

= Energy Trade-Offs

Adapted from the University of Northern Iowa's Energy Education Curriculum Project

Essential question: How can our country manage to get enough energy and dispose of waste while negotiating with other countries with the same needs?

Objectives: Students will...

1. Develop awareness and appreciation of the importance of resources, compromise, politics, and priorities in international trade.
2. Engage in group problem solving efforts in an attempt to meet a country's needs despite limited resources.
3. Demonstrate a global perspective on energy resources.

Subject: Social Studies

Suggested Grade Level: 9 – 12

Materials:

- Resources and Resource Needs of Various Countries (Appendix)
- Distribution of Resources Cards (Appendix)
- Energy trading cards (Appendix)

BACKGROUND

The social studies portion of this interdisciplinary unit focuses on world trade, with an emphasis on energy resources. Students play the roles of resource specialists for six real countries. Provided with knowledge of what their country has and what they need, students proceed to engage in trade with other countries in an effort to meet the needs of their own country. Students are provided with trading cards representing their country's food supply, energy resources and manufactured goods. An interesting twist is thrown in by also giving the countries involved cards representing nuclear waste. The point values on their cards indicate the number of units involved. Through this exercise, students will make a number of conclusions regarding the world perspective on energy resources and relationships between countries. They will likely come to realize that it may not be possible to meet the needs of every nation. This presents a number of issues that are ideal for discussion with middle school students.

PROCEDURE

Briefly introduce the activity before breaking students into country groups. Let students know they will be involved in an exercise in international trade. This is a trading game involving six nations (United States, China, Japan, United Kingdom, India, and Mexico). Each country may make trades for four areas

of resources: Food, Energy, Manufactured Goods, and Nuclear Waste. Every country will know how much of each category of resource their country has to work with. They will also know what their country needs to meet their current demand levels. These nations must trade with each other to meet their needs.

Each country has a predetermined amount of each resource. For example, India has 7 units of food, but needs 34 units of food to meet its food needs. Each country must engage in "trade talks" to get the amount of food, energy and manufactured goods its country needs. They must also find a way to dispose of nuclear waste.

Show students the cards they will be using to trade with. (Once students get the cards, they will be anxious to begin trading, making it more difficult to keep their attention for directions.) Explain the color coding for the different resources. Each card may represent 1, 2, 5, or 10 energy units. Caution students to make certain they notice the numbers on the cards during trading.

Number or assign the students randomly into one of the six nations. There should be approximately 3-6 students assigned to each country (with the optimal number being 4). Each country needs a Food Specialist, an Energy Specialist, a Manufactured Goods Specialist, and a Nuclear Waste Specialist. These specialists will be considered experts in their field. They will be in charge of arranging and negotiating all trade agreements dealing with their resource. You may either assign students to these specialists roles, or have students select which resource they will represent.

Once the countries have been assigned, each group should color their own flag. Ask each student to make a name tag containing an appropriate symbol for their country, their name, and their trade specialty.

Distribute a table to each country listing that country's needs and resources. Ask each group to study their resources, and resource needs. As a group, each country should develop a plan of action. Determine what they are short of and what resources their country needs more of. Since the students do not know which other countries will be involved in the trading and the needs and surpluses of those other countries, no planning can be done in terms of which countries to approach for trading. To discover this information, students will need to ask the representatives from the other countries once trading has begun.

Once all of the preplanning has been completed, students should be given the correct number of game cards representing the resources of their country. (See materials list for how to prepare the cards prior to class)

Level 1: Tell students that the object of the game is to meet all of their country's needs by the end of the game. This is done by trading those resources that their country does not need. If you would like your students to use a treaty form when trading with other countries, a copy of this form is provided in Appendix D.

Rules of the Trade Game

- The trade specialist must be present when any trade involving their resource is made. For example, if you are the food specialist, and another country wants energy in exchange for food, you must go and get the energy specialist from your country before this trade can be made.
- The specialist is the only person allowed to hold resource cards of that resource. For example, the only person who can hold food cards is the food specialist.
- Cards may be traded by your country, even if they have another country's name on them.
- Unequal numbers of cards may be traded for each other. For example, you might trade one energy unit for 4 food units.

DISCUSSION QUESTIONS

1. How were trade agreements arranged during the simulation?
2. How did feel about your trading?
3. What happened to the third world country? Were they able to meet any of their needs? Explain (They probably ended up trading food for nuclear waste.)
4. How do you determine the winners? (Most students will say it is the one who has met the most of their needs. Perhaps someone will suggest that the winner is the country that helped the most other countries.)
5. How do the other countries feel about the United States after the trading? (Most countries may have felt anger toward the U.S. since they had so many resources, but may not have been willing to share them with other countries.)
6. What was the hardest resource for your country to get?
7. The resources for Saudi Arabia can be estimated to be the following:
 Energy: Have 15 -- Need 2
 Manufactured Goods: Have 2 -- Need 1
 Food: Have 0 -- Need 1
 Nuclear Waste: Have 0 -- Need 0

What can you conclude about the size of Saudi Arabia's population? Explain. (Students should be able to conclude Saudi's population is relatively small since they have no food resources, but need only one unit of food imported. How do you think Saudi would have done in the trade game? Explain. (Since Saudi has very few unmet needs, they would not need to trade much, although they have a great deal of extra energy to sell.)

Level 2: Time permitting; you may want to move students to Level 2 of the energy trade game. In Level 2, the object of the game is to meet the needs of all countries by the end of the game. This requires a great deal more cooperation. It will also demand that some countries give resources to other countries free. Have groups sit around the room in a circular arrangement and negotiate together. Give each country the summary table containing all of the countries needs and resources. This data will allow students to do some planning as to how the needs of all can be met through trading. You may wish to have students work out a plan in small groups. Groups could then present their plans at a mock United Nations session.

EXTENSIONS

- The teacher at various intervals during the game may toss in different global problems that must be dealt with. Here are a few examples:
 - Famine: Each country must surrender 1/4 of their food resources to the teacher to be sent to the famine country.
 - Energy Embargo: The world's major supply of petroleum has been cut off. Each country must stop all energy trading. This means that all energy resource cards must be turned in to the teacher and not be used for trading. Continue this trading without the energy cards for several minutes. Ask for student reactions about the trading process without the energy cards. Was it more difficult for your country to get what they needed? Was it easier? Resume the regular game with the energy resource cards after this discussion.
- Challenge students to conduct some library research to discover the haves and needs for a third world country such as Somalia. Ask them to lead a class discussion on that country's chances are for meeting their needs. How are these countries ever able to get out of their rut?
- How would third world countries be affected if technological advances gave third world countries adequate access to solar, wind and tidal energy?

HOME/COMMUNITY CONNECTIONS

- Ask students if they knew there is a connection between their family and international trade. Where do things come from in their homes? Challenge students to find out what countries different home products come from. Make a list.
- Have students find out where nuclear waste from the Palo power plant is disposed of. Ask students to write to Palo and ask. Find out the problems of nuclear waste disposal.

Resources & Needs of Various Countries

USA

Energy: Have 55, Need 52
Manufactured Goods: Have 37, Need 42
Food: Have 33, Need 10
Nuclear Waste: Have 34, Need 0

China

Energy: Have 25, Need 19
Manufactured Goods: Have 7, Need 7
Food: Have 53, Need 46
Nuclear Waste: Have 1, Need 0

Japan

Energy: Have 0, Need 13
Manufactured Goods: Have 41, Need 37
Food: Have 4, Need 5
Nuclear Waste: Have 11, Need 0

United Kingdom

Energy: Have 7, Need 6
Manufactured Goods: Have 6, Need 8
Food: Have 1, Need 2
Nuclear Waste: Have 4, Need 0

India

Energy: Have 6, Need 7
Manufactured Goods: Have 6, Need 3
Food: Have 7, Need 34
Nuclear Waste: Have 1, Need 0

Mexico

Energy: Have 7, Need 3
Manufactured Goods: Have 3, Need 3
Food: Have 2, Need 3
Nuclear Waste: Have 1, Need 0

Distribution of Resource Cards to Various Countries

USA

Energy: 3 Tens, 3 Fives, 2 Twos, 6 Ones
Manufactured Goods: 2 Tens, 1 Five, 3 Twos, 6 Ones
Food: 3 Tens, 1 Two, 1 One
Nuclear Waste: 1 Ten, 2 Fives, 5 Twos, 4 Ones

China

Energy: 2 Tens, 5 Ones
Manufactured Goods: 1 Five, 2 Ones
Food: 2 Tens, 3 Fives, 3 Twos, 12 Ones
Nuclear Waste: 1 One

Japan

Energy: 0
Manufactured Goods: 3 Tens, 2 Fives, 1 One
Food: 1 Two, 2 Ones
Nuclear Waste: 1 Five, 2 Twos, 2 Ones

United Kingdom

Energy: 2 Twos, 3 Ones
Manufactured Goods: 1 Two, 4 Ones
Food: 1 One
Nuclear Waste: 2 Twos, 2 Ones

India

Energy: 1 Two, 4 Ones
Manufactured Goods: 1 Two, 4 Ones
Food: 1 Five, 2 Ones
Nuclear Waste: 1 One

Mexico

Energy: 1 Five, 2 Ones
Manufactured Goods: 3 Ones
Food: 2 Ones
Nuclear Waste: 1 One

Total Cards Needed to Play the Energy Trade Game

Energy

5 tens
4 fives
5 twos
20 ones

Food

5 tens
4 fives
5 twos
20 ones

Manufactured Goods

5 tens
4 fives
5 twos
20 ones

Nuclear Waste

1 ten
3 fives
8 twos
11 ones

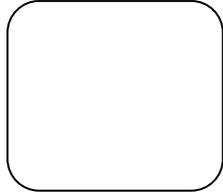
Directions for Photocopying Cards For Use In Class:

The next few pages contain masters of the cards students will need to play the energy trade game. There is one master for each trade category: Energy, Manufactured Goods, Food, and Nuclear Waste. Each page contains masters for 6 cards. While the colors choices can vary, depending on your preference, the number of copies will not. Follow the directions provided below in preparing your cards for play. The cards may be re-used, so it would be wise to print them on card stock and/or have them laminated. You will have a number of cards of each type left after your labeling is complete. Save these to replace lost or damaged cards.

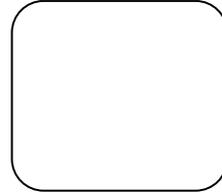
1. Photocopy 6 pages of ENERGY cards on yellow paper (Provided below)
2. Photocopy 6 pages of MANUFACTURED GOODS cards on blue (Provided below)
3. Photocopy 6 pages of FOOD cards on green paper (Provided below)
4. Photocopy 4 pages of NUCLEAR WASTE cards on pink paper (Provided below)
5. Using a magic marker, write numbers on the cards corresponding to those values listed at the top of this page.
6. Print the name of the country that will be given the card at the beginning of the trade game. Use the values provided above. Your cards should now be ready!

ENERGY CARDS

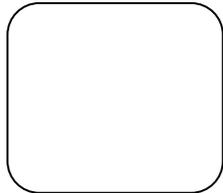
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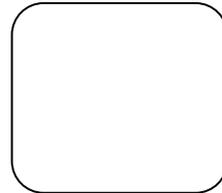
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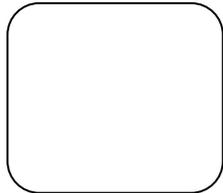
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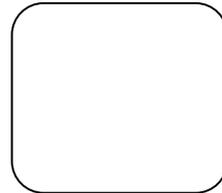
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ENERGY

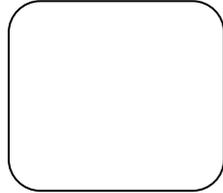


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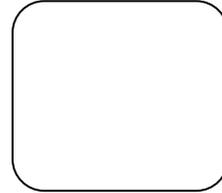
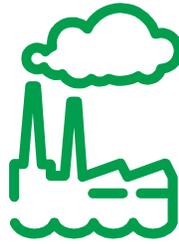


MANUFACTURED GOODS CARDS

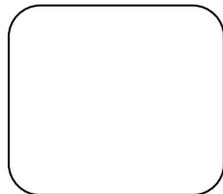
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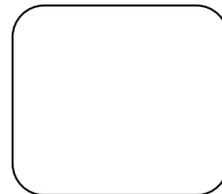
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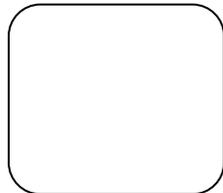
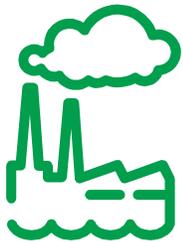
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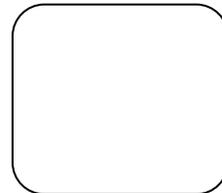
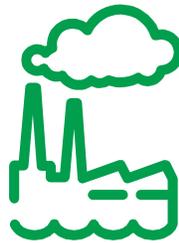
MANUFACTURED GOODS



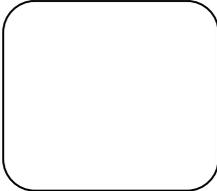
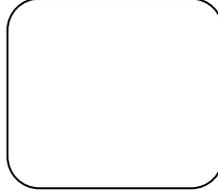
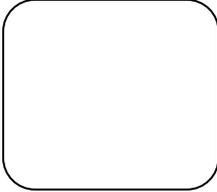
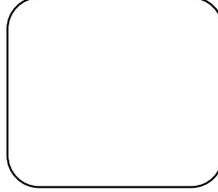
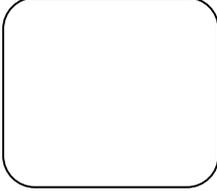
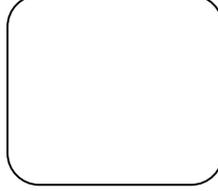
MANUFACTURED GOODS



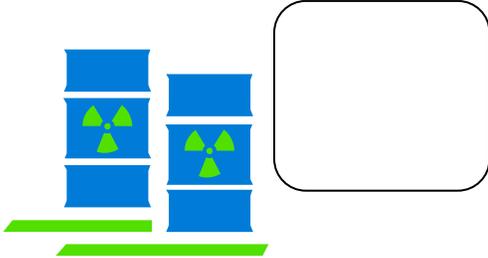
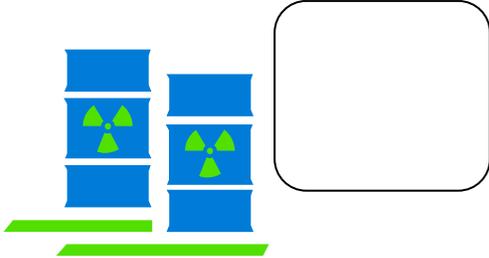
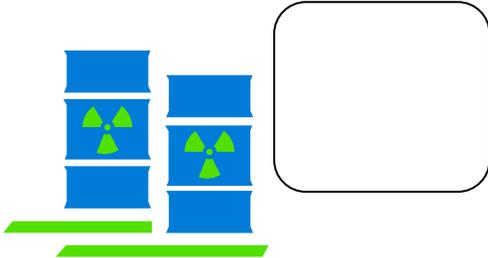
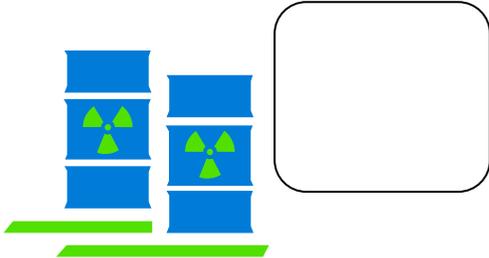
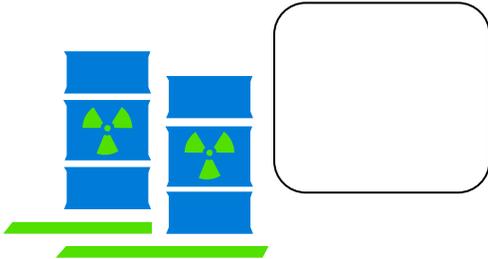
MANUFACTURED GOODS



FOOD CARDS

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<p><u>FOOD</u></p>  	<p><u>FOOD</u></p>  

NUCLEAR WASTE CARDS

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