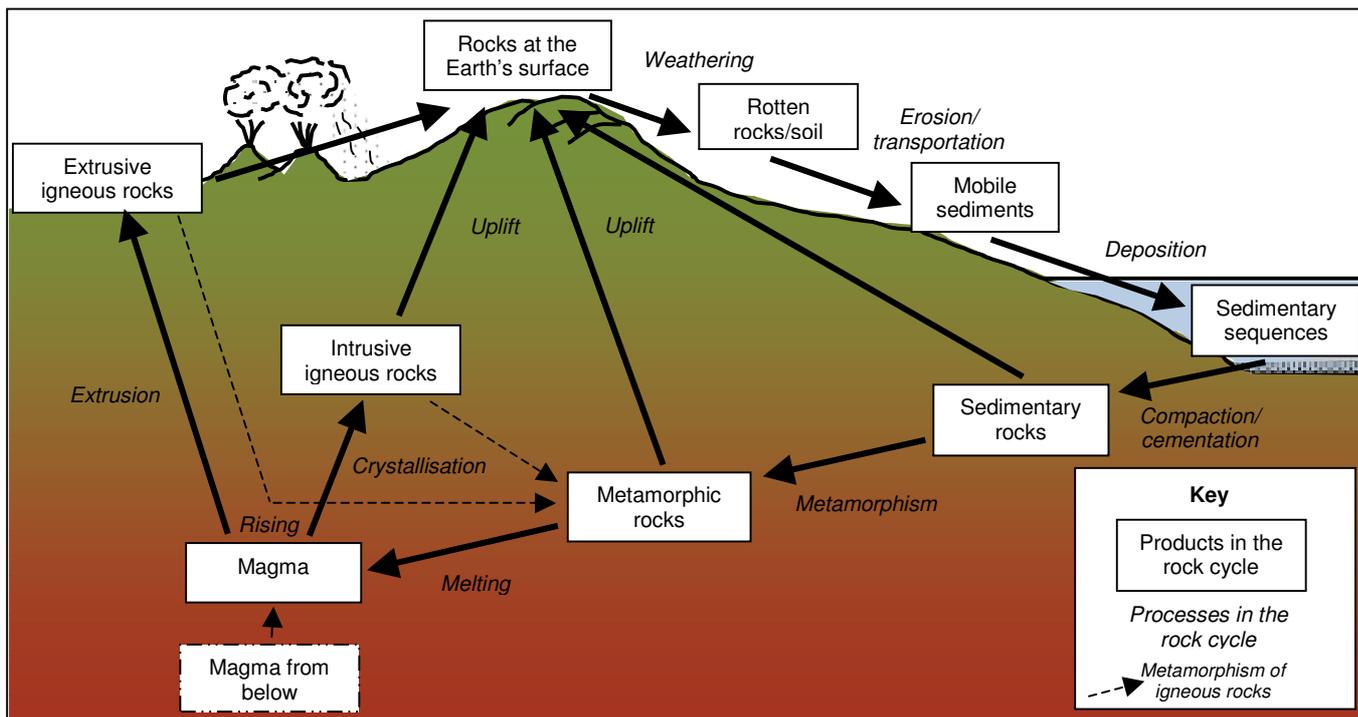


Rock cycle through the window

The rock cycle processes you might be able to see – and those you can't



Look out of the window:

Can you see *weathering*?

Weathering is the natural break up and break down of materials at the surface of the Earth – and your view out of the window is a view of the surface of the Earth. So can you see the effects of:

- physical weathering – bricks, stones or concrete cracked or with pieces breaking off?
- chemical weathering – discoloured surfaces, darker or paler than they used to be?
- biological weathering – where anything is growing on surfaces like brick, stone, concrete or tarmac?

Can you see *erosion/transportation*?

Erosion is the removal of solid material which is then transported away. Can you see erosion by:

- gravity – anything falling, eg. leaves?
- wind – anything being picked up by the wind, eg. leaves, litter?
- water – anything being picked up by water, eg. sand being moved by water flowing along a gutter?
- ice – unless you can see an ice-covered mountain top through the window – you won't be able to see where material is being moved by ice.

Can you see *deposition*?

After transportation, materials are laid down i.e. they are deposited. Can you see where things have been deposited by:

- gravity – when falling things land on the ground, they have been deposited by gravity. Can you see things deposited like this, eg. leaves lying on the ground?

- wind – when gusts of wind die down, things are deposited on the ground, eg. leaves and litter.
- water – you might be able to see gravel, sand or leaves deposited in a gutter like this one, or mud deposited in a dried puddle.
- ice – if you can't see an ice-covered area, you won't be able to see where ice has deposited materials.



Can you see the other rock cycle processes?

Since these processes happen under ground, they can never be seen by humans. So the answer is 'No':

- the **compaction/cementation** of sediments into sedimentary rocks;
- the **metamorphism** of sedimentary rocks (or igneous rocks) into metamorphic rocks;
- the **melting** of rocks beneath the surface and the **rising** of the magma that is formed;
- the **crystallisation** of intrusive igneous rocks from magma deep underground.

But, if you can see hills or mountains through the window – the rocks that form them have been pushed up by **uplift**.

And, if by any chance you can see a volcano erupting through the window, you will be able to see **extrusion** – of volcanic lava, ash or other volcanic debris.

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The back up

Title: Rock cycle through the window.

Subtitle: The rock cycle processes you might be able to see – and those you can't.

Topic: Using the view through the window to gain deeper understanding of rock cycle processes and how they affect the local area.

Age range of pupils: 10 – 18 years

Time needed to complete activity: 20 mins

Pupil learning outcomes: Pupils can:

- describe rock cycle processes as they affect the local area;
- explain how these processes affect materials at the Earth's surface;
- explain why some rock cycle processes cannot be seen.

Context:

Pupils are asked to consider each of the major rock cycle processes in turn and decide whether or not evidence for these can be seen through the window – if so, what evidence?

Additional points:

- cracking of walls or concrete may not be due to the natural physical process of freeze-thaw weathering – but might be due to subsidence or human activity;
- 'biological weathering' is a combination of physical processes (eg. roots widening cracks) and chemical processes (eg. biochemical effects of lichens on rocks or the breaking down of rocks in soils) caused by living things.

Following up the activity:

Following discussion of the rock cycle **processes** that can be seen through the window – pupils could be asked what rock cycle **products** can be seen:

- **Rocks at the Earth's surface** – natural rocks might be visible on a mountainside or in a quarry or cutting.
- **Rotten rocks/soil** – broken rock material may be visible on a rock surface; soil is often seen.
- **Mobile sediments** – sediments being moved by gravity, wind or water might be seen (sediment 'particles' can include leaves or litter as well as sand and mud grains).

- **Sedimentary sequences** – a sequence of loose sediment might be visible, for example in the bank of a river, but this is unlikely as schools should not be built near active river banks!
- **Sedimentary rocks, Metamorphic rocks, Intrusive igneous rocks or Extrusive igneous rocks** may be visible in a nearby quarry or cutting, or in use for building stones.
- **Magma** can never be seen because, even if an eruption were visible through the window, magma at the Earth's surface is called lava.

You might like to reinforce this rock cycle discussion by using the Earthlearningidea, '*The rock cycle in wax - using a candle to demonstrate the rock cycle processes*'. You could also demonstrate rock cycle processes using other Earthlearningideas as well.

Underlying principles:

- Surface rock cycle processes affect the whole surface environment; they are active for much of the time and can be seen in action.
- Deep rock cycle processes cannot be seen in action – they have to be inferred from the characteristics of their products.

Thinking skill development:

Pupils are asked to take the rock cycle model they visualise through 'construction' and apply it to the environment they can see through 'bridging'. Discussions surrounding this are likely to involve 'cognitive conflict' and 'metacognition'.

Resource list:

- a window (or doorway) with a reasonable view

Useful links:

The Geological Society of London has a web-based resource that uses the rock cycle as the centrepiece for presenting a range of Earth processes and products, aimed particularly at 11–14 year olds and their teachers - <http://www.geolsoc.org.uk/gsl/education/rockcycle>. Rock cycle materials can also be found on the Virtual Quarry website - <http://www.virtualquarry.co.uk/text/texttherockcycle.htm>.

Source: Devised by Chris King of the Earthlearningidea team.

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