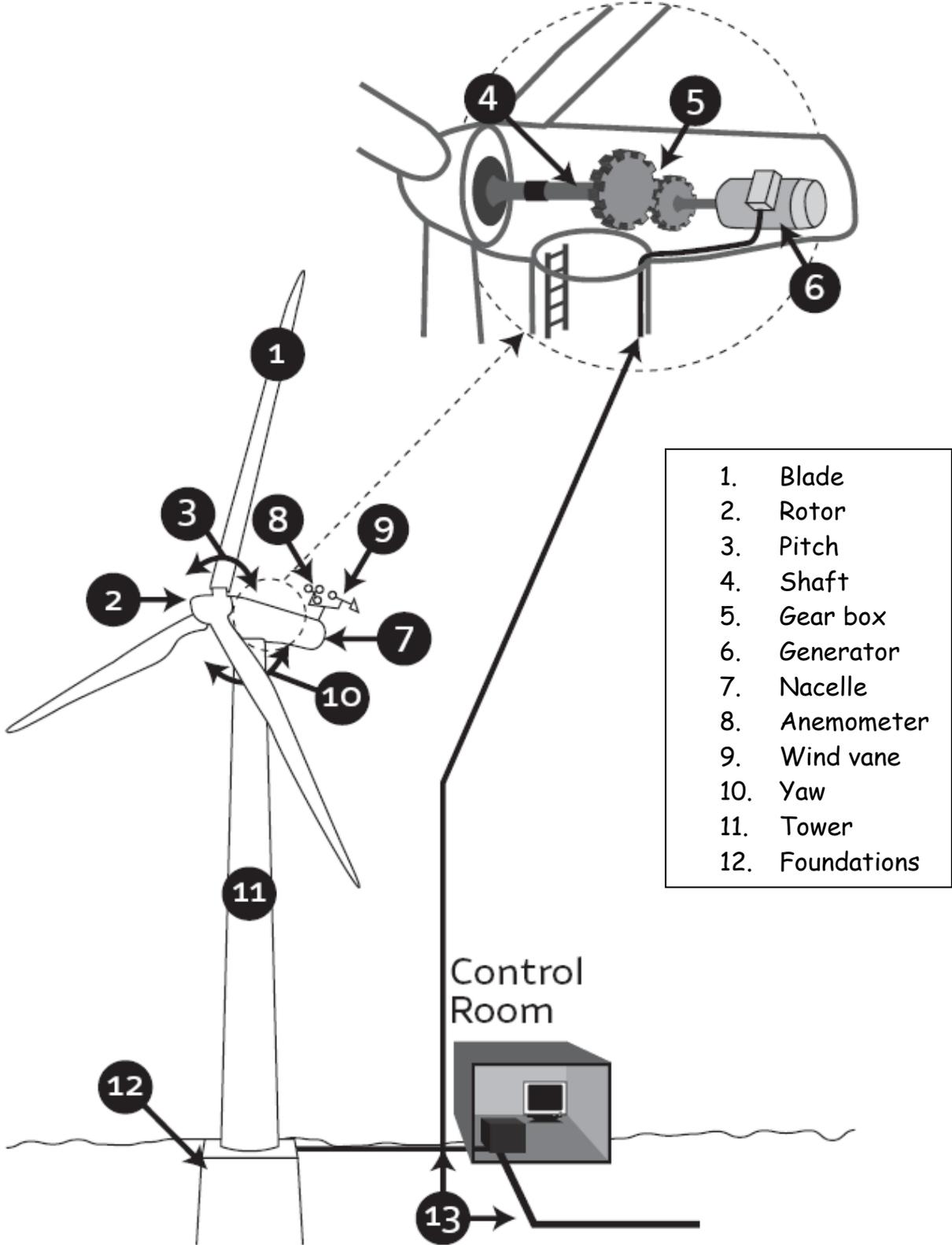


Sheet 7 - The Wind Turbine



Name:

Date:

Sheet 8 - How a Turbine Works

Look at Sheet 7 (The Wind Turbine) to help you match the description of each part of the wind turbine to the names below:

| Description | Name |
|--|-------|
| The large tall structure which holds up the wind turbine | _____ |
| These turn in the wind - there are three of them! | _____ |
| This word means "turn" and describes how the nacelle and blades turn to get the best from the wind | ____ |
| This word describes how each blade changes shape in the wind | _____ |
| This connects the rotor to the gearbox | _____ |
| This machine contains a magnet spinning inside a wire coil to generate electricity | _____ |
| This measures wind speed and sends the information to the control room | _____ |
| These are wires which carry the electricity from the turbine | _____ |
| This is a pod which contains all the working parts of the turbine | _____ |
| The three blades are attached to this and it moves round and round | _____ |
| This stops turbine towers from falling over! | _____ |

cables nacelle anemometer tower shaft rotor
pitch generator foundations yaw blades

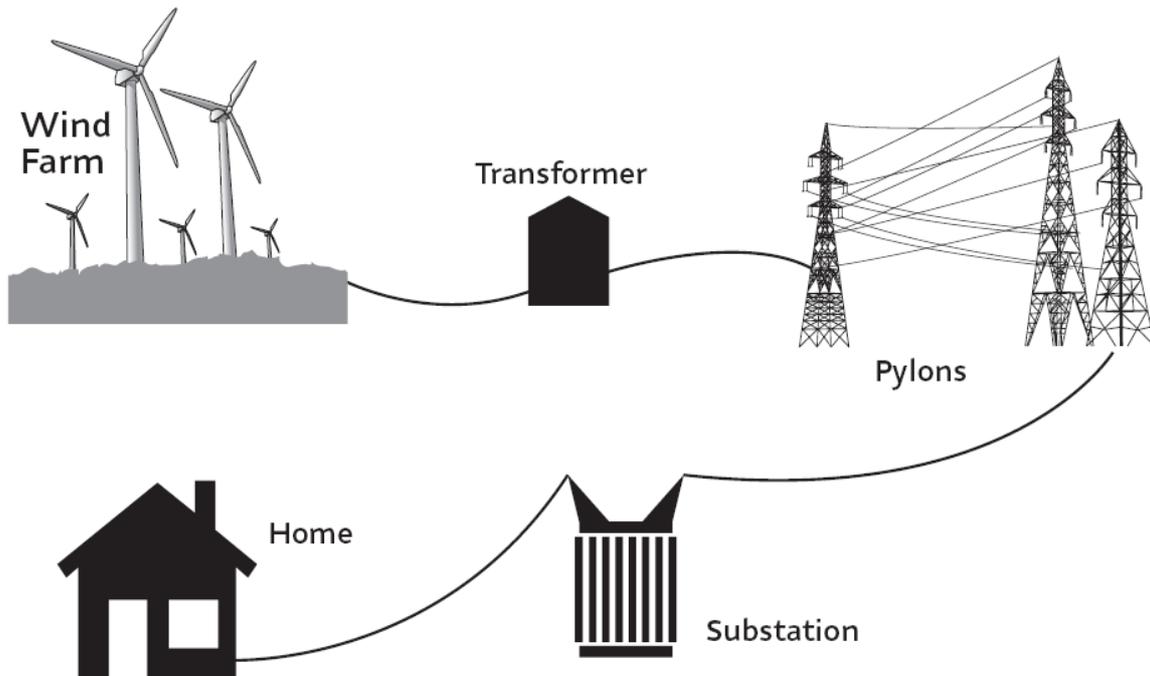
Name:

Date:

Sheet 9 - From the Wind Farm to our Homes

Electricity has to travel from the wind farm to our homes.

- Look at the diagram below which shows the route the electricity takes.
- Cut out the sentences below and put them in the right order - the first one is in the right place.



Firstly, the electricity is generated at a power station.

The blades spin a generator.

This power station is called a wind farm.

High voltage electricity flows from pylon to pylon across the countryside.

Cables carry electricity to a transformer which changes the low voltage electricity to high voltage electricity to make it travel better over long distances.

The electricity flows away from the wind farm along thick wires (cables).

Lastly, cables carry the electricity from the substation to our homes.

Inside the generator, a magnet spins inside a coil of wire to generate electricity.

In substations, the high voltage electricity is changed back to low voltage electricity because we can't use high voltage electricity in our homes.

The wind spins the wind turbines' blades.

Name:

Date:

Sheet 10 - Thinking about the Wind

Wind blows from an area of high pressure to an area of low pressure. You can show this using a balloon:

- Blow up the balloon and hold the opening closed
the air in the balloon is now at high pressure
- Release the air by letting go of the opening
the air rushes out like a wind into the room (an area of low pressure)

We can't see the wind but we can see its effects - good and bad!

- Write or draw something that tells you that the wind is here.



Now wind can be used to generate electricity in wind turbines.

- Can you think of two other ways in which wind is used by people nowadays or in the past?



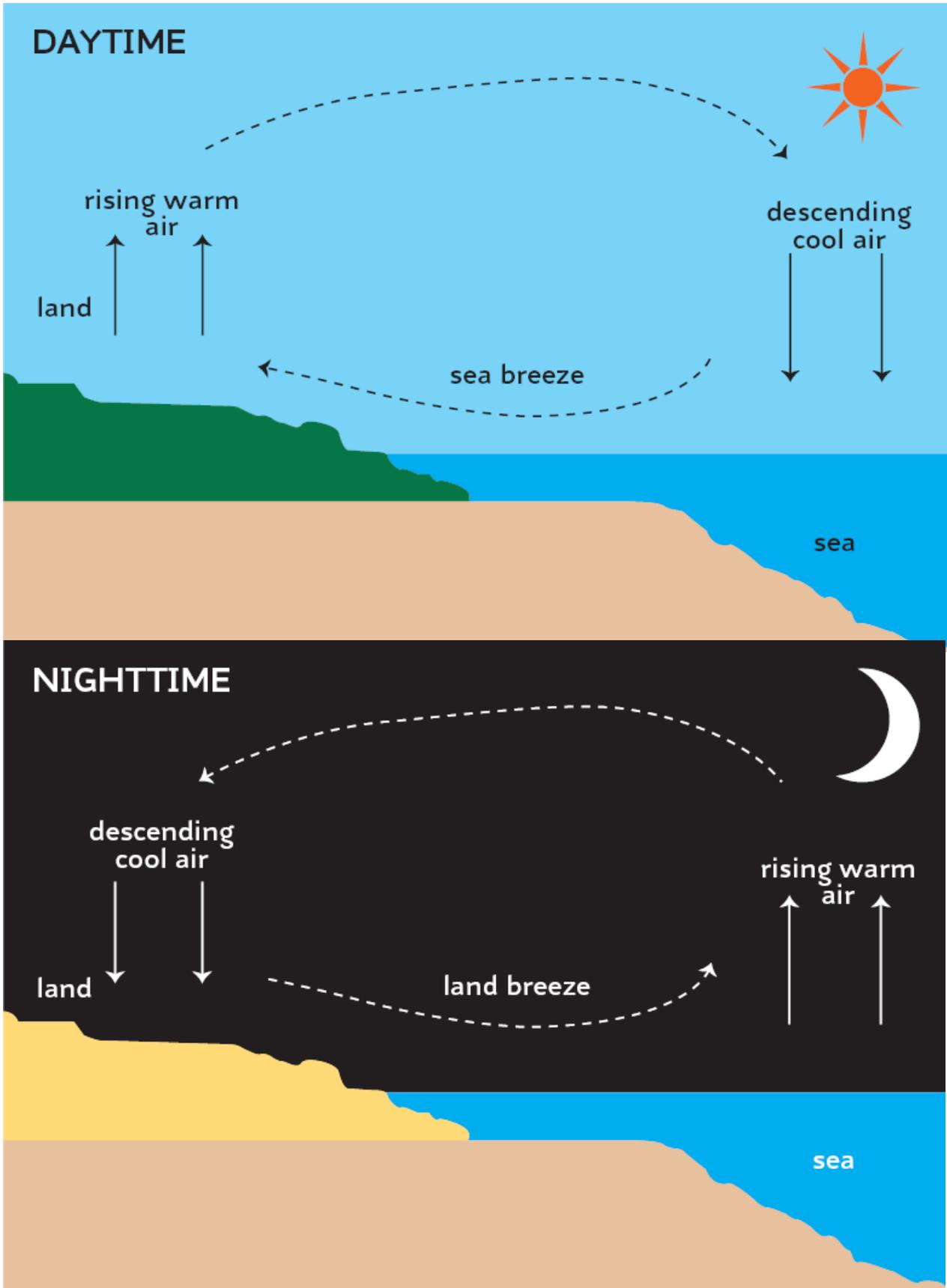
| | |
|----|----|
| 1. | 2. |
|----|----|

Generating electricity from the wind is good for the environment as it doesn't make carbon dioxide or pollute the air but there are challenges to face.

- Can you think of any disadvantages of wind turbines for energy companies or other people?



Sheet 11: Where does wind come from?



Sheet 12 - Teacher Activity: It's a Blow Out!

How is the wind made? The following activities can help to show this.

1 - Land and sea

- Fill identical trays, one with sand and the other with water (land and sea)
- Leave to acclimatise overnight
- Place a thermometer or probe in each and note temperature
- Place identical desk lamps in the same position over each tray and leave on for at least 2 hours
- Take temperature readings again
- Which is higher, land or sea temperature?

2 - Hot air rises!

- Remove the shade of a table lamp (normal bulb)
- Put a small amount of talcum powder on the top of the bulb
- Switch on the lamp
- Note the movement of the powder, it should rise as the bulb heats up.
- Switch off the lamp to see the air falling.

3 - Make the wind

- Place a fan heater in a small anteroom or cupboard (check for safety!)
- Leave on until the room is heated then switch off but leave door closed. Hold a lighted candle up to show the steady flame.
- Open the door and let the air settle
- Hold a lighted candle at the top of the doorway and ask your pupils to look at the flame.
- The flame should point to the cooler room as wind is created at the top of the doorway as warm air is coming into the cooler room and rises
- Now hold the candle at the bottom of the doorway. The flame should point to the warmer room. As the warmer air rises, it makes way for the cooler air to blow in underneath to the warmer room.

4 - Diagrams and web activities

- The diagrams on sheet 12 can be used to show the development of wind in the day and night time
- Pupils can find out more at:
 - www.windpower.org/en/kids/choose/wind/index.htm
 - Then click on Where does wind come from?
 - Then click on Wind and the troposphere
 - Then click on Warm air floats towards the poles