Energy from Biomass
Hands-On Learning Activity
EXPLANATION / TEACHING GUIDE

1. Review the WebQuest.

2. Complete Student Handout 1 before the experiment.

3. Complete the experiment with the class.
   - Gather the following materials:
     - 36 dried peas or beans
     - 6 airtight clear plastic bags
     - Water
     - Bowl
   - Conduct the experiment:
     - Soak the beans or peas in water overnight.
     - Place 6 beans or peas into each bag and squeeze out all of the air before you seal them.
     - Put 2 bags in a warm, sunny place. Put 2 bags in a warm, shady place. Put 2 bags in a dark place. Leave the bags overnight.
     - Check the bags again in the morning.
   - Differentiation Options:
     - Continue observing the bags for 3 days and report the results.
     - Perform the experiment as a class.
     - Perform the experiment in cooperative learning groups.
     - Suggest the experiment for a science fair project.

4. Record the results of the experiment in the chart on Student Handout 2.

5. Discuss the results of the experiment with the class and complete Student Handout 3.
Energy from Biomass
Hands-On Learning Activity
STUDENT HANDOUT 1

Read and answer the following questions before your class experiment.

1. Can you make gas from decaying garbage?

2. Can you control the amount of gas made from decaying garbage?

Read the steps for the experiment and write your hypothesis in the space provided below.

Materials: 36 dried peas or beans, 6 airtight clear plastic bags, water, bowl

Procedure:
1. Soak the beans or peas in water overnight.
2. Place 6 beans or peas into each bag and squeeze out all of the air before you seal them.
3. Place the bags:
   - Put 2 bags in a warm, sunny place.
   - Put 2 bags in a warm, shady place.
   - Put 2 bags in a dark place.
   - Leave the bags overnight.
4. Check the bags the next day.
5. Record the results in the chart on Student Handout 2.

HYPOTHESIS: What do you think will happen in your experiment?
Use this chart to record the results of your experiment.

<table>
<thead>
<tr>
<th>2 bags in a warm, sunny place</th>
<th>2 bags in a warm, shady place</th>
<th>2 bags in a dark place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation after 1 day:</td>
<td>Observation after 7 day:</td>
<td>Observation after 1 day:</td>
</tr>
<tr>
<td>OPTIONAL: after 3 days:</td>
<td>OPTIONAL: after 3 days:</td>
<td>OPTIONAL: after 3 days:</td>
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<td>OPTIONAL: after 3 days:</td>
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</tr>
</tbody>
</table>
Read and answer the following questions after your class experiment.

1. What did you observe with the experiment?

2. Was your hypothesis correct?

3. Did the decaying beans produce a gas?

4. Which environment was best for producing gas?

5. Do you think the gas could be used as a source of energy? Why? How?

6. How did your project create energy from biomass?

7. How can plants create energy?

8. How did the experiment resemble real energy from biomass?