Activity description

This activity enables students to learn about shape and space by designing a shape sorter. The activity will be most relevant to students who are interested in a career in child care or teaching. However this type of toy may also be familiar to students on other courses, and designing such a toy may be something they would enjoy doing.

Suitability and Time

Level 2 (Intermediate/Higher)

1–3 hours

Resources and equipment

Student sheets
Image of shape sorter
Graph paper or squared paper
Compasses, rulers, pencils etc for construction work
Card, glue etc for making models
Optional: access to computers, calculators

Key mathematical language

2D, 3D, cross-section, prism, plan, elevation, names of 2D and 3D shapes, scale, sketch (verb)

Notes on the activity

There are many ways in which you could vary this activity. For example, you may decide to restrict the choice for the container to a cuboid or a cylinder. You might ask that shapes are put into the container through the top only, the sides only or both. Students could draw the diagrams by hand or using computers.

During the activity

The student sheet could be withheld initially and the image used to allow students to generate and discuss the thinking points for themselves.

Discuss which different mathematical 3D shapes might be included, and what different 2D shapes would be needed for the holes.

Students could work individually or in pairs to encourage discussion.

Points for discussion

The 'Think about' section encourages students to consider the properties of 3D shapes in a real life situation.

Students need to be given time to make and review choices. Poor choices should be valued as learning points and not mistakes.

Students are likely to find it helpful and supportive to discuss their initial designs in small groups.

Task 4 could be omitted if time is short.

Task 5 encourages students to practise the skills of reasoning and communicating mathematically.

The reflection questions allow students to consider the cross-sectional properties of 3D shapes, such as a cylinder and a cone, in greater detail.

Extensions

Students could consider how their design might be adapted to minimise use of materials, for instance by cutting shapes efficiently from a block of wood.

Students with an interest in Design & Technology may wish to consider in greater detail how the shape sorter might be manufactured.

Acknowledgement

This activity was developed from an idea contributed by Gill Read of Aldersley High School.