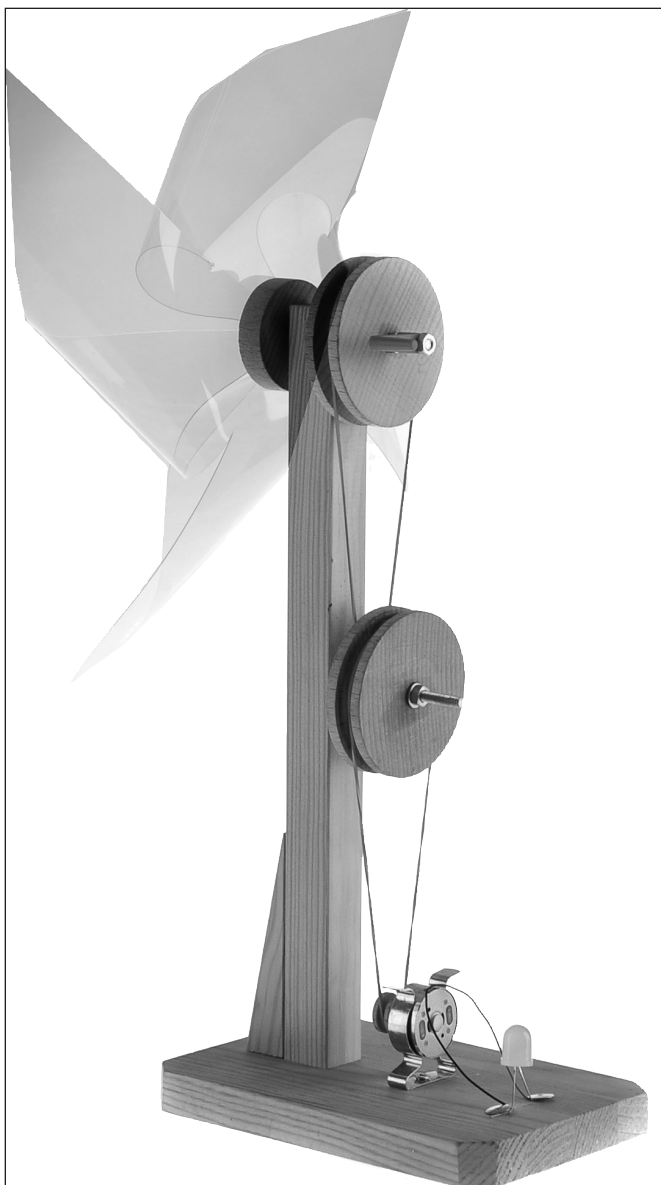


103.410

Wind generator



Parts list

- 1x Jumbo Light Diode
- 1x Solar motor
- 1x Spring clip
- 1x Reducer 4/2 mm
- 2x Pulley \varnothing 15 mm
- 2x Pulley \varnothing 60 mm
- 1x Wooden disc \varnothing 40 mm
- 1x Hand crank
- 1x Vacuum plastic, transparent, DIN A4
- 2x Brass sleeve \varnothing 6/4 x 20 mm
- 2x Machine screw 4 x 70 mm
- 10x Nuts M4
- 10x Washers M4
- 2x Drawing pins
- 1x Screws 3 x 12 mm
- 2x Rubber bands \varnothing 90 x 1 mm
- 1x Wooden base 15 x 100 x 150 mm
- 1x Wooden base 20 x 20 x 350 mm

Necessary tools

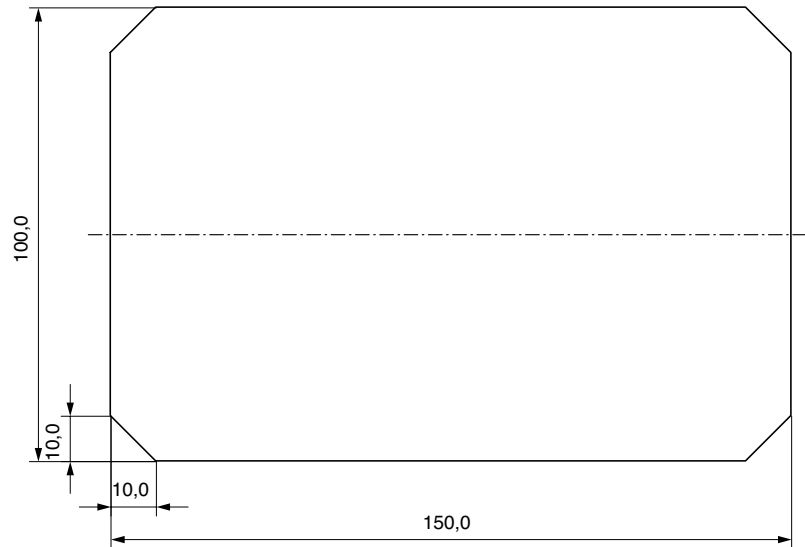
Ruler, pencil
Hacksaw, wood saw
Drills \varnothing 4 + \varnothing 5 mm
Spanner 7 mm
Screwdriver
Crosshead screwdriver
Scissors
Hole punch

Please Note

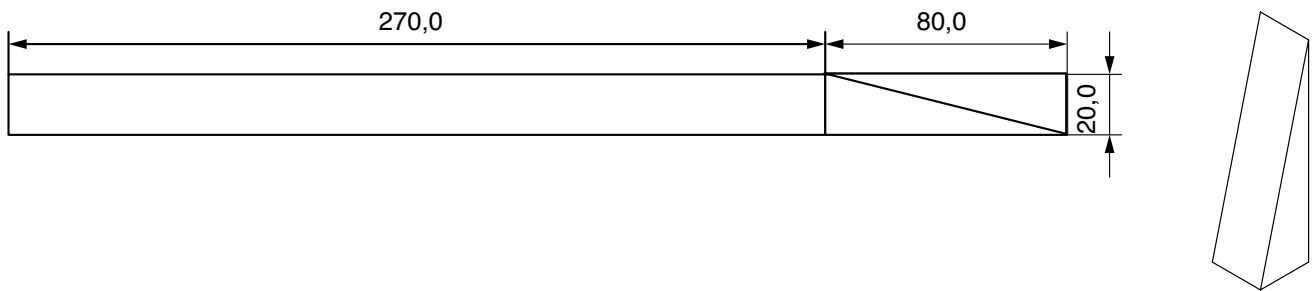
The OPITEC range of projects is not intended as play toys for young children. They are teaching aids for young people learning the skills of Craft, Design and Technology. These projects should only be undertaken and tested with the guidance of a fully qualified adult. The finished projects are not suitable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

Instructions

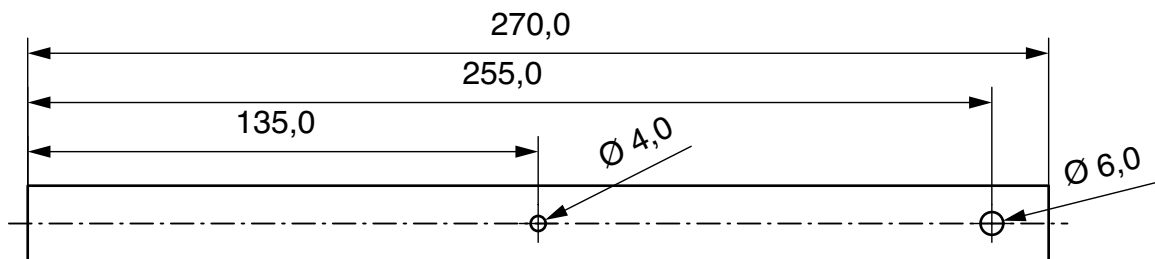
1. Base (15 x 100 x 150 mm) mark out and saw the corners as shown. Sand the corners to finish.



2. Support wedge (20 x 20 x 80mm) cut this from the wood strip 20 x 20 x 350 mm Sand to finish

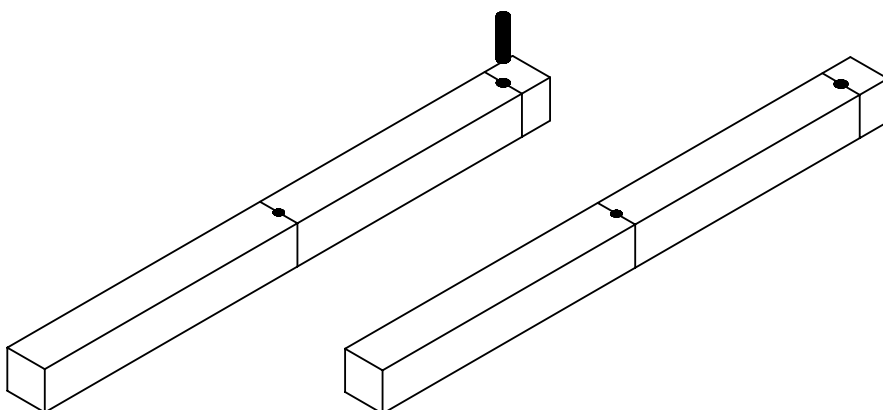


3. Saw the strip to 270 mm long
Drill the $\varnothing 4$ and 6 mm holes as shown



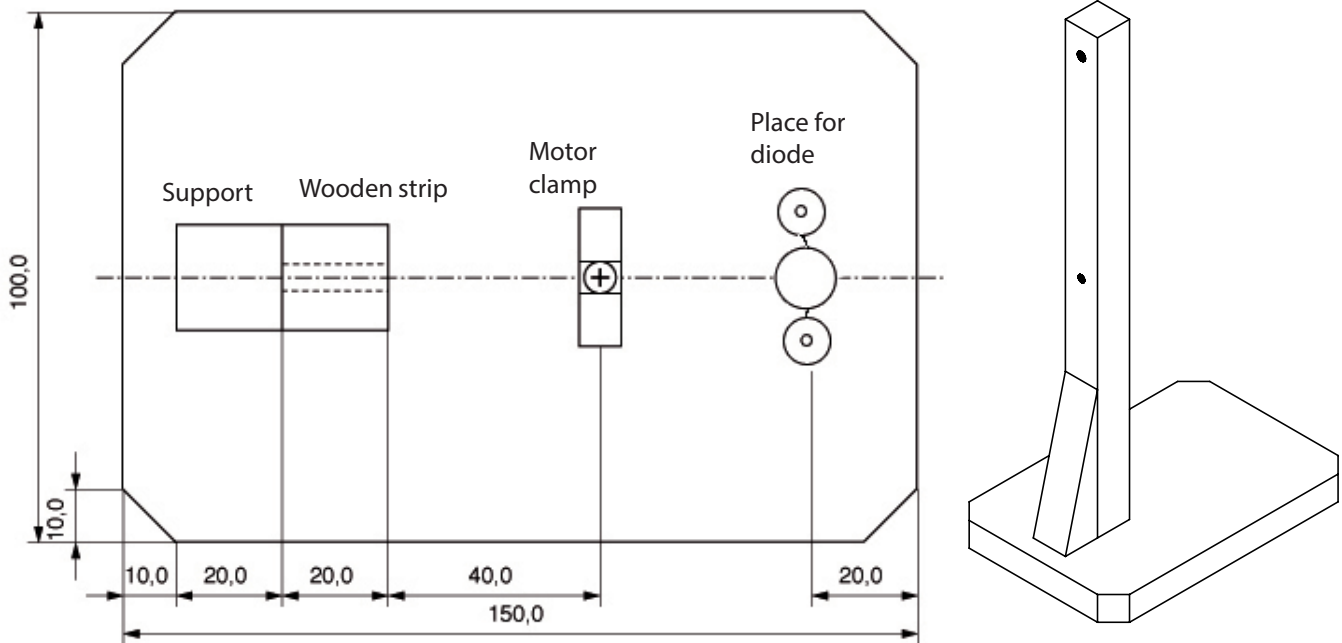
4. Insert a bearing sleeve 6/4 x 20 mm in the 6mm hole drilled in the strip.

Note: Remove any burr from the ends



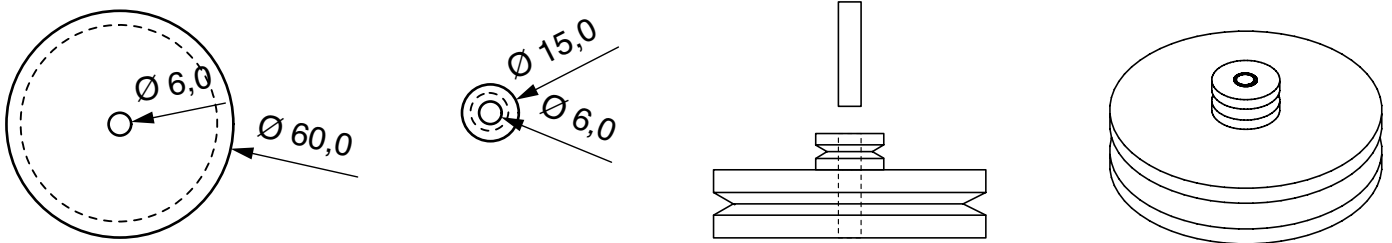
Instructions

5. Glue the stand and support on the base as shown

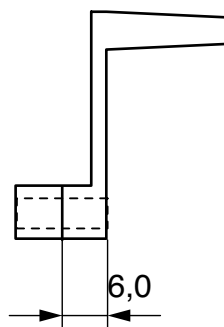


6 Drill the centre of the pulleys 15 and 60mm dia out to 6mm

7. Lay the pulleys on top of each other and glue them together so that the holes line up. Insert the 6/4 x 20 mm sleeve
Note: Remove any burr at the ends



8 Hand crank, shorten to 6 mm

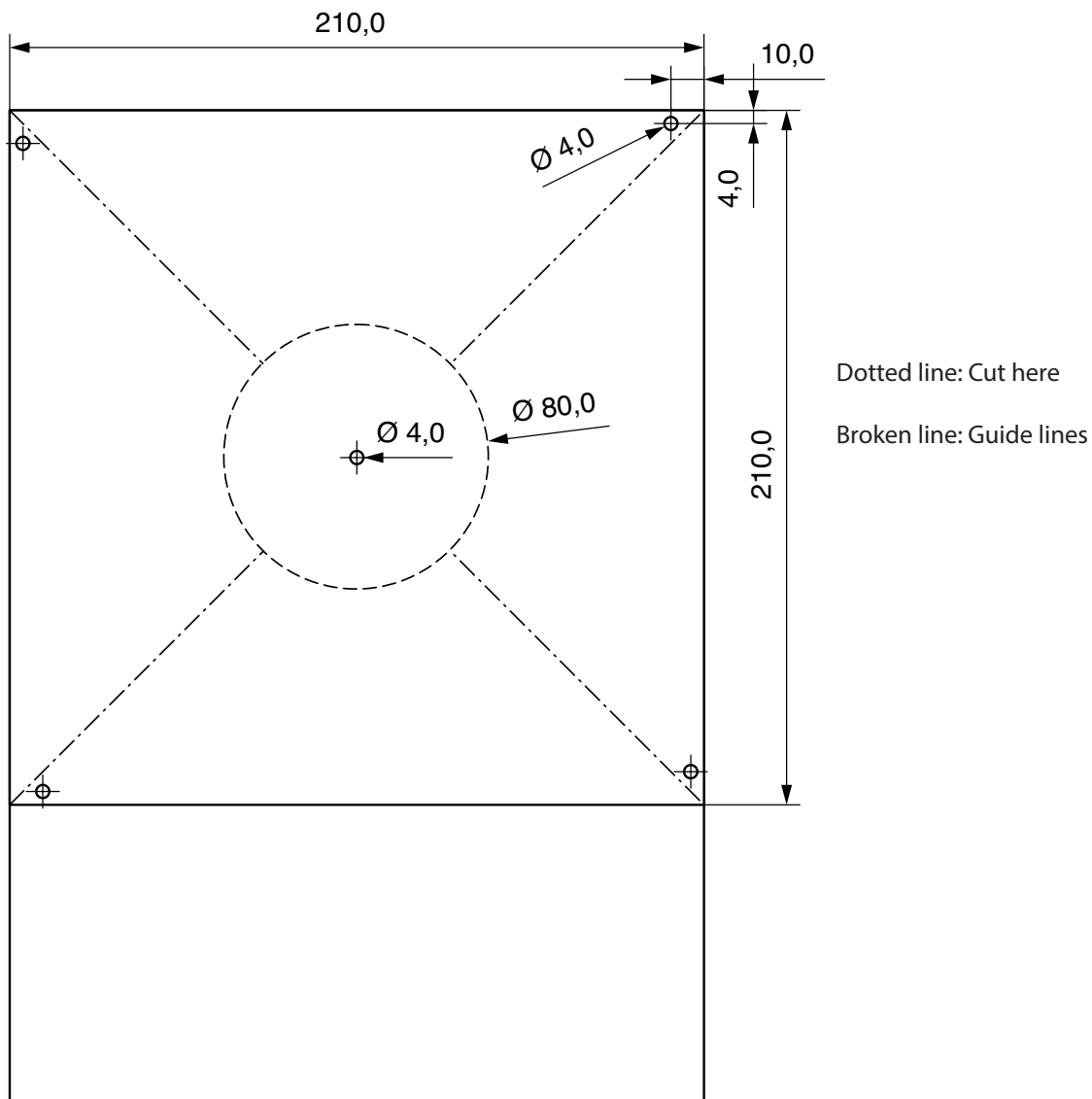


9. Insert the reducer in the second 15 mm pulley



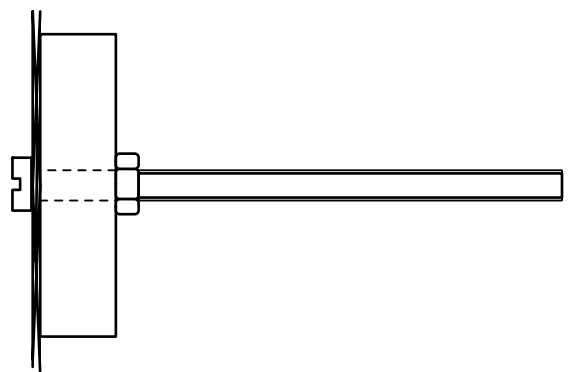
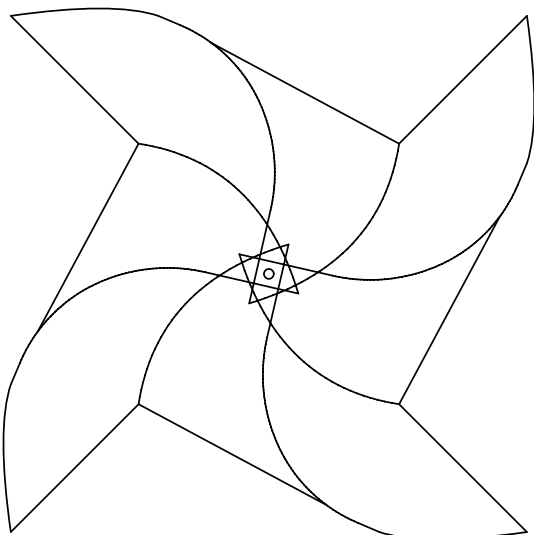
Instructions

10. Cut the plastic foil for the sail into a square as shown. Mark out the diagonals. The circle shows, where at a later stage, the cuts go. Use a hole punch to make a 4mm dia. in each corner as shown. Cut the foil down to the circle and then punch a 4mm dia. hole in the middle



11. Fold the windmill : fold all the corners with holes into the middle.
Insert the machine screw M4 x 70 through the 4mm diameter holes from the front. Slide on the $\varnothing 40$ mm wooden disc and then fix with a nut as shown in the diagram.

Note : Be careful that when tightening the nut , that the shape of the windmill is not distorted!



Instructions

12. To continue, slide a washer up to the nut. Insert the machine screw in the bearing in the stand and on the other side add a further washer and nut. Tighten and adjust the assembly so that the sail can spin freely.

Now add the single large wooden disc and tighten it with a nut. Add a further nut to make sure its tight (Contra tighten)

Note: The sail should still be able to spin freely in its bearing!

Add the hand crank and tighten it with a nut. Again use an extra nut to ensure that it stays tight

Note: The crank handle and the large pulley should be really tight with one another but the sail bearing assembly must spin freely otherwise it will not be able achieve optimal power transference

13. Add a washer to the other M4 x 70 machine screw. Insert it through the free hole in the stand. Then add another washer and two contra tightened nuts so that the screw is held tight and cannot turn. Now add a washer the two pulleys, another washer and again two contra tightened nuts
Use the nuts to adjust the pulley so that it can spin freely

14. Fix the motor clamp to the base as shown (Page 3) with the 3 x 12mm chipboard screws
Take the black cable from the motor (+) strip the insulation from the end and wind the wire around the Anode (Longer leg of the LED or red cable)
Take the red cable (-) from the motor ,strip the insulation and wind the wire around the minus leg of the LED (shorter leg or black cable). Fix the light diode with 2 drawing pins to the base as shown

Push the pulley and reducer on the the motor shaft Slide the motor in the clamp

Note: Note there is no electricity flowing between the parts (current)!

Stretch the rubber bands over the pulleys (first the top and then the bottom)

Turn the crank handle, then the LED lights.

Note: The faster you turn the brighter the Diode!

LED does not light: - Check all the contacts
- LED correctly polarised (step 14)

