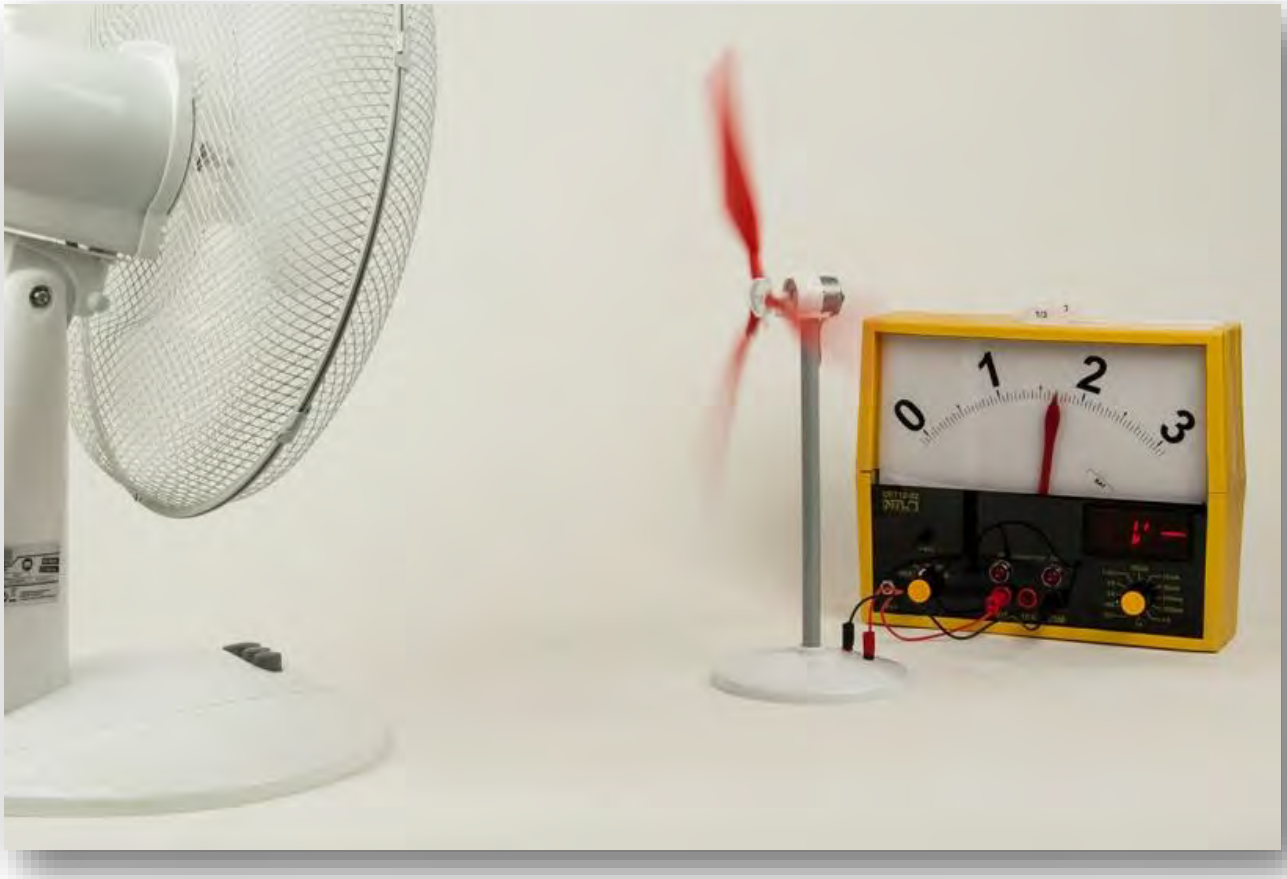
WIND TURBINE

MED 12.04



Material:

ItemNo	Qty	Description
P2840-2W	1	Wind turbine 02
DE712-02	1	Unversal multimeter "inno" II
P2842-1V	1	Fan, table top unit, D=40 cm

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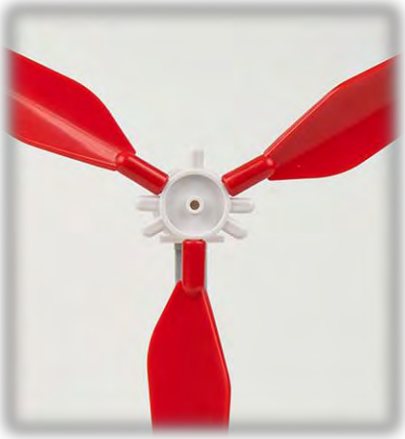
Purpose:

Explain the principle and operation of a wind turbine with generator. Conversion of wind energy into electrical energy.

Setup:

Three rotor blades are attached to the hub of the wind turbine at an angle of 120° each.

The hub is held in place with one hand, while the rotor blades can be attached to the corresponding knobs.



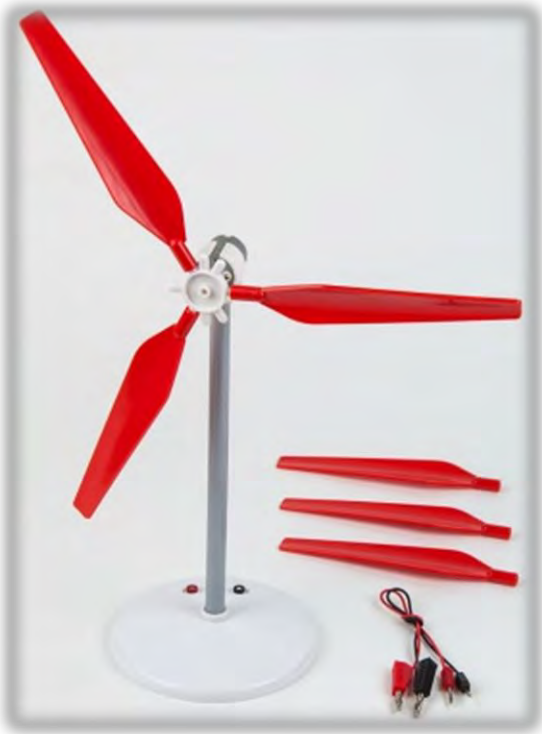
The angle of the rotor blades must be taken into account when attaching them.

The measuring range of 3 V DC is set on the measuring device.

The two cables are connected with the 2 mm plugs to the output sockets on the base plate of the wind turbine. The other ends of the cables are plugged into the corresponding sockets on the measuring device.

A fan is set up about 50 cm in front of the wind turbine. The hub of the wind turbine and the fan should be about the same height.

If this is not the case, the fan must be tilted accordingly to achieve optimum results.



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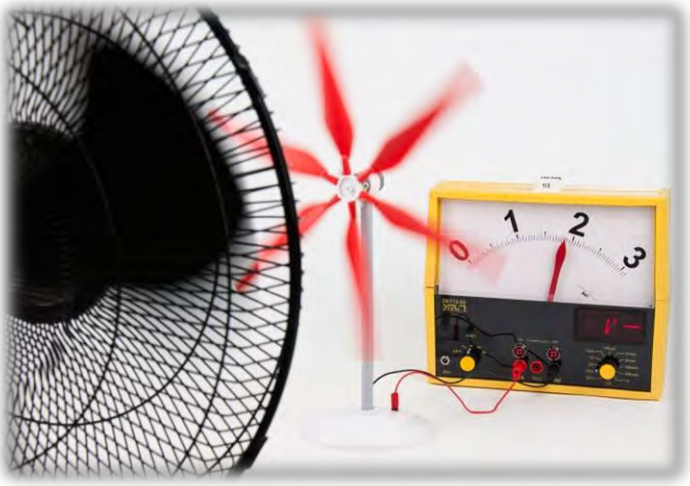
Experiment:

The fan is switched on.

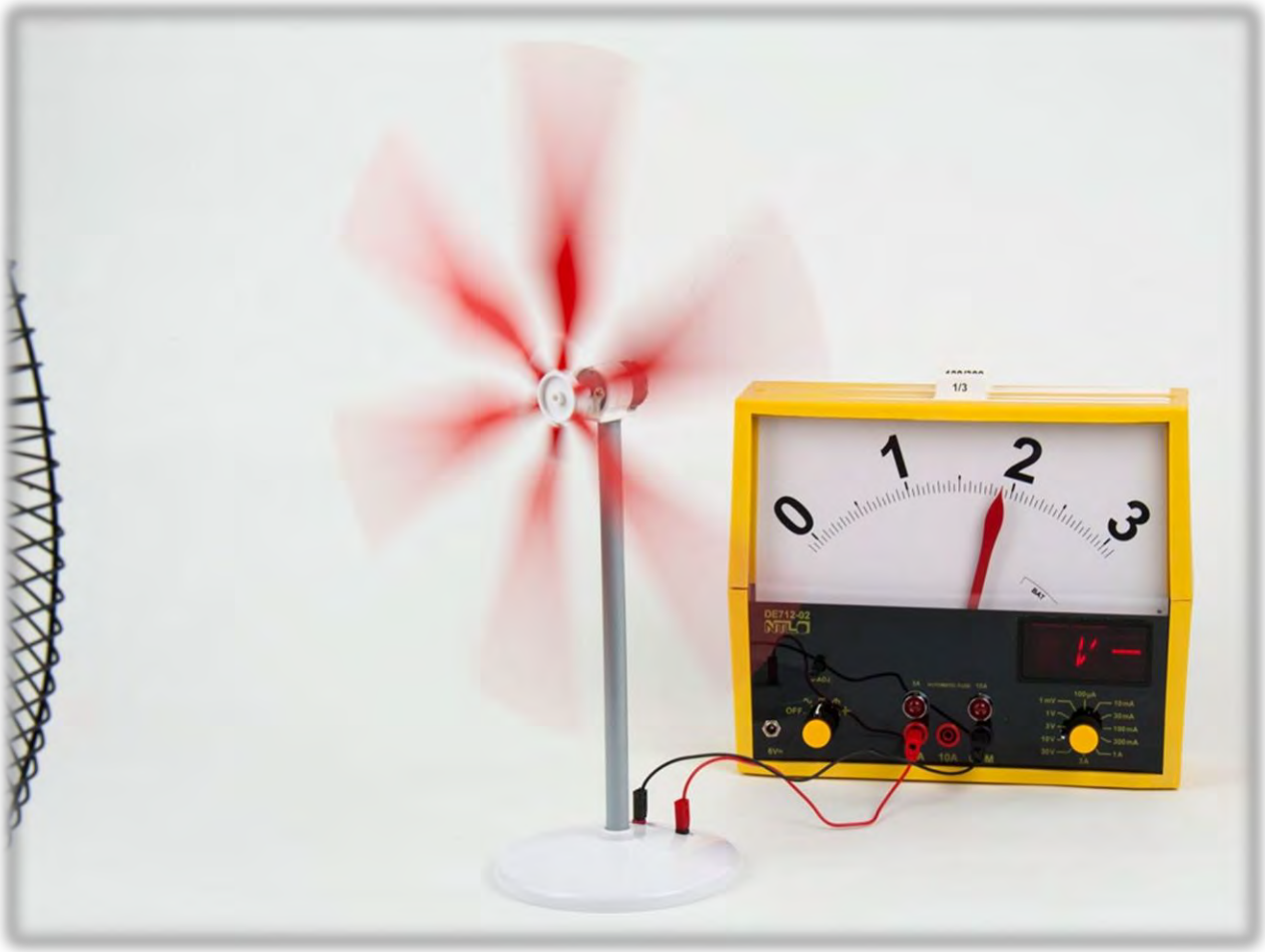


Result:

The wind generated by the fan drives the wind turbine.
The generator on the wind turbine converts the kinetic energy into electrical energy, which is why a voltage is displayed on the measuring device.

As we are operating a DC voltage generator, it may be necessary to reverse the polarity of the two cables.

If the fan has several speed levels, this can be used to change the wind speeds. A higher speed generates a higher wind speed, which in turn causes a higher voltage at the generator.



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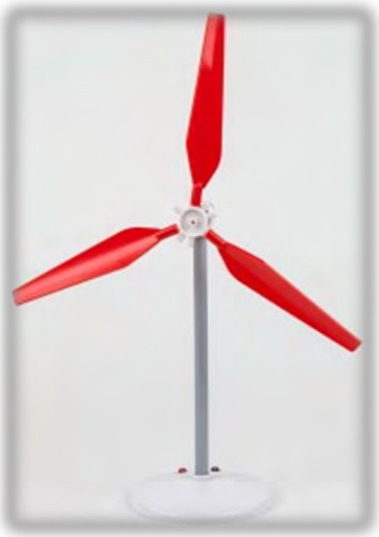
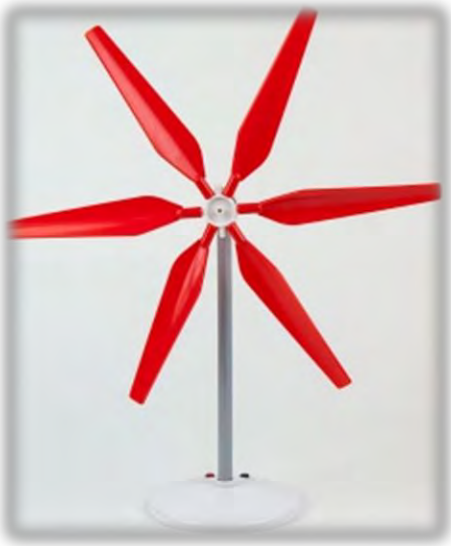
Additional experiments:

The hub of the wind turbine allows either 3, 4 or 6 rotor blades to be attached.
This makes it possible to analyse whether or not several rotor blades produce a more effective result.





Note:

Wind energy has become an important alternative for reducing CO2 emissions worldwide.
The advantages and disadvantages of wind energy can now be discussed.