Nova’s Geological Investigation: Exploring Rocks

Learning objective: To identify and describe the properties of igneous, sedimentary, and metamorphic rocks, and to explain how fossils are formed within sedimentary layers.

Read each question carefully and use your knowledge of geological processes to provide detailed, scientific explanations. Remember to use technical vocabulary where appropriate.

Word bank: igneous · sedimentary · metamorphic · magma · sediment · pressure · permeable · fossilisation · erosion · crystals

1. Nova has discovered a rock that contains small, interlocking crystals and no layers. Explain why this rock is likely to be igneous rather than sedimentary, and describe how the cooling process of magma affects the size of these crystals. (3 marks)

2. Compare and contrast the formation of sedimentary rock with metamorphic rock. In your answer, justify why metamorphic rocks often appear distorted or folded. (4 marks)

3. A builder is choosing stone for a garden wall. They want a rock that will not easily crumble when it rains. Explain the term 'permeable' and suggest which type of rock might be the most durable choice for this project. (3 marks)

4. Describe the process of fossilisation. Why are fossils almost exclusively found in sedimentary rock rather than igneous or metamorphic rock? (4 marks)

5. If a piece of granite (an igneous rock) is subjected to intense heat and pressure deep underground, what might happen to its physical structure? Justify your prediction. (3 marks)

6. Think about the Rock Cycle. Explain why the total amount of rock on Earth remains relatively constant, even though rocks are constantly being weathered and eroded. (3 marks)

Draw: Draw a cross-section of the Earth's crust showing the three layers of rock formation: a volcano producing igneous rock, a river depositing layers of sediment, and a deep area where tectonic plates are creating metamorphic rock.

Extension challenge: Imagine you are a geologist studying a newly discovered cliff face. Write a short field report describing a layer of rock you have found. Include details about its texture, grain size, and what the environment might have been like when that rock was originally formed millions of years ago.