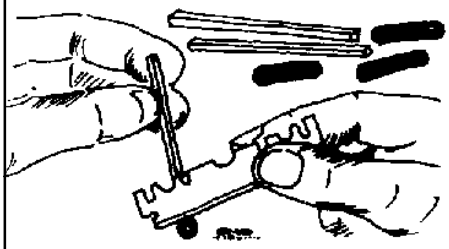
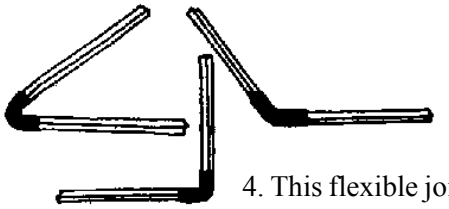
MATCHSTICK MODELS

1. These matchstick models use matchsticks as the basic structural members and cycle valve tubes as the basic joints. Cycle valve tube is cheap. A packet of 100 gms. costs Rs.15/- and contains 12 metres (50 feet) of valve tube.

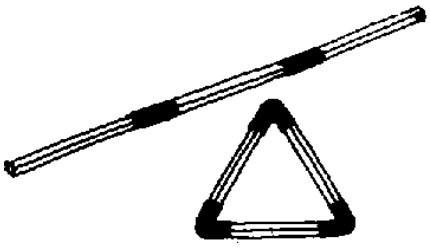


2. Cut 1.5 cms. long pieces of the valve tube. Scrape the sulphur from the matchstick heads with a blade.

3. Push two matchsticks through the two ends of the valve tube. This is a joint -of - two.

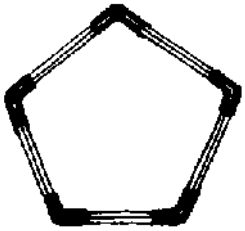


4. This flexible joint can be used for depicting angles - acute, right, obtuse angles etc.

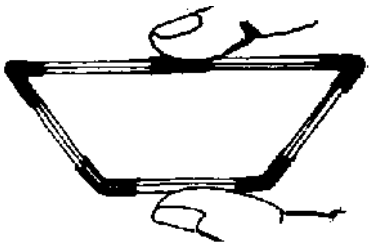


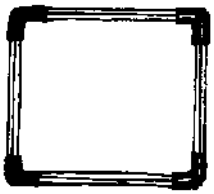
5. Three match- sticks and three valve tubes can be looped to make an equilateral triangle.

6. Other shapes like squares, rectangles, pentagons, hexagons can be made by joining more matchsticks and valve tube pieces.

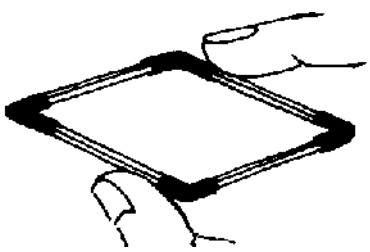


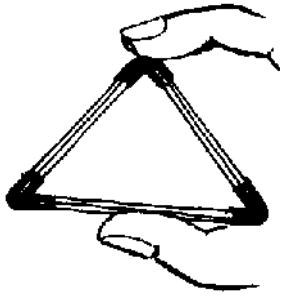
7. If you press the pentagon it changes shape and becomes boat shaped.





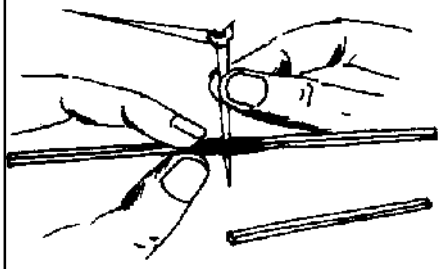
8. The square when pressed becomes a rhombus.



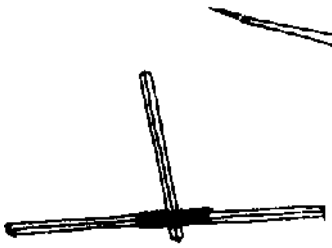


9. But no matter how hard you press, a triangle remains a triangle. The triangle is the only rigid polygon. That is why roof trusses, bridges, electricity towers are made of triangles. The triangles make them rigid and strong.

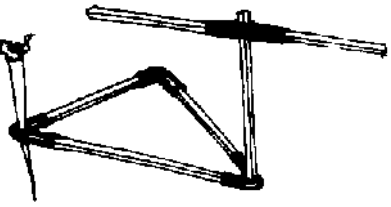
THREE DIMENSIONAL MODELS



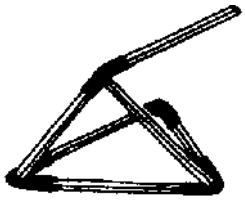
1. Pierce a hole in the valve tube joint-of- two, by poking it at right angles either with a long needle or else a thorn.



2. Insert a third match-stick (slightly sharpened at the end) in this hole. This is a joint- of - three, or simply a T-joint.

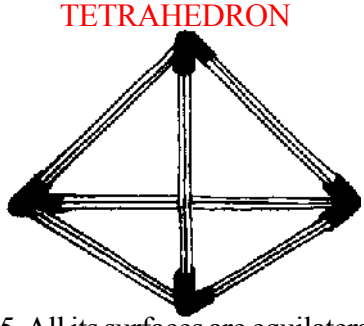


3. Take the equilateral triangle and poke holes in its valve tube joints with a thorn. Now insert the three match-stick ends of the T-joint in the holes of the triangle.

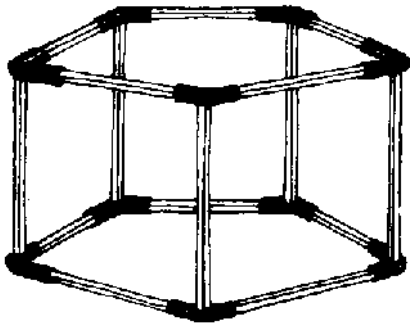


4. This structure is called a TETRAHEDRON. It has 4 corners, 6 edges and 4 distinct surfaces.

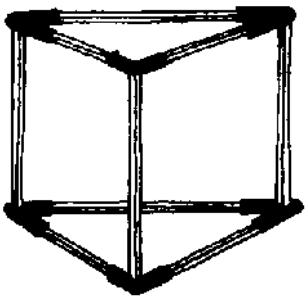
TETRAHEDRON



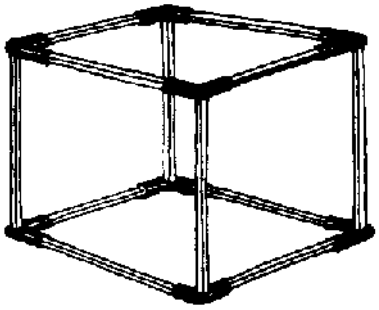
5. All its surfaces are equilateral triangles. Triangles are rigid. So this triangular house is very strong.



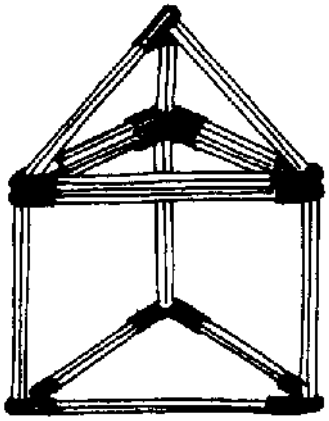
6. PENTAGONAL BOX



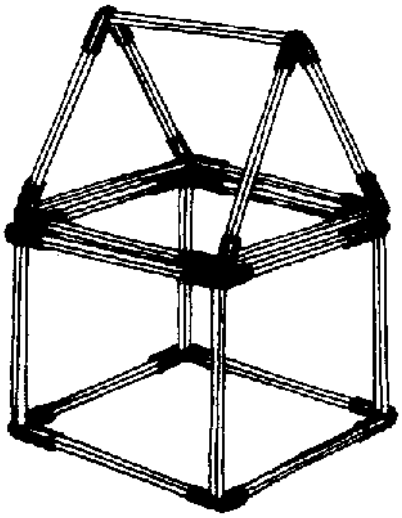
7. In a similar manner two separate triangles can be joined together using three matchsticks to make a PRISM.



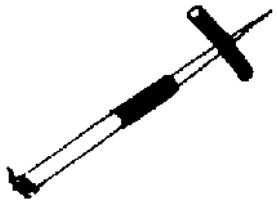
8. Two separate squares can be joined with four matchsticks to make a CUBE.



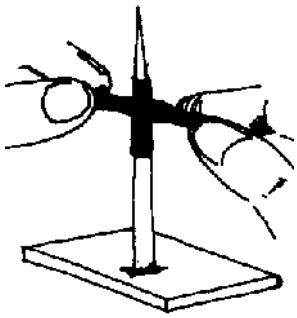
9. Several of these three-dimensional structures can be put together to make different kinds of houses and other configurations. You can play with this simple meccano to create your own models.



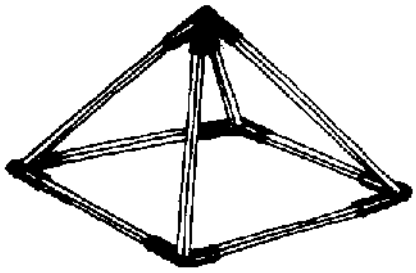
JOINTS OF FOUR, FIVE AND SIX



1. Take two pieces of valve tube about 2 cms. long. Weave a thorn through the hole of one. Then pierce the thorn through the centre of the other valve tube.

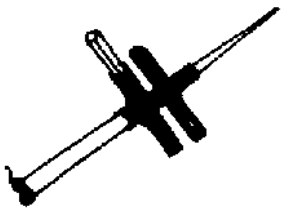


2. Pull both the ends of the second valve tube and slide it over the first one. Gently remove the cross, joint- of-four from the thorn.



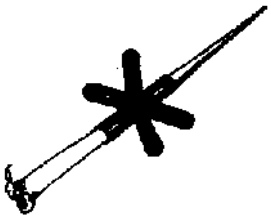
3. Use these joints to make a PYRAMID

4 Make a joint-of-four but do not remove it from the thorn. Just like the second, insert a third valve tube.

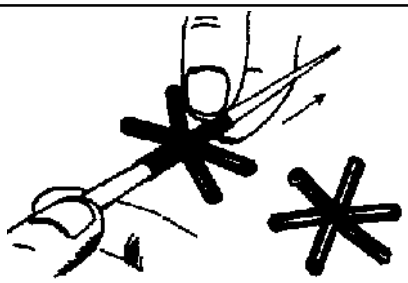


5. The second and the third tubes are at right angles to the first tube. Insert a small piece of a matchstick in any of the four free legs of the 'H'.

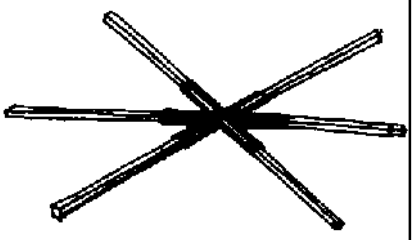
6. Weave this matchstick needle through the centre of the other leg of the 'H'.



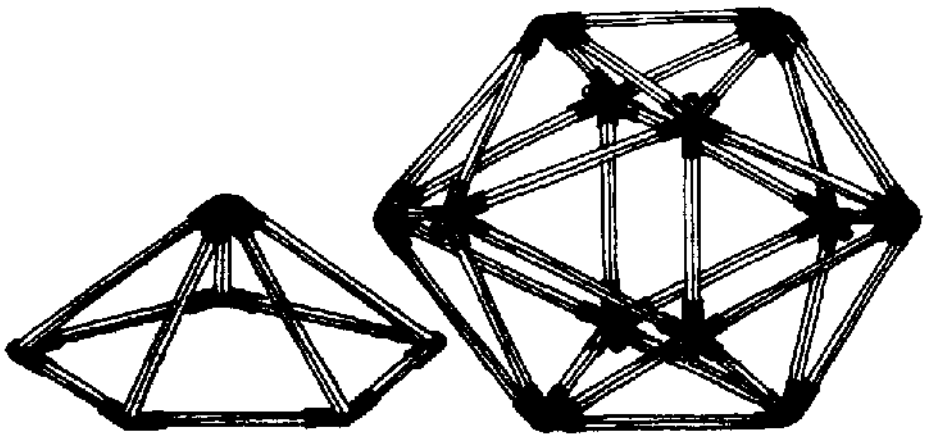
7. Now remove the thorn and phase out the six valve tube legs to form a star.



8. This is a joint-of -six. For a joint-of- five, simply cut one of the legs of the 'H'.



9. You can attach six matchsticks to the star joint.



10. Assemble twelve joints-of- five and thirty matchsticks to make an ICOSAHEDRON. One pentagonal face of the icosahedrons can be flexed in to make an IGLOO. With joints of 2, 3, 4, 5 and 6, and matchsticks as members there are many different kinds of models and structures which you can make. This is a very interesting way to learn solid geometry.