

WJEC Biology Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

This is a sample study guide. To access the full version with hundreds of 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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

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!

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Questions

- 1. Where do embryonic stem cells originate from?**
 - A. Adult tissues**
 - B. Blood cells**
 - C. Developing embryos**
 - D. Procedural cell cultures**
- 2. What role does a hypothesis serve in the scientific method?**
 - A. It summarizes the results of an experiment**
 - B. It provides a testable statement predicting the outcome of an experiment based on existing knowledge**
 - C. It presents the observations made during the experiment**
 - D. It describes the methods used to conduct an experiment**
- 3. Define phagocytosis.**
 - A. Transport of water across a cell membrane**
 - B. The process by which cells divide**
 - C. The process by which a cell engulfs large particles or cells**
 - D. Production of energy in the mitochondria**
- 4. Which process assists in recycling nutrients in ecosystems?**
 - A. Photosynthesis**
 - B. Respiration**
 - C. Decomposition**
 - D. Predation**
- 5. What is a karyotype?**
 - A. A method for assessing organism behavior**
 - B. A visual representation of chromosomes**
 - C. A technique for measuring genetic diversity**
 - D. A test for environmental toxins**
- 6. What are invasive species?**
 - A. Native species in their natural habitat**
 - B. Endangered species**
 - C. Non-native species that significantly affect the ecosystems they invade**
 - D. Animals that are bred for research purposes**

- 7. How can environmental factors impact gene expression?**
- A. They do not affect gene expression**
 - B. They can influence the way genes are expressed, affecting an organism's traits**
 - C. They only affect physical traits, not genetic traits**
 - D. They lead to the permanent change in the genetic code**
- 8. Define homeostasis.**
- A. The process of evolution**
 - B. The maintenance of a stable internal environment**
 - C. The growth and development of an organism**
 - D. The ability of an organism to adapt to new environments**
- 9. Which of the following best describes an allele?**
- A. A variant form of a gene**
 - B. A complete set of genes**
 - C. A section of DNA that codes for proteins**
 - D. A type of chromosome**
- 10. What role does ATP play in the process of photosynthesis?**
- A. It stores energy**
 - B. It transports water**
 - C. It generates oxygen**
 - D. It catalyzes chemical reactions**

Answers

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

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Explanations

1. Where do embryonic stem cells originate from?

- A. Adult tissues
- B. Blood cells
- C. Developing embryos**
- D. Procedural cell cultures

Embryonic stem cells originate from developing embryos, specifically from the inner cell mass of a blastocyst, which is an early stage of embryonic development. At this stage, the cells are pluripotent, meaning they have the ability to differentiate into any cell type in the body. This unique characteristic allows them to be used in research and potential therapies for a variety of diseases and injuries. The ability to develop into any cell type provides a significant advantage in regenerative medicine and therapeutic applications. Other sources of stem cells, such as adult tissues or blood cells, primarily yield adult stem cells, which have more limited differentiation potential compared to embryonic stem cells. Procedural cell cultures refer to methods used to grow cells in vitro but do not directly relate to the natural origin of embryonic stem cells.

2. What role does a hypothesis serve in the scientific method?

- A. It summarizes the results of an experiment
- B. It provides a testable statement predicting the outcome of an experiment based on existing knowledge**
- C. It presents the observations made during the experiment
- D. It describes the methods used to conduct an experiment

A hypothesis plays a critical role in the scientific method as it offers a testable statement that predicts the outcome of an experiment based on existing knowledge. This predictive statement is formulated by considering prior research and observations, allowing scientists to explore specific relationships or effects. By establishing a hypothesis, researchers can design experiments to test its validity, thereby advancing understanding of the topic under study. It is essential for a hypothesis to be testable, meaning that it can be supported or refuted through experimental or observational evidence. This distinction sets a hypothesis apart from other elements of the scientific process, such as results summarization, methodology description, or observation reporting. Each of these other components serves a different function within the overall structure of scientific inquiry, but the hypothesis focuses specifically on prediction and experimentation.

3. Define phagocytosis.

- A. Transport of water across a cell membrane
- B. The process by which cells divide
- C. The process by which a cell engulfs large particles or cells**
- D. Production of energy in the mitochondria

Phagocytosis is defined as the process by which a cell engulfs large particles or other cells. This mechanism is a form of endocytosis, whereby the cell membrane wraps around the material to be ingested, forming a vesicle that brings it into the cell. It plays a crucial role in the immune response, allowing immune cells like macrophages to ingest pathogens and dead cells, thereby helping to maintain the body's homeostasis and defense mechanisms. This is a vital function, enabling the body to eliminate harmful invaders effectively. The incorrect options refer to different biological processes unrelated to phagocytosis. For instance, the transport of water across a cell membrane pertains to osmosis, while cell division involves processes such as mitosis or meiosis. Similarly, the production of energy in mitochondria relates to cellular respiration and ATP synthesis, both of which are distinct from the act of engulfing particles through phagocytosis.

4. Which process assists in recycling nutrients in ecosystems?

- A. Photosynthesis
- B. Respiration
- C. Decomposition**
- D. Predation

Decomposition is the process that plays a crucial role in recycling nutrients within ecosystems. Decomposers, such as fungi, bacteria, and detritivores, break down organic matter from dead plants, animals, and waste products. This breakdown releases essential nutrients back into the soil, making them available for uptake by plants. Through this process, decomposition ensures that nutrients are not lost but are instead returned to the ecosystem, supporting new growth and maintaining the balance of the ecosystem. While photosynthesis involves the conversion of light energy into chemical energy by plants and respiration is crucial for energy production in living organisms, these processes do not primarily focus on recycling nutrients. Additionally, predation involves one organism consuming another and can contribute to energy flow in an ecosystem, but does not contribute to nutrient recycling in the same way as decomposition does.

5. What is a karyotype?

- A. A method for assessing organism behavior
- B. A visual representation of chromosomes**
- C. A technique for measuring genetic diversity
- D. A test for environmental toxins

A karyotype is indeed a visual representation of an organism's chromosomes. This representation is typically arranged in a standard format, showcasing the number, size, and shape of chromosomes, which allows for the identification of chromosomal abnormalities, such as aneuploidies (where there is an abnormal number of chromosomes) or structural changes in chromosomes. In a karyotype, chromosomes are stained to produce distinct banding patterns, which can be used to compare chromosomal compositions between individuals or species and to diagnose genetic disorders. This visual tool is fundamental in genetics, cytogenetics, and prenatal testing, as it provides critical information about an individual's genetic makeup. The other options pertain to different scientific concepts that do not relate to the classification or visual assessment of chromosomes, thus confirming that the correct identification of a karyotype is as a visual representation of chromosomes.

6. What are invasive species?

- A. Native species in their natural habitat
- B. Endangered species
- C. Non-native species that significantly affect the ecosystems they invade**
- D. Animals that are bred for research purposes

Invasive species are defined as non-native species that, once introduced to a new environment, can cause significant disruption to the ecosystems they invade. This impact can manifest in various ways, including outcompeting native species for resources, altering habitat structures, introducing new diseases, and disrupting food webs. When invasive species are introduced—often through human activity—they frequently lack natural predators or regulatory mechanisms in their new environments, allowing them to proliferate quickly. This unchecked growth can lead to a decline in native species populations, decreased biodiversity, and altered ecosystem functions. Understanding invasive species is crucial for ecological conservation and management, as they can threaten the health of ecosystems worldwide. This definition clearly distinguishes invasive species from native species, endangered species, and animals bred for research purposes, highlighting their unique role in ecological disruption.

7. How can environmental factors impact gene expression?

- A. They do not affect gene expression
- B. They can influence the way genes are expressed, affecting an organism's traits**
- C. They only affect physical traits, not genetic traits
- D. They lead to the permanent change in the genetic code

Environmental factors can significantly influence gene expression by modulating how genes are activated or deactivated in response to external stimuli. This process, known as gene regulation, can affect an organism's phenotype—its observable characteristics—without altering the underlying genetic sequence. For example, factors such as temperature, light, and availability of nutrients can trigger changes in gene activity, leading to variations in traits like coloration, growth rates, and even metabolic processes. This adaptability is crucial for survival, as organisms can alter their traits in response to changing environments. Such a phenomenon illustrates the interplay between genetics and the environment, emphasizing that while the genetic code remains constant, the expression of these genes can vary greatly depending on external conditions.

8. Define homeostasis.

- A. The process of evolution
- B. The maintenance of a stable internal environment**
- C. The growth and development of an organism
- D. The ability of an organism to adapt to new environments

Homeostasis refers to the mechanisms through which living organisms regulate their internal environment to maintain stable, constant conditions despite external changes. This internal stability is vital for the proper functioning of cells and, consequently, the entire organism. For instance, humans maintain a relatively constant body temperature, pH level, and glucose concentration, allowing physiological processes to occur optimally. The concept encompasses a variety of processes, including thermoregulation, osmoregulation, and blood sugar regulation. When an external temperature fluctuates, for example, the body responds in ways that help maintain a core temperature around 37 degrees Celsius. Other choices refer to different biological concepts: evolution involves changes in species over generations, growth and development describe how organisms increase in size and complexity over time, and adaptation relates to changes that help organisms survive in different environments. These distinctions highlight why the maintenance of a stable internal environment is specifically linked to homeostasis.

9. Which of the following best describes an allele?

- A. A variant form of a gene**
- B. A complete set of genes**
- C. A section of DNA that codes for proteins**
- D. A type of chromosome**

An allele is best described as a variant form of a gene. Genes are segments of DNA that carry the instructions for the development and functioning of an organism, and alleles are different versions of these genes that may produce different traits. For example, a gene for flower color in a plant may have several alleles, such as one for red flowers and another for white flowers. The presence of different alleles contributes to genetic diversity within a population, influencing traits and characteristics in offspring. The other options describe related concepts but do not accurately define an allele. A complete set of genes refers to the organism's genome, while a section of DNA that codes for proteins describes a gene itself. A type of chromosome indicates a structural component of the cell, not specifically the variations of genes. Therefore, identifying an allele as a variant form of a gene captures its role in genetics clearly and accurately.

10. What role does ATP play in the process of photosynthesis?

- A. It stores energy**
- B. It transports water**
- C. It generates oxygen**
- D. It catalyzes chemical reactions**

ATP, or adenosine triphosphate, is crucial in the process of photosynthesis as it serves as the primary energy carrier within cells. During photosynthesis, the light-dependent reactions convert solar energy into chemical energy, which is stored in the form of ATP and NADPH. This energy is then utilized in the Calvin cycle, the light-independent reactions, to synthesize glucose from carbon dioxide. Specifically, ATP provides the energy required for various biochemical reactions that occur in the chloroplasts, helping to drive the conversion of carbon dioxide into organic molecules. Its role as an energy store enables plants to harness sunlight effectively and convert it into fuel for growth and development. Additionally, ATP does not directly transport water, generate oxygen, or act as a catalyst for chemical reactions, but its role as an energy store and currency in cellular processes is vital for sustaining the overall function of photosynthesis.

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:

<https://wjecbiology.examzify.com>

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