HOAE GENERAL 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.

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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!

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Questions

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1. How many chromosomes are typically found in a human somatic cell?

A. 23

B. 44

C. 46

D. 48

2. What exponent or power of 10 would you use to express how many meters are in a kilometer?

A. 10 to the third power

B. 10 to the first power

C. 10 to the second power

D. 10 to the fourth power

3. Which body in our solar system has very good evidence for the presence, at one time in the past, for liquid water?

A. Mars

B. Earth

C. Mercury

D. Venus

4. If entropy decreases in a system, what must occur on some larger scale?

A. Energy must be conserved

B. Entropy must decrease on some larger scale

C. Entropy must increase on some larger scale

D. Temperature rises

5. Mendel's classic heredity experiments used which plant species?

A. Beans

B. Rice plants

C. Pea plants

D. Corn plants

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6. What is the term for the shallow submerged region of the ocean that meets the deep ocean floor?

A. Continental shelf

B. Continental margin

C. Abyssal plain

D. Trench

7. The symbol N in physics represents the SI unit for which quantity?

A. Energy

B. Power

C. Force

D. Momentum

8. Which pair of subatomic particles has opposite electric charges?

A. Electron and proton

B. Neutron and proton

C. Electron and neutron

D. Proton and neutron

9. Crude oil originated from which type of material?

A. Ancient fossilized organic material

B. Modern plant debris

C. Inorganic minerals

D. Animal bones

10. Which unit of energy is equivalent to a Newton-meter?

A. Calorie

B. Watt

C. Electronvolt

D. Joule

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Answers

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

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Explanations

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1. How many chromosomes are typically found in a human somatic cell?

A. 23

B. 44

C. 46

D. 48

Somatic cells in humans are diploid, meaning they carry two full sets of chromosomes. That totals 46 chromosomes per cell, organized as 23 pairs. One chromosome of each pair comes from each parent, with 22 autosomes and a pair of sex chromosomes (XX or XY). Gametes (sperm and egg) are haploid, containing 23 chromosomes, so fertilization restores the 46. The number 23 describes the haploid set in reproductive cells, not somatic cells. A count of 44 would miss a chromosome pair and isn't the normal human number, while 48 would be an abnormal (extra) chromosome situation.

2. What exponent or power of 10 would you use to express how many meters are in a kilometer?

A. 10 to the third power

B. 10 to the first power

C. 10 to the second power

D. 10 to the fourth power

The key idea is metric prefixes and moving between units with powers of ten. Kilometers are larger than meters by a factor of one thousand, and one thousand is written as 10^3. So 1 kilometer equals 1 × 10^3 meters, i.e., the exponent is 3. The other exponents (10^1 for ten, 10^2 for a hundred, 10^4 for ten thousand) don't match the kilometer-to-meter relationship. Therefore, the appropriate power of ten is 10^3.

3. Which body in our solar system has very good evidence for the presence, at one time in the past, for liquid water?

A. Mars

B. Earth

C. Mercury

D. Venus

A planet shows past liquid water when its surface bears signs that only liquid water can create, such as river-like channels, lakebeds, deltas, and minerals that form in watery conditions. Mars displays these clues more clearly than the others. Its ancient terrain is threaded with valley networks and large outflow channels that resemble dried-up rivers and floods, pointing to flowing water in the distant past. Missions have detected minerals that form in water, like clays and sulfates, indicating rocks were altered by liquid water for extended periods. In places such as Jezero and Gale craters, there are sedimentary deposits and features consistent with ancient lakes and deltas, meaning standing bodies of water once filled those basins. While Mercury and Venus have surface conditions that aren't conducive to stable liquid water, and Earth currently has water, Mars uniquely shows a robust combination of landforms and minerals that record a past hydrologic cycle on its surface.

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4. If entropy decreases in a system, what must occur on some larger scale?

A. Energy must be conserved

B. Entropy must decrease on some larger scale

C. Entropy must increase on some larger scale

D. Temperature rises

The key idea is the second law of thermodynamics: the total entropy of an isolated system cannot decrease. If a part of a system shows a decrease in entropy, there must be a compensating, greater increase somewhere else so that the overall entropy rises. In other words, entropy must increase on a larger scale to balance any local drop. That's why the correct statement is that entropy increases overall when you look at a bigger system, even though a smaller part might temporarily become more ordered. Energy conservation and temperature changes aren't the direct requirement here—the crucial point is the global increase in entropy.

5. Mendel's classic heredity experiments used which plant species?

A. Beans

B. Rice plants

C. Pea plants

D. Corn plants

Mendel chose pea plants because they are ideal for studying heredity with clear, controllable experiments. Peas have easily observable, distinct traits and come in true-breeding varieties, so you can start with a known parental type and reliably see how traits segregate in the offspring. They also allow precise control of fertilization: pollen can be manually transferred to cross-pollinate plants or let to self-pollinate, making it possible to track how one trait from each parent is passed to the next generation. In addition, peas produce many offspring and have a short generation time, so you can gather enough data quickly to identify predictable patterns, like how dominant and recessive traits appear in ratios across generations. Other plants, like beans, rice, or corn, don't offer the same combination of easy controlled crosses, discrete traits, and rapid, abundant offspring, which is why peas were the chosen model.

6. What is the term for the shallow submerged region of the ocean that meets the deep ocean floor?

A. Continental shelf

B. Continental margin

C. Abyssal plain

D. Trench

The continental shelf is the shallow submerged edge of a continent, stretching from the coastline out to where the seafloor drops more steeply at the shelf break. It is the shallow region that meets the deeper ocean floor, marking the boundary between the continental crust and the deeper ocean. Depths on the shelf are relatively shallow, often up to about 200 meters, before the slope descends into deeper regions like the continental slope and beyond. This region fits the description because it describes the transition from shallow water near land to the deeper ocean floor. A continental margin is the broader zone that includes the shelf, slope, and rise; the abyssal plain is the deep, flat region far beyond the shelf, and a trench is a deep, narrow trough formed at subduction zones.

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7. The symbol N in physics represents the SI unit for which quantity?

A. Energy

B. Power

C. Force

D. Momentum

Newtons measure force. According to Newton's second law, force equals mass times acceleration. The unit newton is defined so that F = ma with mass in kilograms and acceleration in meters per second squared, giving 1 N = 1 kg·m/s^2. That makes the symbol N the unit of force. Energy uses joules (1 J = 1 kg·m^2/s^2), power uses watts (1 W = 1 J/s = 1 kg·m^2/s^3), and momentum uses kilograms times meters per second (kg·m/s). Therefore the symbol N corresponds to force, not energy, power, or momentum.

8. Which pair of subatomic particles has opposite electric charges?

A. Electron and proton

B. Neutron and proton

C. Electron and neutron

D. Proton and neutron

Electric charge comes in positive, negative, and neutral. Opposite charges mean one is negative and the other is positive, so they attract each other. The pair that has opposite charges is the electron and the proton. The electron has a negative charge, while the proton has a positive charge, so they carry opposite charges. The neutron, on the other hand, is electrically neutral, so it does not have a charge opposite to the electron or the proton. That's why the other pairings don't fit as opposite charges.

9. Crude oil originated from which type of material?

A. Ancient fossilized organic material

B. Modern plant debris

C. Inorganic minerals

D. Animal bones

Crude oil comes from ancient organic material that was deposited and buried in sediments long ago. Over millions of years, heat and pressure transformed that organic matter—mostly microscopic marine organisms like plankton and algae—into kerogen, and with further heating into liquid hydrocarbons that migrate and pool as crude oil. This source is different from modern plant debris, which over geological time tends to form coal under different conditions; inorganic minerals cannot turn into hydrocarbons; and animal bones are not the primary source of crude oil. The idea hinges on oil arising from long-dead organic matter that has been subjected to the right burial, temperature, and pressure conditions.

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10. Which unit of energy is equivalent to a Newton-meter?

A. Calorie

B. Watt

C. Electronvolt

D. Joule

The main idea is that energy, or work, is measured in the same unit, defined as force times distance. A Joule is specifically the amount of energy when one Newton of force moves an object one meter. Since a Newton is kg·m/s^2, multiplying by meters gives kg·m^2/s^2, which is defined as the Joule. So a Newton-meter is just another way to say one Joule. Other energy units exist, like calories or electronvolts, but they are not equal to a Newton-meter: 1 calorie is about 4.184 joules and 1 electronvolt is about 1.602×10^-19 joules. A watt, meanwhile, is a unit of power (joules per second), not energy itself.

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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:

https://hoaegenscience.examzify.com

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

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