SIRIUS

SAMPLER
Use with Your Students!

BIOLOGY ZINGERS

Solving the Most-Missed STAAR® Test Items

2018 Streamlined TEKS

- **Challenging test items engage students.**
- **Interactive instruction promotes student thinking.**
- **Guided practice builds test-taking confidence.**

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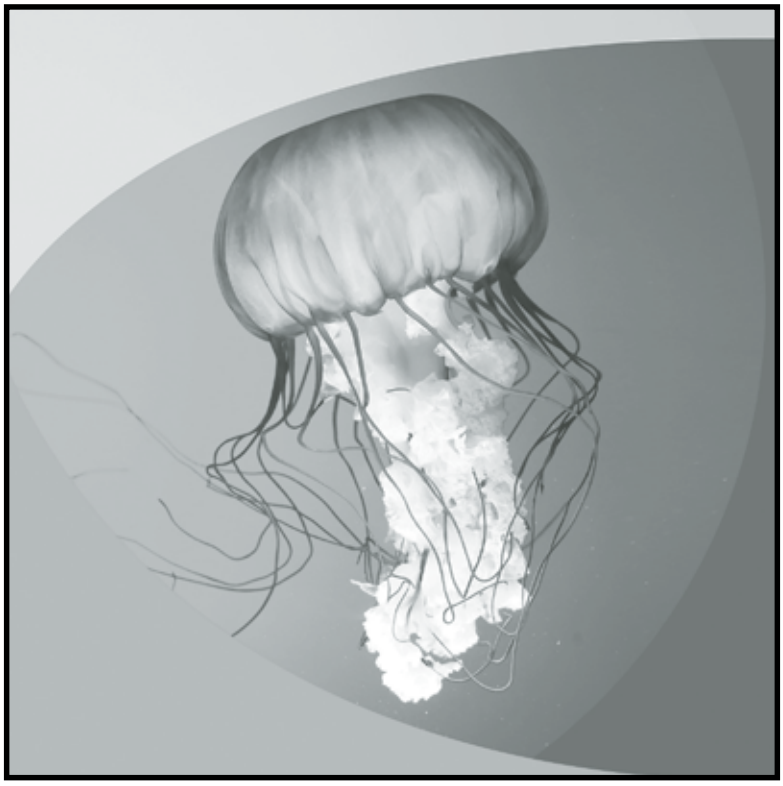
BIOLOGY ZINGERS

Solving the Most-Missed STAAR® Test Items

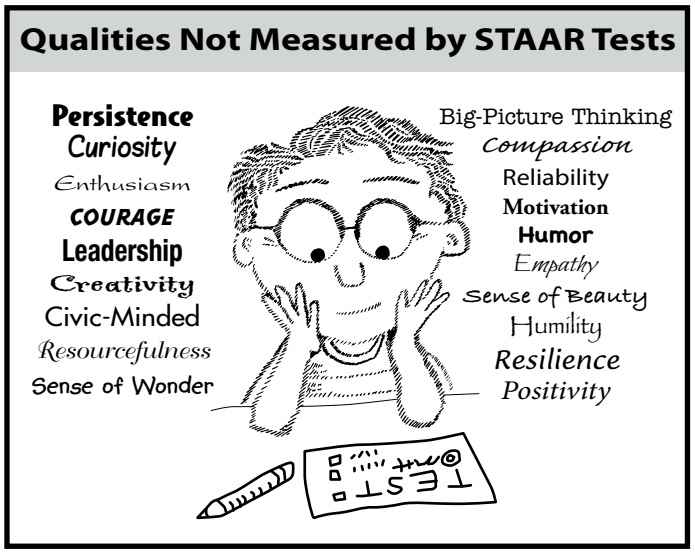


Printed in Texas.

ISBN: 978-1-943008-88-9

Dear Students,

There are many important qualities of character and intelligence that the STAAR tests are **not** designed to measure—as this cartoon shows.



What the STAAR Biology test does measure is your ability to solve specific kinds of math problems. The lessons in this workbook will teach you how to approach and successfully answer STAAR test questions. These skills are fun to learn, so you will probably enjoy the lessons.

Zingers— Solving the Most-Missed Test Items

Zingers challenge and support ALL students to THINK in ways that help them solve STAAR problems. Each Zinger presents one of the most difficult released STAAR test items and guides you to: read for understanding, plan and solve the problem, and reflect on the solution process. Finally, you practice with a similar test item to apply what you learned.

Practicing Smart Is the Secret to STAAR Success

There is a secret to success on the STAAR tests—practice, practice, and more practice. However, not all practice is the same . . . so you want to practice smart.

First, practice with test questions that are likely to appear on the actual STAAR test. That's easy, since this workbook is full of them! Next, focus on your weaknesses—the types of questions that you most need to improve. Think of it like this: if your basketball shot needs improvement, you don't practice dribbling. Instead, you practice shooting.

Focusing on your weaknesses also means analyzing each test question you get wrong. Why did you get it wrong? If your basketball shot is off, you identify what you are doing wrong (aiming too far left) and correct it with your next shot (aim further right).

When you practice, give each question your full attention. (Take a short break *after* you answer the question.) Your attention is a muscle that you can build by using it, one practice test question at a time. Do you believe unfocused, sloppy practice of your basketball shot will help you perform during a big game? Your attention is your greatest power. You develop it with practice.

Preparing for the STAAR test can actually be a fun challenge. And when you practice smart, you are building life skills at the same time you prepare for the STAAR test!

Your partners in STAAR success,

The Sirius Education Team

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Included in Sampler

Zingers—Solving the Most-Missed STAAR Test Items

On Your Own—Mixed Readiness Practice 47

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	TEKS	Correlations to *Biology: Preparation and Practice*
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Using Biology Zingers

Zingers teach how to **read actively**, **think carefully**, and **solve** some of the most-missed STAAR test items.

① READ and UNDERSTAND

Good problem solvers carefully read and reread the problem. Use the **interactive questions** to help you identify key facts such as:

- What **information is given**?
- What does the **problem ask for**?
- What **key concepts** do you need?

② PLAN and SOLVE

Examine what two **students think** as they attempt to solve the problem.

The students often use **different methods** to solve the problem. They might make mistakes. Correcting these mistakes helps you **avoid** making **common mistakes** on the STAAR test.

③ LOOK BACK

What do you think? What did you learn from the other students' solution processes?

Reflecting on the problem will help you remember it when you see similar problems on the STAAR test.

④ GUIDED PRACTICE

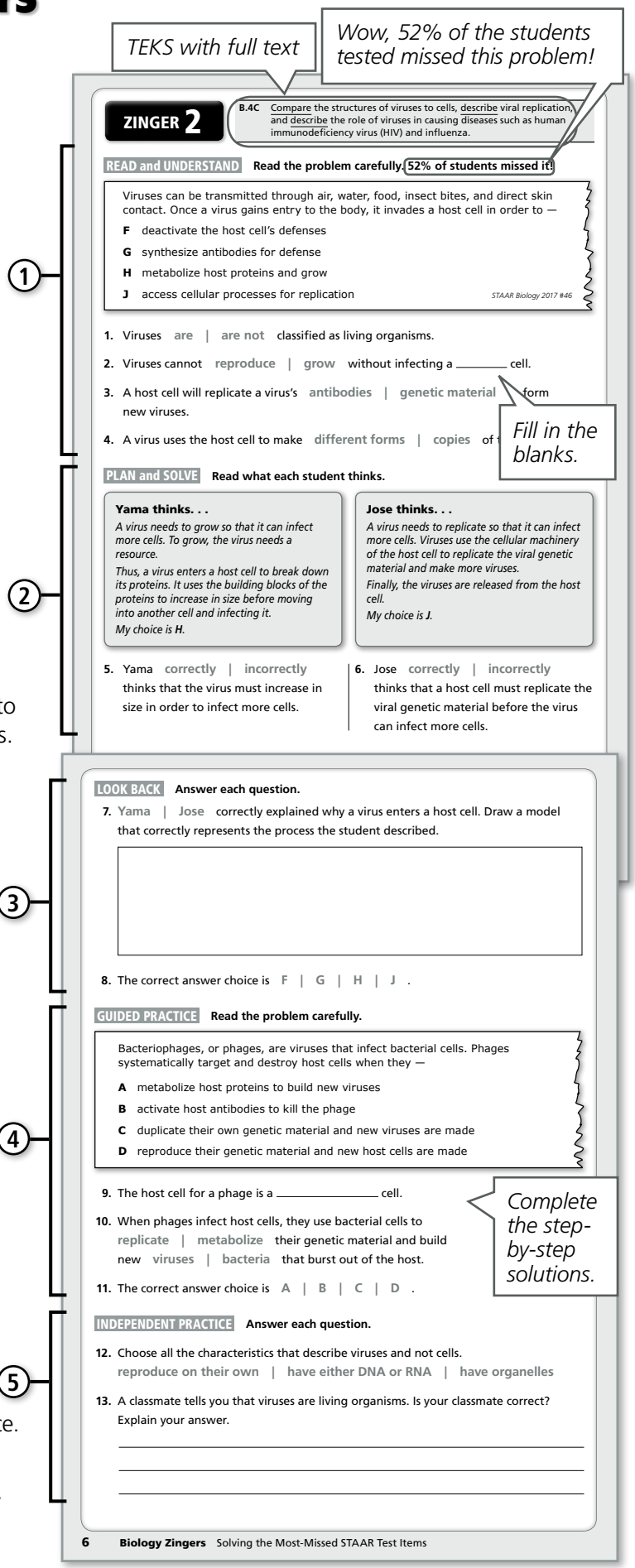
Now it's your turn to **solve a similar problem.**

Use the **step-by-step** solution to avoid careless errors. With practice, you can solve the problems most students missed!

⑤ INDEPENDENT PRACTICE

Apply what you learned with more practice.

After this, you will feel **more confident** that you can succeed on the STAAR test. After all, you just solved one of the hardest problems!



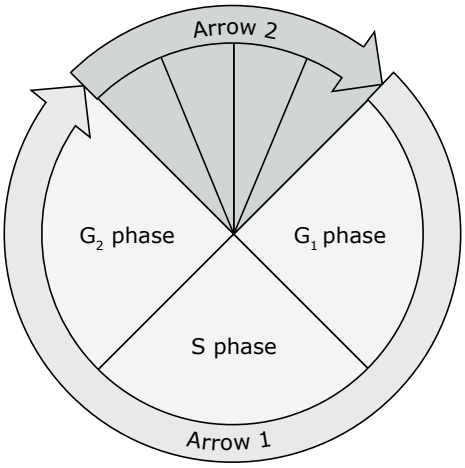
ZINGER 3

B.5A Describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms.

READ and UNDERSTAND

Read the problem carefully. 47% of students missed it!

This model of the cell cycle includes two arrows that each represent a process in the cycle.



What do the two arrows represent?

STAAR Biology 2018 #46

F Arrow 1 represents prophase, and Arrow 2 represents interphase.

G Arrow 1 represents mitosis, and Arrow 2 represents meiosis.

H Arrow 1 represents interphase, and Arrow 2 represents mitosis.

J Arrow 1 represents meiosis, and Arrow 2 represents prophase.

1. The cell cycle represents the main **stages | divisions** that most eukaryotic cells go through during their lifetime.
2. **Interphase | Prophase** is the part of the cell cycle in which a cell grows, copies the DNA, and prepares for cell division.
3. **Interphase | Mitosis** is the part of the cell cycle that leads to two identical nuclei during the process of cell division.

PLAN and SOLVE

Read what each student thinks.

Angel thinks. . .

The stem "pro-" means beforehand, and the prefix "inter-" means between. Therefore, prophase must occur before interphase.

*My choice is **F**.*

Matthew thinks. . .

There are two main stages in the cell cycle, known as interphase and cell division. Interphase is longer than cell division. Arrow 1 is longer than Arrow 2.

*My choice is **H**.*

4. Angel **correctly** | **incorrectly** identified prophase as the first stage of the cell cycle.

5. Matthew **correctly** | **incorrectly** states that interphase is longer than cell division.

LOOK BACK **Answer each question.**

6. **Angel** | **Matthew** finds the correct answer choice.

What mistake did the other student make? _____

_____

_____

7. Lani recalls that DNA synthesis (S) happens in interphase. Explain how she can use this fact to find the correct answer. _____

_____

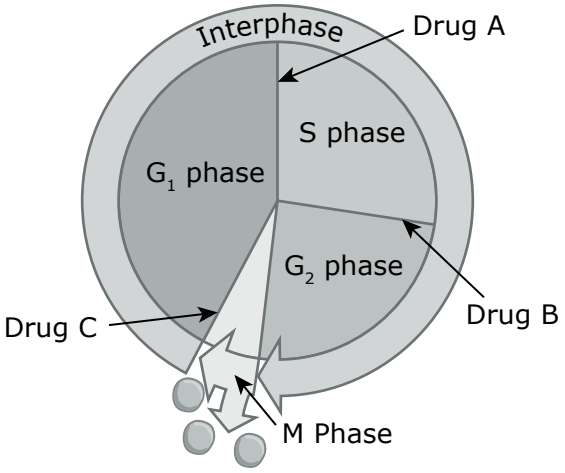
_____

_____

8. The correct answer choice is **F** | **G** | **H** | **J** .

GUIDED PRACTICE **Read the problem carefully.**

Cancer is caused by cells that have lost control of the cell cycle. Many cancer medications interfere with the cell cycle to stop tumor growth. The model below shows the stages of the cell cycle at which three drugs interact with cancer cells.



Which drug(s) will prevent the cell from entering the cell division phase, but still allow DNA to replicate?

A Drug A

B Drug B

C Drugs A and B

D Drugs B and C

9. DNA replication occurs only during the **G_1 | S | G_2** phase.

10. If the cell cycle starts at G_1, then Drug **A | B** disrupts the cell cycle before DNA replicates.

11. If the cell cycle starts at G_1, then Drug **B | C** also disrupts the cell cycle before DNA replicates.

12. The correct answer choice is **A | B | C | D** .

INDEPENDENT PRACTICE **Answer each question.**

13. Choose all the events that occur during interphase, and not during mitosis.
anaphase | chromosomes separate | DNA replication | G_1 phase | G_2 phase | organelle growth | M phase | metaphase | prophase | S phase

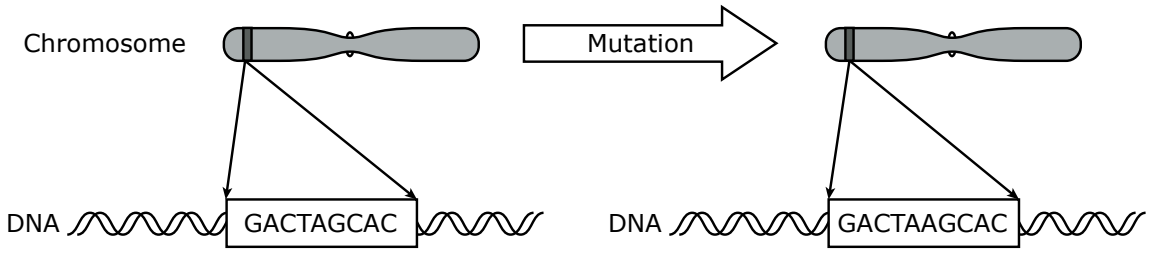
14. A new drug is developed that allows DNA replication, but prevents the chromosomes from separating. Which stage of the cell cycle, shown in the Guided Practice, will the drug affect? Explain.

ZINGER 5

B.6E Identify and illustrate changes in DNA and evaluate the significance of these changes.

READ and UNDERSTAND **Read the problem carefully. 47% of students missed it!**

Different types of mutations can occur in DNA. The diagram represents a type of mutation.



Which statement describes the mutation in the diagram?

F A silent mutation results in the insertion of a different amino acid.

G A substitution occurs with the adenine base.

H A deletion of a cytosine base occurs.

J A base is inserted into one strand of the DNA.

STAAR Biology 2017 #2

1. A mutation is a change in the sequence of **carbon atoms** | **bases** in a molecule of DNA.
2. Each DNA nucleotide contains one of four possible bases. These bases are adenine (A), thymine (T), cytosine (C), and _____.
3. A silent mutation has **a harmful effect** | **no effect** on an organism.
4. A substitution mutation replaces a base with **a different** | **the same** base.
5. A deletion mutation removes one or more **bases** | **amino acids** from the DNA strand.
6. A(n) **insertion** | **frameshift** mutation adds one or more bases to a DNA strand.

PLAN and SOLVE **Read what each student thinks.**

Alejandro thinks. . .

*This is not a silent mutation because it will cause a change in the DNA reading frame and have a major effect. That means **F** is false.*

I also know that an insertion mutation has one or more bases added into the DNA sequence. I see that the mutated DNA has an additional adenine base that is not in the original sequence.

*My choice is **J**.*

Dakota thinks. . .

A silent mutation is a mutation with little or no effect. An insertion occurs when one or more amino acids are added to the DNA sequence. Because the mutated sequence has only one adenine base added and that will add just one amino acid, it will have a small effect.

*My choice is **F**.*

7. Alejandro **correctly** | **incorrectly** thinks this mutation will change the reading frame.

8. Dakota **correctly** | **incorrectly** thinks that when one base is added, it adds an amino acid.

LOOK BACK **Answer each question.**

9. **Alejandro** | **Dakota** finds the correct answer choice.

What mistake does the other student make? _____

10. Alicia said she counted DNA bases to find the correct answer.

Explain how this can help. _____

11. The correct answer choice is **F** | **G** | **H** | **J** .

GUIDED PRACTICE **Read the problem carefully.**

The base sequences below represent an original mRNA strand (left) and a mutated mRNA strand (right).

Original		Mutation
U		U
C		C
G		G
A	→	A
C		U
U		U
G		G

Which type of DNA mutation produced the mutated strand of RNA shown?

A Deletion

B Insertion

C Substitution

D Inversion

12. A deletion mutation happens when a base is **added to** | **removed from** a sequence, so this mutation **is** | **is not** a deletion.

13. An insertion mutation happens when a base is **added to** | **removed from** a sequence, so this **is** | **is not** an insertion.

14. This **is** | **is not** a mutation in which a base is replaced by another base, which is called a(n) **inversion** | **substitution** .

15. The correct answer choice is **A** | **B** | **C** | **D** .

INDEPENDENT PRACTICE **Answer each question.**

16. The original base sequence of a section of mRNA was as follows:

UCGACUG

Write the type of mutation (Deletion, Insertion, Inversion, or Substitution) beside each mutated sequence below and circle where the mutation occurs:

UCGGACUG: _____

UCGAAUG: _____

UCACUG: _____

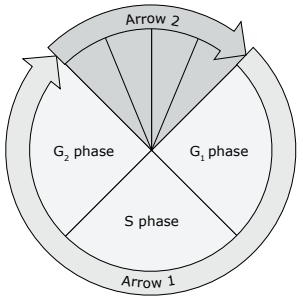
UCUCAGG: _____

ZINGER 3

B.5A Describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms.

READ and UNDERSTAND **Read the problem carefully. 47% of students missed it!**

This model of the cell cycle includes two arrows that each represent a process in the cycle.



What do the two arrows represent? *STAAR Biology 2018 #46*

F Arrow 1 represents prophase, and Arrow 2 represents interphase. 21%

G Arrow 1 represents mitosis, and Arrow 2 represents meiosis. 18%

H Arrow 1 represents interphase, and Arrow 2 represents mitosis. 53%

J Arrow 1 represents meiosis, and Arrow 2 represents prophase. 8%

1. The cell cycle represents the main (stages) | divisions that most eukaryotic cells go through during their lifetime.
2. (Interphase) | Prophase is the part of the cell cycle in which a cell grows, copies the DNA, and prepares for cell division.
3. Interphase | (Mitosis) is the part of the cell cycle that leads to two identical nuclei during the process of cell division.

PLAN and SOLVE **Read what each student thinks.**

Angel thinks. . .
The stem "pro-" means beforehand, and the prefix "inter-" means between. Therefore, prophase must occur before interphase.
*My choice is **F**.*

Matthew thinks. . .
There are two main stages in the cell cycle, known as interphase and cell division. Interphase is longer than cell division. Arrow 1 is longer than Arrow 2.
*My choice is **H**.*

SAMPLER

BIOLOGY ZINGERS CONTENTS

ZINGERS

ON YOUR OWN

16 Mixed Readiness TEKS STAAR Practice Items

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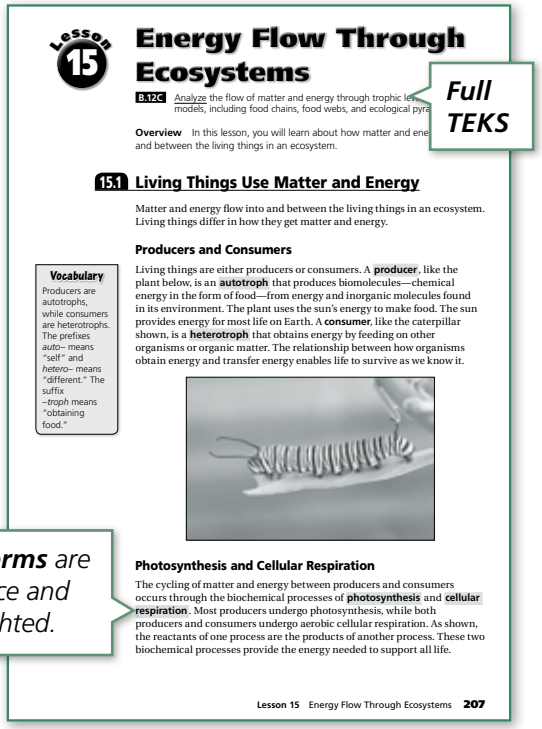
BIOLOGY EOC

STAAR Preparation and Practice

A 340-page workbook with instruction and practice in all tested Biology TEKS.

TEKS Instruction—Engaging Interactive Learning

Concise and **student-friendly** instruction reviews each Readiness TEKS. Students actively participate in learning with **interactive** and **scaffolded** Your Turn questions.



Lesson 15

Energy Flow Through Ecosystems

B.12C Analyze the flow of matter and energy through trophic le… models, including food chains, food webs, and ecological pyra…

Overview In this lesson, you will learn about how matter and ene… and between the living things in an ecosystem.

15.1 Living Things Use Matter and Energy

Matter and energy flow into and between the living things in an ecosystem. Living things differ in how they get matter and energy.

Producers and Consumers

Living things are either producers or consumers. A **producer**, like the plant below, is an **autotroph** that produces biomolecules—chemical energy in the form of food—from energy and inorganic molecules found in its environment. The plant uses the sun's energy to make food. The sun provides energy for most life on Earth. A **consumer**, like the caterpillar shown, is a **heterotroph** that obtains energy by feeding on other organisms or organic matter. The relationship between how organisms obtain energy and transfer energy enables life to survive as we know it.

Vocabulary
Producers are autotrophs, while consumers are heterotrophs. The prefixes *auto–* means "self" and *hetero–* means "different." The suffix *–troph* means "obtaining food."

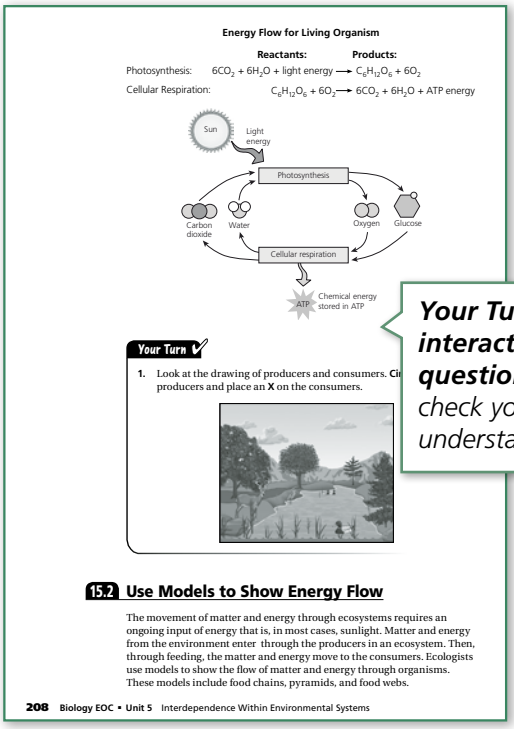
Photosynthesis and Cellular Respiration

The cycling of matter and energy between producers and consumers occurs through the biochemical processes of **photosynthesis** and **cellular respiration**. Most producers undergo photosynthesis, while both producers and consumers undergo aerobic cellular respiration. As shown, the reactants of one process are the products of another process. These two biochemical processes provide the energy needed to support all life.

Lesson 15 Energy Flow Through Ecosystems **207**

Full TEKS

***Key terms** are boldface and highlighted.*



Energy Flow for Living Organism

	Reactants:	Products:
Photosynthesis:	$6CO_2 + 6H_2O$ + light energy	$C_6H_{12}O_6 + 6O_2$
Cellular Respiration:	$C_6H_{12}O_6 + 6O_2$	$6CO_2 + 6H_2O$ + ATP energy

Your Turn

1. Look at the drawing of producers and consumers. Ci… producers and place an **X** on the consumers.

15.2 Use Models to Show Energy Flow

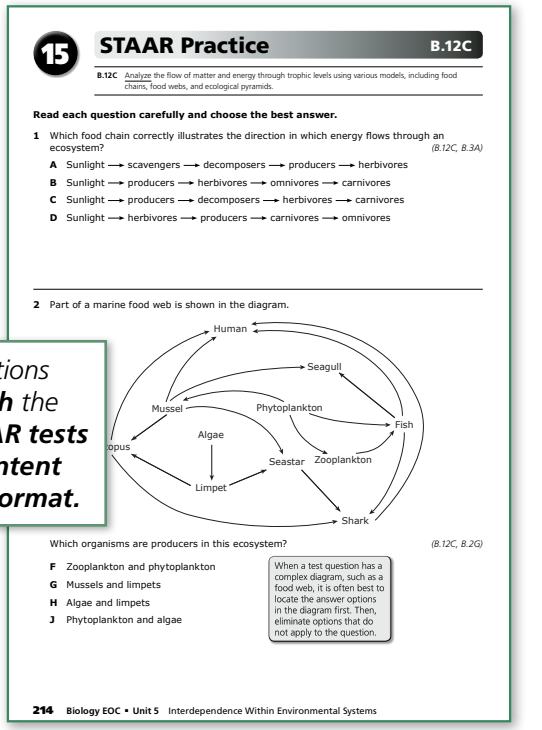
The movement of matter and energy through ecosystems requires an ongoing input of energy that is, in most cases, sunlight. Matter and energy from the environment enter through the producers in an ecosystem. Then, through feeding, the matter and energy move to the consumers. Ecologists use models to show the flow of matter and energy through organisms. These models include food chains, pyramids, and food webs.

208 **Biology EOC • Unit 5** Interdependence Within Environmental Systems

***Your Turn interactive questions** check your understanding.*

STAAR Practice—Abundant and Systematic Practice

Each lesson includes **authentic STAAR practice** with **test-taking tips**.



15 **STAAR Practice** B.12C

B.12C Analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids.

Read each question carefully and choose the best answer.

1 Which food chain correctly illustrates the direction in which energy flows through an ecosystem? *(B.12C, B.3A)*

A Sunlight → scavengers → decomposers → producers → herbivores
B Sunlight → producers → herbivores → omnivores → carnivores
C Sunlight → producers → decomposers → herbivores → carnivores
D Sunlight → herbivores → producers → carnivores → omnivores

2 Part of a marine food web is shown in the diagram.

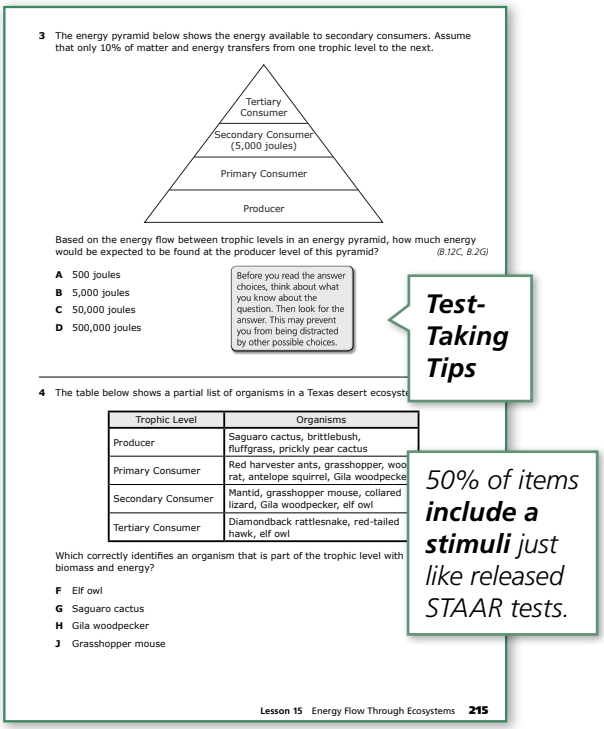
Which organisms are producers in this ecosystem? *(B.12C, B.2G)*

F Zooplankton and phytoplankton
G Mussels and limpets
H Algae and limpets
J Phytoplankton and algae

When a test question has a complex diagram, such as a food web, it is often best to locate the answer options in the diagram first. Then, eliminate options that do not apply to the question.

214 **Biology EOC • Unit 5** Interdependence Within Environmental Systems

*Questions **match** the **STAAR tests** in **content** and **format.***



3 The energy pyramid below shows the energy available to secondary consumers. Assume that only 10% of matter and energy transfers from one trophic level to the next.

Based on the energy flow between trophic levels in an energy pyramid, how much energy would be expected to be found at the producer level of this pyramid? *(B.12C, B.2G)*

A 500 joules
B 5,000 joules
C 50,000 joules
D 500,000 joules

Before you read the answer choices, think about what you know about the question. Then look for the answer. This may prevent you from being distracted by other possible choices.

4 The table below shows a partial list of organisms in a Texas desert ecosyst…

Trophic Level	Organisms
Producer	Saguaro cactus, brittlebush, fluffgrass, prickly pear cactus
Primary Consumer	Red harvester ants, grasshopper, woo… rat, antelope squirrel, Gila woodpecke…
Secondary Consumer	Mantid, grasshopper mouse, collared lizard, Gila woodpecker, elf owl
Tertiary Consumer	Diamondback rattlesnake, red-tailed hawk, elf owl

Which correctly identifies an organism that is part of the trophic level with biomass and energy?

F Elf owl
G Saguaro cactus
H Gila woodpecker
J Grasshopper mouse

Lesson 15 Energy Flow Through Ecosystems **215**

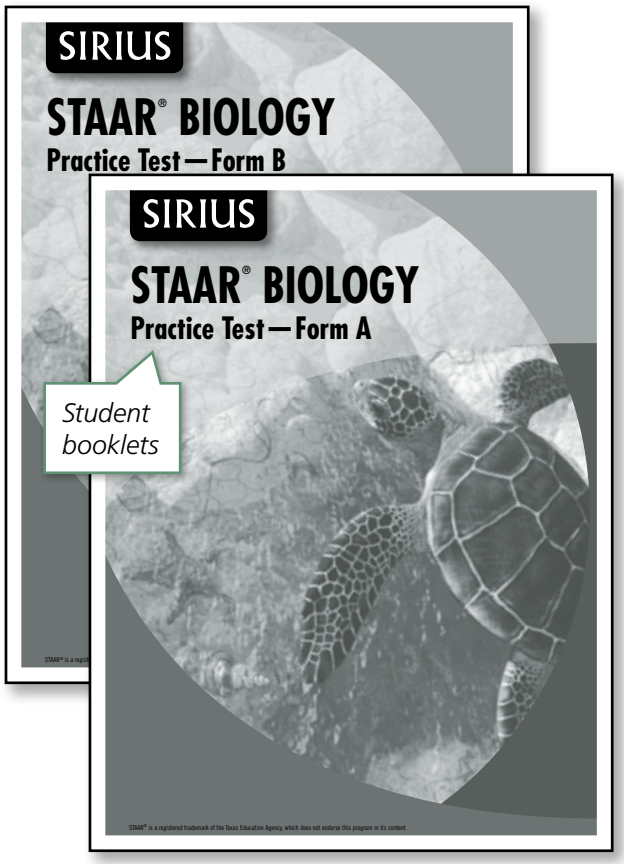
Test-Taking Tips

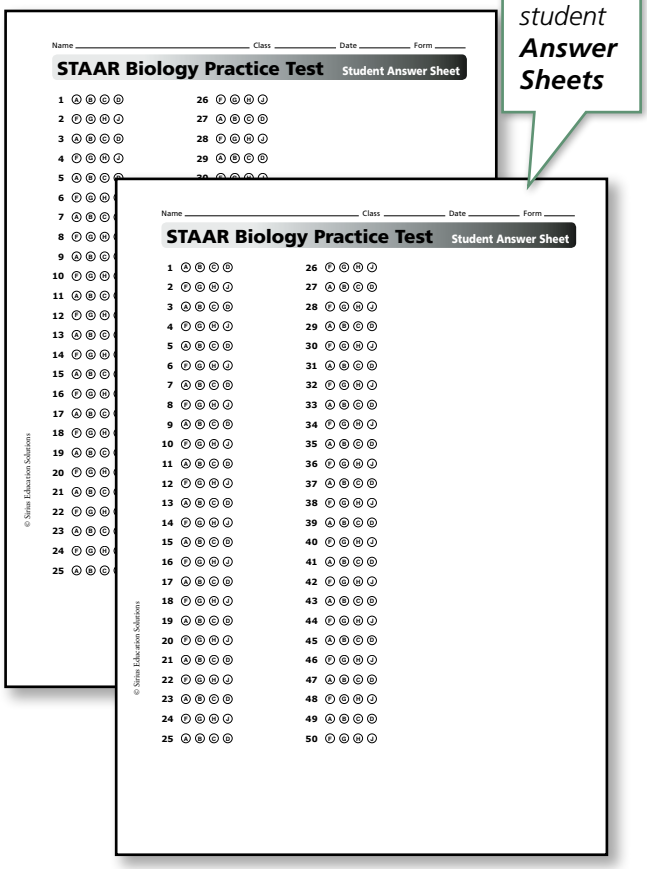
*50% of items **include a stimuli** just like released STAAR tests.*

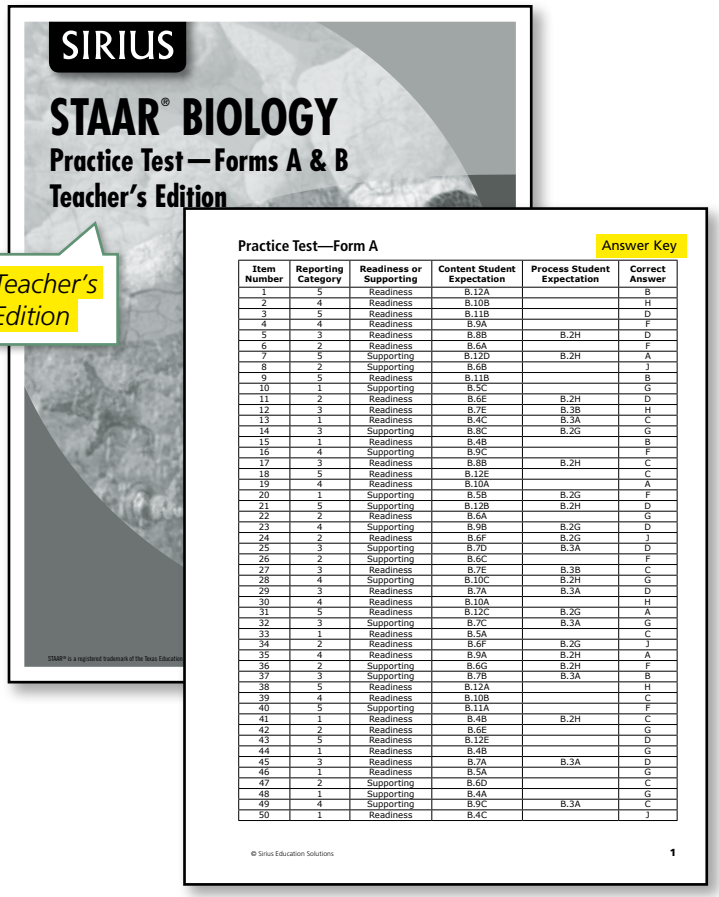
STAAR BIOLOGY

STAAR Practice Tests Forms A & B

Two distinct secure form tests that closely match the released STAAR test items and blueprint.

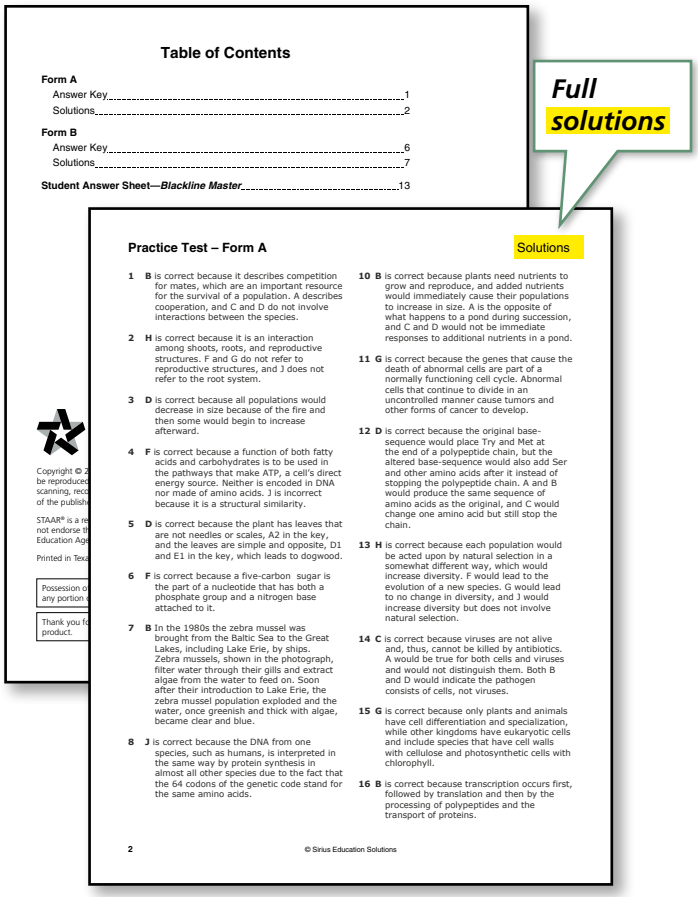






Practice Test—Form A — Answer Key

Item Number	Reporting Category	Readiness or Supporting	Content Student Expectation	Process Student Expectation	Correct Answer
1	5	Readiness	B.12A		B
2	4	Readiness	B.10B		H
3	5	Readiness	B.11B		D
4	4	Readiness	B.9A		F
5	3	Readiness	B.8B	B.2H	D
6	2	Readiness	B.6A		F
7	5	Supporting	B.12D	B.2H	A
8	2	Supporting	B.6B		J
9	5	Readiness	B.11B		B
10	1	Supporting	B.5C		G
11	2	Readiness	B.6E	B.2H	D
12	3	Readiness	B.7E	B.3B	H
13	1	Readiness	B.4C	B.3A	C
14	3	Supporting	B.8C	B.2G	G
15	1	Readiness	B.4B		B
16	4	Supporting	B.9C		F
17	3	Readiness	B.8B	B.2H	C
18	5	Readiness	B.12E		C
19	4	Readiness	B.10A		A
20	1	Supporting	B.5B	B.2G	F
21	5	Supporting	B.12B	B.2H	D
22	2	Readiness	B.6A		G
23	4	Supporting	B.9B	B.2G	D
24	2	Readiness	B.6F	B.2G	J
25	3	Supporting	B.7D	B.3A	D
26	2	Supporting	B.6C		F
27	3	Readiness	B.7E	B.3B	C
28	4	Supporting	B.10C	B.2H	G
29	3	Readiness	B.7A	B.3A	D
30	4	Readiness	B.10A		H
31	5	Readiness	B.12C	B.2G	A
32	3	Supporting	B.7C	B.3A	G
33	1	Readiness	B.5A		C
34	2	Readiness	B.6F	B.2G	J
35	4	Readiness	B.9A	B.2H	A
36	2	Supporting	B.6G	B.2H	F
37	3	Supporting	B.7B	B.3A	B
38	5	Readiness	B.12A		H
39	4	Readiness	B.10B		C
40	5	Supporting	B.11A		F
41	1	Readiness	B.4B	B.2H	C
42	2	Readiness	B.6E		G
43	5	Readiness	B.12E		D
44	1	Readiness	B.4B		G
45	3	Readiness	B.7A	B.3A	D
46	1	Readiness	B.5A		G
47	2	Supporting	B.6D		C
48	1	Supporting	B.4A		G
49	4	Supporting	B.9C	B.3A	C
50	1	Readiness	B.4C		J



Practice Tests are sold in 10-packs: 10 Form A & 10 Form B student booklets with bubble sheets, and 1 Teacher's Edition