Subject:Basic science

Topic: Energy

Week:2

Class:Year 8

In this lesson, we will be exploring the concept of energy, which is everywhere in our daily lives. We will learn about the different forms of energy and how they interact with each other.

Let us begin by understanding what energy is. Simply put, energy is the ability to do work. In other words, it is what makes things happen. Without energy, nothing would move or change.

There are different forms of energy, and one of them is mechanical energy. Mechanical energy is the energy that is associated with the movement or position of an object. It can either be potential or kinetic energy. Potential energy is the energy that an object has because of its position or condition. On the other hand, kinetic energy is the energy that an object possesses because of its motion.

Another form of energy is thermal energy, which is also known as heat energy. Thermal energy is the energy that is produced when objects are heated. This type of energy is essential in our daily lives. We use thermal energy to cook our food, warm our homes, and power our industries.

Electrical energy is another form of energy that we use every day. It is the energy that is produced when charged particles move from one place to another. We use electrical energy to power our appliances, gadgets, and lighting. Without electrical energy, we wouldn't have lights to see, fridges to preserve our food, or phones to communicate.

Finally, we have chemical energy, which is the energy that is stored in the bonds between atoms and molecules. It is the primary source of energy for living organisms. Our bodies convert the food we eat into chemical energy that we can use to do work.

Subject: Basic science

Topic:Thermal energy

Week:2

Class:year 8

Today, we will be learning about thermal energy. It is important to understand this concept as it plays a role in our everyday lives.

What is Thermal Energy?

Thermal energy is the energy that comes from heat. It is the total kinetic energy of all the particles in an object. The higher the temperature of an object, the more thermal energy it has. Thermal energy can be transferred from one object to another through conduction, convection, or radiation.

Importance of Thermal Energy

Thermal energy is essential for our everyday lives. It is responsible for many natural processes such as the water cycle and weather. Thermal energy is also used in our homes for cooking and heating. In industries, it is used to generate electricity and power machines.

Key terms to remember

Thermal energy

Heat

Kinetic energy

Temperature

Conduction

Convection

Radiation

Make sure to understand these terms as they will come up frequently in your future science classes.

Fun facts about Thermal Energy

The Sun is a major source of thermal energy for our planet.

Thermal energy can be converted into other forms of energy such as electrical or mechanical energy.

Infrared cameras use thermal energy to detect heat signatures.

Subject: Basic science

Topic: Work, energy and power

Week:3,4 and 5

Class:year 8

Introduction to Work

Work is something we do in everyday life, but it has a special meaning in science.

In science, work is done when a force acts on an object and causes it to move in the direction of the force.

Work is calculated by multiplying the force applied by the distance the object moves in the direction of the force.

Types of Energy

Energy is the ability to do work, and it comes in many forms.

Some common types of energy are mechanical, thermal, light, sound, electrical, and chemical energy.

Energy can change forms, but it is always conserved, meaning it cannot be created or destroyed, only transformed.

Physical Work and Power

Work is related to the amount of energy transferred, and power is related to how quickly the energy is transferred.

The SI unit for work is the joule (J), and the SI unit for power is the watt (W).

Power can be calculated by dividing the work done by the time it takes to do the work.

Work, Energy, and Power in Our Daily Lives

We use energy to do work every day, like lifting objects, riding a bike, or turning on a light.

Understanding the concepts of work, energy, and power can help us make informed decisions about our energy usage and conservation.

Renewable energy sources such as wind, water, and solar power harness energy from natural resources to do work and minimize the environmental impact.

Subject: Basic science

Topic: Simple machines

Week:6

Class:year 8

Simple Machines

A simple machine is a mechanical device that can produce a large output force with minimal input force. They make tasks easier to perform by either increasing the distance over which a force acts or by changing the direction of the force. Simple machines are classified into six types:

Lever - a rigid bar that is free to rotate in a fixed point called the fulcrum. It can be used to lift heavy objects with much less effort.

Pulley - consists of a grooved wheel with a rope wrapped around it. It can be used to lift objects vertically or to change the direction of a force.

Wheel and Axle - consists of a wheel attached to a smaller cylinder (axle) that rotates with the wheel. It is used to lift or move heavy objects.

Inclined Plane - a flat surface with one end higher than the other. It reduces the effort needed to raise a heavy object to a certain height.

Wedge - a triangular-shaped object that increases the force applied to it. It is used to split, hold or tighten objects.

Screw - an inclined plane wrapped around a cylinder, forming a spiral. It is used to hold objects together or to lift them.

Using a combination of simple machines can further increase the magnitude or direction of a force to make tasks easier. For example, a pair of scissors uses two levers to cut through objects.

Fun fact: The earliest known simple machine was the inclined plane, used by ancient Egyptians to build the pyramids.

Subject: Basic science

Topic: Activities of living things

Week:7,8 and 9

Class:year 8

Basic science is filled with wonders, one of which is the diverse living creatures on this planet. From the tiniest of microorganisms to the largest of land animals, living things are significant in various ways. In this lesson, we will be discussing the activities of living things and how they vary among different organisms.

Let us first define what a living organism is. A living organism is any living thing that has the ability to grow, reproduce, and respond to its environment. Examples of living organisms include plants, animals, fungi, and bacteria.

The six main activities of living things are movement, reproduction, respiration, sensitivity, nutrition, and excretion. These activities enable living organisms to survive in their respective environments. Let's take a closer look at each activity.

Movement is the ability to change position or location. Living organisms move to find food, escape danger, or find a suitable habitat. For example, an ant moves from one place to another to find food for its colony.

Reproduction is the process by which living organisms produce offspring. It ensures the continuation of a species. Plants reproduce through flowers, fruits, and seeds, while animals

reproduce through eggs or live birth.

Respiration is the process by which living organisms obtain energy from food. It involves the exchange of gases such as oxygen and carbon dioxide. For example, humans breathe in oxygen and breathe out carbon dioxide to produce energy.

Sensitivity is the ability to respond to changes in the environment. It helps living organisms stay alive by detecting changes such as temperature, light, or sound. For instance, a dog has sensitive ears that can hear even the slightest sound.

Nutrition is the process by which living organisms obtain energy and nutrients from food. It provides the energy needed for their daily activities. Plants perform photosynthesis to produce their food, while animals obtain food by hunting, grazing, or scavenging.

Excretion is the process of removing waste products from the body. It helps to keep the body clean and healthy. For example, humans excrete waste products through sweating, urinating, and breathing.

Subject: Basic science

Topic: Nutrition and diets

Week:10 and 11

Class:Year 8

Nutrition and diets

Nutrition is the study of how food affects our health and what we need for a healthy lifestyle. It is important to have a well-balanced diet that includes all the essential nutrients in the right amounts. In this note, we will be discussing the role of nutrition in maintaining good health and the different types of diets.

Some key terms to note are nutrients, essential, healthy lifestyle, and diets.

Nutrients are substances found in food that are essential for our bodies to function properly. They include carbohydrates, proteins, fats, vitamins, and minerals.

These nutrients are considered essential because our bodies cannot produce them on their own, so we must obtain them from the food we eat.

Having a healthy lifestyle means making conscious choices that promote overall well-being. This includes eating a balanced diet, exercising, and getting enough rest.

Diets refer to the types of food a person eats on a regular basis. There are many different types of diets, each with its own benefits and limitations.

Now, let's look at the different types of diets that are commonly practiced.

Balanced diet: This consists of a variety of foods from different food groups in the right proportions. It provides all the essential nutrients our bodies need to stay healthy.

Vegan diet: This excludes all animal products and focuses on plant-based foods. It can be a healthy diet as long as it includes a variety of nutrient-rich foods.

Keto diet: This is a high-fat, moderate-protein, and very low-carb diet. It aims to put the body in a state of ketosis, where it burns fat for energy instead of carbs. This diet is not suitable for everyone and should be done under the supervision of a healthcare professional.

Mediterranean diet: This is based on the traditional eating habits of people living in Mediterranean countries. It emphasizes whole grains, fruits, vegetables, fish, and healthy fats like olive oil.

Subject:Basic science

Topic: Health and diseases

Week:12

Class:Year 12

Introduction

Have you ever wondered what makes you healthy? What causes you to fall sick sometimes? In this note, we will explore the causes of diseases, the different types of diseases, and how we can stay healthy.

Diseases

Diseases are changes or abnormalities that occur in our body and can disrupt its normal functions. There are different types of diseases that can affect us, such as infectious diseases, non-infectious diseases, and genetic diseases.

Infectious Diseases

Infectious diseases are caused by pathogenic microorganisms, such as viruses, bacteria, fungi, and parasites. These diseases can be spread from one person to another through direct contact, contaminated food or water, or air.

Some common infectious diseases are:

Malaria - caused by the Plasmodium parasite and transmitted through the bite of an infected mosquito.

Tuberculosis (TB) - caused by the Mycobacterium tuberculosis bacteria and transmitted through the air when an infected person coughs, sneezes, or talks.

Typhoid Fever - caused by the Salmonella typhi bacteria and transmitted through contaminated food or water.

Influenza (Flu) - caused by the influenza virus and transmitted through the air when an infected person coughs or sneezes.

Non-Infectious Diseases

Non-infectious diseases are not caused by microorganisms and cannot be spread from one person to another. These diseases are often caused by lifestyle factors, environmental factors,

or genetic factors.

Some common non-infectious diseases are:

Hypertension - also known as high blood pressure, it is caused by various factors such as poor diet, lack of exercise, and genetics.

Diabetes - caused by the body's inability to produce or use insulin, a hormone that regulates blood sugar levels.

Cancer - caused by uncontrolled cell growth and can be influenced by genetic and environmental factors.

Asthma - a chronic lung disease that can be triggered by allergies or environmental factors.

Genetic Diseases

Genetic diseases are caused by changes or mutations in genes, which can be inherited from parents or occur spontaneously. Some common genetic diseases are:

Sickle Cell Anemia - an inherited blood disorder caused by a mutation in the gene that produces hemoglobin.

Down Syndrome - a genetic disorder caused by an extra copy of chromosome 21.

Hemophilia - a rare genetic disorder that affects the blood's ability to clot.