Modelling faulting – by hand
Using your hands to demonstrate different fault features

You can use your hands to model the movement directions of different types of faults. The surface along which fault movement takes place is called the fault plane. Faults where the movement is up and down the fault plane are called dip-slip faults and include, normal, reverse and thrust faulting. Faults with movement horizontally along the fault plane are strike-slip faults.

Where a fault is not vertical, the rocks which lie above it are termed the hanging wall and those which lie below are the footwall. The footwalls and hanging walls are shown on the normal fault, reverse fault and thrust fault hand models below.

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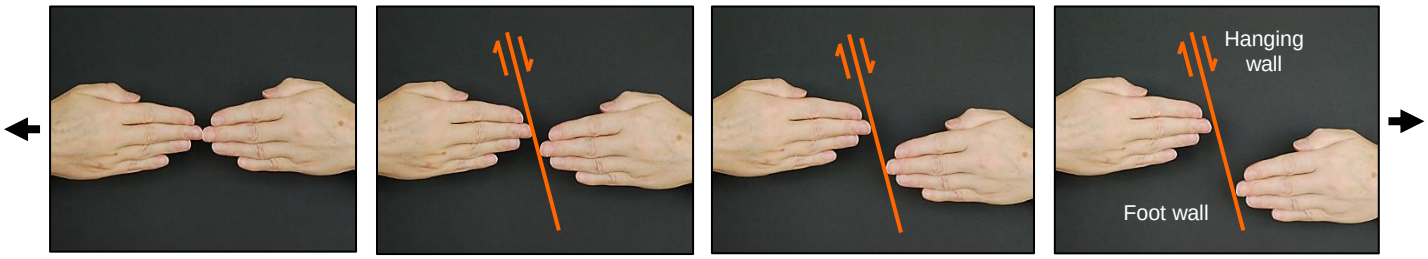
Normal faults – are caused when there is tension in the Earth's crust and the tensional forces cause the rocks to fracture and one side to slide down. The result is that the crust becomes wider through crustal extension. Normal faults are so called because they are the most common fault types. They usually have steep fault planes of around 70º-80º but can be vertical or have lower angles.



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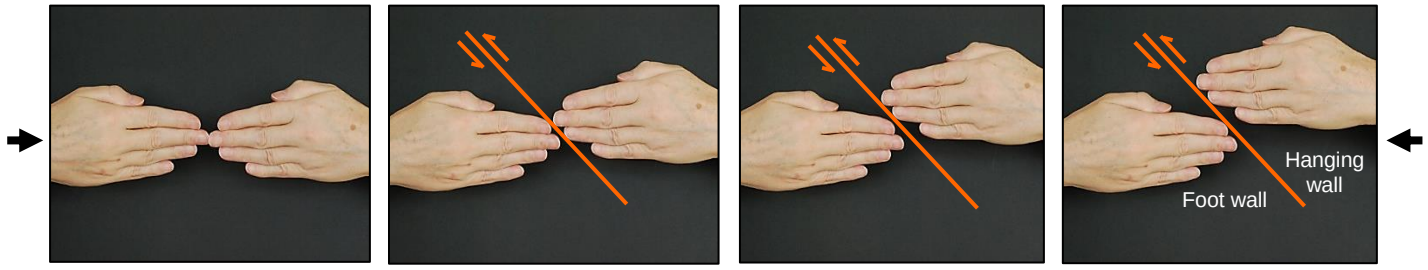
Reverse faults – caused when the crust is being compressed. Under compressional stress, the rock fractures and one side slides up over the other, usually along fault planes dipping at around 45º (but they can be shallower or steeper). The result is crustal shortening.



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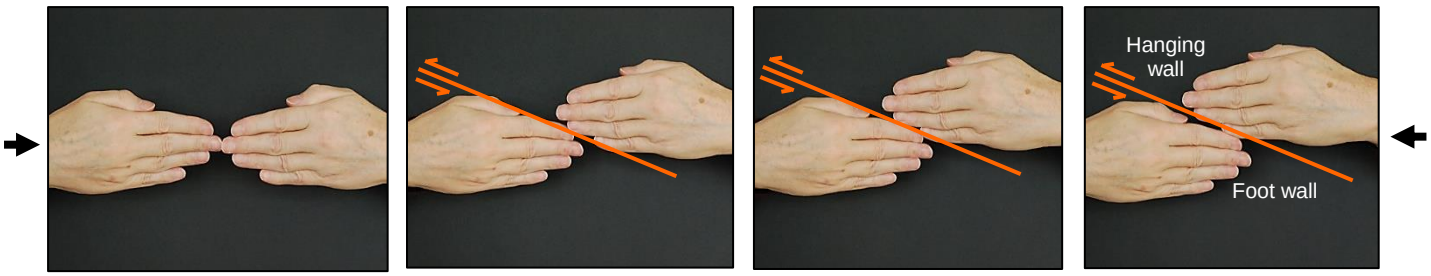
Thrust faults – are low-angle reverse faults with fault planes that often dip at around 10º but can be shallower or steeper. The low angle of thrust faults can result in great crustal shortening.



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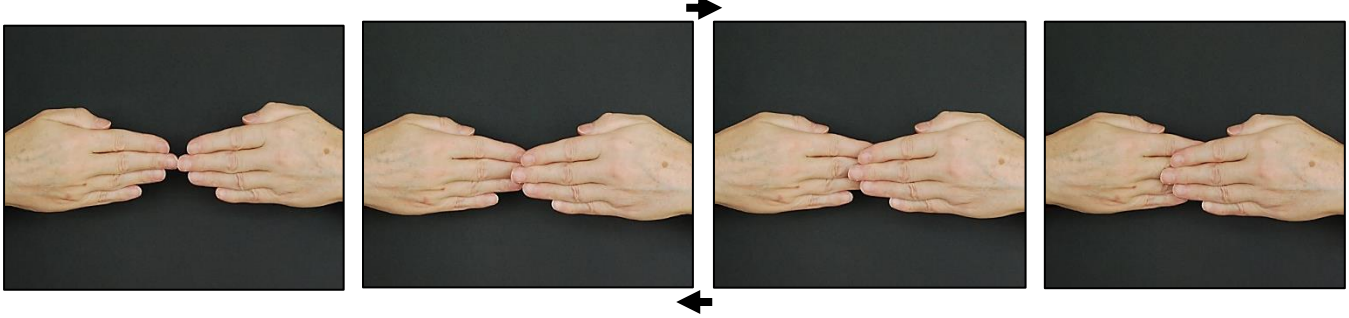
Strike-slip faults (also known as wrench or tear faults) are caused when the crust fractures and one side moves horizontally past the other as a result of shear stress. They usually have vertical fault planes.



Normal fault in Seppap Gorge, Morocco.

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Small thrust fault, Listock Bay, Somerset, UK.

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A reverse fault, Quantocks Head near Kilve, UK.

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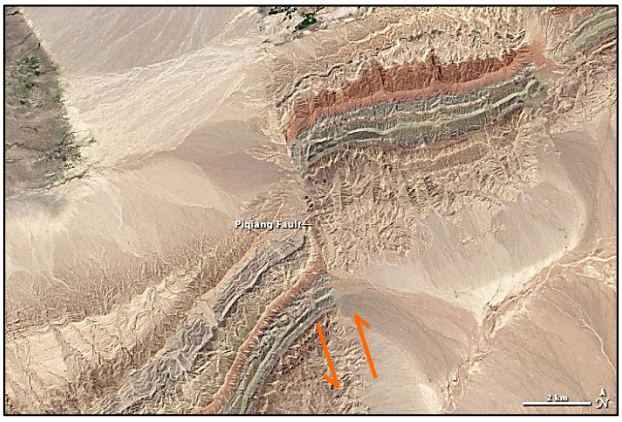

Satellite view of part of the Piqiang strike-slip fault in China.

This file is in the public domain because it was solely created by NASA.

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The back up

Title: Modelling faulting – by hand.

Subtitle: Using your hands to demonstrate different fault features.

Topic: Pupils use their hands to illustrate the different types of faulting through this activity.

Age range of pupils: 14 years +

Time needed to complete activity: 5 minutes

Pupil learning outcomes: Pupils can:

- describe faulting processes and terminology;
- model these with their hands.

Context:
Understanding and describing faulting involves complex terminology. This activity helps pupils to understand the processes and terms involved.

The educational advantages of using your hands to model geoscience features and processes have been explained in the Earthlearningidea, *Rock cycle at your fingertips.*

Following up the activity:
Pupils could be asked for different ways of illustrating the terminology of faulting in rocks, they might suggest:

- drawing and labelling faults on paper, computer or a white- or black-board;
- making and labelling paper models;
- using modelling clay and labelling the features with sticky labels.

Underlying principles:

- Much of the terminology for describing faults and the processes which form them can be illustrated using your hands.

Thinking skill development:

Illustrating faulting terminology with your hands involves construction. Relating the hand models to real world faulted rocks involves bridging.

Resource list:

- your hands

Useful links:

See: https://opentextbc.ca/geology/chapter/12-3-fracturing-and-faulting/

Source: Devised by Chris King; photos by Peter Kennett, both of the Earthlearningidea Team.

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
	Modelling faulting – by hand: using your hands to demonstrate different fault features
Climate change activities	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