SANDSTONES

How did the sandstone plateaus in Gwalior city form?

SEDIMENTARY ROCK FORMATION

Sedimentary rocks are created by the deposition and lithification (compaction and cementation) of sediment particles with the help of water, wind, ice, or living creatures.

In short, sandstones are formed when millions of sand particles get compressed into layered rocks.

Here are some of the key processes they underwent:

WEATHERING & EROSION

Rain & wind cause mountains & boulders to break down into weathered sediments. These are eroded or transported by agents like running water, wind, or seawaves.

SEDIMENTATION

Sediments such as sand, clay & silt, are eventually deposited in shallow ponds or lakes. Slowly, the sediments settle at the bottom of these depressions.





LITHIFICATION: COMPACTION & CEMENTATION

Over time, more layers of sediments pile up & press down upon the older layers. As layers are compacted, certain silicate minerals help cement the material together - to create rocks. This compaction and cementation results in lithification, or the formation of solid, often layered rocks from loose sediments.

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GWALIOR'S PLATEAUS

PATTERNS IN SEDIMENTARY ROCKS

As sedimentary rocks are often formed in shallow waterbodies like basins or depressions, Gwalior's huge sandstone plateau indicates that the region must have been part of a rather large and deep basin millennia ago.

Research has shown that Gwalior's plateaus were formed in a shallow waterbody roughly 1850–1900 million years ago. Here are some of the interesting patterns you can see in the rocks.

RIPPLES & DUNES

Some of the rocks used in the Gwalior plateau monuments show distinct ripples or dune marks indicating that they were formed underwater.

HONEYCOMB WEATHERING

When weathering occurs in overhanging rock with coarse grains, the moisture creates smooth, rounded cavities, that resemble a honeycomb.





DIFFERENT COLOURS & HUES

Sandstones get their colours from the different minerals compacted or the cementing mineral. Potassium feldspar imparts a pinkish colour, and minerals like slate, chert or andesite result in a salt-and-pepper look. The more quartz in a sandstone, the glassier and whiter its appearance. If the rock is cemented by iron oxide, it is often yellow, orange, brown or red-hued, calcite imparts a greyish hue, and chlorite makes it greenish-black, and extremely hard.



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