

# ENERGY



- Energy is all around you!
  - You can hear energy as sound.
  - You can see energy as light.
  - And you can feel it as wind.



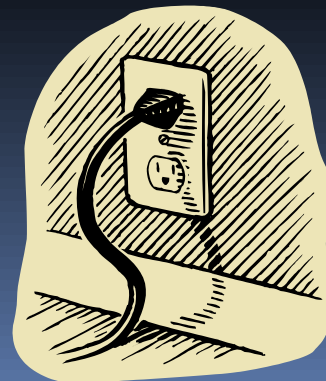
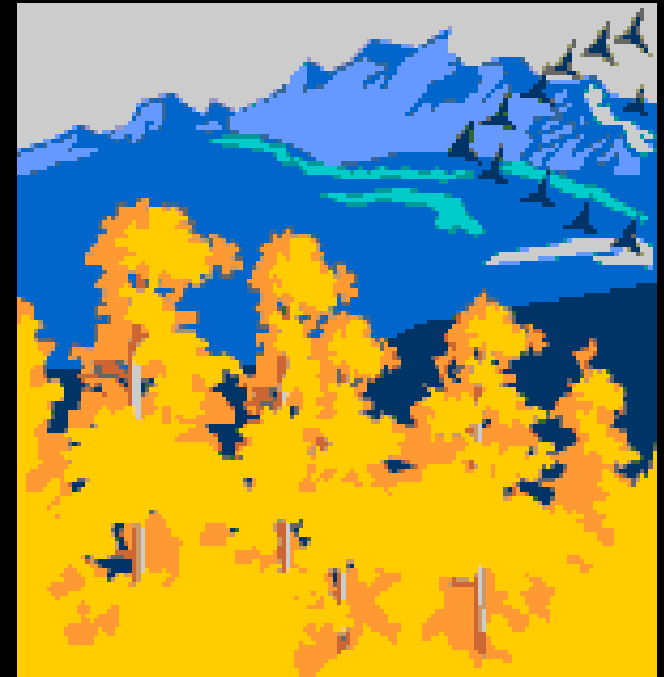
- You use energy when you:
  - ▣ hit a softball.
  - ▣ lift your book bag.
  - ▣ compress a spring.








Living organisms need energy for growth and movement.

- Energy is involved when:
  - a bird flies.
  - a bomb explodes.
  - rain falls from the sky.
  - electricity flows in a wire.



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- What is energy that it can be involved in so many different activities?
    - **Energy** can be defined as the ability to do work or cause change.
    - If an object or organism does work (exerts a force over a distance to move an object) the object or organism uses energy.

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- Energy cannot be created or destroyed but can diminish in quality from useful to less useful.
  - Energy can be transformed from one form to another.
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# What are the different forms of Energy?

- Energy has a number of different forms, all of which measure the ability of an object to do work on or change another object.
- In other words, there are *different ways* that an object can possess energy.



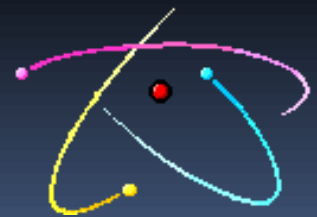


# What are the different forms of Energy?

- Mechanical Energy
  - Thermal, or heat energy
  - Chemical Energy
  - Electrical Energy
  - Electromagnetic Energy (light)
  - Sound Energy
  - Nuclear Energy
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# What is Mechanical energy?

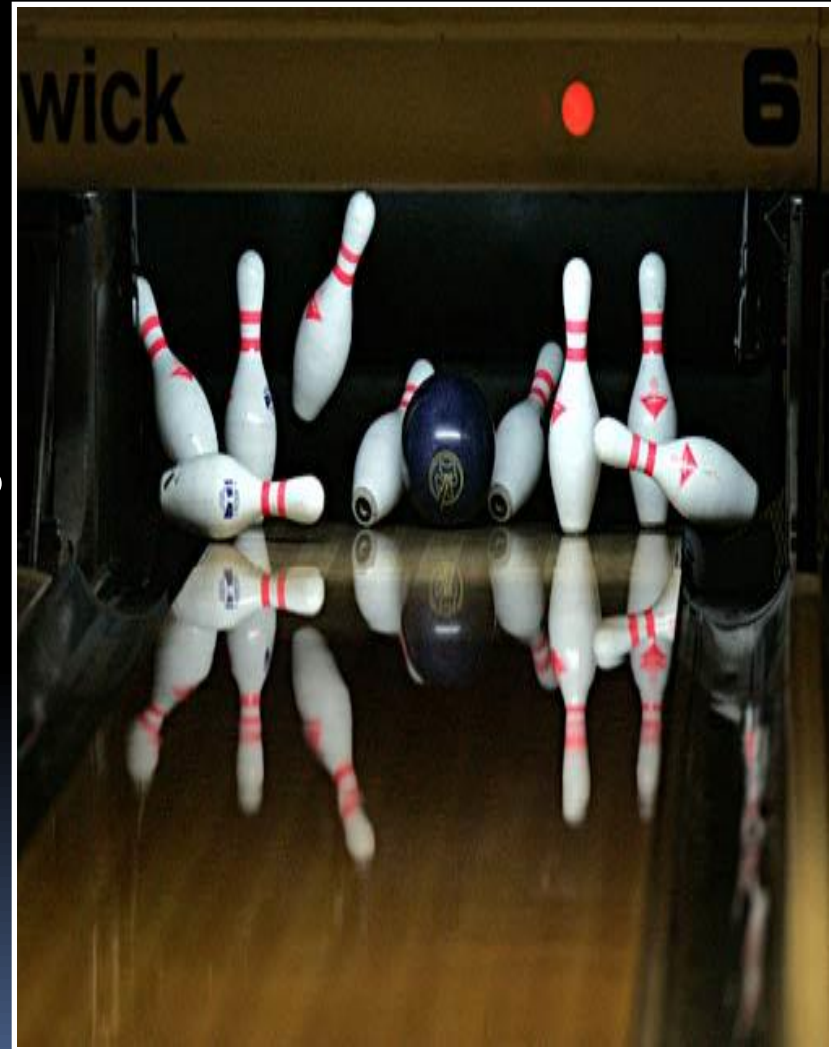
- Energy can cause motion and create change.
  - Car moving
  - A person Walking
  - A ball bouncing



# What is Mechanical Energy?

The bowling ball has mechanical energy.

When the ball strikes the pins, mechanical energy is transferred to the pins!



# Examples of Mechanical Energy

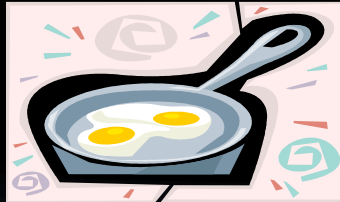


# What is thermal energy?



- Heat energy flows from warmer substances to cooler substances.
- The **faster** the atoms vibrate the **more heat energy** they have
- Heat is transferred from one object to another in three different ways:

Conduction



Convection



Radiation



# What is Thermal Energy?



EXCITED  
"HOT"  
ATOM

Heat energy

The heat energy of an object determines how active its atoms are.



LAI D B A C K  
"COOL"  
ATOM

A hot object is one whose atoms and molecules are excited and show rapid movement.

A cooler object's molecules and atoms will show less movement.





# What is Chemical Energy?

- Chemical energy is made when substances react and form new substances.
- Food, batteries, and fuels such as oil and gasoline are stored chemical energy.
- Chemical energy can change to:
  - sound
  - light
  - heat
  - electrical
  - motion



# What is Chemical Energy?



- Energy that is available for release from chemical reactions.

Example: The chemical bonds in a matchstick store energy that is transformed into thermal energy when the match is struck.



# Examples of Chemical Energy

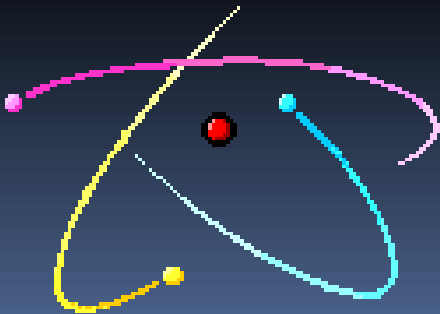


- *Food*
- *Fire Cracker*
- *Stomach*
- *Battery*

# What is Electrical energy?

- A form of energy that is produced when electrons move from one place to another.
- Electrons are particles that are in the space around the nucleus of an atom.

<https://www.pearsonsuccessnet.com/snpapp/login/login.jsp>



# What is Electrical Energy?

Easily transported  
through power lines  
and converted into  
other forms of energy



# What is Electromagnetic Energy?



Light energy

Includes energy from  
gamma rays, x-rays,  
ultraviolet rays, visible  
light, infrared rays,  
microwave and radio  
bands

# What is light?



- Light is something that allows us to see objects.
- Light is produced by the vibrations of electrically charged particles.





# What is Sound?

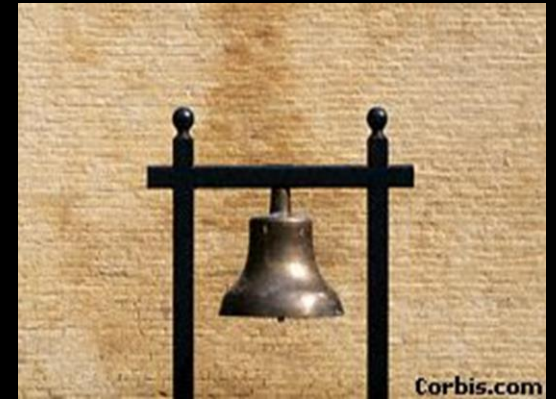
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- Sound is a form of energy produced by a vibration or a back and forth movement of an object.
- Sound is a wave of vibrations that spread from its source of its matter.
- The more vibrations the waves have, the more energy, the louder the sound.
- The faster the vibrations or the frequency, the higher the sound.
- How high or low a sound is called the pitch.



# Sound Energy

- Vibrates air molecules
- The air molecules move tiny bones in your ear
- The message of sound then moves to your brain

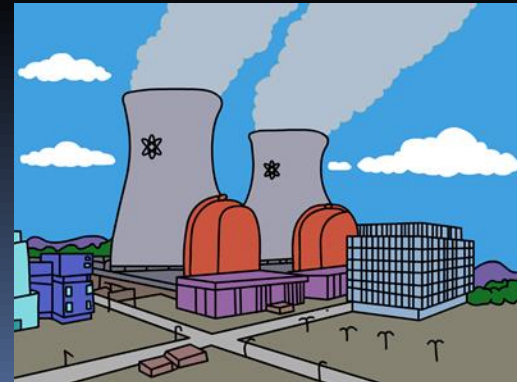




# Nuclear Energy



- Holds protons and neutrons together in an atom's nucleus
- Powers the sun and nuclear power plants





# QUIZ TIME!

1. What type of energy cooks food in a microwave oven?
2. What type of energy is the spinning plate inside of a microwave oven?





Electrical energy is transported to your house through power lines.

3. When you plug an electric fan to a power outlet, electrical energy is transform into what type of energy?



4. What energy transformation occurs when an electric lamp is turned on?



ELECTRICAL ENERGY



\_\_\_\_\_ ENERGY

## 5. What types of energy are shown below?



\_\_\_\_\_ and Thermal Energy  
(Don't forget friction)

## 6. What type of energy is shown below?



\_\_\_\_\_ is used by the  
trees.

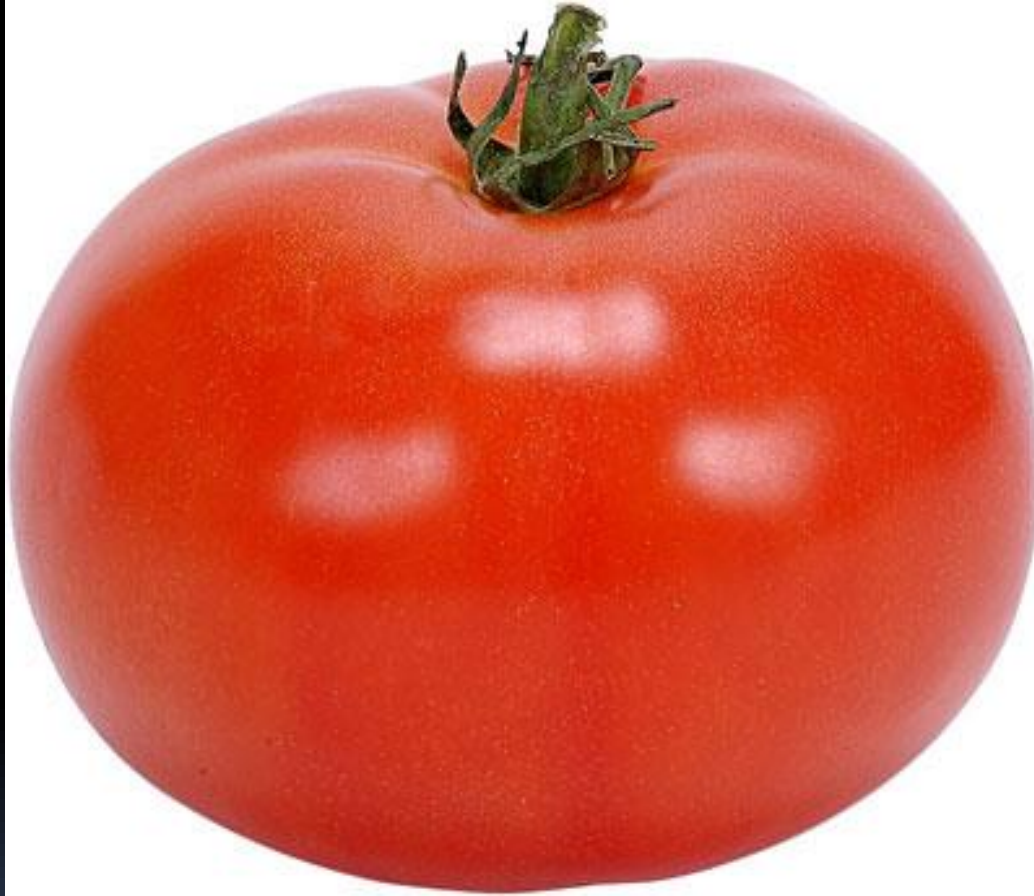


# 7. What types of energy are shown below?



\_\_\_\_\_, \_\_\_\_\_ and  
\_\_\_\_\_

8. What type of energy is shown below?



\_\_\_\_\_ Energy (yummy)

# 9. What type of energy is shown below?



\_\_\_\_\_ Energy