



The evolution of Uluru and Kata Tjuta is explained differently by the park's Traditional Owners and European scientists. Here we explain creation from the perspective of a geologist.

### What are Uluru and Kata Tjuta made of?

A quick close-up look at Uluru-Kata Tjuta will leave you in no doubt that they are made of different types of rock. Uluru rock is arkose, a coarse-grained sandstone rich in the mineral feldspar. The sandy sediment which hardened to form this arkose was eroded from huge mountains composed largely of granite. Kata Tjuta rock is a conglomerate. The conglomerate is gravel consisting of pebbles, cobbles and boulders cemented by sand and mud. Most of the gravel pieces are granite and basalt and give the conglomerate a plum pudding effect.

### How and when were Uluru and Kata Tjuta formed?

Uluru and Kata Tjuta lay near the southern margin of an area called the Amadeus Basin. This depression in the earth's crust formed about 900 million years ago and received layer

upon layer of sediment over several hundred million years. This stopped about 300 million years ago.

At times, the Amadeus Basin was a shallow sea collecting sediments. The older sediments in the Amadeus Basin were crumpled and buckled about 550 million years ago in an event geologists call the Petermann Ranges Orogeny.

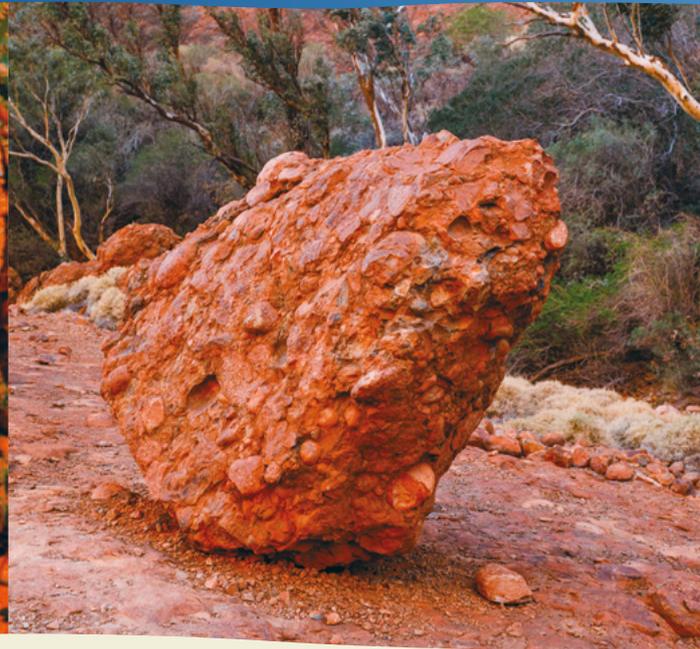
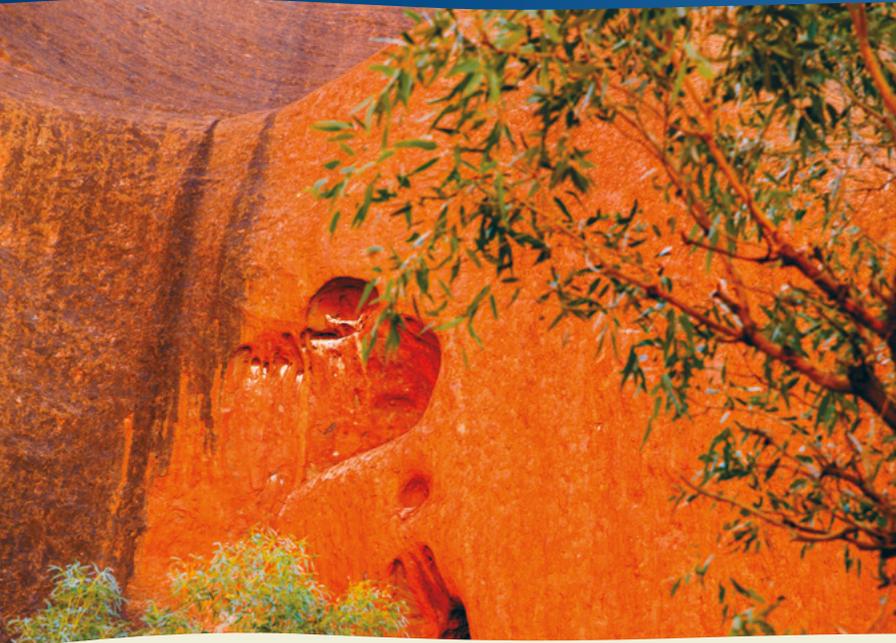
At this time, there were no trees or grasses covering the landscape. Bacteria and algae were the only life forms and they helped break down the jagged mountain ranges. These bare mountains eroded easily. Huge amounts of sediment washed away and when it rained, formed alluvial fans

adjacent to the ranges. It is the remains of these alluvial fans that are seen today as Uluru and Kata Tjuta.

As the ranges eroded, the building of the alluvial fans slowed. About 500 million years ago, the region was again covered by a shallow sea.

The sea receded approximately 300–400 million years ago and the rocks were folded and fractured again. This second major folding and faulting event is called the *Alice Springs Orogeny*. It raised the region above sea level.

The landscape the first Aboriginal settlers saw over 30,000 years ago looked much the same as it does now



During this event, the horizontal layers of the Uluru arkose were turned nearly 90 degrees to their present position. The Kata Tjuṯa conglomerates were tilted only about 15–20 degrees from the horizontal. Initially, the rocks eroded rapidly. This erosion still continues now at a slower rate. Uluru and Kata Tjuṯa are the visible tips of rock which extends far beneath the ground. It is possible they extend down as far as six kilometres.

### What caused the interesting shapes of caves and patterns?

Many visitors assume that the action of sand and wind formed the shapes of Uluru and Kata Tjuṯa. Scientists believe this is only partly true.

Since sand is only raised a few metres during sand storms, it could only affect that small part of the rock near ground level. The sculptured shapes are more likely a combination of mechanical erosion and other events such as chemical changes caused by moisture. The major valleys of Kata Tjuṯa may reflect fractures which formed during the *Alice Springs Orogeny*. Chemical weathering by ground water widened these fissures and rain water run-off gradually formed the canyons we see today.

Unlike Kata Tjuṯa, there are no major joints and fractures visible in Uluru. Water erosion from rain runoff has formed steep valleys with pot-holes and a series of plunge pools in the arkose on the southern side of Uluru. On the north-western side, weathering has produced parallel ridges outlining the sedimentary layers.

The flaky surface of Uluru results from the chemical decay of minerals. The characteristic rusty colour of the exposed surface of these flakes is just that – rust. It is caused by the oxidation of the iron in the arkose. The fresh arkose is greyish in colour.

### Underground water in the region

Between Uluru and Kata Tjuṯa is an old valley which is filled with sediment up to 100 metres thick. The sand layers in these sediments hold water which eventually seeps into Lake Amadeus.

Bores drilled into these sands provide water for the resort. The water table lies 25 metres deep near Kata Tjuṯa but shallows to 12 metres near the airport. It is slightly salty and is desalinated before use.

### Do the sand dunes move?

The landscape Aboriginal people saw here more than 30,000 years ago looked much the same as it does now. Geologists have found that the dunes have remained in their present position for 30,000 years.

However, the crests of the dunes are looser and some sand does shift with the wind.

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