

Making the models

The first step is to saw seventeen wooden cubes.

For the 10 bigger ones, you need about 40 cm of planed soft wood with a cross section approximately 30 mm square.

For the 7 smaller cubes you need about 20 cm of planed soft wood with cross section approximately 20 mm square.

All the sawn faces should be smoothed with fine sand paper.



Models: here is the complete set.

Carbon atom models (6)

Put a large cube on the bench, and mark two diagonally opposite corners of the upper face. Turn the cube 90° and mark the corner that is diagonally opposite an already marked corner. Turn the cube another 90° and again mark the corner diagonally opposite an already marked corner.

Put the cube in a vice and drill holes in the four marked corners, about 1.5 cm deep, aiming directly at the cube's centre. Use a sharp 8 mm drill bit.

Repeat with another five cubes.

Nitrogen atom models (2)

Do exactly as with carbon atom models, but stop after 3 holes have been drilled in each cube.

Oxygen atom models (2)

Do exactly as with carbon atom models, but stop after 2 holes have been drilled in each cube.

Hydrogen, fluorine, and bromine atom models

For each of the seven small cubes, drill a hole in the centre of one face,

Model bonds

Buy at least 20 dowel rods, 35 mm x 8 mm.

Cut four 8 cm lengths from 8 mm plastic tubing.

Finishing the models

(1) Quick method

Use felt pens or highlighters to colour the cubes as follows: carbon (6 cubes) black; oxygen (2 cubes) bright red; nitrogen (2 cubes) light blue; fluorine (3 cubes) yellow; hydrogen (3 cubes) white; bromine (1 cube) orange.

Write “O” on one face of each oxygen cube, and “16” on the opposite face, using a black felt pen. Write “N” and “14” similarly on opposite faces of each nitrogen cube, “F” and “19” on each fluorine cube, “H” and “1” on each hydrogen cube, and “Br” and “80” on the bromine cube.

For the black carbon cubes, press round self-adhesive white labels on opposite faces, and write “C” and “12” on them.

Take 14 dowel rods and whiten one tip of each with correcting fluid.

(2) Best method

Painting cubes in the colours described makes the models more attractive. Drill some 8 mm holes in a board, then hold each cube by a dowel rod while you are painting it, and to let the paint dry put the other end of the rod in one of the board’s holes. Use two coats of water-based acrylic paint.

When the cubes are painted, write the letters and numbers on them as described above, but using a black paint pen. In the case of the black carbon cubes, take the gloss off two opposite faces with fine sand paper, and press round self-adhesive labels on. Paint those two faces with acrylic clear varnish, then write on the labels with the black paint pen.

To make all the cubes smoother and glossier, sand finely between coats, and after the writing, finish with a coat of acrylic clear varnish.

Take 14 dowel rods and paint one tip of each white.

IMPORTANT

To prevent the wood drying out, the models can be kept in a plastic bag or a box with a lid; but the possibility of dowel rods becoming loose in the holes can be eliminated altogether by slightly tapering the end 3-4 mm of the drill bit with a grinding wheel when the models are being made.