

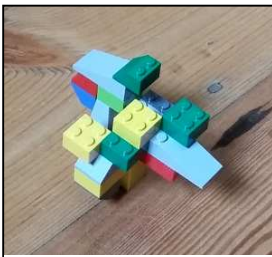
The Lego™ method of showing weathering, erosion, transportation and deposition Using Lego™ bricks to demonstrate sedimentary processes

This activity requires some space and is best carried out in a hall or outside.

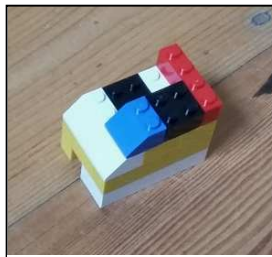
The class should be divided into groups of about five or six pupils. Each group should be given a set of about twenty assorted Lego™ bricks.

Place the groups at regular intervals on one side of the hall. Scatter a few Lego™ bricks along a track leading from each group to the other side of the hall. Explain that these tracks represent river beds.

Ask the pupils to make their bricks into a 'rock'. Tell them that rocks are made of minerals. Some can be made of only one or two minerals while others are made of many different minerals. In some rocks the minerals are fitted tightly together while in the others they are loosely cemented (glued) together. Tell them they can fit the bricks together in any way they choose, as shown in the photos below.



Loosely-fitting brick 'rock'



Tightly-fitting brick 'rock'

When their 'rocks' are completed, ask each group to '**weather**', i.e. partially break apart, their 'rock'. Tell them this is **not** a race.

When a few bricks are broken off, one member of the group rolls these bricks along the floor to the other side of the hall, gathering some of the scattered bricks loosely in their hands, along the way.

Tell the pupils that as the 'rock' bricks are moving along, they are becoming more broken down and are wearing bits away from the river bed, (the scattered bricks). This represents **erosion** and the process of movement of all the bricks is **transportation**.



The river moves bricks along, collecting and transporting the scattered bricks too
(Photos: Elizabeth Devon)

When the bricks reach the other side of the hall, they are left in a pile. This represents **deposition**.

Eventually, all the Lego™ bricks will be on the other side of the hall. **Ask the pupils** why it took longer for some groups to reach the other side than others. They will say that some of the 'rocks' were fitted more tightly together than others and so were more difficult to 'weather' or break apart.

Tell them that the bricks that were tightly fitted together represent the rocks made of **interlocking crystals** or minerals, i.e. the igneous and metamorphic rocks. Those which came apart easily represent the rocks that are made of grains (minerals and fossils) cemented together and are the **sedimentary** rocks.

At the end of the activity, ask the pupils:

1. to think of another way that transport of the bricks could take place, other than by rivers. They could suggest wind, sea or ice;
2. why deposition took place. It was because the speed of transportation slowed down;
3. what they think will happen to the deposited bricks (sediment) in thousands of years time. It will become new rock.

The back up:

Title: The Lego™ method of showing weathering , erosion, transportation and deposition

Subtitle: Using Lego™ bricks to demonstrate sedimentary processes

Topic: Sedimentary processes of weathering, erosion, transportation and deposition.

Age range of pupils: 7 - 10 years

Time needed to complete activity: 20-30 minutes

Pupil learning outcomes: Pupils can:

- appreciate that rocks are made of minerals;
- some rocks are made of tightly-fitting minerals while others are made of loosely-cemented minerals;
- rocks are weathered at different rates;
- erosion takes place as the weathered minerals are transported;
- transportation can take place by rivers, the sea, wind or by ice;
- deposition takes place when the speed of transportation slows;

- the deposited material will become a new rock in thousands or millions of years time.

Context: The activity demonstrates how different rocks break down at different rates. The sedimentary processes of erosion, transportation and deposition are also explored.

Following up the activity:

Ask the pupils to make specific rock types in three different Lego™ brick colours, i.e. two tightly fitting blocks of bricks to represent the interlocking crystals of an igneous rock and a metamorphic rock and also a loosely fitting block of bricks to represent a sedimentary rock.

‘Weather’ all three ‘rocks’ at the same time and transport the weathered bricks along one river bed to be deposited together. The deposit now contains all three colours having been derived from all three different rocks.

When that deposit becomes a new rock in thousands of years time, it will be interesting to work out the origin of all the minerals within it.

Underlying principles:

- Igneous and metamorphic rocks are made of interlocking crystals and there is no space between them.
- Sedimentary rocks are made of grains cemented together and there may be space (pore space) between the grains.
- Sedimentary rocks usually weather more easily than igneous and metamorphic rocks.
- When the weathered minerals are transported, erosion takes place.
- When the speed of transportation slows, deposition takes place.
- Deposited sediment will form new rock in thousands or millions of years time.

Thinking skill development:

A pattern can be seen in the construction of the Lego™ brick blocks. Discussion of the activity at the end involves metacognition and cognitive conflict is caused when the minerals from all rock types are jumbled together. Relating the Lego™ bricks to rocks and following the sedimentary processes are bridging skills.

Resource list:

- Lego™ bricks

Useful links:

Earthlearningideas:-

Investigating small-scale sedimentary processes AND modelling mighty rivers

https://www.earthlearningidea.com/PDF/260_River_processes.pdf

Rock builder

https://www.earthlearningidea.com/PDF/241_Rock_builder.pdf

Laying out the rock cycle: product and process

https://www.earthlearningidea.com/PDF/253_Rock_cycle_product_process.pdf

Source: Idea sent to the ELI team by Emma Smith, Gairloch High School, from a video clip viewed on <https://youtu.be/dMaQTu-Qr6s?t=680>

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