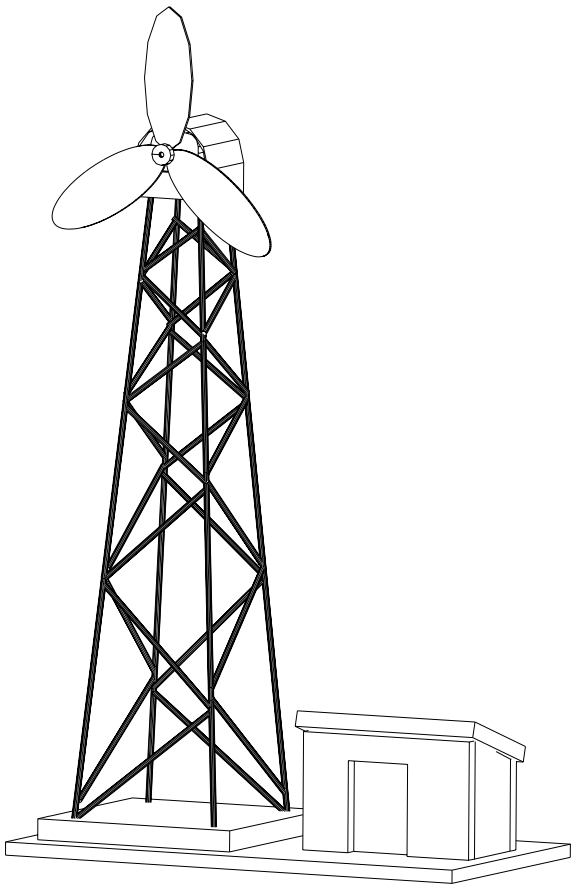
OPITEC

124.014

SOLAR-WIND STATION

Please Note

The OPITEC range of projects is not intended as play toys for young children.They are teaching aids for young people learning the skills of Craft, Design and Technology.These projects should only be undertaken and tested with the guidance of a fully qualified adult.
The finished projects are not suitable to give to children under 3 years old. Some parts can be swallowed. Danger of suffocation!



Contents

1 x Propellor	
1 x Solar Cell	400 mA
1 x Solarmotor	
1 x Metal sheet	5 x 50 x 70mm
1 x Gabun ply sheet	5 x 100 x 200mm
1 x Gabun ply sheet	8 x 80 x 80mm
1 x Pine ply sheet	5/4 x 50 x 150mm
2 x Pine strips	10 x 30 x 100mm
10 x Welding rod	Ω 2 x 250mm
1 x Insulated wire	1 metre

Tools necessary for making this project

Soldering iron (60W) solder,flux.
Wood file, sandpaper.
Fret saw or similar
Wood glue, UHU kraft glue (Order No. 5863)
Drill with 2mm bit
End cutters for metal
Scissors
Clamps

Planning and making

The Solar Windmill project introduces the student to:-

Woodwork
Soldering Techniques
Solar Technology (Electronics)

Please read through the plans before starting this project.

1. Cut from one of the pine strips 10 x 30 x 100mm the side walls of the house as shown on the plans.

2. The wooden door and the base for the Solarmotor are cut from the second pine strip 10 x 30 x 115mm.

3. The front and rear walls of the house are made from the pine plywood 5/4 x 50 x 150mm (see the plans for the pattern)

4. Now finish all the wooden parts (base, house walls, door etc) using a file and sandpaper.

5.Construct the house on the large groundbase (10mm from one end) as shown on the plans and glue together. The door is set in behind the cut out in the wall.

6. Now make a 45 degree chamfer 3-4mm wide around the edges of the tower base (8 x 80 x 80mm)

7. The holes (for the tower uprights) have their centres marked in 10mm from the edge of the base so that they form a square 60 x 60mm.

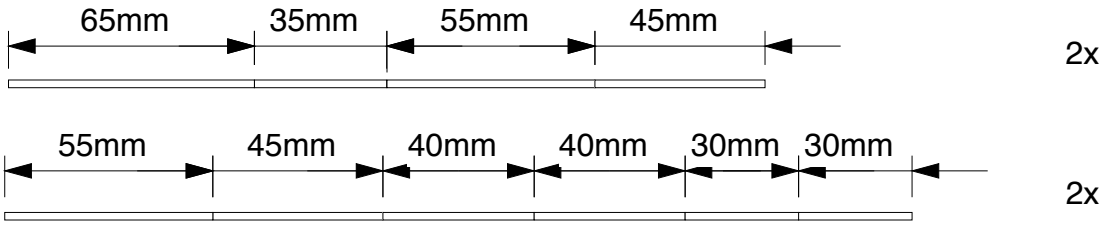
8. The holes in the motor base (8 x 30 x 30) are marked out in a similar fashion. The distance from the edge of base is 5mm leaving the holes making a square of 20mm.

9. Drill all the holes using a 2mm diameter bit. The holes in the tower base are drilled completely through and in the motor base 5mm deep only. To ensure the correct depth wind a small piece of masking tape or sellotape around the drill.

10. Saw two lengths of welding rod in the middle and insert them in the tower base and then in the motor base.

11. For the framework you need 4 lengths 70mm long
4 lengths 65mm long
4 lengths 55mm long
4 lengths 45mm long
4 lengths 40mm long
4 lengths 35mm long
and 4 lengths 30mm long

scale 1:2



12.Solder the framework in a zig zag pattern starting from the bottom of the tower and working upwards. Solder the opposite framework the other way around. (see drawings) When soldering add flux to clean the area where you wish to make the join. You may find it easier to work with a partner when undertaking this stage.

13. Glue the solarmotor centrally to the motor base. (top of tower)

14. Cut the insulated wire in half and remove 10mm of insulation from the ends. Place the wires next to each other and twist them together, to form a single cable. Finally thread the cable from the bottom to the top of the tower at the rear. Solder the bared top ends of the wire to the tags on the motor contacts.

15. If you wish to paint the tower, do it at this stage. We recommend using Marabu Decorlack green (Order No.452115) for the ground base and silver (Order No. 452148) for the tower base and motor base.

16. Cut the soft metal sheet to a size of 30 x 70mm. Then bend it, starting from the middle, into a semi-circular shape, diameter 30mm. This serves as a casing for the motor and needs to be glued to the left and right side of the motor base with kraft glue.

17. Glue the base of the tower centrally on the ground base, about 10mm from the end. (Clamp if necessary)

18. Place a drop of UHU-kraft glue into the eight holes where the four tower supports join their bases. (top and bottom)

19. Connect the other ends of the insulated wire onto the plus and minus poles,of the solar cell. (remove insulation first) (polarity does not matter)

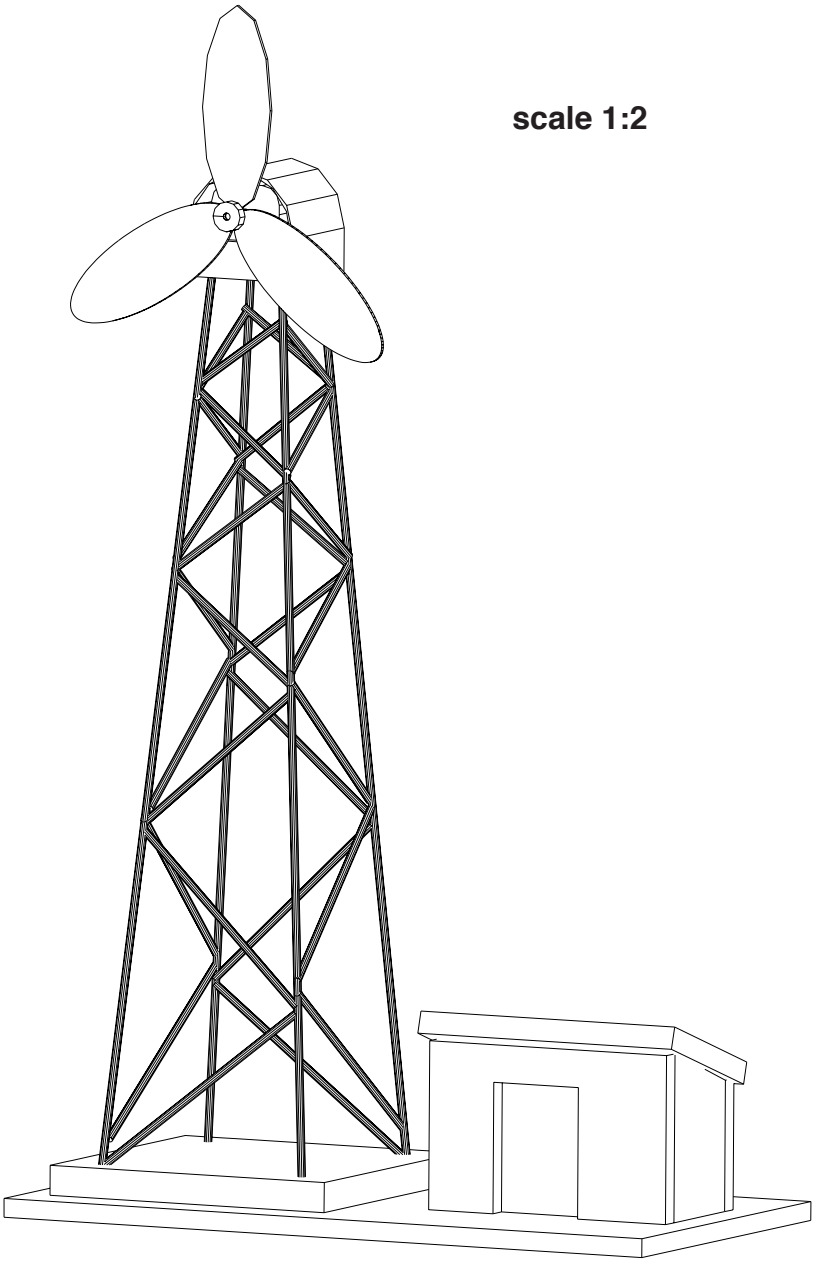
20.File a small notch in the left wall of the house for the cable to run,through.

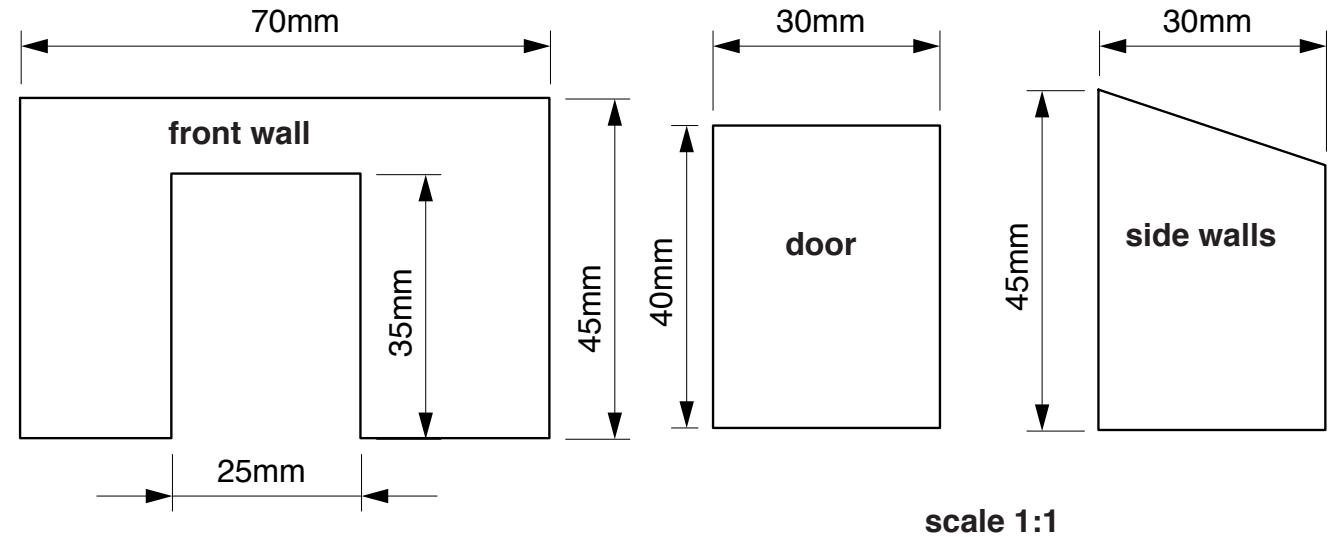
21. Glue and fit the Solar cell to the top of the house, making sure that the,cable lies in the notch. (Use UHU-Kraft glue)

22. Finally mount the propellor on the shaft of the motor.

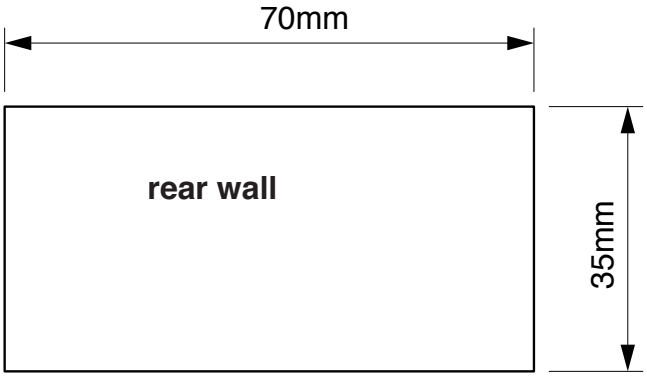
IMPORTANT: The solar cell needs to be placed in bright sunlight to produce enough electricity to drive the motor.

scale 1:2

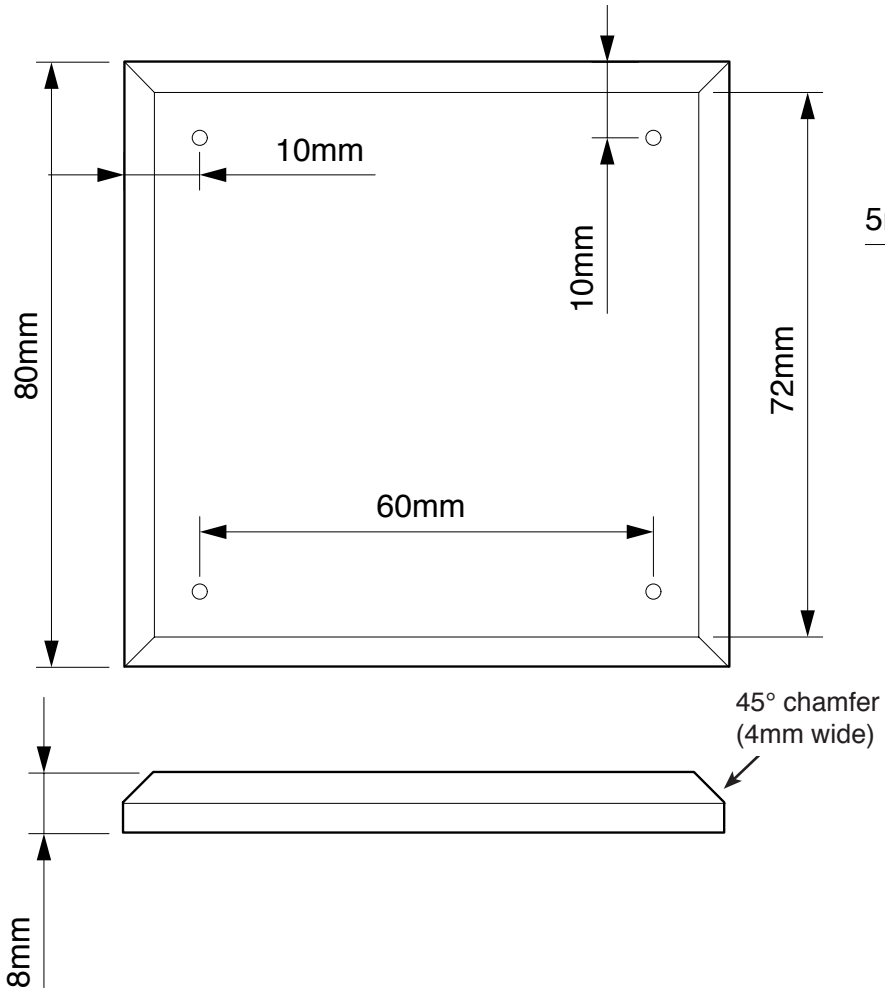




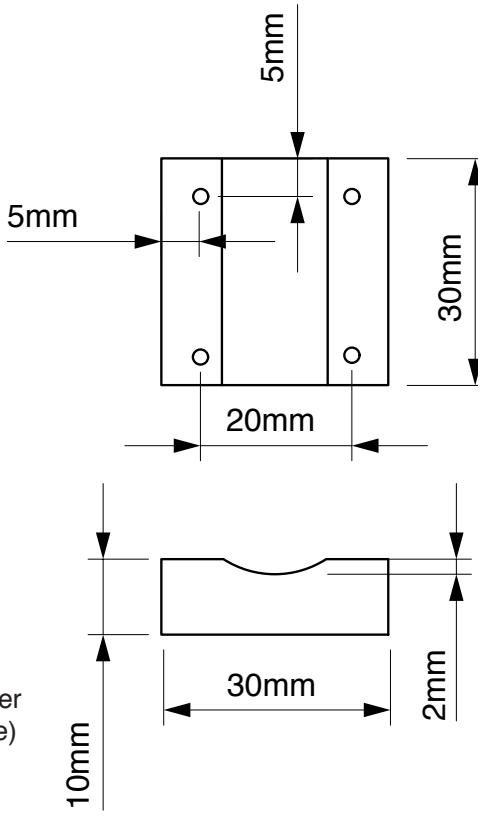
scale 1:1



tower base



motor base



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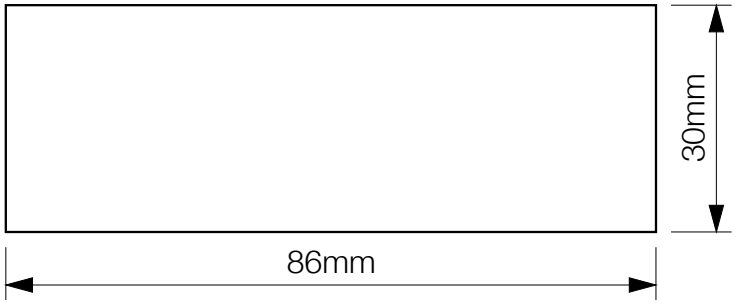
construction of the tower



soft metal sheet for motor housing