

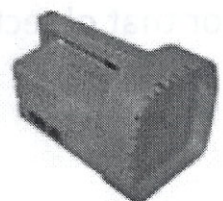
Energy Changes

As we have said, energy is constantly changing from one type into another. This is happening all around us and throughout the universe.

Please read through.

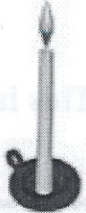
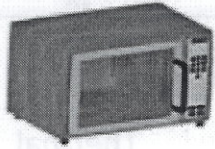
Examples of Changes

Many of the most obvious examples of energy changing from one type into another occurs in our homes. A number of examples are illustrated below. In each example energy starts as one type (energy in) and changes into another type (energy out). In some cases the energy might actually change into more than one type before the final energy out. In those situations, ignore the energy changes in the middle. Try to identify when this is happening and check your guesses with the information given after the examples.

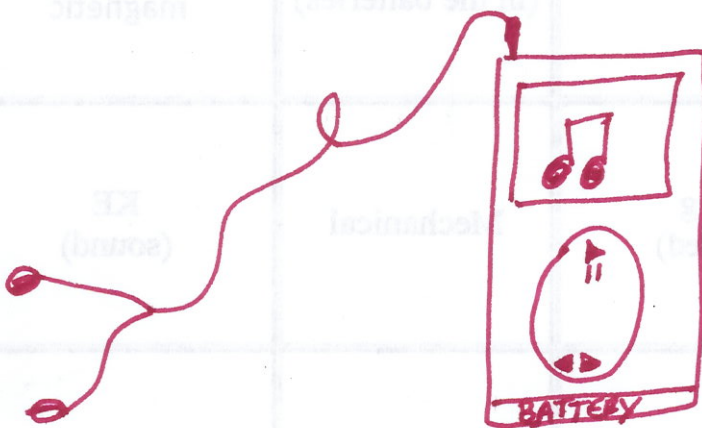
	Example Description	Energy In	Energy Out
	Electric Wok	Electrical	Thermal
	Flashlight *	Chemical (in the batteries)	Electro- magnetic
	Guitar String (being plucked)	Mechanical	KE (sound)
	Blinds (being opened)	Mechanical	Gravitational

* Notes: The one example where there was an obvious energy change in the "middle" was the flashlight. Chemical energy from the chemicals inside the batteries first changed into electrical energy before finally being changed into light energy.

Okay, now it's your turn. Can you decide the ENERGY OUT for these items?

	Burning Candle	Chemical (wax)	Electro-magnetic (and thermal)
	Sand Clock	Gravitational (Potential Energy)	Kinetic/ Mechanical
	Gasoline Powered Lawnmower	Chemical	Mechanical
	Microwave Oven	Electro-magnetic	Thermal

In the space below, draw an object that requires energy. Then, below your picture, identify the energy transformation that takes place for that object to function (to work):



The energy transformation(s) that take place in order for this object to function is/are:

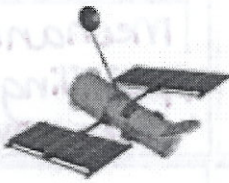
Chemical $\rightarrow$ Electrical $\rightarrow$ Sound
(Battery) (head phones)

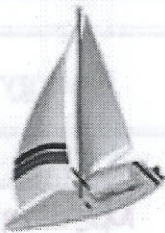
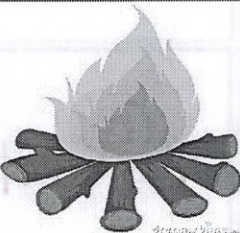
Energy Changes

You have seen a number of examples of energy changes. Let's see if you can identify some energy changes on your own.

Fill In Exercise

There are 10 examples of energy changes below. Type in or print and fill in what you think the energy in and energy out will be for each example. Then check your answers against the answers given below.

		Example Description	Energy In	Energy Out
1		Blender	Electrical	Mechanical
2		Solar Panel Powered Communications Satellite	Electro-magnetic	Electrical
3		Gas Powered Grill	Chemical	Thermal
4		Water Dispenser		
5		Electric Pencil Sharpener	Electrical	Mechanical

6		Game Controller	Mechanical	Electrical
7		Microphone	Sound	Electrical
8		Sail Boat	Potential (Together this is Mechanical)	Kinetic
9		Bike	Chemical (from your body)	Mechanical (pedalling bike... bike moves)
10		Fire	Chemical	Electro-magnetic and thermal

Energy Transformations

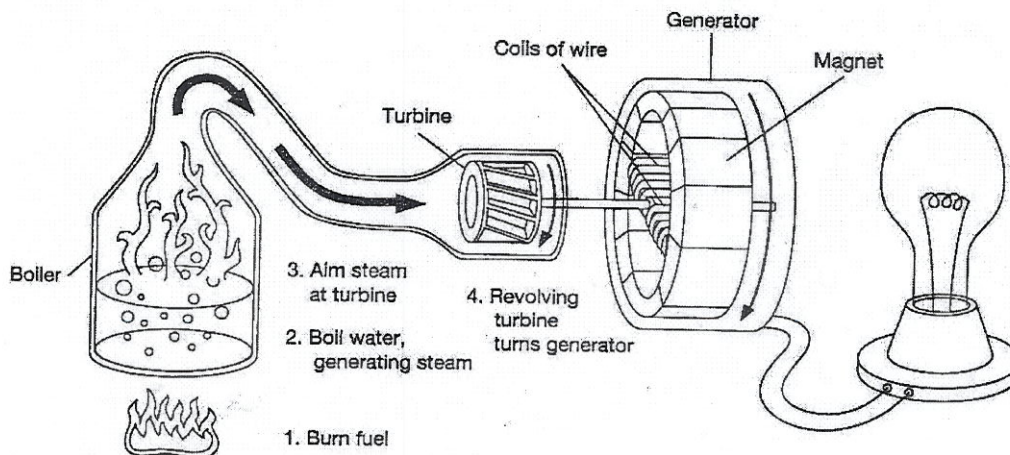
Choose the sequence of energy forms that best fits each item.

- B 1. Hairdryer
C 2. Electric saw
B 3. Toaster
C 4. Shredder
B 5. Coffee Pot
D 6. Windmill
A 7. iPod
C 8. Speaker Vibrates

- a. chemical energy - electrical energy - mechanical energy
 b. electrical energy - thermal energy
 c. electrical energy - mechanical energy
 d. mechanical energy - electrical energy

A Steam Powered Generator

The diagram below shows the steps involved in using the energy in steam to generate electricity. Use the diagram to help you fill in the blanks in the story. Here are the forms of energy that fit into the blanks, in random order: **chemical, electrical, heat, light, and mechanical**. Some words may be used more than once.



- (1) chemical energy from gas, oil, or coal provides
 (2) heat energy to water to produce steam. A turbine changes the energy of the steam into the (3) mechanical energy of the rotating turbine and generator. The generator converts this energy into
 (4) electrical energy. The lamp is an energy converter, changing (5) electrical energy to (6) electromagnetic (light) energy and
 (7) heat energy.

Name _____
 Period _____

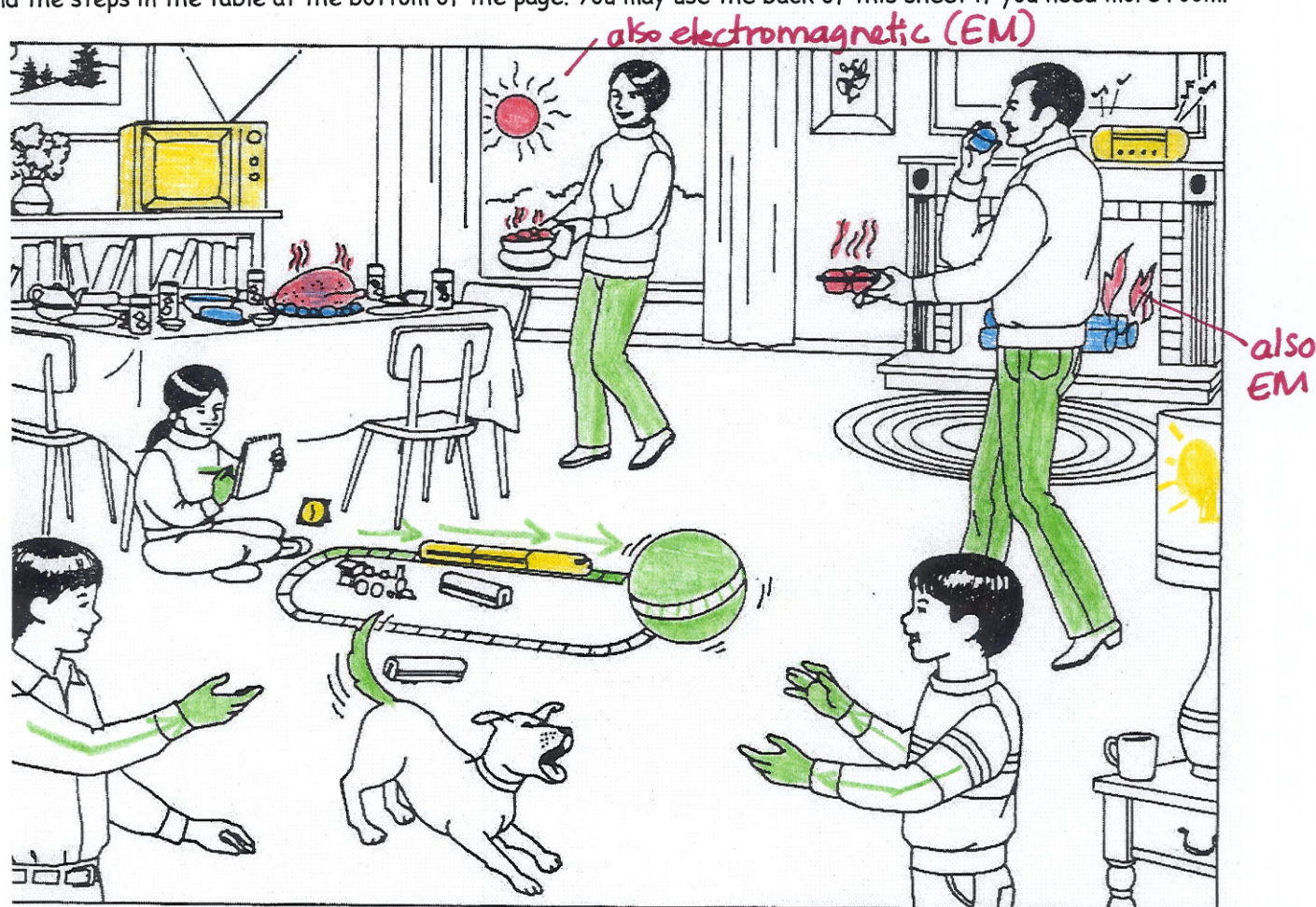
In Class & At Home
 Assignment

Illustrations of Energy and Energy Transformations

Using the picture, find as many forms of energy as you can. Following the chart below, color the parts of the illustration where you might find each of the four forms of energy. You may find more than one example of each. There will be a prize for 1st, 2nd, and 3rd place.

Form of energy	Color
Electrical energy	yellow
Thermal (heat) energy	red
Chemical energy	blue
Mechanical energy	green

BONUS CHALLENGE: Number any energy transformations you can identify. Record the type of transformation and the steps in the table at the bottom of the page. You may use the back of this sheet if you need more room.



Number on Diagram	Type of Transformation	Steps (Types of Energy) <i>ex. chemical → mechanical</i>