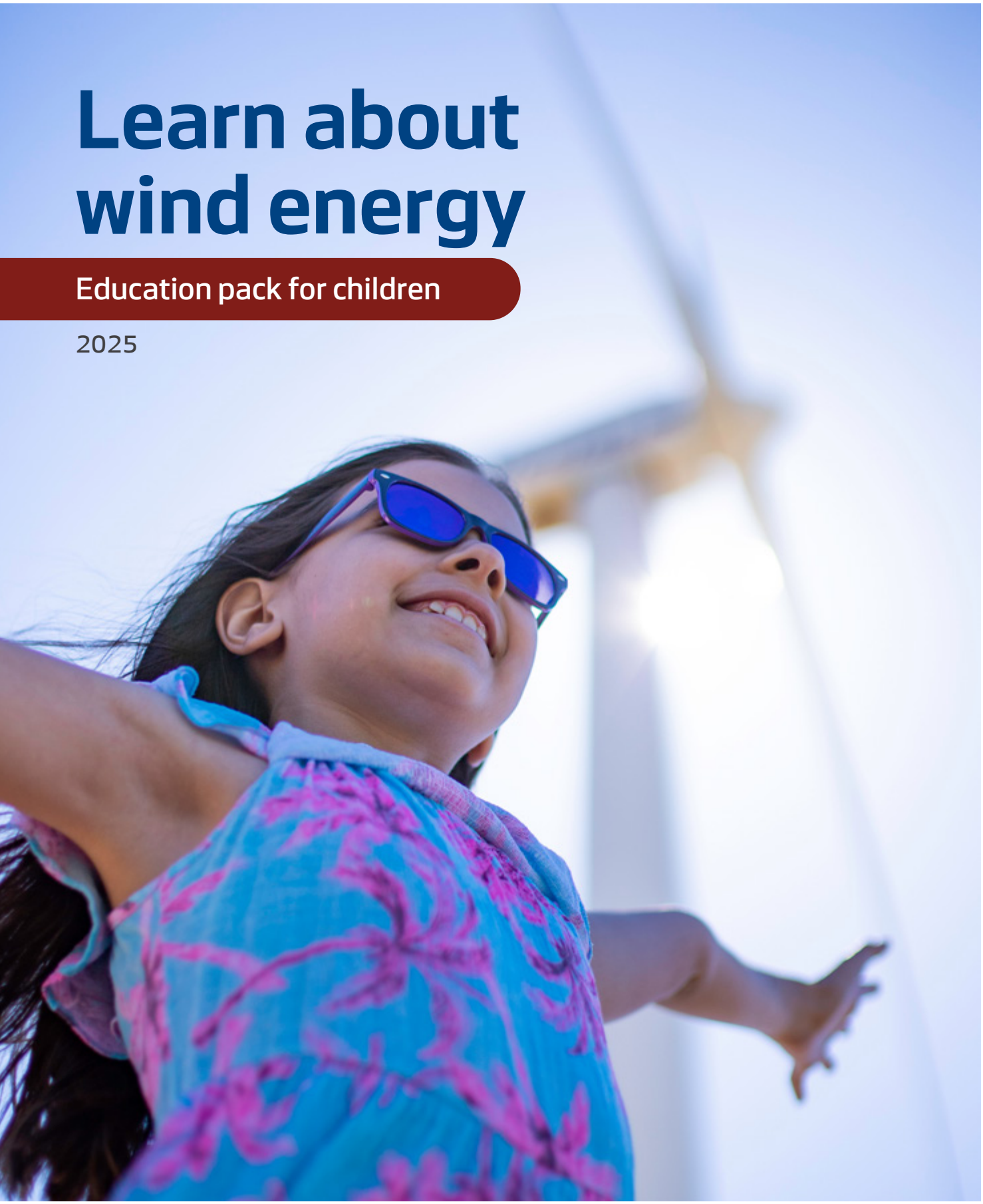
Cleve WIND FARM

Learn about wind energy

Education pack for children

2025



What is the wind and what causes it?

What is the wind?

Wind is air in motion. Can you think of three signs of wind?

Activity 1

Can you think of three signs of wind?

Tip: think about ways you can see, feel or hear the wind.

1 _____

2 _____

3 _____

Try this!

Take a deep breath in and blow it all out. You just created wind! You could use the energy in this small burst of wind to perform small tasks, such as blowing out a candle or making a fan turn.

What causes wind?

Wind is caused by differences in air temperature. When the Sun rises in the morning, it heats up the land, and as the land warms up, it heats up the air above. This warm air rises, and cooler air moves in to take its place. This air movement is what we feel as wind!

In Australia, this air movement is often very noticeable at the coast. In the morning, air above the land heats up faster than air above the ocean. This creates a difference in air temperature between the land and the sea. As the air over the land starts to rise, air from the sea moves in to replace it. This is what we sometimes call a "sea breeze". You can see that in the first picture on the next page.

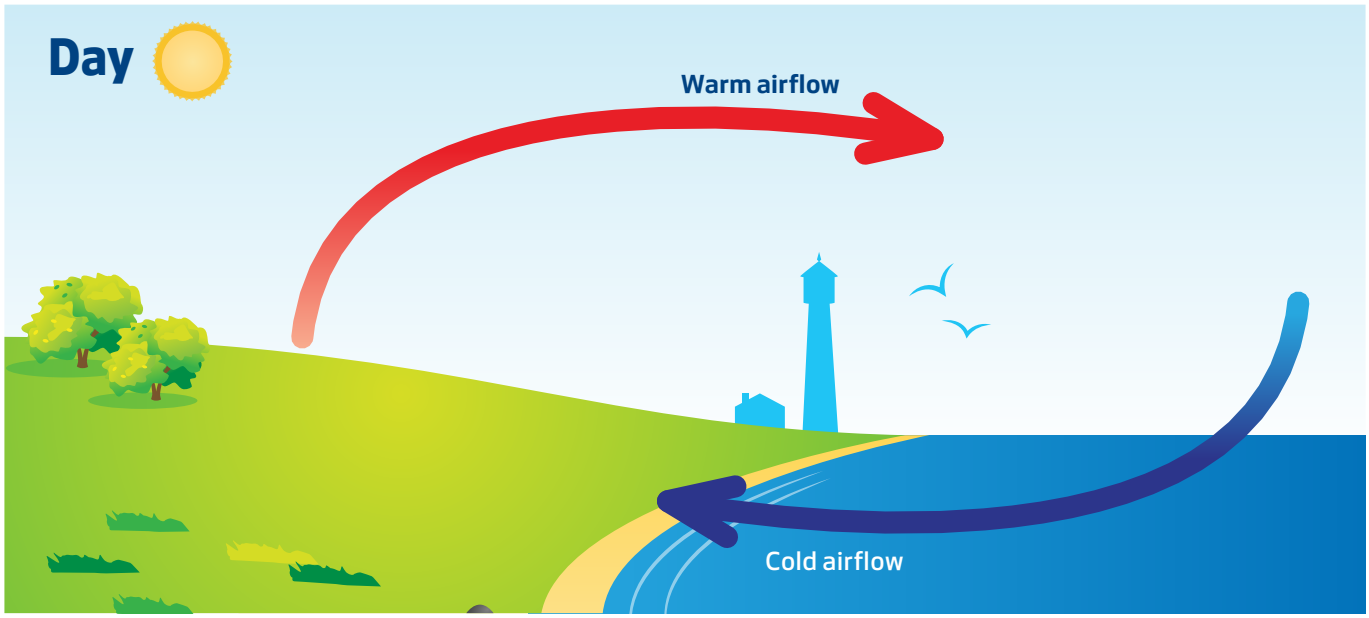
At night, the situation is often reversed. As the Sun goes down, air above the land starts to cool, and it cools much faster than the air above the ocean. When this happens, we actually get air moving from the land to the sea, and we call this a "land breeze". You can see this in the second picture on the next page.

In both cases, we feel this air movement as wind. You could even think of the wind as nature's way of redistributing heat around the Earth!

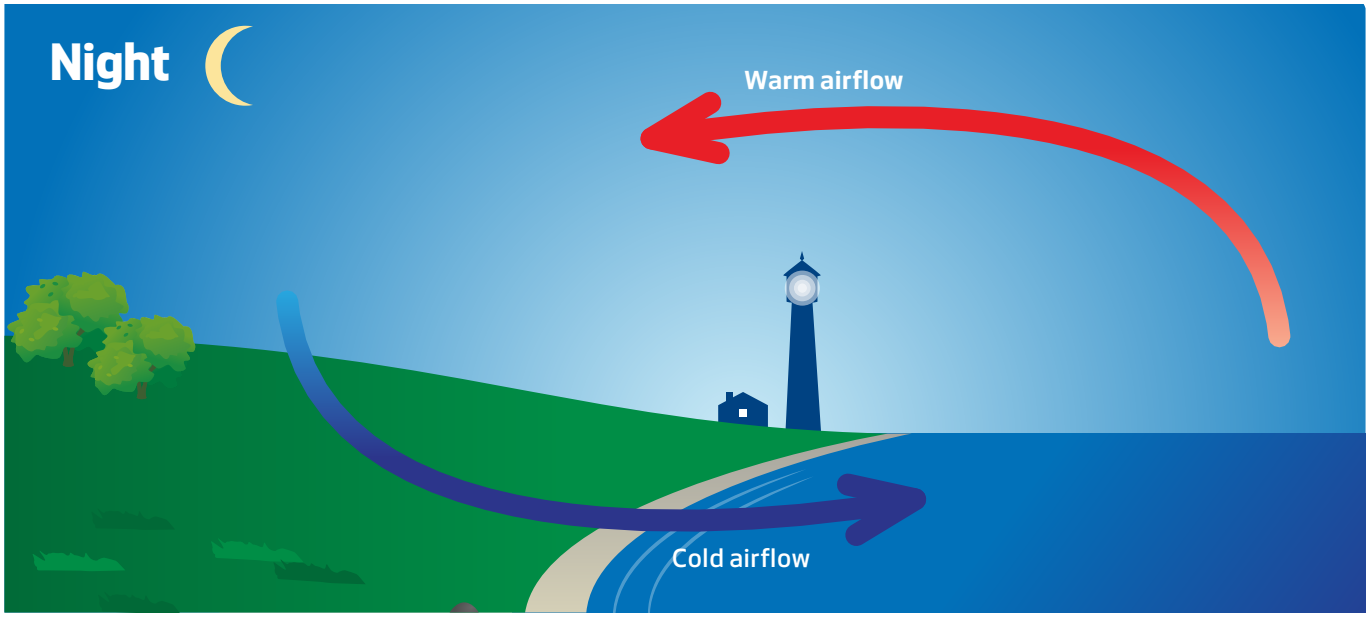
Activity 2

Can you circle the correct words?

During the day, the air above the **land/sea** is warmer than the air above the **land/sea**. The warm air **rises/falls** and is replaced by the cold air coming from the sea. We call this a sea breeze.



During the night, the air above the **land/sea** is warmer than the air above the land/sea. The warm air **rises/falls** and is replaced by the cold air coming from the land. We call this a land breeze.

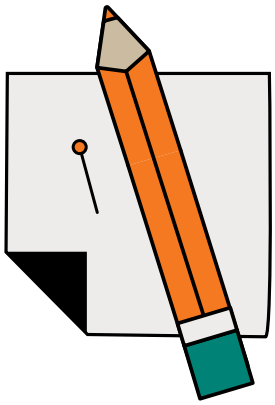


Wind in the natural environment is capable of doing big jobs. For example, it can help boats sail the seas, help fly a glider plane or it can be harnessed to produce electricity.

Optional activity

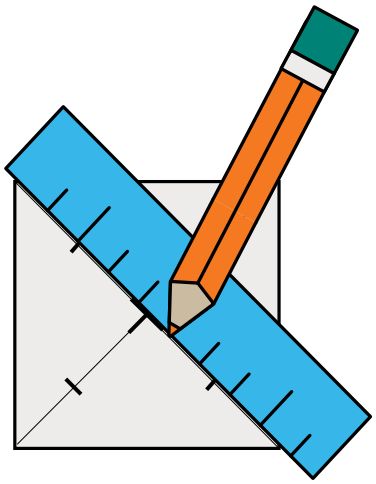
Making fan turn

You can make your own fan turn by creating a fan out of a piece of square paper, a pencil and a needle.



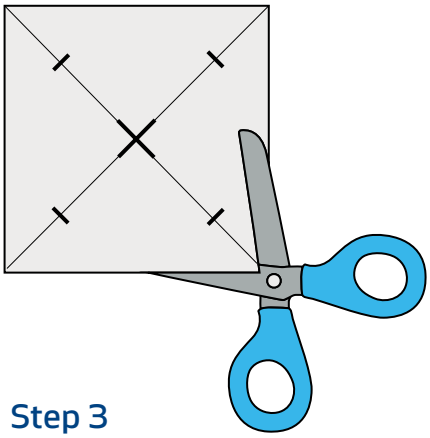
Step 1

Find a piece of square paper, pencil (with eraser) and a needle pin.



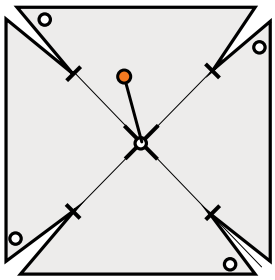
Step 2

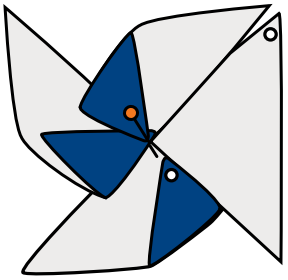
Draw lines using a pencil and ruler. Use this drawing as a guide.



Step 3

Use scissors to cut the paper up to the first line from each corner.





Step 5

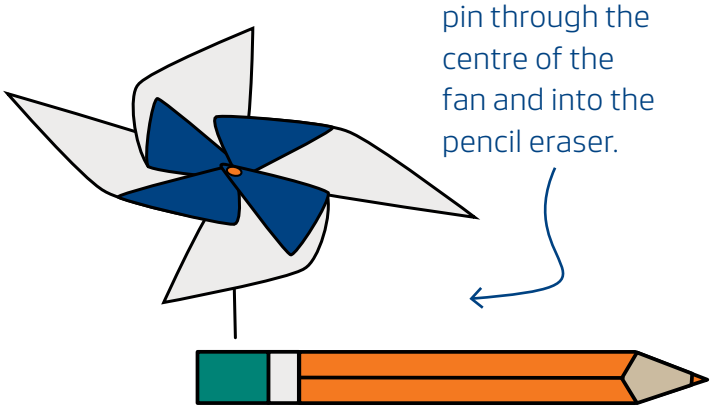
Fold the corners to the center.

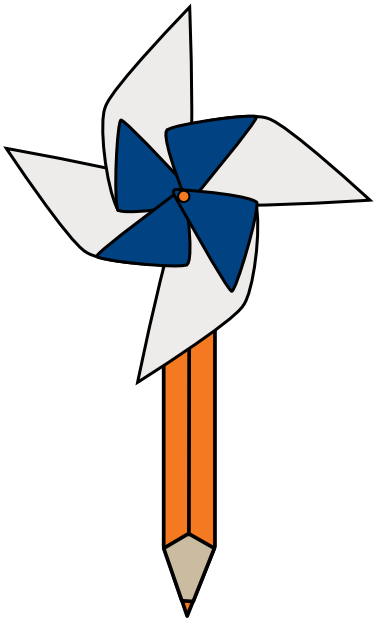
Step 6

Pierce the needle pin through the centre of the fan and into the pencil eraser.

Step 4

Use the needle pin to pinch holes in the same spots as pictured in this drawing.





Step 7

Your fan is ready! Blow into the blades to make them spin.

Energy sources

Have you ever thought about how things work? For example, what makes it possible for us to watch television? Or toast a piece of bread? It is energy! Energy comes in many different forms, such as heat, light, sound, and motion. But one of the most important forms of energy for our daily lives is electrical energy. . .more commonly known as electricity. We use electricity to power our lights, our appliances, our computers, and even some types of cars, buses, and trains!

Activity 3

Which of the following objects need electricity to work?

- ☐  Heater
- ☐  Row boat
- ☐  Kite
- ☐  Roller skates
- ☐  Light bulb
- ☐  Game console
- ☐  Toaster
- ☐  Guitar

Activity 4

Engineers have figured out lots of ways to make electricity.

Can you think of some sources of electrical energy?

For example, wind energy.

1 _____

2 _____

3 _____

We get energy from two types of sources: renewable and non-renewable.

Non-renewable energy sources, like oil, natural gas and coal, take a very, very long time to form (millions of years), so they cannot be replaced once they are used up. These sources of energy are often called "fossil fuels". These resources are dug up or pumped out of the earth. Australia has a lot of fossil fuels, but they will not last forever. Unfortunately, these sources of energy also create a lot of pollution in our environment.

Renewable energy sources are continuously replaced and will never run out. Wind energy and solar energy are the most common examples of renewable energy. Other examples are hydro energy (from water) and geothermal energy (from heat in the earth). These forms of energy are clean and do not create pollution in our environment. And, they will never run out, the sun rises every day and wind is naturally occurring all the time.

Activity 5

Fill in the blanks

We can divide the energy sources we use each day into two types:

1. _____ energy sources are made from resources 'mother nature' will replace, like wind, water and sunshine.

2. _____ energy sources cannot be replaced once they are used up.

Both of the above sources of energy can be used to produce _____ .

Wind energy

The question is, how can wind be used to generate electricity?

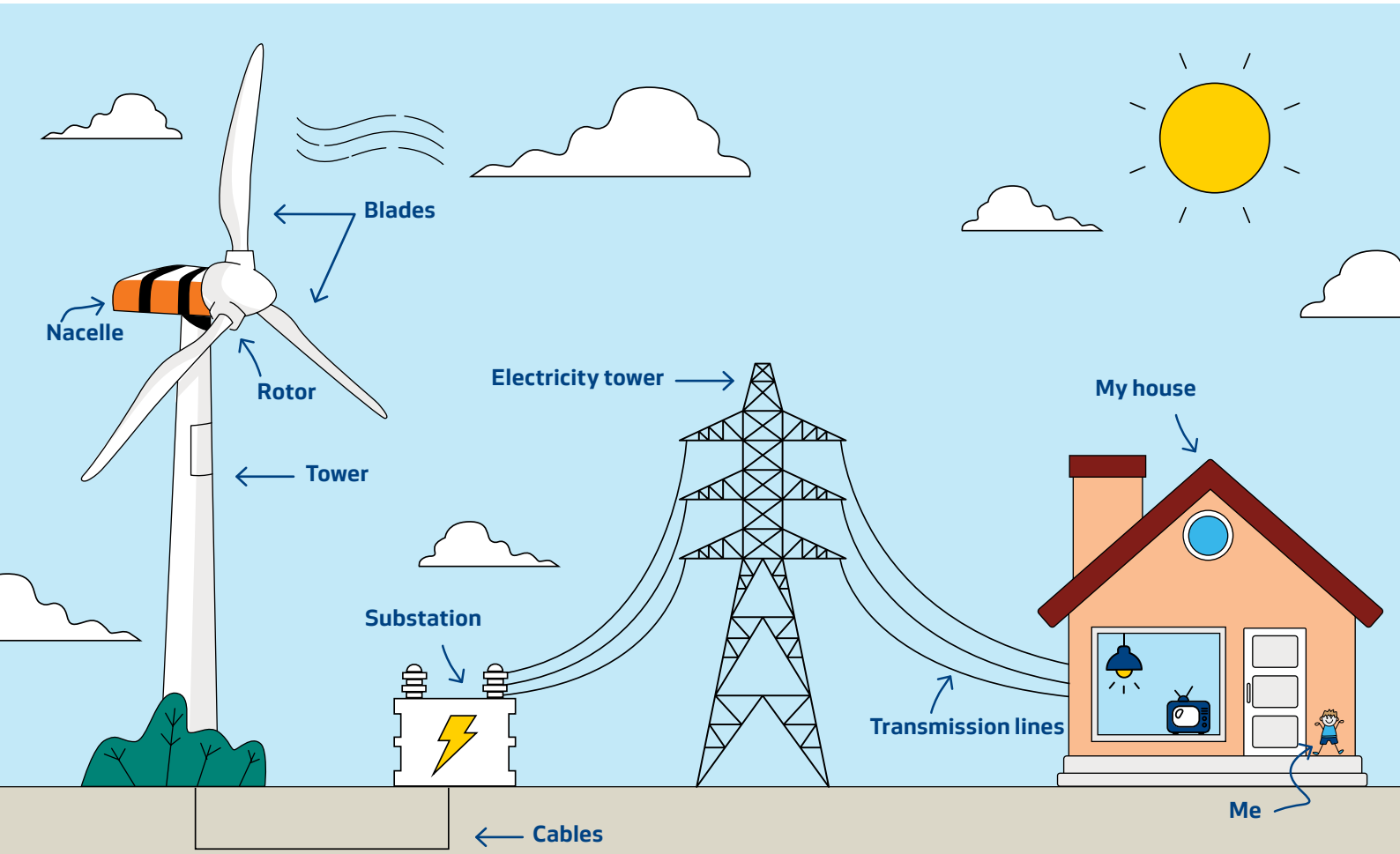
We use wind turbines that can harness the energy from the wind and turn it into electricity. This electricity reaches our home so our appliances and devices can turn on.

Imagine a wind turbine like in the illustration below. Wind moves the blades which turns the rotor. The rotor is connected to a generator located inside the nacelle. The wind turns the blades, which turns the rotor, which turns the generator, which creates electricity! The electricity then passes through cables down the tower to a substation, and from there to our homes, factories, and schools.

Wind turbines are equipped with sensors that can detect wind direction and speed. The wind turbine is able to turn to face the wind, no matter which direction it is blowing from. Also, if the wind is too strong, the wind turbine will shut down temporarily so that the equipment is not damaged.

When we capture the power of the wind and use it to do work, we call it wind energy.

A wind turbine operates in the opposite way to a fan. A wind turbine uses wind to create energy. A fan uses energy to create wind!



Activity 6

Find the words

TIP: *Look in all directions.*
Words can share letters as they cross over each other.

L	T	Y	R	L	D	B	U	M	Z	U	V	S	Y	I
A	D	U	Y	I	L	I	O	C	L	X	C	E	I	V
R	E	S	R	O	A	Y	R	R	N	D	T	N	S	A
U	E	Q	W	B	G	C	O	E	M	H	E	S	E	E
T	P	K	D	R	I	T	W	Q	C	Q	R	O	L	C
A	S	H	E	N	O	N	O	E	P	T	O	R	B	F
N	U	N	H	R	I	R	E	W	O	P	I	S	A	A
B	E	G	L	A	F	W	O	Z	O	Z	G	O	C	B
T	E	L	E	C	T	R	I	C	I	T	Y	X	N	L
E	L	L	E	C	A	N	F	R	U	E	Y	S	U	A
B	T	E	L	B	A	W	E	N	E	R	T	B	D	D
T	Q	I	J	J	T	B	I	L	L	W	Z	V	N	E
H	Y	R	E	S	O	U	R	C	E	S	O	K	J	S
W	J	G	H	P	V	Q	G	P	S	U	U	T	L	S
Y	I	Y	C	X	M	Y	O	K	Z	K	J	H	Q	O

Air
Blades
Blow
Cables
Direction
Electricity
Energy
Hub
Nacelle
Natural
Power
Renewable
Resources
Rotor
Sensors
Speed
Tower
Turbine
Wind

Wind farms

A collection of wind turbines is called a wind farm.

Modern wind turbines can be over 200 metres tall, with blades that are 80 metres long! That is almost as long as a soccer field.

There are some wind farms which are built in the ocean. These are called "offshore" wind farms.

Safety is very important. That is why the people who work at a wind farm are always well-equipped and protected.

In Australia, there are more than 126 wind farms, and they produce over 13% of all the electricity in the entire country!

Once a wind turbine is built, it can create electricity for our homes cheaper than than using fossil fuels like coal or natural gas.

Wind farms do not require water to operate. Fossil fuels require a lot of water. Fresh water is a pretty important and scarce resource, especially in Australia.

The land underneath the turbines can still be used for farming. Sometimes sheep like to sit underneath turbines to get some shade!

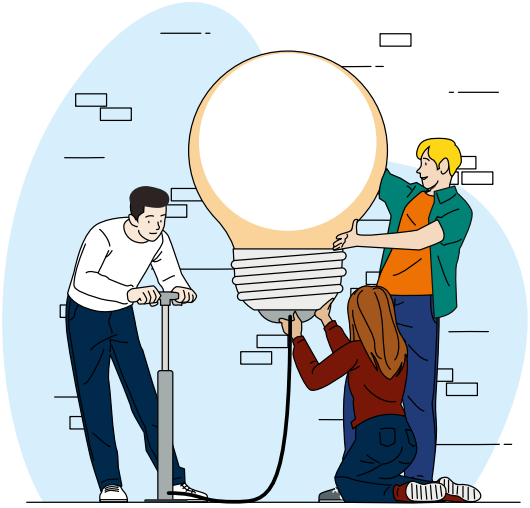
Is wind energy a good idea?

What are the benefits of wind energy?

1. Wind turbines use a renewable resource – the wind – to produce electricity.
2. Wind turbines do not create pollution of the air, water or land.
3. Wind farms create electricity more cheaply than traditional fossil fuels like coal and natural gas.
4. Wind farms create new jobs for people to earn an income and support their families.
5. Most of the land used for wind farms can also be used for other activities. such as agriculture, farming and forestry.

What are the drawbacks of wind energy?

1. Some people think wind turbines can spoil the scenery and create noise.
2. Wind farms do not produce electricity when the wind is not blowing.
3. Wind turbines can be dangerous for some birds and bats.



Activity 7

How do you feel about wind energy and wind turbines?

Write here

Every wind farm design is different. The Cleve Wind Farm is a proposed wind farm project on the Eyre Peninsula, approximately 100km South West of Whyalla, and is being developed by a company called Vestas. The area has strong and consistent winds, making it a suitable place for a wind farm.

Did you know?

One wind turbine blade is longer than **6 school buses**.

The wind turbines are almost as tall as a **70-storey building**.

The wind farm

70 wind turbines that will generate up to **500 megawatts (MW).**

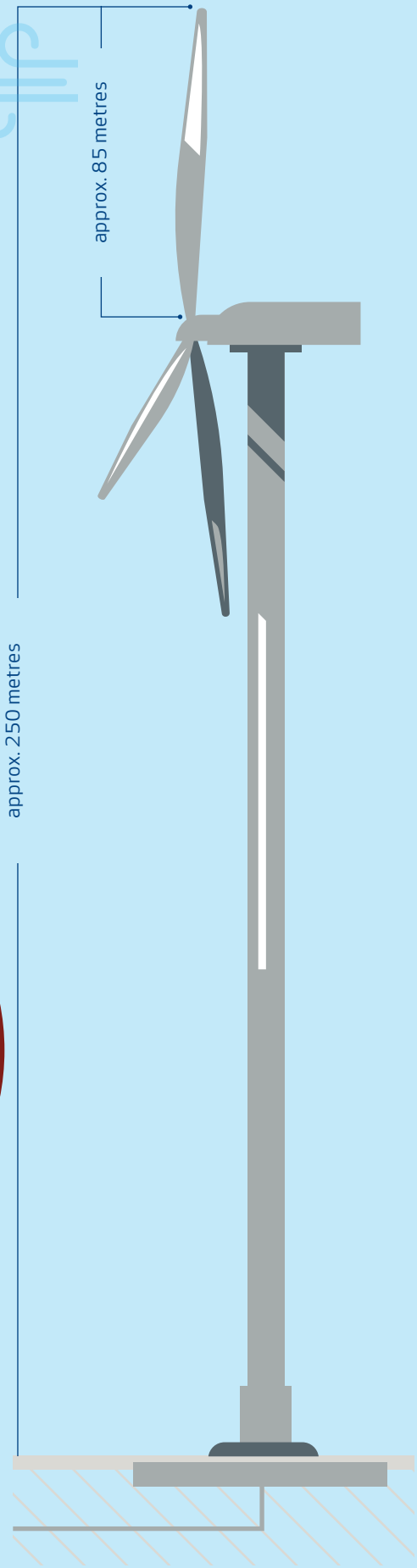
More than **$1 billion investment** in the local region.

Creates around **350** new jobs during construction.

Vestas®

More than **40 Years** of experience in wind energy.

More than **90,000 turbines** installed in 88 countries around the world.




Cleve
WIND FARM