EARTH SCIENCE AND ENVIRONMENTAL POLLUTION 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.

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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. Which energy source is NOT among the three largest energy sources?

A. Petroleum, natural gas, and coal

B. Coal, oil, and natural gas

C. Nuclear, wind, and solar

D. Petroleum, coal, and hydropower

2. What is NOT true about water?

A. Water is a polar molecule

B. Water is a nonpolar molecule

C. Water has a high surface tension

D. Water expands when it freezes

3. What health effects may result from exposure to radionuclides?

A. Cancer and organ damage depending on dose.

B. Skin irritation only.

C. No health effects at any dose.

D. Immediate death.

4. Biochemical oxygen demand (BOD) is a measure of the amount of oxygen consumed by microorganisms during the decomposition of organic matter.

A. Oxygen produced by photosynthesis

B. Oxygen dissolved in water not affected by organisms

C. Oxygen consumed by microorganisms during decomposition

D. Oxygen released during plant respiration

5. Which statement best describes the greenhouse effect and major human-caused greenhouse gases?

A. It traps infrared radiation; major gases include CO2, CH4, N2O, and fluorinated gases

B. Greenhouse gases reflect solar radiation away from Earth

C. Greenhouse effect is caused by depletion of ozone in the stratosphere

D. Water vapor has no role in the greenhouse effect

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6. What are the three largest sources of energy for the United States?

A. Nuclear, solar, and wind

B. Coal, hydropower, geothermal

C. Petroleum, coal, and natural gas

D. Petroleum, natural gas, and coal

7. What are the four steps of environmental risk assessment?

A. Hazard identification; dose-response assessment; exposure assessment; risk characterization.

B. Monitoring; auditing; reporting; enforcement.

C. Source identification; transport; fate; effects.

D. Problem framing; stakeholder engagement; policy analysis; implementation.

8. What is NOT true about aquifers?

A. Artesian wells cannot be drilled directly into an aquifer due to the tremendous water pressure

B. Groundwater moves slowly through underground rock and soil

C. Aquifers store large amounts of water

D. Aquifers can be naturally recharged by precipitation

9. Define PM2.5 and PM10 and discuss their health impacts.

A. PM2.5 are fine particles ≤2.5 μm; PM10 ≤10 μm; smaller particles penetrate deeper into lungs and bloodstream, causing respiratory and cardiovascular problems.

B. PM2.5 are coarse particles 10-50 μm; PM10 are fine.

C. PM2.5 refer to vapor pollutants

D. PM10 only exist in deserts

10. Which statement best describes solar, wind, and hydroelectric power in terms of reliability and land use?

A. Solar and wind are intermittent, while hydro is highly reliable and requires little land.

B. Hydro is intermittent and affects river ecosystems.

C. Solar and wind are intermittent; hydro is reliable but can impact rivers, fish; land use and habitat.

D. All three energy sources have identical environmental impacts.

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Answers

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

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Explanations

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1. Which energy source is NOT among the three largest energy sources?

A. Petroleum, natural gas, and coal

B. Coal, oil, and natural gas

C. Nuclear, wind, and solar

D. Petroleum, coal, and hydropower

The main idea is identifying which energy sources dominate global energy use by total primary energy consumption. Globally, petroleum (oil), coal, and natural gas make up the largest shares of primary energy. Nuclear energy, along with wind and solar, contribute far less to total energy use, even though they're important for electricity and decarbonization. Therefore, the trio of nuclear, wind, and solar is not among the three largest energy sources.

2. What is NOT true about water?

A. Water is a polar molecule

B. Water is a nonpolar molecule

C. Water has a high surface tension

D. Water expands when it freezes

Water's polarity is what governs many of its distinctive behaviors, so the statement that it is nonpolar is not true. The oxygen atom in a water molecule is more electronegative than hydrogen, pulling electron density toward itself in the O–H bonds. Because the molecule is bent rather than straight, those partial charges don't cancel out, giving water a net dipole moment. That polarity enables hydrogen bonding between water molecules, which is the glue that holds the liquid together strongly and leads to high surface tension—myd cohesive forces at the surface pull inward, creating a tight "skin." It also explains why ice expands upon freezing: the hydrogen-bonded network in solid water forms an open, hexagonal structure that is less dense than liquid water, so ice floats. So the true description is that water is polar and forms strong hydrogen bonds, which accounts for its high surface tension and the expansion upon freezing; the nonpolar description does not fit.

3. What health effects may result from exposure to radionuclides?

A. Cancer and organ damage depending on dose.

B. Skin irritation only.

C. No health effects at any dose.

D. Immediate death.

Exposure to radionuclides involves ionizing radiation that can damage cells and DNA. The health effects depend on how much radiation is absorbed (the dose) and on which tissues are affected. At lower doses, the main concern is an increased risk of cancer over time, a probabilistic outcome that rises with dose. At higher doses, there can be immediate tissue injury and organ dysfunction once a threshold is exceeded, a deterministic effect. So, cancer and organ damage may result, depending on dose, which covers the range from long-term cancer risk to acute tissue injury. Other options are not comprehensive: skin irritation can occur at very high exposures but is not the only risk, and no health effects at any dose or immediate death are not generally applicable except in extreme situations.

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4. Biochemical oxygen demand (BOD) is a measure of the amount of oxygen consumed by microorganisms during the decomposition of organic matter.

A. Oxygen produced by photosynthesis

B. Oxygen dissolved in water not affected by organisms

C. Oxygen consumed by microorganisms during decomposition

D. Oxygen released during plant respiration

Biochemical oxygen demand shows how much oxygen microorganisms require to break down organic matter in water. The key idea is oxygen consumption by microbes during decomposition, so the correct description is oxygen consumed by microorganisms as they decompose organic material. The other ideas describe oxygen production, oxygen that remains unaffected, or oxygen released during plant respiration, none of which reflect the microbial consumption at the heart of BOD. In practice, a higher BOD indicates more organic pollution and greater potential for oxygen depletion in aquatic environments.

5. Which statement best describes the greenhouse effect and major human-caused greenhouse gases?

A. It traps infrared radiation; major gases include CO_2, CH_4, N_2O, and fluorinated gases

B. Greenhouse gases reflect solar radiation away from Earth

C. Greenhouse effect is caused by depletion of ozone in the stratosphere

D. Water vapor has no role in the greenhouse effect

The main idea is that the greenhouse effect happens when certain gases in Earth's atmosphere absorb infrared radiation emitted by the surface and re-emit heat in all directions, trapping warmth near the planet. The best choice describes this infrared trapping and lists the major human-caused greenhouse gases: carbon dioxide, methane, nitrous oxide, and fluorinated gases, which come from burning fossil fuels, agriculture, industry, and refrigerants. That combination captures both the mechanism and the sources, making it the correct description. The notion that greenhouse gases reflect solar radiation away is not how heat is trapped—the issue is heat that has already been emitted by the surface, not sunlight being reflected. Depletion of ozone in the stratosphere is a different issue tied to UV shielding and has a separate climate impact, not the core infrared-absorption process. Water vapor does contribute to warming, but its amount is largely a response to temperature and other gases, not a direct emission control, so saying it has no role would be misleading.

6. What are the three largest sources of energy for the United States?

A. Nuclear, solar, and wind

B. Coal, hydropower, geothermal

C. Petroleum, coal, and natural gas

D. Petroleum, natural gas, and coal

The main idea being tested is how energy is used across the whole economy, not just for electricity. Petroleum dominates because transportation consumes the largest share of energy, and most transportation fuels come from petroleum liquids like gasoline, diesel, and jet fuel. The second-largest source is natural gas, which powers a large portion of electricity generation and is widely used for heating and industrial processes. The third-largest is coal, which still provides a substantial chunk of electricity and industrial energy, even as its use declines in some sectors. Other options don't fit because nuclear, solar, and wind contribute much smaller shares of total energy use, and while hydro is important for electricity, it typically contributes less to total primary energy than coal.

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7. What are the four steps of environmental risk assessment?

A. Hazard identification; dose-response assessment; exposure assessment; risk characterization.

B. Monitoring; auditing; reporting; enforcement.

C. Source identification; transport; fate; effects.

D. Problem framing; stakeholder engagement; policy analysis; implementation.

The main idea being tested is how environmental risk assessment is organized into a clear, Four-step process that connects what a hazard can do with how people or ecosystems might actually be exposed. First, hazard identification asks what adverse effects a substance or activity could cause and what hazards exist. Next, dose–response assessment looks at how the severity or likelihood of those effects changes with different levels of exposure, helping establish thresholds and potencies. Then, exposure assessment estimates who or what is exposed, how much, how often, and for how long, to translate the hazard into real-world risk. Finally, risk characterization integrates the hazard information, dose–response data, and exposure estimates to describe the overall risk and its uncertainties, often summarizing what's known and what remains uncertain. This sequence is the best choice because it follows the logical flow from identifying potential harm, understanding how risk scales with dose, quantifying actual exposure, to delivering a final risk estimate. The other options describe activities that are important in environmental work but belong to different stages: management or compliance (monitoring, auditing, reporting, enforcement), fate and transport analysis (source identification, transport, fate, effects), or policy development and stakeholder processes (problem framing, engagement, policy analysis, implementation).

8. What is NOT true about aquifers?

A. Artesian wells cannot be drilled directly into an aquifer due to the tremendous water pressure

B. Groundwater moves slowly through underground rock and soil

C. Aquifers store large amounts of water

D. Aquifers can be naturally recharged by precipitation

A key idea is that groundwater in aquifers can be under pressure when it's in a confined layer. Artesian wells happen precisely because a confined aquifer traps water under pressure; when you drill into it, the pressurized water can rise up the borehole and may reach the surface without pumping. So saying artesian wells cannot be drilled into an aquifer because of the pressure isn't accurate—the pressure is what makes artesian flow possible, not a barrier to drilling. The other statements are true: groundwater moves slowly through underground rock and soil, which is why aquifers have long timescales for flow; aquifers store large amounts of water, acting as natural reservoirs; and they can be naturally recharged by precipitation that infiltrates down to replenish the stored groundwater.

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9. Define PM2.5 and PM10 and discuss their health impacts.

A. PM2.5 are fine particles ≤2.5 µm; PM10 ≤10 µm; smaller particles penetrate deeper into lungs and bloodstream, causing respiratory and cardiovascular problems.

B. PM2.5 are coarse particles 10-50 µm; PM10 are fine.

C. PM2.5 refer to vapor pollutants

D. PM10 only exist in deserts

Particulate matter is classified by the size of the particles, which determines how deep they can travel in the respiratory system and how long they stay suspended in air. PM2.5 refers to fine particles with an aerodynamic diameter of 2.5 micrometers (µm) or smaller. PM10 includes particles with a diameter of 10 µm or smaller. Since PM2.5 is a subset of PM10, the smaller particles can bypass the nose and throat defenses and reach the deeper airways, including the gas-exchange regions of the lungs, and some can even enter the bloodstream. Because of their small size, these particles can cause more severe health effects. They can irritate and inflame the airways, worsen asthma, and reduce lung function. In the cardiovascular system, PM2.5 exposure is linked to inflammation and changes in heart rhythm, increased blood pressure, and a higher risk of heart attacks and strokes. Over the long term, sustained exposure is associated with chronic respiratory and cardiovascular diseases and can contribute to adverse birth outcomes and increased mortality. The choice that correctly defines the sizes and notes the deeper lung penetration and associated respiratory and cardiovascular problems aligns with how these particles behave in the body. The other options misstate the definitions or the nature of PM, such as calling PM2.5 vapor pollutants or suggesting PM10 only exists in deserts, which isn't accurate.

10. Which statement best describes solar, wind, and hydroelectric power in terms of reliability and land use?

A. Solar and wind are intermittent, while hydro is highly reliable and requires little land.

B. Hydro is intermittent and affects river ecosystems.

C. Solar and wind are intermittent; hydro is reliable but can impact rivers, fish; land use and habitat.

D. All three energy sources have identical environmental impacts.

Reliability and land-use tradeoffs are at the heart of comparing these energy sources. Solar and wind depend on weather: when the sun isn't shining or the wind isn't blowing, their output drops, so they're intermittent. That doesn't mean they can't supply a lot of power, but it does mean their reliability on its own is limited unless paired with storage, other generation, or grid interconnections. Hydroelectric power, by contrast, is more dispatchable. Dams and reservoirs can release power when needed, making hydro a more reliable source for meeting varying demand. But this reliability comes with ecological and land-use costs: damming rivers alters flow regimes, affects fish and other aquatic life, changes sediment transport, and floods large areas to create reservoirs, which changes habitat and land use. So the best description is that solar and wind are intermittent; hydro is more reliable but can impact rivers, fish, and land-use/habitat. The other statements mischaracterize hydro's reliability or the environmental impacts.

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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://earthscienceenvipollution.examzify.com

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

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