Wind Energy

In this activity, you and your group members will build pinwheels to investigate how a wind turbine uses wind to produce energy. You will observe the action of the pinwheel in front of a fan. Your group will analyze the data and relate your findings to real wind turbines. Then you will research and debate the advantages and disadvantages of using wind energy resources.

Materials List:
- Plastic lid from coffee can, margarine tub, jar of nuts, etc.
- Ruler
- Pen
- Scissors
- Thread spool (empty)
- Glue
- Electric fan
### Key Question

<table>
<thead>
<tr>
<th>What was the question that you wanted to answer?</th>
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<tbody>
<tr>
<td><em>Directions:</em> Write the question for the investigation. The question should be specific and be able to be investigated.</td>
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</table>

**Key Components**
- Specific (one general thought, does not combine two or more questions)
- Is able to be investigated

### Hypothesis

<table>
<thead>
<tr>
<th>Claim that answers your question based on the evidence</th>
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<tbody>
<tr>
<td><em>Directions:</em> Develop a claim about what you think is going to happen.</td>
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**Key Components**
- Expresses a cause and effect relationship
- Is testable
- Incorporates prior knowledge
## Plan

<table>
<thead>
<tr>
<th>How Will You Investigate the Question?</th>
<th>Directions: Describe the plan that you will use to study your question and analyze your hypothesis.</th>
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### Key Components

- Plan is easily repeatable by others
- Plan describes the use of materials
- Plan is in a logical order
Data

<table>
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<tr>
<th>Evidence from this investigation</th>
<th>Directions: Record all of the evidence that has been collected. Evidence can be any data that helps answer the question appropriately and completely. The focus of this section is on what was found during the investigation.</th>
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<tbody>
<tr>
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<td><strong>Key Components</strong></td>
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</table>
|                                 | • Data (from an investigation and/or other sources, such as observations, reading material, archived date, etc.)  
• Appropriate (data applies directly to the question)  
• Sufficient (uses enough data to completely answer the question and determine a finding on the hypothesis) |
## Conclusion

### Summarize Your Findings

**Directions:** Develop a conclusion for your investigation. The conclusion should contain clear thoughts and vocabulary that has been studied. This section focuses on the answer to the question and either proving or refuting the hypothesis. This should be done by linking the hypothesis to the data using logical reasoning.

### Key Components

- Use precise and accurate language
- Use scientific vocabulary
- Provide clear logical thoughts
- Use evidence and reasoning to support or refute the hypothesis
Research and Debate Wind Energy

1. In the groups your teacher has assigned, conduct additional research on wind energy. Organize the data in a chart that lists and compares the advantages and disadvantages of using wind energy resources. You may also include details that you learned during this investigation.

2. With your group members, prepare for and then stage a debate on the value of wind energy. Begin by dividing into two teams: one team to argue against new development and research of wind energy, and one team to argue in favor. With your team members, review your chart of advantages and disadvantages to help you gather evidence in support of your position and against your opponents’ position. Prepare for potential counterarguments from the opposing group. Also prepare a brief opening statement for the debate. Then hold the debate in front of the class. Your teacher may wish to act as moderator.