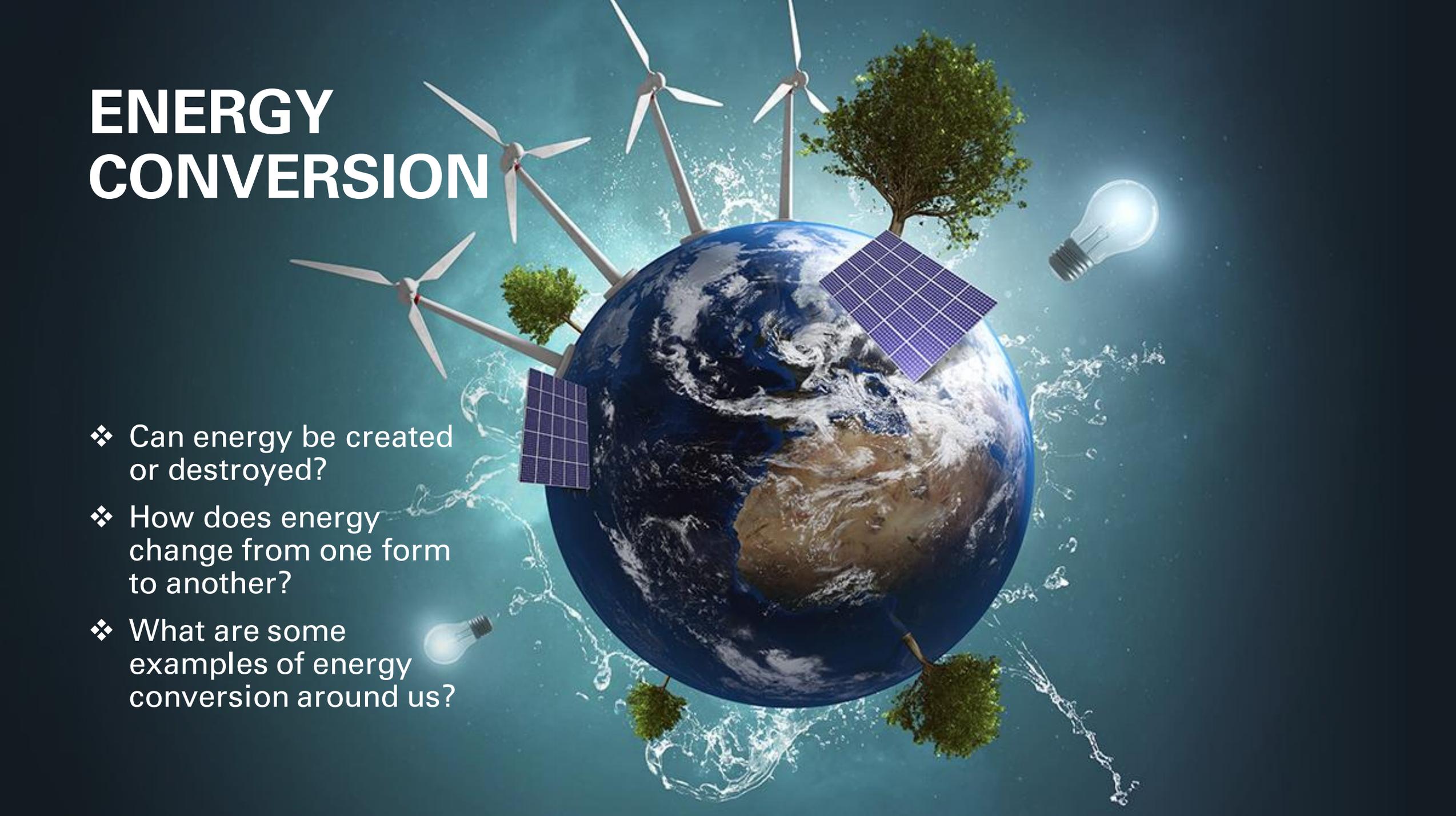


ENERGY CONVERSION

The background of the slide features a central image of the Earth. Surrounding the Earth are several wind turbines, solar panels, trees, and light bulbs, all set against a dark blue, starry space background. The Earth is shown from a perspective that highlights its blue oceans and brown continents. The wind turbines are white with three blades each. The solar panels are blue and rectangular. The trees are green and leafy. The light bulbs are glowing yellow, indicating they are turned on. The overall theme is sustainable energy and energy conversion.

- ❖ Can energy be created or destroyed?
- ❖ How does energy change from one form to another?
- ❖ What are some examples of energy conversion around us?

What are some forms of energy?

[VIDEO](#)

light energy



heat energy



sound energy



electrical energy



potential energy



kinetic energy



20.1 ENERGY CHANGES FROM ONE FORM TO ANOTHER

How does energy change
from one form to another?

Energy cannot be created or
destroyed, but it can change
from one form to another.

The Sun provides plants with
light energy to make food.
When plants use light energy
from the Sun to make food
during photosynthesis, this
light energy is not lost. The
light energy is changed to
chemical potential energy in
plants.



A silhouette of a person shooting a basketball against a sunset sky. The person is on the right, reaching up with their right arm. A basketball is suspended in the air above the hoop. The basketball hoop and backboard are on the left. The sun is a bright yellow glow on the right side of the frame, creating a silhouette effect on the person and the hoop. The sky is a gradient of blue and orange.

Food stores chemical potential energy. We get our energy from the food we eat. When we move, chemical potential energy from the food we eat is changed to kinetic energy.

❖ Where do the children get their energy from?

❖ What form of energy do the children have as they move forward?

❖ What form of energy do the children have when they jump?

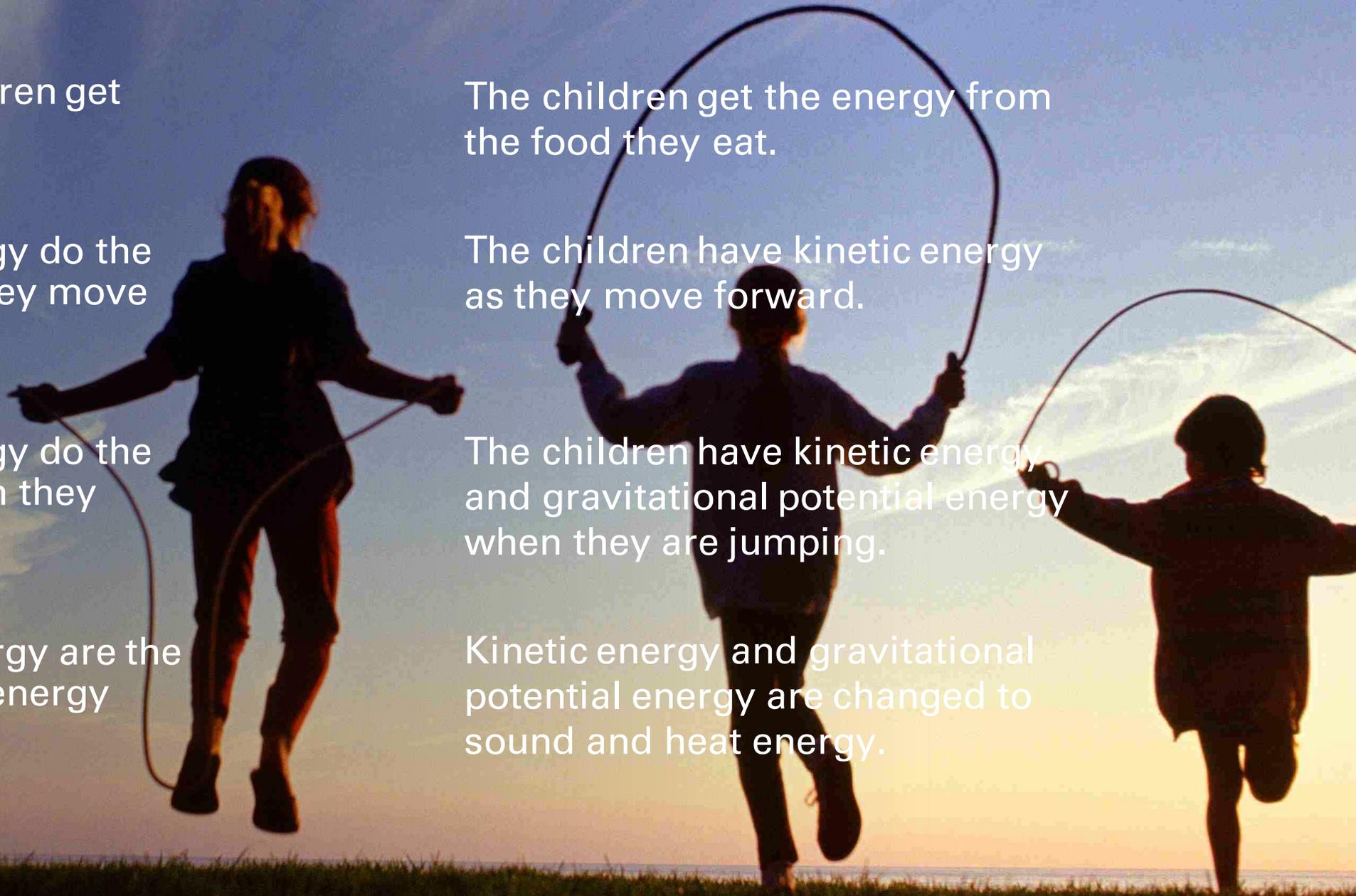
❖ What forms of energy are the previous forms of energy changed to?

The children get the energy from the food they eat.

The children have kinetic energy as they move forward.

The children have kinetic energy and gravitational potential energy when they are jumping.

Kinetic energy and gravitational potential energy are changed to sound and heat energy.





MISCONCEPTION

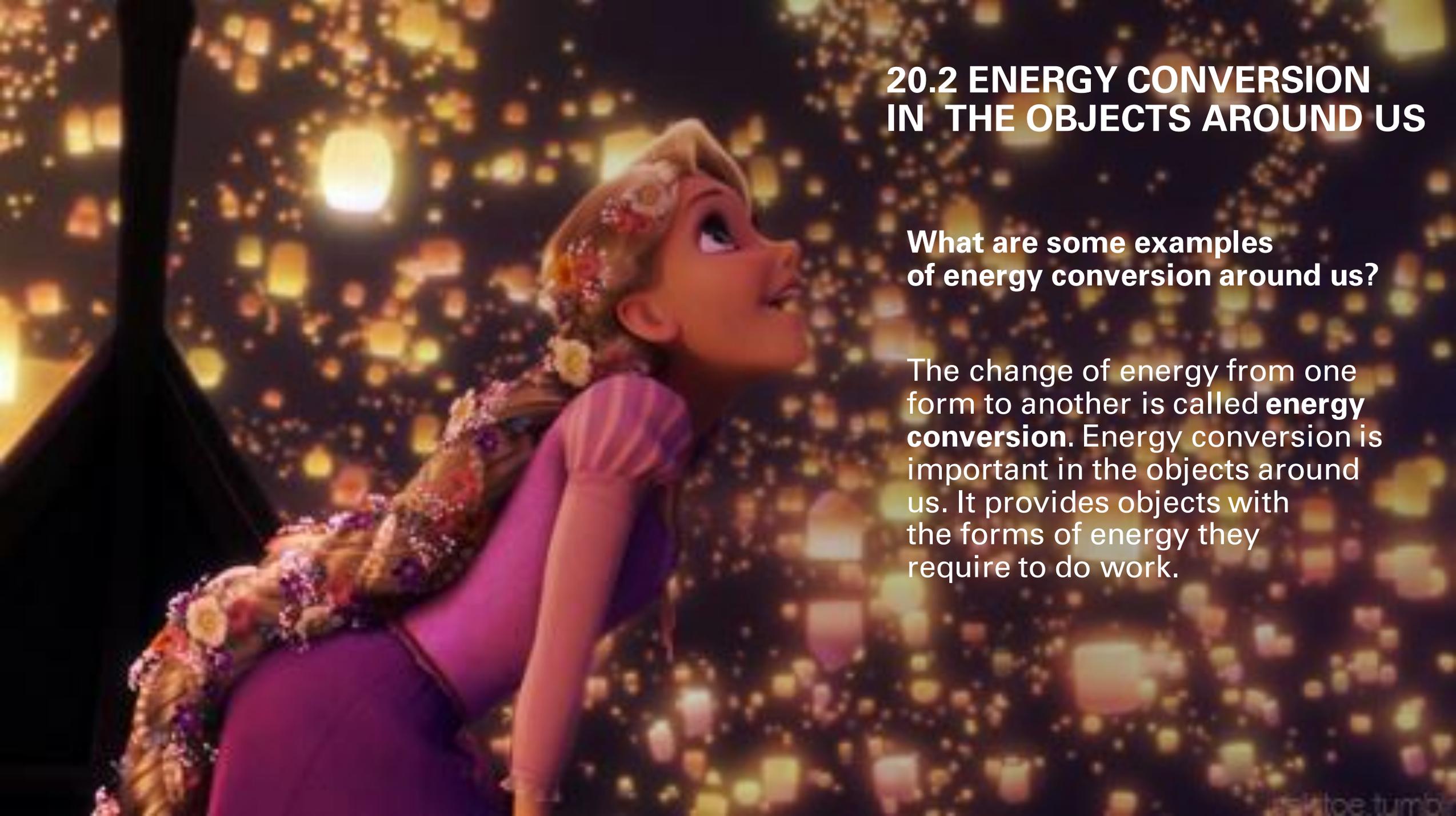
[VIDEO](#)

Energy is created as a result of an activity or a process. For example, energy is created for our body when we eat.

ACTUAL FACT

Energy cannot be created or destroyed. It can only be converted from one form to another or transferred from one body to another during an activity or process.

For example, when we eat, chemical potential energy in the food is transferred to our body. This chemical potential energy is converted to kinetic energy when we move.

A scene from the Disney movie 'Tangled' showing Rapunzel with her long, braided hair adorned with flowers, looking up at a night sky filled with many glowing, colorful fireflies or magical lights. The scene is set in a dark, possibly underground or cave-like environment.

20.2 ENERGY CONVERSION IN THE OBJECTS AROUND US

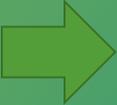
What are some examples of energy conversion around us?

The change of energy from one form to another is called **energy conversion**. Energy conversion is important in the objects around us. It provides objects with the forms of energy they require to do work.

BURNING CANDLE

A candle is made of wax.
The candle wax stores
chemical potential energy.

When we light a candle, the
candle wax burns. Chemical
potential energy in the
candle wax is converted to
light and heat energy.

chemical potential energy  light energy + heat energy

[VIDEO](#)





BURNING CHARCOAL

When charcoal is burnt, chemical potential energy stored in the charcoal is converted to light and heat energy.

chemical potential energy



light energy



heat energy

Battery-Operated Toy Car



When a battery-operated toy car is switched on, chemical potential energy in the batteries is **converted** to electrical energy. The electrical energy is then converted to kinetic energy when the toy car moves.

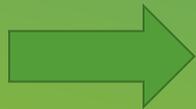
chemical potential energy → electrical energy → kinetic energy



BATTERY-OPERATED ALARM CLOCK

When an alarm clock rings, chemical potential energy in the battery is converted to electrical energy, which is then converted to sound energy.

chemical potential energy



electrical energy



sound energy



Paper Airplane

When we throw a paper airplane, chemical potential energy from the food we eat is converted in our body to kinetic energy. This kinetic energy is **transferred** to the paper airplane when it flies.



Musical Instrument - Flute

When we blow air into a flute, chemical potential energy from the food we eat is converted to kinetic energy in the air that we blow out. When the air particles enter the flute and vibrate inside it, the kinetic energy is converted to sound energy. We are then able to hear the sound made by the flute.

chemical
potential energy

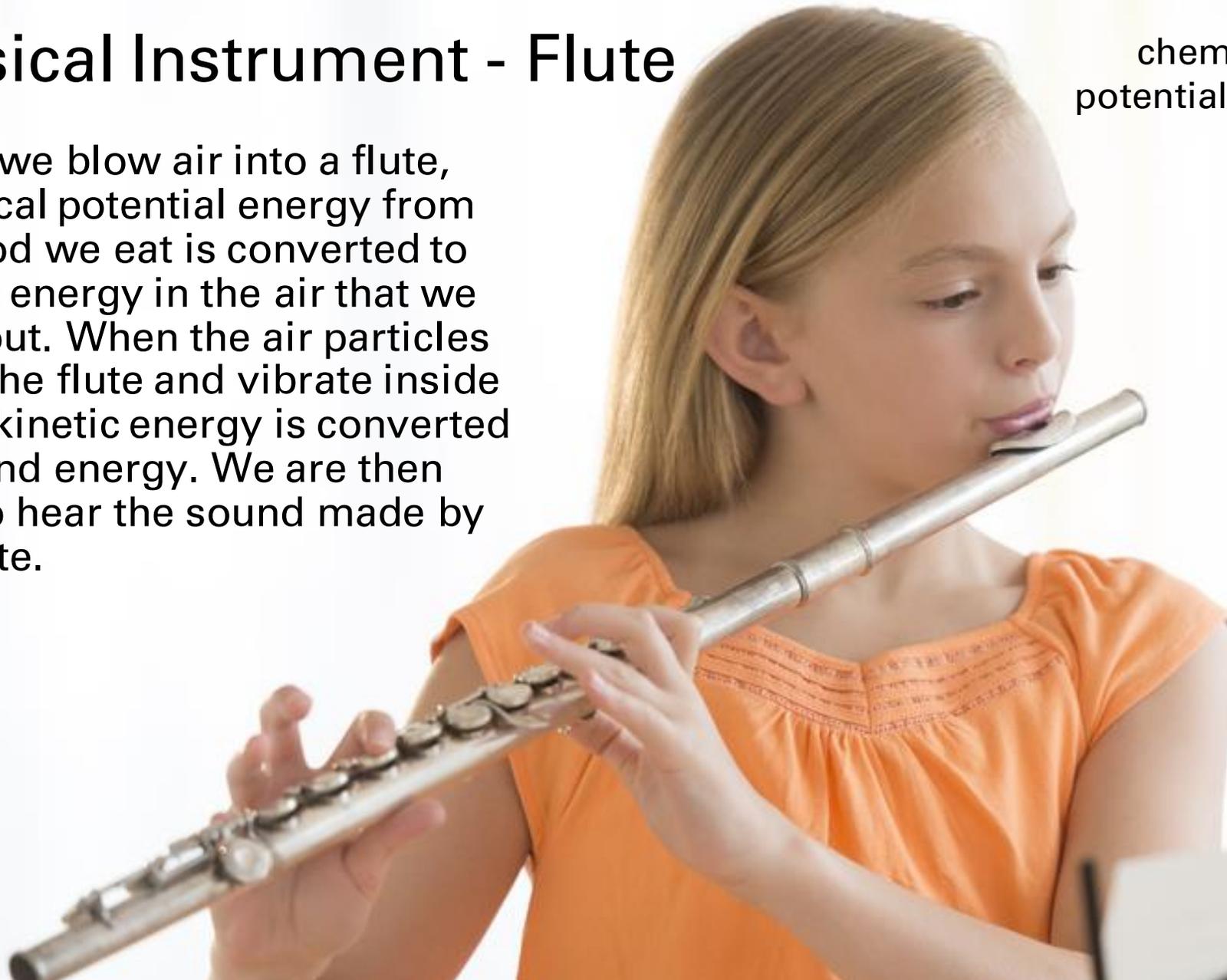


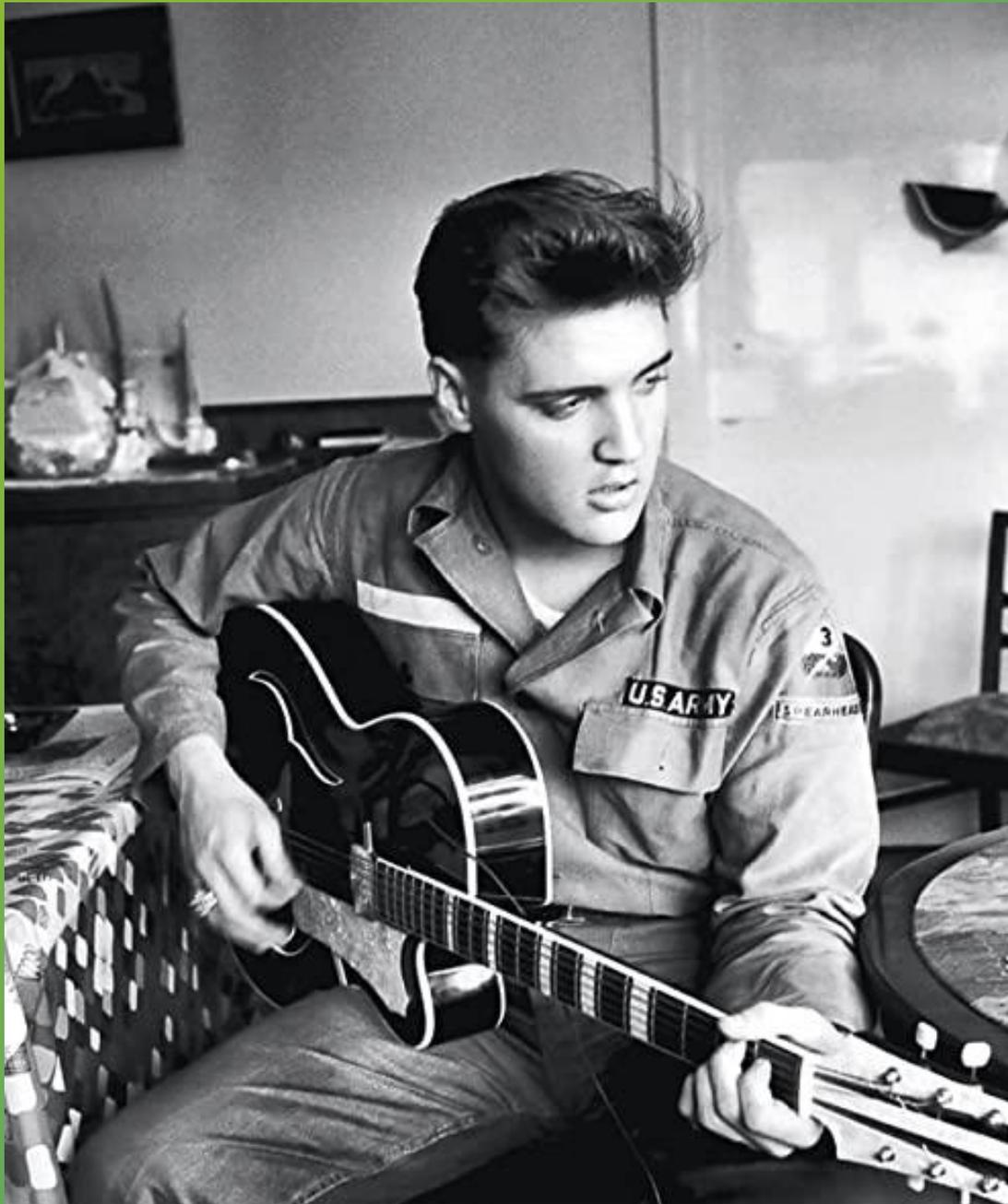
kinetic
energy

kinetic
energy



sound
energy





Musical Instrument Guitar

When we pluck a guitar string, chemical potential energy from the food we eat is converted to kinetic energy in our hands. This kinetic energy is transferred to the string of the guitar when the string vibrates. The kinetic energy in the vibrating string is converted to sound energy. We are then able to hear the sound made by the guitar.





Musical Instrument Drums

[VIDEO](#)

When we hit a drum, chemical potential energy from the food we eat is converted to kinetic energy in our hands. This kinetic energy is transferred to the drum skin when the drum skin vibrates. The kinetic energy in the vibrating drum skin is then converted to sound energy.

chemical potential energy → kinetic energy → sound energy

Electrical Appliance Television Set

When we switch on a television set, electrical energy is converted to light, sound and heat energy. The heat energy is not useful; hence it is wasted.

electrical energy  light energy  sound energy  heat energy



Electrical Appliance Speakers

When music is played through a speaker, electrical energy is converted to sound energy in the speaker



Microphone

When a speaker speaks into a microphone, sound energy is converted to electrical energy.

[VIDEO](#)

electrical
energy



sound
energy

sound
energy



electrical
energy

Electrical Appliance

Electrical Fan

When we switch on a fan, electrical energy is converted to kinetic energy in the electric motor of the fan. This allows the blades of the fan to move, which in turn causes the air around it to move. Heat energy is also given out.

electrical energy → kinetic energy + heat energy

Is the heat energy useful?

The heat energy given out from an electric fan is not useful because the purpose of the electric fan is to cool the air.





MISCONCEPTION

Electrical appliances use up electrical energy when they do work.

ACTUAL FACT

Electrical appliances require electrical energy in order to do work. However, this electrical energy is not used by the electrical appliances. It is actually converted to other forms of energy such as light, heat and sound energy.

Paper Lanterns

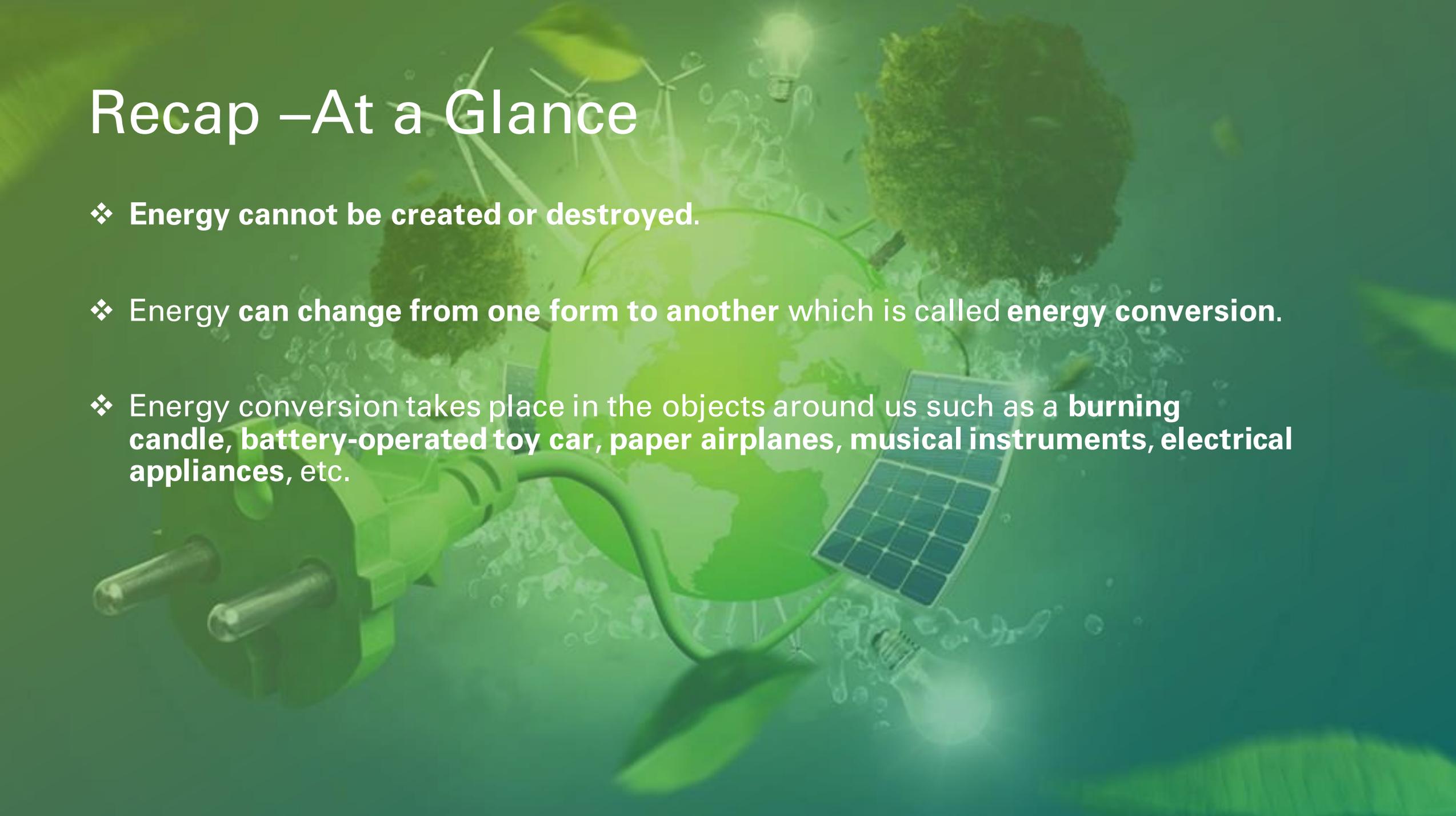
[VIDEO](#)



The chemical potential energy in the candle is converted to light and heat energy in the flame. The heat energy of the flame is transferred to the air inside the lantern, thus giving it more movement (kinetic energy). This movement of the air within the lamp provides the kinetic energy for the lamp to rise.



Recap –At a Glance

A green-tinted collage of energy-related icons. In the center is a glowing globe. Surrounding it are various symbols: wind turbines, a glowing lightbulb, a tree, a solar panel, and a power plug. The background is a soft, green gradient with faint, abstract patterns.

- ❖ Energy cannot be created or destroyed.
- ❖ Energy can change from one form to another which is called energy conversion.
- ❖ Energy conversion takes place in the objects around us such as a **burning candle, battery-operated toy car, paper airplanes, musical instruments, electrical appliances, etc.**

Where does
the Sun get
its energy?

[VIDEO](#)

