



# BIOMASS

JILL WILLIAMS

## EXPLORATION INTO WHAT BIOMASS IS

<b>Time Frame:</b>	<b>Standards:</b>
4-5 class periods of 45 minutes  Most of this time is research time and time creating PowerPoints and presentation scripts.	8-9.PS.1.2.1 Use observations and data as evidence on which to base scientific explanations. 8-9.PS.1.6.3 Use appropriate technology and math to make investigations. 8-9.PS.1.8.1 Analyze technical writing, graphs, charts and diagrams. 8-9.ES.5.1.1 Analyze environmental issues such as water and air quality, hazardous waste, and depletion of natural resources. 7.S.1.6.2 Use appropriate tools and techniques to gather and display data. 7.S.5.3.1 Identify alternative sources of energy.
<b>Objectives:</b>	
To increase students' knowledge about biomass energy using web-based resources and, as groups, create PowerPoint presentations about biomass energy.	
<b>Background Information:</b>	
<p>“Biomass is any organic matter – wood, crops, seaweed, animal wastes – that can be used as an energy source. Biomass is a renewable source of energy because we can grow more in a short period of time. We use biomass to fuel our bodies, heat our homes, generate electricity and as a transportation fuel.”</p> <p>Taken from The Need Project's Transparent Energy 2008 pg 7 <a href="http://www.need.org/needpdf/Transparent%20Energy.pdf">http://www.need.org/needpdf/Transparent%20Energy.pdf</a></p> <p>Need more background information go to: <a href="http://www1.eere.energy.gov/biomass/for_students.html">www1.eere.energy.gov/biomass/for_students.html</a> <a href="http://www.nrel.gov/learning/re_biomass.html">www.nrel.gov/learning/re_biomass.html</a></p>	
<b>Materials:</b>	
Access to computers List of guide questions List of websites for research Rubric for grading	



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### Procedure:

#### Preparation:

Make copies of guide questions (optional), student to-do list, and grading rubric. Separate the class into five groups. An example of the guide questions and student to-do list are found in the additional content below.

#### Procedure:

1. Introduce the topic of Biomass. Tell the students they are going to be researching biomass and creating a PowerPoint and creating a script for the group to present to the class during the PowerPoint.
2. Separate the students into five groups. Give each group a certain area of biomass to research.
3. Take the students to the computer lab and give them time to research the subject and create the PowerPoint. Check on each group and make sure they are working on a script and a PowerPoint.
4. Each PowerPoint will consist of 6 or more slides including a title slide, at least four slides that provide information about their topic and a resource listing slide. Remind them to list both advantages and disadvantages if there are any.
5. Take one to two days and have the students present their PowerPoints using the scripts they wrote. These presentations should be about 10 minutes each. Allow time for questions or reemphasis of certain points.

### Assessment:

Group turns in PowerPoint and written script.

#### Sample rubric for grading:

Major points – 10 points

Script – 25 points

Presentation – 25 points

Group work – 20 points

Powerpoint – 20 points

**Total – 100 points**

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### Additional Content:

#### Guide Questions

##### Group One: Biomass and Photosynthesis

1. What is biomass?
2. Is biomass energy renewable or nonrenewable? Why?
3. What do we use biomass for?
4. Where does biomass receive its energy?

##### Group Two: Consumption of Biomass

1. How much energy does biomass provide in the United States?
2. Where does this biomass energy come from?
3. How does biomass release its energy to be used by us?
4. Could we (people in the United States) increase our use of biomass energy?

##### Group Three: Waste-to-Energy

1. What is waste-to-energy?
2. How is it used in the United States?
3. What do waste-to-energy plants burn?
4. How much waste does it take to equal the same amount of heat energy produced by coal?

##### Group Four: Ethanol and Biomass

1. What is ethanol?
2. How is ethanol produced?
3. What is ethanol used for? What are the advantages? What are the disadvantages?
4. What is E10 and how is it used?

##### Group Five: Biomass Resources and the Environment

1. Where are good biomass resources in the United States? Where are better wood resources? Where are better agriculture resources?
2. Is burning biomass for energy creating air pollutants?
3. How does biomass compare to fossil fuel in the amount of air pollutants?
4. Is there a increase or a decrease of carbon dioxide created by biomass?

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### Student Checklist

- Do research
  - List main ideas
  - Write script for presentation – Everyone must have a part!!
  - Create PowerPoint
  - Rehearse presentation
  - Make presentation to classmates
  - Turn in script and PowerPoint
1. Each group needs to have a PowerPoint with 6 or more slides including a title slide, at least four slides that provide information about their topic and a resource listing slide.
  2. Each group needs a written script for their presentation. In the script should be parts for each student in the group.
  3. Everyone needs to work together on all parts of the assignment.

### Presentation tips:

1. Know your information or memorize your part.
2. Speak loudly enough that all students can hear you.
3. Speak clearly and slowly. Do not rush through your part. Many people tend to talk faster when they are nervous.
4. Remember, everyone else is probably feeling nervous about speaking in front of other people.

### List of possible resources:

[www.need.rog/needpdf/Intermediate%20Energy%20Infobook.pdf](http://www.need.rog/needpdf/Intermediate%20Energy%20Infobook.pdf)

[www.eia.doe.gov/kids](http://www.eia.doe.gov/kids)

[www.nrel.gov/learning/re\\_biomass.html](http://www.nrel.gov/learning/re_biomass.html)

[www1.eere.energy.gov/biomass/for\\_students.html](http://www1.eere.energy.gov/biomass/for_students.html)



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### References:

The Need Project's Transparent Energy 2008 pg 7  
<http://www.need.org/needpdf/Transparent%20Energy.pdf>

**Energy for Educators**

Bringing Energy into the Classroom