Subject:Basic science

Topic: Resources from living things and non living things

Week:1

Class:year 9

Introduction:

In this topic, we will explore the various resources that we can obtain from living and non-living things. These resources are vital for our survival and are necessary for our daily lives. Let's delve deeper into this fascinating topic!

What are Living and Non-Living Things?

Living things are organisms that possess the characteristics of life, such as the ability to grow, reproduce, and respond to stimuli. On the other hand, non-living things do not have these characteristics and are generally man-made.

Resources from Living Things:

Food: Plants and animals are living things that provide us with food for nourishment.

Medicine: Many medicines and treatments are derived from plants, such as penicillin from mold and painkillers from willow bark.

Clothing: Cotton, silk, and wool are all materials obtained from living things that we use to make clothing.

Wood: Trees are living things that provide us with wood, which is used in construction and furniture making.

Resources from Non-Living Things:

Energy: Fossil fuels such as coal, oil, and natural gas are examples of non-living resources that are used to generate electricity and power vehicles.

Metals: Iron, copper, and gold are all examples of metals that are obtained from non-living things and used for various purposes.

Minerals: Salt, sand, and diamonds are all resources that are obtained from non-living things and have different uses.

Water: Although it is not technically a non-living thing, water is an essential resource that is vital for our survival and is obtained from natural sources such as rivers, oceans, and lakes.

How we Obtain Resources from Living and Non-Living Things:

Living things are usually harvested or cultivated for their resources, while non-living things are often extracted from the earth through mining or drilling.

Importance of Sustaining Resources:

It is essential to sustain our resources from living and non-living things for future generations. Overexploitation of resources can lead to scarcity and affect the balance of our ecosystem.

Subject: Basic science

Topic: Light, sound and electrical energy

Week:2

Class:Year 9

Introduction

Light, sound and electrical energy are all forms of energy that are transmitted through different mediums. Although they may seem different, they are all connected by their ability to transfer energy through vibrations.

Light

Light is a type of energy that is visible to our eyes. It travels in straight lines and at very high speeds. The speed of light is approximately 300,000,000 meters per second (m/s) and is the fastest form of energy known to us. Light can be produced by natural sources like the sun, or artificial sources like light bulbs.

Sound

Sound is a type of energy that is produced by vibrations. These vibrations travel through a medium, such as air, and can be heard by our ears. Just like light, sound also travels in waves. The speed of sound varies depending on the medium it is traveling through, but it is approximately 343 meters per second (m/s) in air.

Electrical Energy

Electrical energy is the energy associated with the movement of electrons. This energy can be generated and harnessed to power our homes, schools and other devices. It is the most widely used form of energy in today's world.

Subject: Basic science

Topic: Radioactivity

Week:3

Class:Year 9

Radiation and Radioactivity

Radioactivity is a natural process where unstable isotopes undergo spontaneous nuclear decay, releasing energy and emitting radiation. It is a fascinating topic that is closely linked to many areas of modern science, such as medicine, energy production, and geology.

Radiation is the energy that is given off by radioactive materials. There are three main types of radiation: alpha, beta, and gamma. Each type has different properties, and they behave differently when exposed to matter.

Types of Radiation

Alpha radiation: This is the least penetrating type of radiation and can be stopped by a piece of paper. It consists of alpha particles which are made up of two protons and two neutrons. Alpha particles are positively charged, and they move slowly through materials.

Beta radiation: This type of radiation is more penetrating than alpha radiation and can be stopped by a few millimetres of aluminium. It consists of beta particles which are high-energy electrons. Beta particles are negatively charged and can travel faster and farther than alpha particles.

Gamma radiation: This is the most penetrating type of radiation and can travel through most materials, including concrete and steel. It is the most dangerous type of radiation. Gamma rays

are high-energy electromagnetic waves with no mass or charge.

Uses of Radioactivity

Energy production: Radioactivity is widely used in the production of electricity. Nuclear power plants use the energy released from the nuclear fission of radioactive materials to generate electricity.

Medical applications: Radioactive isotopes can be used to diagnose and treat illnesses. For example, a small amount of a radioactive isotope injected into the body can be used to locate and image internal body organs, which helps doctors diagnose medical conditions.

Industrial applications: Radioactive isotopes are used for many industrial applications, such as monitoring pipelines, detecting leaks in underground fuel tanks, and detecting food spoilage.

Safety Measures

Radioactivity can have harmful effects on living organisms. Therefore, it is important to follow safety measures when using radioactive materials. These include:

Shielding: Using materials like lead or concrete to block and absorb radiation.

Distance: The further apart you are from a radioactive source, the safer you are.

Time: Limit your exposure to radiation by minimizing the time spent near a radioactive source.

Protective clothing: Wear protective clothing like lab coats, gloves and goggles when handling radioactive materials.

Energy transfer is simply the movement of energy from one form to another. Now, I know what you're thinking, "But energy can't go anywhere, right?" Actually, energy travels all around us, all the time! In fact, it's the reason why we can see, move, and even breathe!

Subject: Basic science

Topic: Energy transfer

Week:4,5 and 6

Class:Year 9

Energy transfer is a crucial concept in basic science. It helps us understand the different forms of energy and how they can change from one form to another.

So, let's dive into the different ways energy can be transferred. The most common methods are through heat, light, and sound. For example, when we turn on a lightbulb, electrical energy is transferred into light and heat energy. Similarly, when we strike a match, chemical energy is transferred into light and heat energy.

But that's not all! Energy can also be transferred through motion. When you throw a ball, your kinetic energy is transferred to the ball, causing it to move. You can also see energy transfer in action when playing on a seesaw or riding a bicycle.

Now, let's take a look at some keywords you should keep in mind when learning about energy transfer:

Energy

Transfer

Form

Heat

Light

Sound

Motion

Kinetic energy

Potential energy

Subject:basic science

Topic: Family traits

Week:7 and 8

Class:year nine

Family traits can be fun. They make you different and unique. Your family's genes determine your family traits, such as hair color, eye color, and physical features.

What Are Family Traits?

Family traits are characteristics that are passed down from one generation to the next. These traits are inherited through genes from your parents, and their parents, and so on.

Inherited Traits

There are two types of family traits: inherited traits and acquired traits. Inherited traits are traits that you are born with and are passed down through your genes. These traits are often physical, such as hair and eye color. You may have inherited your mom's curly hair or your dad's dimples.

Dominant and Recessive Traits

Inherited traits can be dominant or recessive. A dominant trait is one that is expressed over a recessive trait. For example, if you have one parent with blue eyes and one parent with brown eyes, you are more likely to have brown eyes because that trait is dominant.

Acquired Traits

Acquired traits are traits that you develop over time through your experiences and environment. These are not inherited but are learned or developed. For example, if you learn how to ride a bike, that is an acquired trait, not an inherited one.

Examples of Inherited Traits

Some examples of inherited traits are:

Hair color

Eye color

Height

Skin color

Facial features

Why Are Family Traits Important?

Family traits are important because they make you unique and connect you to your family. They are a reminder of where you come from and the shared traits that make your family special.

Subject:Basic science

Topic:Drug abuse

Week:9

Class:Year 9

Drug abuse is a major problem in today's society, especially among young people. It refers to the use of illegal or harmful drugs in a way that causes harm to oneself or others.

In Nigeria, the Nigerian Educational Research and Development Council (NERDC) has identified

drug abuse as a relevant topic to be included in the Basic Science curriculum for Year 9 students. This is because the effects of drug abuse can have a significant impact on an individual's physical and mental health.

Drug abuse is a serious problem that can lead to addiction, which is a chronic relapsing disease. This means that once an individual becomes addicted to a drug, it is very difficult for them to stop using it even if they are aware of the negative consequences.

The most common drugs abused in Nigeria include cannabis, heroin, cocaine, and codeine. These drugs can be taken in various forms such as smoking, snorting, injecting, or even swallowing.

The short-term effects of drug abuse can be damaging as it affects the brain's reward system and can result in feelings of pleasure and euphoria. However, continued use of these drugs can lead to long-term negative effects such as memory loss, decreased cognitive function, and even permanent brain damage.

There are many factors that contribute to drug abuse, such as peer pressure, stress, and easy access to drugs. Students need to be educated on the dangers of drug abuse and the importance of making responsible and informed decisions.

Some ways to prevent drug abuse include staying away from peer pressure, finding healthy outlets for stress, and seeking help if one feels they have developed a problem with drugs.

Subject: Basic science

Topic: Metabolism in human beings

Week:10

Class:Year 9

Metabolism plays a crucial role in the human body, and it can be a fun topic to learn about! This process is responsible for converting food into energy, building new cells, and eliminating waste products. In this lesson, we will explore the different components of metabolism and how they

work together to keep our bodies functioning at their best.

To start, let's define metabolism. Metabolism is a series of biochemical reactions that take place in an organism to maintain life. This includes processes such as digestion, respiration, and synthesis of new cells. These reactions are regulated by enzymes, which are proteins that act as catalysts to speed up chemical reactions in the body.

Now, let's take a closer look at the two main types of metabolism: catabolism and anabolism. Catabolism is the breakdown of complex molecules into simpler ones, while anabolism is the opposite – the production of complex molecules from simpler ones. Catabolism provides the energy needed for anabolism to occur, making the two processes complementary and necessary for the body to function properly.

During digestion, the food we eat is broken down into smaller molecules, which are then absorbed into the bloodstream and transported to our cells. These molecules are then further broken down through catabolism to release energy. The energy is used to power various processes in our bodies, including muscle movement, breathing, and even thinking!

But what happens to the waste products of this process? This is where excretion comes in. The waste products are eliminated through urine, sweat, and breath. If these waste products are not eliminated, they can be harmful to the body, so it is crucial for our bodies to have a healthy metabolism.

To ensure a healthy metabolism, there are some essential factors to consider, such as a balanced diet, regular exercise, and enough rest. Eating a variety of healthy foods provides the body with the necessary nutrients, vitamins, and minerals to maintain a healthy metabolism. Similarly, regular exercise helps to keep our metabolism active, and getting enough rest allows our bodies to restore and regenerate cells.

Subject: Basic science

Topic:Sense organs

Week:11 and 12

Class:Year nine

The human body has five sense organs, which are the eyes, ears, nose, tongue, and skin. These organs work together to help us perceive the world around us. Isn't that incredible?

Now, let's take a closer look at each of these sense organs and their unique abilities.

Eyes

The eyes are responsible for our sense of sight. They work by capturing light from objects and sending it to the brain for processing. Fun fact: The eyes are the most complex organ in the human body!

Ears

Our ears are responsible for our sense of hearing. They capture sound waves and convert them into electrical signals that are sent to the brain for interpretation. Did you know that the ears also help us maintain balance and orientation? Cool, right?

Nose

The nose is responsible for our sense of smell. It has special cells that detect different smells and send signals to the brain for interpretation. The nose also helps us to taste since our sense of taste is closely linked to our sense of smell.

Tongue

The tongue is responsible for our sense of taste. It contains specialized cells called taste buds that help us identify different tastes, such as sweet, sour, salty, and bitter. Amazingly, our tongue can also sense temperature and texture!

Skin

Our skin is the largest sense organ in the body and is responsible for our sense of touch. It has many specialized cells that can detect temperature, pressure, and pain. Fun fact: The average adult has approximately 20 square feet of skin!