

ASSESSMENT AND QUALIFICATIONS ALLIANCE (AQA) GCSE BIOLOGY PAPER 2 PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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 are NPK fertilizers primarily composed of?**
 - A. Formulations of various salts containing appropriate percentages of nitrogen, phosphorus, and potassium
 - B. Organic compounds designed to enhance soil nutrients
 - C. Liquid solutions infused with trace elements
 - D. Mineral mixtures used for improving crop yields
- 2. What is the function of the temperature of 450°C in the Haber process?**
 - A. To maximize ammonia production rate.
 - B. To ensure complete reaction of gases.
 - C. To provide a compromise for yield and rate of reaction.
 - D. To minimize formation of side products.
- 3. What conditions are required for alkenes to react with water?**
 - A. Cold water with a catalyst
 - B. Steam at 300°C with a catalyst
 - C. Room temperature only
 - D. Hot water without a catalyst
- 4. What is sacrificial protection in metal treatment?**
 - A. A method of applying paint to prevent rust
 - B. Coating a metal with a more reactive metal to prevent corrosion
 - C. The use of chemicals to inhibit rust formation
 - D. A process that removes corrosion from metals
- 5. What is considered the major cause of climate change?**
 - A. Natural disasters
 - B. An increase in average global temperature
 - C. Population growth
 - D. Invasive species
- 6. Why is potable water not considered pure water?**
 - A. It contains suspended sediments
 - B. It has a high pH level
 - C. Because it contains dissolved substances
 - D. It tastes different based on geographical location

7. What characterizes a reversible reaction?

- A. The reactants can form products that cannot revert back
- B. The products can react to form the original reactants
- C. The reaction produces irreversible compounds
- D. The process requires continuous energy input

8. Increasing the frequency of collisions in a reaction typically results in what outcome?

- A. A decrease in rate of reaction
- B. No change in rate of reaction
- C. An increase in rate of reaction
- D. A halt in the reaction process

9. Which of the following is a common use of crude oil fractions?

- A. Only for production of plastics
- B. As fuels or feedstocks
- C. Exclusively for cleaning materials
- D. For agricultural pesticides

10. What is the benefit of recycling materials?

- A. It decreases overall production costs.
- B. It reduces the demand for new raw materials.
- C. It makes products more expensive.
- D. It increases waste output.

Answers

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

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Explanations

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1. What are NPK fertilizers primarily composed of?

- A. Formulations of various salts containing appropriate percentages of nitrogen, phosphorus, and potassium**
- B. Organic compounds designed to enhance soil nutrients
- C. Liquid solutions infused with trace elements
- D. Mineral mixtures used for improving crop yields

NPK fertilizers are primarily composed of specific formulations that contain nitrogen, phosphorus, and potassium in varying percentages. These three essential nutrients are crucial for plant growth and development: nitrogen is vital for leaf and stem growth, phosphorus supports root and flower development, and potassium is important for overall plant health and disease resistance. The formulation into salts means these nutrients are available in a form that plants can easily absorb. This is why option A correctly identifies the primary composition of NPK fertilizers. It provides a straightforward understanding that they are chemically formulated to deliver balanced nutrition to plants in a highly effective manner. Other options suggest different types of materials. Organic compounds, for example, focus on enhancing soil structure and microbial activity rather than directly supplying nutrients in controlled amounts as NPK fertilizers do. Liquid solutions infused with trace elements typically include additional nutrients beyond the primary NPK components, which is not the focus of standard NPK fertilizers. Lastly, while mineral mixtures can improve crop yields, they do not specifically denote the nitrogen, phosphorus, and potassium ratios that characterize NPK fertilizers.

2. What is the function of the temperature of 450°C in the Haber process?

- A. To maximize ammonia production rate.
- B. To ensure complete reaction of gases.
- C. To provide a compromise for yield and rate of reaction.**
- D. To minimize formation of side products.

In the Haber process, which synthesizes ammonia from nitrogen and hydrogen gases, operating at a temperature of 450°C serves as a compromise between the rate of reaction and the yield of ammonia produced. At higher temperatures, the reaction rate increases due to the greater kinetic energy of the molecules, allowing them to collide more frequently and with sufficient energy to overcome the activation energy barrier. However, the Haber process is exothermic, meaning that lower temperatures favor the formation of ammonia. Thus, if the temperature were significantly lowered, the reaction could proceed more effectively toward the production of ammonia, but the rate of reaction would slow down significantly, making the process inefficient in terms of production time. Consequently, 450°C is an optimal temperature that balances these two aspects: it is high enough to ensure a reasonable rate of reaction while still allowing for a decent yield of ammonia. In contrast, a much higher temperature would speed up the reaction but reduce ammonia yield, while a much lower temperature would increase yield but slow down the reaction rate unacceptably. Therefore, the specific temperature of 450°C is crucial for maximizing efficiency in ammonia production.

3. What conditions are required for alkenes to react with water?

- A. Cold water with a catalyst
- B. Steam at 300°C with a catalyst**
- C. Room temperature only
- D. Hot water without a catalyst

Alkenes react with water through a process known as hydration, and the reaction requires specific conditions to proceed effectively. The correct conditions involve using steam at high temperatures, typically around 300°C, in the presence of a catalyst, often phosphoric acid or sulfuric acid. The high temperature is essential because it provides the energy needed to help break the double bond between the carbon atoms in the alkene, allowing the water molecules to add across the double bond and form an alcohol. The catalyst further accelerates the reaction without being consumed in the process, facilitating the conversion of the alkene into the corresponding alcohol more efficiently. In contrast, cold water with a catalyst is generally not effective for alkene hydration, as lower temperatures do not provide enough energy for the reaction to occur at a practical rate. Similarly, room temperature conditions lack both the necessary energy and the appropriate catalyst setup to ensure that hydration takes place effectively. Lastly, while hot water may seem beneficial, it is insufficient without a catalyst and does not provide the right conditions for the reaction to occur at a significant rate. Thus, steam under high temperature and in the presence of a catalyst is critical for the successful reaction of alkenes with water.

4. What is sacrificial protection in metal treatment?

- A. A method of applying paint to prevent rust
- B. Coating a metal with a more reactive metal to prevent corrosion**
- C. The use of chemicals to inhibit rust formation
- D. A process that removes corrosion from metals

Sacrificial protection involves coating a metal with a more reactive metal to prevent corrosion. This technique works on the principle of electrochemistry, where the more reactive metal acts as a sacrificial anode. When the two metals are in contact in the presence of an electrolyte, the more reactive metal oxidizes preferentially, protecting the less reactive metal from corroding. This is commonly seen in applications such as galvanization, where steel is coated with zinc. The zinc corrodes instead of the steel, thus preserving the integrity of the underlying metal structure. This method is particularly effective for metals that are prone to rusting, as it provides a long-term protective measure that extends the life of the metal object in harsh environments. This contrasts with the other options, which may involve preventive measures against corrosion but do not utilize the concept of a more reactive metal protecting a less reactive one.

5. What is considered the major cause of climate change?

- A. Natural disasters
- B. An increase in average global temperature**
- C. Population growth
- D. Invasive species

The major cause of climate change is tied closely to the increase in average global temperature. This rise in temperature is primarily driven by the accumulation of greenhouse gases in the atmosphere, such as carbon dioxide and methane, which are largely attributed to human activities such as fossil fuel combustion, deforestation, and industrial processes. As these gases trap heat, they lead to changes in climate patterns, affecting weather systems and causing various environmental impacts. While natural disasters may be exacerbated by climate change, they are not a direct cause. Population growth can contribute to increased greenhouse gas emissions due to greater energy demand and resource consumption, but it is not the primary cause. Similarly, invasive species can disrupt ecosystems but do not fundamentally drive climate change. Thus, the increase in average global temperature serves as the central indicator and consequence of the broader phenomenon of climate change, making it the most accurate answer.

6. Why is potable water not considered pure water?

- A. It contains suspended sediments
- B. It has a high pH level
- C. Because it contains dissolved substances**
- D. It tastes different based on geographical location

Potable water is defined as water that is safe to drink and meets the health standards required for consumption. However, it is not considered pure water because it contains dissolved substances, such as minerals, salts, and sometimes trace amounts of organic and inorganic compounds. These substances are often required to provide essential nutrients and to improve the taste and quality of the water. In contrast, pure water, typically represented as distilled or deionized water, is H₂O without any other components, meaning it is devoid of all impurities and dissolved minerals. Since potable water must have certain dissolved solids to be safe and palatable, it does not meet the strict definition of purity found in scientific contexts.

7. What characterizes a reversible reaction?

- A. The reactants can form products that cannot revert back
- B. The products can react to form the original reactants**
- C. The reaction produces irreversible compounds
- D. The process requires continuous energy input

A reversible reaction is characterized by the ability of products to react and form the original reactants again. This means that both the forward and reverse reactions can occur under the right conditions, allowing the system to reach dynamic equilibrium. In such a scenario, the reactants are not permanently altered into products; instead, they can be converted back and forth. This behavior contrasts with irreversible reactions, where the products formed cannot revert to reactants under normal conditions. While other aspects such as energy input or the nature of compounds produced may influence a chemical process, the defining feature of a reversible reaction is its capacity to allow both the forward and backward progression of a reaction.

8. Increasing the frequency of collisions in a reaction typically results in what outcome?

- A. A decrease in rate of reaction
- B. No change in rate of reaction
- C. An increase in rate of reaction**
- D. A halt in the reaction process

Increasing the frequency of collisions in a reaction leads to an increase in the rate of reaction because reactions occur when reactant particles collide with sufficient energy and the correct orientation. When the frequency of these collisions rises, there are more opportunities for particles to interact. This enhances the likelihood that effective collisions, those capable of overcoming the activation energy barrier, will occur. As a result, more reactants can be transformed into products in a given timeframe, thereby accelerating the overall reaction rate. When considering the other possible outcomes: a decrease in the rate of reaction would imply that collisions are less effective or less frequent, which does not align with the principle that more collisions generally accelerate reactions. No change in the rate of reaction suggests that collisions do not affect the reaction rate, which contradicts the fundamental chemistry concepts regarding reaction kinetics. Finally, a halt in the reaction process implies that collisions are not occurring at all, which would mean the reaction is effectively stopped, also not consistent with increased collision frequency. Thus, the understanding of reaction kinetics supports that increased collision frequency correlates directly with an enhanced reaction rate.

9. Which of the following is a common use of crude oil fractions?

- A. Only for production of plastics
- B. As fuels or feedstocks**
- C. Exclusively for cleaning materials
- D. For agricultural pesticides

Crude oil fractions have a wide range of uses, making them crucial in various industries. The correct choice highlights that these fractions are primarily used as fuels, such as gasoline, diesel, and kerosene, which power transportation and heating systems. In addition, they serve as feedstocks for producing essential chemicals and materials, including plastics, solvents, and detergents. This versatility ensures that crude oil fractions play a significant role in both energy production and the manufacture of various products. The other options imply a narrower scope of use. While plastics are indeed produced from crude oil fractions, this is only one application among many. Similarly, although some cleaning materials may derive from crude oil derivatives, it's not accurate to say these fractions are exclusively used for such products. Agricultural pesticides may also have chemical components from petrochemical sources, but they represent a very specialized application of crude oil fractions rather than a common or primary use. Thus, the broader categorization of crude oil fractions as fuels and feedstocks best captures their importance in both energy and chemical production.

10. What is the benefit of recycling materials?

- A. It decreases overall production costs.
- B. It reduces the demand for new raw materials.**
- C. It makes products more expensive.
- D. It increases waste output.

Choosing to recycle materials has significant environmental and economic benefits, particularly in terms of reducing the demand for new raw materials. When materials are recycled, they are reprocessed and reused to create new products, which diminishes the need to extract and process virgin materials from the Earth. This not only conserves natural resources but also lessens the energy consumption and environmental impact associated with mining, logging, and other raw material extraction processes. Recycling contributes to sustainability efforts by helping to maintain the supply of raw materials for future use, while also minimizing the ecological footprint of product manufacturing. By decreasing the reliance on new resources, it supports conservation efforts and helps to protect habitats and ecosystems. In contrast, options that suggest increasing production costs or waste output contradict the principles of recycling; rather, effective recycling practices are designed to improve efficiency and reduce waste.

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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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