

IB Marine Science Standard Level (SL) Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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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. Which microorganisms are primarily responsible for oxidizing ammonium to nitrite and nitrite to nitrate in the nitrogen cycle?**
 - A. Denitrifying Bacteria**
 - B. Nitrogen-Fixing Bacteria**
 - C. Nitrifying Bacteria**
 - D. Photosynthetic Bacteria**

- 2. Which term describes planktonic organisms large enough to be seen with the naked eye, such as jellyfish?**
 - A. Holoplankton**
 - B. Macroplankton**
 - C. Meroplankton**
 - D. Microbial Loop**

- 3. What term refers to a spring of hot, mineral- and gas-rich seawater found on ocean ridges in zones of active seafloor spreading?**
 - A. Ocean Basin**
 - B. Hydrothermal Vent**
 - C. Seamount**
 - D. Submarine Canyon**

- 4. Which term describes free-floating organisms that drift with currents and cannot swim against them?**
 - A. Nekton**
 - B. Phytoplankton**
 - C. Plankton**
 - D. Plankter**

- 5. Which discipline focuses on the order of rock layers and their relative ages?**
 - A. Absorption**
 - B. Aphotic Zone**
 - C. Stratigraphy**
 - D. Adhesion**

- 6. Which field of geology studies layered sedimentary rocks and their relative ages?**
- A. Absorption**
 - B. Adhesion**
 - C. Stratigraphy**
 - D. Aphotic Zone**
- 7. The siliceous cell walls of diatoms are called what?**
- A. Holdfast**
 - B. Mangrove**
 - C. Frustule**
 - D. Gas Bladder**
- 8. Which taxonomic class includes snails and slugs?**
- A. Echinodermata**
 - B. Echinoidea**
 - C. Gill Membranes**
 - D. Gastropoda**
- 9. What is the term for the total mass of living matter in a given area or ecosystem?**
- A. Carbon Cycle**
 - B. Disphotic Zone**
 - C. Biomass**
 - D. Chemosynthesis**
- 10. Which term describes upwelling that occurs adjacent to a coast, usually induced by wind?**
- A. Coastal Upwelling**
 - B. Eastern Boundary Current**
 - C. Eddy**
 - D. Current**

Answers

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

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Explanations

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1. Which microorganisms are primarily responsible for oxidizing ammonium to nitrite and nitrite to nitrate in the nitrogen cycle?

- A. Denitrifying Bacteria**
- B. Nitrogen-Fixing Bacteria**
- C. Nitrifying Bacteria**
- D. Photosynthetic Bacteria**

Nitrification is the process where certain bacteria gain energy by oxidizing inorganic nitrogen compounds. In the first step, ammonia-oxidizing bacteria convert ammonium (NH_4^+) to nitrite (NO_2^-); in the second step, nitrite-oxidizing bacteria convert nitrite to nitrate (NO_3^-). These two groups together are responsible for turning reduced forms of nitrogen into nitrate that plants can use. They are chemoautotrophs, meaning they obtain energy from chemical reactions (the oxidation of $\text{NH}_3/\text{NH}_4^+$ and NO_2^-) and use CO_2 as a carbon source; they require oxygen for the oxidation reactions. This differs from denitrifying bacteria, which reduce nitrate to nitrogen gas under low oxygen conditions; nitrogen-fixing bacteria, which convert N_2 into NH_3 ; and photosynthetic bacteria, which rely on light to drive energy for carbon fixation.

2. Which term describes planktonic organisms large enough to be seen with the naked eye, such as jellyfish?

- A. Holoplankton**
- B. Macroplankton**
- C. Meroplankton**
- D. Microbial Loop**

Macroplankton is the term for planktonic organisms large enough to be seen with the naked eye, such as jellyfish. This size-based category groups bigger drifting organisms separate from the microscopic microplankton or nanoplankton. The other terms describe life-cycle timing (holoplankton spend their entire life as plankton; meroplankton are planktonic only as larvae) or a trophic concept (the microbial loop), not size.

3. What term refers to a spring of hot, mineral- and gas-rich seawater found on ocean ridges in zones of active seafloor spreading?

A. Ocean Basin

B. Hydrothermal Vent

C. Seamount

D. Submarine Canyon

Hydrothermal vents are springs of hot, mineral- and gas-rich seawater that erupt along mid-ocean ridges where sea floors are spreading. Seawater infiltrates the crust, is heated by underlying magma, dissolves minerals and gases, and then rises back through the water column, creating vent fluids that are rich in minerals and often hydrogen sulfide. These environments support unique chemosynthetic ecosystems and can form black smokers when the dissolved minerals precipitate as dark metal sulfides. An ocean basin is a broad expanse of the ocean floor, not a vent system. A seamount is an underwater volcanic mountain, which may vent minerals but is defined by topography rather than hydrothermal flow. A submarine canyon is a deep, dendritic valley on the continental slope carved by turbidity currents, not a hydrothermal feature.

4. Which term describes free-floating organisms that drift with currents and cannot swim against them?

A. Nekton

B. Phytoplankton

C. Plankton

D. Plankter

Plankton are organisms that drift with the water and are carried by currents, with little ability to swim against them. Nekton are the swimmers—animals that actively move through the water, like fish and squid. Phytoplankton are the photosynthetic members of the drifting community, but the term that describes the entire drifting group is plankton. Plankter is not the standard label used in most textbooks. So, the best term for free-floating organisms that drift with currents and cannot swim against them is plankton.

5. Which discipline focuses on the order of rock layers and their relative ages?

- A. Absorption**
- B. Aphotic Zone**
- C. Stratigraphy**
- D. Adhesion**

Stratigraphy is the study of how sedimentary rock layers are arranged and how their sequence reveals their relative ages. By reading the layers from bottom to top, we apply the idea that newer material typically sits above older material (the law of superposition). Other clues include that layers were laid down horizontally, so tilting or deformation reveals later events; anything that cuts across layers (like faults or igneous intrusions) is younger than the rocks it disrupts; and fragments included in a rock are older than the rock itself. This discipline is central to interpreting past environments in marine settings, such as sediment cores or layered shore deposits, helping us infer changes in sea level, sediment supply, or tectonics over time. The other terms describe unrelated ideas—absorption, a low-light ocean zone, and adhesion.

6. Which field of geology studies layered sedimentary rocks and their relative ages?

- A. Absorption**
- B. Adhesion**
- C. Stratigraphy**
- D. Aphotic Zone**

Stratigraphy studies layered sedimentary rocks and their relative ages. It uses principles such as the law of superposition, original horizontality, cross-cutting relationships, and fossil succession to determine which layers are older or younger without exact dates. Sedimentary rocks form in layered sequences, so their order records the passage of time. The other terms aren't geology fields about rock layers—absorption and adhesion describe physical processes, and the aphotic zone is a marine zone lacking light. So stratigraphy is the field that fits.

7. The siliceous cell walls of diatoms are called what?

- A. Holdfast**
- B. Mangrove**
- C. Frustule**
- D. Gas Bladder**

Diatoms have silica-based cell walls that form a two-piece shell known as the frustule. This frustule is made of hydrated silica and fits together like a tiny, ornate box, with pores and patterns that vary by species. The term frustule is specific to diatoms and is a hallmark of their biology, linking their microscopic form to their well-known fossil material (diatomaceous earth). The other terms refer to structures in different organisms—a holdfast helps algae attach to surfaces, a mangrove is a woody coastal plant, and a gas bladder is a buoyancy structure in some aquatic organisms.

8. Which taxonomic class includes snails and slugs?

- A. Echinodermata
- B. Echinoidea
- C. Gill Membranes
- D. Gastropoda**

Taxonomic classification is about placing organisms into hierarchical groups based on shared features. Snails and slugs are mollusks that belong to the class Gastropoda, a group whose members typically move with a broad, muscular foot and often have a single shell (snails) or no shell at all (slugs). The name Gastropoda reflects their “stomach-foot” form of locomotion, a hallmark of this class. Echinodermata is a different phylum that includes animals like starfish and sea urchins, with Echinoidea being one of its classes—so they don’t include snails or slugs. Gill membranes aren’t a taxonomic category at all, so they don’t apply here.

9. What is the term for the total mass of living matter in a given area or ecosystem?

- A. Carbon Cycle
- B. Disphotic Zone
- C. Biomass**
- D. Chemosynthesis

Biomass is the total mass of living matter in a given area or ecosystem. It represents the standing stock of organisms, often measured as dry mass per unit area (e.g., g/m^2) or as total wet mass. This concept helps ecologists compare how much living material exists in different habitats and to gauge the energy available to fuel trophic levels. For example, a forest typically has a high biomass because of large trees, while a nutrient-poor ocean area has lower biomass. This term is distinct from the carbon cycle (movement of carbon through reservoirs), the disphotic zone (a dimly lit ocean layer), and chemosynthesis (a process some organisms use to make organic matter from chemical energy).

10. Which term describes upwelling that occurs adjacent to a coast, usually induced by wind?

- A. Coastal Upwelling**
- B. Eastern Boundary Current
- C. Eddy
- D. Current

Coastal upwelling describes the rise of deep, nutrient-rich water to the surface right next to the coast, driven by wind. When winds blow parallel to the shore, surface waters are moved away from the coast by Ekman transport, and water from below moves in to replace it. This wind-driven process occurs along many western continental margins and supports high productivity in those waters. The other options don’t fit as well: an eastern boundary current is a broad current system, not the specific near-shore upwelling process; an eddy is a rotating patch of water that can cause local mixing but isn’t the standard wind-induced coastal upwelling; a current is too general to capture the specific coastal, wind-driven vertical movement. So the best term is coastal upwelling.

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://ibmarinesciencesl.examzify.com>

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

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