Visual aids using a Magnetic board

Diagrams are drawn on card and these are held onto a magnetic board using magnetic tape. The advantage of these visual aids is that they can be moved around to show, for instance, the effects of displacement on a fault.

The magnetic board itself consists of a sheet of white painted steel. Many white boards are backed with steel and will hold card with magnetic tape stuck on it. Alternatively and old metal door or a sheet of galvanised steel will work just as well.

These visual aids were made before the advent data projectors which can now easily be used show the effects of movement. However students get rather bored with continual power point presentations. The diagrams could, never the less, be used as a basis for power point presentations on the topics listed below

Any stiff white card is suitable. Each piece of card has three or four pieces of magnetic tape stuck to the back. Magnetic tape about 1cm wide is available in rolls in office supply shops. The models are easy to make.

To make the models you will need scissors, a sharp knife, a steel ruler, felt tip pens and glue as well as card and magnetic tape.

The following models are described below:

Structural Geology

- *Normal, reverse, wrench and thrust faults*
- *Rifts and horsts*
- *Omission and repetition of strata due to faulting*
- *Angle of fault plane and mineralization*

Igneous Geology

- *Dykes*
- *Sill with feed dyke*
- *Cone sheet and ring dyke*
- *Stoping and the formation of xenoliths*
- *Offsetting of strata by dyke intrusion*

Sedimentary Geology

- *Formation of Atolls*
- *Walther's Law and deltaic deposition*

Bouma sequences

Normal and reverse faults

For normal and reverse faults cut an A4 sheet of card in the pattern shown in diagram 1 and ornament it with either horizontal lines or diagonal lines to represent the bedding. Put magnetic tape behind each piece. For a normal fault move block A down until the top is level with the top of block C. You now have a fault scarp. Erode away the upstanding land by removing block B to show the age of the strata now exposed. For reverse faults use the model the other way up.

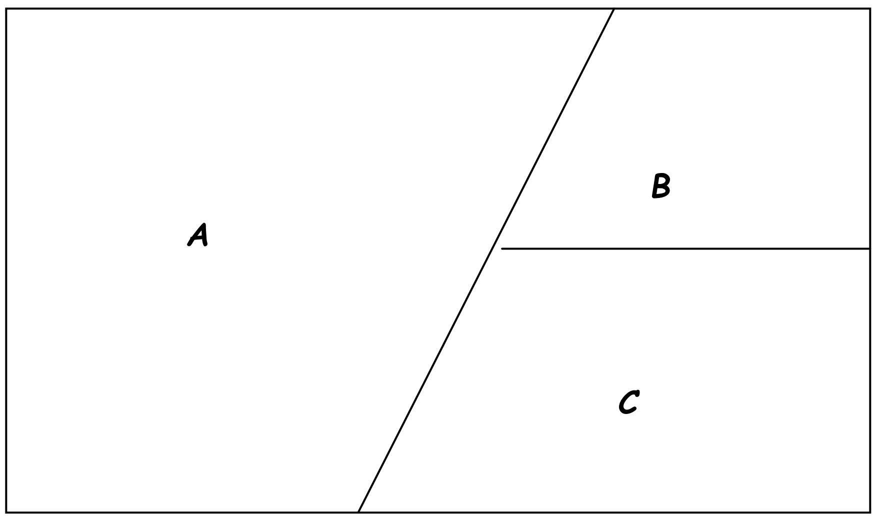

Diagram 1

Omission and repetition

To show omission and repetition use one model with the strata dipping in the same direction as the fault and another with the strata dipping in the opposite direction. Move and erode as described above.

Thrust faults

For thrust faults make the angle lower.

Wrench faults

For wrench faults draw a dyke crossing an A4 sheet of card and then cut the card in half length ways.

Rifts
Draw horizontal strata on the card and then cut the card as in diagram 2 below. Stick magnetic tape only on the outside pieces. Place the three pieces together on the magnetic board. When the two outer pieces are pulled apart the central piece drops down.

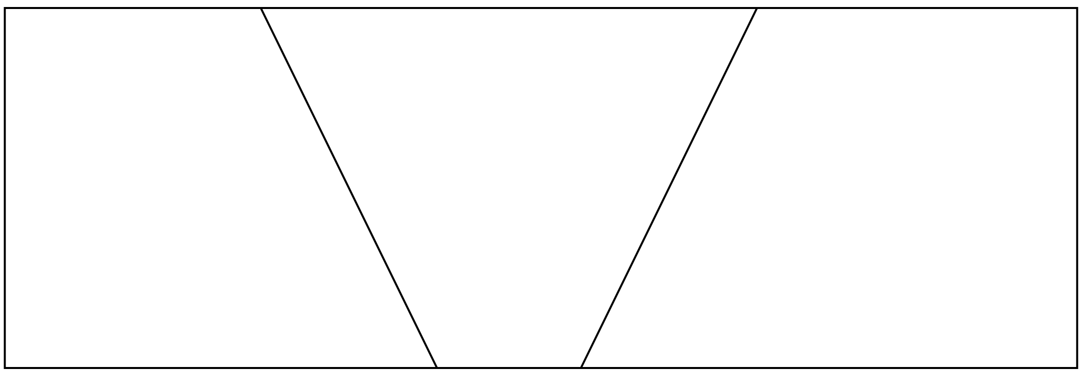

Diagram 2

Horsts
If you want to illustrate rift valleys with a horst between them cut you card as on diagram 3. Put magnetic tape on the outside and central pieces only. As the outside pieces are pulled apart the rift valleys drop down.

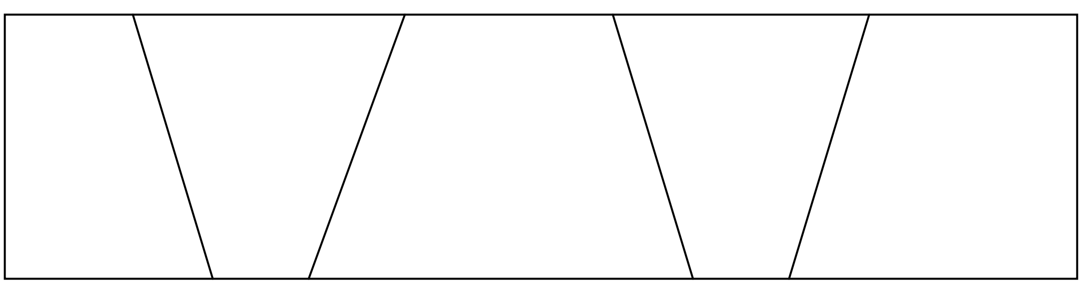

Diagram 3

Effects of changing angle of the fault plane
A fault plane will change angle from one rock type to the next. Draw horizontal strata on the card and then cut as shown in diagram 4 below. Movement will open up a gap where minerals often accumulate.

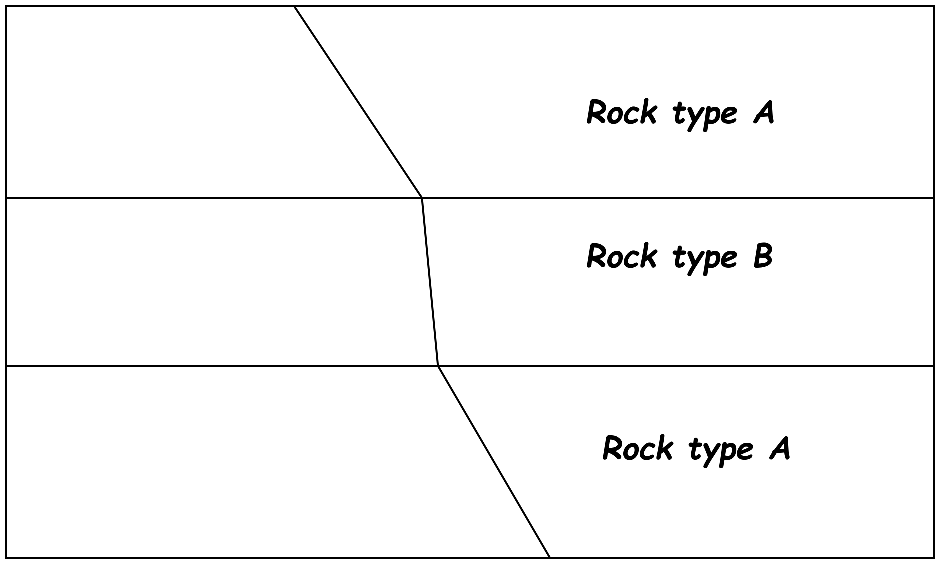

Diagram 4

Dyke

Draw horizontal strata on an A4 card in landscape orientation, Then cut the card vertically in half. Glue an A4 sheet of red paper behind the left half so that it protrudes from the cut edge. Put magnetic tape behind both pieces.. Place both pieces together on the white board. Pull the right half sideways by about 1cm and the red dyke appears.

Transgressive sill with feeder dyke

Draw horizontal strata on the card in landscape orientation. Cut the card as shown in diagram 5. Place an A4 sheet of red paper behind the pieces but glue it to the bottom left piece only. Put magnetic tape on all three pieces.

Place the bottom left piece on the magnetic board and then the other two pieces. Move the right hand piece sideways to reveal the feeder dyke, then move the top piece upwards to reveal the transgressive sill.

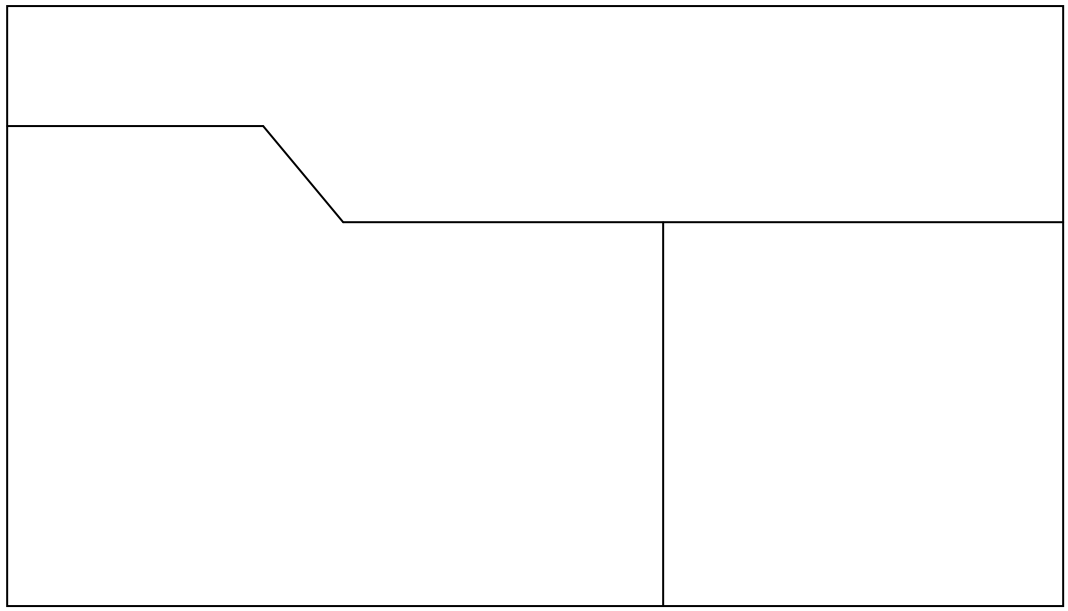

Diagram 5

Cone sheet and ring dyke
Draw horizontal strata on an A4 sheet of card in landscape format. Cut the card as shown in diagram 6 and discard the semicircular piece. Glue an A4 sheet of red paper to the outer two pieces. When the central piece is pulled upward the cone sheet appears. A model for a ring dyke is similar except that lines slope outwards.

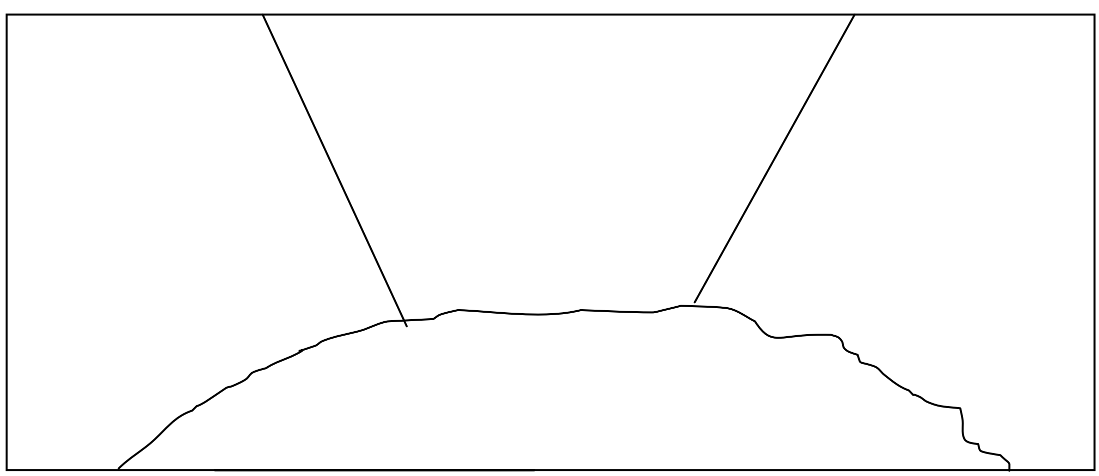

Diagram 6

Stoping and the formation of xenoliths
Take an A4 sheet of card in landscape format. Cut out and dispose of the curved piece at the bottom. Colour the upper part grey to represent the thermally metamorphosed rocks. Now make the other cuts approximately as shown in diagram 7. Stick the upper, larger part only onto an A4 sheet of red paper. Attach magnetic strip to all pieces and place all together on a magnetic board. Move a small piece downwards so that a crack appears. This is the magma forcing its way into the roof rocks. Now pull it downwards so that it is surrounded by magma. This is stoping and the formation a xenolith. Repeat with the other small pieces.

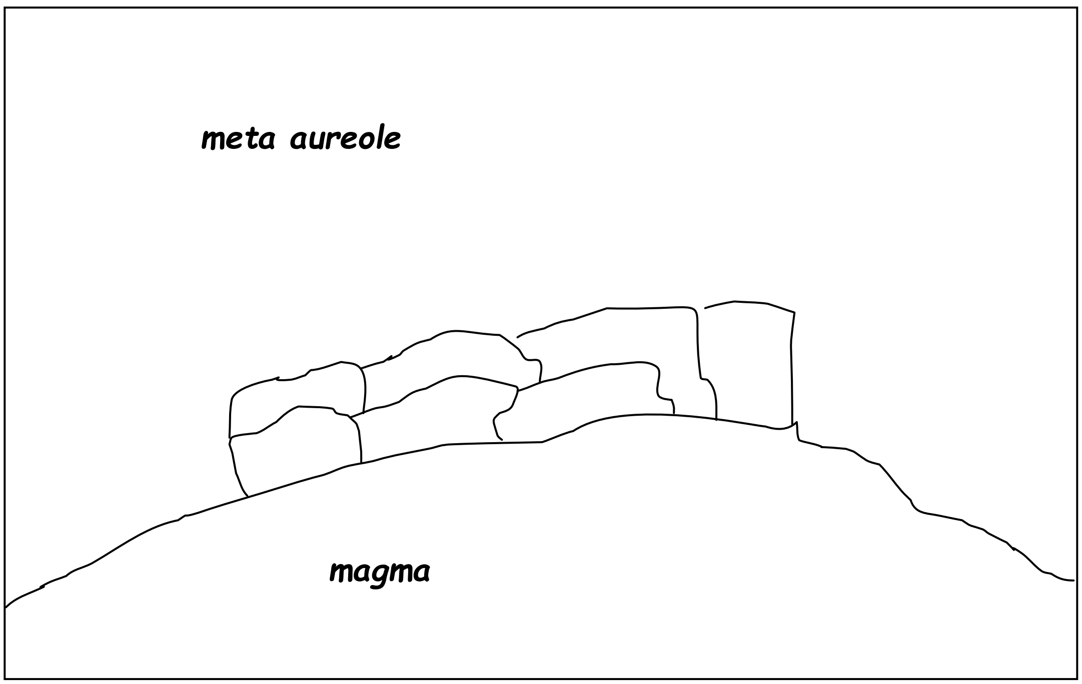

Diagram 7

Offsetting of strata by a dyke
Draw strata dipping at 45° on card in landscape orientation and then cut the card in half vertically. Glue an A4 sheet of red paper to the left half. Attach magnetic tape to both halves. Put the two halves together on the magnetic board. Pull the right hand side to the right. The dyke shows and the strata are now offset.

Formation of atolls
Draw the cross section of the sea and oceanic crust shown in diagram 8. The heavy lines represent the coral reef. Make an equilateral triangle out of red card to represent a volcano. Put magnetic tape behind the cross section and the volcano.

Place the cross section on the magnetic board and the newly formed volcano on so that the bottom rests on the top of the oceanic crust and hides the coral reef. Move the volcano down to represent isostatic adjustment. The reef now appears to grow up and forms first a fringing reef, then a barrier reef and finally as the top of the volcano disappears below sea level, an atoll.

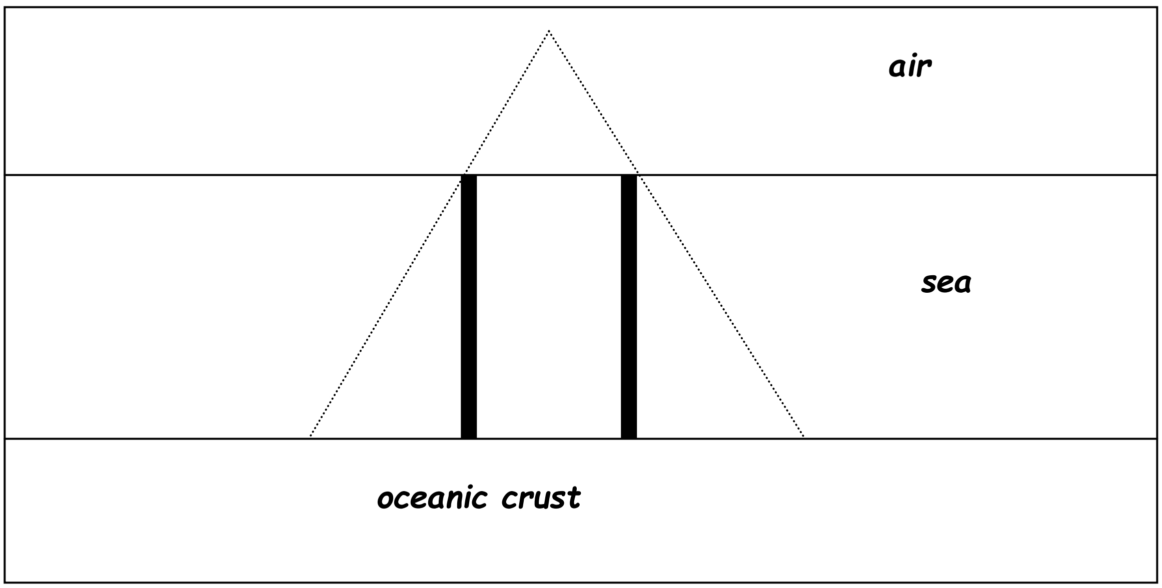

Diagram 8

Walther's Law and deltaic deposits
Enlarge the cross section of a delta, diagram 9 below so that it is about 50cm long and copy or stick it onto card. The deposits of each time unit are cut out and magnetic tape stuck to each. They are then added to the magnetic board one by one so students can see how the diachronous beds are built up, how the coarsening upward sequence is formed and how the vertical sequence represents the original horizontal sequence of environments. A similar model can be made for river deposits.

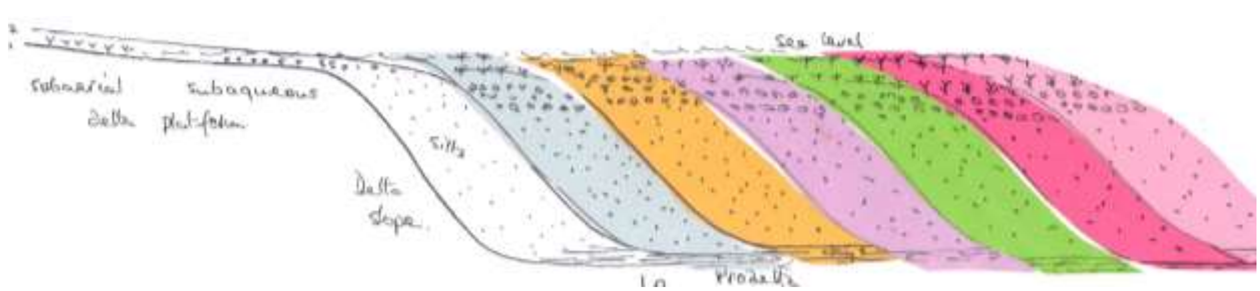

Diagram 9

Bouma sequences

Make several coloured cards for each of the Bouma units. Place them above each other on the board as you describe each unit. You can then erode the top units and start a new sequence or you can have a weaker current and start with unit B or C. In this way you can show how incomplete Bouma sequences form