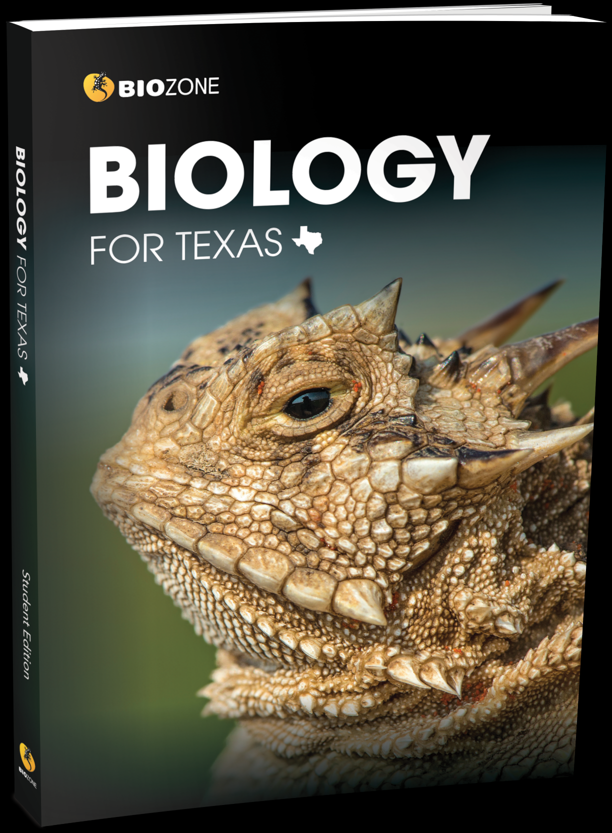
BIOZONE

TEXAS PROGRAMS

BIOZONE

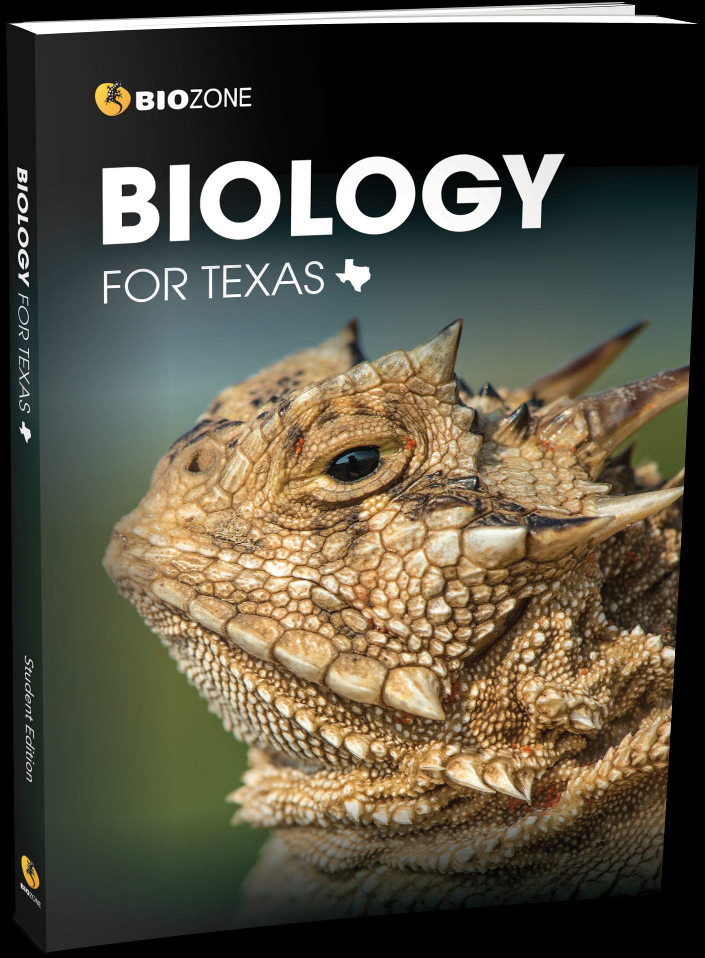


Biology for Texas

Why this title *needs* to be on your resource list

Overview

- Product overview
- BIOZONE's points of difference
- About Biology for Texas
  - Features
  - Teacher toolkit
- Digital platform: BIOZONE WORLD



BIOZONE’s delivery

Print | Digital | Blended

What sets BIOZONE apart?

Teachers write our resources

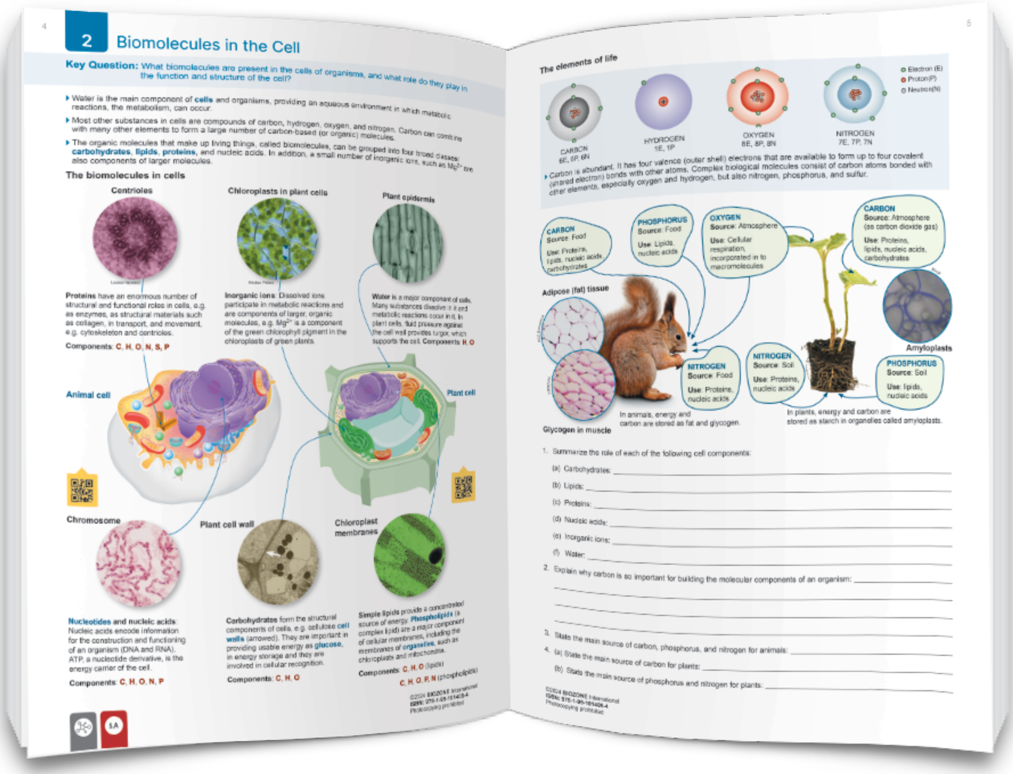
Questions? Author Hotline: authors@biozone.com

BIOZONE Worktexts

Combine the very best features of a **textbook** ....

.... with the utility of **workbook**

STUDENT OWNED RESOURCE



A 3-in-1 hybrid resource:

Part textbook

Part study guide

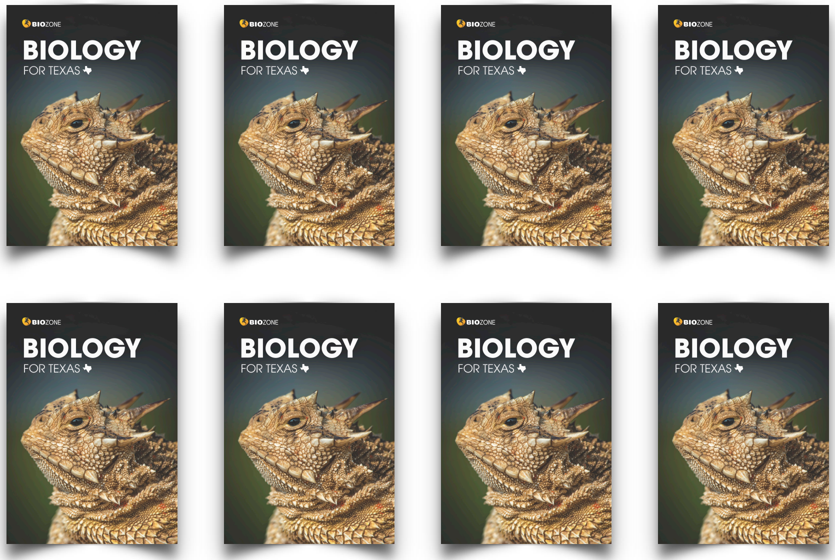
Part activity workbook

An all-in-one comprehensive resource,

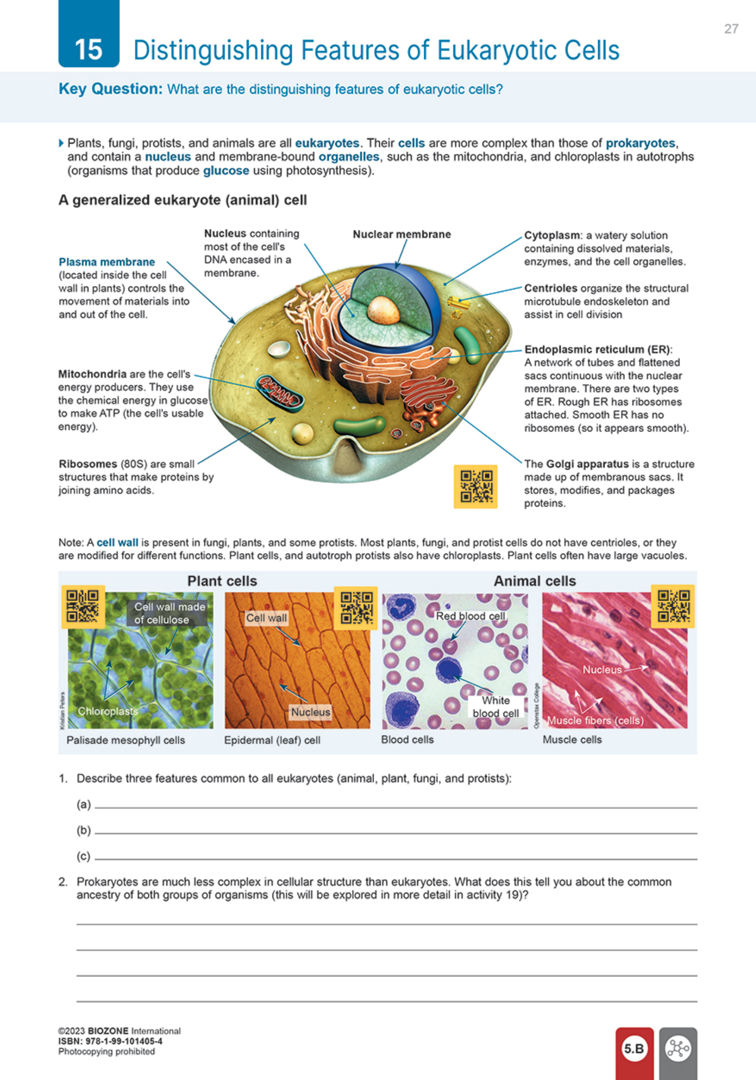
eliminating the need for

a separate textbook.

What is the **BIOZONE solution?**



Each year of an adoption, students get a **fresh new copy** of the worktext to begin their learning journey.



15 Distinguishing Features of Eukaryotic Cells

Key Question: What are the distinguishing features of eukaryotic cells?

- Plants, fungi, protists, and animals are all **eukaryotes**. Their **cells** are more complex than those of **prokaryotes**, and contain a **nucleus** and membrane-bound **organelles**, such as the mitochondria, and chloroplasts in autotrophs (organisms that produce **glucose** using photosynthesis).

A generalized eukaryote (animal) cell

Note: A **cell wall** is present in fungi, plants, and some protists. Most plants, fungi, and protist cells do not have centrioles, or they are modified for different functions. Plant cells, and autotroph protists also have chloroplasts. Plant cells often have large vacuoles.

Palisade mesophyll cells | Epidermal (leaf) cell | Blood cells | Muscle cells

1. Describe three features common to all eukaryotes (animal, plant, fungi, and protists):

(a) ______

(b) ______

(c) ______

2. Prokaryotes are much less complex in cellular structure than eukaryotes. What does this tell you about the common ancestry of both groups of organisms (this will be explored in more detail in activity 19)?

______

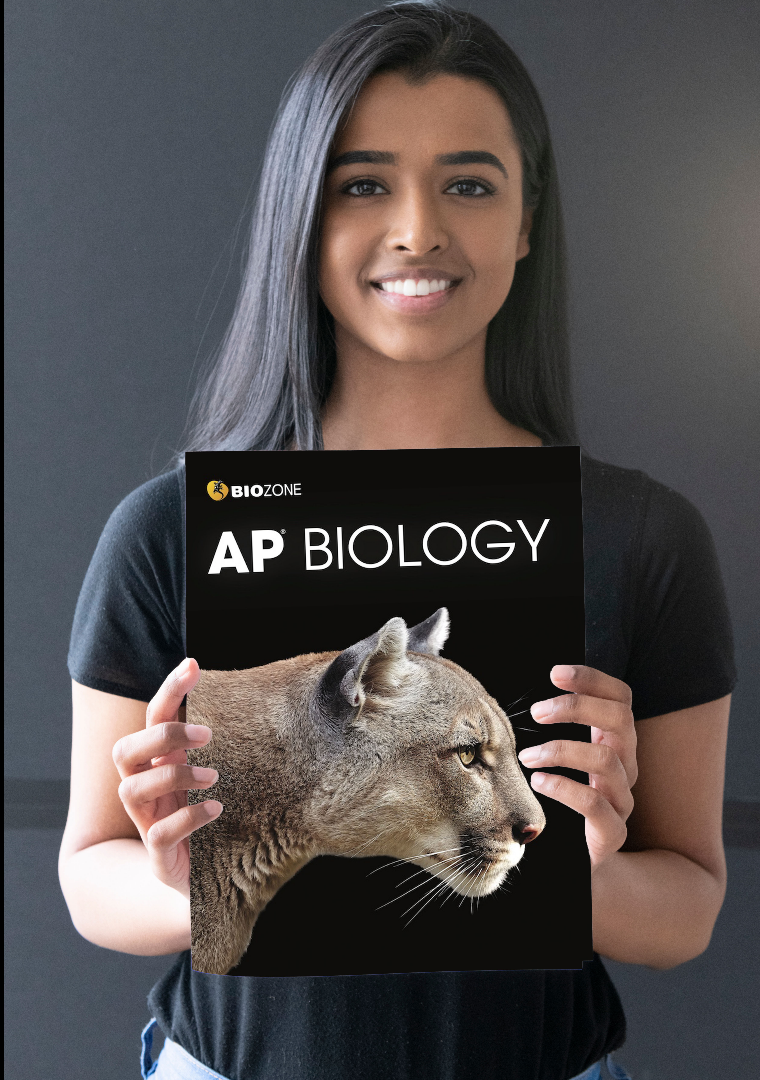
ISBN: 978-1-99-101405-4

Why are BIOZONE resources unique?

- A reputation for scientific rigor …
  … but our information is accessible.
  - Graphical delivery of science concepts.
  - Chunked text.
- Students interact directly with material: forms a record of work
  - Reinforces understanding.
  - Easy revision.
  - Self grading and answer refinement.

Advantages of the BIOZONE approach

- Student ownership and engagement
- Empowers students to be fully involved in their learning journey
- Flexible delivery modes
- Regular updates:
    - Content
    - Pedagogy
    - Features
    - Support tools

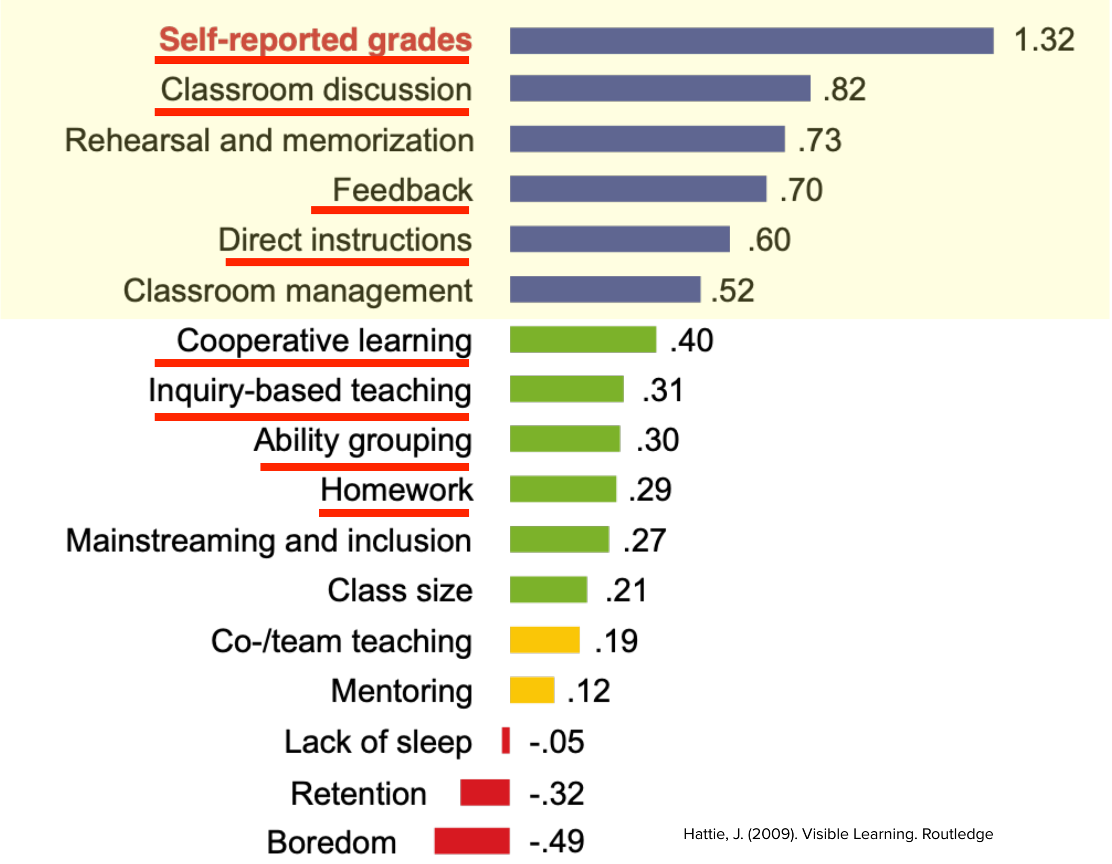


Pedagogical tools

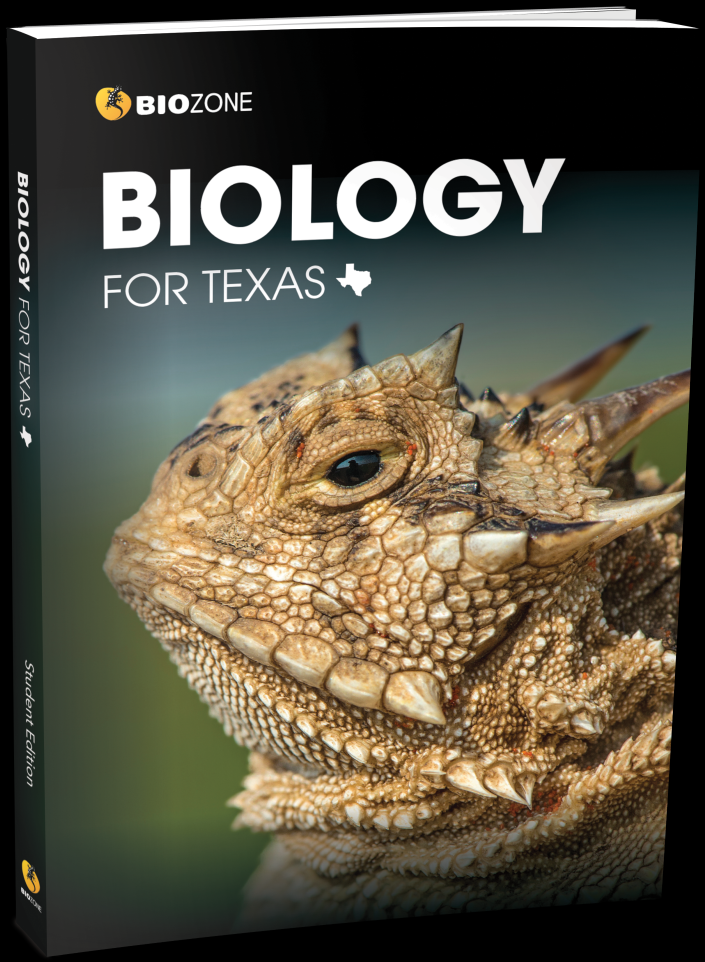
- Where does the data come from?
  A synthesis of >1,500 meta studies involving over 90,000 individual studies and 300 million students.

- BIOZONE products incorporate many of the factors shown to positively influence student achievement.

Influences on student achievement

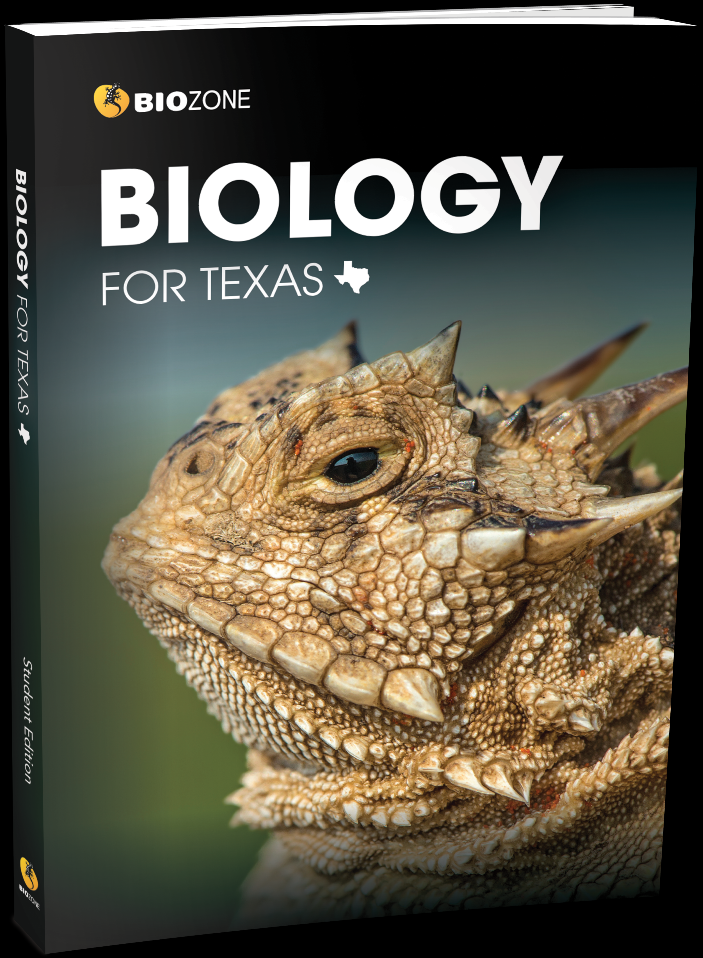


Hattie, J. (2009). Visible Learning. Routledge



BIOLOGY FOR TEXAS

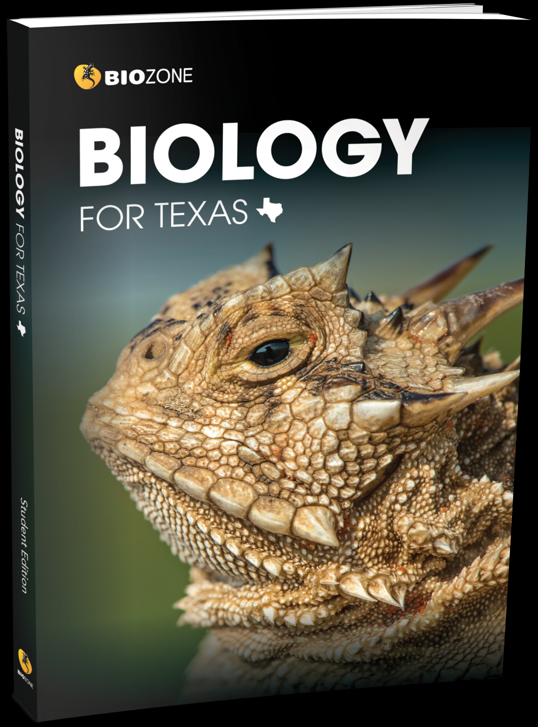
BIOZONE



Written for the **Texas Essential Knowledge and Skills** (TEKS) for Science (High School Biology) specified in **Proclamation 2024**.

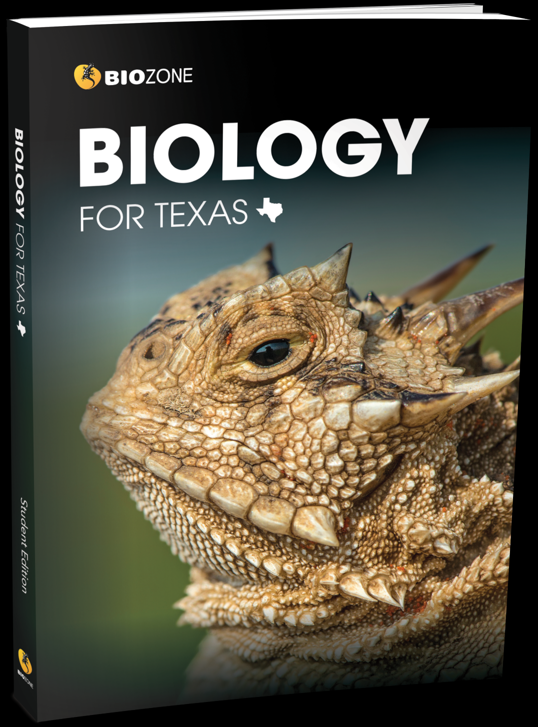
Texas Education Agency

Design Features



- Written and structured on the HS Biology TEKS
- TEKS clearly identified
- ELPS clearly identified (4 levels)
- Content anchors book-end each chapter
- In-built assessments
- In-built practical Investigations and equipment list
- QR codes for direct access to 3D models
- Digital and print options

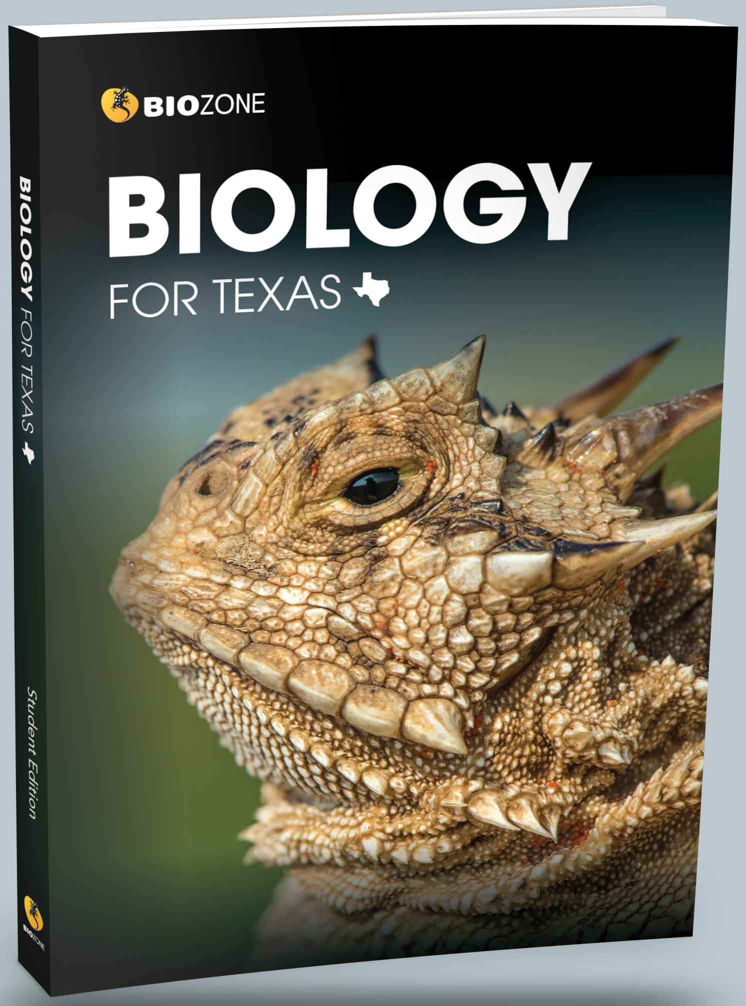
Support Features



- Translation tool - digital platform

  150 languages including Spanish
- Science skills chapter
- Glossary (English & Spanish)
- Extensive teacher support materials
- Implementation and PD training

Structure



BIOLOGY FOR TEXAS

1. Cells and Cellular Processes
2. Cell Cycle
3. Photosynthesis and Cellular Respiration
4. Animal and Plant Structure and Function
5. DNA and Gene Expression
6. Patterns of Inheritance
7. Common Ancestry
8. Evolution and Natural Selection
9. Ecological Interactions
10. Science Practices

Structure of a chapter

CHAPTER INTRODUCTION

Identifies the activities relating to the learning outcomes. Relevant TEKS and ELPS are identified.

CONTENT ANCHOR

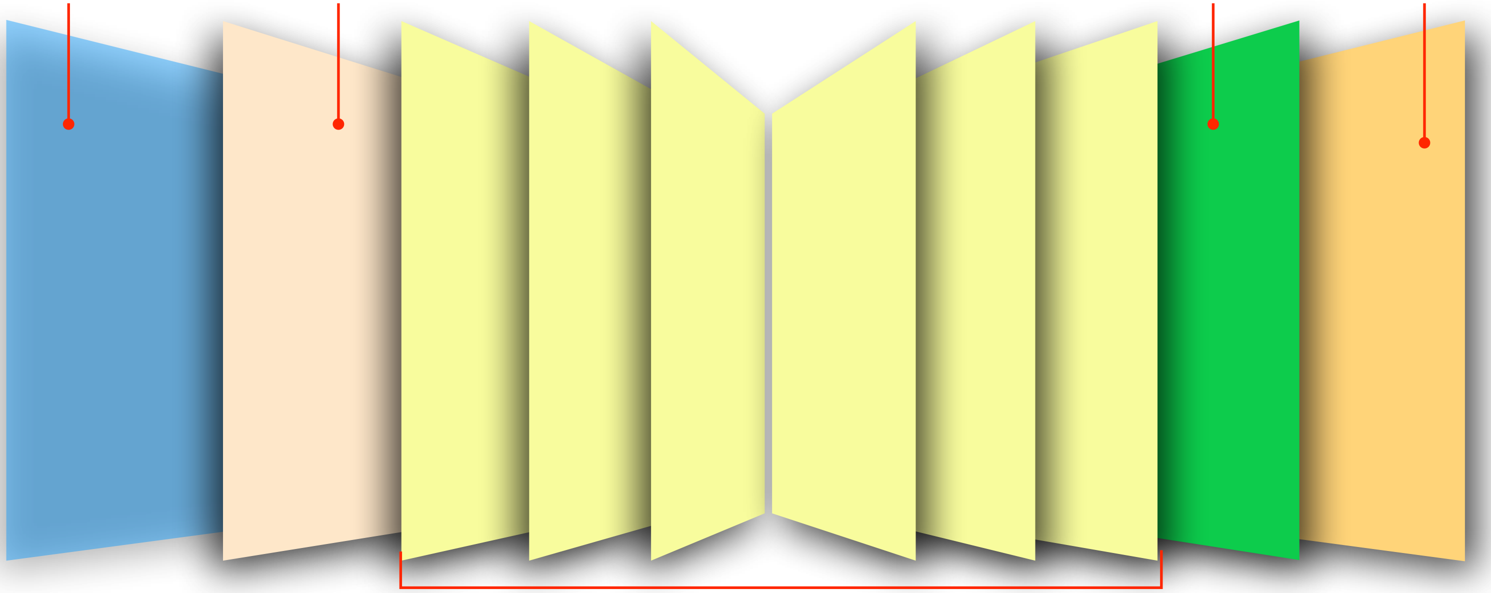
The first activity is an anchor for the chapter. It introduces a phenomenon that students come to understand through the activities in the chapter.

CONTENT ANCHOR REVISITED

Students should be able to explain various aspects of the content anchor fully.

SUMMING UP

Find out what students know about the content and skills they have explored in the chapter.



ACTIVITY PAGES

- Material is scaffolded over a learning sequence to develop deeper understanding.
- Questions allow students to demonstrate their understanding of the material.

TEKS & ELPS

BIOZONE

Locating the TEKS

Differentiated for easy navigation

- Chapter fronts
- Tab on activity pages:
  - **Red** = Science Concept TEKS
  - **Blue** = Scientific and Engineering Practice TEKS
- Summary tables in Teacher's Edition
  - Science Concepts TEKS
  - Scientific and Engineering Practice TEKS

TEKS SCIENTIFIC AND ENGINEERING PRACTICES

B.1: Scientific and engineering practices.

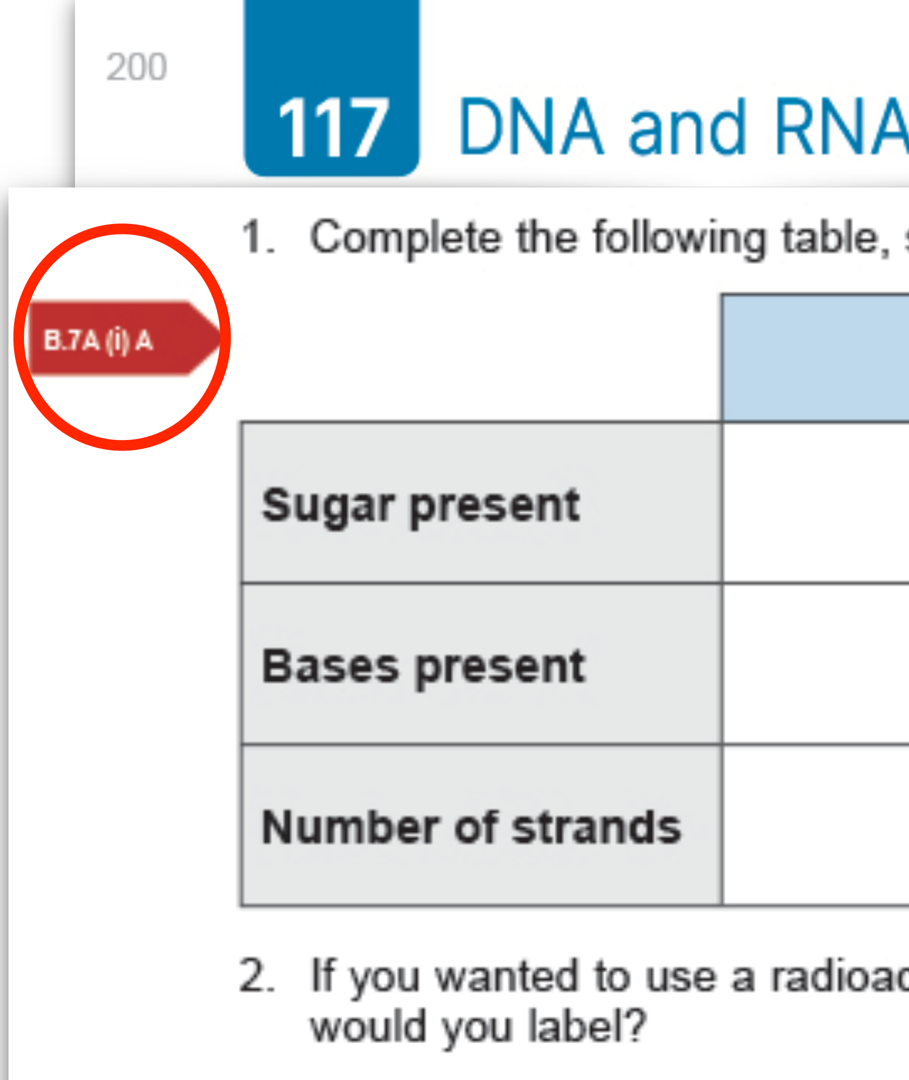
The student, for at least 40% of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models.

TEKS	Student Expectation	Activity Number	Page number	Activity Number	Page number	Activity Number	Page number
B1.A	Ask questions and define problems based on observations or information from text, phenomena, models, or investigations	34	63	94	166, 167	246	424
		66	119, 120	170	295	249	427
B1.B	Apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems	9	17	94	166, 167, 168	226	384
		11	20	98	173	232	393
		12	22	102	179	238	406
		21	38	151	260	239	410
		30	53	181	315	249	427
		56	100	188	326	250	428
		60	106	215	367	257	435
		66	119	216	369	274	457
		80	143, 144	217	370		
B1.C	Use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards	11	20	66	119, 120	232	393
		21	38	181	315	272	452, 453, 454
		38	69	211	361	274	457
		60	106	218	372		
		65	117	230	389		
B1.D	Use appropriate tools	11	20	90	161	255	433
		21	38	149	256	258	436
		60	106	230	389		
		65	117	232	393		
B1.E	Collect quantitative data using the International System of Units (SI) and qualitative data as evidence	21	38	94	167	258	436
		30	53	181	315	273	455
		60	106	211	361	274	456, 457
		65	117	218	372		
		90	161	256	434		
B1.F	Organize quantitative and qualitative data using scatter plots, line graphs, bar graphs, charts, data tables, digital tools, diagrams, scientific drawings, and student-prepared models	11	20	145	251	238	406
		21	38	149	256	239	408, 411
		28	49	167	289	244	419
		29	51	174	299	245	421
		30	53, 54	183	318	259	437
		38	69	187	323	260	438
		47	81	188	325, 326, 327	261	439
		50	87	211	362	262	440
		56	100	219	373	263	441
		60	106, 107, 108	224	380, 381	264	442
		65	117, 118	225	382, 383	266	444
		66	120	226	384	270	449, 450
		80	142	227	385	271	451
		90	161	230	389	273	455
		94	167, 168	234	397	274	456, 457, 458
		109	187	236	400, 401		

Locating the Breakouts

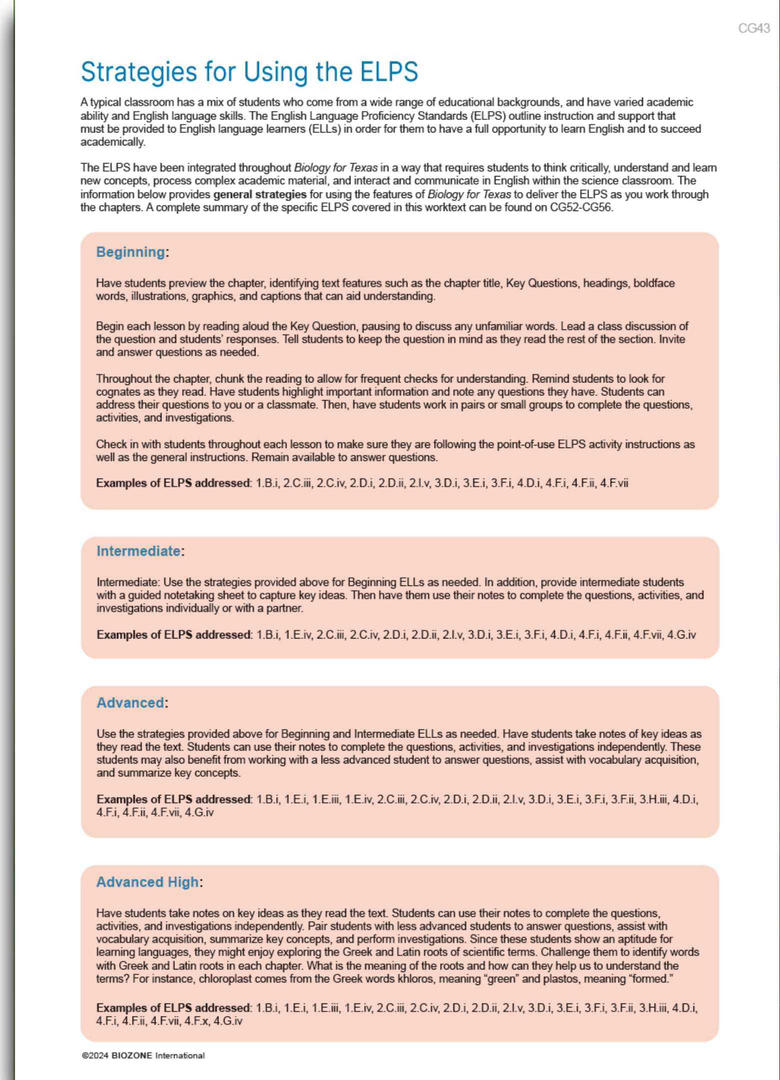
Differentiated for easy identification

- Breakout codes in the margin of Teacher's Edition identifies the breakouts.
    - **Red** = Science Concept breakouts
    - **Blue** = Scientific and Engineering Practice breakouts
- A **N** denotes a narrative component.
- An **A** denotes an activity component.



Locating the ELPS

- Chapter fronts
- Margin icons
- Summary tables in Teacher's Edition
  - The four proficiency levels are identified
- Strategies provided for delivering ELPS



Strategies for Using the ELPS

A typical classroom has a mix of students who come from a wide range of educational backgrounds, and have varied academic ability and English language skills. The English Language Proficiency Standards (ELPS) outline instruction and support that must be provided to English language learners (ELLs) in order for them to have a full opportunity to learn English and to succeed academically.

The ELPS have been integrated throughout *Biology for Texas* in a way that requires students to think critically, understand and learn new concepts, process complex academic material, and interact and communicate in English within the science classroom. The information below provides **general strategies** for using the features of *Biology for Texas* to deliver the ELPS as you work through the chapters. A complete summary of the specific ELPS covered in this worktext can be found on CG52-CG56.

Beginning:

Have students preview the chapter, identifying text features such as the chapter title, Key Questions, headings, boldface words, illustrations, graphics, and captions that can aid understanding.

Begin each lesson by reading aloud the Key Question, pausing to discuss any unfamiliar words. Lead a class discussion of the question and students' responses. Tell students to keep the question in mind as they read the rest of the section. Invite and answer questions as needed.

Throughout the chapter, chunk the reading to allow for frequent checks for understanding. Remind students to look for cognates as they read. Have students highlight important information and note any questions they have. Students can address their questions to you or a classmate. Then, have students work in pairs or small groups to complete the questions, activities, and investigations.

Check in with students throughout each lesson to make sure they are following the point-of-use ELPS activity instructions as well as the general instructions. Remain available to answer questions.

Examples of ELPS addressed: 1.B.i, 2.C.iii, 2.C.iv, 2.D.i, 2.D.ii, 2.I.v, 3.D.i, 3.E.i, 3.F.i, 4.D.i, 4.F.i, 4.F.ii, 4.F.vii

Intermediate:

Intermediate: Use the strategies provided above for Beginning ELLs as needed. In addition, provide intermediate students with a guided notetaking sheet to capture key ideas. Then have them use their notes to complete the questions, activities, and investigations individually or with a partner.

Examples of ELPS addressed: 1.B.i, 1.E.iv, 2.C.iii, 2.C.iv, 2.D.i, 2.D.ii, 2.I.v, 3.D.i, 3.E.i, 3.F.i, 4.D.i, 4.F.i, 4.F.ii, 4.F.vii, 4.G.iv

Advanced:

Use the strategies provided above for Beginning and Intermediate ELLs as needed. Have students take notes of key ideas as they read the text. Students can use their notes to complete the questions, activities, and investigations independently. These students may also benefit from working with a less advanced student to answer questions, assist with vocabulary acquisition, and summarize key concepts.

Examples of ELPS addressed: 1.B.i, 1.E.i, 1.E.iii, 1.E.iv, 2.C.iii, 2.C.iv, 2.D.i, 2.D.ii, 2.I.v, 3.D.i, 3.E.i, 3.F.i, 3.F.ii, 3.H.iii, 4.D.i, 4.F.i, 4.F.ii, 4.F.vii, 4.G.iv

Advanced High:

Have students take notes on key ideas as they read the text. Students can use their notes to complete the questions, activities, and investigations independently. Pair students with less advanced students to answer questions, assist with vocabulary acquisition, summarize key concepts, and perform investigations. Since these students show an aptitude for learning languages, they might enjoy exploring the Greek and Latin roots of scientific terms. Challenge them to identify words with Greek and Latin roots in each chapter. What is the meaning of the roots and how can they help us to understand the terms? For instance, chloroplast comes from the Greek words khloros, meaning "green" and plastos, meaning "formed."

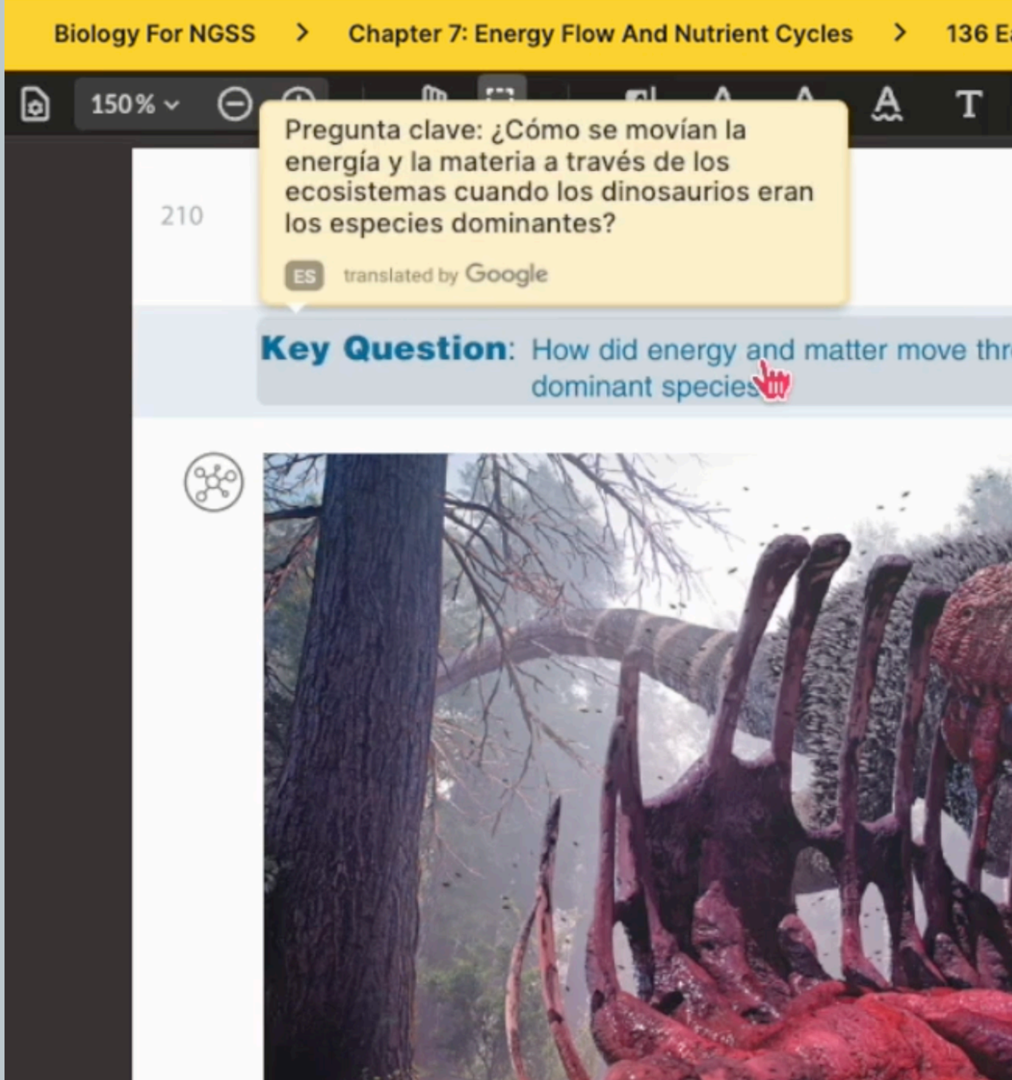
Examples of ELPS addressed: 1.B.i, 1.E.i, 1.E.iii, 1.E.iv, 2.C.iii, 2.C.iv, 2.D.i, 2.D.ii, 2.I.v, 3.D.i, 3.E.i, 3.F.i, 3.F.ii, 3.H.iii, 4.D.i, 4.F.i, 4.F.ii, 4.F.vii, 4.F.x, 4.G.iv

Translation

Digital platform

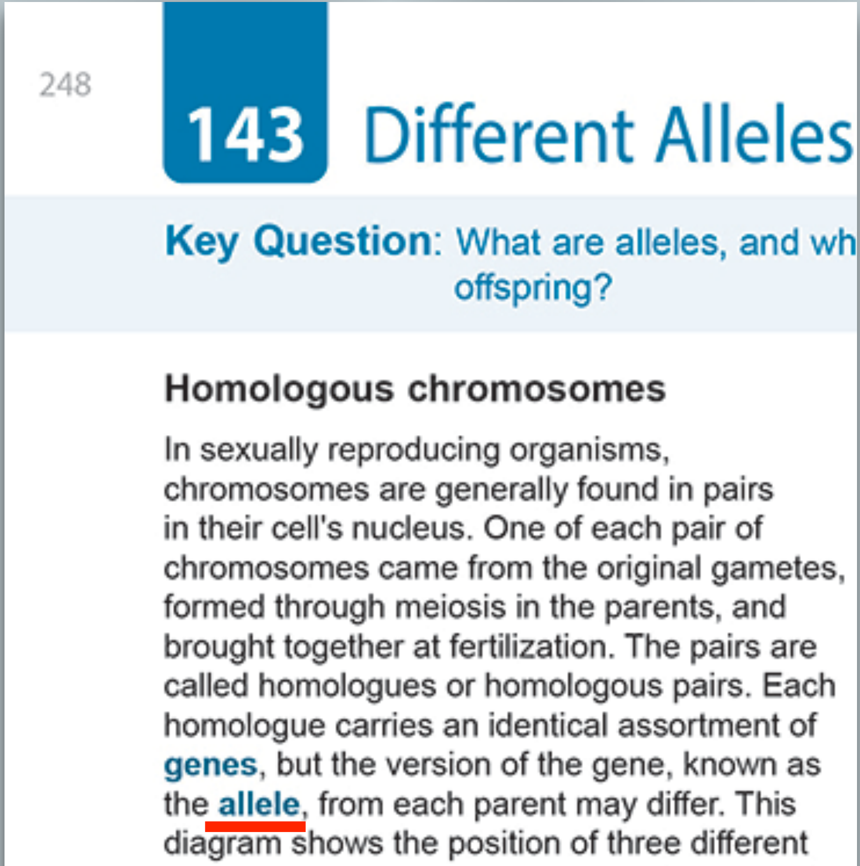
150 languages

Dual language view



Glossary

Building scientific literacy


248

143 Different Alleles

Key Question: What are alleles, and wh
offspring?

Homologous chromosomes

In sexually reproducing organisms, chromosomes are generally found in pairs in their cell's nucleus. One of each pair of chromosomes came from the original gametes, formed through meiosis in the parents, and brought together at fertilization. The pairs are called homologues or homologous pairs. Each homologue carries an identical assortment of **genes**, but the version of the gene, known as the **allele**, from each parent may differ. This diagram shows the position of three different

Glossary: English/Spanish

abiotic factor: Non-living, physical features in an ecosystem, including temperature, humidity, and rainfall.
factor abiótico: Características físicas no vivas en un ecosistema, incluida la temperatura, la humedad y la lluvia.

accuracy: The correctness of a measurement; how close a measured value is to the true value.
exactitud: La exactitud de una medición; qué tan cerca está un valor medido del valor verdadero.

active site: Region of an enzyme where the substrate binds and undergoes a chemical reaction.
sitio activo: Región de una enzima donde el sustrato se une y sufre una re

aerobic: A biological process that requires oxygen.
aerobio: Un proceso biológico que requiere oxígeno.

aerobic respiration: type of respiration that requires oxygen.
Respiración aeróbica: tipo de respiración que requiere oxígeno.

allele: Any of the alternative versions of a gene that may produce distinguishable phenotypes.
alelo: Cualquiera de las versiones alternativas de un gen que puede producir fenotipos distinguibles.

amino acid: Any organic compound containing both an amino group and a carboxylic acid group.
aminoácido: Cualquier orgánico compuesto que contenga tanto un grupo amino como un grupo ácido carboxílico. Los bloques de construcción de las proteínas.

anabolic reaction / anabolism: A chemical reaction that constructs large, complex molecules from simpler molecules.
reacción anabólica: Una reacción química que construye moléculas grandes y complejas a partir de moléculas más simples.

anaerobic respiration: Type of respiration that does not require oxygen.
respiración anaerobica: Tipo de respiración que no requiere oxígeno.

antibody: A protein produced by the body in response to a specific antigen and aimed at targeting and destroying it.
anticuerpo: Una proteína producido por el cuerpo en respuesta a un antígeno

allele: Any of the alternative versions of a gene that may produce distinguishable phenotypes.
alelo: Cualquiera de las versiones alternativas de un gen que puede producir fenotipos distinguibles.

assumed to be true but is not (or cannot be) tested.
presunción: Una afirmación que se supone que es verdadera pero que no se prueba (o no se puede probar).

ATP/adenosine triphosphate: An organic compound that serves as an energy source for metabolic processes.
ATP/trifosfato de adenosina: Un compuesto orgánico que sirve como fuente de energía para los procesos metabólicos.

auxin: Any of several plant hormones that regulate the growth and development of plants.
auxina: Cualquiera de varias hormonas vegetales que regulan el crecimiento y desarrollo de las plantas.

biodiversity: The amount of biological variation present in a region (includes genetic, species, and habitat diversity).
biodiversidad: La cantidad de variación biológica presente en una región (incluye genética, especies y diversidad de hábitat).

bioinformatics: The use of computer science, mathematics, and information theory to organize and analyze complex biological data.
bioinformática: El uso de las ciencias computacionales, las matemáticas y la teoría de la información para organizar y analizar datos biológicos complejos.

biological drawing: An illustration that visually communicates the structure of a subject being studied, showing specific details.
dibujo biológico: Una ilustración que comunica visualmente la estructura de un tema que se está estudiando, mostrando detalles específicos.

biotic factor: Relating to the living

carbon cycle: The process by which carbon is exchanged between living organisms, the earth and its atmosphere.
ciclo del carbono: El proceso por el cual el carbono se intercambia entre los organismos vivos, la tierra y su atmósfera.

catabolic reaction / catabolism: The breakdown of large, complex molecules into smaller, simpler molecules.
reacción catabólica: La descomposición de moléculas grandes y complejas en moléculas más pequeñas y simples.

catalyst: A substance that modifies and increases the rate of a chemical reaction without being consumed in the process.
catalizador: Sustancia que modifica y aumenta la velocidad de una reacción química sin ser consumida en el proceso.

Science Practices

Supporting Scientific and Engineering Practices

- **Dedicated chapter**
  supports students to master the Scientific and Engineering Practices TEKS
- **Need help icon**
  directs students to support

CHAPTER 10

Science Practices

TEKS

Scientific and Engineering Practices

B.1: Investigation and Inquiry

1.A 1.B 1.C 1.D 1.E 1.F 1.G 1.H

The student, for at least 40% of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models.

B.2: Data and Patterns

2.A 2.B 2.C 2.D

The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs.

B.3: Communicating in Science

The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions.

B.4: Science as a Human Endeavor

4.A 4.C

The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society.

RESOURCE HUB
bit.ly/3ycPUSZ

Learning Outcomes

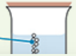
I know I have achieved this when I can:

	Activity number
☐ Discuss the features of Science, in small groups.	246
☐ Define and link the terms system and model, in a science context.	247
☐ Define and compare the scientific terms hypothesis, law, and theory.	248
☐ Generate a hypothesis from a provided case, and describe the assumptions used.	249
☐ Convert between decimal and standard form in given numerical values.	250-251
☐ Discuss the value of processing raw data.	252
☐ Calculate fractions and ratios from provided numerical values.	253
☐ Evaluate the usefulness of logarithm and semi-log graphs for processing exponential data.	254
☐ Calculate the percentage error for provided measurements.	255
☐ Classify data as quantitative, ranked, or qualitative.	256
☐ Evaluate the suitability of collecting qualitative or quantitative data in different types of investigations.	256
☐ Define independent, dependent, and control variables, describing the purpose of each in an investigation.	257, 274
☐ Discuss the value of accurate data recording, including tables, and the use of dataloggers.	258-259
☐ Plot a line graph, from provided data.	261, 274
☐ Draw a scatter plot, including a line of best fit.	262
☐ Distinguish between correlation and causation in data.	263
☐ Process raw data and draw a bar graph and histogram, from provided data.	264-265
☐ Calculate percentages from provided data and use the values to construct pie graphs.	266
☐ Calculate mean, median, and mode, from provided data.	267
☐ Calculate standard deviations, explaining what this statistical tool indicates about the data and sampling bias of the data.	268-269
☐ Construct a biological drawing from a provided photograph.	271
☐ Identify safety issues and risks in the classroom laboratory, and also in fieldwork settings.	272
☐ Discuss procedures for collecting qualitative data, in a provided case study.	273
☐ Process raw data into a data table.	274
☐ Evaluate an investigation method, from a provided case study.	274

56 Investigating Photosynthetic Rate

Investigation 3.1 Measuring bubble production in *Cabomba*

See appendix for equipment list.



1. Fill a boiling tube 2/3 full with a 20°C solution of 1% sodium

1. Use your calculated means to draw a graph of gas production
vs light intensity (distance).

2. What did your splint test tell you about the gas produced by the *Cabomba* plant?

3. From this experiment what can you say about photosynthesis, light, and the gas produced?

4. How could you improve the design of this investigation?

stopper from the tube and test the gas with a glowing splint. What happens?

5
0

3. From this experiment what can you say about photosynthesis, light, and the gas produced?

4. How could you improve the design of this investigation?

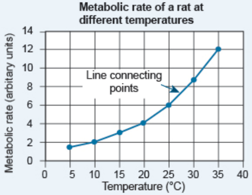
ISBN: 978-1-99-101405-4

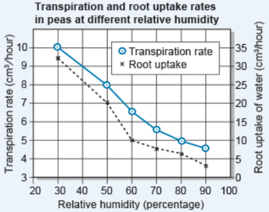
261 Drawing Line Graphs

Key Question: What kind of data is plotted on line graphs, and how do they show the relationship between the independent variable and the dependent variable?

Graphs provide a way to visually see **data** trends. Line graphs are used when one variable (the **independent variable**) affects another, the **dependent variable**. Important features of line graphs are:

- The data must be continuous for both variables.
- The dependent variable is usually a biological response.
- The independent variable is often time or the experimental treatment.
- The relationship between two variables can be represented as a continuum and the data points are plotted accurately and connected directly (point to point).
- Line graphs may be drawn with a measure of error. The data are presented as points (the calculated **means**), with bars above and below, indicating a measure of variability or spread in the data, e.g. standard deviation.
- More than one curve can be plotted per set of axes. If the two data sets use the same measurement units and a similar range of values for the dependent variable, one scale on the y axis is used. If the two data sets use different units and/or have a very different range of values for the dependent variable, two scales for the y axis are used (see right). Distinguish between the two curves with a key.





1. The results (shown right) were collected in a study investigating the effect of temperature on the activity of an enzyme.

(a) Using the results provided, plot a line graph on the grid below:

(b) Estimate the rate of reaction at 15°C: ______

Lab Notebook

An enzyme's activity at different temperatures

Temperature (°C)	Rate of reaction (mg of product formed per minute)
10	1.0
20	2.1
30	3.2
35	3.7
40	4.1
45	3.7
50	2.7
60	0

ISBN: 978-1-99-101405-4

Assessment

BIOZONE

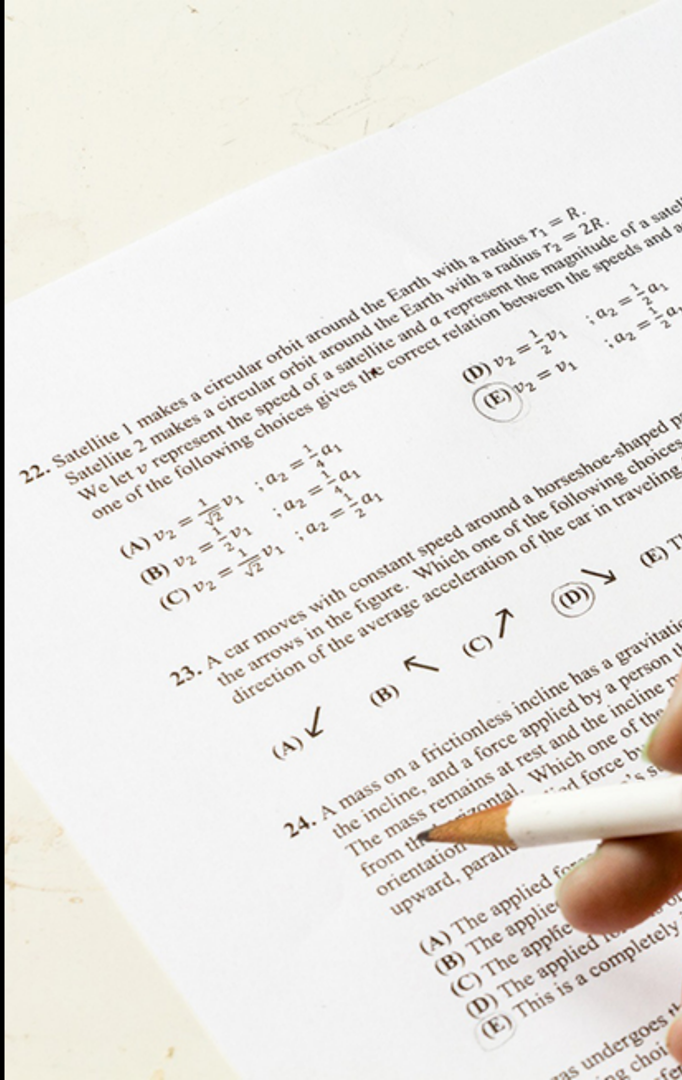
Assessments

Embedded assessments

- Pre-assessment
- Peer assessment
- Formative assessment
- Summative assessment

External assessment resources

- Test Bank
- Question Library



Content Anchors

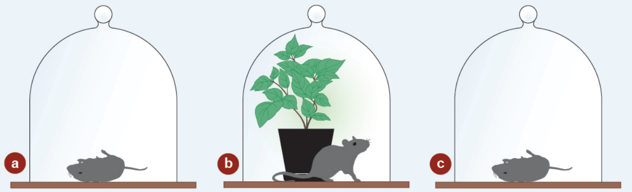
- Use as pre or formative assessment
  - Student demonstrate prior knowledge
  - Teachers identify misconceptions and knowledge gaps

51 Mouse Trap

Content Anchor: Under what conditions can an animal survive in a sealed system?

Mouse in a jar

▸ Around 1772, Joseph Priestley carried out a series of experiments. He wanted to see if there was a relationship between the survival of plants and animals in a closed system. One of his experiments is shown below.



(a) Priestley placed a mouse in a sealed, empty bell jar. The mouse quickly collapsed and died.

(b) Priestley placed a mint plant in a sealed bell jar and left it for several days before adding a mouse. After several minutes the mouse was still alive.

(c) Priestley removed the mouse from jar (b) and placed it into a sealed, empty bell jar. The mouse died very quickly.

1. (a) Can you explain why the mouse died in jars (a) and (c), but not in jar (b)? ______

   (b) What metabolic or chemical processes might explain the results that Joseph Priestley obtained? ______

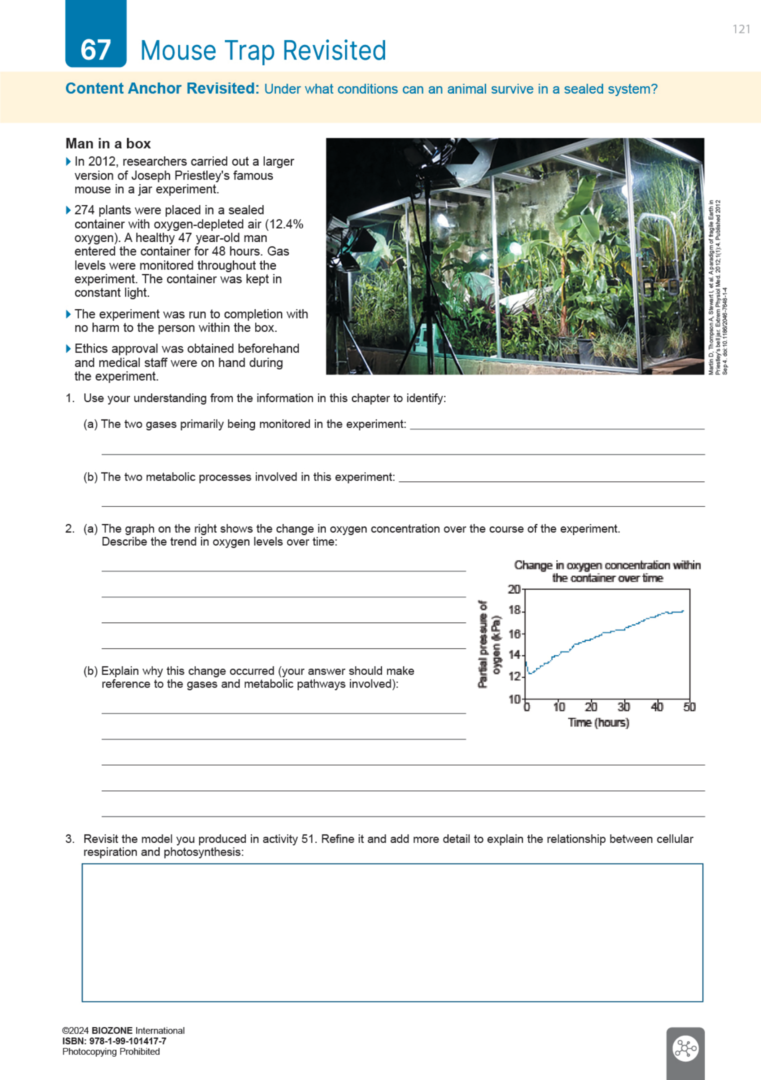
2. Draw a very simple diagram to show what is happening in jar (b):

3. In another experiment, Joseph Priestley left a plant covered with a bell jar for many days. He then placed a candle with a glowing wick into the jar. The wick ignited and began to burn. What was present to allow the wick to ignite?

ISBN: 978-1-99-101417-7

Content Anchor Revisited

- Revisited at end of chapter
- Students should be able to fully explain the Content Anchor
- Formative assessment
- Is there anything which needs to be revisited before moving on?



67 Mouse Trap Revisited

Content Anchor Revisited: Under what conditions can an animal survive in a sealed system?

Man in a box

- In 2012, researchers carried out a larger version of Joseph Priestley's famous mouse in a jar experiment.
- 274 plants were placed in a sealed container with oxygen-depleted air (12.4% oxygen). A healthy 47 year-old man entered the container for 48 hours. Gas levels were monitored throughout the experiment. The container was kept in constant light.
- The experiment was run to completion with no harm to the person within the box.
- Ethics approval was obtained beforehand and medical staff were on hand during the experiment.

Martin D, Thompson A, Stewart I, et al. A paradigm of fragile Earth in Priestley's bell jar. Extrem Physiol Med. 2012;1(1):4. Published 2012 Sep 4. doi:10.1186/2046-7648-1-4

1. Use your understanding from the information in this chapter to identify:

   (a) The two gases primarily being monitored in the experiment: ______

   (b) The two metabolic processes involved in this experiment: ______

2. (a) The graph on the right shows the change in oxygen concentration over the course of the experiment. Describe the trend in oxygen levels over time:

   Change in oxygen concentration within the container over time

   Partial pressure of oxygen (kPa): 10, 12, 14, 16, 18, 20

   Time (hours): 0, 10, 20, 30, 40, 50

   (b) Explain why this change occurred (your answer should make reference to the gases and metabolic pathways involved):

3. Revisit the model you produced in activity 51. Refine it and add more detail to explain the relationship between cellular respiration and photosynthesis:

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Summative Assessment

Conclude each chapter

68 Summing Up

Read each question carefully. Place a cross in the box beside the best answer to the question from the four answer choices provided.

1. Which statement best describes the function of ATP?
- ◻ (a) ATP is a structural component of plant cell walls
- ◻ (b) ATP carries the genetic information of organisms
- ◻ (c) ATP provides the energy for chemical reactions to occur
- ◻ (d) ATP is a biological catalyst

2. Select the option which correctly identifies the organelle below AND the cellular process which takes place in it:

- ◻ (a) Chloroplast, photosynthesis
- ◻ (b) Chloroplast, cellular respiration
- ◻ (c) Mitochondrion, photosynthesis
- ◻ (d) Mitochondrion, cellular respiration

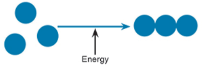
3. Enzymes speed up reactions by:
- ◻ (a) Reducing the activation energy needed
- ◻ (b) Increasing the activation energy needed
- ◻ (c) Adding energy to the reaction
- ◻ (d) Taking part in the reaction and forming part of the product(s)

4. The type of energy transformation occurring during photosynthesis is:
- ◻ (a) Light to heat
- ◻ (b) Light to chemical
- ◻ (c) Chemical to heat
- ◻ (d) None of the above

5. Which group of macromolecules do enzymes belong to?
- ◻ (a) Lipids
- ◻ (b) Proteins
- ◻ (c) Carbohydrates
- ◻ (d) Nucleotides

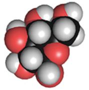
6. A solution of amylase was heated to 70°C for 10 minutes. When the treated amylase was added to a solution of starch, the iodine test showed no sugars had been produced. This is because:
- ◻ (a) The enzyme has been denatured
- ◻ (b) An enzyme inhibitor is preventing the enzyme from working
- ◻ (c) There is no substrate present
- ◻ (d) Amylase does not catalyze the reaction which converts starch in to sugars

7. The diagram below is showing:



- ◻ (a) A catabolic reaction, such as cellular respiration
- ◻ (b) A catabolic reaction, such as photosynthesis
- ◻ (c) An anabolic reaction, such as cellular respiration
- ◻ (d) An anabolic reaction, such as photosynthesis

8. The model below is of a glucose molecule. During cellular respiration glucose is converted into:



- ◻ (a) Starch and carbon dioxide
- ◻ (b) Starch and water
- ◻ (c) Water and oxygen
- ◻ (d) Water and carbon dioxide

9. Enzymes can change shape when exposed to extremes of temperature or pH. What is the most likely results if the shape of an enzyme changes?
- ◻ (a) The enzyme will no longer be able to bind its substrate
- ◻ (b) Enzyme activity will speed up
- ◻ (c) The enzyme will bind a new substrate
- ◻ (d) Different products will be produced during the reaction

10. Which molecules are both the products of cellular respiration and the raw materials for photosynthesis?
- ◻ (a) Carbon dioxide, ATP, and oxygen
- ◻ (b) Carbon dioxide and water
- ◻ (c) Glucose and oxygen
- ◻ (d) Glucose, ATP, and oxygen

11. Which answer correctly describes the equation below, and the organelle in which it takes place?

$$H_2O + CO_2 \longrightarrow C_6H_{12}O_6 + O_2$$

- ◻ (a) Photosynthesis, chloroplast
- ◻ (b) Photosynthesis, mitochondrion
- ◻ (c) Cellular respiration, chloroplast
- ◻ (d) Cellular respiration, mitochondrion

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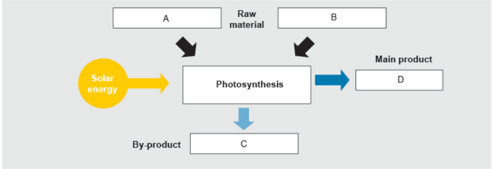
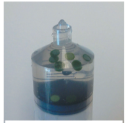
Question 12 and 13 relate the to the process of photosynthesis, shown below:



12. Raw materials A and B are:
- ◻ (a) Oxygen, carbon dioxide
- ◻ (b) Carbon dioxide, water
- ◻ (c) Water, oxygen
- ◻ (d) Water, glucose

13. Main product D and by-product C are
- ◻ (a) D: Oxygen C: Glucose
- ◻ (b) D: Carbon dioxide C: Oxygen
- ◻ (c) D: Glucose C: Oxygen
- ◻ (d) D: Water C: Glucose

14. Students investigated the effect of different light wavelengths (color) on the rate of photosynthesis. They used a leaf disk assay in which the rate of photosynthesis is measured indirectly by timing how long it takes for prepared leaf disks (right) to float to the surface when placed in an illuminated beaker of sodium hydrogen carbonate. The results are tabulated below:



Preparing the leaf disks by applying pressure to a sodium hydrogen carbonate solution.

Light color	Time taken for 10 discs to float (s)
Blue	162
Red	558
Green	998
White	694

(a) Why do you think photosynthesizing leaf disks would float?

(b) Which light color was the most effective at driving photosynthesis? Explain:

(c) Which light color was the least effective at driving photosynthesis?

15. Outline the differences between photosynthesis and cellular respiration, including reference to the raw materials used and the waste products produced:

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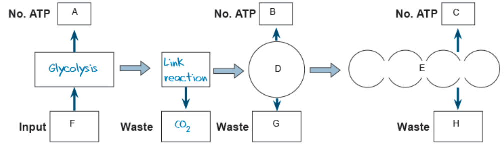
Refer to the diagram of cellular respiration below for questions 16-17



16. The total number of ATP molecules produced in steps A, B, and C is:
- ◻ (a) Approximately 20
- ◻ (b) Approximately 28
- ◻ (c) Approximately 32
- ◻ (d) Approximately 38

17. The waste products G and H are
- ◻ (a) G: Oxygen H: Carbon dioxide
- ◻ (b) G: Carbon dioxide H: Oxygen
- ◻ (c) G: Water H: Carbon dioxide
- ◻ (d) G: Carbon dioxide H: Water

18. Study the enzymatic word equation below and answer the following questions:

Sucrose + Water $\xrightarrow{\textit{Sucrase}}$ Glucose + Fructose

(a) Identify the substrate:

(b) Identify the products:

(c) Identify the enzyme:

19. Identify the following statements as true of false (circle the correct answer)

(a) Enzymes are biological catalysts. They lower the activation energy of a reaction. True / False

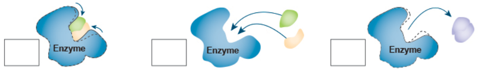
(b) Enzyme inhibitors allow enzymes to work faster. True / False

(c) The induced fit model states that the enzyme changes shape when a substrate fits into the active site. True / False

20. The diagram below outlines the three main steps when an enzyme catalyzes a reaction. The steps are NOT in order.

(a) In the boxes below, write the numbers 1 - 3 to indicate the correct order of sequence:

(b) Write a brief description under each image to describe what is happening:



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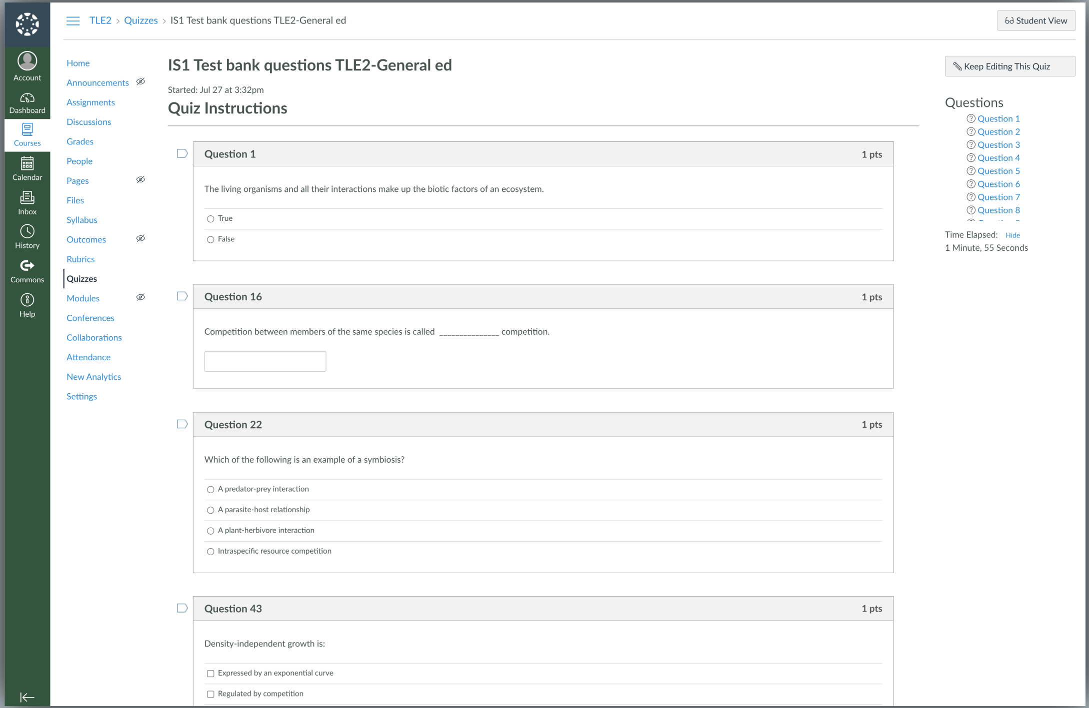
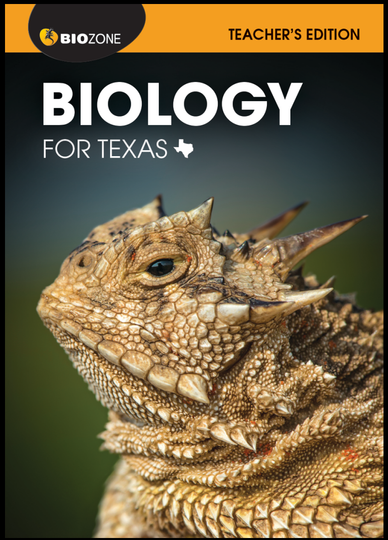
Test Bank content

- Additional questions test student knowledge.
- Formatted to ingest directly into your own test software or LMS.
- Range of question types, including:
    - Multiple choice
    - Multiple response
    - True/False
    - Modified true/false
    - Numeric
    - Matching

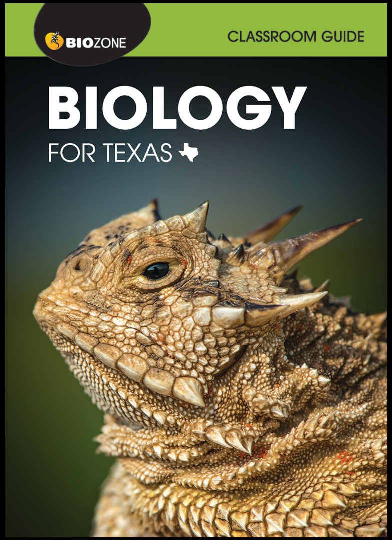


Teacher Support

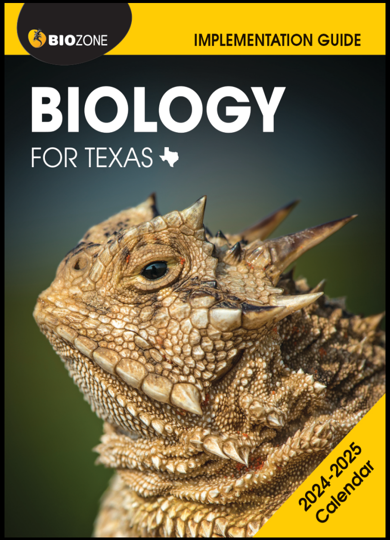
Teacher Resources



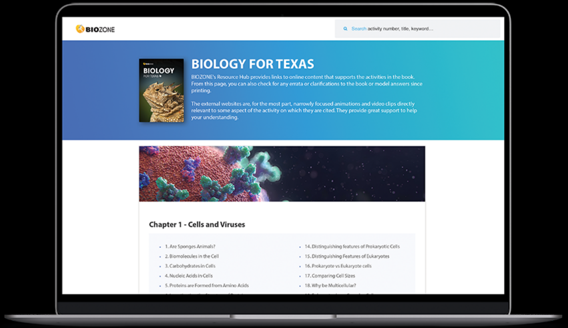
Teacher's Edition



Classroom Guide



Implementation Guide



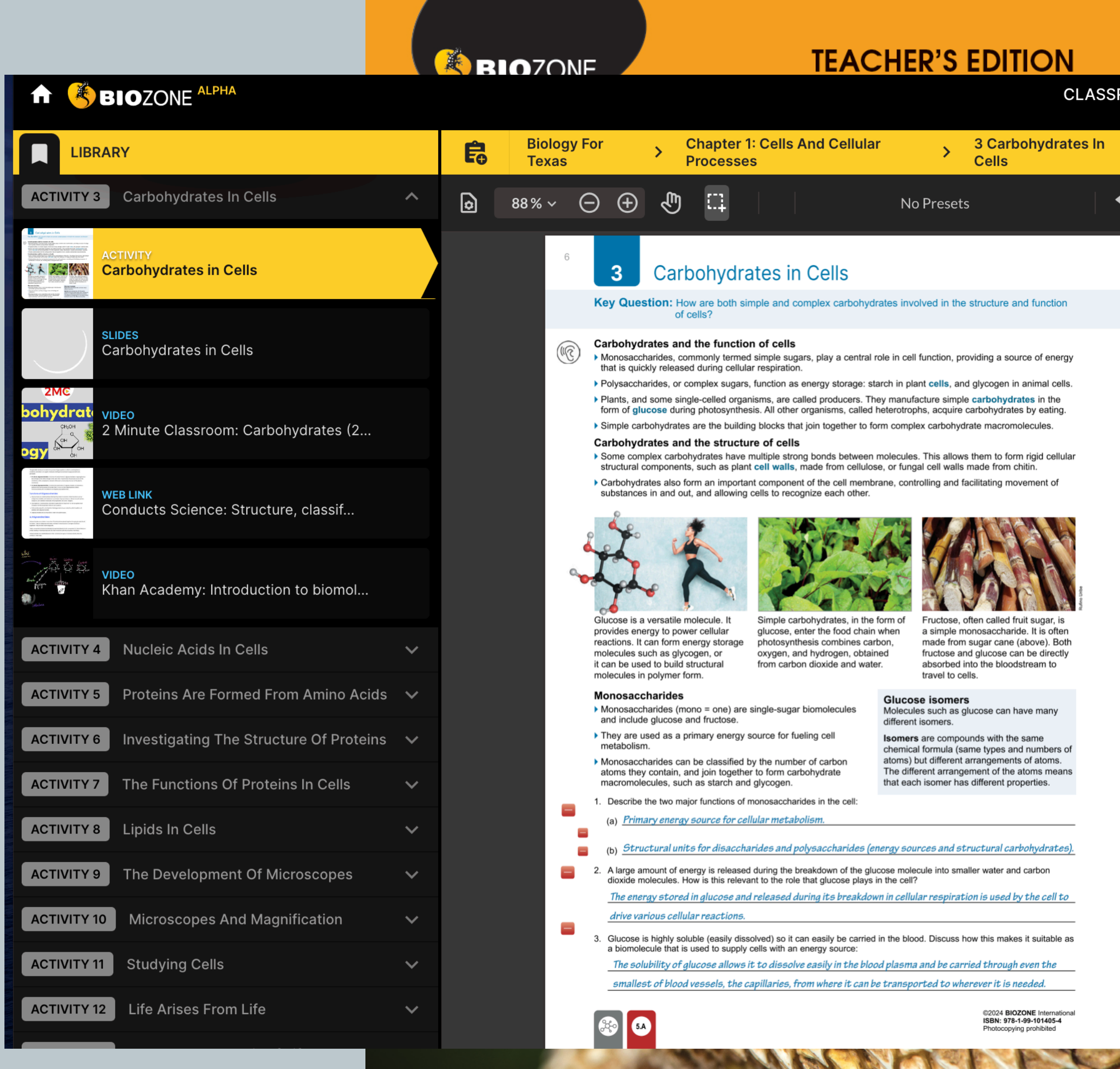
Resource Hub

Test Bank + Question Library

Teacher's Edition

- Available formats:
  - **Print**
  - **Digital** (BIOZONE WORLD)

- Additional content:
  - Classroom Guide
  - Student and Teacher ELPS
  - TEKS and breakouts
  - Model answers in place



Classroom Guide

- In Teacher's Edition or **download for free**
- Product orientation and features
- Teacher resources explained
- Planning, delivery, and assessment strategies
- Teacher notes (mini lesson plans)
- TEKS and ELPS summary tables

TEKS SCIENTIFIC AND ENGINEERING PRACTICES

B.1: Scientific and engineering practices.

- The student, for at least 40% of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models.

TEKS	Student Expectation	Activity Number	Page number	Activity Number	Page number	Activity Number	Page number
B1.A	Ask questions and define problems based on observations or information from text, phenomena, models, or investigations	34	63	94	166, 167	246	424
		66	119, 120	170	295	249	427
B1.B	Apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems	9	17	94	166, 167, 168	226	384
		11	20	98	173	232	393
		12	22	102	179	238	406
		21	38	151	260	239	410
		30	53	181	315	249	427
		56	100	188	326	250	428
		60	106	215	367	257	435
		66	119	216	369	274	457
		80	143, 144	217	370		
B1.C	Use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards	11	20	66	119, 120	232	393
		21	38	181	315	272	452, 453, 454
		38	69	211	361	274	457
		60	106	218	372		
		65	117	230	389		
B1.D	Use appropriate tools	11	20	90	161	255	433
		21	38	149	256	258	436
		60	106	230	389		
		65	117	232	393		
B1.E	Collect quantitative data using the International System of Units (SI) and qualitative data as evidence	21	38	94	167	258	436
		30	53	181	315	273	455
		60	106	211	361	274	456, 457
		65	117	218	372		
		90	161	256	434		
B1.F	Organize quantitative and qualitative data using scatter plots, line graphs, bar graphs, charts, data tables, digital tools, diagrams, scientific drawings, and student-prepared models	11	20	145	251	238	406
		21	38	149	256	239	408, 411
		28	49	167	289	244	419
		29	51	174	299	245	421
		30	53, 54	183	318	259	437
		38	69	187	323	260	438
		47	81	188	325, 326, 327	261	439
		50	87	211	362	262	440
		56	100	219	373	263	441
		60	106, 107, 108	224	380, 381	264	442
		65	117, 118	225	382, 383	266	444
		66	120	226	384	270	449, 450
		80	142	227	385	271	451
		90	161	230	389	273	455
		94	167, 168	234	397	274	456, 457, 458
		109	187	236	400, 401		

Implementation Guide

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- Scope and sequence guide
- Pacing guide
- Vertical alignment guide
- Lesson implementation guide
- Concept maps
- Progress tracker:
  - Teacher and student
  - Print and digital

Biology for TEXAS – Progress Tracker

Chapter 1: Cells and Viruses

Student Name ______________________________ Class ____________

5.A relate the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids, to the structure and function of a cell

Activity	**Biomolecules** Learning Outcomes	Approaching	Proficient	Mastery
2	Summarize the role of key biomolecules in the cell			
3	Distinguish between monosaccharides and polysaccharides and understand their role in cell structure and function.			
4	Identify components of nucleic acids, and explain the role they have in cells.			
5-7	Discuss how cellular proteins are formed, including their folding, and match their function to examples found in cells.			
8	Link the structure of lipids to their function in cells.			

5.B compare and contrast prokaryotic and eukaryotic cells, including their complexity, and compare and contrast scientific explanations for cellular complexity

Activity	**Prokaryotes and Eukaryotes** Learning Outcomes	Approaching	Proficient	Mastery
13	Identify key features of different groups of cells.			
14-16	Compare and contrast prokaryote and eukaryote cells, including presence of organelles.			
17	Compare and contrast prokaryote and eukaryote cells, including size.			
18	Compare and contrast prokaryote and eukaryote cells, including multicellular forms.			
19	Evaluate evidence for eukaryote complexity, including endosymbiosis, and bacteria engulfment by protists.			

5.C investigate homeostasis through the cellular transport of molecules

Activity	**Homeostasis and Cellular Transport** Learning Outcomes	Approaching	Proficient	Mastery
20	Explore the fluid-mosaic model of the cell membrane, including building a model and examining evidence for its structure.			
21-22	Investigate diffusion, especially osmosis, as a process in passive transport in the cell membrane, that is linked to cellular homeostasis.			
23-24	Explain how active transport allows substances to travel against the concentration gradient in the cellular membrane.			
25	Compare and contrast prokaryote and eukaryote cells, including multicellular forms.			

5.D compare the structure of viruses to cells and explain how viruses spread and cause disease

Activity	**Viruses** Learning Outcomes	Approaching	Proficient	Mastery
26	Compare and contrast viral and cellular structures, linking to the classification of living organisms.			
27	Link the method of reproduction to the classification of viruses, including the use of 'spikes' to gain entry to cells.			
27	Distinguish between viral lysogenic and lytic cycles, linking to appearance of disease.			
28	Conduct a literature search on the method of transmission, entry, and disease symptoms of a selected human virus.			
29	Define the terms epidemic and pandemic, and discuss factors involved in their origin.			
29	Summarize key features shared by zoonotic diseases.			
30	Model viral disease spread using a digital simulation.			
31	Describe the methods of SARS-CoV-2 coronavirus transmission, and aspects of the COVID-19 disease.			

* after completing the activity, shade the square aligning to self-assessment of your progress. This may be revised after subsequent revision.

Resource Hub

Curated Digital Resources

- **FREE for teachers and students**
- Access to curated materials and resources which support the content of the worktext.

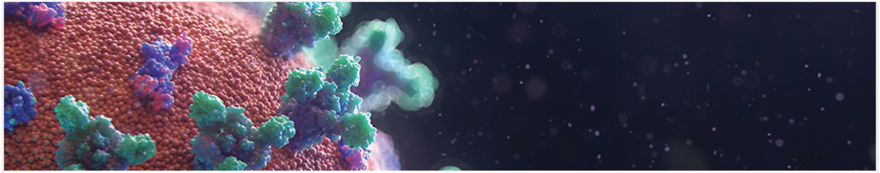
- Articles
- Videos
- Simulations
- Animations
- Games
- Spreadsheets
- 3D Models
- And more…

Search activity number, title, keyword…

BIOLOGY FOR TEXAS

BIOZONE's Resource Hub provides links to online content that supports the activities in the book. From this page, you can also check for any errata or clarifications to the book or model answers since printing.

The external websites are, for the most part, narrowly focused animations and video clips directly relevant to some aspect of the activity on which they are cited. They provide great support to help your understanding.



Chapter 1 - Cells and Viruses

- 1. Are Sponges Animals?
- 2. Biomolecules in the Cell
- 3. Carbohydrates in Cells
- 4. Nucleic Acids in Cells
- 5. Proteins are Formed from Amino Acids
- 6. Investigating the Structure of Proteins
- 7. The Functions of Proteins in Cells
- 8. Lipids in Cells
- 9. The Development of Microscopes
- 10. Microscopes and Magnification
- 11. Studying Cells
- 12. Life Arises from Life
- 13. The Cell is the Unit of Life
- 14. Distinguishing features of Prokaryotic Cells
- 15. Distinguishing Features of Eukaryotes
- 16. Prokaryote vs Eukaryote cells
- 17. Comparing Cell Sizes
- 18. Why be Multicellular?
- 19. Eukaryotes have Complex Cells
- 20. Cellular Membranes Structure
- 21. Diffision in Cells - Passive Transport
- 22. Osmosis in Cells - Diffusion of Water
- 23. Active Transport in Cells
- 24. What is an Ion Pump?
- 25. Cytosis
- 26. Comparing Virus and Cell Structure

Resource Hub

Rich content to enhance learning

- Rich collection of resources at your fingertips
  - No need spend your time searching for content
- Engage students of all abilities
- Extend gifted and talented students
- Teacher resources tagged

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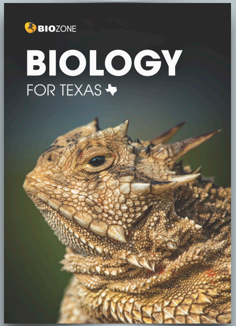
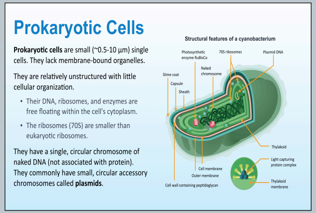


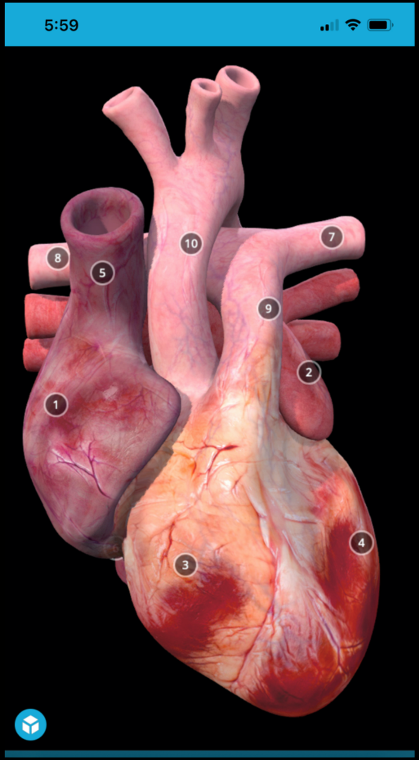
LIST OF RESOURCE HUB MATERIALS

Resource type	Number of resources*
PDFs	36
3D models	182
Videos	455
Weblinks	312
Interactives	245
Spreadsheets	7

* approximate number of resources



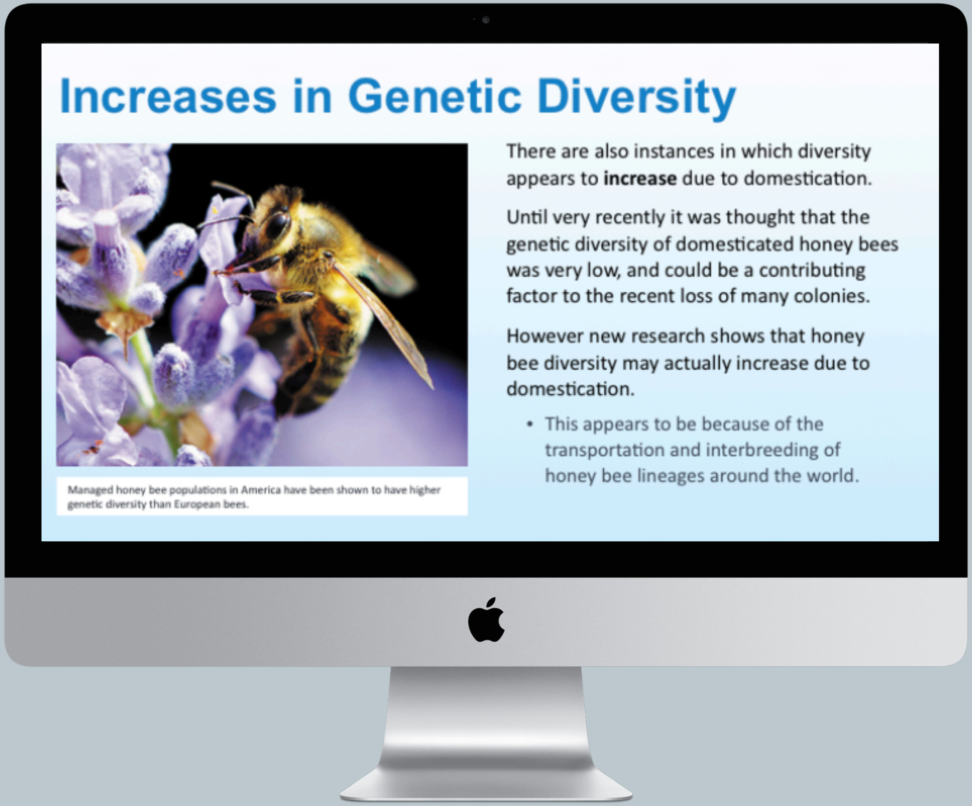
Engagement: Interactive 3D models



Presentation Slides

Embedded in BIOZONE WORLD

- Deliver BIOZONE content in a different and **engaging way**
- Present to your students using a **projector** or **interactive whiteboard**
- **Free teacher access** with purchase of class sets of the print books or with BIOZONE WORLD subscriptions



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    - Multiple response
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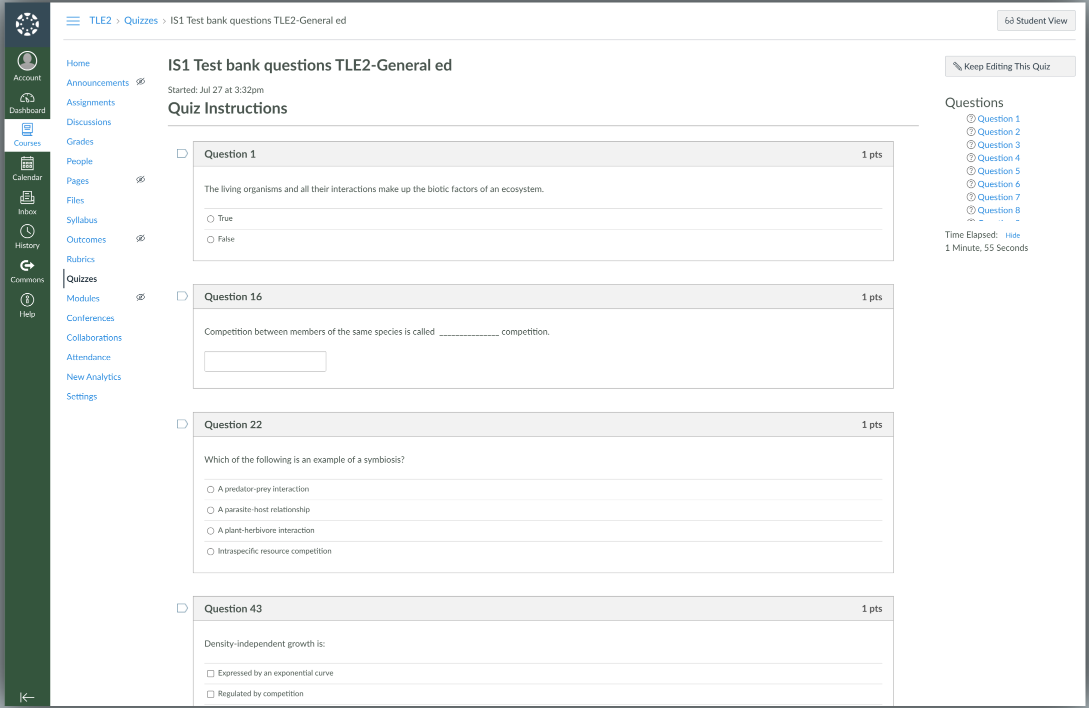
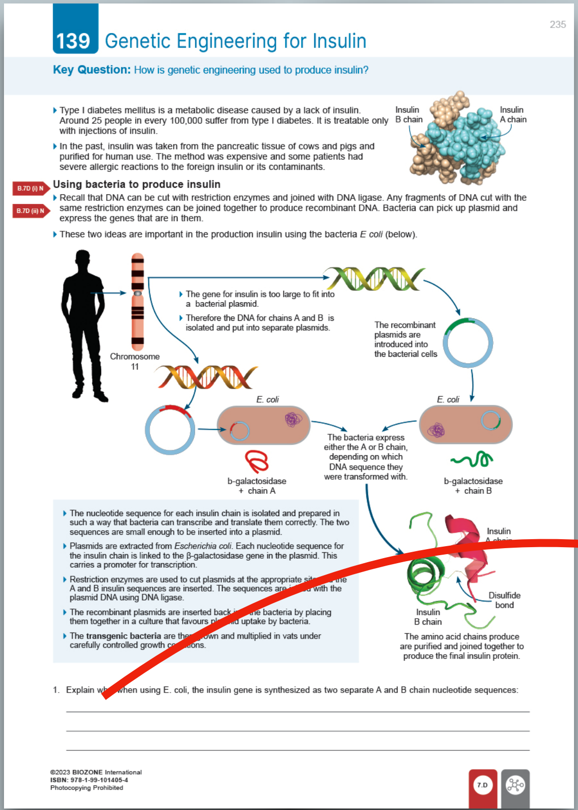
    - Modified true/false
    - Numeric
    - Matching



Question Library

- Embedded questions from the worktext are also provided digitally as a **question library**.

- Question library allows you to:
  - Deliver the same questions from the print version to students via an **online service** such as Google Classroom
  - **Customize questions** to suit **reading ability** and possible **ELL** support.



235

139 Genetic Engineering for Insulin

Key Question: How is genetic engineering used to produce insulin?

- Type I diabetes mellitus is a metabolic disease caused by a lack of insulin. Around 25 people in every 100,000 suffer from type I diabetes. It is treatable only with injections of insulin.
- In the past, insulin was taken from the pancreatic tissue of cows and pigs and purified for human use. The method was expensive and some patients had severe allergic reactions to the foreign insulin or its contaminants.

B.7D (i) N
B.7D (ii) N

Using bacteria to produce insulin

- Recall that DNA can be cut with restriction enzymes and joined with DNA ligase. Any fragments of DNA cut with the same restriction enzymes can be joined together to produce recombinant DNA. Bacteria can pick up plasmid and express the genes that are in them.
- These two ideas are important in the production insulin using the bacteria *E coli* (below).

- The nucleotide sequence for each insulin chain is isolated and prepared in such a way that bacteria can transcribe and translate them correctly. The two sequences are small enough to be inserted into a plasmid.
- Plasmids are extracted from *Escherichia coli*. Each nucleotide sequence for the insulin chain is linked to the β-galactosidase gene in the plasmid. This carries a promoter for transcription.
- Restriction enzymes are used to cut plasmids at the appropriate sit[illegible] the A and B insulin sequences are inserted. The sequences are [illegible] with the plasmid DNA using DNA ligase.
- The recombinant plasmids are inserted back [illegible] the bacteria by placing them together in a culture that favours pl[illegible] uptake by bacteria.
- The **transgenic bacteria** are the[illegible]own and multiplied in vats under carefully controlled growth c[illegible]tions.

1. Explain w[illegible] when using E. coli, the insulin gene is synthesized as two separate A and B chain nucleotide sequences:

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7.D

DIGITAL PLATFORM

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A single place of integration

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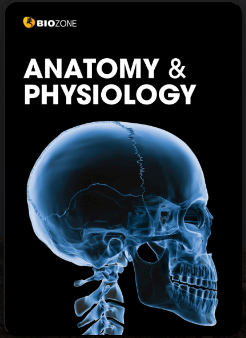
LB

MY CLASSROOM

DASHBOARD ASSIGNMENTS STUDENTS

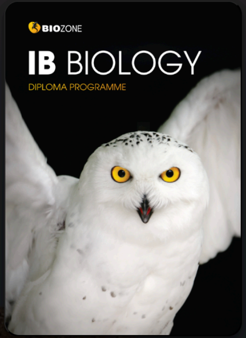
CLASS SETTINGS

ANATOMY & PHYSIOLOGY

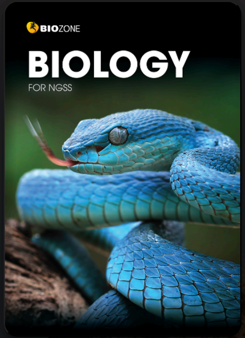


ENVIRONMENTAL SCIENCE

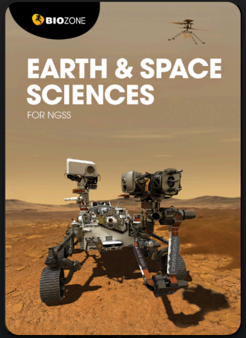
INTERNATIONAL BACCALAUREATE



STANDARD NGSS - BIO



STANDARD NGSS - ESS

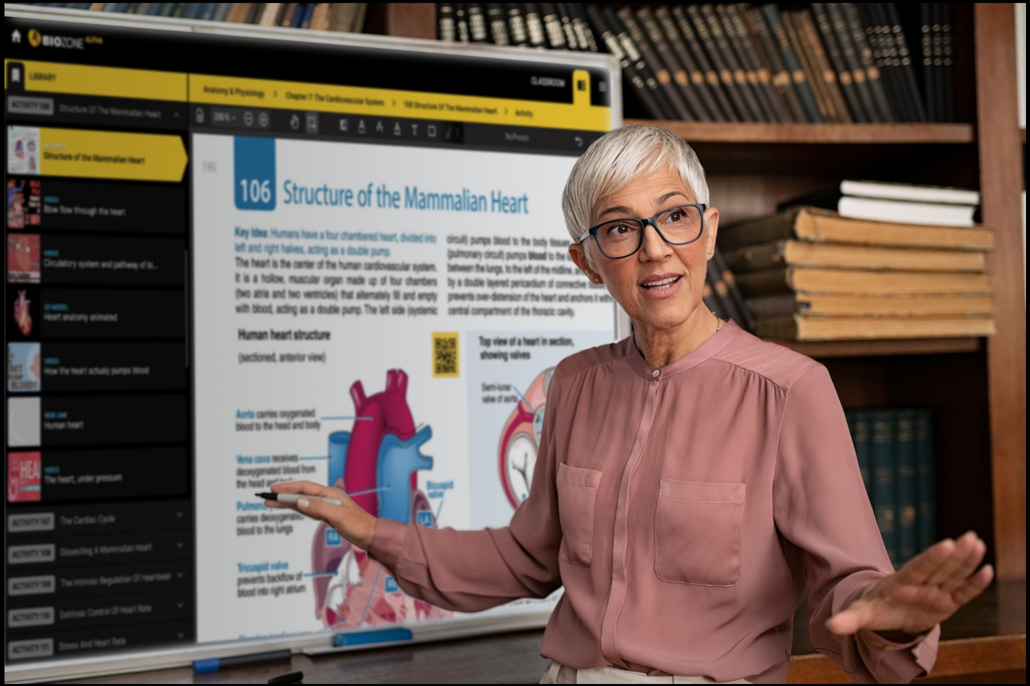


LAST ACTIVITY

ACTIVITY
Gas Exchange Adaptations

Streamline classroom-based

Collaborative Learning



Teacher

introduces Activity

Brief class discussion to "unpack" the Activity's **infographic** or **data**

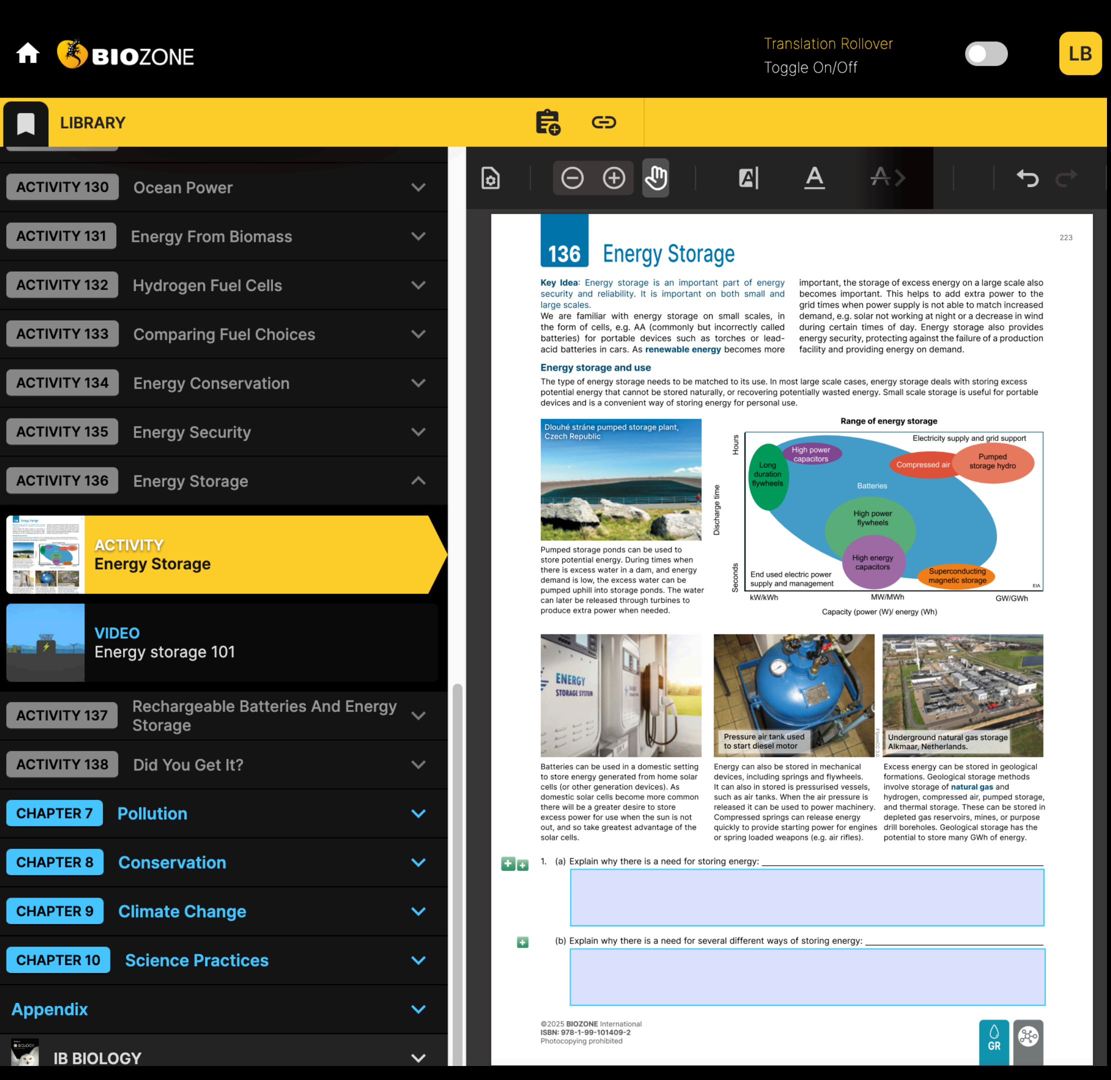
Breakout into small student groups

Student Group A
Collaborate, Summarize, generate Q&As

Student Group B
Collaborate, Summarize, generate Q&As

Student Group C
Collaborate, Summarize, generate Q&As

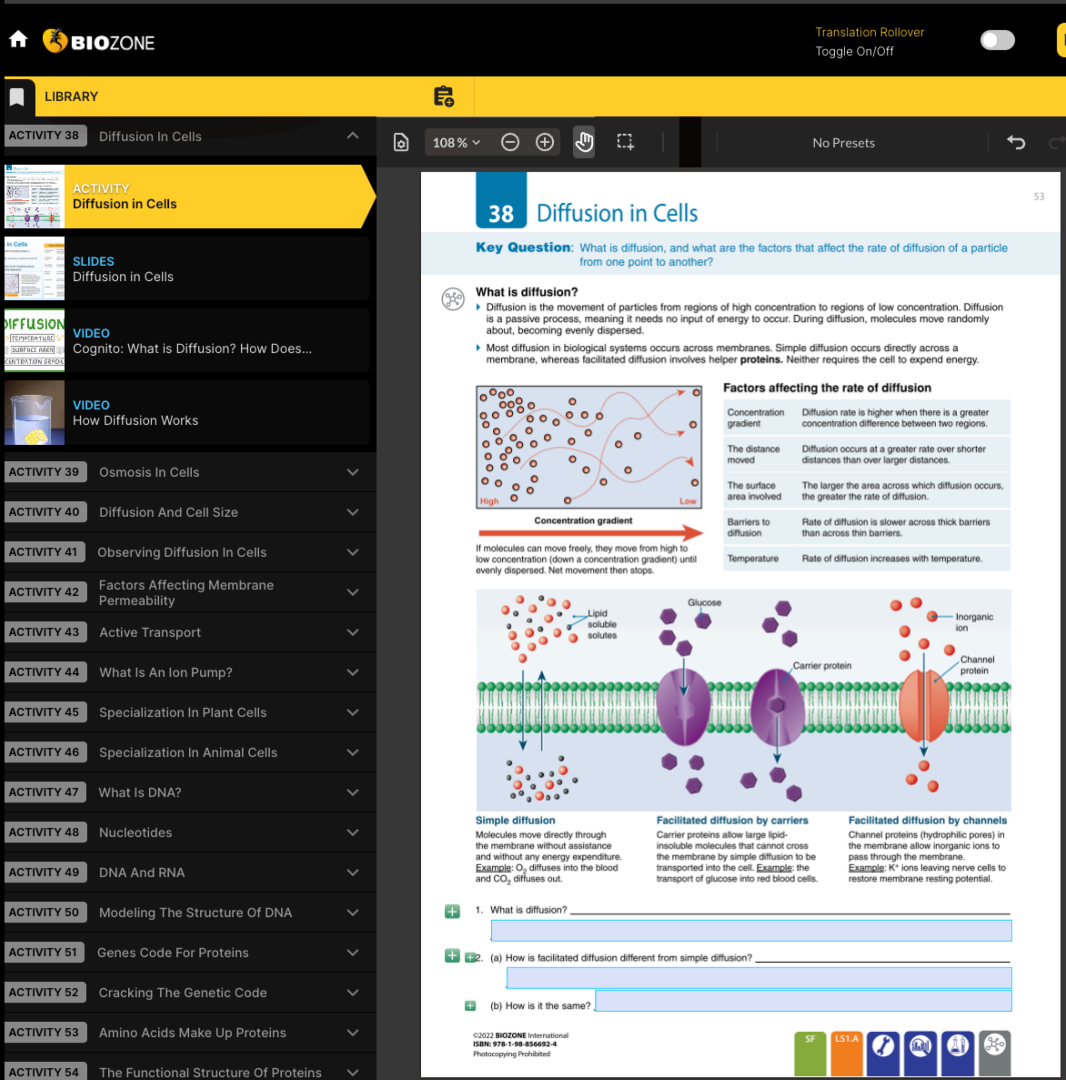
Students **report back** via **teacher-led discussion** then **Self-grade** and **improve answers**

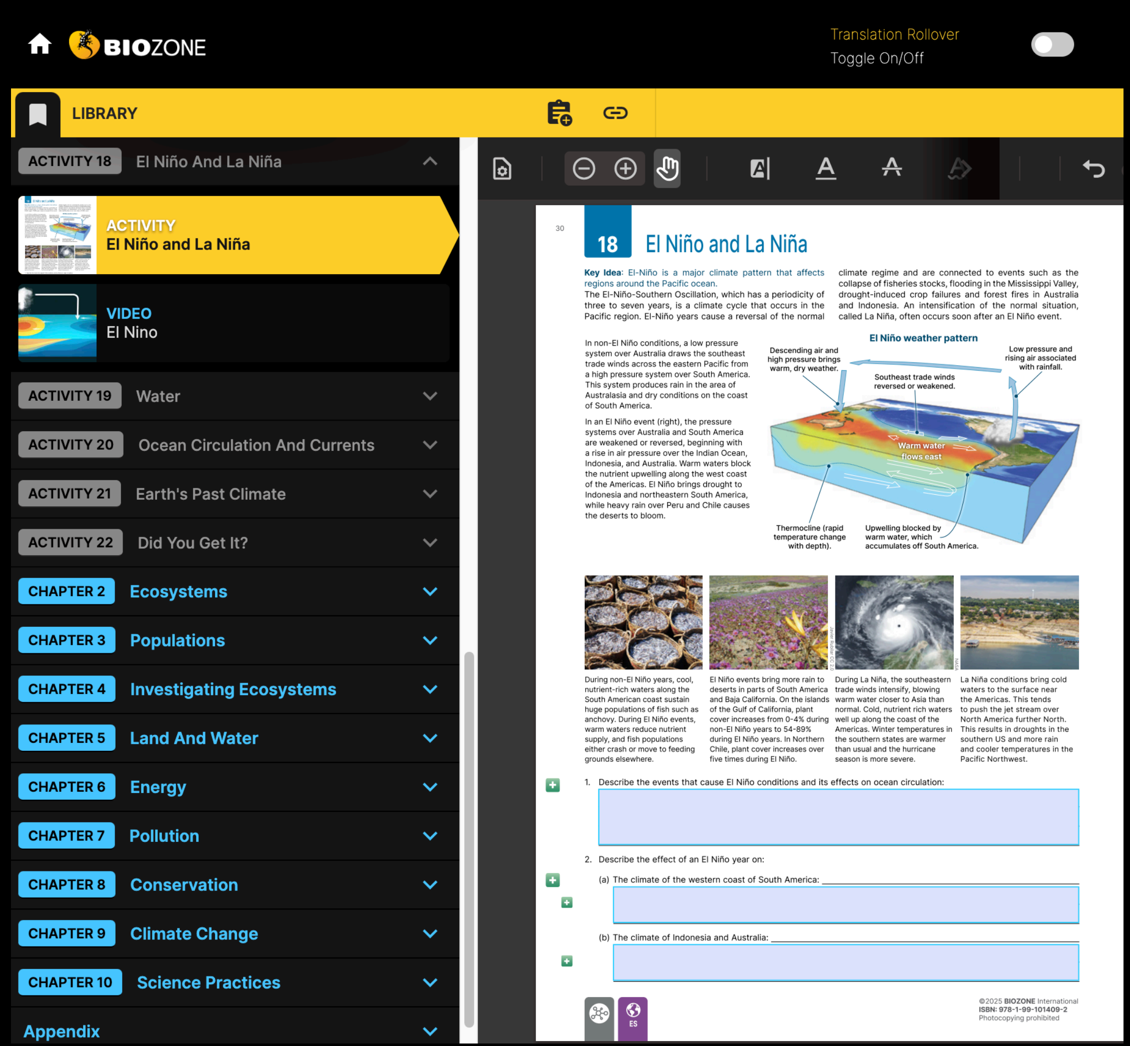


- Replicas of the printed books allow students to view content and answer questions online.
- Student view and teacher view.
- Direct access to:
    - Presentation slides
    - 3D models
    - Curated Videos
    - Websites

Digital platform

- Activity content and order are the same as the print resources.
    - Seamless transition between print and digital.
- Rostering capability.
- Digital resources inbuilt.





- **Students can**:
  - Input answers into the platform for review and grading.
  - Add notes, draw on the page and highlight text passages.
- **Teachers can**:
  - View and show answers
  - Assign activities
  - Grade and return work
  - Force hand in

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LIBRARY

CHAPTER 6 Energy

CHAPTER 7 Pollution

INTRODUCTION Pollution

ACTIVITY 139 Types Of Pollution

ACTIVITY 140 Water Pollution

ACTIVITY 141 Nitrogen Pollution

ACTIVITY 142 Eutrophication And Water Quality

ACTIVITY 143 Biomagnification

ACTIVITY 144 Sewage Treatment

ACTIVITY 145 Waste Management

ACTIVITY 146 Reducing Waste

ACTIVITY 147 Plastics In The Environment

ACTIVITY
Plastics in the Environment

3D MODEL
Hawkesbill turtle

WEB LINK
Our planet is choking on plastic

WEB LINK
Plastic island

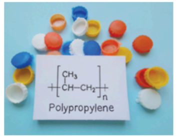
147 Plastics in the Environment

Key Idea: The widespread presence of plastic waste is causing significant harm to ecosystems and the organisms that inhabit them.

Almost every home and industry contains plastic: a synthetic substance that has only been introduced in the last 100 years. Plastic is widely used because it is convenient and easy to produce. However, its low cost of production also makes it easy to discard. Due to the ocean currents spreading the material, even the most remote parts of the world are now affected by **plastic pollution**. Currently, around 19-23 million tonnes of plastic are released into the environment each year as waste into lakes, rivers, and oceans. This problem will only be partially solved by plastic **recycling**. Instead, a shift to non-plastic products and the development of innovative breakdown processes that can tackle the issue of plastic permanence will be required.

Plastic permanence is a problem

- The problem with plastic is its stability. In nature, organic material is broken down by enzymes and microbes that have evolved over billions of years to deal with the chemical bonds found in nature. Plastic degradation is limited due to the difference of chemical bonds in most plastics compared to those found in nature. This results in only a small number of organisms capable of breaking down plastic.
- Plastics have a long-lasting presence in the environment, persisting for hundreds of years. The excessive disposal of plastic products over the past 50 years has led to significant environmental and **waste management** challenges.
- Environmental groups are collecting plastic from polluted areas, but the problem then becomes how to get rid of it completely.




Colorful, cheap plastic is in most homes.


Plastic pellets can be molded into products.


Waterway plastic pollution, Tamil Nadu

Plastic is everywhere
The earliest forms of synthetic plastics, such as Bakelite (1909), cellophane (1912), PVC (1926), and teflon and nylon (1938), revolutionized many products. Mass use in medical supplies and shopping bags increased during the 1970s. Fleece clothing entered the market in 1993. In a relatively short time, plastic became an indispensable material: light, cheap to make, and waterproof. Shops offer a huge variety of plastic products, and nearly every food and drink is packaged in plastic.

Plastics and health
The production of plastic from fossil fuels and other chemicals can have detrimental effects on the environment, including the emission of greenhouse gases. Elevated numbers of cancer cases have occurred in Louisiana near plastic production plants. Certain additives such as BPA, found in plastic, including children's toys, have been found to negatively impact both the reproductive and immune systems. Additionally, when waste plastic is incinerated, harmful fumes are released.

Plastic pollution and water supply
Plastic waste in waterways that supply water for human use can make much of it unusable. India is one country with a significant plastic pollution problem, partly because of the concentrated population. In Tamil Nadu, above, the local government is attempting to solve their plastic pollution by importing several 'boom interceptors' from the Netherlands. However, without an effective recycling plan, this will just collect and move the plastic from one site to another.

1. Why are so many products used by humans made from plastic? *The plastic is cheap to manufacture, is ideal for packaging food and drink, being waterproof and easy to sterilize. It can be molded into many different shapes. It is light to transport around.*

2. Explain why plastics persist in the environment: *The chemical bonds in plastics are not like those found in nature so there are very few organisms that can break the chemical bonds in plastic and degrade it.*

3. Explain how plastic pollution can impact human communities: *Plastic can be esthetically unpleasing and highly visible when discarded. The plastic can break down into small pieces that leach toxins (and forever chemicals) and be washed into the waterways, polluting drinking water and affecting taste. The plastic can block pipes. The plastic can impact the growth of plants and be ingested by farm animals, causing them harm.*

GC

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- Perfect for introducing or reviewing content with students via shared screen.
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- Students can refine their own answers based on the model answers.

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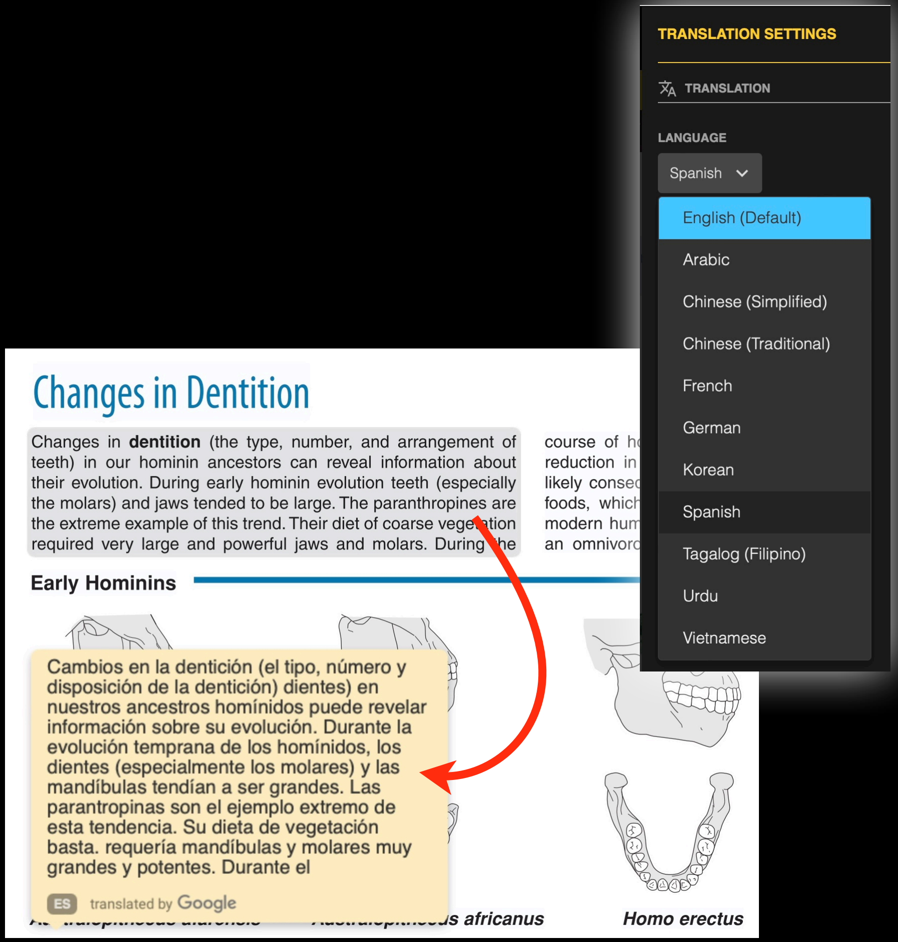
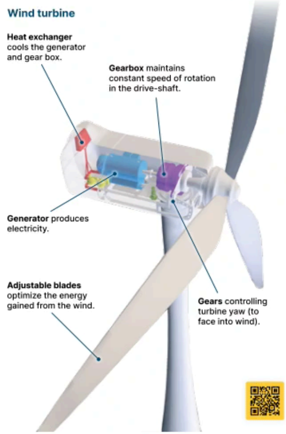


126 Wind Power

Key Idea: Wind power provides a relatively simple and scalable way to produce electricity.

Wind power has been used for centuries to provide the mechanical energy to pump water or run milling machinery. Today, it is mainly used to produce electricity. Wind power is becoming increasingly reliable and cost effective as the technology develops and turbines are able to operate in a range of conditions and wind speeds. In fact **wind energy** is one of the cheapest types of energy to build, maintain, and use. Globally, wind power is steadily increasing in generation capacity, but wind is a variable energy provider. There can be problems matching output to demand, such as during seasonal demands and low (or extremely high) winds. This means systems for managing and distributing electricity will be required as well as backup or base load electricity supplies, e.g. hydro or geothermal power.

Wind turbine



Wind farms often cover large areas of land but turbines can be designed to operate at sea and, on a smaller scale, along highway edges. The scalability of **wind turbines** makes them simple to install in many locations, with turbine sizes ranging from a few metres to over 200 metres in diameter.

At the end of 2022, the power output from wind turbines was around 7% of global electricity production. Global installed capacity was more than 800 GW. Electricity generation from wind is rising every year.

1. A typical wind turbine produces around 2.3 MW. The average house uses 30 kWh of energy per day (a kilowatt hour is the equivalent of 1000 joules of energy per second (1kW) running for 1 hour). Calculate the following:

(a) The minimum number of wind turbines required to power a town of 20,000 households:

(b) Wind turbines cost around $1.3 million per MW of energy production to build. What will the be the cost of (a) above?

(c) The cost of building, running, and maintaining wind turbines over their 20 year lifetimes is about $50 per MWh. What could the 20,000 households using the wind turbines above expect to pay in dollars per year for the use of electricity provided by the wind turbines?

(d) Why can households actually expect to have to pay a lot more than this?

GR

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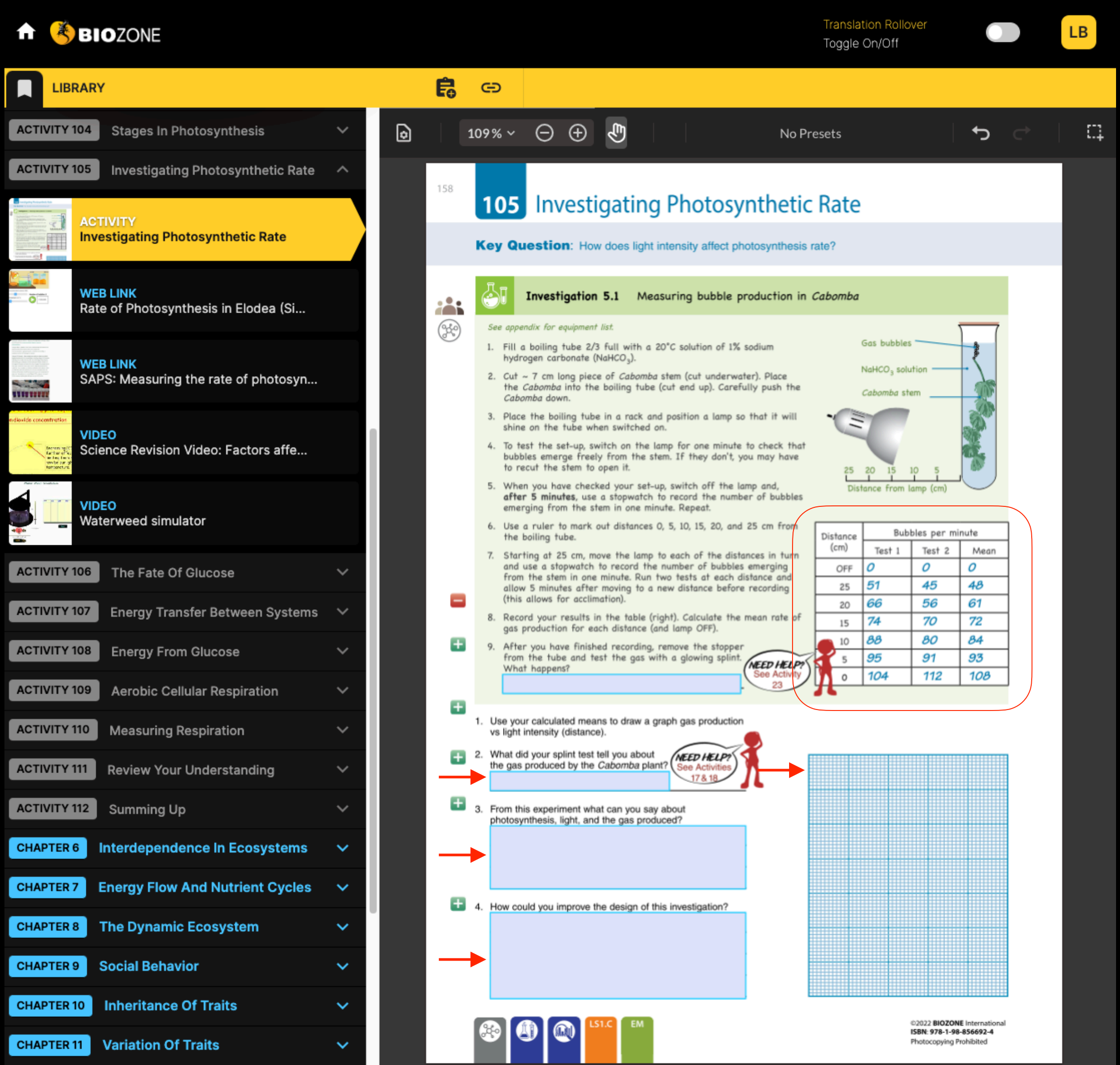
Practical Investigations

- Short on time?
- Student results can't be used?

- Share the model answer data.
- Students still do the graphing and analysis of results.



In summary …

STUDENT Access

Digital interactive replica of the book:

- Students can view the book, add **annotations** and **markup**.
- Students can enter **answers online** and **submit** them to their teacher.
- Access embedded resources: **3D models**, **presentation slides**, curated OER **videos**, **weblinks**.

TEACHER Access

All the functions the student has plus:

- Teacher has access to **model answers** & can show/hide via display buttons.
- Teacher can **assign activities** to students.
- Force hand in.
- Teacher can **view**, **comment,** and **grade** student responses to questions.

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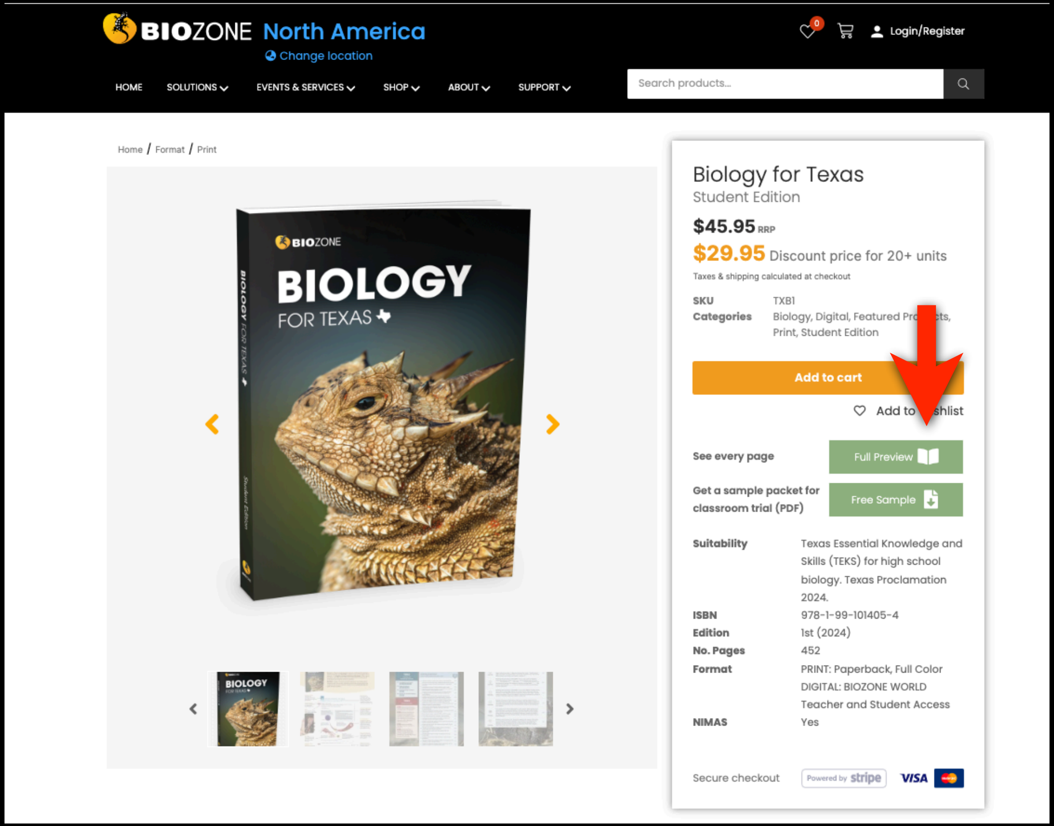

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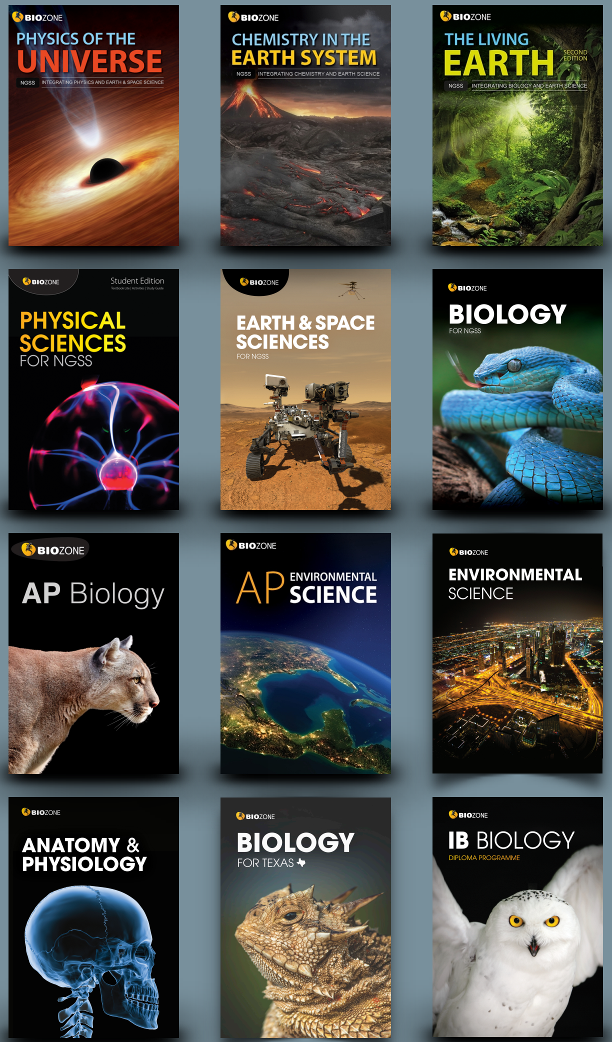

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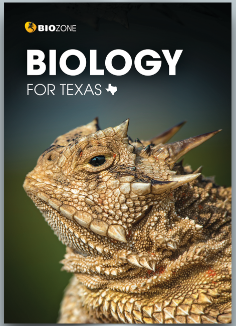

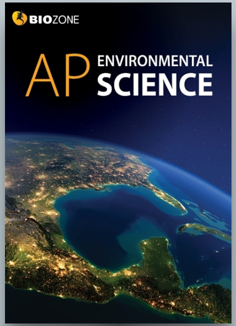

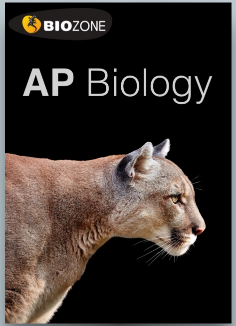

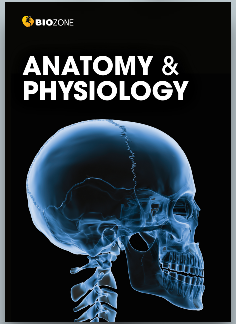

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