

CARDBOARD WORK—SECOND STAGE—NO. 1.

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The course of work to be outlined for the second stage of this series is similar in its design and principles to that of the first. With the experience gained during the working out of the simpler models, however, much more ambitious work may be attempted and more complex manipulations be included in the various exercises.

The development of the constructive faculty of the pupils; the training of their reasoning powers by the concrete application of much of their abstract work in arithmetic and drawing; the acquiring of deftness and skill of the hands and the corresponding growth and quickening of the brain cells controlling them; the training in neatness and accuracy; the discipline of will power involved in the task of striving with the difficulties of the exercises; the training of the eye to appreciate form; the joy and strength that comes of *doing*; these and many other attributes will be found to belong especially to this form of manual training. To the rural teacher struggling with a large mixed school and to the town teacher in a fully graded school, it will be found equally helpful. Children and teachers turn with relief to something that is not so much a task set the pupils, as a something they *want to do*. With the motive coming from *within* the pupil, the teacher's task is incomparably easier.

The drawing materials and other instruments used are the same as in the earlier models, but for this course there are two new appliances that are indispensable,—the cardboard knife and a cutting board or pad to protect the desk tops. For the thicker cardboard used in the models, scissors will

be found of little use, and a knife of some sort is necessary. In the hands of a skilful adult the ordinary pocket knife may answer, but for children a broader pointed, and therefore safer, shape must be used. Many forms have been suggested and tried, but the writer prefers the shape shown in Fig. 1. The cutting edge is at *a* and the edges *b b*,

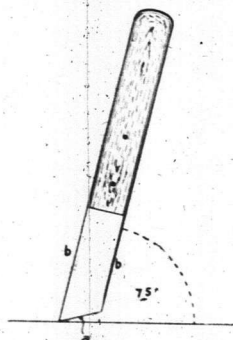


Fig. 1. Showing knife and cutting angle.

are quite thick and blunt, thus allowing the knife to

be held close down, precisely as a pen is held in writing. Such a knife will be found to serve for any thickness of cardboard or, if kept in order, will cut the thinnest paper.

The cutting board is a piece of common "straw-board," usually of a straw or buff color, the sort that is used for making packing boxes. A piece about twelve or fourteen inches is large enough for any of the exercises and will last for a very long time.

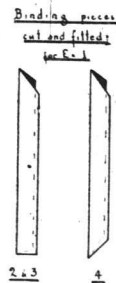
The cardboard used in most of the models is of the thickness known as "six-ply," and may be white, grey, or fancy, at pleasure. A fairly good quality is necessary, as the common pulpy grades of cardboard do not bend well, but give a poor, ragged angle.

Some gummed bookbinders' cloth for binding the edges and angles of the models will be needed. If it cannot be obtained ready gummed, it can be pasted by the pupils as required. The writer has tried both ways of using it, and considers the gummed cloth superior, as the children keep their work cleaner than when using paste.

Sometimes gummed paper is used, and proves quite satisfactory for binding edges and angles, but is not strong enough for the backs of folios and hinges of boxes, etc., in some of the later models.

A bottle of liquid glue and one or two small pieces of sponge will complete the outfit, if the rulers, set squares, etc., used in the elementary work are still available. If not, these must be procured, as the drawing is of quite as much importance as ever.

For the first exercise, a simple four-inch square is suggested, as it will involve in very simple form the two new operations of cutting with the knife and binding the edges. The drawing



should be of the finished exercise, which may be called a table mat. Care must be taken that the lines showing the binding on the edges are exactly parallel, and that the margin is the same on each edge of the square. Any error in these details will cause the "mitre," that is the joint in the binding which bisects the angle, to look very bad on the drawing.

For the practical work, proceed as before by first drawing the square very carefully on the cardboard. Then lay the piece of cardboard on the cutting board and place the ruler in position along one of the lines, holding it firmly with the left hand, with the knife held like a pen, not gripped in the fist, make a cut