

BIOLOGY STAAR (STATE OF TEXAS ASSESSMENTS OF ACADEMIC READINESS) PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	15

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

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- 1. In which type of symbiotic relationship does one organism benefit while the other is unharmed?**
 - A. Mutualism
 - B. Parasitism
 - C. Commensalism
 - D. Competition
- 2. Which biomolecule is responsible for storing genetic information?**
 - A. Carbohydrates
 - B. Lipids
 - C. Nucleic acids
 - D. Proteins
- 3. Which blood type system illustrates the concept of multiple alleles?**
 - A. Type A blood only
 - B. Type AB blood only
 - C. The ABO blood type system
 - D. The type O blood type only
- 4. What type of sugar is found in RNA?**
 - A. Glucose
 - B. Fructose
 - C. Ribose
 - D. Deoxyribose
- 5. What does a karyotype show?**
 - A. The number of mutations in the DNA
 - B. The shape and size of the individual chromosomes
 - C. Whether an individual has too many or too few chromosomes
 - D. The genetic variations of an individual
- 6. Which process is primarily responsible for energy production in cells?**
 - A. Osmosis
 - B. Cellular respiration
 - C. Diffusion
 - D. Photosynthesis

- 7. What type of molecules mainly constitute the plasma membrane?**
- A. Carbohydrates
 - B. Proteins
 - C. Phospholipids
 - D. Nucleic acids
- 8. What does it mean if an organism is homozygous?**
- A. Its allele pairs are different
 - B. It has two identical alleles
 - C. It has no alleles present
 - D. It is genetically diverse
- 9. What is the role of melanin in the skin?**
- A. To provide elasticity
 - B. To give color and protect from sun damage
 - C. To enhance sensory perception
 - D. To regulate body temperature
- 10. Which part of the brain is responsible for coordinating balance and posture?**
- A. Cerebrum
 - B. Cerebellum
 - C. Brain stem
 - D. Thalamus

Answers

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1. C
2. C
3. C
4. C
5. C
6. B
7. C
8. B
9. B
10. B

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Explanations

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1. In which type of symbiotic relationship does one organism benefit while the other is unharmed?

- A. Mutualism
- B. Parasitism
- C. Commensalism**
- D. Competition

In a symbiotic relationship characterized as commensalism, one organism benefits while the other remains unaffected. This interaction involves two different species where one species gains advantages, such as food or shelter, without causing any harm or benefit to the other species involved. This scenario is a key aspect of ecological relationships, highlighting the myriad ways organisms can interact within their environments. Mutualism, in contrast, involves both organisms benefitting from the relationship. Parasitism is where one organism benefits at the expense of the other, often causing harm. Competition refers to the struggle between organisms for the same resources, resulting in a detrimental effect for both participants. Commensalism can be observed in many natural settings, such as barnacles adhering to whales, where the barnacles receive mobility and access to feeding opportunities while the whales are largely unaffected.

2. Which biomolecule is responsible for storing genetic information?

- A. Carbohydrates
- B. Lipids
- C. Nucleic acids**
- D. Proteins

Nucleic acids are the biomolecules that store genetic information. They include DNA (deoxyribonucleic acid) and RNA (ribonucleic acid). DNA carries the genetic blueprints that determine the characteristics of living organisms and is responsible for the hereditary material passed from parents to offspring. The structure of DNA, characterized by its double helix formation, allows it to store vast amounts of genetic information within its sequences of nucleotides. On the other hand, carbohydrates serve primarily as energy sources and structural components in cells. Lipids, which include fats and oils, play key roles in energy storage and forming cellular membranes. Proteins are essential for countless functions within the body, including catalyzing metabolic reactions and providing structural support, but they do not store genetic information. The specific role of nucleic acids in genetics explains why they are recognized as the primary storage molecules for hereditary information.

3. Which blood type system illustrates the concept of multiple alleles?

- A. Type A blood only
- B. Type AB blood only
- C. The ABO blood type system**
- D. The type O blood type only

The ABO blood type system is a classic example of multiple alleles because it consists of three alleles: A, B, and O. In this system, the presence of these alleles leads to four possible blood types: A, B, AB, and O. Each individual inherits one allele from each parent, which means that the combinations of these alleles dictate the individual's blood type. For instance, if a person inherits an A allele from one parent and a B allele from the other, their blood type would be AB, demonstrating co-dominance where both alleles are expressed. Similarly, if an individual inherits two O alleles, their blood type will be O. The concept of multiple alleles is essential in understanding genetic diversity and how different traits are expressed in populations. In contrast, focusing solely on a single blood type, such as A or O, does not highlight the presence of multiple alleles since these types are just specific outcomes of the ABO system. Type AB blood represents only one possible combination of alleles and does not encompass the entirety of the genetic variation provided by the three alleles.

4. What type of sugar is found in RNA?

- A. Glucose
- B. Fructose
- C. Ribose**
- D. Deoxyribose

The type of sugar found in RNA is ribose. Ribose is a five-carbon sugar (pentose) that plays a critical role in the structure of RNA molecules. In RNA, ribose serves as the backbone, linking the nitrogenous bases (adenine, cytosine, guanine, and uracil) to phosphate groups. This structure is vital because it allows RNA to perform its functions in the cell, including encoding genetic information and facilitating protein synthesis. Other sugars mentioned, like glucose and fructose, are not components of RNA. Glucose is a six-carbon sugar that primarily serves as an energy source in cells, while fructose is a fruit sugar that also provides energy but is not part of RNA structure. Deoxyribose, a similar sugar, is found in DNA, but it lacks one oxygen atom compared to ribose, distinguishing the two nucleic acids from one another. Understanding the specific role of ribose in RNA helps clarify the differences between RNA and DNA as well as their respective functions in biological systems.

5. What does a karyotype show?

- A. The number of mutations in the DNA
- B. The shape and size of the individual chromosomes
- C. Whether an individual has too many or too few chromosomes**
- D. The genetic variations of an individual

A karyotype is a visual representation of an individual's chromosomes, typically arranged and displayed by size and shape. The primary purpose of a karyotype is to analyze the number of chromosomes present in an organism's cells, which allows researchers and healthcare professionals to identify chromosomal abnormalities. The correct choice emphasizes the karyotype's ability to reveal whether an individual has the normal diploid number of chromosomes (46 in humans) or if there are any anomalies, such as an extra chromosome (as seen in Down syndrome, which involves trisomy 21) or a missing chromosome (such as Turner syndrome). While a karyotype does provide information on the size and shape of chromosomes, which relates to the option that discusses the shape and size of chromosomes, the main application of a karyotype is to confirm variations in chromosome number. The option regarding mutations in DNA or genetic variations does not specifically pertain to the karyotype's primary focus, which is chromosome count rather than detailed genetic analysis.

6. Which process is primarily responsible for energy production in cells?

- A. Osmosis
- B. Cellular respiration**
- C. Diffusion
- D. Photosynthesis

Cellular respiration is the primary process responsible for energy production in cells. During cellular respiration, glucose and oxygen are converted into carbon dioxide, water, and adenosine triphosphate (ATP), which is the energy currency of the cell. This process occurs in the mitochondria of eukaryotic cells and involves several stages, including glycolysis, the Krebs cycle, and the electron transport chain. While diffusion and osmosis are important transport mechanisms in cells, they do not produce energy; rather, they facilitate the movement of substances across cell membranes. Photosynthesis, on the other hand, is the process by which plants, algae, and some bacteria convert light energy into chemical energy stored in glucose, which can then be utilized in cellular respiration. However, cellular respiration itself is the key process that directly generates energy for cellular functions.

7. What type of molecules mainly constitute the plasma membrane?

- A. Carbohydrates
- B. Proteins
- C. Phospholipids**
- D. Nucleic acids

The plasma membrane, which surrounds and protects the cell, is primarily made up of phospholipids. These molecules have a unique structure that includes a hydrophilic (water-attracting) "head" and two hydrophobic (water-repelling) "tails." This arrangement allows them to form a bilayer, where the hydrophilic heads face outward toward the watery environments both inside and outside the cell, while the hydrophobic tails face each other, away from water. This phospholipid bilayer is crucial for the membrane's functions, providing a barrier to most water-soluble substances and maintaining the cell's internal environment. While proteins, carbohydrates, and nucleic acids play important roles in cellular functions and processes associated with the plasma membrane, such as signaling and structural support, it is the phospholipids that create the fundamental structure of the membrane itself. Thus, phospholipids are essential for forming the basic framework that enables the membrane's selective permeability and overall integrity.

8. What does it mean if an organism is homozygous?

- A. Its allele pairs are different
- B. It has two identical alleles**
- C. It has no alleles present
- D. It is genetically diverse

When an organism is described as homozygous, it means that it has two identical alleles for a particular gene. This can occur in two forms: homozygous dominant, where both alleles are the dominant form, or homozygous recessive, where both alleles are the recessive form. Having identical alleles can affect traits that are expressed, as both will contribute equally to the phenotype. In contrast, if an organism had different allele pairs, it would be classified as heterozygous, which introduces genetic variation. If an organism had no alleles present at all, it would not be able to inherit or express traits from that particular gene. Additionally, genetic diversity implies the presence of a variety of alleles rather than identical ones. Thus, being homozygous specifically refers to the identity of the alleles rather than their presence or the genetic diversity of the organism.

9. What is the role of melanin in the skin?

- A. To provide elasticity
- B. To give color and protect from sun damage**
- C. To enhance sensory perception
- D. To regulate body temperature

Melanin plays a crucial role in the skin primarily by giving color and providing protection from sun damage. This pigment is produced by cells called melanocytes, which are found in the epidermis. The amount and type of melanin produced determine the color of a person's skin, hair, and eyes. One of the key functions of melanin is its protective role against ultraviolet (UV) radiation from the sun. When skin is exposed to UV light, melanin absorbs and dissipates this radiation, helping to prevent DNA damage in skin cells, which can lead to skin cancer. Thus, individuals with higher levels of melanin generally have a lower risk of sunburn and other forms of UV-induced skin damage. In contrast, the other options relate to functions that are not directly associated with melanin. Elasticity is primarily provided by proteins such as collagen and elastin in the skin. Sensory perception is facilitated by nerves and receptors in the skin, not melanin. Body temperature regulation is managed by blood vessels and sweat glands rather than the pigment in the skin.

10. Which part of the brain is responsible for coordinating balance and posture?

- A. Cerebrum
- B. Cerebellum**
- C. Brain stem
- D. Thalamus

The cerebellum is crucial for coordinating balance and posture due to its role in fine-tuning motor activity. It processes sensory information related to body position and movement, helping to maintain equilibrium and ensure smooth, accurate movements. The cerebellum integrates input from the inner ear, eyes, and muscle receptors and uses this information to adjust posture and coordination dynamically. This is particularly important because maintaining balance involves the integration of multiple sensory inputs and motor outputs to adjust movements in real-time. The cerebellum's functions contribute to activities such as walking, running, and even simple tasks like standing still without wobbling. In contrast, the cerebrum is primarily responsible for higher-order brain functions, such as thinking, problem-solving, and voluntary muscle movements, rather than focusing on balance. The brain stem controls basic life functions like heart rate and breathing but does not specifically coordinate balance and posture. The thalamus serves as a relay station for sensory information but does not directly coordinate motor functions related to balance.

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Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

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We wish you the very best on your exam journey. You've got this!

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