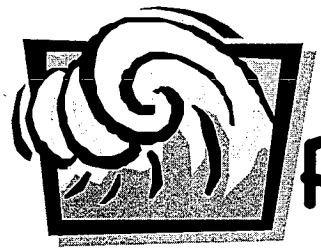
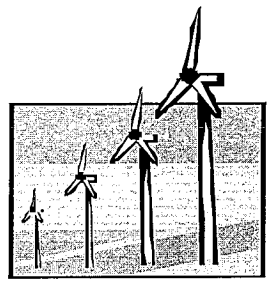
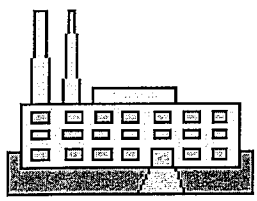


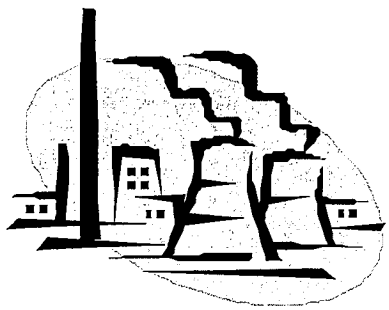
Physical Science



Energy Source Debate

Cedar Cliff High School





Energy Source Debate Study Guide

Major topics will include:

A. Using Energy
   a. Reason to Utilize Alternative Energy Sources

B. Types of Energy Sources
   a. Nonrenewable (Petroleum, Natural Gas, Gasoline, Coal, Wood, Nuclear)
   b. Renewable (Geothermal, Hydroelectric, Solar, Wind)

C. Biomass
   a. Advantages
   b. Disadvantages

D. Coal
   a. Advantages
   b. Disadvantages

E. Hydroelectric
   a. Advantages
   b. Disadvantages

F. Nuclear
   a. Advantages
   b. Disadvantages

G. Solar
   a. Advantages
   b. Disadvantages

H. Wind
   a. Advantages
   b. Disadvantages

Curriculum: West Shore SD 2009 Curriculum
Course: Physical Science -HS

WEST SHORE SD
Date: July 13, 2009 ET

Topic: Energy Debate
Subject Area(s): Science

Days: 10
Grade(s): 9

Key Learning: The rate of use of natural resources has an impact on sustainability.

The practical use of alternative sources of energy can help address environmental problems.

Unit Essential Question(s): What is the best energy source for our town?

Concept: **Pros and Cons of Energy Sources** S11.A.3.1.4, S11.A.1.1.4, S11.A.1.2.1, S11.C.2.2.1, S11.A.1.3.4, S11.C.2.2.2, S11.C.2.2.3, S11.A.1.3.2, S11.C.2.1.3, S11.C.3.1.4	Concept:	Concept:
Lesson Essential Question(s): What are the major pros and cons of each energy source? (ET) How does your energy source work? (ET)	**Lesson Essential Question(s):**	**Lesson Essential Question(s):**
Vocabulary: Biomass, Coal, Geothermal, Hydroelectric, Nuclear, Solar, Wind	**Vocabulary:**	**Vocabulary:**

Additional Information:

Attached Document(s):

Essential Questions List

Date Started: _____
Question #1: _____
Notes: (to be filled out on review day)

Date Started: _____
Question #2: _____
Notes: (to be filled out on review day)

Date Started: _____
Question #3: _____
Notes: (to be filled out on review day)

Date Started: _____
Question #4: _____
Notes: (to be filled out on review day)

The I Deal Place to Live

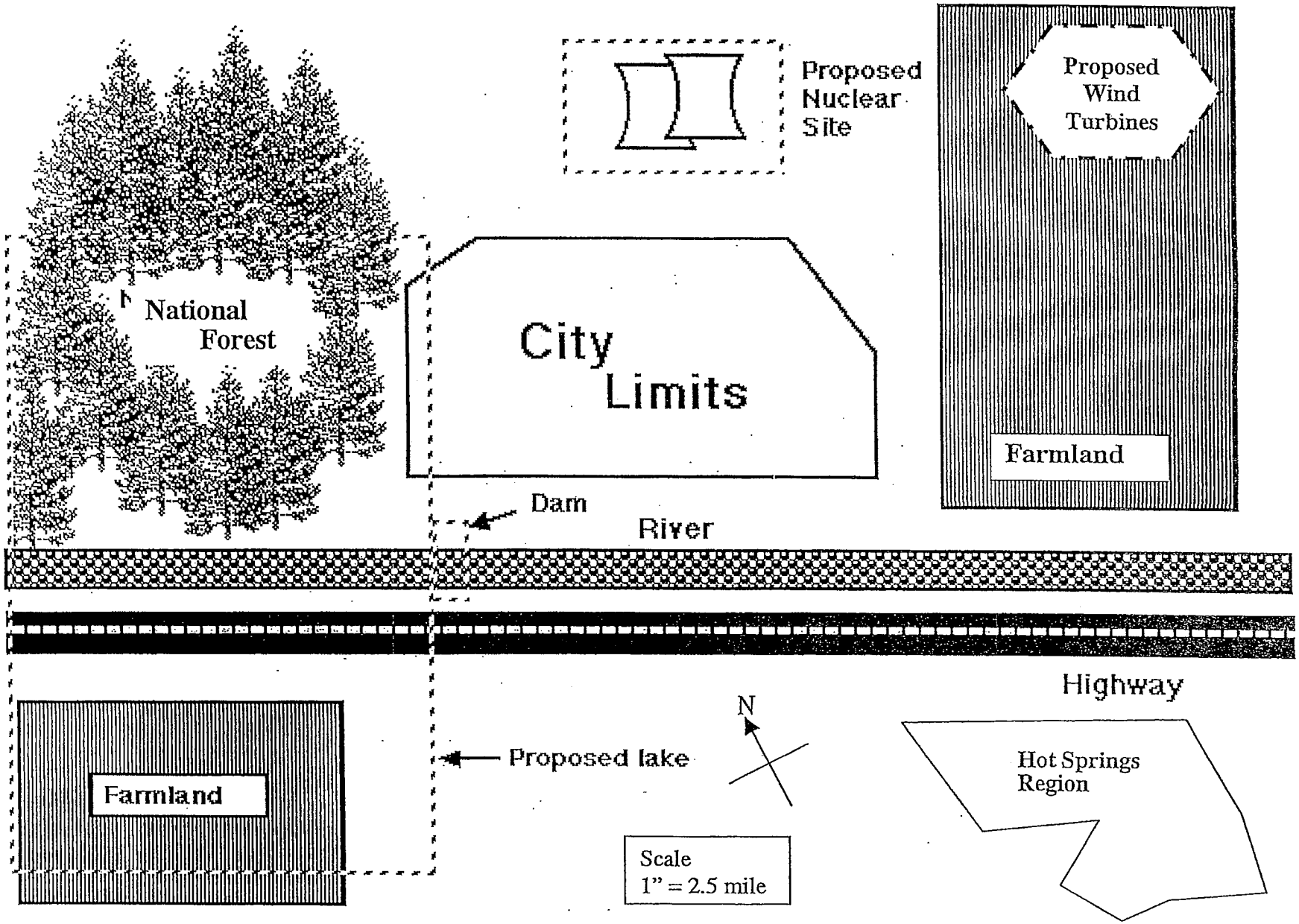
Lots of people choose where they want to live...they may even design their own home. In this activity you are not going to choose the ideal house to live, instead you will design the ideal town to live. We are not just talking about designing the layout of buildings, we are talking about designing the lay out of rivers, forests, coal mines, fields, and any other natural resource needed for the ideal town.

Although you are designing your own town, all the towns will have certain things in common. This town is smaller than York or Harrisburg with a population of about 50,000. There is one high school, two middle schools, and four elementary schools. There is a small mall, many businesses, and one good sized modern hospital. There are a number of professional office buildings and some medium sized production companies including a small Ford truck pickup plant. The town does not have a traditional mayor. Instead, they have a town council that is comprised of neutrally minded community members. Whenever an important issue needs to be decided, members of the town meet in a town meeting and they try to convince the council members what the best thing to do is. The council votes at the end of the meeting and their decision stands. A majority council vote is all that is needed.

This week the issue is how to layout the town with the best possible resources for the best possible source of energy. What is the ideal energy source for an ideal town.

1. Biomass	**3. Hydroelectric**	**5. Solar**
2. Coal	**4. Nuclear**	**6. Wind**

You will need to select the energy source you wish to defend and present. You will also need to come up with a map showing the ideal location of the town, power supply, and the natural resources related to the power supply. There is a map provided to give you an idea of how to do this. There will be 4 – 5 people in each group and each person will have a job to do.


Proposed
Nuclear
Site
Proposed
Wind
Turbines
National
Forest
City
Limits
Farmland
Dam
River
Highway
N
Proposed lake
Farmland
Hot Springs
Region
Scale
1" = 2.5 mile

Energy Sleuth Questions

Here are a few topics you might want to consider researching on your topic:

Team Leader

- ✓ Explain the technologies used in extracting or processing or building the energy source
- ✓ Its economic potential and the feasibility for a small city of about 50,000 people
- ✓ The history of its use
- ✓ The sustainability of its use
- ✓ Legislation (current or pending) which would benefit your energy source
- ✓ Average kWh consumption per business and per person
- ✓ Cost per kWh to maintain electricity production
- ✓ Startup costs to build the power plant

Protector/Antagonist

- ✓ Pros and cons: 3 advantages and 3 disadvantages related to the environment and town.
- ✓ Make sure you shed a positive light on the 3 disadvantages of your energy source
- ✓ Explain the disadvantages to the other sources

Please do not limit yourself to these questions, but use them as a starting point in the research process. At times it may seem that the Team Leader and the PA are investigating the same things, that is okay. Don't be afraid to ask for help. GOOD LUCK!! ☺

Group Roles

(1) Team Leader – This person will be the spokesperson for the presentation. This member of the group must see that all are on task and research facts about their energy source. They must have a complete understanding of the operation of the energy source and develop a map showing the layout of the town and any natural resources related to their energy source.

(2) Protector of all that is good/Antagonist (PA) – This person will be the spokesperson for the debate. This member of the group must have a good understanding of the good and bad of the energy source. They must have an answer for the questions and problems that will be posed by the other groups against their source and be able to turn the negatives into positives for their group. They must also seek out negatives for each of the other sources of energy and be prepared to ask a "hard" question of each other group to try and discredit their source of energy.

(3) Graphics –This member of the group must prepare all of the visual aids the group will use during their presentation. This will include a power point for the presentation and a pamphlet for the debate.

TEAM LEADER

Work Time:

_____ Answering the Energy Sleuth Questions
_____ Developing the City Map
- _____ River (Colored in Blue)
- _____ Coal Location
- _____ Farmland
- _____ 1 High School
- _____ 2 Middle Schools
- _____ 4 Elementary Schools
- _____ 50 Business Location(s)
- _____ 15 Professional Business Location(s)
- _____ 1 Automobile Plant
- _____ 1 Mall
- _____ 1 Modern Hospital
- _____ Housing Location(s)
- _____ Your Energy Source Location

_____ Checking the Progress of the Other Members in Your Group
_____ Reporting on the Progress of the Other Members in Your Groups to the Teacher

Presentation:

_____ Energy Source
_____ Students Involved
_____ Technology for Extracting or Processing
_____ Economic Potential
_____ Economic Feasibility for City of 50,000 people
_____ History of Use
_____ Sustainability of Its Use
_____ Average kWh Consumption for a Business
_____ Average kWh Consumption per Person
_____ Cost per kWh to Maintain Electricity Production
_____ Startup Costs to Install Energy Source in the City
_____ Legislation (Current or Pending) That Would Benefit Your Energy Source
_____ _____ _____ Three Advantages of Using Your Energy Source
_____ Proposed Site on Map
_____ Extra Information
_____ Completed City Map

Debate:

N/A

PROTECTOR/ANTAGONIST

Work Time: Research the Following

_____ Answering the Energy Sleuth Questions

_____ _____ _____ Three Advantages of Using Your Energy Source

Three Disadvantages for Each of the Alternative Energy Sources (15 Total)

Biomass: _____ _____ _____
Coal: _____ _____ _____
Hydroelectric: _____ _____ _____
Nuclear: _____ _____ _____
Solar: _____ _____ _____
Wind: _____ _____ _____

____ Justification or Solutions to Show Your Energy Sources Disadvantages in a Positive Light

Presentation:

N/A

Debate:

Reiterate Presentation Information (*Choose any 5 from the following):*

_____ *Energy Source*
_____ *Students Involved*
_____ *Technology for Extracting or Processing*
_____ *Economic Potential*
_____ *Economic Feasibility for City of 50,000*
_____ *History of Use*
_____ *Sustainability of Its Use*
_____ *Average kWh Consumption for a Business*
_____ *Average kWh Consumption per Person*
_____ *Cost per kWh to Maintain Electricity Production*
_____ *Startup Costs to Install Energy Source in the City*
_____ *Legislation (Current or Pending) That Would Benefit Your Energy Source*

_____ Extra Information

_____ _____ _____ Three Advantages of Using Your Energy Source

Three Disadvantages for Each of the Alternative Energy Sources (15 Total)

Biomass: _____ _____ _____
Coal: _____ _____ _____
Hydroelectric: _____ _____ _____
Nuclear: _____ _____ _____
Solar: _____ _____ _____
Wind: _____ _____ _____

_____ _____ _____ Justification or Solutions to Show Your Three Energy Sources Disadvantages in a Positive Light

GRAPHICS DESIGNER

Work Time (Create PowerPoint Presentation and Debate Pamphlet – SEE CRITERIA BELOW)

_____ Develop the PowerPoint Slide Structure and Order (1st Half of Day 1)
_____ Enter Information for PowerPoint Slide From Group Partner's Research
_____ Develop the Debate Pamphlet Structure (2nd Half of Day 1)
_____ Create Debate Pamphlet

Presentation: The Following Pages on PowerPoint Slides

_____ Energy Source (Title Slide)
_____ Students Involved (Title Slide)
_____ Technology for Extracting or Processing
_____ Economic Potential
_____ Economic Feasibility for City of 50,000
_____ History of Use
_____ Sustainability of Its Use
_____ Average kWh Consumption for a Business
_____ Average kWh Consumption per Person
_____ Cost per kWh to Produce Electricity
_____ Startup Costs to Install Energy Source in the City
_____ Legislation (Current or Pending) That Would Benefit Your Energy Source
_____ Extra Information
_____ _____ _____ Three Advantages of Using Your Energy Source
_____ _____ _____ Three Appropriate Pictures/Graphics

Debate Pamphlet (*Choose any 5 from the following*):

_____ *Energy Source*
_____ *Students Involved*
_____ *Technology for Extracting or Processing*
_____ *Economic Potential*
_____ *Economic Feasibility for City of 50,000*
_____ *History of Use*
_____ *Sustainability of Its Use*
_____ *Average kWh Consumption for a Business*
_____ *Average kWh Consumption per Person*
_____ *Cost per kWh to Produce Electricity*
_____ *Startup Costs to Install Energy Source in the City*
_____ *Legislation (Current or Pending) That Would Benefit Your Energy Source*
_____ Extra Information
_____ _____ _____ Three Advantages of Using Your Energy Source:
_____ _____ _____ Three Appropriate Pictures/Graphics

Three Disadvantages for Each of the Alternative Energy Sources (15 Total)

Biomass: _____ _____ _____
Coal: _____ _____ _____
Hydroelectric: _____ _____ _____
Nuclear: _____ _____ _____
Solar: _____ _____ _____
Wind: _____ _____ _____

_____ _____ _____ Justification or Solutions to Show Your Three Energy Sources Disadvantages in a Positive Light

Rules for the debate

1. Each member of the group must participate in the presentation to be given to the town council.

2. Each group will be given a maximum of eight (8) minutes to make their presentation to the town council. Each presentation should include graphics and all the basic information about the source. Information must have documentation and be backed with facts.

3. Each group will be given time to question other groups and will also need to defend their position.

4. The town council will be given time to question any group on any point they feel still needs further clarification.

5. The decision of the town council is final and binding.

6. At the end of the debate all note cards, printouts, graphics and resource information must be turned into the town council for possible further review.

7. All sources must be listed in a Bibliography.

Your Name: _____

Presentation Notes

Group: Biomass

Pros:

Cons:

Other Info:

Questions:

Group: Coal

Pros:

Cons:

Other Info:

Questions:

Your Name: _____

Presentation Notes

Group: Hydroelectric

Pros:

Cons:

Other Info:

Questions:

Group: Nuclear

Pros:

Cons:

Other Info:

Questions:

Your Name: _____

Presentation Notes

Group: Solar

Pros:

Cons:

Other Info:

Questions:

Group: Wind

Pros:

Cons:

Other Info:

Questions:

Group Energy Source: _____

Your Name _____

Rating 1-10 : _____

Your Contributions:

Group Member 1 _____

Rating 1-10 : _____

Their Contributions:

Group Member 2 _____

Rating 1-10 : _____

Their Contributions: