

TEXES SCIENCE PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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. What is the conjugate acid of ammonia?
 - A. NH_3
 - B. NH_4^+
 - C. NaOH
 - D. H_2O
2. According to Hooke's Law, how is restoring force expressed in relation to displacement?
 - A. $F = kx$
 - B. $F = -kx$
 - C. $F = x/k$
 - D. $F = -x/k$
3. What did Mendeleev discover about element properties in the 1850s?
 - A. They varied with temperature
 - B. They occurred in random order
 - C. They repeated in regular intervals
 - D. They were unique to each element
4. Which principle is responsible for the magnification of an object through a lens?
 - A. Reflection
 - B. Diffraction
 - C. Refraction
 - D. Absorption
5. Which factor contributed to the early atmosphere of the Earth breaking down gases?
 - A. Geothermal activity
 - B. Solar winds
 - C. Sun's ultraviolet radiation
 - D. Asteroid impacts

- 6. Which statement correctly describes the environmental impact of increased carbon dioxide levels?**
- A. It only causes ocean acidification
 - B. It has no impact on climate
 - C. It can contribute to global warming
 - D. It primarily enhances plant photosynthesis
- 7. What phenomenon occurs when bonding electrons are equally shared between atoms?**
- A. Ionic bond
 - B. Polar covalent bond
 - C. Nonpolar covalent bond
 - D. Metallic bond
- 8. What is the membrane network responsible for synthesizing lipids and carbohydrates called?**
- A. Rough endoplasmic reticulum
 - B. Smooth endoplasmic reticulum
 - C. Golgi apparatus
 - D. Lysosome
- 9. Which of the following correctly describes the role of guard cells in plants?**
- A. They absorb nutrients for the plant
 - B. They control the opening and closing of stomata
 - C. They transport water throughout the plant
 - D. They store energy in the form of starch
- 10. Which aspect of light is evidenced by its dispersion through a prism?**
- A. Intensity
 - B. Speed
 - C. Color spectrum
 - D. Curvature

Answers

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

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Explanations

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1. What is the conjugate acid of ammonia?

- A. NH_3
- B. NH_4^+**
- C. NaOH
- D. H_2O

The conjugate acid of a base is formed when the base accepts a proton (H^+ ion). In this case, ammonia (NH_3) is the base, and when it interacts with a proton, it accepts that proton to become ammonium (NH_4^+). This transformation reflects the definition of a conjugate acid, as the species that results from the protonation of the base. The other options do not qualify as the conjugate acid of ammonia. NH_3 is the base itself, NaOH is a strong base often dissociated in water, and H_2O is neutral and does not derive directly from ammonia accepting a proton. Therefore, the correct identity of the conjugate acid formed from ammonia is indeed NH_4^+ .

2. According to Hooke's Law, how is restoring force expressed in relation to displacement?

- A. $F = kx$
- B. $F = -kx$**
- C. $F = x/k$
- D. $F = -x/k$

Hooke's Law states that the restoring force exerted by a spring or elastic material is directly proportional to the displacement from its equilibrium position but in the opposite direction. This relationship is succinctly captured in the formula $F = -kx$, where F represents the restoring force, k is the spring constant (a measure of the stiffness of the spring), and x is the displacement from the equilibrium position. The negative sign in the equation indicates that the force exerted by the spring acts in the opposite direction to the displacement. For example, if the spring is stretched (displacement is positive), the restoring force will pull back toward the equilibrium position (force is negative). Conversely, if the spring is compressed (displacement is negative), the restoring force will act in the positive direction to return to equilibrium. Thus, since the correct expression emphasizes the restoring nature of the force in opposition to displacement, it conforms perfectly to the principles outlined by Hooke's Law.

3. What did Mendeleev discover about element properties in the 1850s?

- A. They varied with temperature
- B. They occurred in random order
- C. They repeated in regular intervals**
- D. They were unique to each element

In the 1850s, Dmitri Mendeleev made a significant contribution to chemistry with his discovery regarding the properties of elements. He observed that when elements were arranged according to increasing atomic mass, their chemical properties exhibited a periodicity; this means that certain properties of the elements repeated at regular intervals. This pattern allowed him to create the first widely recognized periodic table, leading to the understanding that similar properties recur periodically as one moves through the table. This periodic relationship provided a powerful framework for predicting the properties of unknown elements based on their positions in the table, reinforcing the idea that the behavior of elements is not haphazard but rather systematic. This insight was foundational in the development of modern chemistry, as it illustrated a deeper underlying structure in the relationships between the elements.

4. Which principle is responsible for the magnification of an object through a lens?

- A. Reflection
- B. Diffraction
- C. Refraction**
- D. Absorption

The principle responsible for the magnification of an object through a lens is refraction. Refraction occurs when light travels from one medium to another and changes speed, which causes the light to bend. This bending of light as it passes through a lens enables the lens to focus light rays or diverge them, thereby enlarging the image of an object. Convex lenses, for example, are thicker in the center and cause parallel incoming light rays to converge to a point, creating a magnified image. Conversely, concave lenses, which are thinner in the center, spread out light rays, allowing for objects to appear larger when viewed through the lens. Reflection involves the bouncing of light off surfaces, which does not contribute to the magnifying effect provided by lenses. Diffraction is the bending of waves around obstacles and through openings, playing a role in wave behavior but not in the magnification directly through lenses. Absorption relates to materials taking in light rather than allowing it to pass through and create images. Thus, refraction is the key principle behind the magnifying capabilities of lenses.

5. Which factor contributed to the early atmosphere of the Earth breaking down gases?

- A. Geothermal activity
- B. Solar winds
- C. Sun's ultraviolet radiation**
- D. Asteroid impacts

The early atmosphere of the Earth was primarily composed of gases such as hydrogen and helium, which were later influenced by a variety of factors. The primary reason that the Sun's ultraviolet radiation significantly contributed to the breakdown of gases in this atmosphere lies in its ability to provide high-energy photons. As the early Earth was bombarded by high levels of ultraviolet radiation due to a weak magnetic field and a lack of an ozone layer, this radiation caused photodissociation. Photodissociation is a process where molecules break apart into their constituent atoms under the influence of UV radiation. For instance, the intense ultraviolet light could break down water vapor into hydrogen and oxygen. This splitting of molecules contributed to a change in the atmospheric composition, paving the way for the development of a more complex atmosphere that would later support life. While geothermal activity, solar winds, and asteroid impacts may also have played a role in shaping the early Earth's environment, they did not directly break down atmospheric gases in the manner that ultraviolet radiation did. Therefore, recognizing the role of the Sun's ultraviolet radiation is crucial in understanding the evolution of the Earth's atmosphere during its formative years.

6. Which statement correctly describes the environmental impact of increased carbon dioxide levels?

- A. It only causes ocean acidification
- B. It has no impact on climate
- C. It can contribute to global warming**
- D. It primarily enhances plant photosynthesis

The statement that increased carbon dioxide levels can contribute to global warming is correct because carbon dioxide (CO₂) is a greenhouse gas. This means it has the ability to trap heat in the Earth's atmosphere, leading to an increase in global temperatures. As CO₂ concentrations rise, the greenhouse effect becomes more pronounced, resulting in a warming of the planet. This warming can lead to a variety of environmental impacts, including changes in weather patterns, more intense storms, rising sea levels, and disruptions to ecosystems. The other statements do not accurately reflect the broader impacts of increased carbon dioxide levels. For example, while CO₂ does contribute to ocean acidification, it is not the only impact, and asserting that it "only" causes this phenomenon limits the understanding of its overall effects. Saying it has no impact on climate is incorrect, as the scientific consensus affirms its significant role in climate change. Additionally, while CO₂ can enhance plant photosynthesis to some extent, the overall consequences of increased levels of this gas are far more complex and involve many negative environmental effects. Therefore, the most comprehensive view reflects the connection between increased carbon dioxide levels and global warming.

7. What phenomenon occurs when bonding electrons are equally shared between atoms?

- A. Ionic bond
- B. Polar covalent bond
- C. Nonpolar covalent bond**
- D. Metallic bond

When bonding electrons are equally shared between atoms, a nonpolar covalent bond is formed. In this type of bond, the atoms involved typically have similar electronegativities, which means they attract the bonding electrons at an equal level. As a result, there is no significant charge difference across the bond, leading to a balanced distribution of electron density. In contrast, ionic bonds occur when electrons are transferred from one atom to another, creating charged ions that are held together by electrostatic forces. Polar covalent bonds involve unequal sharing of electrons due to differences in electronegativity, resulting in a partial positive charge on one atom and a partial negative charge on the other. Metallic bonds, on the other hand, involve the sharing of free electrons among a lattice of metal atoms, leading to unique properties like electrical conductivity and malleability. Given this context, the definition aligns with the nature of nonpolar covalent bonds, making it the correct answer.

8. What is the membrane network responsible for synthesizing lipids and carbohydrates called?

- A. Rough endoplasmic reticulum
- B. Smooth endoplasmic reticulum**
- C. Golgi apparatus
- D. Lysosome

The membrane network responsible for synthesizing lipids and carbohydrates is known as the smooth endoplasmic reticulum (SER). This organelle plays a crucial role in the synthesis of lipids, including phospholipids and cholesterol, which are essential for cell membrane formation. Additionally, the smooth endoplasmic reticulum is involved in carbohydrate metabolism and detoxification processes within the cell. Unlike the rough endoplasmic reticulum, which is studded with ribosomes and primarily involved in protein synthesis, the smooth endoplasmic reticulum lacks these ribosomes and focuses on lipid and carbohydrate synthesis, making it integral to various metabolic pathways. The Golgi apparatus, while significant in modifying, sorting, and packaging proteins and lipids for secretion or delivery to other organelles, does not primarily synthesize these molecules. Lysosomes are involved in waste processing and digestion within the cell, but they do not play a role in the synthesis of lipids and carbohydrates.

9. Which of the following correctly describes the role of guard cells in plants?

- A. They absorb nutrients for the plant
- B. They control the opening and closing of stomata**
- C. They transport water throughout the plant
- D. They store energy in the form of starch

Guard cells play a crucial role in the regulation of gas exchange in plants by controlling the opening and closing of stomata. These specialized cells are located on either side of a stoma, the small openings found on the surface of leaves. When guard cells absorb water and become turgid, they bend away from each other, causing the stomatal pore to open. This allows essential gases, such as carbon dioxide to enter for photosynthesis, and oxygen to exit. Conversely, when guard cells lose water, they become flaccid and close the stomata, which helps prevent excessive water loss through transpiration and can also protect the plant from drought conditions. Understanding this functioning of guard cells is vital for grasping how plants maintain homeostasis and respond to environmental changes. The other options do not accurately depict the role of guard cells. While absorbing nutrients and transporting water are essential functions in plants, they are typically carried out by roots and vascular tissues. Storing energy in the form of starch is primarily a function of various plant tissues, particularly parenchyma cells, and is not related to the function of guard cells.

10. Which aspect of light is evidenced by its dispersion through a prism?

- A. Intensity
- B. Speed
- C. Color spectrum**
- D. Curvature

The dispersion of light through a prism is a demonstration of the color spectrum. When white light travels through a prism, it is refracted at different angles depending on the wavelength (or color) of the light. This refraction separates the light into its constituent colors, creating a visible spectrum that includes red, orange, yellow, green, blue, indigo, and violet. Each color bends by a different amount due to its unique wavelength, thus revealing the full spectrum of colors that compose white light. The other options do not accurately represent what is demonstrated by the effects of a prism. Intensity pertains to the brightness of light, which does not change upon passing through a prism. Speed is related to how quickly light travels, which remains constant in a given medium (though it changes when transitioning between mediums). Curvature refers more to the path of light in a non-linear direction, which is not the primary phenomenon observed in this scenario. Therefore, the correct answer focuses solely on the fact that dispersion distinctly showcases the different colors of light that make up the visible spectrum.

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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