

## **SIMPLE SHEAR I**

### **Purpose**

*This activity is to show how beds change thickness when subjected to simple shear.*

### **Activity.**

*The pack of cards represents a bed which is being progressively sheared.*

*1. Place the edge of the bar on 0° and push the cards up against it.*

*2. Measure the thickness between the red lines on the cards at right angles to the bar using the setsquare.*

*Plot your results as follows:*

<i>angle</i>	<i>thickness</i>	<i>thickness /original thickness</i>
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*3. Move the cards away from the bar and then move the bar to 5°. Push the cards against the bar. Do not use the bar to move the cards.*

*4. Again measure the thickness of the bed using the setsquare.*

*5. Repeat instructions 3 and 4 for every 5° until 50°.*

*6. Plot your results on a graph. Plot the angle against new thickness / original thickness. Leave space on your graph for the angle to increase to 90°.*

*7. Work out the mathematical relationship between bed thickness and angle of shear.*

*8. Use your information to calculate the shear angle on the limb of a fold in the sample or photograph. First you will need to measure the thickness of the bed at the hinge, this will be the original thickness. Then measure the thickness on the limbs. Make a sketch of the fold*

## Teacher's Section

### Requirements

Shearing box.

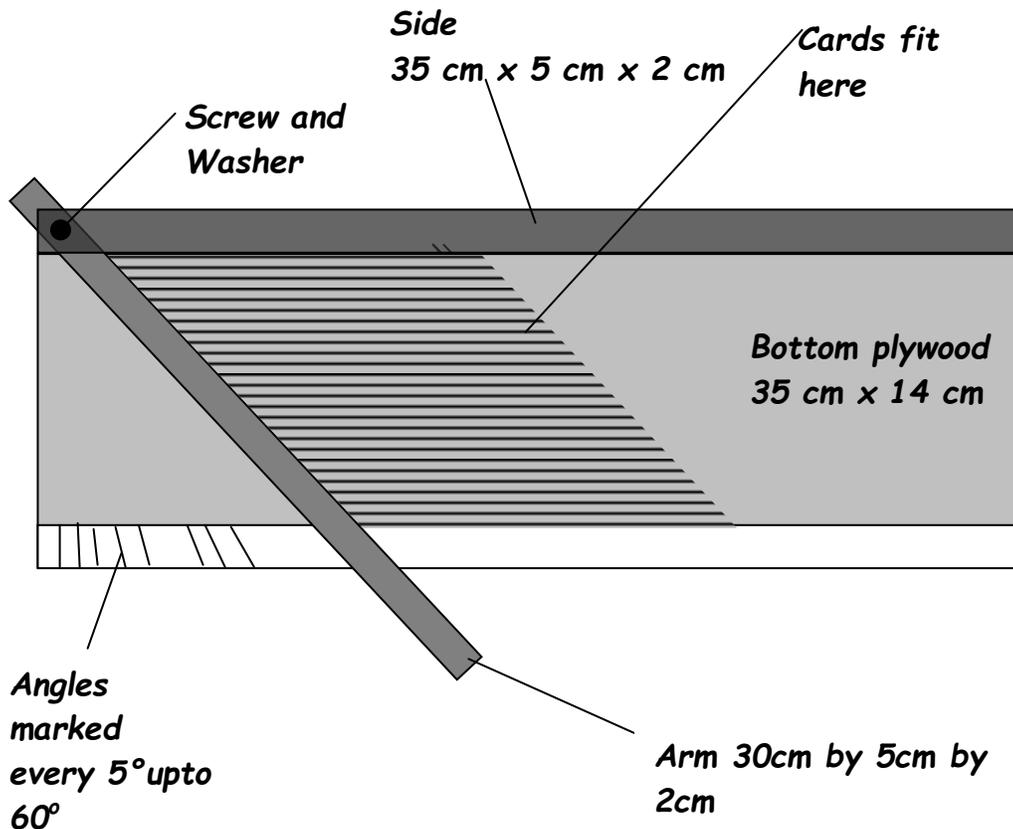
A pile of 12.5cm by 7.5cm filling cards enough to fit in the box, that is 6 packs

Set square,

sample or photograph (Weiss plate 93).

### Making the equipment (1 hour)

The wooden box should be 35cm long by 11cm wide by 5cm high and open at both ends. The arm should be 30cm long. Construct the box as shown in the diagram. Mark the angle on one side. Fill the box with enough cards for them to be tight but still to slide. With the arm at right angles to the side mark two red lines on the top edge of the cards exactly 10cm apart



### **Notes**

*Simple shear is, as it says shearing, such as occurs in an incompetent bed during folding.*

*The experiment "Simple Shear II " is also about simple shear but deals with pebbles in a conglomerate. Make sure students do not use the bar to move the cards as it damages the cards especially at high angles. It gets difficult to keep the cards together above 50°.*

### **Results**

*The mathematical relationship is  $\text{thickness} = 10 \cos \text{angle}$*

### **Time**

*About 20 minutes for making the measurements.*



*Simple shear apparatus*



*Folded Dalradian metasediment. Measure limb and hinge thickness.*