

ONTARIO GRADE 9 SCIENCE CLASS PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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. What is a galaxy?

- A. A single star
- B. A small group of stars
- C. A huge group of single stars, star systems, star clusters, dust, and gas bound together by gravity
- D. A satellite of Earth

2. What is the first step in the nitrogen cycle?

- A. Nitrification
- B. Nitrogen fixation
- C. Assimilation
- D. Denitrification

3. What is the lithosphere?

- A. The layer of Earth's atmosphere where life exists.
- B. The body of water covering the Earth's surface.
- C. The solid, outer layer of the earth that consists of the crust and the rigid upper part of the mantle.
- D. A collective term for all ecosystems on Earth.

4. What defines an independent variable in an experiment?

- A. The factor that remains constant throughout the experiment.
- B. The factor changed or manipulated to test effects.
- C. The factor that is observed as a result.
- D. The variable that cannot be measured.

5. What are comets made of?

- A. Gas and dust only
- B. Lava and rock
- C. Ice, rock, and dust
- D. Liquid water and minerals

- 6. In Newton's first law, what is meant by "net external force"?**
- A. A force that has no effect on motion
 - B. A force acting on an object that can change its state of motion
 - C. A force applied by an object itself
 - D. A force that balances all other forces
- 7. Which are the three types of heat transfer?**
- A. Conduction, insulation, and radiation
 - B. Convection, expansion, and radiation
 - C. Conduction, convection, and radiation
 - D. Convection, conduction, and evaporation
- 8. What impact do invasive species have on ecosystems?**
- A. They improve biodiversity
 - B. They have no impact
 - C. They harm native species and habitats
 - D. They enhance soil fertility
- 9. Which of the following are primary components of blood?**
- A. Red blood cells, green blood cells, platelets, and plasma
 - B. Red blood cells, white blood cells, platelets, and plasma
 - C. White blood cells, yellow blood cells, and plasma
 - D. Plasma, fibers, and nutrients only
- 10. Which of the following describes convection?**
- A. Heat transfer through solids
 - B. Heat transfer through liquids and gases due to movement
 - C. Heat transfer through electromagnetic radiation
 - D. Heat transfer only occurring in metals

Answers

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

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Explanations

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1. What is a galaxy?

- A. A single star
- B. A small group of stars
- C. A huge group of single stars, star systems, star clusters, dust, and gas bound together by gravity**
- D. A satellite of Earth

A galaxy is indeed a huge group of single stars, star systems, star clusters, dust, and gas bound together by gravity. This definition encompasses the vast complexity and scale of galaxies, which can contain billions to trillions of stars along with various celestial objects and materials that compose them. The gravitational forces at play in a galaxy allow for the formation of structures such as spiral arms, bars, and other features, depending on the galaxy's type. In contrast, a single star, while it is indeed a significant astronomical object, does not represent the collective nature or large scale that characterizes a galaxy. Similarly, a small group of stars lacks the extensive variety and quantity inherent in larger galaxies. A satellite of Earth, such as the Moon, refers specifically to an astronomical body that orbits a planet, rather than the vast structure of star systems and materials we find in a galaxy. Thus, the comprehensive nature of C accurately describes what galaxies are in the universe.

2. What is the first step in the nitrogen cycle?

- A. Nitrification
- B. Nitrogen fixation**
- C. Assimilation
- D. Denitrification

The first step in the nitrogen cycle is nitrogen fixation. This process involves the conversion of atmospheric nitrogen gas (N_2), which cannot be used directly by most living organisms, into ammonia (NH_3) or related compounds that can be assimilated by plants. Nitrogen fixation can occur abiotically through natural processes such as lightning or through biological means, primarily facilitated by certain bacteria that live in the soil or in symbiotic relationships with plants, particularly legumes. This step is crucial because it makes nitrogen, an essential nutrient for all living organisms, accessible in a form that can be utilized in biological processes, such as the synthesis of amino acids and proteins. Without nitrogen fixation, the nitrogen present in the atmosphere would not be available for the growth and development of plants, which form the base of most food chains.

3. What is the lithosphere?

- A. The layer of Earth's atmosphere where life exists.
- B. The body of water covering the Earth's surface.
- C. The solid, outer layer of the earth that consists of the crust and the rigid upper part of the mantle.**
- D. A collective term for all ecosystems on Earth.

The lithosphere is the solid, outer layer of the Earth that includes both the crust and the rigid upper portion of the mantle. This is different from option A which describes the atmosphere, B which describes the hydrosphere (water), and D which encompasses all living organisms in the biosphere. The lithosphere specifically refers to the combination of the Earth's solid geologic materials, making it the correct choice in this question.

4. What defines an independent variable in an experiment?

- A. The factor that remains constant throughout the experiment.
- B. The factor changed or manipulated to test effects.**
- C. The factor that is observed as a result.
- D. The variable that cannot be measured.

The independent variable in an experiment is defined as the factor that is changed or manipulated by the researcher to observe its effects on other variables. This is crucial in scientific experiments because it allows the researcher to establish a cause-and-effect relationship. By altering this variable, you can assess how it influences dependent variables, which are the factors observed or measured as outcomes. In essence, the independent variable is what the experimenter varies deliberately, aiming to see how it impacts the results or responses of the dependent variables. This manipulation is key to testing hypotheses and gaining a deeper understanding of the phenomena being studied.

5. What are comets made of?

- A. Gas and dust only
- B. Lava and rock
- C. Ice, rock, and dust**
- D. Liquid water and minerals

Comets are astronomical objects made of ice, rock, and dust. Option A is incorrect because comets are not exclusively made of gas and dust. While they may have a gas-like appearance due to the sublimation of ice, they also contain solid materials. Option B is incorrect because comets do not have a molten or liquid interior, and are not composed of lava. Option D is incorrect as comets are not known to have liquid water as a component, and minerals only make up a small fraction of their overall composition. Therefore, the best answer is C which includes all three components commonly found in comets.

6. In Newton's first law, what is meant by "net external force"?

- A. A force that has no effect on motion
- B. A force acting on an object that can change its state of motion**
- C. A force applied by an object itself
- D. A force that balances all other forces

In the context of Newton's first law, "net external force" refers to the total force acting on an object that can lead to a change in its state of motion. When we talk about the net external force, we are considering all the forces acting on the object from outside of it. If this net force is not zero, it can cause the object to accelerate, decelerate, or change direction, indicating that there is an effect on the object's motion. For example, if a person pushes a stationary book across a table, the push is an external force that affects the book's motion. If the push is strong enough to overcome any opposing forces (such as friction), the book will start moving. This illustrates how a net external force acts to change an object's state of motion, aligning with the principles described in Newton's first law, which states that an object at rest stays at rest, and an object in motion continues in motion at a constant velocity unless acted upon by a net external force.

7. Which are the three types of heat transfer?

- A. Conduction, insulation, and radiation
- B. Convection, expansion, and radiation
- C. Conduction, convection, and radiation**
- D. Convection, conduction, and evaporation

The three types of heat transfer are conduction, convection, and radiation. Conduction involves the transfer of heat through direct contact between materials. When you touch a hot stove, heat moves from the stove to your hand, demonstrating conduction. This process occurs in solids where particles are closely packed and can easily transfer energy by colliding with one another. Convection is the transfer of heat through fluids (liquids and gases) caused by the movement of the fluid itself. As a fluid heats up, it becomes less dense and rises, while cooler, denser fluid sinks. This creates a convection current, which is responsible for various phenomena, such as the heating of water in a pot or the warming of air in a room. Radiation, on the other hand, involves the transfer of heat through electromagnetic waves, which can occur in a vacuum as well as in the atmosphere. This is how the Sun warms the Earth; it emits energy that travels through space and warms up the ground and air upon reaching them. Understanding these three processes provides foundational knowledge in thermal dynamics and can explain everyday phenomena, from cooking to weather patterns.

8. What impact do invasive species have on ecosystems?

- A. They improve biodiversity
- B. They have no impact
- C. They harm native species and habitats**
- D. They enhance soil fertility

Invasive species can cause harm to native species and their habitats by outcompeting them for resources, introducing new diseases, and altering the natural balance of the ecosystem. This can lead to negative cascading effects on other organisms and disrupt the overall functioning of the ecosystem. Options A and D are incorrect because invasive species do not improve biodiversity or enhance soil fertility, as they often dominate and push out other native species. Option B is incorrect because, as mentioned, invasive species can have significant and damaging impacts on ecosystems.

9. Which of the following are primary components of blood?

- A. Red blood cells, green blood cells, platelets, and plasma
- B. Red blood cells, white blood cells, platelets, and plasma**
- C. White blood cells, yellow blood cells, and plasma
- D. Plasma, fibers, and nutrients only

The selection of red blood cells, white blood cells, platelets, and plasma as the primary components of blood is accurate and reflects the essential elements that make up blood and its functions within the body. Red blood cells, also known as erythrocytes, are crucial for transporting oxygen from the lungs to the tissues and facilitating the return of carbon dioxide from the tissues back to the lungs. This function is vital for cellular respiration and energy production. White blood cells, or leukocytes, play an important role in the immune system. They help defend the body against infections and foreign invaders, making them essential for maintaining health and wellness. Platelets, or thrombocytes, are involved in blood clotting, which is necessary to stop bleeding when injuries occur. They aggregate at the site of a wound and work to form a clot, preventing excessive blood loss. Plasma is the liquid portion of blood, constituting about 55% of its volume. It carries hormones, nutrients, waste products, and proteins throughout the body, facilitating essential biological processes. Together, these components work synergistically to ensure the body operates effectively, thus confirming the correctness of selecting this option.

10. Which of the following describes convection?

- A. Heat transfer through solids
- B. Heat transfer through liquids and gases due to movement**
- C. Heat transfer through electromagnetic radiation
- D. Heat transfer only occurring in metals

Convection is the process of heat transfer that occurs in fluids, which include both liquids and gases, as a result of the movement of the fluid itself. The key aspect of convection is this movement—hotter areas of a liquid or gas become less dense and rise, while cooler areas sink, creating a continuous circulation pattern. This movement facilitates the transfer of heat from one part of the fluid to another. In the context of the options provided, B is correct because it accurately captures this essential mechanism of heat transfer through liquids and gases due to movement. Other options fail to encompass the full nature of convection; for instance, describing heat transfer through solids relates to conduction, while heat transfer through electromagnetic radiation pertains to radiation. Additionally, stating that heat transfer only occurs in metals is misleading since convection can happen across various fluids, not merely through solid conductive materials.

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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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