

# UNIT 2: MATTER AND ENERGY



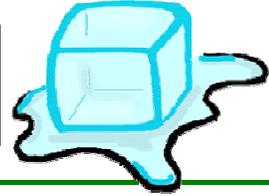
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[http://www.enwin.com/kids/electricity/types\\_of\\_energy.cfm](http://www.enwin.com/kids/electricity/types_of_energy.cfm)  
<http://www.eschooltoday.com/http://examples.yourdictionary.com/law-of-conservation-of-energy-examples.html>

Full name: \_\_\_\_\_  
Date: \_\_\_\_\_  
Class: \_\_\_\_\_  
School: \_\_\_\_\_  
Teacher: \_\_\_\_\_

# VOCABULARY



## A

- another: otra

## B

- be: ser  
- become: convertirse  
- bonfire: hoguera  
- both: ambos, los dos  
- burn: quemar

## C

- cannot: no puede  
- change:  
cambiar/cambio  
- chemical: químico  
- circuit: circuito  
- clean: limpio/a

## D

- decrease: disminuir  
- due to: debido a

## E

## F

- fireplace: chimenea

## G

- glass: vaso, cristal  
- gysers: géiser

## H

- heat: calor

## I

- ice cubes: cubitos de  
hielo  
- if: si (condicional)

## J

## K

## L

- like: como  
- log: tronco

## M

- measure: medir  
- melt down: derretirse

## N

- nuclei: núcleos

## O

- occur: suceder, ocurrir

## P

## R

- release: liberar  
- renewable: renovable  
- rub: frotar

## S

- so: así que  
- source: fuente (energía)  
- stored: almacenado/a

## T

- through: a través de  
- to: para  
- travel: viajar

## U

- understand: entender

## V

## W

- windmill: Molino de viento  
- wires: cables  
- work: trabajo

## 1.- Introduction

By transformation we understand any change in the initial properties of an object. There are two physical agents that can produce transformation. They are heat and work.

Imagine a glass with ice. If we add hot coffee, we are applying heat and so ice becomes liquid water. Now imagine we have two ice cubes. If you rub them, we are applying force and the result is that ice melts down. In both cases, there is a change of state.



## 2.- Energy

By energy we understand the capacity of bodies to transfer heat or do work. When this transfer occurs, the energy of a body decreases. We measure energy in joules.

Energy  
is  
the  
ability  
to  
do  
work.



### 2.1.- Types of energy

Energy can take many different forms:

- Potential energy is stored energy. It is energy due to position. If we release this energy, it can do a lot of work. Water in a lake in the mountains.
- Kinetic energy is energy in motion. Some examples are wind, electricity and moving water.
- Mechanical energy is the energy of motion that does the work. A windmill
- Chemical energy is energy caused by chemical reactions. When we burn a log in the fireplace or when we are cooking food.
- Thermal energy is energy due to the motion of the particles of an object. Gysers, lava or the sun are some examples.
- Electrical energy is energy produced by the charge of electrical charge. Electric charge travels through the wires in a circuit. When an MP3 id playing
- Electromagnetic energy is the energy stored in electromagnetic waves like radiation, X-rays or ultraviolet radiation. A radio station broadcasts its usual programme.
- Natural energy is the energy stored in the nuclei of atoms.



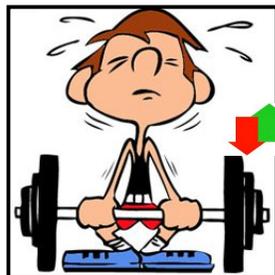
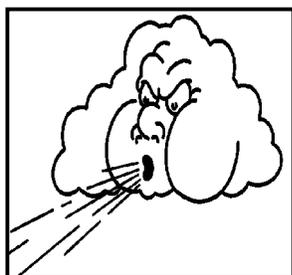
Activity one. 😊 😊 😐 😐 😐

Look at the picture.  
Circle the apples that  
have potential energy in  
blue. Then circle the  
apples that have kinetic  
energy in yellow.

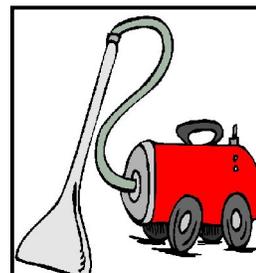
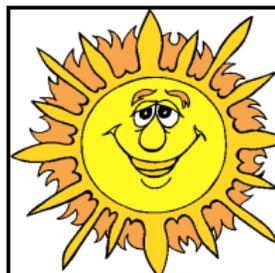
**Activity two.** - Write the words under the correct picture and say the type of energy that it produces.



wind / sun / go on a ride / lift weights / blender / vacuum cleaner / lightning / bonfire









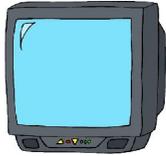
**Activity two.** - Say if the following statements are TRUE or FALSE. Correct the false statements



- 1.- Heat and work are two physical elements. \_\_\_\_\_
- 2.- Ice melts down when we add heat. \_\_\_\_\_
- 3.- Joule is the international unit of energy. \_\_\_\_\_
- 4.- Potential energy is energy due to motion. \_\_\_\_\_
- 5.- Wind is an example of electromagnetic energy. \_\_\_\_\_
- 6.- Stored water in a swimming pool is an example of potential energy. \_\_\_\_\_

### 3.- Law of conservation of energy

This law says that energy can change form but it cannot be created or destroyed.



A television changes electrical energy into sound and light energy.



A toaster changes electrical energy into thermal and mechanical energy.



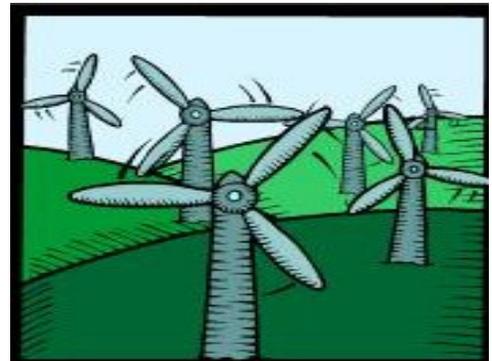
A car changes chemical energy from fuel into thermal energy and mechanical energy.



A torch changes chemical energy from batteries into light energy.

### 4- Renewable energy sources

They are also called green or alternative. Renewable energies can be regenerated continuously and naturally. Some examples are biomass, hydroelectric, solar, wind, geothermal and tidal. Scientists say that these energies are unlimited and clean but a bit expensive.



**wind energy is clean and unlimited**

### 5- Non-Renewable energy sources

Non-renewable energies are cheap but limited. Some examples are uranium and fossil fuels like oil, coal and natural gas. They pollute the environment and contribute to global warming.

**Activity three.** Watch the video from youtube and write down five ways to save energy.

<https://www.youtube.com/watch?v=1-q73ty9v04>

1.- You can use your bike to go to school.

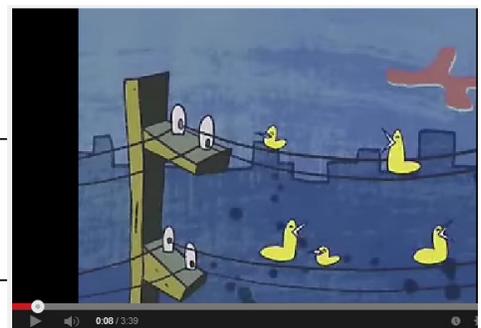
2.- \_\_\_\_\_

3.- \_\_\_\_\_

4.- \_\_\_\_\_

5.- \_\_\_\_\_

6.- \_\_\_\_\_



Activity four (for fast finishers students). ENERGY.  
Complete the crossword.



The crossword puzzle grid consists of 21 numbered starting points for words:

- 1: 3 letters, vertical
- 2: 3 letters, vertical
- 3: 3 letters, horizontal
- 4: 3 letters, horizontal
- 5: 3 letters, vertical
- 6: 3 letters, horizontal
- 7: 3 letters, vertical
- 8: 8 letters, horizontal
- 9: 5 letters, horizontal
- 10: 4 letters, horizontal
- 11: 4 letters, horizontal
- 12: 3 letters, horizontal
- 13: 8 letters, horizontal
- 14: 8 letters, horizontal
- 15: 3 letters, vertical
- 16: 3 letters, horizontal
- 17: 2 letters, horizontal
- 18: 2 letters, horizontal
- 19: 2 letters, horizontal
- 20: 6 letters, horizontal
- 21: 5 letters, horizontal

- |            |            |
|------------|------------|
| Energy     | wind       |
| Heat       | solar      |
| Kinetic    | hydraulic  |
| Potential  | biomass    |
| Mechanical | mass       |
| Internal   | volume     |
| Nuclear    | density    |
| Renewable  | gravity    |
| Oil        | sources    |
| Coal       | geothermal |
| Uranium    |            |

### Across

6. It is a source which uses the energy from the Sun to produce electricity and heat.
8. It depends on weight and height. A form of energy that objects have because of its position.
9. They might be renewable or non-renewable.
11. property of a body or system to do work or produce a change, expressed usually in joules.
13. kinetic energy plus potential energy.
14. A form of energy associated with the type of substance, mass and temperature. Some substances as fuels and explosives have a lot of it, and it's produced by its combustion.
16. A form of energy that is transferred by a difference in temperature.
18. It is a source which uses the kinetic energy of the air in movement to produce electrical energy.
20. The energy released by atomic reaction, especially by fission or fusion.
21. It includes plant or animal matter that can be converted into fibers or other industrial chemicals, including biofuels.

### Down

1. It depends on mass and speed. A form of energy that objects in movement have.
2. It is a non-renewable resource. It is formed of large quantities of dead plants.
3. The amount of space an object occupies.
4. A measure of how much matter is in an object.
5. It is the energy associated with the internal energy that there is in the interior of the Earth.
7. It is the energy that water has that runs through the mountains, streams and rivers.
10. They can be replaced or used again and they will not run out for now.
12. The force of attraction by which terrestrial bodies tend to fall.
15. It is a non-renewable resource. It is used in nuclear reactions.
17. It is a non-renewable resource. It is formed of large quantities of dead organisms under sedimentary rocks.
19. A measure of how much matter is in a certain volume.