

## **SIMPLE SHEAR II**

**Purpose**

The purpose of this activity is to determine the amount of shearing that a metamorphosed conglomerate has undergone.

**Instructions**

1. Measure the longest and shortest axis of 10 separate pebbles in your sample or photograph and calculate the ratio (shortest divided by longest). Tabulate your results in a table like this but with ten clear lines.

| <i>Long</i> | <i>short</i> | <i>Short/long</i> |
|-------------|--------------|-------------------|
|             |              |                   |

2. Calculate the average ratio.
3. Use the shear box and cards to measure the deformation of a circle as it is sheared. Place the arm at 0° and move the cards against it. Measure the longest diameter and the shortest diameter (the latter will be at right angles to the former).
4. Move the cards away from the arm and move the arm to 5°. Push the cards back against the arm. Again measure the maximum and minimum diameters.
5. Repeat instructions 3 and 4 for every five degrees up to 50° and record as follows (11 lines)

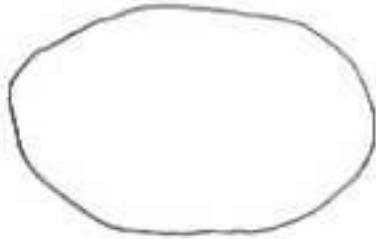
| <i>angle</i> | <i>Longest diameter</i> | <i>Shortest diameter</i> | <i>Shortest/longest</i> |
|--------------|-------------------------|--------------------------|-------------------------|
|              |                         |                          |                         |

6. Plot your data as a graph of angle against shortest/longest.
7. Plot your average pebble ratio on the graph and so determine the amount of shearing.

8. Think carefully about the experiment and suggest the major sources of error when using pebbles.

#### Question

Below is a drawing showing the outline of an oolite made from a photo of a thin section. Oolites are spheres when formed. How much shearing has it undergone?



### Teacher's Section

#### Requirements

Slice of a sheared conglomerate or a photograph of one. Weiss has good photographs on plate 177.

Shearing box See Simple Shear 1 for how to construct one.

A pile of 12.5cm by 7.5cm filing cards 11cm thick = 6 packs. Number the cards so they can be put back in the same order. The cards once placed in the box should have a 10cm diameter circle drawn on their edges.

Ruler

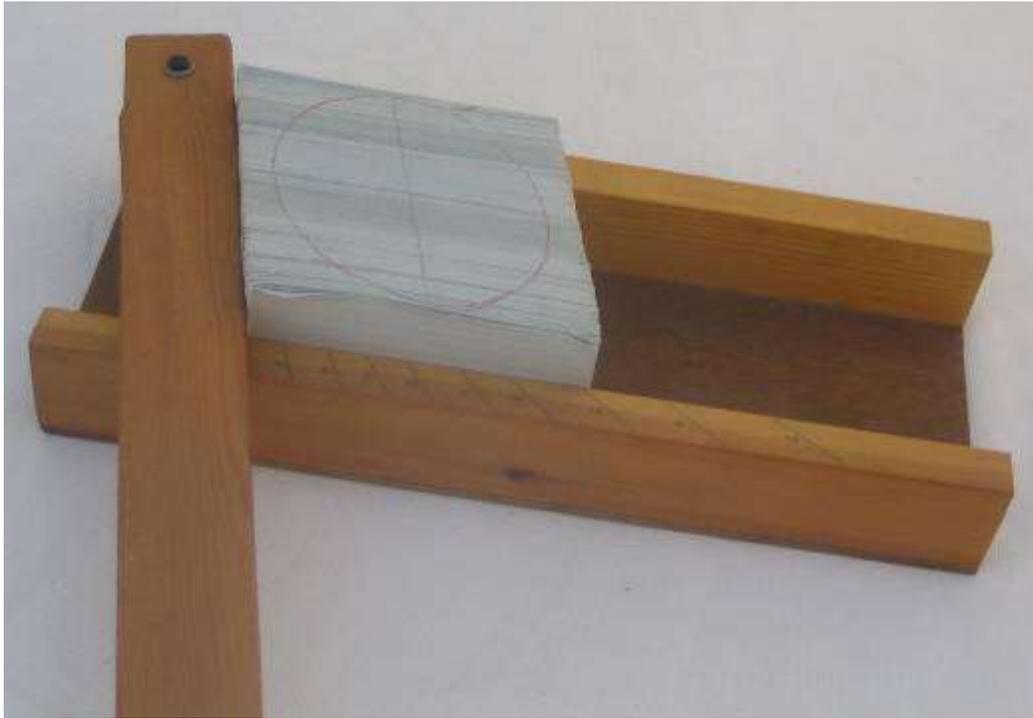
#### Notes

Make sure the students do not use the bar to move the cards. This will bend the card particularly at the higher angles.

#### Results

Students should make the point that the original pebbles were unlikely to have been spherical. However the graph could be used for sheared oolites. The oolite has been sheared by  $27^\circ$

**Time**  
**About 30minutes**



***Simple shear II***