

Name \_\_\_\_\_

## Exploring Energy How Do You Use Energy?

**Directions:** Look around your house for things that use energy. Some things use muscle power, some use electrical power, some are examples of sound energy, and some use heat energy. Draw lines from the pictures to the kinds of energy they use. Some pictures will have more than one line.

**Mechanical Energy  
(muscle power)**

**Heat Energy**

**Sound Energy**

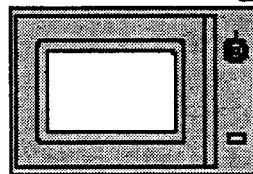
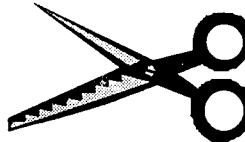
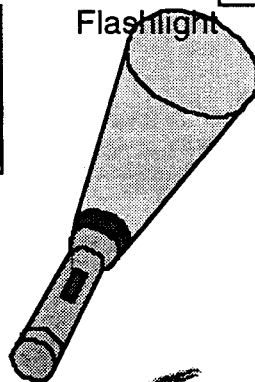
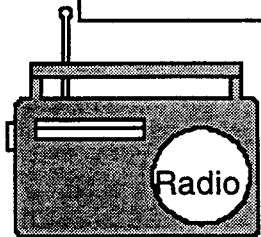
**Light Energy**

**Electrical Energy**

Flashlight

Scissors

Frying pan



Hair dryer

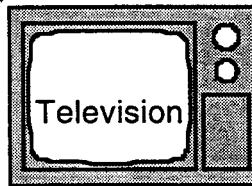
Microwave



Iron



Blender



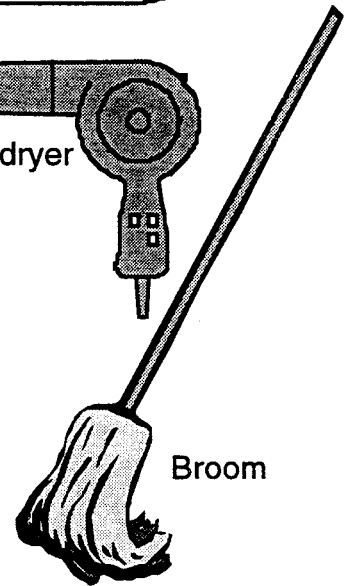
Television



Table lamp



Vacuum cleaner



Broom

Name \_\_\_\_\_

## EXPLORING ENERGY

### Examples of Energy

**Directions:** Look in magazines and newspapers to find pictures of things that use energy and cut them out. Cut these labels out and paste them to pieces of construction paper. Then paste the pictures you have cut out onto the same piece of construction paper as the kind of energy it represents.

**Mechanical Energy**  
(Muscle Power or Energy  
of Motion)

**Heat  
Energy**

**Electrical  
Energy**

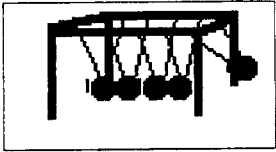
**Light  
Energy**

**Sound  
Energy**

**Chemical  
Energy**

**Nuclear  
Energy**

Name \_\_\_\_\_



**EXPLORING ENERGY**  
**Videotape Viewer's Worksheet**

**Directions:** The video is organized with four stops or pauses. You will be asked to think about a situation and then record your answer below.

**PAUSE ONE:** What will happen if one ball is lifted and released? (Circle the answer you think is correct.)

1. All the balls will start to move.
2. The ball on the far side will jump out and then return to hit the others and cause the first ball to move again.
3. Two balls from the opposite side will bounce away from the group.

**PAUSE TWO:** What will happen if two balls are released together? (Circle the answer you think is correct.)

1. All the balls will start to move.
2. One ball on the far side will jump twice as far and then return to hit the others and cause the first two balls to move again.
3. Two balls from the opposite side will bounce out from the group.

**PAUSE THREE:** What will happen if three balls are released from one side? (Circle the answer you think is correct.)

1. All the balls will start to move.
2. One ball will bounce very far from the group.
3. The two remaining balls will be joined by one of the released balls and three balls will fly up on the other side.
4. The two remaining balls will fly up higher because three balls will hit them.

**PAUSE FOUR:** What will happen if one ball from each side is released at the same time?

1. All the balls will start to move.
2. Two balls from each side will bounce out.
3. The two balls will bounce back out from the group.

## Exploring Energy The Pendulum

Name \_\_\_\_\_

**PURPOSE:** To explore the behavior of a pendulum.

**MATERIALS:** 4 washers      paper clip      string      ruler      2 books      meter stick

- PROCEDURE:**
1. Set the ruler on a desk or table so that about three inches of the ruler hang over the edge.
  2. Use books to hold the ruler in place.
  3. Tie the paper clip to one end of the string. Slip 2 washers on the paper clip.
  4. Tie the other end of the string to the part of the ruler hanging over the edge of the table. Use a ruler to measure the length of the string from the support ruler to the bottom of the paper clip which should be almost touching the floor.
  5. Place the meter stick on the floor so that the one end is under the paper clip.
  6. Lift the paper clip and washers about 20 centimeters from the starting position and release.
  7. Count the number of swings in one minute. (One full swing is from the starting position all the way to the other side and back again.)
  8. Record the number of swings in one minute in the chart below.
  9. Repeat this with other dropping distances. Record data in the chart below.
  10. After using two washers, try adding two more and repeat the experiment.

**OBSERVATIONS:**

	20 cm drop	30 cm drop	40 cm drop	50 cm drop
Number of swings 2 washers				
Number of swings 4 washers				

**CONCLUSIONS:**

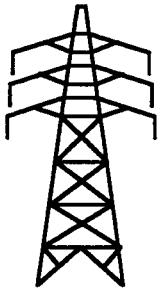
What did you find out about the way a pendulum moves?

Name \_\_\_\_\_

## EXPLORING ENERGY

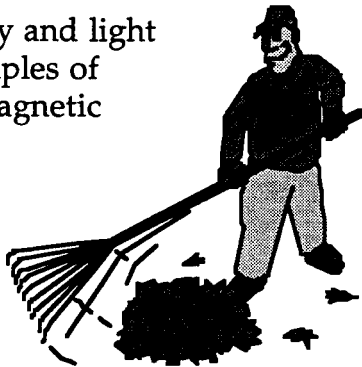
### The Five Main Forms of Energy

**Directions:** Look through a newspaper to find examples of these forms of energy. Cut out the article and circle the words that relate to energy.



### ELECTROMAGNETIC ENERGY

Electricity and light are examples of electromagnetic energy.



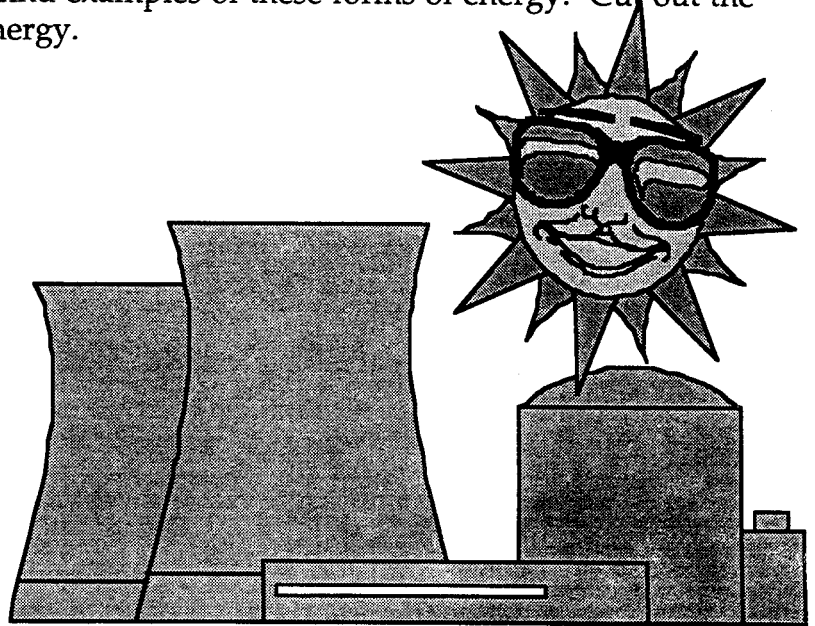
### MECHANICAL ENERGY

This is the energy of motion. The wind, cars moving, riding a bike, and even sound are all examples of mechanical energy.



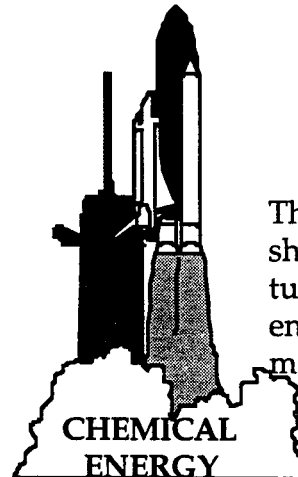
### HEAT ENERGY

The faster atoms move the greater the heat energy.



### NUCLEAR ENERGY

Nuclear energy has to do with the energy found inside the atom. The sun carries on a nuclear reaction all the time releasing huge amounts of energy. Nuclear power plants generate electricity.



### CHEMICAL ENERGY

The fuel used by the space shuttle is burned and it turns from chemical energy to heat and mechanical energy.

Name \_\_\_\_\_

## Exploring Energy The Height of a Dropped Weight

**PURPOSE:** To determine how speed and height relates to the energy of a dropped weight.

**MATERIALS:** Fish weights twine 2 rulers block of wood 2 books

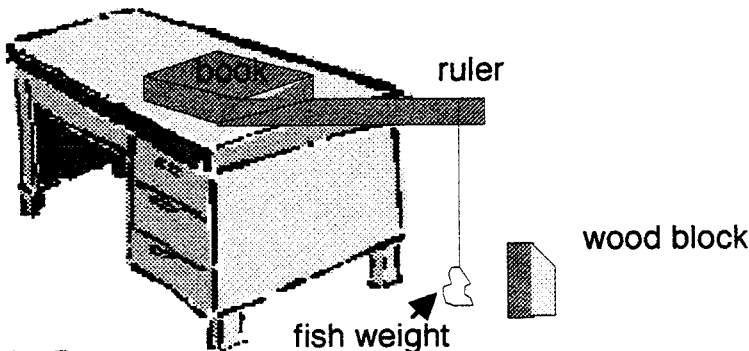
- PROCEDURE:**
1. Set the ruler on a desk or table so that about three inches of the ruler hang over the edge.
  2. Use books to hold the ruler in place.
  3. Tie a fish weight to one end of the twine.
  4. Tie the other end of the twine to the part of the ruler hanging over the edge of the table. The weight should be about 3 centimeters off the floor.
  5. Make a mark on the floor where the weight hangs down straight.
  6. Place the block of wood on that mark so that it is standing up.
  7. Lift or pull back the weight so that it is about 10 centimeters off the floor.
  8. Release the weight and watch it hit the block of wood. Measure how far the block goes from the mark on the floor you made before. Record below.
  9. Repeat this with other dropping heights. Record data in the chart below.

**OBSERVATIONS:**

	10 cm drop	20 cm drop	30 cm drop	40 cm drop
Distance block is hit				

**CONCLUSIONS:**

Compare the different trials. Which drop height caused the block to be hit the furthest?



Name \_\_\_\_\_

## Exploring Energy The Mass of a Dropped Weight

**PURPOSE:** To determine how mass relates to the energy of a dropped fish weight.

**MATERIALS:** Fish weights twine 2 rulers block of wood 2 books

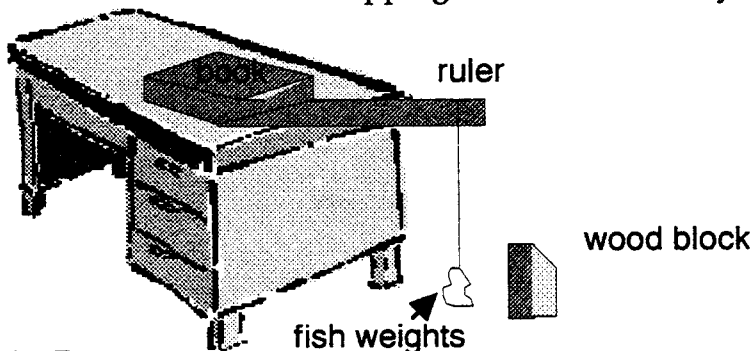
- PROCEDURE:**
1. Set the ruler on a desk or table so that about three inches of the ruler hang over the edge.
  2. Use books to hold the ruler in place.
  3. Tie 2 fish weights to one end of the twine.
  4. Tie the other end of the twine to the part of the ruler hanging over the edge of the table. The weights should be about 3 centimeters off the floor.
  5. Make a mark on the floor where the weights hang down straight.
  6. Place the block of wood on that mark so that it is standing up.
  7. Lift or pull back the weights so that they are about 10 centimeters off the floor.
  8. Release the weights and watch them hit the block of wood. Measure how far the block goes from the mark on the floor you made before. Record below.
  9. Repeat this with other dropping heights. Record data in the chart below.

**OBSERVATIONS:**

	10 cm drop	20 cm drop	30 cm drop	40 cm drop
Distance block is hit				

**CONCLUSIONS:**

How does the data from this experiment compare with the data on the sheet about dropping distances and only one fish weight?



Name \_\_\_\_\_

## EXPLORING ENERGY QUIZ

### Part A

**DIRECTIONS:** Answer the following multiple choice questions by circling the correct answer.

1. Energy is the ability to do  
a. work    b. power    c. acceleration    d. speed
2. The fuel used in a rocket is energy stored as  
a. mechanical energy    b. nuclear energy    c. chemical energy    d. electromagnetic
3. Energy of motion is  
a. kinetic    b. potential    c. chemical    d. electromagnetic
4. A rubber band stretched between two fingers is an example of  
a. kinetic energy    b. potential energy    c. chemical energy    d. electromagnetic energy
5. Light, laser light, and electricity are examples of  
a. chemical energy    b. mechanical energy    c. heat energy    d. electromagnetic energy

### Part B

**DIRECTIONS:** Answer the following short-answer questions in the space provided.

1. Describe five examples of mechanical energy.
2. All energy comes from the sun. Explain how this fits in with the food we eat.
3. On a roller coaster ride, there are hills of various size.
  - a. Where is the potential energy the greatest?
  - b. Where is the kinetic energy the strongest?
  - c. Where is the potential energy the least?

