

Wind Turbine Information Sheet (1)

Below is a cut-away drawing of a wind turbine, showing the main parts. The wind turbine at the school looks slightly different to this, but the way it works is the same.

If you are using an electronic version of this Information Sheet, you can use the link below to take you to a wind power animation

HYPERLINK "http://www.eere.energy.gov/consumerinfo/animations.html"
<http://www.eere.energy.gov/consumerinfo/animations.html>

How a wind turbine works

A wind turbine works the opposite of a fan. Instead of using electricity to make wind, a turbine uses wind to make electricity.

The main parts are:

The **blades (1)** form part of the **rotor (2)**. Most wind turbines have 2 or 3 blades. The Proven turbine at the school has 3 blades. Wind blowing over the blades causes

the **rotor (2)** to rotate.

Blades can be turned or **pitched (3)** to stop the **rotor (2)** turning in winds that are too high

A **brake (4)** can be used to stop the turbine in emergencies.

The rotor turns the **low-speed shaft (5)**. The speed this shaft rotates at is too slow to produce electricity, so it is connected to a **gear box (6)**

The **gearbox (6)** connects the low-speed shaft to the **high-speed shaft (12)**, which increases the speed to about 1200 to 1800 revolutions per minute.

The **high speed shaft (12)** drives the **generator (7)**, which produces electricity, which is sent to the school.

The **controller (8)** starts the turbine and stops it when the wind speeds are too high, to prevent damage to the blades and the tower.

The **anemometer (9)** measures the wind speed and sends this data to the **controller (8)**. The school wind turbine does not have an external anemometer.

Some turbines have a **wind vane (10)** that measures wind direction to make sure the turbine always faces in the correct direction. The school turbine does not have a wind vane

The drawing shows an **Upwind** turbine, where the **rotor (2)** faces the direction of the wind. This type of turbine needs a **yaw drive (13)**, to keep the rotor facing into the wind as the wind direction changes. The **yaw drive (13)** is powered by a **yaw motor (14)**

The school turbine is a **Downwind** turbine, where the wind blows from behind the rotor. This does not need a **yaw drive**, as the wind changes the direction of the rotor

The Tower (15) of the school turbine is made from tubular steel.

The working parts are covered by a **nacelle (11)**

