

# FOLD WAVELENGTH

## Purpose

This experiment is designed to show the relationship between fold wavelength and the thickness of the competent layer. The wavelength is also affected by the relative strengths of the layers.

## Activity

In this experiment folding is simulated by compressing layers of sponge with layers of rubber or paper between them.

A, B, C, D and E are made of sponge and rubber

F is paper and sponge

G and H are rubber, paper and sponge.

- 1 Examine and draw the sample or photograph. Note that one bed has many small folds in it and the other only one. Try to explain how this may have come about.
- 2 Take one block of sponge and measure the thickness of the rubber using the callipers. (If you do not know how to use the vernier scale ask)
- 3 Place the sponge block in the wooden holder and use the piece of plywood to compress it, keeping the plywood horizontal.
- 4 Is the number of folds affected by the amount of compression?
- 5 Compress the board until it is at the 20cm mark and then count and record the number of folds. Measure the wavelength and amplitude
- 6 Repeat for the other sponge blocks except G and H. When using the narrower blocks put in two at a time.
- 7 Plot a graph of thickness against wavelength.
- 8 Squeeze and examine G and H but do not measure them. Sketch one of them.
- 9 Write your conclusions explaining why the one bed in the sample has many small folds and the other only one large fold.

## Teacher's Section

### Requirements

Sponge pieces

Box as shown below with internal dimensions of 33cm by 20cm by 10cm

Piece of stiff plywood 10cm by 20cm

Sample or photograph of folded strata in which a single thicker bed is beside a thinner much more folded bed. Good pictures in L.E. Weiss Minor structures of deformed rocks plates 105 and 106

### Making the equipment (box 30 minutes, sponge if already cut 30 minutes)

To make the blocks you will need

14 pieces of sponge each 30cm by 10cm by 10cm (obtainable from furniture shops or see Yellow Pages)

1 piece 7.5 by 10 by 30cm

1 piece 5.0 by 10 by 30cm

3 pieces of 2.5 by 10 by 30cm

and 5 pieces of rubber each 10cm by 20cm but of varying thicknesses (obtainable from good hardware shops). The thicknesses I use are 1mm, 2mm, 3mm, 4mm, 5mm and 6mm. You will need one of each except for 1mm and 6mm of which you will need 2.

3 pieces of paper each 10cm by 20cm.

For A to F each piece of rubber or paper should be glued between 2 pieces of sponge. For G and H glue the pieces together as shown in the diagram.

Box should be made as is shown in the diagram a

### Results

The thinner the competent bed the more folds it will form.

### References

Roberts R L 1993 Field guide to Geological Structures Macmillan London

Weiss L E 1972 The minor structures of deformed rocks Springer-Verlag  
New York

### Cost

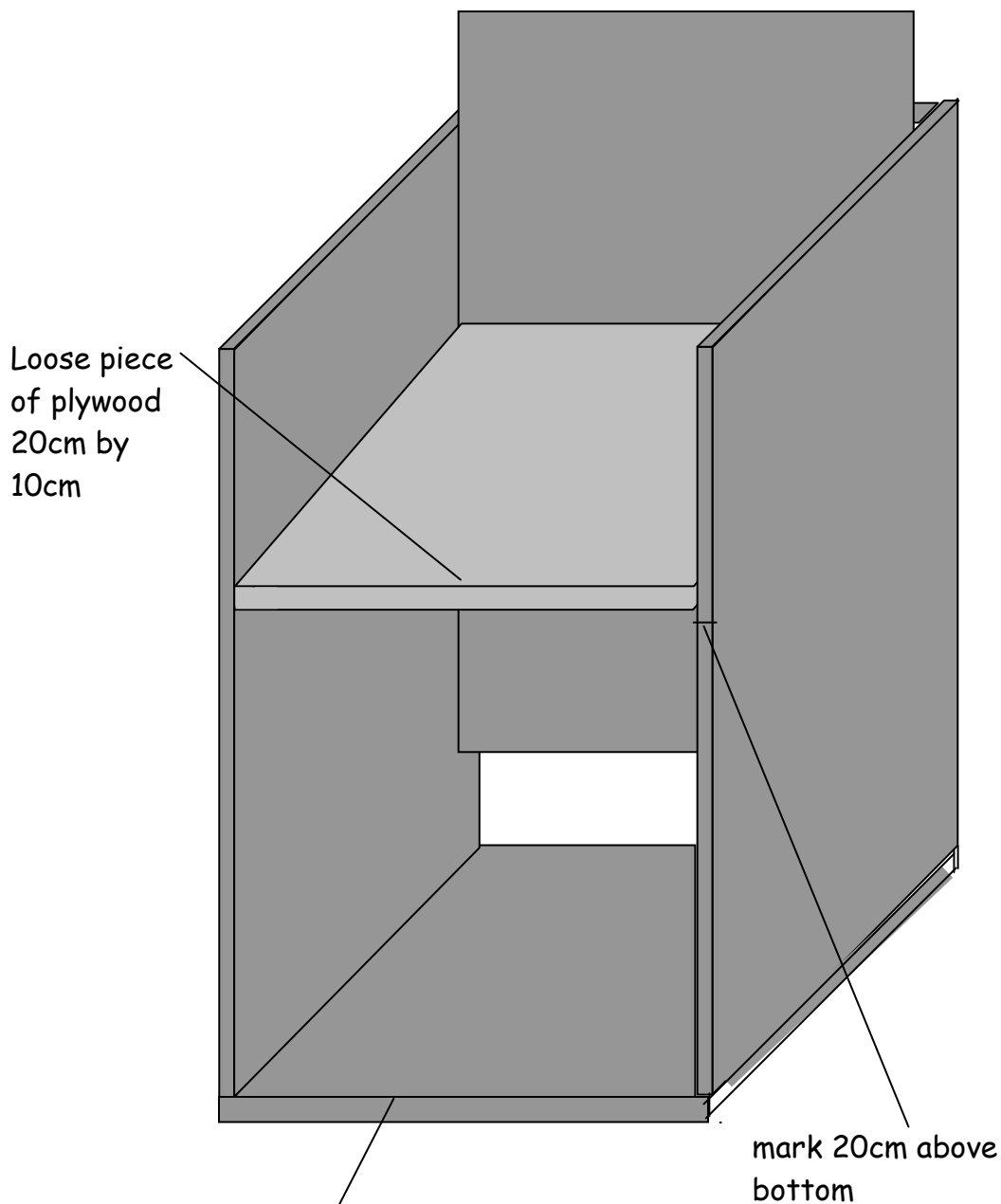
All the sponge £6

All the rubber sheet £5

**Time**  
40 minutes

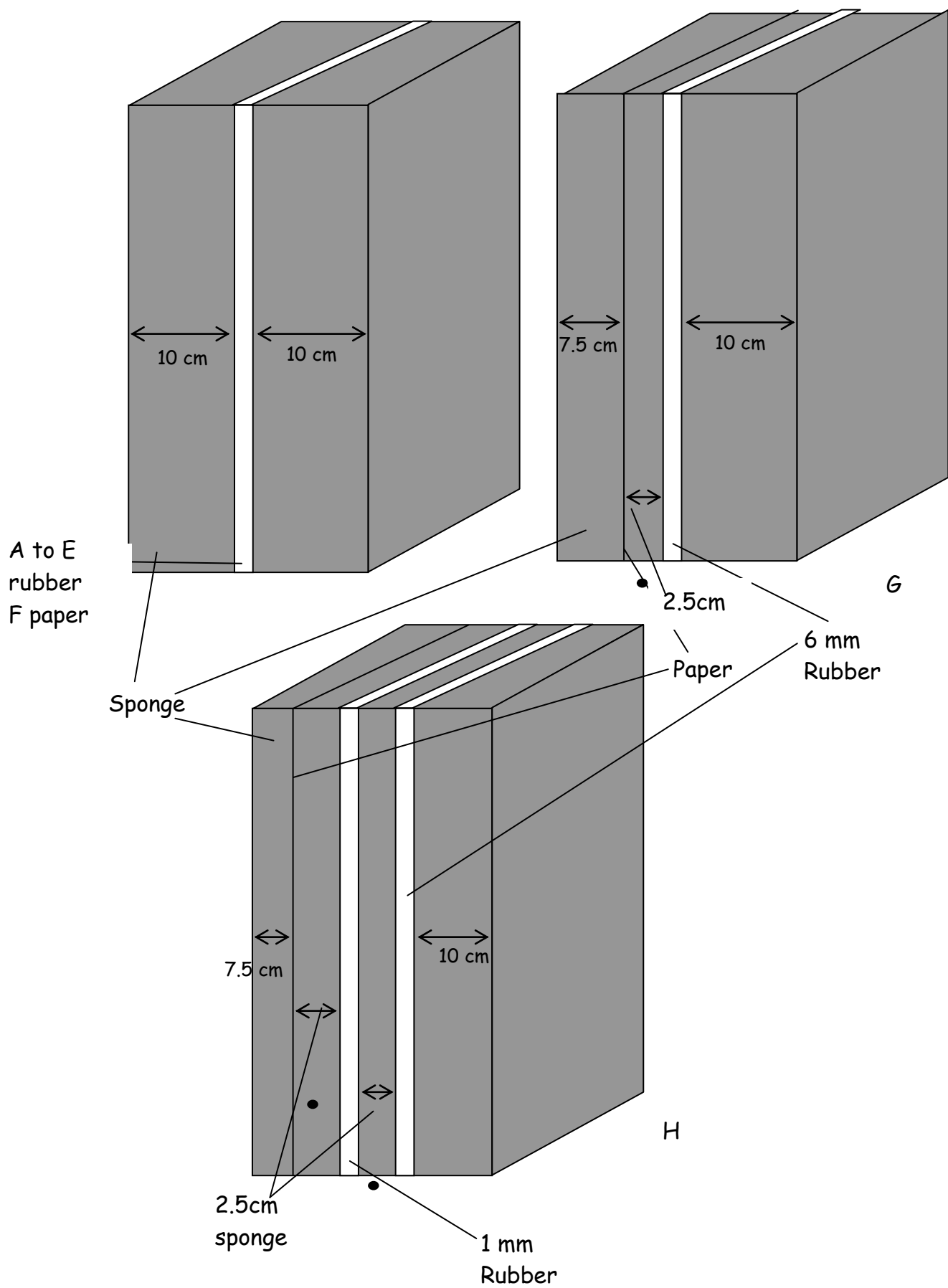


Fold wavelength diagram a



**Open Box**  
Internal  
Measurements  
10 cm x 20 cm x 33  
cm

Fold wavelength diagram b





Block H. Two layers of rubber and one of paper between sponge rubber