

**Curriculum topics:**

- Energy
- Solar Power
- Recycling
- Conservation

**Subject:**

**Physical Science**

**Grade range: 4 – 8**

**Who we are:**

Resource Area for Teaching (RAFT) helps educators transform the learning experience through affordable “hands-on” activities that engage students and inspire the joy and discovery of learning.

For more ideas and to see RAFT Locations

[www.raft.net/visit-raft-locations](http://www.raft.net/visit-raft-locations)

# THE ENERGY GAME

Make smart energy choices at home, school, work and play!



As they play the Energy Game, young students will start to think about their own energy choices. Older players will discover that the game is intriguing and involves quite a bit of strategy.



Home



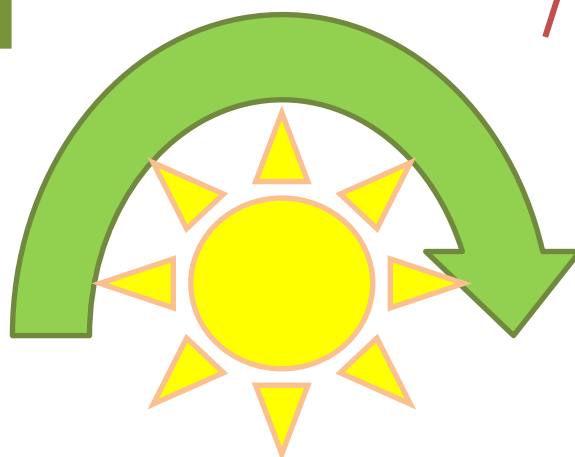
Play



Work



School



## THE ENERGY GAME

# Materials required

- Counters with 25 beads each, 4  
Each counter is made with the following:
  - Corrugated cardboard or plastic square, ~15 cm x 15 cm (6"x6"), 1
  - Plastic tubing, ~32 mm (1/8") diameter; ~41 cm (16") long, or chenille stem ~30 cm (12") long, 1
  - Pony beads, 20 of one color, 5 of another color
  - Label & tape
- Deck of 52 special playing cards, 1  
[Deck includes 4 additional (optional) blank cards (1 of each suit) – use to create new “energy choice” options, if desired.]
- Optional: Glue
- Optional: Game Board

[Download a pattern for the cards & game board at [www.raft.net/raft-idea?isid=674](http://www.raft.net/raft-idea?isid=674).]

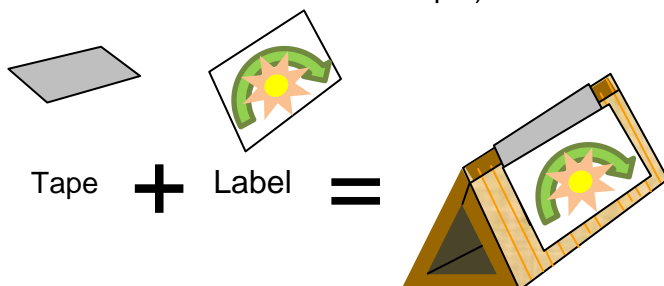
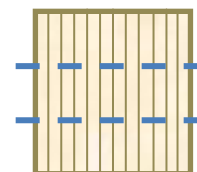
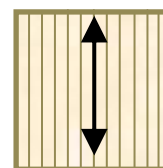
## How to build it

If the deck of cards is not pre-cut, use scissors or a paper cutter to separate the cards.



If the bead counters are not pre-assembled, assemble them as follows:

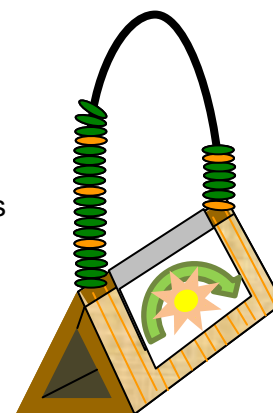
- 1 Locate the four squares of corrugated cardboard. Arrange them so the corrugations run up and down (important).
- 2 Fold each square in thirds (across the corrugations) as shown. To make a straight bend, use a straight edge, or the edge of a table, if needed.
- 3 Tape to complete the triangular base, then apply the label (leave room to insert the tube or chenille stem in step 5):



- 4 Separate the beads into 2 groups, according to color. Note which color has the most beads. Slide 4 of those beads on to the plastic tube or chenille stem, followed by 1 bead of the other color. Repeat until there are 25 beads on the tube.



- 5 Carefully insert the tube or chenille stem, into the corrugations as shown. Add a little glue if desired. Repeat 1-5 to complete the other three counters.



# Playing the game (for 4 players)

*Objective: To pay the least amount for energy by making smart choices.*

- 1 Get ready.** Give each player a bead counter to track their energy costs. At the start of the game, all the beads should be on the left-hand side of the counter. Pick a dealer to shuffle the deck and deal all cards to the players.
- 2 Start the first round.** The player to the left of the dealer starts the first round by choosing a card and placing it face-up on the table. The player announces the "suit" (Home, School, Work, or Play) and reads the "energy choice" on the card aloud. The number on the card represents the cost of energy used by the activity shown – low numbers represent good energy choices!
- 3 Complete the round.** Other players must "follow suit" if they can. This means each player puts down a card of the same suit as the first player. If a player cannot follow suit, that player may play any card of another suit (which will not count against the player when the round is scored). Each card is read aloud as it is placed next to the other card(s).
- 4 Keep score.** At the end of the round, when all players have played a card, the person who played the highest number card in the suit must "pay" for their energy. For example, if the highest card in the suit was a 4, that player must move 4 beads to the right-hand side of their counter. If more than one person played the highest number, all players who played it must pay. Exception: if an energy savings card is scored, no one needs to pay!

**To score an energy savings card:** The amount saved appears as a negative (-) number on the card. If a player plays a savings card, and the card is in the suit, then that player can move up to 5 beads (depending on the number of beads available) back to the left-hand side of the counter.

- 5 Start the next round.** Once the scoring is done, gather the used cards and put them aside. The next round is started by the player to the left of the player who started the previous round. Repeat steps 2-5 until all cards have been played.
- 6 Find the winner.** At the end of the game, the winner is the player who paid the least for energy (has the fewest beads on the right-hand side of their counter). Multiple winners are possible – good work everyone!

## About the Game

Each card in this game displays an everyday use of energy. Some of the energy uses are smart, such as "Use recycled paper." Other choices are not so smart, such as "Make a special trip to the store." Players try to minimize the amount of energy they use.

Students will find it helpful to arrange their cards by suit. They will quickly see there is an advantage to playing high cards at certain times (e.g., when they can be safely played without penalty).

Players can come from behind with the help of bonus cards that actually reduce their costs by doing smart things like installing a photovoltaic system. In some games, it may be wise to hold onto these bonus cards until the end. In other games, this approach can backfire because the cards will be played without benefit.

## Curriculum Standards:

Energy can be transferred from place to place by electrical currents  
(Next Generation Science Standards: Grade 4, Physical Science, 3-2)

Energy, natural resources, & the environment  
(Next Generation Science Standards: Grade 4, Earth and Space Science, 3-1)

Human Impacts  
(Next Generation Science Standards: Grade 5, Earth and Space Science, 3-1; Middle School, Earth and Space Science, 3-3)

Additional standards at:  
<http://www.raft.net/raft-idea?isid=674>

# Learn more

- This game can be played by teams. Encourage students to work together to get the lowest combined score using two hands!
- Ask students to keep a log of their home energy uses. How many times do they open the refrigerator each day? How often do they use a bike instead of asking for a car ride? See the RAFT Idea Sheet [Journaling Your Trash](#) for a way to make a simple journal out of reused materials.
- Identify three ways to reduce energy in the classroom. Students can use some of the ideas on the Energy Game playing cards for inspiration.
- Look at the “100 People Under the Sun” educational program (see link below). Have your class participate!

**Related activities:** See RAFT Idea Sheets:

### Resources

#### **Journaling Your Trash –**

<http://www.raft.net/ideas/Journaling Your Trash.pdf>

#### **Paper Recycling –**

<http://www.raft.net/ideas/Paper Recycling.pdf>

#### **Thinking Like a Real Survivor –**

<http://www.raft.net/ideas/Thinking Like a Real Survivor.pdf>

### Solar Energy

#### **Auto Sunshade Solar Collector –**

<http://www.raft.net/ideas/Auto Sunshade Solar Collector.pdf>

#### **Solar Cell Sandwich –**

<http://www.raft.net/ideas/Solar Cell Sandwich.pdf>

### Conservation of Energy

#### **Retractor a Go-Go Car –**

<http://www.raft.net/ideas/Retractor a Go-Go Car.pdf>

#### **Rollback Can –**

<http://www.raft.net/ideas/Rollback Can.pdf>

# Resources

Visit [www.raft.net/raft-idea?isid=674](http://www.raft.net/raft-idea?isid=674) for “how-to” video demos & more ideas!

See this website for more information:

- **SunPower Foundation: 100 People Under the Sun Project -**  
[http://100people.org/100people\\_under\\_the\\_sun\\_lesson\\_plan\\_home.php](http://100people.org/100people_under_the_sun_lesson_plan_home.php)

## **Acknowledgement:**

RAFT thanks the employees of SunPower Corporation for their help in developing this activity.