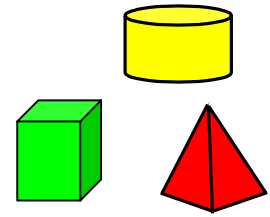
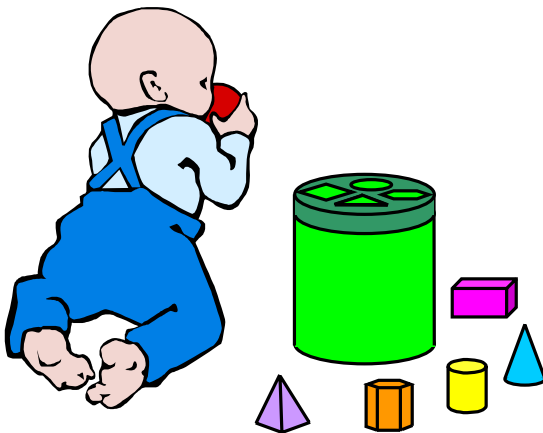


Shape Sorter



When you were a child did you have a shape sorter?

A shape sorter consists of a set of three-dimensional shapes and a container. The container has holes in the top. Each shape will pass through just one of the holes into the container.



In order to put the shapes into the container a child has to find the right hole for each shape.

The container has a lid that can be removed so that the shapes can be taken out again.

Assignment

Your task is to design a shape sorter.

You will need to take care with the dimensions of each hole and each shape. Remember that each shape should pass through only one of the holes in the lid.

Your work should include:

- a scale drawing of the lid, showing clearly the position and size of each hole
- a plan and elevation(s) of each shape
These can be sketches giving all the dimensions, or diagrams drawn to scale. Show the hidden detail. You may use a computer to do some of your drawings, but some of the work must be done by hand.
- a description of each hole and each shape using the correct geometrical terms.

When you have completed your design, produce accurate models of each shape and the lid to show that your design will work in practice.



Teacher Notes

Unit Intermediate Level, Solving problems in shape and space

Skills used in this activity:

- using geometrical terms for 2 and 3 dimensional shapes
- drawing plans and elevations to scale
- making 3 dimensional models

Preparation

Students will need:

- copy of the assignment (page 1)
- graph paper (or squared paper)
- compasses, rulers, pencils (etc.) for construction work
- card, glue (etc.) for making models

Notes on the Assignment

The assignment requires students to design a shape sorter. This will be most relevant to students who are interested in a career in child care or teaching. However the type of toy described will also be familiar to students on other courses and designing such a toy may be something that they would enjoy doing.

The assignment should provide some of the evidence for portfolio requirements 2 and 4 (given below):

What you need to produce	You must
<p>2</p> <p>Drawings of detailed plan(s) and/or elevation(s) of two different 3-dimensional situations.</p> <p>Your work should include examples of your use of hidden detail, sections and construction techniques.</p> <p>You may use computer software to do some of your drawings but one of the situations must be represented by drawings done by hand.</p>	<ul style="list-style-type: none"> • include sufficient detail including dimensions and/or scale for a user to re-create the situation. • present clear accurate drawings
<p>4</p> <p>Written accounts in which you use geometrical terms and ideas to describe two different 2 or 3 dimensional situations.</p>	<ul style="list-style-type: none"> • write your accounts clearly using appropriate language about geometry

At the end of the assignment students are asked to produce accurate models of the shapes and lid to show that their design will work in practice. This part could be omitted if you wish to save time.

Alternatively, if students produce plans and elevations of a suitable standard, they could be asked to exchange these drawings and produce models of the shapes and lid designed by someone else.

This would provide evidence for portfolio requirement 1:

<p>1</p> <p>Either</p> <ul style="list-style-type: none"> • sketches, or • evidence of models or real situations <p>which you have developed from the drawings (plans and/or elevations) of others.</p>	<ul style="list-style-type: none"> • include all main features of the situation • indicate by including dimensions or a scale that you understand clearly the size of the main features of the situation
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