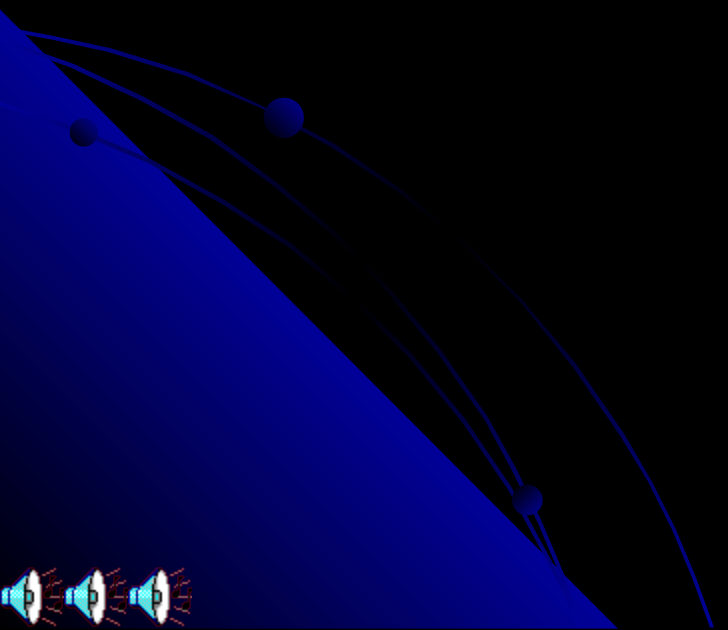
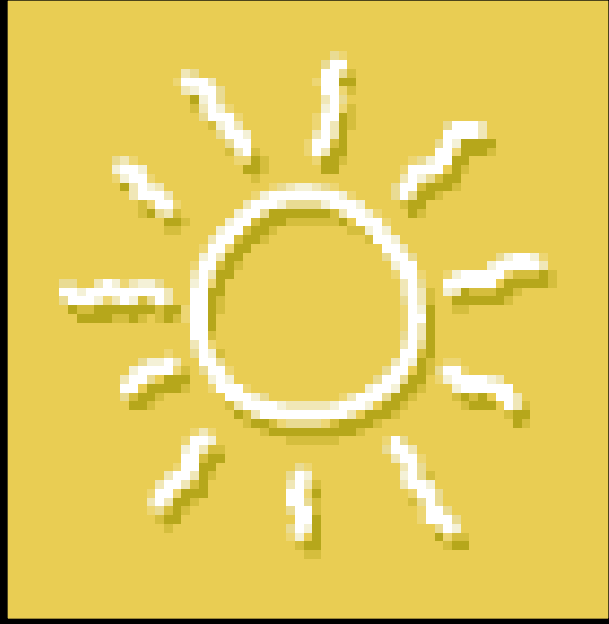
# ENERGY



# Energy comes in many forms:

- Thermal
- Radiant
- Sound
- Chemical
- Electrical
- Mechanical

When energy is used to make things move, it is transformed from one form into another.



Most energy transformations can be traced back to the sun: the original source of energy for life on earth.

**Simple energy transformation**:

Sunlight (radiant energy) shines on a person's face and changes to thermal energy.

# Why this happens:

As your skin absorbs energy the molecules move faster which produces heat.

Some energy transformations take place in complex chains.

# Old style steam locomotive

In this old steam engine, steam is used to move pistons which make the wheels turn.

Radiant → Chemical → Thermal → Mechanical

# Old style steam locomotive

How it works:

Radiant energy from the sun is absorbed by plants. Plants produce chemical energy through photosynthesis. The plants die and become fossil fuels (chemical energy). In the locomotive the chemical energy is burned (thermal energy). The steam created from the thermal energy turns (mechanical energy) the wheels to make the locomotive move.

# Battery – powered alarm clock

In this battery-powered alarm clock, the hands move and an alarm rings when it's time to wake up.

Chemical ➡ Electrical ➡ Mechanical ➡ Sound

# Solar-powered car

Most cars run by using a battery for electrical energy and gasoline for chemical energy. A solar powered car runs using only energy from the sun.

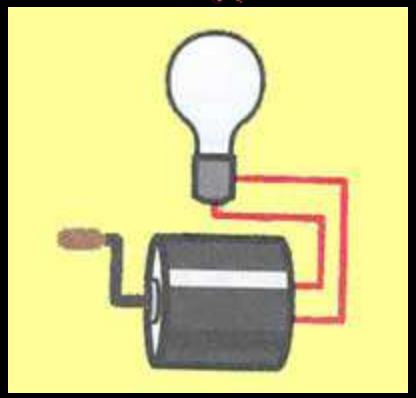

**Radiant** → **Electrical** → **Mechanical**

# Hand-cranked generator

A generator is the opposite of a motor:

Motor: put in electricity and motion comes out.

Generator: put in motion and electricity comes out.



Chemical → Mechanical → Electrical → Radiant → Thermal

# THINK ABOUT IT

Energy cannot be created or destroyed. It can only be transformed from one form to another.

Identify all the energy transformations that occur when you operate a hair dryer.

# Transformations From source to use

Energy source: fossil fuels (coal)

Transformations:

Chemical (burning) -> Thermal (steam) -> Mechanical (generator) -> Electrical -> Thermal and Mechanical (fan inside)

# Conclusion

As we each move through our day, we are constantly witnessing and experiencing transformations of energy.

- Alarm clock, microwave oven, lights, car
- Even the leaves on plants are quietly converting solar energy into chemical energy!

# Critical Questions:

- What energy transformations take place inside a working battery?
- How about in your i-pod?
- Flash light?
- Hand-crank flash light?
- Car engine?
- Your body?