

Nova's Geological Journey: Understanding Rocks

Learning objective: To identify and describe the properties of igneous, sedimentary, and metamorphic rocks and understand the processes of their formation.

Read the passage carefully, then answer the questions below. Use the word bank to help you understand key terminology.

Nova the owl spent her evening perched upon a jagged cliff, observing the fascinating variety of rocks beneath her talons. She knew that the Earth's crust is a complex puzzle of three main rock types. Igneous rocks are born from molten magma deep underground; when it cools and solidifies, it forms hard, crystalline structures like granite. As rain and wind cause erosion, fragments of rock break away and settle as sediment in riverbeds. Over millions of years, the weight of layers compresses these particles into sedimentary rocks, such as sandstone or limestone. Sometimes, extreme heat and immense pressure transform existing rocks without melting them. This process creates metamorphic rocks, like marble or slate, which are often dense and durable. Nova marvelled at how these stones tell a silent story of our planet's history. From the shimmering quartz in a granite boulder to the layered patterns in a piece of limestone, every pebble holds a secret about how the Earth has shifted, groaned, and settled over vast aeons of time. For Nova, the ground was not merely dirt; it was a magnificent, ever-changing geological tapestry.

Word bank: Magma · Sediment · Permeable · Erosion · Metamorphic · Geological

1. Identify the two processes that lead to the creation of sedimentary rocks. (2 marks)

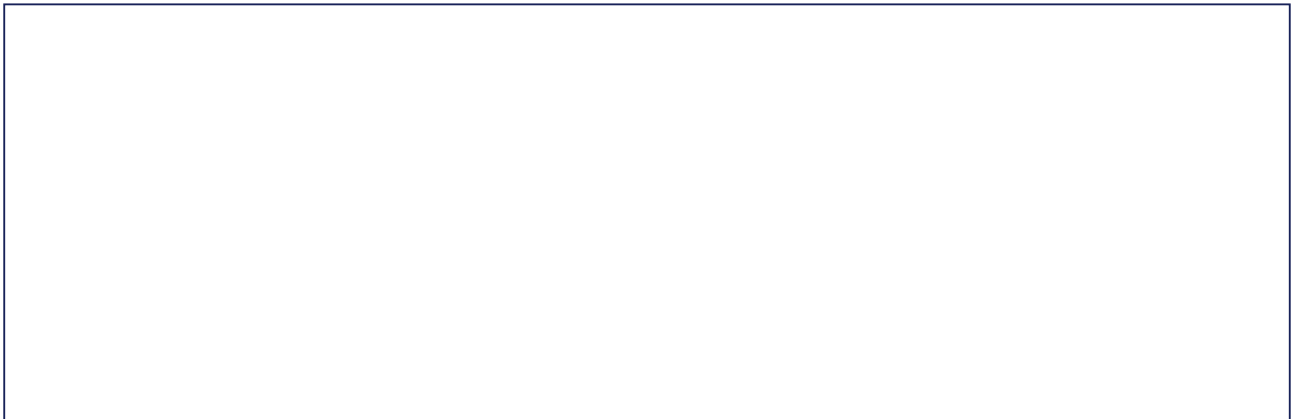
2. According to the text, what is the primary difference between how igneous and metamorphic rocks are formed? (2 marks)

3. Why might Nova describe the ground as a 'geological tapestry'? (2 marks)

4. Explain why metamorphic rocks are often found deep within the Earth's crust rather than on the surface. (2 marks)

5. If you were choosing a rock to build a monument that must last for thousands of years, which type would you choose and why? Justify your decision using evidence from the text. (3 marks)

Draw: Draw a cross-section of the Earth showing the three layers of rock formation: magma cooling below, layers of sediment forming in a river, and a transformation zone where pressure creates metamorphic rock.



Extension challenge: Compare and contrast the properties of permeable sedimentary rocks with non-permeable igneous rocks. What might happen if a building was constructed from highly permeable rock in an area with high rainfall? Explain the potential consequences for the structure.