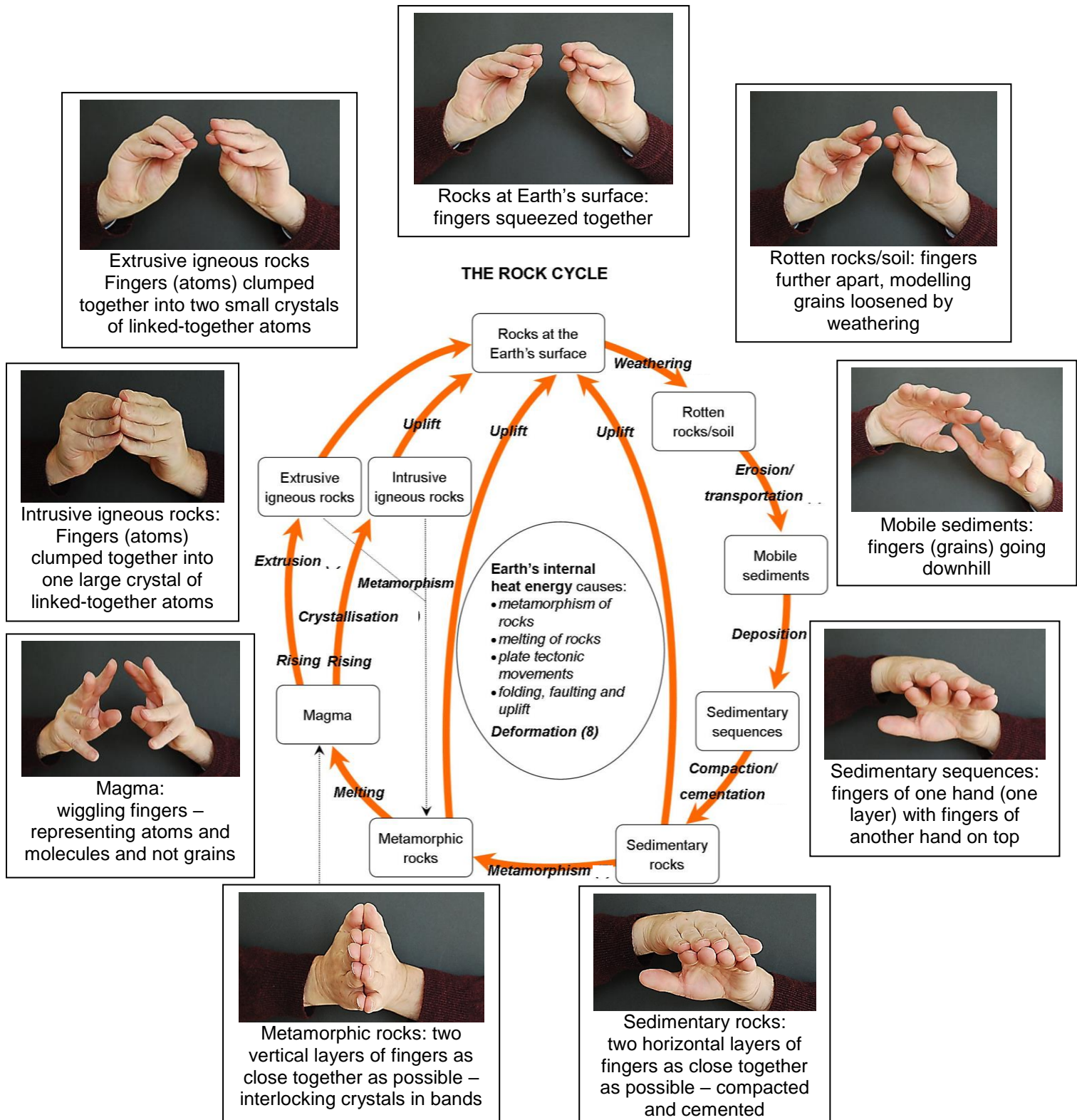


The rock cycle at your fingertips Modelling the rock cycle with your fingers

Model the rock cycle with your fingers, as in the photos below:



The back up

Title: The rock cycle at your fingertips.

Subtitle: Modelling the rock cycle with your fingers.

Topic: A class activity to help the pupils to remember the products of the rock cycle through modelling with their fingers.

Age range of pupils: 10 years upwards

Time needed to complete activity: 5 minutes

Pupil learning outcomes: Pupils can:

- describe the different products of the rock cycle;
- model them with their fingers.

Context:

The rock cycle is an abstract concept which pupils can find difficult to understand. Research has shown that, 'students did not grasp the purpose of instruction about the rock cycle. Instead their responses indicate they perceive the rock cycle as the *cause* of rock formation, rather than a model representing relationships between rock categories and their formation. For example, when asked how a rock formed, one student responded, "It went through the rock cycle" much as laundry goes through a wash cycle – something that is done to a rock to change it.' (Ford, 2005).

Since pupils can find the rock cycle so difficult to understand, when we teach it, we need to do all we can to reinforce our teaching. This activity is one kinaesthetic method (where students use physical activity in their learning) that can be used to consolidate learning.

Asking your pupils to use their hands as a teaching and consolidation aid is an excellent strategy for the following reasons.

- It is a kinaesthetic activity which involves the pupils in practical visualisation, aiding memory and understanding.
- It aids abstract thinking.
- All the pupils in a group can readily be involved.
- The pupils always have their hands with them, so they can re-run the activity easily at any time, such as at home, in an exam or in the field.
- There is no time-consuming distribution and collection of materials, as in many other practical activities.
- It aids three-dimensional thinking and, because the model changes over time, the fourth dimension of time is involved too.
- Using their hands gives an opportunity for a dynamic model that can be manipulated and investigated, rather than a static model.

The value of using your hands in explanation is emphasised by Dominik Conrad's research presented as: '*Small gesture, big effect: investigation of the role of gestures in teaching plate tectonics through an eye-tracking experiment.*' at the 35th Geological Congress in Cape Town in 2016.

Following up the activity:

Ask the pupils for ideas about other ways in which the rock cycle could be modelled. They may suggest:

- a computer model, like the one found at: <https://www.geolsoc.org.uk/ks3/gsl/education/resources/rockcycle.html> ;
- a three-dimensional model made from papier mâché;
- a class model, asking different groups of pupils to enact different processes as in the Earthlearningidea 'Rockery 2'

Underlying principles:

- The different products of the rock cycle can all be modelled with your fingertips, if you use your imagination.

Thinking skill development:

Thinking about how to model the rock cycle with your fingers involves seeking patterns and then using your imaginative skills to show these patterns.

Resource list:

- your fingers

Useful links:

Try some of the other rock cycle-based Earthlearningideas (see the list of rock cycle activities in the Earthlearningidea teaching strategies lists at:

http://www.earthlearningidea.com/home/Teaching_strategies.html)

Reference

Ford, D. J. (2005). The challenges of observing geologically: third graders' descriptions of rock and mineral properties. *Science Education*, 89, 276-295, p375.

Source: Devised by Chris King; photos by Peter Kennett, both of the Earthlearningidea Team. Rock cycle diagram used by permission of the Earth Science Education Unit (ESEU).

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The Earthlearningidea hand-modelling activities	
Modelling Earth processes	The rock cycle at your fingertips: modelling the rock cycle with your fingers
	Plate margins by hand: modelling plate margins and plate movement with your hands
	Modelling by hand 'when the youngest rock is not on top': illustrating how rock sequences can have older rocks on top of younger ones
	Modelling unconformity – by hand: using your hands to demonstrate how unconformities form
Modelling structural geology nomenclature	Modelling Earth stresses isometrically: using your hands to model Earth stresses
	Modelling folding – by hand: using your hands to demonstrate different fold features
	Right way up or upside down? - modelling anti- and synforms by hand: use your hands to show how folds can be the right way up or inverted
	Visualising plunging folds - with a piece of paper and your hands: using your hands and folded and torn paper to show the patterns made by plunging folds
Climate change activities	Modelling faulting – by hand: using your hands to demonstrate different fault features
	The Earth during Milankovitch cycles – by hand: modelling the Earth's squashed orbit, tilt and wobble using your hands
	Modelling tipping points – by hands: demonstrating tipping points in the Earth's system with the hands of three pupils