

Name _____

Rock Time Travel: How Long Does the Rock Cycle Take?

Open-Ended Response Answer Key

1. Igneous rocks form from magma or lava that cools and solidifies. This process is prolonged, spanning millions to billions of years, as the Earth's interior is extremely hot, and cooling takes time. Igneous rocks can endure for eons, with minimal changes, once formed.
2. Weathering and erosion are gradual processes caused by the action of wind, water, and ice. These forces slowly break down rocks into smaller pieces or sediments. The timeline for this process can vary widely, from tens of thousands to millions of years, depending on factors such as climate and rock type.
3. Sedimentary rocks are formed when sediments accumulate and compress over time. This accumulation can take millions of years as sediments gradually settle and harden into rock layers. Each layer represents a snapshot of geological history.
4. Metamorphism occurs when sedimentary rocks are subjected to high heat and pressure deep within the Earth. The duration of this process is extensive, spanning tens of millions to hundreds of millions of years, as it depends on the rate of burial and the intensity of heat and pressure. After metamorphism, rocks can continue the rock cycle by melting and becoming magma. This cycle is ongoing and has been in operation for billions of years, shaping the Earth's surface and geological history.

