WIND POWER CHALLENGE

KEYWORDS

wind energy | turbine technician | renewable energy | engineering | clean power

Wind turbine technicians and engineers work on the tall towers and huge spinning blades of wind turbines. These machines turn moving air (wind) into electricity, which can power entire neighborhoods without producing pollution. Wind is a renewable energy source because it keeps blowing and doesn't run out. Wind farms – large groups of wind turbines – are found in places with lots of wind, such as on hills or near the sea. Workers in this field must understand engineering, electricity, and even weather patterns to make sure turbines work safely and efficiently. Wind power helps reduce the need for fossil fuels and supports clean energy goals. As more countries aim to lower their carbon emissions, more green jobs are opening up in the wind energy industry.

AGE RANGE
6-8 years

SMALL GROUPS COMPETING
(4 groups of 5-6 children)

DURATION
35 minutes

CONNECTION TO SDG

MATERIALS

- Colored paper or card stock
- Plastic cups (clear, 8-12 oz)
- Dried beans or rice (about 1/4 cup per group)
- Wooden skewers or pencils
- Tape or glue
- Scissors
- String (12 inches per group)
- Hair dryer or fan

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PROCEDURE

Building the Windmill:

1. Cut 4-6 identical rectangular pieces of paper (3" x 2" each)
2. Fold each piece diagonally to create windmill blades
3. Attach blades to one end of the wooden skewer using tape ensuring they're angled to catch wind
4. Test blade angle - they should be at approximately 45 degrees

Setting Up the Lifting System:

1. Tie one end of the string around the skewer, about 2 inches from the blades
2. Tie the other end to the plastic cup handle (or tape to cup if no handle)
3. Place exactly 20 beans in the cup - this provides a standard weight for comparison
4. Hold the windmill vertically with the cup hanging down

How the Beans Lift:

1. When wind hits the angled blades, they rotate around the skewer
2. The rotation winds up the string around the skewer
3. As the string shortens, it pulls the cup (and beans) upward
4. Students can measure how high the cup lifts in 30 seconds of wind exposure
5. Compare different blade designs and angles to see which lifts the beans highest

Safety Note:
Adult supervision required when using hair dryer.

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INSTRUCTIONAL GUIDELINES FOR FACILITATOR

- **Give each group different colored paper for identification**
- **Supervise hair dryer use safely**
- **Encourage experimentation with blade shapes**
- **Connect to wind turbine technician careers**

LEARNING OUTCOMES

- **Understand wind energy conversion**
- **Learn about renewable energy careers**
- **Practice engineering design and teamwork**

EXTENSION SUGGESTIONS

- Look for wind turbines in your area
- Make pinwheels at home
- Learn about wind patterns