11

Name: ..... Form: .....

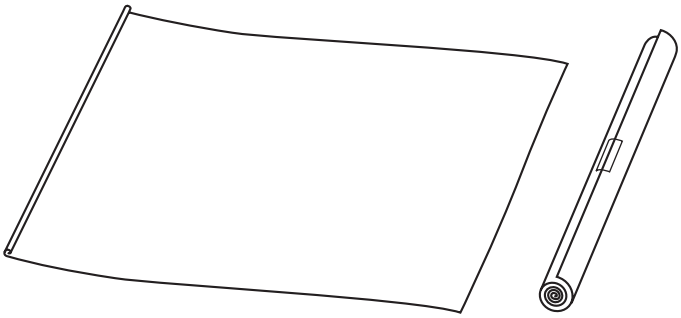
See **pages 24 and 25** of The Body Book

PRACTICAL B

Testing the thickness of 'bones'

Bones are different thicknesses. Is the thickness of a bone related to its strength?

(1) Make your model 'bones' from paper in the following way:

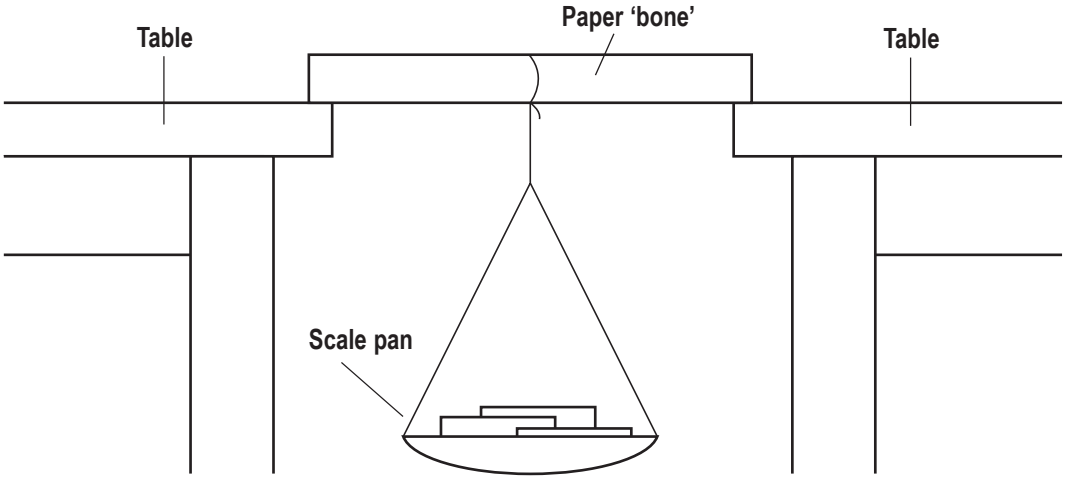


Roll up a sheet of paper and hold it together with a piece of tape as shown in this diagram. This is your thinnest 'bone'.

Roll up a second sheet, then roll a third sheet round it. This is a slightly thicker 'bone'. Again, use a piece of tape to hold it together.

Make several bones with different thicknesses by using different amounts of paper. Notice that you must make the 'bones' all the same length, so use the same type of paper if you are to carry out a fair test.

(2) Test your bones as this diagram shows.



(3) Draw a table on a separate sheet of paper in which to record your results.

(4) Write down what you find.

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11 Teacher's sheet: Practical

See **pages 24 and 25** of *The Body Book*

Equipment

Each class group will need sheets of paper, a means of supporting the paper 'bones', a scale pan and some weights (actual scientific masses or small objects such as coins) and perhaps kitchen weights to use with the larger 'bones'.

Introducing the work

This activity can be introduced as an example of scientific modelling. It allows an investigation of the idea by using standard 'bones' rather than actual bones which may vary a little from each other and would have to be cleaned and sterilised before use in a classroom.

The practical may be done by half the class while others do Practical 11A, and the results of both groups pooled to find out how length and thickness affect bone strength. Alternatively, this practical could be done by students who have done Practical 11A previously. In this case the practical gives the class an opportunity to build on a technique they have learnt before. The students will probably make quite thick 'bones' and will need to adapt their weights to generate stronger forces. If all the bones are thick enough they may like to use a force meter instead of a scale pan and weights. This is attached in the same way as the scale pan but a member of the group slowly pulls down until the 'bone' bends. At this time a second member of the group records the distance travelled by the pointer on the spring of the meter.

Outcomes

The children:

- Can construct a table and fill in the results.
- Can identify a pattern in their results.
- Can control risks in the performance of an activity.

Background

The need for repeating the experiment may be more readily grasped, as the quality of the 'bones' also depends on the ability of the members of the group making them.

The class should find that the thicker bones are stronger than the thinner bones.

Extending the work

If the class have done the work on breathing and pulse rates previously, some class members may suggest repeating their bones experiment and producing averages. If this does not occur suggest it to the class.