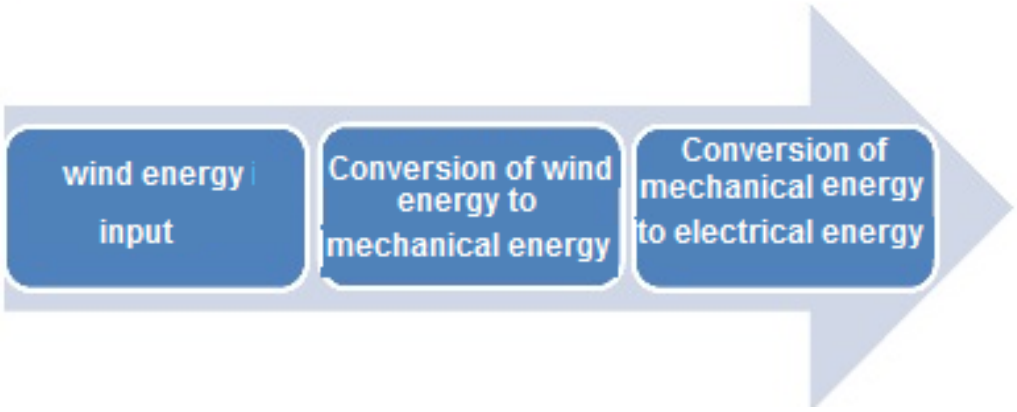
Department
TECHNOLOGY

Subjetc: Science and Technology	**Level:** ESO

Wind generator

1ª part



Work group:

Conceptos del proyecto

TECHNOLOGY

↓

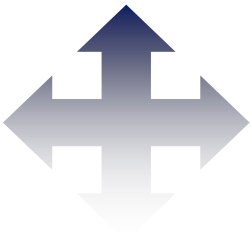
AUTOMATIÓN

↓

GROUP WORK

↓

NEW MATERIALS AND ELECTRONICS COMPONENTS, ENERGY



Problem and theoretical framework

To carry out this Project we study the energy conversion processes, the principles of operation of a machine in terms of energy conversion, the operation of an electric motor, energy types, principles of electronics, why and how you can take advantage the wind energy.

We build a wind generator and to make its parts, we mainly use wood and only some components of metal and / or plastic. Among the main problems to make a design we must ensure that the friction forces are very low, since there there is a lot of energy lost there.

For the construction of the project it is convenient previously to perform various experiences and investigate electricity and electronics laws and principles, to reach our goal.

The dependence on polluting energy sources is having severe environmental consequences, that is why we should use alternative energy sources such as wind power which is a renewable energy source, to reduce the use of polluting energy sources. From this arises the project idea, thinking about it's a challenge for science and technology, the developing of the elements that help the humans the use of renewable energy, here we do it on a small scale and study the relationship that exist between wind power and the uses that we can carry out, like turning on a LED diode.

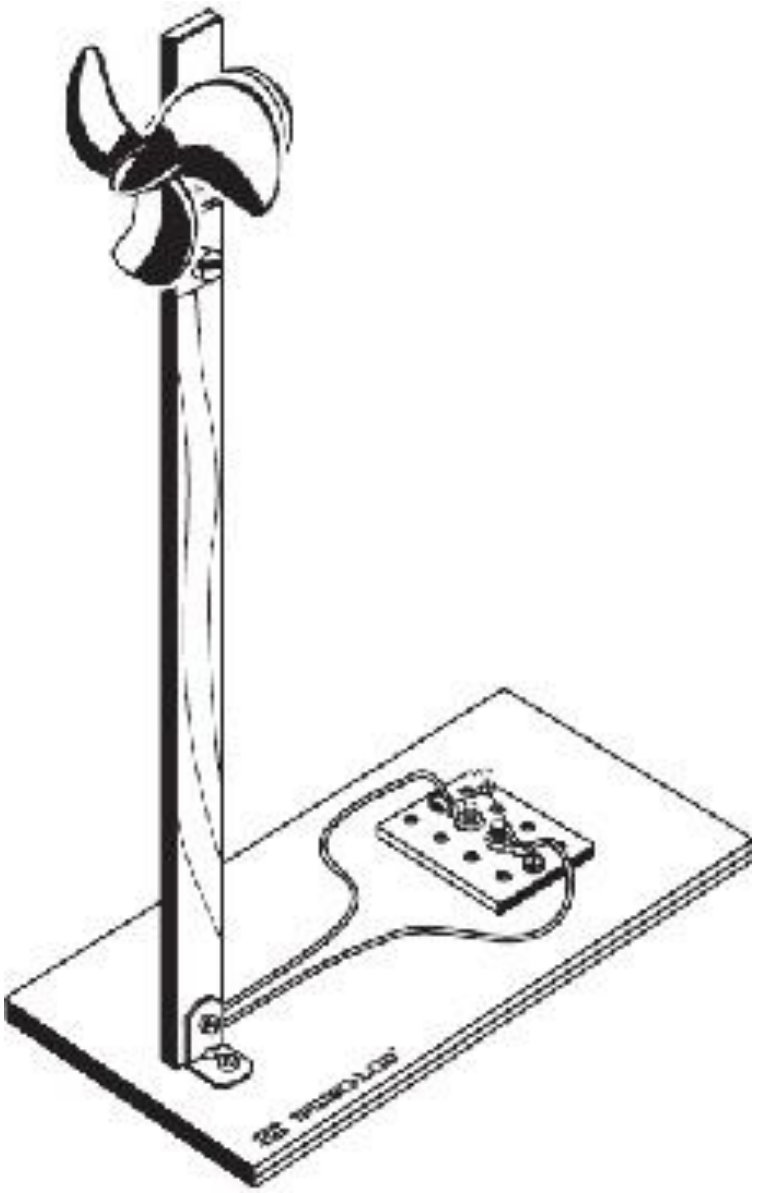
OBJECTIVES

- Building a mechanism that generates electricity through wind action, that is, a wind turbine or a wind generator. Understanding the principles of energy conversion.
- Defining the configuration and proper assembly of the device so that it is functional.

Operation

When there is some wind or you blow on the propellers, electricity that lights a LED that is connected to the motor terminals is generated. In this system the movement produces electricity.

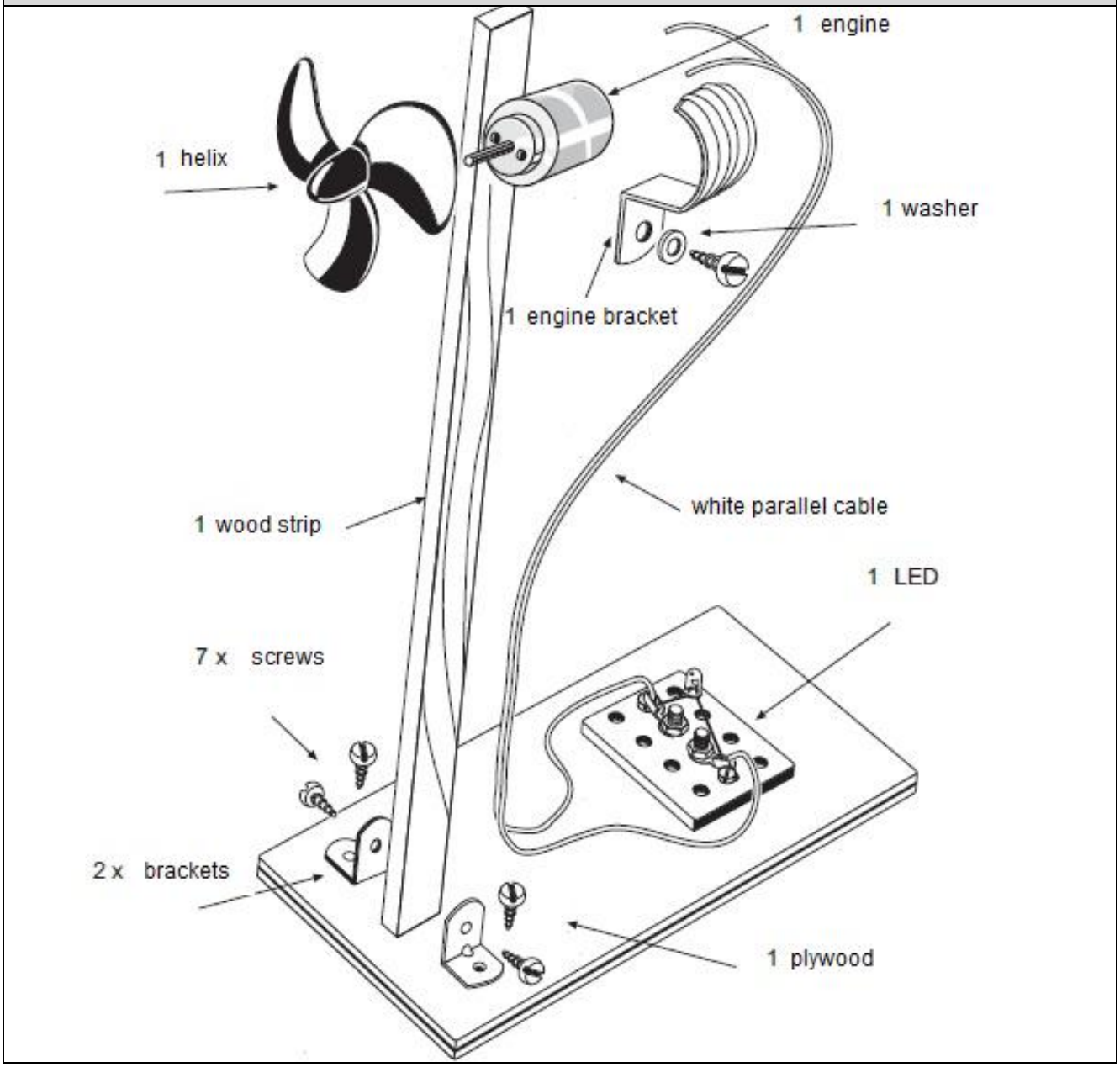
The LED diode needs 2.3 volts to be lit. The battery provides 1.5 v. the remaining voltage, to be lit, we need the action of the wind is obtained, because the DC electric motor, by applying movement, electricity is generated.



Bill of Materials

1 Solar engine
1 Three helix propeller
1 Plywood 12 x 24 cm
1 Strip wood 2 x 24 cm
2 Squads 2 cm
7 Self tapping screws
1 Washer M4
1 Clamp engine
1 Diode LED
Metro 1/2 white parallel cable
1 Cardboard 12 x 24 cm
Project sheet

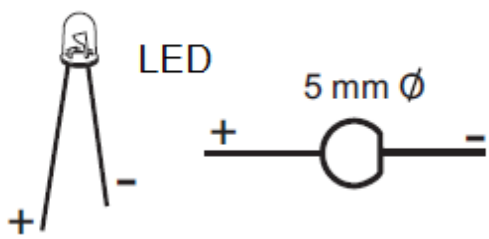
Construction



Electrical circuit

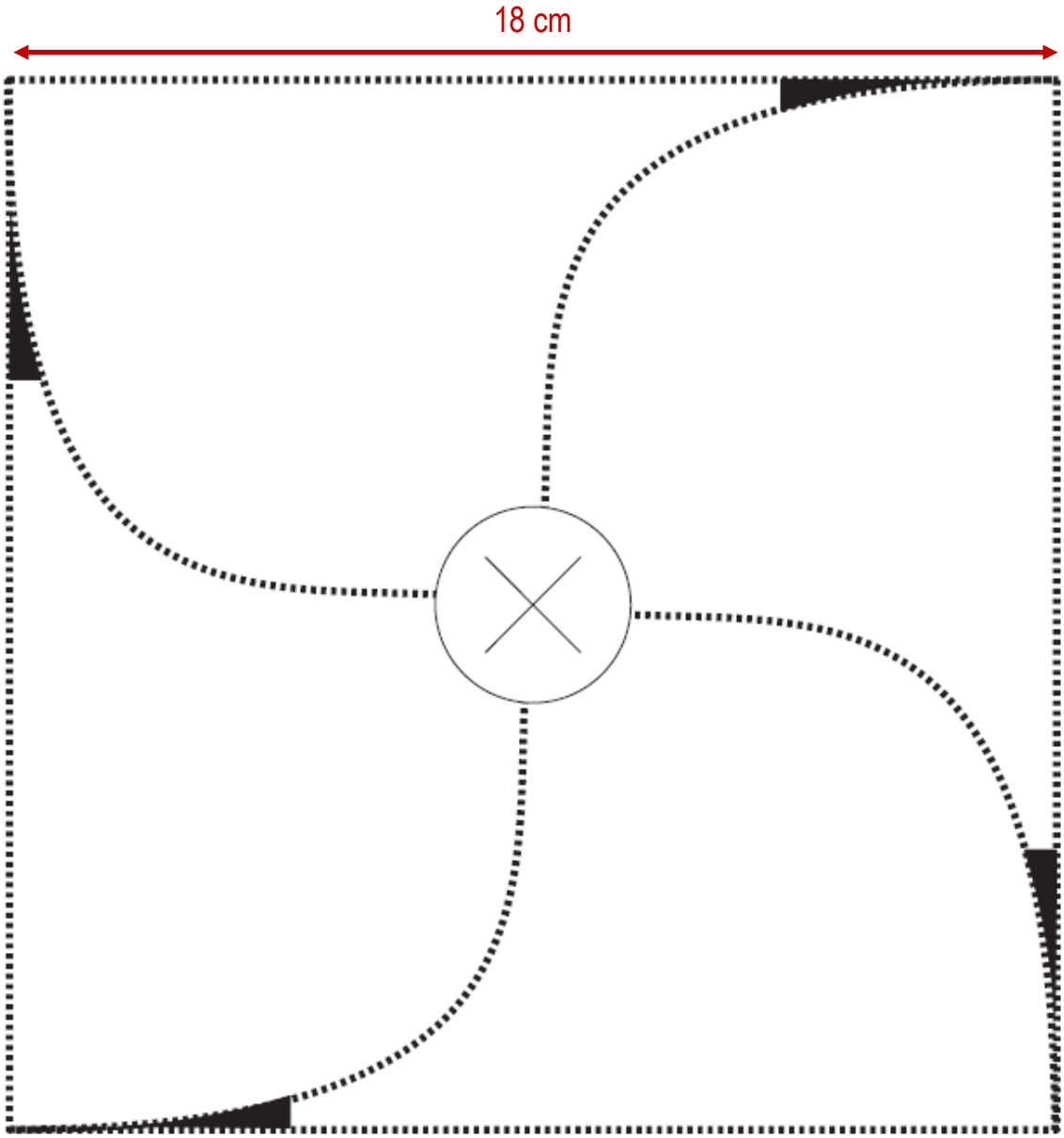
- Checking with a multimeter the motor polarity, which is the positive terminal and which one is the negative to connect the Led diode properly.

- Connecting the red lead of the multimeter to a motor terminal and the black lead to the other terminal, puting the meter in volts and blowing; if it is properly marked it means that the red lead terminal is positive and the other one is negative, but if the meter marks negative values it means they are connected backwards.



Practicalities and extension activities

- The set lends itself to be decorated according to the creator's imagination (paint, varnish ...).
- No batteries required.
- Level of difficulty: Easy
- Approximate build time: 1 hour.
- We can build a helix with cardboard or plastic (sheets separator), such as a grinder using the pattern bellow. Once cut by the broken line, join the shaded ends to the center:

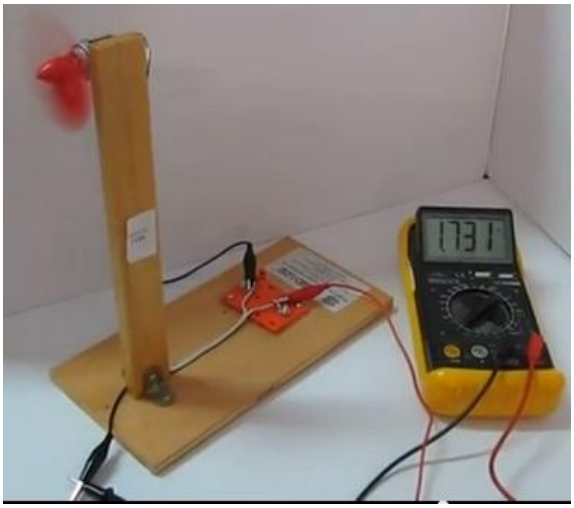


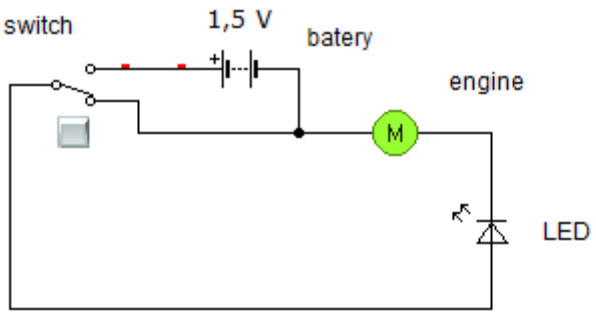
Tools

- Screwdriver	- Strippers
- Auger	- Pencil / rule
- Glue	- Hammer
- Welder / tin	- Scissors
- Pliers	- Cables

Testing

- Checking the LED connections. The LED just lead in one direction; it's connected in reverse, the model won't be lit.
- Using different winds: Hiss, bellows, natural wind, fan, manipulative thrust of the propeller ...
- Replacing the LED by an ammeter in series with the motor, them you can see a needle swing according to the intensity of the wind on the propeller.
- Connecting the terminals with a tester and waching the voltage variation with the blow..
- Performing tests in a dark room, to highlight LED lighting.





- Assemblyng the scheme .
- Analyzing the variation that occurs in the operation.
- Performing measurements with the multimeter.
- Analyzing the result.

¡A good job¡

	***Department TECHNOLOGY***
Subjetc: Science and Technology	***Level: ESO***
Wind generator	

Specification

2ª part

Documents:

1. **DESIGN GROUP**
2. **PROCESS SHEET**
3. **ALLOCATION**
4. **ELECTRICAL CIRCUITS**
5. **ASSESSMENT FORM THE PROPOSAL**

Work group:	
Nº	Name

1. DESIGN GROUP

BRIEFLY EXPLAIN THE OPERATION INTENDED

GROUP	**Date**

PROCESS SHEET Nº					
Order construction	**Sketch of the part or element**	**Part Name element**	**Measures of the piece**	**Materials needed**	**Tools Needed**

PROCESS SHEET Nº					
Order construction	**Sketch of the part or element**	**Part Name element**	**Measures of the piece**	**Materials needed**	**Tools Needed**

ALLOCATION AND FUNCTIONS OF GROUP NNº:

Nº	NAME	RESPONSIBILITY

LABOUR ORGANIZATION

Nº	TASK / FUNCTION	STUDENT	TIME

ASSESSMENT FORM THE PROPOSAL

	5	4	3	2	1
Did you find the proposal easy					
Did you find it interesting					
Do you think it was clear					
What resources have been helpful for you:					
- The Teacher's Interventions					
- The group's discussion					
- Films, videos, maps ...					
- Operations and machines analysis					
- The observation of the environment					
- Conversations with others groups					
- Others					
Did you find the duration of the proposal appropriate					

(5 Too much, 4 Much, 3 Normal, 2 Not much, 1 No)

SUGGESTIONS FOR IMPROVING THIS PROPOSAL OR FUTURE ONES