



GET BLOWN AWAY BY WIND ENERGY

THIS WIND IS SO **POWERFUL!** CAN'T WE **CAPTURE** ALL THIS ENERGY?



YES,
WE CAN ...

THAT'S **EXACTLY** WHAT SCIENTISTS ARE DOING. IT'S CALLED **WIND POWER!**



ACTIVITY: MEASURING WIND SPEED



FOR THIS
ACTIVITY
YOU WILL
NEED:



- PAPER DRINKING CUPS
- STIFF CARDBOARD
- SCISSORS, STAPLER, PIN
- PENCIL WITH AN ERASER ON THE END
- WATCH OR PHONE TO MEASURE SECONDS
- A WINDY DAY

WHAT TO DO:

- 1 CUT 2 CARDBOARD STRIPS (ABOUT 20CM LONG) AND STAPLE THEM TOGETHER. STAPLE 4 CUPS TO THE STRIPS. COLOUR THE BOTTOM OF ONE CUP (THIS WILL HELP YOU TO COUNT WHEN THE CUPS SPIN).
- 2 FIND THE EXACT BALANCE POINT. PUSH THE PIN DOWN THROUGH THIS POINT INTO THE ERASER. BLOW INTO THE CUPS. THEY SHOULD SPIN FREELY AROUND THE PIN. SUPPORT THE PENCIL SO THAT IT STANDS SECURELY.
- 3 PLACE YOUR MODEL AT DIFFERENT PLACES IN THE SCHOOL GROUNDS. COUNT HOW MANY TIMES IT SPINS IN 15 SECONDS.
- 4 DRAW A MAP OF THE SCHOOL GROUNDS. WRITE THE NUMBER OF SPINS AT EACH PLACE ON THE MAP. WHICH WOULD BE THE BEST PLACE FOR A WINDMILL OR TURBINE?



WHAT'S HAPPENING HERE?

THE MODEL THAT YOU BUILT IS CALLED AN **ANEMOMETER**. IT IS USED TO MEASURE THE SPEED OF THE WIND. THE MAP THAT YOU DREW SHOWS THE BEST POSITIONS FOR COLLECTING WIND ENERGY.



THE BEST WIND FOR COLLECTING WIND ENERGY HAS A STEADY SPEED NOT MORE THAN 48 KM/HOUR. A STEADY FLOW OF WIND IS BETTER THAN VERY FAST GUSTS.

HOW IS WIND ENERGY USED IN SOUTH AFRICA?

WE CAN CAPTURE ENERGY FROM WIND (KINETIC ENERGY) AND CONVERT IT INTO OTHER USEFUL FORMS OF ENERGY. FOR EXAMPLE, **WINDMILLS** ARE USED TO PUMP WATER.

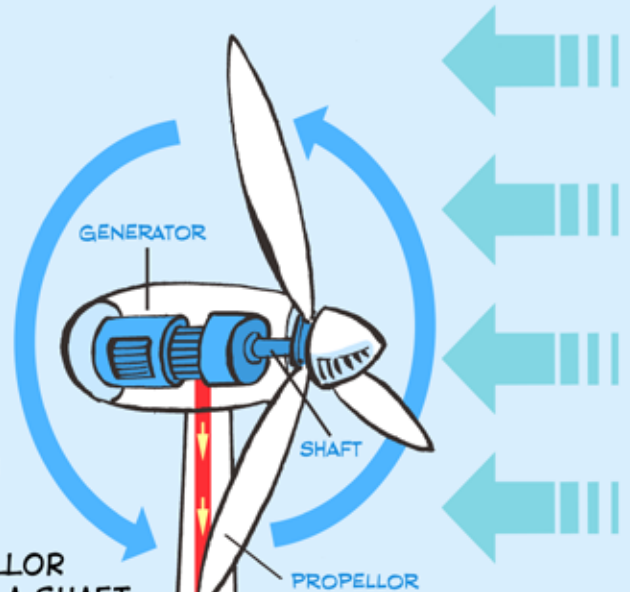
A **WIND TURBINE** CONVERTS WIND ENERGY INTO ELECTRICAL ENERGY. A SINGLE WIND TURBINE CAN GIVE POWER TO 500 HOMES. **WIND FARMS** WITH MANY TURBINES GENERATE ELECTRICITY WHICH IS ADDED TO THE NATIONAL POWER GRID.

WHY IS WIND ENERGY IMPORTANT?

WIND ENERGY IS A **RENEWABLE ENERGY SOURCE**. IT DOES NOT CAUSE POLLUTION OR CONTRIBUTE TO GLOBAL WARMING. THERE WILL ALWAYS BE WIND, SO THIS ENERGY SOURCE WILL NOT RUN OUT. WIND ENERGY IS BEING USED MORE AND MORE, AND IT IS ONE OF THE LOWEST-PRICED RENEWABLE ENERGY SOURCES.

2

THE PROPELLOR TURNS A SHAFT CONNECTED TO A GENERATOR WHICH GENERATES ELECTRICITY.



1

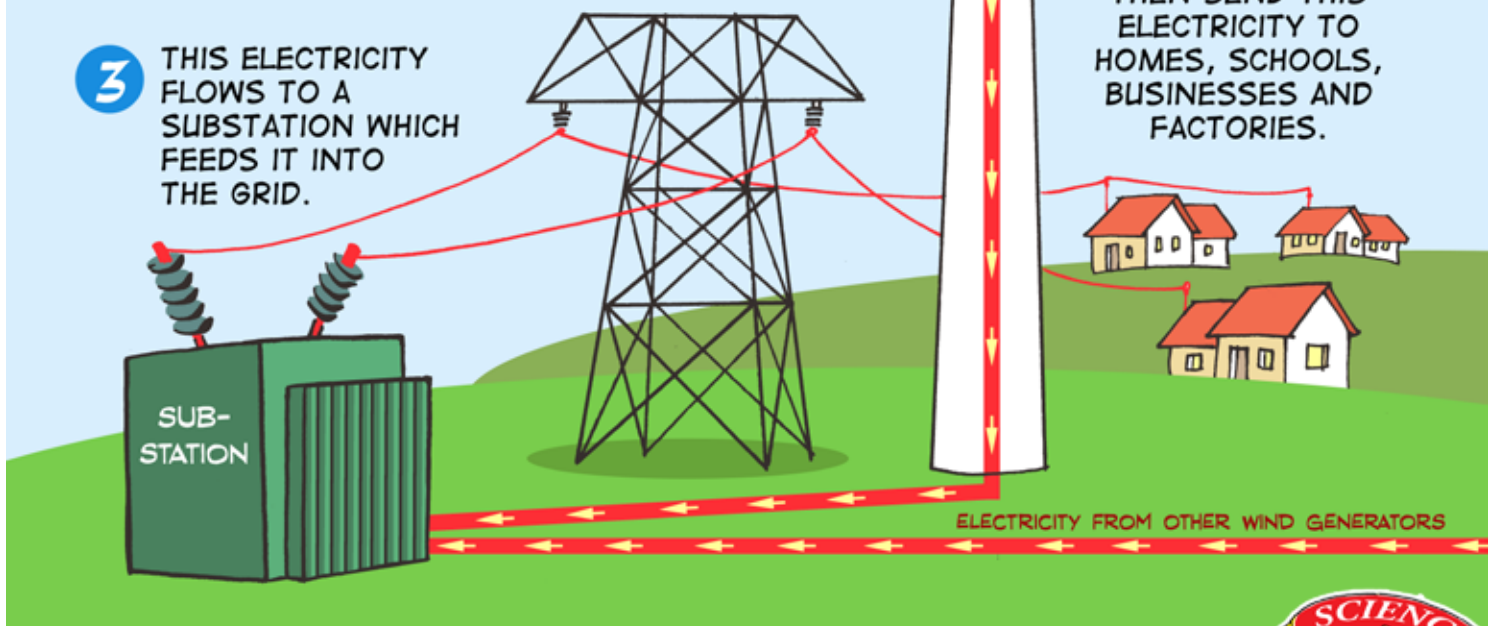
THE WIND BLOWS AND TURNS THE PROPELLOR.

4

POWER LINES THEN SEND THIS ELECTRICITY TO HOMES, SCHOOLS, BUSINESSES AND FACTORIES.

3

THIS ELECTRICITY FLOWS TO A SUBSTATION WHICH FEEDS IT INTO THE GRID.



ARE THERE ANY PROBLEMS WITH USING WIND ENERGY?

WIND TURBINES CAN KILL BIRDS OR BATS, AND CAUSE A LOW-FREQUENCY NOISE WHICH CAN DISTURB PEOPLE. WIND TURBINES REQUIRE LARGE AREAS OF LAND.

HOWEVER, WIND ENERGY CAUSES **MUCH LESS HARM** TO HUMANS AND THE ENVIRONMENT THAN THE BURNING OF NON-RENEWABLE **FOSSIL FUELS**.

PUZZLE YOUR MIND!!!

THE WIND HAS SCRAMBLED ALL THE LETTERS OF THE WORDS BELOW. CAN YOU UNSCRAMBLE THEM TO FIND 6 WORDS THAT ARE LINKED WITH WIND ENERGY?

L A S I

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W R O P E

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L I W N M I L D

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Z E U T R I B

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E W R A T E N E B

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Z E Y R E G

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CAREERS

HERE ARE SOME GREAT JOB OPPORTUNITIES:

- ELECTRICAL ENGINEERING
- INDUSTRIAL DESIGNING
- ENVIRONMENTAL SCIENTIST

CURRICULUM LINKS

- GRADE 7: **ENERGY & CHANGE** (SOURCES OF ENERGY)
- GRADE 9: **ENERGY & CHANGE** (ENERGY AND THE NATIONAL ELECTRICITY GRID)
- GRADE 12: **ELECTROMAGNETISM** (ELECTRICAL GENERATORS)

START YOUR OWN SCIENCE SPAZA

Name of school: _____

Municipality: _____

Province: _____

Name of your science club:

Name of contact person: _____

Telephone number: _____

Email address: _____

Postal address: _____

To be filled in by responsible adult (parent/teacher)

Name: _____

Surname: _____

Position: _____

ID Number: _____

Signature (parent/teacher):

Date: _____

Send to PO Box 22106, Mayor's Walk, 3208 Fax to 086 610 5453 email: info@sciencespaza.org or submit your application online at www.sciencespaza.org



The South African Young Academy of Science (SAYAS) was launched in 2011 in response to the need for young scientists to contribute towards making a difference and solving issues faced by the country today. It allows young scientists to speak out and be heard, and to play a part in making decisions.



RECORD's mission is to be recognised as the foremost institution for renewable energy research coordination and collaboration in SA. Its vision is to facilitate renewable energy research coordination, collaboration and dissemination of national and international renewable energy knowledge contributing towards a sustainable low carbon energy future. This is achieved through 4 core activities: coordinating renewable energy research in SA; facilitating renewable energy research collaboration; contributing to energy skills development and targeted awareness regarding renewable energy in SA.



The South African National Energy Development Institute (SANEDI) is an organisation that promotes the development of renewable energy sources. They conduct research and promote, direct and monitor energy efficiency and green energy initiatives. Its vision is to promote sustainable energy innovation, transformation and technology diffusion in support of sustainable development that benefits everyone in South Africa.



Science Spaza is an initiative of Jive Media Africa. *What moves you?*

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Puzzle answers: sail, power, windmill, turbine, renewable, energy

