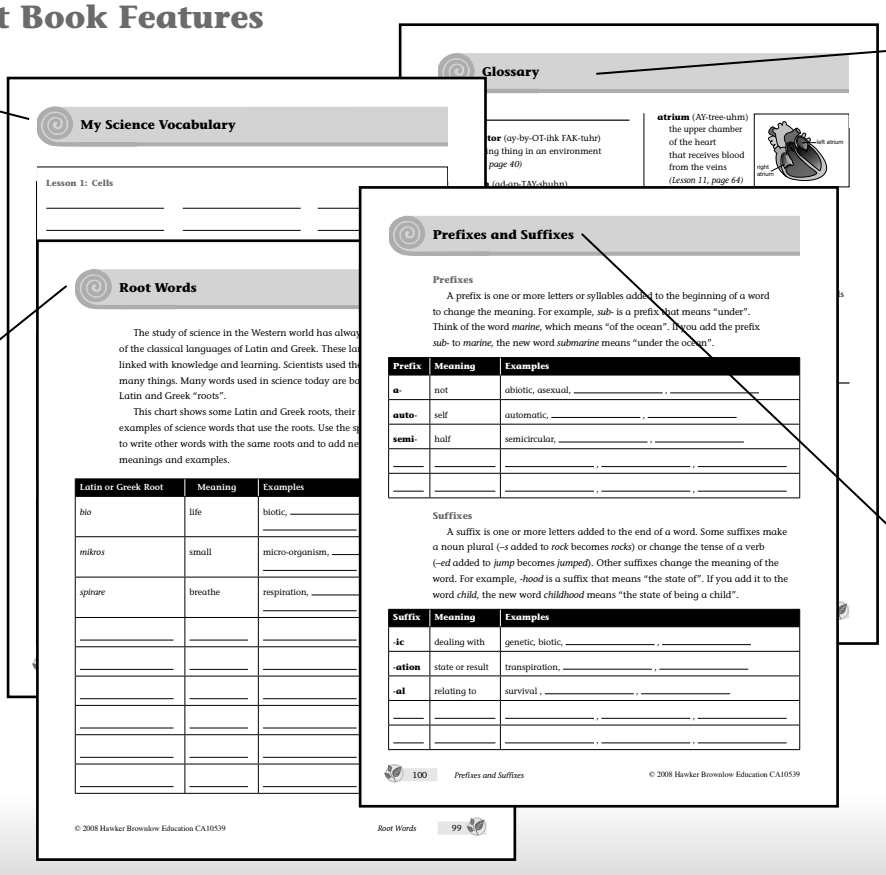
Word Root
Students learn about the Greek or Latin root of a target vocabulary word.

Activity C
Students use target vocabulary words in cloze sentences.

Activity D
Students create sentences using the target vocabulary words.

Write!
An independent writing activity strengthens and expands students' experience with the target vocabulary words.

Other Student Book Features



My Science Vocabulary
Students create a personal dictionary organised by topic area.

Root Words
Students complete a chart about the Greek or Latin roots of target vocabulary words.

Glossary
An illustrated glossary of the 150 target vocabulary words is found at the back of the book. Each entry includes a phonetic re-spelling and a simple definition, as well as the lesson number and page on which the word first appears.

Prefixes and Suffixes
Students complete charts about the meaning of the prefixes and suffixes found in target vocabulary words.

Teacher Guide

The Teacher Guide for ***Science Passwords: Vocabulary for Science*** contains resources that may be used to introduce, support and extend students' science vocabulary studies. The Teacher Guide includes guided instruction for each student-book lesson.

Multi-Step Lesson Plan

Science Passwords is built upon the premise that students benefit most from the direct instruction of vocabulary. Each lesson as presented in the Teacher Guide follows a multi-step lesson plan.

1. Introduction of the target vocabulary
2. Activation of students' prior knowledge
3. Provision of the meaning of unknown words
4. Creation by students of visual representations using graphic organisers
5. Further experiences with the target vocabulary
6. Activities that help students retain the word and its meaning

Listening, Speaking, Reading and Writing

Science Passwords provides opportunities for students to practise the target vocabulary words while listening, speaking, reading and writing. These icons indicate opportunities for students to use the vocabulary words in different domains.

 Listening

 Speaking

 Reading

 Writing

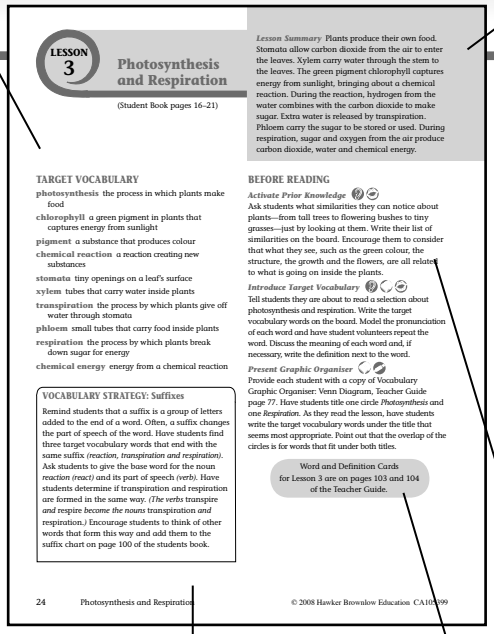
Features of the Guided Teaching Lessons

Each lesson of the Teacher Guide contains these features:

- Target Vocabulary with definitions
- Vocabulary Strategy
- Lesson Summary
- Before Reading
- Word and Definition Cards
- Reproduced student book pages
- During Reading
- After Reading
- Annotated student book activity pages
- Extensions
- Ideas for introducing the Write! activity
- Sample answer for Write!
- Word Root extension

Target Vocabulary

The ten target vocabulary words are listed here with convenient, student-friendly definitions.



LESSON 3

Photosynthesis and Respiration

(Student Book pages 16–21)

Lesson Summary Plants produce their own food. Stomata allow carbon dioxide from the air to enter the leaves. Xylem carry water through the stem to the leaves. The green pigment chlorophyll captures energy from sunlight, bringing about a chemical reaction. During the reaction, hydrogen from the water combines with the carbon dioxide to make sugar. Extra water is released by transpiration. Phloem carry the sugar to be stored or used. During respiration, sugar and oxygen from the air produce carbon dioxide, water and chemical energy.

TARGET VOCABULARY

photosynthesis the process in which plants make food
chlorophyll a green pigment in plants that captures energy from sunlight
pigment a substance that produces colour
chemical reaction a reaction creating new substances
stomata tiny openings on a leaf's surface
xylem tubes that carry water inside plants
transpiration the process by which plants give off water through stomata
phloem small tubes that carry food inside plants
respiration the process by which plants break down sugar for energy
chemical energy energy from a chemical reaction

VOCABULARY STRATEGY: Suffixes

Remind students that a suffix is a group of letters added to the end of a word. Often, a suffix changes the part of speech of the word. Have students find three target vocabulary words that end with the same suffix *(reaction, transpiration and respiration)*. Ask students to give the base word for the noun *reaction (react)* and its part of speech *(verb)*. Have students determine if transpiration and respiration are formed in the same way. *(The verbs* transpire *and* respire *become the nouns* transpiration *and* respiration.*)* Encourage students to think of other words that form this way and add them to the suffix chart on page 100 of the students book.

BEFORE READING

Activate Prior Knowledge
Ask students what similarities they can notice about plants—from tall trees to flowering bushes to tiny grasses—just by looking at them. Write their list of similarities on the board. Encourage them to consider that what they see, such as the green colour, the structure, the growth and the flowers, are all related to what is going on inside the plants.

Introduce Target Vocabulary
Tell students they are about to read a selection about photosynthesis and respiration. Write the target vocabulary words on the board. Model the pronunciation of each word and have student volunteers repeat the word. Discuss the meaning of each word and, if necessary, write the definition next to the word.

Present Graphic Organiser
Provide each student with a copy of Vocabulary Graphic Organiser: Venn Diagram, Teacher Guide page 77. Have students title one circle *Photosynthesis* and one *Respiration*. As they read the lesson, have students write the target vocabulary words under the title that seems most appropriate. Point out that the overlap of the circles is for words that fit under both titles.

Word and Definition Cards for Lesson 3 are on pages 103 and 104 of the Teacher Guide.

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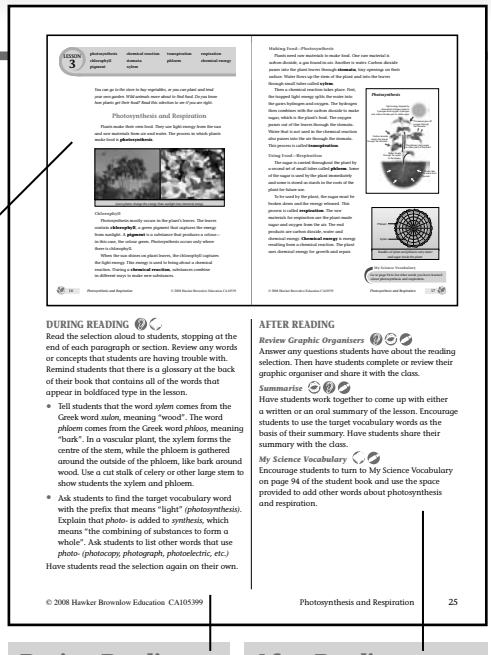
Lesson Summary

Use the summary for a quick introduction to the topic of the lesson.

Reproduced Student Book Pages

Student book lessons are reproduced for easy reference.



LESSON 3 photosynthesis chlorophyll pigment chemical reaction stomata xylem transpiration phloem respiration chemical energy

Photosynthesis and Respiration

Chlorophyll

Making Food—Photosynthesis

Using Food—Respiration

Photosynthesis

DURING READING

Read the selection aloud to students, stopping at the end of each paragraph or section. Review any words or concepts that students are having trouble with. Remind students that there is a glossary at the back of their book that contains all of the words that appear in boldfaced type in the lesson.

- Tell students that the word *xylem* comes from the Greek word *xulon*, meaning "wood". The word *phloem* comes from the Greek word phloos, meaning "bark". In a vascular plant, the xylem forms the centre of the stem, while the phloem is gathered around the outside of the phloem, like bark around wood. Use a cut stalk of celery or other large stem to show students the xylem and phloem.
- Ask students to find the target vocabulary word with the prefix that means "light" *(photosynthesis)*. Explain that *photo-* is added to *synthesis*, which means "the combining of substances to form a whole". Ask students to list other words that use *photo- (photocopy, photograph, photoelectric, etc.)*

Have students read the selection again on their own.

AFTER READING

Review Graphic Organisers
Answer any questions students have about the reading selection. Then have students complete or review their graphic organiser and share it with the class.

Summarise
Have students work together to come up with either a written or an oral summary of the lesson. Encourage students to use the target vocabulary words as the basis of their summary. Have students share their summary with the class.

My Science Vocabulary
Encourage students to turn to My Science Vocabulary on page 94 of the student book and use the space provided to add other words about photosynthesis and respiration.

© 2008 Hawker Brownlow Education CA105399 Photosynthesis and Respiration 25

Before Reading

Questions and activities activate student's prior knowledge, build background and motivate students to read. Graphic organisers are provided to build students' understanding of the target vocabulary words.

Vocabulary Strategy

A vocabulary strategy that is particularly appropriate for the lesson is highlighted here.

Word and Definition Cards

Teacher Guide page references make it easy to find and use the word and definition cards.

During Reading

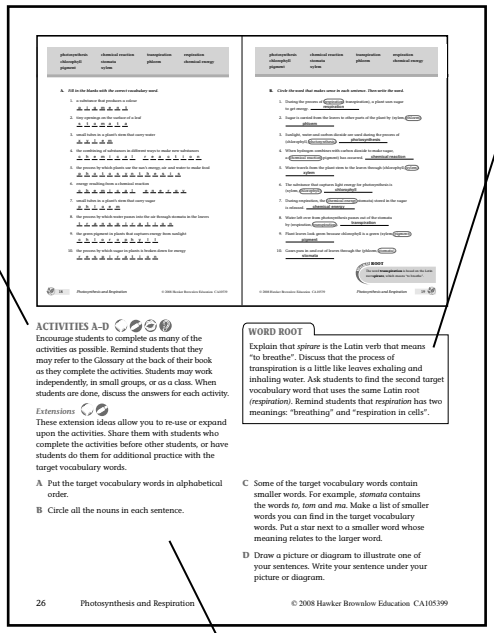
Includes suggestions for presenting the reading selection and tips for explaining possibly difficult or confusing target vocabulary words.

After Reading

Provides guidance in using the graphic organisers to sum up the lesson and reminders to direct students to My Science Vocabulary and the Glossary.

Activities

The reproduced student book activity pages are annotated.



photosynthesis chlorophyll pigment chemical reaction stomata xylem transpiration phloem respiration chemical energy

A. Fill in the blanks with the correct vocabulary word.

B. Circle the word that makes sense in each sentence. Then write the word.

ACTIVITIES A–D

Encourage students to complete as many of the activities as possible. Remind students that they may refer to the Glossary at the back of their book as they complete the activities. Students may work independently, in small groups, or as a class. When students are done, discuss the answers for each activity.

Extensions
These extension ideas allow you to re-use or expand upon the activities. Share them with students who complete the activities before other students, or have students do them for additional practice with the target vocabulary words.

A Put the target vocabulary words in alphabetical order.

B Circle all the nouns in each sentence.

WORD ROOT

Explain that *spirare* is the Latin verb that means "to breathe". Discuss that the process of transpiration is a little like leaves exhaling and inhaling water. Ask students to find the second target vocabulary word that uses the same Latin root *(respiration)*. Remind students that *respiration* has two meanings: "breathing" and "respiration in cells".

C Some of the target vocabulary words contain smaller words. For example, *stomata* contains the words *to, tom* and *ma*. Make a list of smaller words you can find in the target vocabulary words. Put a star next to a smaller word whose meaning relates to the larger word.

D Draw a picture or diagram to illustrate one of your sentences. Write your sentence under your picture or diagram.

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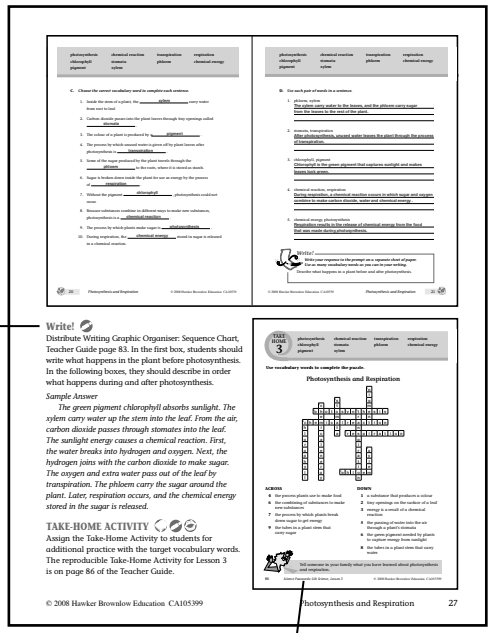
Word Root

Provides additional information about the student book Word Root.

Write!

Each guided lesson provides hints about presenting the Write! activity as well as a sample answer.



photosynthesis chlorophyll pigment chemical reaction stomata xylem transpiration phloem respiration chemical energy

C. Choose the correct vocabulary word to complete each sentence.

Write!

Distribute Writing Graphic Organiser: Sequence Chart, Teacher Guide page 83. In the first box, students should write what happens in the plant before photosynthesis. In the following boxes, they should describe in order what happens during and after photosynthesis.

Sample Answer

The green pigment chlorophyll absorbs sunlight. The xylem carry water up the stem into the leaf. From the air, carbon dioxide passes through stomates into the leaf. The sunlight energy causes a chemical reaction. First, the water breaks into hydrogen and oxygen. Next, the hydrogen joins with the carbon dioxide to make sugar. The oxygen and extra water pass out of the leaf by transpiration. The phloem carry the sugar around the plant. Later, respiration occurs, and the chemical energy stored in the sugar is released.

TAKE-HOME ACTIVITY

Assign the Take-Home Activity to students for additional practice with the target vocabulary words. The reproducible Take-Home Activity for Lesson 3 is on page 86 of the Teacher Guide.

TAKE-HOME 3

Use vocabulary words to complete the puzzle.

Photosynthesis and Respiration

ACROSS

DOWN

Tell someone in your family what you have learned about photosynthesis and respiration.

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Extensions

An extension idea for each student book activity allows the activities to be re-used or expanded.

Take-Home Activity

The Take-Home Activity for the lesson is reproduced with the answers provided.

Other Teacher Guide Features

- **Vocabulary Teaching Strategies**
  Information and tips about how to employ vocabulary teaching strategies that have proven effective with struggling learners and English language learners begin on page 9.

- **Research Summary**
  A summary of the research that forms the basis of ***Science Passwords: Vocabulary for Science*** is on pages 12–15.

- **Reproducibles**
  Pages 76–128 of the Teacher Guide contain reproducibles for you to share with students.

  ### Graphic Organisers

  You may either photocopy the graphic organisers for students to use or use the sample graphic organiser as a model for students to create their own. The Before Reading section of each guided lesson suggests a particular vocabulary graphic organiser to use with the lesson. The Write! section of each guided lesson suggests a writing graphic organiser to use with the Write! activity.

  - **Vocabulary Graphic Organisers**

    Word Web Students write a topic in the central circle. Then they group related target vocabulary words in the outer circles. Beside each circle, they write a phrase that explains why they grouped the words together.

    Word Chart Students use this graphic organiser to write a target vocabulary word, record its definition, list examples, use the word in a sentence, and draw a picture, a diagram, or write an equation about the word.

    Four Square In this graphic organiser, students write a target vocabulary word in the centre rectangle. They illustrate the word, use the word in a sentence, write a definition of the word and list the part of the word (roots, prefixes and suffixes) in the surrounding squares.

    Word Arrow Students use this graphic organiser to record target vocabulary words that follow a progression or sequence. They write the words that begin the sequence on the left of the arrow and add the target vocabulary words in the appropriate order, proceeding right to the arrow point.

  - **Writing Graphic Organisers**

    Main Idea and Details Chart This graphic organiser may be used with a variety of writing assignments. Students write a main idea in one box and the details that support it in another box.

    Idea Wheel This variation of a web can be used with different types of writing. Students write a topic or main idea in the centre of the wheel. On the spokes of the wheel, they add details or ideas about the topic or main idea.

    Narrative Map Use this graphic organiser when students are asked to write a narrative. They record the character(s) and setting(s) in the top boxes and the events of the narrative in the bottom box.

    Sequence Chart A sequence chart provides students with a visual representation of the steps in a process. In this organiser, they record the steps, in order, in a series of boxes.

  ### Word and Definition Cards

  Word cards for each target vocabulary word as well as cards with the definitions for the words are on pages 99–128 of this Teacher Guide. You may either cut the cards out of the book or photocopy them, cut them apart, and then use them. For ideas on how to use the word and definition cards, see page 10 of this Teacher Guide.

  ### Take-Home Activities

  Each student book lesson has a take-home activity for additional practice and an opportunity for students to share what they have learned with family members.

LESSON 7

Ecosystems

(Student Book pages 40–45)

Lesson Summary Ecology is the study of the interaction of biotic and abiotic factors in the environment. Large regions with similar climate and specific organisms are called biomes. Within biomes are ecosystems, where exchanges of energy and materials occur between biotic and abiotic factors. Each organism lives in a specific habitat and has a niche, or role, within it. In an ecosystem, competition may threaten a species. Overpopulation or overhunting may disturb an ecosystem's equilibrium.

TARGET VOCABULARY

biotic factor a living thing in the environment

abiotic factor a non-living thing in the environment

ecology the study of how living and non-living things interact

biome a large region with the same climate and organisms

ecosystem an area where living and non-living things exchange energy and materials

habitat the place an organism lives

niche what an organism does in its habitat

competition the struggle between living things for limited resources

threatened in danger of dying out

equilibrium the balance of organisms in an ecosystem

VOCABULARY STRATEGY: Roots, Prefixes and Suffixes

Remind students that knowing the meaning of the root of a word and any prefixes or suffixes added to the root can help them understand the meaning of an unknown word. Ask students to look at the target vocabulary words *biotic factor* and *abiotic factor*. Tell students that the root *bio-* means "life". The suffix *-ic* means "dealing with". *Biotic*, therefore, means "dealing with life, or living things". The word *abiotic* adds the prefix *a-*, which means "not". *Abiotic*, therefore, means "dealing with things that are not living". Ask students to list other words that use *bio-* *(biome, biography, biology, biosphere, bionics, etc.)*.

BEFORE READING

Activate Prior Knowledge

Bring in or have students bring in newspaper, magazine, or internet articles, or pictures that have to do with ecology. Discuss some of the issues presented in the articles and pictures and why they are important. Then have students complete this phrase: "Ecology is important to me because ____."

Introduce Target Vocabulary

Tell students they are about to read a selection about ecosystems. Write the target vocabulary words on the board. Model the pronunciation of each word and have student volunteers repeat the word. Discuss the meaning of each word and, if necessary, write the definition next to the word.

Present Graphic Organiser

Provide each student with a copy of Vocabulary Graphic Organiser: Word Web, Teacher Guide page 76. Have students write *Ecology* in the centre circle of the web. As they read the lesson, have students group related target vocabulary words in the outer circles. Have them write a phrase next to each circle that explains why they grouped the words together. Tell them they may add circles, if necessary.

Word and Definition Cards
for Lesson 7 are on pages 111 and 112
of the Teacher Guide.

LESSON 7

biotic factor | abiotic factor | ecology | biome | ecosystem | habitat | niche | competition | threatened | equilibrium

Ecology is a big topic in the news. What exactly is ecology? Why is it important? Read this selection to find out more about ecology.

Ecosystems

Ecology

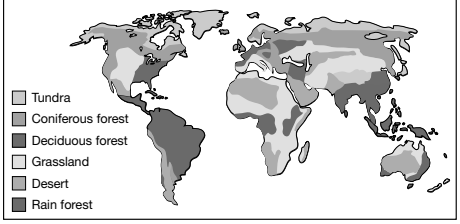
Everything that surrounds a living thing is its environment. The environment has both living and non-living things. Each living thing is a **biotic factor**. For example, all the animals and plants are biotic factors. Each non-living thing is an **abiotic factor**. Light, air and landforms are examples of abiotic factors.

Ecology is the study of how living things and non-living things in an environment act upon one another. Scientists study ecology to learn how to protect living things and the environment as a whole.

Biomes

A **biome** is a large region with specific plants and animals and the same climate. Among the six main land biomes are rain forests, grasslands and deserts. Water biomes include salt water and fresh water.

The Main Land Biomes



Ecosystems

Within biomes are smaller areas called ecosystems. In an **ecosystem**, the living and non-living things act upon one another by exchanging energy and materials. Ecosystems can be as large as a forest or as small as a seed. In an ecosystem, living things depend on the abiotic factors. They also depend on and compete with one another.

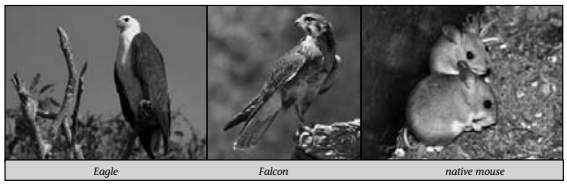
Habitat

Each organism in an ecosystem has a habitat that provides what the organism needs to live. The **habitat** is the place where an organism lives. For example, a koala's habitat is a tree.

Each organism in a habitat also has a niche. The **niche** is what the organism does in its habitat. For example, part of the niche of a koala is to collect and eat eucalypt leaves.

In a habitat, two species may need the same resources, such as water, food or space. The struggle between living things for limited resources is called **competition**. The competition for resources may put one or both of the species at risk. One species may become **threatened**, or close to being in danger of dying out.

For example, in an ecosystem, too many eagles and falcons hunting native mice may upset the **equilibrium**, or state of balance, among the animals. If too many native mice are eaten, they may become threatened. Then the falcons and eagles would also become threatened because they have lost their source of food.



Eagle *Falcon* *native mouse*

My Science Vocabulary

Go to page 96 to list other words you have learned about ecosystems.

DURING READING

Read the selection aloud to students, stopping at the end of each paragraph or section. Review any words or concepts that students are having trouble with. Remind students that there is a glossary at the back of their book that contains all of the words that appear in boldfaced type in the lesson.

- Starting with the word *environment*, have students list the words *habitat, biome, ecosystem* and *niche* in order from largest to smallest in area or range *(biome, ecosystem, habitat, niche)*.
- Use the map on page 40 to emphasise that biomes are very large areas with organisms that are adapted to the climate and conditions. The six major land biomes are rainforests, coniferous forests, deciduous forests, grasslands, deserts and tundra. Explain that the biomes are not really separated by thin boundaries as the map shows but blend into each other.
- Have students find the two words that begin with the same prefix *(ecology, ecosystem)*. Discuss that *eco-* comes from the Greek word *oikos*, which means "house", added to *logy*, meaning "study", for ecology, and added to *system*, meaning "a composite whole", for *ecosystem*. Help students understand that "house" should be taken figuratively, i.e. "Earth", not literally.

Have students read the selection again on their own.

AFTER READING

Review Graphic Organisers

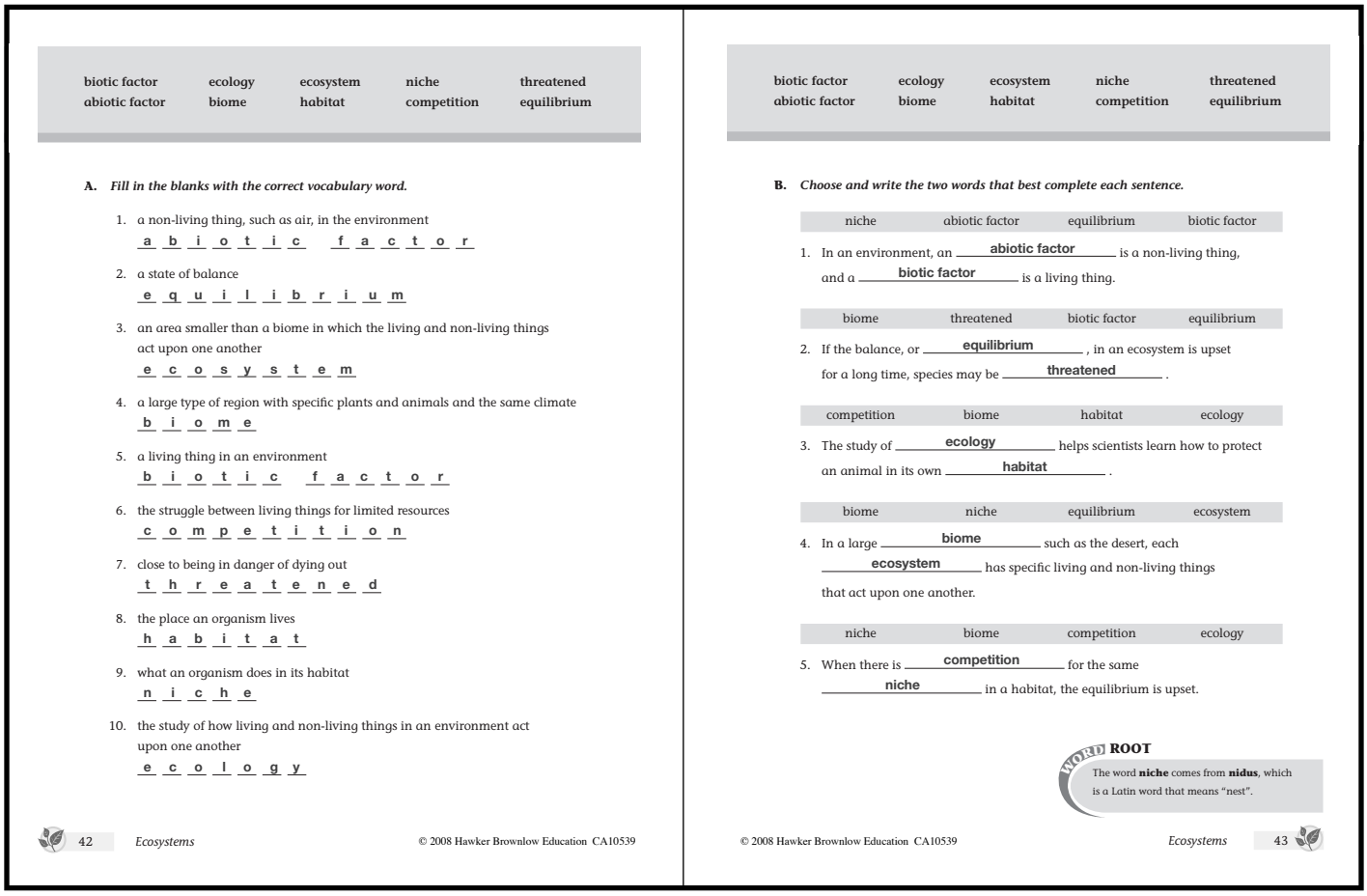
Answer any questions students have about the reading selection. Then have students complete or review their graphic organiser and share it with the class.

Summarise

Have students work together to come up with either a written or an oral summary of the lesson. Encourage students to use the target vocabulary words as the basis of their summary. Have students share their summary with the class.

My Science Vocabulary

Encourage students to turn to My Science Vocabulary on page 96 of the student book and use the space provided to add other words about ecosystems.



biotic factor | ecology | ecosystem | niche | threatened
abiotic factor | biome | habitat | competition | equilibrium

A. ***Fill in the blanks with the correct vocabulary word.***

1. a non-living thing, such as air, in the environment
   a b i o t i c f a c t o r
2. a state of balance
   e q u i l i b r i u m
3. an area smaller than a biome in which the living and non-living things act upon one another
   e c o s y s t e m
4. a large type of region with specific plants and animals and the same climate
   b i o m e
5. a living thing in an environment
   b i o t i c f a c t o r
6. the struggle between living things for limited resources
   c o m p e t i t i o n
7. close to being in danger of dying out
   t h r e a t e n e d
8. the place an organism lives
   h a b i t a t
9. what an organism does in its habitat
   n i c h e
10. the study of how living and non-living things in an environment act upon one another
    e c o l o g y

biotic factor | ecology | ecosystem | niche | threatened
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B. ***Choose and write the two words that best complete each sentence.***

niche | abiotic factor | equilibrium | biotic factor

1. In an environment, an **abiotic factor** is a non-living thing, and a **biotic factor** is a living thing.

biome | threatened | biotic factor | equilibrium

2. If the balance, or **equilibrium**, in an ecosystem is upset for a long time, species may be **threatened**.

competition | biome | habitat | ecology

3. The study of **ecology** helps scientists learn how to protect an animal in its own **habitat**.

biome | niche | equilibrium | ecosystem

4. In a large **biome** such as the desert, each **ecosystem** has specific living and non-living things that act upon one another.

niche | biome | competition | ecology

5. When there is **competition** for the same **niche** in a habitat, the equilibrium is upset.

WORD ROOT

The word **niche** comes from **nidus**, which is a Latin word that means "nest".

ACTIVITIES A–D

Encourage students to complete as many of the activities as possible. Remind students that they may refer to the Glossary at the back of their book as they complete the activities. Students may work independently, in small groups, or as a class. When students are done, discuss the answers for each activity.

Extensions

These extension ideas allow you to re-use or expand upon the activities. Share them with students who complete the activities before other students, or have students do them for additional practice with the target vocabulary words.

A Write the target vocabulary words in alphabetical order.

B Choose a target vocabulary word and draw a picture to illustrate its meaning. Post your picture.

C Rewrite each pair of sentences as a single sentence providing the same information.

D Write a second sentence that provides details or examples related to the sentence you wrote.

WORD ROOT

Ask students to provide or look up in a dictionary the meaning of the word *nest*. Then have students discuss how *nest* relates to the word *niche*. Lead them to understand that a nest is a place of nurture and safety, where baby birds or other animals are provided with everything they need to survive. In the same way, niche includes the places and the activities an organism needs to survive in its habitat.

biotic factor · abiotic factor · ecology · biome · ecosystem · habitat · niche · competition · threatened · equilibrium

C. *Write the vocabulary word that best completes each pair of sentences.*

1. A large type of region makes up a **biome**.
   A rainforest, dessert, or grassland is a **biome**.
2. Within a biome is a smaller area, or **ecosystem**.
   In an **ecosystem**, living and non-living things exchange energy and materials.
3. If a whole species is at risk of dying out, the species is **threatened**.
   Competition can result in a **threatened** species.
4. Each organism in a habitat has a **niche**.
   What an organism does in its habitat is its **niche**.
5. The struggle with another living thing for food is **competition**.
   Species can become threatened because of **competition**.
6. Each living thing in an environment is a **biotic factor**.
   A plant or an animal is a **biotic factor**.
7. The study of the living and non-living things in an environment is **ecology**.
   Scientists study **ecology** to help protect organisms.
8. A non-living thing is called an **abiotic factor**.
   Light, air or a landform is an **abiotic factor**.
9. A balanced state within a habitat is called **equilibrium**.
   Too many eagles hunting native mice can upset the **equilibrium**.
10. The place where an animal lives is its **habitat**.
    An animal's **habitat** provides what it needs to live.

biotic factor · abiotic factor · ecology · biome · ecosystem · habitat · niche · competition · threatened · equilibrium

D. *Use each word in a sentence that shows you understand the meaning of the word.*

1. ecosystem **An ecosystem has living and non-living things that exchange energy and materials.**
2. biome **One water biome is the saltwater biome.**
3. competition **If two species need the same food, competition may occur.**
4. habitat **The kind of place where an animal lives and finds what it needs is its habitat.**
5. biotic factor **In the environment, a living thing is a biotic factor.**
6. niche **One part of a koala's niche is to collect and eat eucalypt leaves.**
7. ecology **The study of ecology helps people protect species and the environment.**
8. equilibrium **A balanced state, or equilibrium, occurs when the right number of each type of animal lives in a habitat.**
9. abiotic factor **Each thing in the environment that is not alive, such as sunlight, water and soil, is an abiotic factor.**
10. threatened **If a lack of equilibrium lasts a long time, a whole species may be threatened.**

Write!

Write your response to the prompt on a separate sheet of paper. Use as many vocabulary words as you can in your writing.

Imagine a pair of glasses that lets you see Earth from afar and then move closer in. What interactions would you see among living and non-living things?

Write!

Distribute Writing Graphic Organiser: Sequence Chart, Teacher Guide page 83. In the first box, students should write how Earth appears to them from a distance. In the following boxes, they should describe the next closer view, and so on.

Sample Answer

I see each living thing, or biotic factor, and each non-living thing, or abiotic factor. I focus first on the saltwater biome. The ecosystem at the shore has seaweed and mussels. The sand is the habitat for the crabs.

Then I look at a dry grassland where there's competition for food. When two species need the same food, part of their niche is the same. With little food left, the equilibrium is upset. In this situation one of the two species may begin to die out, and over time become a threatened species. Using ecology might save them!

TAKE-HOME ACTIVITY

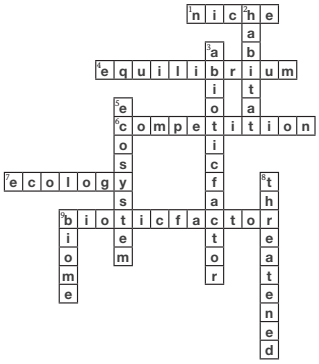
Assign the Take-Home Activity to students for additional practice with the target vocabulary words. The reproducible Take-Home Activity for Lesson 7 is on page 90 of the Teacher Guide.

TAKE HOME 7

biotic factor · abiotic factor · ecology · biome · ecosystem · habitat · niche · competition · threatened · equilibrium

Use vocabulary words to complete the puzzle.

Ecosystems



ACROSS

1. what an organism does in its habitat
4. a state of balance
6. the struggle between living things for limited resources
7. the study of how living things and non-living things in an environment act upon one another
9. any living thing in an environment

DOWN

2. the place where an organism lives
3. any non-living thing in an environment
5. an area in which living and non-living things act upon one another by exchanging energy and materials
8. close to being in danger of dying out
9. a large region with specific plants and animals and the same climate

Tell someone in your family what you have learned about ecosystems.