

# ASSESSMENT AND QUALIFICATIONS ALLIANCE (AQA) AS BIOLOGY PRACTICE EXAM (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. Which factors are known to contribute to the loss of biodiversity?**
  - A. Climate stability and natural disasters
  - B. Increased genetic diversity and conservation efforts
  - C. Habitat destruction and pollution
  - D. Urban development and improved agriculture
- 2. Which of the following best describes the hydrophobic tails of phospholipids?**
  - A. Water-attracting
  - B. Water-repelling
  - C. Soluble in water
  - D. Highly reactive with sugars
- 3. In terms of genetic variation, what is a primary outcome of meiosis?**
  - A. Creation of diploid cells
  - B. Production of haploid gametes
  - C. Formation of identical genetic copies
  - D. Reduction of chromosome aberrations
- 4. What is the primary function of haploid cells in sexual reproduction?**
  - A. To produce energy for the organism
  - B. To form diploid zygotes when combined
  - C. To perform cellular respiration
  - D. To act as the main transport mechanism for nutrients
- 5. What is the formula for photosynthesis?**
  - A.  $O + H_2O \rightarrow C_6H_{12}O_6 + CO_2$
  - B.  $6CO_2 + 6H_2O + \text{light energy} \rightarrow C_6H_{12}O_6 + 6O_2$
  - C.  $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
  - D.  $6CO_2 + 6O_2 + \text{light energy} \rightarrow C_6H_{12}O_6 + H_2O$
- 6. How is biodiversity best defined?**
  - A. The total number of species in a country
  - B. The genetic variation within a single species
  - C. The variety of life within an ecosystem
  - D. The health status of a specific wildlife population

**7. What is genetic variation?**

- A. Uniformity in genetic makeup among individuals
- B. Differences in genetic makeup among individuals within a population
- C. Stability of genetic traits over generations
- D. Uniformity in physical traits among a population

**8. Why might a population show low levels of genetic diversity?**

- A. The population is constantly mutating
- B. The population has been very large throughout history
- C. The population was founded by a small number of individuals
- D. The population includes many unrelated individuals

**9. What process occurs during cellular respiration?**

- A. Photosynthesis
- B. Glucose is stored as starch
- C. Glucose is broken down to produce ATP
- D. Oxygen is generated for photosynthesis

**10. What is the structure of a phospholipid bilayer?**

- A. A single layer of phospholipids
- B. A double layer of phospholipids with heads inward
- C. A double layer of phospholipids with heads outward
- D. A triple layer of phospholipids and proteins

## **Answers**

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

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## **Explanations**

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## 1. Which factors are known to contribute to the loss of biodiversity?

- A. Climate stability and natural disasters
- B. Increased genetic diversity and conservation efforts
- C. Habitat destruction and pollution**
- D. Urban development and improved agriculture

*The loss of biodiversity is significantly influenced by habitat destruction and pollution. Habitat destruction refers to the alteration or elimination of natural environments, typically due to human activities such as deforestation, urbanization, and agricultural expansion. When habitats are destroyed, the species that rely on those environments for survival can become endangered or extinct, leading to a reduction in biodiversity. Pollution acts as another major contributor by contaminating air, water, and soil, which can harm organisms directly or disrupt their habitats. For instance, pollutants can lead to the degradation of ecosystems, affecting species survival rates and their ability to reproduce. In contrast, factors like climate stability and natural disasters can influence biodiversity, but they do not typically lead to a consistent pattern of loss as habitat destruction and pollution do. Increased genetic diversity and conservation efforts are usually associated with positive outcomes for biodiversity rather than contributing to its loss. Urban development and improved agriculture can lead to biodiversity loss mainly through habitat destruction and the use of pesticides or fertilizers, but they are not as direct or comprehensive in their impact as habitat destruction and pollution. Therefore, the correct answer focuses on the clear and direct actions leading to biodiversity decline.*

## 2. Which of the following best describes the hydrophobic tails of phospholipids?

- A. Water-attracting
- B. Water-repelling**
- C. Soluble in water
- D. Highly reactive with sugars

*The correct choice is that the hydrophobic tails of phospholipids are water-repelling. This characteristic is fundamental to the structure of phospholipids, which are key components of cell membranes. Phospholipids consist of a hydrophilic (water-attracting) head and two hydrophobic (water-repelling) tails. The tails are typically composed of long fatty acid chains, which do not interact favorably with water. This hydrophobic nature means that in an aqueous environment, phospholipids will organize themselves into a bilayer structure, with the hydrophilic heads facing outward towards water and the hydrophobic tails tucked away from the water in the interior of the membrane. This arrangement is crucial for forming a stable cellular barrier, influencing membrane fluidity, and allowing for various functions such as signaling and transport. In contrast, the other options do not accurately describe the properties of the hydrophobic tails. They do not attract water, nor are they soluble in it. Additionally, while they can play a role in interactions with other molecules, describing them as highly reactive with sugars is misleading and not characteristic of their fundamental nature.*

### 3. In terms of genetic variation, what is a primary outcome of meiosis?

- A. Creation of diploid cells
- B. Production of haploid gametes**
- C. Formation of identical genetic copies
- D. Reduction of chromosome aberrations

*The correct outcome of meiosis in terms of genetic variation is the production of haploid gametes. During meiosis, a single diploid cell undergoes two rounds of division to ultimately produce four haploid cells. These haploid gametes—sperm and egg cells in animals—contain half the number of chromosomes of the original diploid cell, leading to a unique combination of genetic material. The significance of this process for genetic variation lies in two key mechanisms during meiosis: independent assortment and crossing over. Independent assortment occurs when chromosomes are randomly distributed to the gametes, allowing for different combinations of maternal and paternal chromosomes. Crossing over involves the exchange of genetic material between homologous chromosomes, resulting in new allele combinations that were not present in the parent organisms. Together, these processes enhance genetic diversity in populations, which is essential for evolution and adaptation. Other options focus on aspects that do not contribute directly to genetic variation. The creation of diploid cells is characteristic of mitosis, not meiosis. The formation of identical genetic copies relates to processes like asexual reproduction or mitosis, where cells divide to produce clones. Reduction of chromosome aberrations, while an important concept, does not specifically address the genetic variation produced by meiosis. Hence, the*

### 4. What is the primary function of haploid cells in sexual reproduction?

- A. To produce energy for the organism
- B. To form diploid zygotes when combined**
- C. To perform cellular respiration
- D. To act as the main transport mechanism for nutrients

*The primary function of haploid cells in sexual reproduction is to form diploid zygotes when they combine during fertilization. Haploid cells, which carry one set of chromosomes, are produced through meiosis. In sexual reproduction, two haploid gametes (one from each parent) merge to create a diploid zygote containing two sets of chromosomes, one from each parent. This zygote undergoes further development to eventually form a new organism, maintaining the genetic diversity that is crucial in sexual reproduction. The other answer choices do not align with the primary role of haploid cells. While energy production and cellular respiration are critical processes for any living organism, they are not the key function of haploid cells during reproduction. Moreover, the transport of nutrients is an essential function within multicellular organisms, but it does not relate to the role of haploid cells in sexual reproduction.*

## 5. What is the formula for photosynthesis?

- A.  $O + H_2O \rightarrow C_6H_{12}O_6 + CO_2$
- B.  $6CO_2 + 6H_2O + \text{light energy} \rightarrow C_6H_{12}O_6 + 6O_2$**
- C.  $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
- D.  $6CO_2 + 6O_2 + \text{light energy} \rightarrow C_6H_{12}O_6 + H_2O$

The formula for photosynthesis is represented by the correct answer, which describes the process where carbon dioxide and water, in the presence of light energy, are converted into glucose and oxygen. Specifically, the reaction illustrates that six molecules of carbon dioxide ( $6CO_2$ ) combine with six molecules of water ( $6H_2O$ ) and light energy to produce one molecule of glucose ( $C_6H_{12}O_6$ ) and six molecules of oxygen ( $6O_2$ ). This equation encapsulates the essence of photosynthesis, which occurs primarily in the chloroplasts of plant cells. The importance of light energy is also highlighted, as it powers the reactions, allowing plants to convert inorganic molecules into organic compounds, which are crucial for life on Earth. Other options do not accurately represent the photosynthesis process; for instance, some inaccurately place oxygen as a reactant or product in contexts that do not align with the established chemical understanding of photosynthesis. The provided equation reflects the correct stoichiometry and serves as a foundation for understanding how plants synthesize food, contributing to the broader ecological and biochemical cycles.

## 6. How is biodiversity best defined?

- A. The total number of species in a country
- B. The genetic variation within a single species
- C. The variety of life within an ecosystem**
- D. The health status of a specific wildlife population

Biodiversity is best defined as the variety of life within an ecosystem. This definition encompasses not just the number of different species present but also the variety of genetic differences within those species and the complex interactions between them within their environments. It reflects the richness of life forms and the ecological relationships that contribute to the resilience and stability of ecosystems. The complexity and interactions among organisms, including their roles in food webs, nutrient cycling, and habitat structures, underscore the holistic nature of biodiversity. This broad definition captures the significance of maintaining natural habitats and ecological processes, highlighting the intricate balance necessary for sustaining life. The other options, while related to aspects of biodiversity, do not fully encapsulate the concept. For instance, counting only the total number of species in a country fails to consider genetic variation and ecosystem interactions. Focusing on genetic variation within a single species overlooks the diversity found across different species and ecosystems. Evaluating the health status of a specific wildlife population does not represent biodiversity as a whole; it is just one aspect of understanding the broader ecological context.

## 7. What is genetic variation?

- A. Uniformity in genetic makeup among individuals
- B. Differences in genetic makeup among individuals within a population**
- C. Stability of genetic traits over generations
- D. Uniformity in physical traits among a population

*Genetic variation refers to the differences in genetic makeup among individuals within a population. This variation is crucial for the process of evolution and natural selection, as it provides the raw material upon which these processes can act. When there is a high level of genetic variation in a population, it means that individuals possess different alleles, or versions of genes, which can lead to a wide range of traits and characteristics. For example, in a population of plants, some may be tall while others are short, or some may have different flower colors, all due to the genetic differences present. This diversity is also important for the adaptability of populations to changing environments, as it allows some individuals to survive and reproduce under different conditions, thereby passing their advantageous traits on to the next generation. In contrast, uniformity in genetic makeup, stability of genetic traits, or uniformity in physical traits implies a lack of variation, which could result in reduced resilience and adaptability to environmental changes or threats.*

## 8. Why might a population show low levels of genetic diversity?

- A. The population is constantly mutating
- B. The population has been very large throughout history
- C. The population was founded by a small number of individuals**
- D. The population includes many unrelated individuals

*A population may show low levels of genetic diversity when it was founded by a small number of individuals, a phenomenon known as the founder effect. This situation arises because the genetic variation of the new population will be limited to only the alleles present in those initial founders. When a population originates from just a few individuals, the gene pool is reduced, resulting in reduced genetic variation over generations. This lack of diversity can lead to increased susceptibility to diseases and a reduced ability to adapt to environmental changes, as the genetic traits within the population are not sufficiently varied. Genetic drift can further exacerbate this situation, leading to the loss of alleles over time, especially in small populations. In contrast, constant mutation processes, historical population size, and having many unrelated individuals are less likely to contribute to low genetic diversity in the same way. Large populations generally have more genetic variation simply due to a larger gene pool.*

## 9. What process occurs during cellular respiration?

- A. Photosynthesis
- B. Glucose is stored as starch
- C. Glucose is broken down to produce ATP**
- D. Oxygen is generated for photosynthesis

Cellular respiration is a biochemical process that occurs in living organisms, where glucose is broken down to produce adenosine triphosphate (ATP), the energy currency of the cell. This process is crucial because ATP provides the energy necessary for various cellular activities, such as muscle contraction, active transport, and biosynthesis. The breakdown of glucose in cellular respiration involves several metabolic pathways, including glycolysis, the citric acid cycle (Krebs cycle), and oxidative phosphorylation. During these steps, glucose is oxidized, and the high-energy electrons released are used to power the production of ATP. Oxygen plays a significant role in aerobic cellular respiration, acting as the final electron acceptor, which helps generate a large amount of ATP. In contrast, photosynthesis, storing glucose as starch, and generating oxygen for photosynthesis do not occur in cellular respiration. Photosynthesis is the process by which plants convert light energy into chemical energy, while glucose storage as starch is a method of energy reserves rather than energy production. The generation of oxygen is a byproduct of photosynthesis, not a function of cellular respiration. Thus, breaking down glucose to produce ATP is the defining process of cellular respiration.

## 10. What is the structure of a phospholipid bilayer?

- A. A single layer of phospholipids
- B. A double layer of phospholipids with heads inward
- C. A double layer of phospholipids with heads outward**
- D. A triple layer of phospholipids and proteins

The structure of a phospholipid bilayer is accurately described by the idea that it consists of a double layer of phospholipids with their heads facing outward. This arrangement is crucial for the formation of cell membranes. In a phospholipid, there is a hydrophilic (water-attracting) head and two hydrophobic (water-repelling) tails. The phospholipids align themselves in such a way that the hydrophilic heads are oriented toward the aqueous environment inside and outside of the cell, while the hydrophobic tails face each other in the interior of the bilayer, shielded from the water. This orientation contributes to the membrane's fluidity and the selective permeability of the cell, allowing certain substances to enter and exit while forming a barrier against others. This bilayer structure is fundamental to cell biology and underlies various cellular functions, such as signaling and transport processes. Understanding this arrangement helps in grasping more complex concepts related to membranes and their functions in living organisms.

## 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](mailto:hello@examzify.com).

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

<https://aqa-asbiology.examzify.com>

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

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