The Mini Page®

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LAS VEGAS REVIEW-JOURNAL NEWSPAPERS IN EDUCATION

Next Week: Meet Sojourner Truth

Welcome to the Wind Farm

photo by Neal Wellons

Mini Fact:
Some wind turbine towers might be 200 feet tall.

When we flip on the lights in our homes, the electrical current that makes them shine might have been generated in a plant a hundred miles away.

Most of our power in the United States comes from **fossil fuels**, which are taken from the ground. These include natural gas, coal and petroleum. We also get some energy from **nuclear** power plants.

Power companies also use **renewable energy** for producing electricity. Renewables are sources that don't get used up eventually, like fossil fuels. They include wind and solar energy and **hydropower**, or energy from water.

Wind farms

Have you noticed wind farms along highways, or even out at sea? The first **wind farms**, or areas with large numbers of wind **turbines**, were installed in California in the early 1980s. A turbine is an engine that turns.

photo courtesy Department of Agriculture

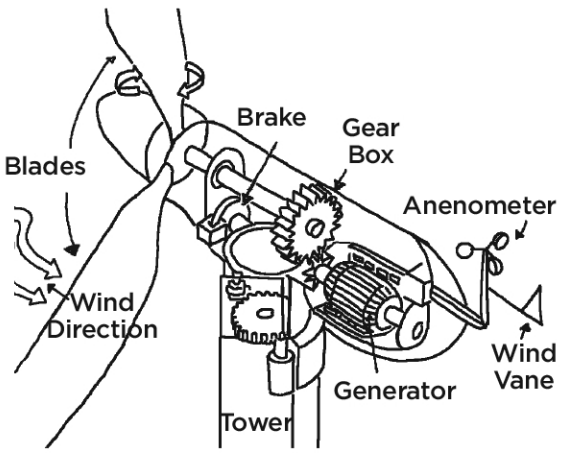
Windmills like this have been used on farms to pump water. They also might be used to produce power.

When the wind blows at the right speed, the turbines begin to turn. Turbines are usually very tall because winds are stronger higher up.

How do they work?

Wind turbines have:

• towers topped with **blades** and a part that holds the equipment, the **nacelle** (nuh-SELL). The blades might be from 20 to 100 feet long.



• The **anemometer** (an-uh-MOM-uh-ter) tells how fast the wind is blowing.

• The blades begin to turn when wind speeds reach about 10 mph. Most turbines have three blades.

• The **brake** stops the motor in the event of an emergency.

• The **gear box** transfers energy from the blades to the generator.

• The **generator** produces the electricity.

• **Wind vanes** tell what direction the wind is coming from.

Most turbines are owned by wind-power companies that make money by selling electricity. Small wind turbines are sometimes operated by landowners, small businesses or communities.

What is wind?

Wind is moving air. As long as the sun shines, we will have winds. Wind blows because the sun heats the Earth unevenly. The land heats more quickly than water.

For example, in the daytime, the hot air over land heats and rises, then cold air from oceans and lakes rushes in to take its place. This makes a **sea breeze.**

At night, since air cools more rapidly over land than over water, cool air from the land rushes in to take the place of warm air over the ocean or lake. This is called a **land breeze.**

Measuring wind

The **Beaufort Scale** is a way you can tell how fast the wind is blowing without having to use any instruments. Just look and see what's going on outside.

photo by Renee Andriani

A strong gale, No. 9 on the scale, with winds from 47 to 54 mph, can cause tree branches to break and roofs to be damaged.

The scale uses numbers ranging from 1 to 12. It was invented by a British admiral, Sir Francis Beaufort, in 1806.

For example, No. 4 on the scale is wind from 13 to 18 mph, or a **moderate breeze.** It causes branches to move and dust or paper to rise.

Resources

On the Web:

- bit.ly/MPwindenergy
- 3dgeography.co.uk/beaufort-scale

At the library:

- "Discovering Energy" by Veronica Sanz and Johannes Hirn

Try 'n' Find

Words that remind us of wind energy are hidden in this puzzle. Some words are hidden backward or diagonally, and some letters are used twice. See if you can find:

ANEMOMETER, BEAUFORT, BLADE, BRAKE, BREEZE, ENERGY, FARM, FOSSIL, FUEL, GEAR, GENERATOR, HYDROPOWER, LAND, NACELLE, RENEWABLE, SCALE, SEA, SOLAR, TOWER, TURBINE, VANE, WIND.

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

Mini Jokes

Wendy: Are you interested in renewable energy?
Wayne: Actually, I'm a big fan!

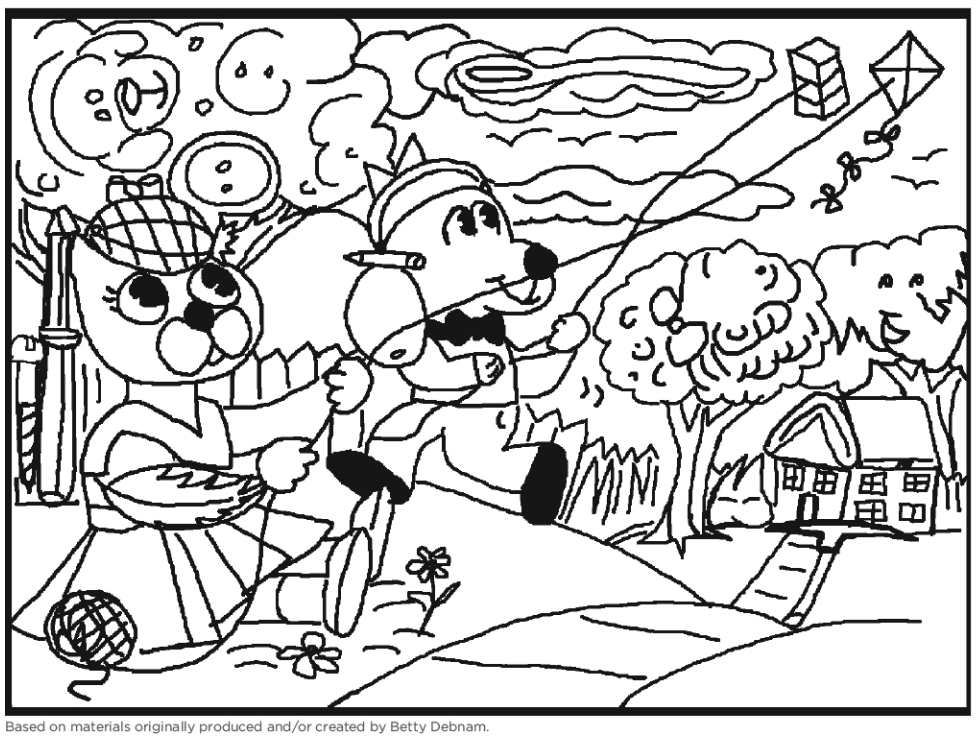
Eco Note

In 2019, 42 U.S. states had utility-scale wind power projects, which together generated a total of about 300 billion kilowatt-hours (kWh). This amounted to about 7.3% of all large-scale energy production. The five states with the most electricity generation from wind in 2019 were Texas, Oklahoma, Iowa, Kansas and California. Around the world, the top countries generating power with wind in 2017 were China, the United States, Germany, India, Spain and the United Kingdom.

adapted from Energy Information Administration

Mini Spy Classics

Mini Spy and Basset Brown are flying kites on a windy day. See if you can find the hidden pictures. Then color the picture.



Mini Spy Classics appear in the first issue of each month.

Hey Mini Spy Fans! Order your Mini Spy Booklets (Volumes 1, 2 and 3) with 48 of your favorite puzzles! Visit MiniPageBooks.com, or call 844-426-1256 to order. Just $4 plus $1 shipping.

Based on materials originally produced and/or created by Betty Debnam.

- elephant's head
- boomerang
- pickax
- banana
- number 3
- spoon
- feather
- screwdriver
- man's face
- word MINI
- pineapple
- number 8
- button
- dog's face
- number 2
- book
- screw
- tooth
- olive

For later:

Look in your newspaper for articles about energy costs in your area.

Teachers: For standards-based activities to accompany this feature, visit: bit.ly/MPstandards. And follow The Mini Page on Facebook!