

Cracking the Deep: Ocean Trenches

Category: Non-Fiction - Marine Science & Exploration | Time Allowed: 45 Minutes | Total Marks: 35

Candidate Name: _____ Date: _____ Score: _____

READING EXTRACT - Read carefully before answering Section A questions

- 1 Remarkably, less than a quarter of Earth's ocean floors have been mapped with high-resolution sonar, meaning we possess far more detailed topographic maps of the lunar surface and Mars than of our own seabed. The deepest known chasm on our planet is the Challenger Deep within the Mariana Trench, descending nearly eleven kilometres into the abyss: deep enough to
- 5 submerge Mount Everest with over two kilometres of water above its peak.

Venturing into the hadal zone (depths exceeding 6,000 metres) poses monumental engineering hurdles. Hydrostatic pressure escalates exponentially with depth: at the bottom of the trench, pressure exceeds one thousand atmospheres, equivalent to having an adult elephant balanced upon every square inch of hull surface. Early submersibles required forged titanium sphere hulls

10 several inches thick to avoid catastrophic implosion.

Despite crushing pressure, freezing temperatures, and impenetrable darkness, these abyssal depths teem with extraordinary biodiversity. Organisms have developed unique biological adaptations, such as flexible skeletons devoid of gas-filled cavities, and bioluminescence: the production of cold light through luciferin chemical reactions used for hunting, camouflage, and

15 communication.

11+ EXAMINER GUIDANCE & STUDY TIPS FOR THIS EXTRACT

1. Active Reading: Read the extract twice. Underline key verbs, adjectives, and character reactions.
2. VIPERS Focus: Look for context clues around unfamiliar words to deduce meanings accurately.
3. Evidence: For 2-mark and 3-mark questions, always quote directly or paraphrase specific evidence.
4. Timing: Spend ~15 minutes reading, 15 minutes on Comprehension, and 15 minutes on Creative Writing.
5. Need 1-to-1 preparation? Tailored tuition with Fiaraz Iqbal: www.themathsandsciencetutor.co.uk

Section A: VIPERS Comprehension Questions

Answer all questions in full sentences using evidence from the extract. Total: 15 Marks

[V] VOCABULARY**Question 1****[2 marks]**

Define the term "bioluminescence" using clues provided in paragraph 3.

[R] RETRIEVAL**Question 2****[2 marks]**

What is the name and depth of the deepest recorded location on Earth?

[I] INFERENCE**Question 3****[2 marks]**

Why does the author compare the ocean floor to the surfaces of Mars and the Moon?

[E] EXPLAIN**Question 4****[2 marks]**

Explain the metaphor of an "adult elephant balanced upon every square inch". Why is this effective?

[I] INFERENCE**Question 5****[2 marks]**

Why must deep-sea creatures avoid having gas-filled cavities in their bodies?

[S] SUMMARISE**Question 6****[3 marks]**

Summarise the main reasons why deep ocean exploration remains so technically challenging.

Write a sequence of logbook entries from a deep-sea pilot descending into the Mariana Trench from 1,000m down to 11,000m.
Detail changes in lighting, external pressure gauges, acoustic sonar pings, and encounters with glowing abyssal fauna.

Write a persuasive speech arguing why governments should allocate more scientific funding to exploring our oceans rather than space.

Use rhetorical questions, compelling statistics, emotive language, and structured paragraphs.

[] Varied Sentence Openers [] Figurative Language [] Fronted Adverbials [] Accurate Dialogue Punctuation
[] Sensory Imagery (Sight, Sound, Touch) [] Powerful Verbs [] Ambitious 11+ Vocabulary Choices

Section C: Examiner Mark Scheme & Model Answers

Comprehensive answers, acceptable variations, and 11+ mark allocation criteria.

Question 1 [V]

Bioluminescence is the biochemical capability of organisms to generate and emit cold light via internal chemical reactions (luciferin).

Question 2 [R]

The Challenger Deep within the Mariana Trench, descending nearly 11 kilometres (11,000 metres).

Question 3 [I]

To highlight the surprising contrast that humanity has charted distant space bodies more completely than our own planet's oceans.

Question 4 [E]

It converts an abstract scientific metric (1000 atmospheres) into a striking, relatable visual image conveying immense physical force.

Question 5 [I]

Gases compress violently under extreme hydrostatic pressure; air-filled cavities (such as lungs or bladders) would collapse and crush the organism.

Question 6 [S]

1) Extreme hydrostatic pressure demanding reinforced titanium hulls; 2) Frigid near-freezing temperatures; 3) Total darkness requiring specialized lighting and submersibles.

CREATIVE WRITING BAND MARKING SCHEME (20 Marks Total):

- Band 1 (16-20 Marks): Exceptional atmosphere, compelling narrative voice, sophisticated vocabulary, diverse syntax.
- Band 2 (11-15 Marks): Clear narrative structure, good descriptive detail, accurate paragraphs and punctuation.
- Band 3 (6-10 Marks): Basic story progression, simple adjectives, occasional punctuation errors.
- SPaG (5 Marks): Award up to 5 additional marks for spelling accuracy, ambitious vocabulary, and neat handwriting.

EXPERT 1-TO-1 TUITION WITH FIARAZ IQBAL

Looking for top grammar school or independent school entrance (QE Boys, Henrietta Barnett, Latymer, King's)?

- Over 30 years of classroom teaching & senior school leadership experience (Former Headteacher).
- Proven track record preparing students for 11+ GL Assessment, CSSE, ISEB, and CEM exams.
- Specialist tuition in English Comprehension, Creative Writing, 11+ Mathematics, and Verbal Reasoning.
- Live online 1-to-1 lessons available across the UK and internationally (Singapore, Hong Kong, Dubai).

WhatsApp: +44 7760 257814 | Website: www.themathsandsciencetutor.co.uk

Book your free 30-minute diagnostic consultation today.