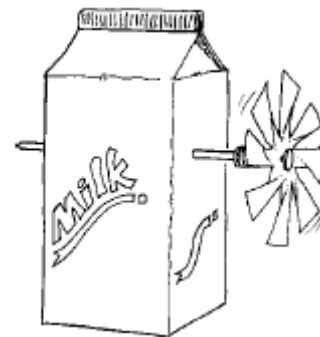


PROPELLER DESIGN

WIND LESSON

| Time Frame: | Standards: |
|---|--|
| <p>2 – 45 minutes blocks</p> <p>1st Grade</p> | <p>1.S.1.2.1 Make observations collect, and use data.</p> <p>1.S.1.6.1 Make and record observations.</p> <p>1.S.1.7.1 Demonstrate cooperation and interaction skills</p> <p>1.S.1.8.1 Follow multi-step instructions</p> <p>1.S.2.2.1 Describe the position and motion of objects. (Ex revolve, rotate, at rest, float, and fall)</p> |
| Objectives: | |
| <p>SWBAT work with others and follow multistep instructions. By doing so the students will create a propeller that spins with a gentle breeze.</p> | |
| Background Information: | |
| <p>Wind is moving air. We can use the energy in wind to do work. Early Egyptians used the wind to sail ships on the Nile River. People use wind to move them in Sailboats. In Holland, people used windmills to grind wheat. Pilgrims used windmills to grind corn, to pump water, and to run sawmills. Today, we use wind to make electricity. With this lesson, it is intends to show students that wind is able to work. Wind is able to move object, from simple to more complex.</p> | |
| Materials: | |
| <ul style="list-style-type: none"> • Material from which to cut blades: Such as cardboard, plates or plastic container • Dowel wooden • Drinking straw • Milk container or plastic bottle for the stand • Glue • Scissors • Paint or crayons | |

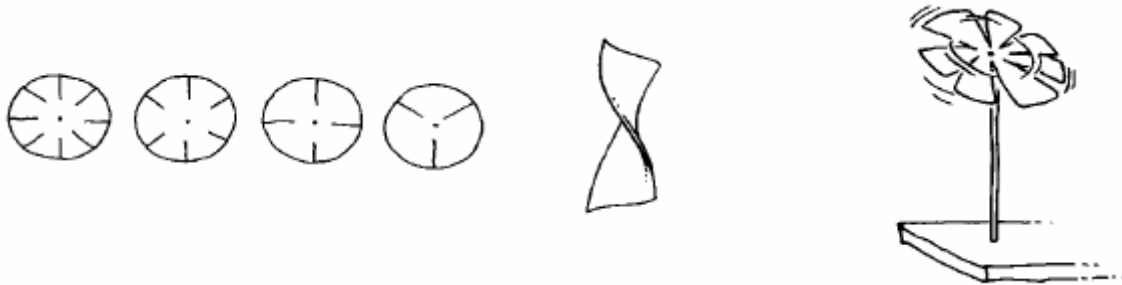


PROPELLER DESIGN

WIND LESSON

Procedure:

Using the designs presented as a start, allow the students to freely experiment with different blade shapes to construct their own 'windmill' then test it under a number of wind speeds (e.g. the wind outside, their own breath, a fan). The pictures below show some patterns for propellers.

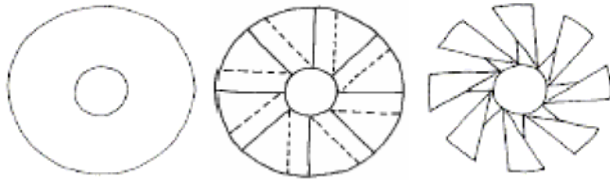


1. Draw and cut out the circle from the cardboard.
2. Have the students draw the dotted lines as shown
3. Also have the students design a blade that could possibly work
4. Have the students glue their blades onto their wooden dowels.
5. Insert the straw into the milk or plastic carton.
6. Make sure that the holes that you put into the carton are level.
7. Insert the straw
8. Insert the wooden dowel into the straw
9. Have the students test their different blades
10. Discuss which blades work best.
11. Also discuss what the blades are doing in the sense of rotating, spinning. Etc.

PROPELLER DESIGN

JUSTIN TAYLOR

WIND LESSON



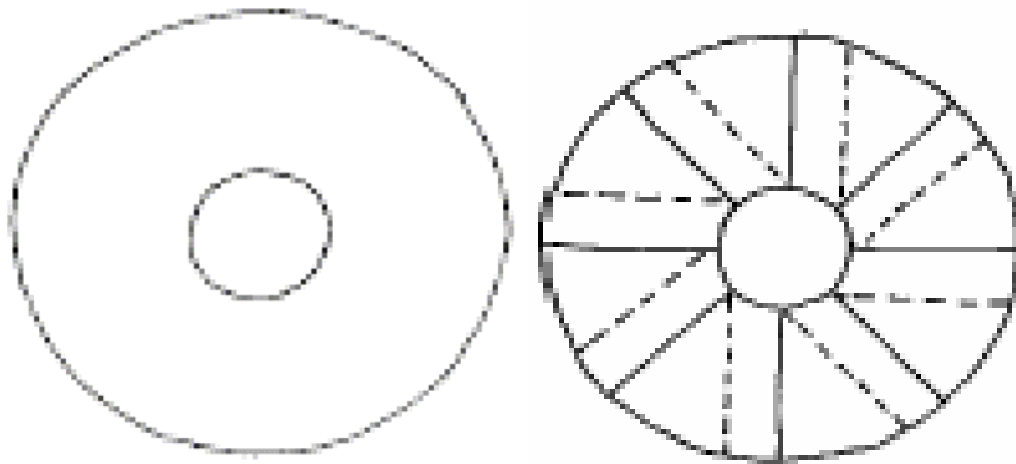
Try out some of these designs (or your own) and find which ones spin best. You might hold a competition for the mechanically most efficient, or the best workmanship, and/or the best appearance.

Have the students determine how the efficiency of the models could be tested. One way would be to have an electric fan provide a standard wind speed, and counting the revolutions per 10 seconds. (You will need to color or mark one blade in order to do this.)

Assessment:

Assessment is observation. Are the students able to follow directions and create a turbine that is able to function?

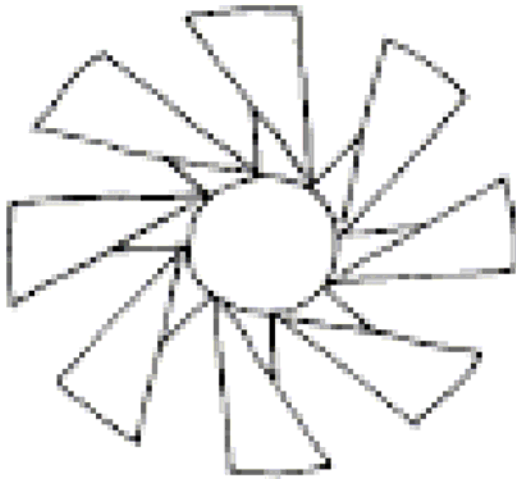
Additional Content:



PROPELLER DESIGN

JUSTIN TAYLOR

WIND LESSON



References:

Wind Power is one of a series of five publications collated by the Queensland Sustainable Energy Industry Development Group, a nongovernment alliance of organizations whose aim is to enhance the sustainability of Queensland's energy supply. Each of the topics in the series contain a range of practical activity-based workshops for use in Queensland schools and aims to allow students and teachers to explore and discover the fundamental principles that underpin sustainable energy.

Other activity sets in this series include

- Global Warming and Climate Change
- Passive Solar Building Design
- Photovoltaics (Solar Electricity)
- Solar Cooking

http://apps1.eere.energy.gov/education/lessonplans/pdfs/wind_power.pdf