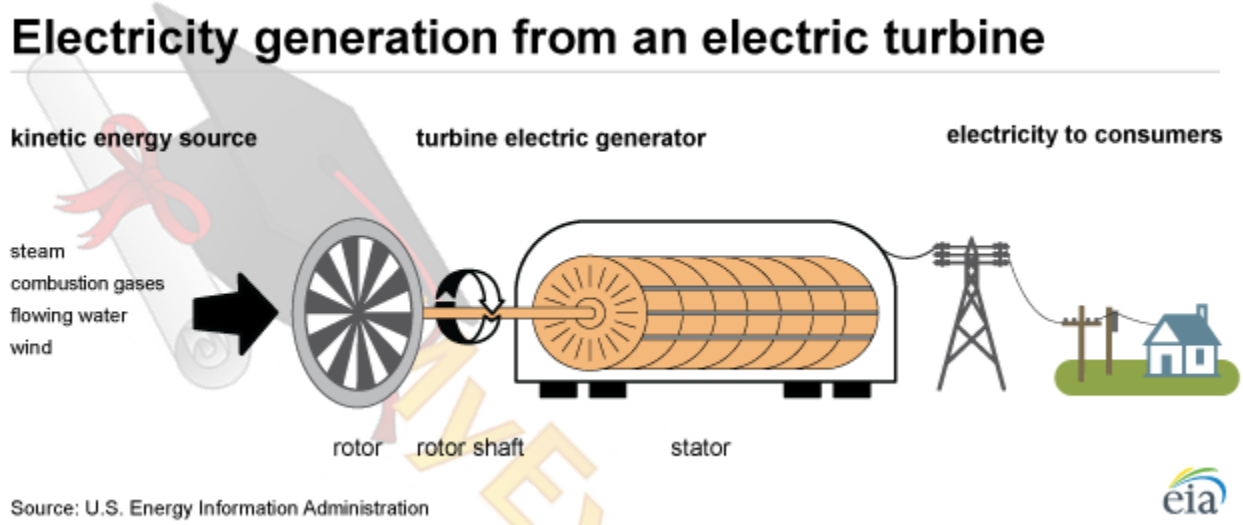
G3. Mechanical-Electrical Energy

Mechanical-Electrical Energy

Energy is what makes things work. It allows us to do activities like running, playing games, and turning on the lights in our homes. There are different forms of energy, and two essential types are mechanical energy and electrical energy.



Mechanical Energy: What Makes Things Move
Mechanical energy is the energy that comes from motion or movement. When an object is moving, it possesses mechanical energy. There are two main types of mechanical energy: kinetic energy and potential energy.

Kinetic Energy
Kinetic energy is the energy an object has when it is in motion. The faster an object moves and the more massive it is, the more kinetic energy it has. Imagine a soccer ball rolling on the ground or a car zooming down the road. Both the soccer ball and the car have kinetic energy because they are in motion.

Potential Energy
Potential energy is the energy an object has due to its position or condition. It's like stored energy waiting to be used. For example, think of a book sitting on a shelf. Even though it's not moving, it has potential energy because if it falls, it can do work by exerting force.

Converting Mechanical Energy
Mechanical energy can change from one form to another. When you push a swing, you give it kinetic energy as it moves back and forth. When the swing reaches its highest point, it has the most potential energy because it can fall back down. As it swings down again, the potential energy transforms into kinetic energy.

Electrical Energy: Powering Our World
Electrical energy is the energy produced by charged particles like electrons. It's a form of energy that is essential in our everyday lives. Almost everything we use, from phones and computers to lamps and TVs, relies on electrical energy.

Generating Electricity
Electricity is created by generators. These machines use different sources of energy, like coal, natural gas, wind, or water, to produce electrical energy. The electrical energy is then sent through power lines to our homes, schools, and businesses.

Using Electrical Energy
When you turn on a light switch, you complete an electrical circuit, allowing electrical energy to flow from the power source to the light bulb. The electrical energy causes the light bulb to glow and light up the room. Similarly, when you plug in your tablet to charge, electrical energy flows from the power outlet to your device's battery, giving it power.

Safety with Electrical Energy

While electrical energy is incredibly useful, it can also be dangerous if not used properly. We should never play with electrical outlets or put objects into them. It's important to follow safety rules and never touch electrical wires or appliances with wet hands.

1. What is mechanical energy?
    A) The energy produced by charged particles
    B) The energy that comes from motion
    C) The energy of light and heat
    D) The energy stored in objects at rest

2. Which type of mechanical energy does a moving car have?
    A) Kinetic energy
    B) Potential energy
    C) Electrical energy
    D) Thermal energy

3. What is potential energy?
    A) The energy an object has when it is in motion
    B) The energy produced by charged particles
    C) The energy stored in objects due to their position or condition
    D) The energy that comes from light and heat

4. How can potential energy be converted into kinetic energy?
    A) By pushing a swing
    B) By turning on a light switch
    C) By plugging in a device
    D) By using a generator

5. What is electrical energy?
    A) The energy that comes from light and heat
    B) The energy produced by charged particles
    C) The energy of motion
    D) The energy stored in objects due to their position or condition

6. What do generators use to produce electrical energy?
    A) Wind and water
    B) Light and heat
    C) Moving objects
    D) Charged particles

7. What happens when you turn on a light switch?
    A) Kinetic energy is converted into potential energy
    B) Electrical energy is converted into mechanical energy
    C) A circuit is completed, allowing electrical energy to flow to the light bulb
    D) Thermal energy is generated

8. Which safety rule is essential when dealing with electrical energy?
    A) Playing with electrical outlets
    B) Putting objects into electrical outlets
    C) Following safety rules and never touching electrical wires with wet hands
    D) Touching electrical appliances with wet hands

9. How is electrical energy sent to our homes, schools, and businesses?
    A) Through power lines
    B) Through generators
    C) Through light switches
    D) Through electrical outlets

10. What type of mechanical energy does a book on a shelf have?
    A) Kinetic energy
    B) Potential energy
    C) Electrical energy
    D) Thermal energy

ANSWERS & EXPLANATIONS

1. B - The energy that comes from motion.
    - Mechanical energy is the energy that comes from motion or movement.

2. A - Kinetic energy.
    - A moving car has kinetic energy because it is in motion.

3. C - The energy stored in objects due to their position or condition.
    - Potential energy is the energy stored in objects due to their position or condition.

4. A - By pushing a swing.
    - Potential energy can be converted into kinetic energy by pushing a swing.

5. B - The energy produced by charged particles.
    - Electrical energy is the energy produced by charged particles like electrons.

6. A - Wind and water.
    - Generators use different sources of energy like wind and water to produce electrical energy.

7. C - A circuit is completed, allowing electrical energy to flow to the light bulb.
    - When you turn on a light switch, you complete an electrical circuit, allowing electrical energy to flow to the light bulb and make it glow.

8. C - Following safety rules and never touching electrical wires with wet hands.
    - When dealing with electrical energy, it is essential to follow safety rules and never touch electrical wires or appliances with wet hands.

9. A - Through power lines.
    - Electrical energy is sent through power lines to our homes, schools, and businesses.

10. B - Potential energy.
    - A book on a shelf has potential energy because of its position or condition.