

The Rock Cycle – Student Activity

Three Main Types of Rocks

Rocks on Earth are constantly being recycled. Rocks at the surface are broken down into tiny pieces, washed or blown to another location, buried by newer bits of former rocks, and then turned into new kinds of rocks by a variety of processes.

What are the three main types of rocks and how are they formed?

Types of rocks	How they form

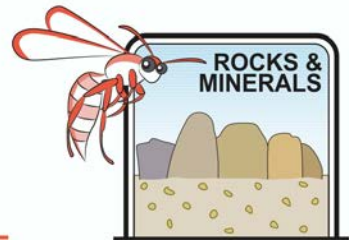
Weathering

Weathering is the process by which rocks are broken to form sediments (smaller pieces of rocks) or otherwise altered. Weathering occurs by physical processes (such as water washing away bits of rock), chemical processes (such as iron minerals in a rock rusting by oxidation), or biological processes (such as plants or animals affecting the rocks).

Read through the following examples of weathering. Then choose the correct category for each example – is it an example of physical, or chemical or biological weathering?

Example	Physical, chemical or biological weathering?
Skateboard riders damaging a rock outcrop.	
The outside of a rock changing from dark grey to a rusty red colour after it has been exposed to the atmosphere.	
Crushing a rock with a hammer.	
A dark rock cracking after a hot day is rapidly followed by a very cold night.	
A glacier freezing onto the side of a valley and plucking off a piece of rock.	
Exhaust fumes from cars causing acid rain which damages marble statues.	
Tree roots breaking off lumps of rock from a cliff.	
Crumbling of marble rocks alongside a major roadway because of car exhaust dissolved in rain.	
A waterfall constantly running over a rock ledge.	

Describe TWO ways water can break rock into smaller pieces.






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Erosion

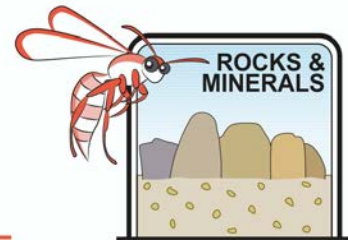
Erosion is the removal and transport of sediment. Erosion causes sediments to move away from the parent rock, to eventually end up somewhere new. The 'agents' of erosion are the different forces that remove and transport sediment, and these forces can be physical, chemical, or biological.

In each picture below, what agent(s) of erosion are wearing (or have worn) away the rocks?

Picture		Agents of erosion
		
		
		

What are the two main agents of erosion in nature?

How can something as gentle as the wind erode rock?



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Let's say a cube of rock is removed from its source rock. Draw what changes would happen to the cubic piece of rock as it is carried away along the course of a river. What would the rock look like?

Close to the source rock				→	Distant from the source rock

Deposition

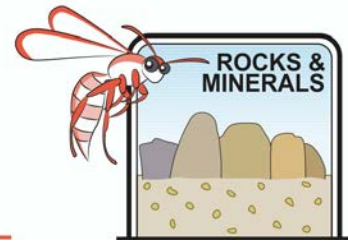
Erosive agents (particularly wind and water) tend to deposit sediments based on their size; larger sediments are found closer to their source rock, whilst smaller sediments are more easily transported farther away. This is because it takes more energy to carry a big piece than a small piece. Imagine you had to carry a piece of rock until you got tired: if the rock weighed 10 kilos, you might get tired very quickly and drop it, but if the rock weighed 10 grams, you might be able to carry it very far.

This is also the reason that deposited sediments tend to be 'sorted' (i.e. all of a similar size) depending on the distance from the source rock: the longer the transported distance, the more sorted by size the rock pieces become.

At which location along a riverbed would you expect to find a deposit of all clast sizes ranging from small to large?

	Why or why not?
Half way along the river system.	
On the river flats.	
Close to the source rock.	
After the river meets the sea.	

A river is flowing well after heavy rain. It is carrying a mixture of sediment sizes. What will happen if there is a dry spell and the river flow slows down?



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Lithification - Changing sediments into sedimentary rock

The word 'lithification' comes from the ancient Greek word 'lithos' which means rock; the term basically means 'to turn into a rock'. There are two important processes by which sediments (loose bits of broken rock) are lithified: compaction and cementation.

Describe how compaction forms sedimentary rocks.

Describe how cementation forms sedimentary rocks.

Sedimentary rocks deep in the Earth's crust can be subjected to intense heat and pressure, which can make the minerals in the rock recrystallise. What is the name of this process?

Very, very deep in the Earth's crust, rocks can be subjected to such high temperatures that they actually melt. When they cool down, the minerals crystallise. What kinds of rocks are produced by this process?

The Rock Cycle

Now that you've explored all the steps involved in the rock cycle, draw a diagram of the rock cycle showing the three main types of rocks and all the processes.