KidsBuddy
Educational Application

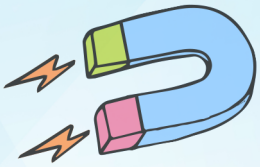
KidsBuddy

Grade 5 Ebook Science

Download on the App Store

GET IT ON Google Play

Index



Chapter 1.....1

Cells 1

Knowledge card 1

Quiz..... 17

Chapter 2.....24

Materials and their structure.....24

Knowledge card 24

Kids challenges 37

Quiz..... 48

Chapter 3.....54

Forces and Energy.....54

Knowledge card 54

Kids challenges 70

Quiz..... 82

Chapter 4.....

Grouping and Identifying Organisms.....

Chapter 5.....

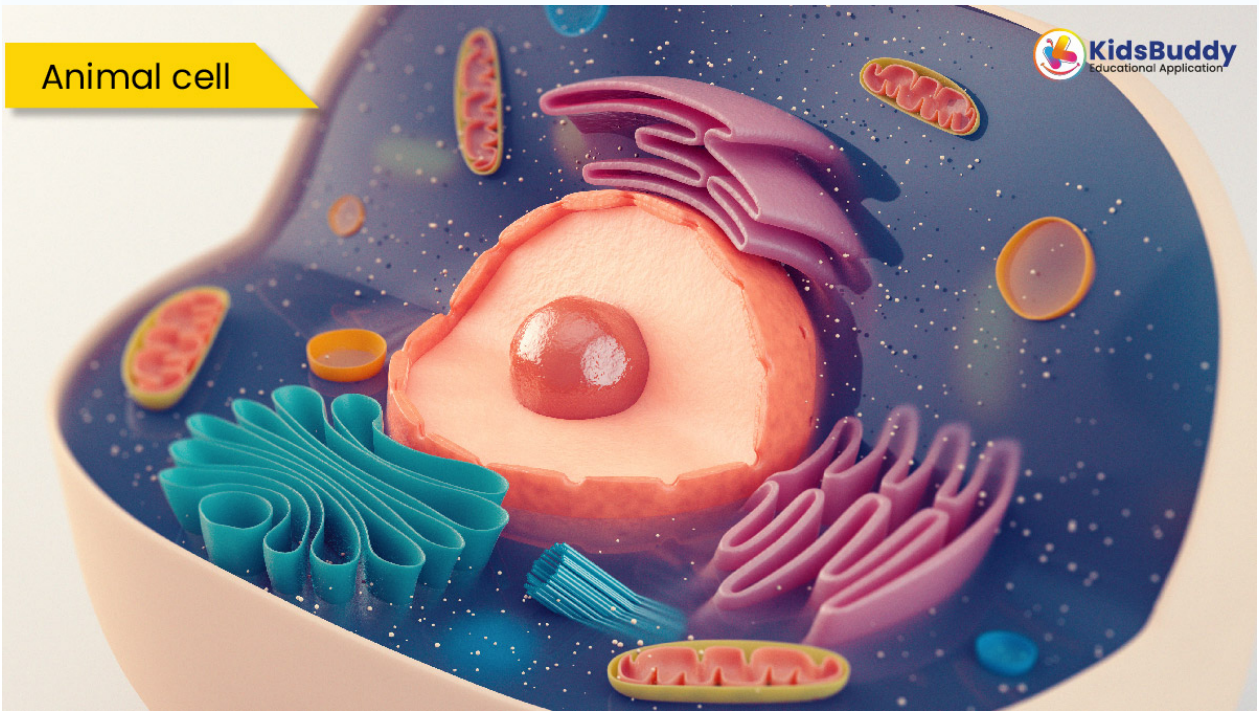
Properties of Materials.....

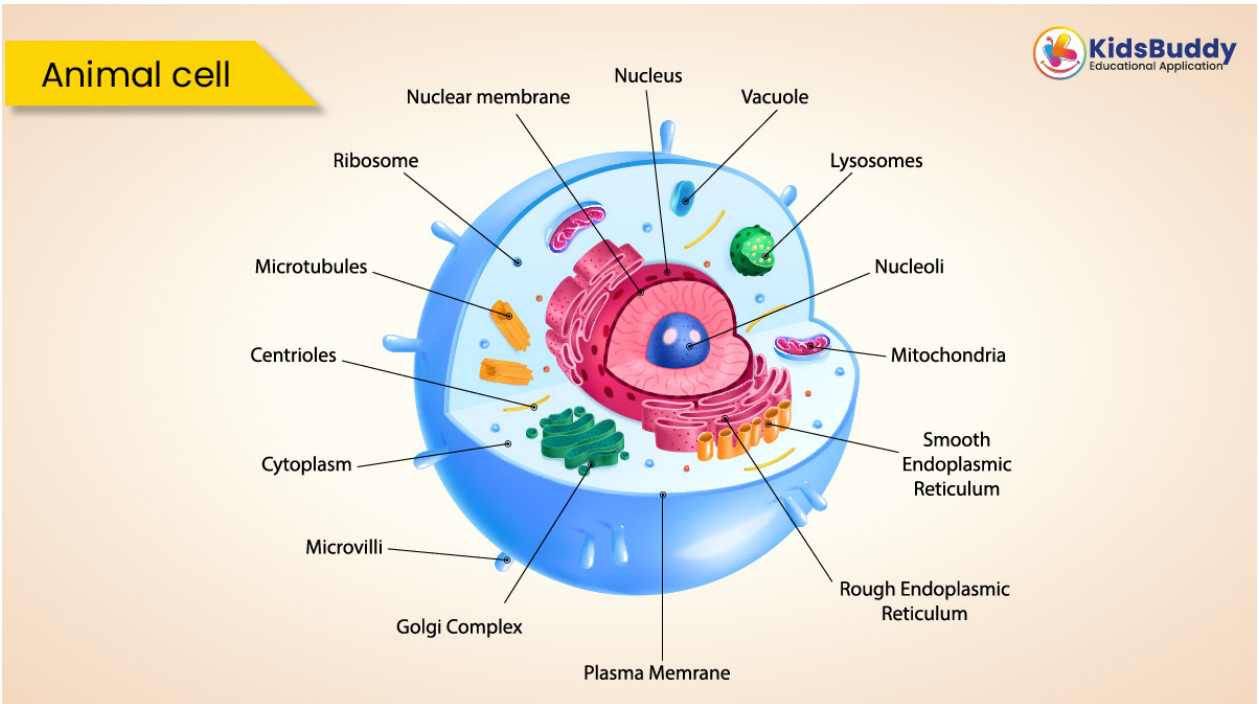
Chapter 6.....
Earth Physics(Sound).....
Chapter 7.....
Microorganism in the environment.....
Chapter 8.....
Changes to material.....
Chapter 9.....
Electricity.....

KNOWLEDGE CARDS

Chapter- 1
Cells

1 CELLS





Cells are the fundamental units of life that carry out essential functions necessary for the survival of all living organisms. Human beings are composed of approximately 75 trillion cells, while large plants and animals have billions of cells. However, the size and structure of cells differ among different living organisms. There are two primary types of cells: plant cells and animal cells. Plant cells have a rigid cell wall that provides structural support and protects the cell membrane. Additionally, most plant cells contain chloroplasts, which are responsible for photosynthesis and give plants their green color. On the other hand, animal cells do not have cell walls, and chloroplasts are absent. Animal cells are characterized by a flexible cell membrane that surrounds the cell's cytoplasm and organelles.

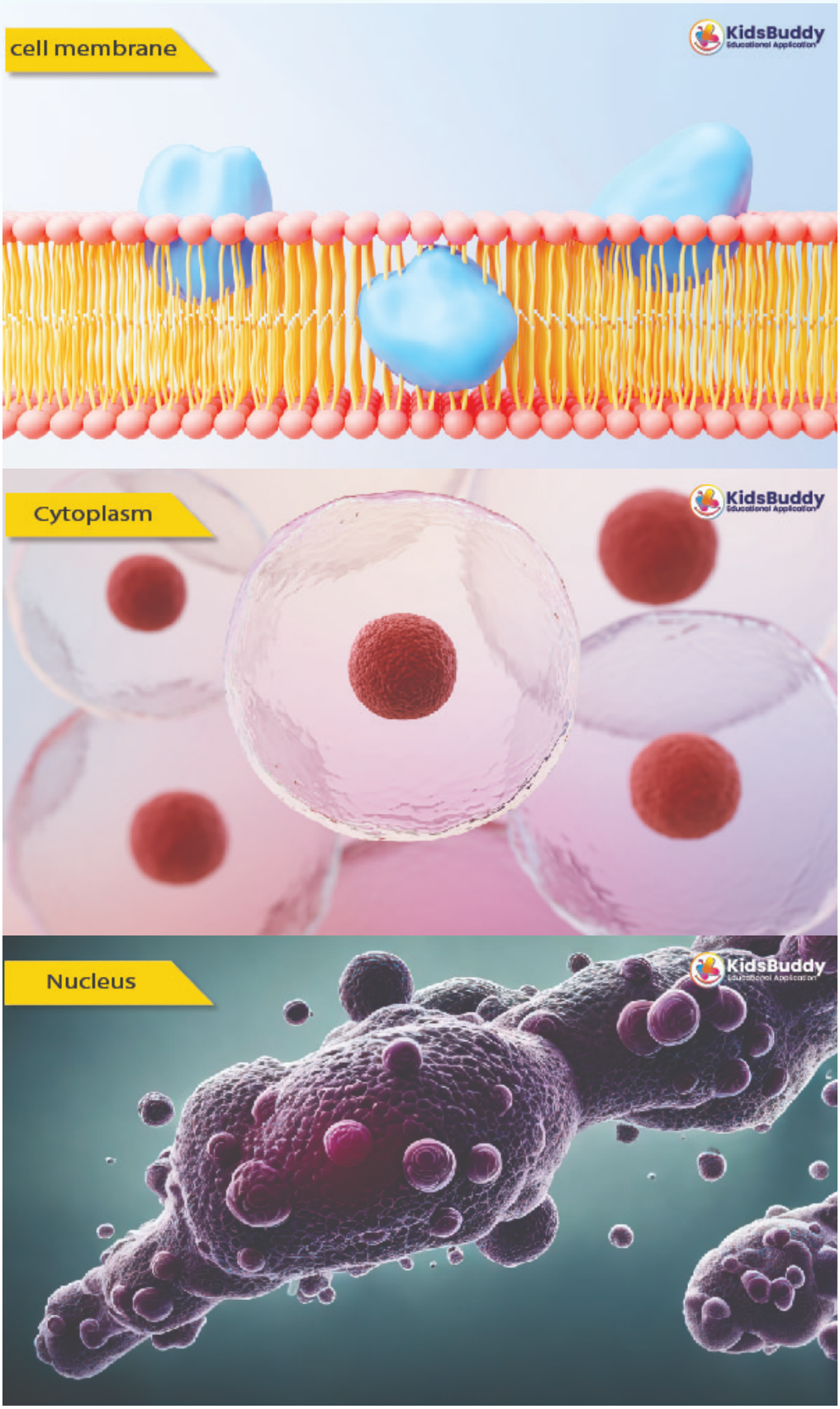
1.1 The _____ is the smallest unit.

- Cell
- Shell
- Smell
- None of these

1.2 Plant cells _____ rigid wall.

- Have
- Do not have

2 PARTS OF CELL



The cell is the basic unit of life, and it is the smallest structure that exhibits all the essential properties of living organisms. The majority of cells consist of three primary components, namely the cell membrane, cytoplasm, and nucleus.

The cell membrane is a thin, flexible wall that surrounds the cell and regulates the movement of substances in and out of the cell. It allows essential nutrients and molecules to enter the cell, while blocking the entry of harmful substances, maintaining the cell's internal environment. The cytoplasm is a gel-like substance composed mainly of water and contains various organelles such as mitochondria, ribosomes, and endoplasmic reticulum, which are responsible for carrying out specific cellular functions, including energy production, protein synthesis, and intracellular transport. The nucleus is a prominent structure located in the center of the cell and serves as the cell's control center. It contains the genetic material in the form of DNA, which regulates the cell's activities and coordinates cell growth and reproduction.

The study of cells and their functions is a critical field of biology known as cell biology or cytology. Knowledge of cell biology is essential in various scientific fields, including medicine, biotechnology, and genetics

2.1 Most cells have_____ main parts.

1 | 2

3 | 4

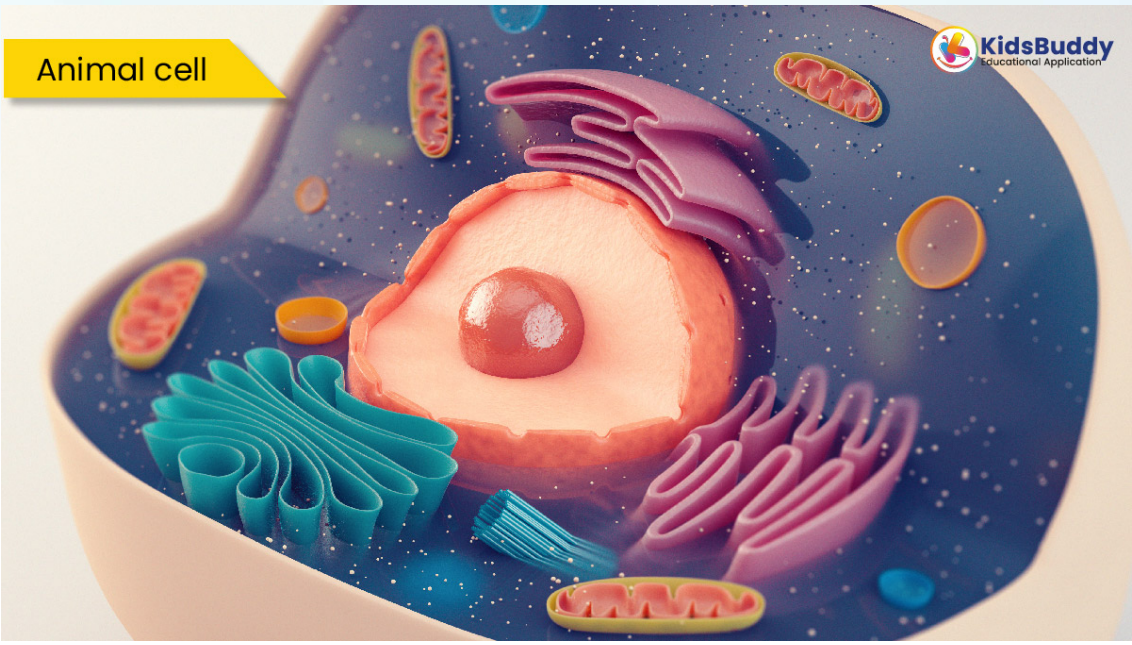
2.2 _____ is a thin wall surrounding the cell.

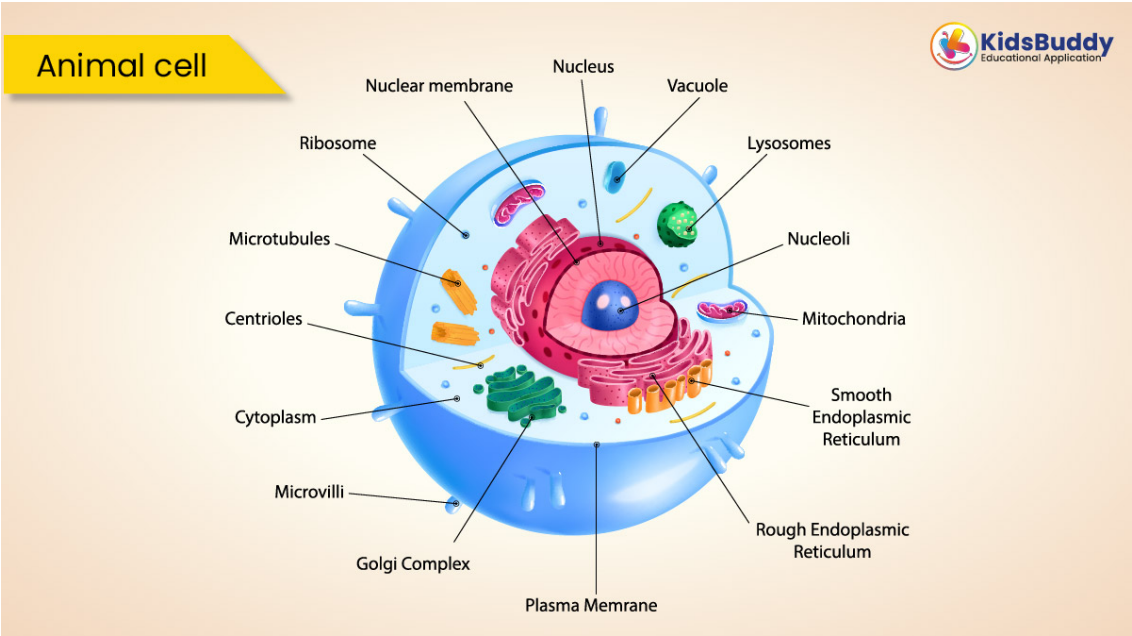
Cell membrane

Cytoplasm

Nucleus

3 ANIMAL CELLS





Animal cells have several unique features that distinguish them from other types of cells.

Firstly, they are typically multicellular organisms, meaning they are composed of many cells that work together to perform different functions.

Secondly, their cells are characterized by a unique membrane that surrounds the nucleus, called the nuclear envelope.

Unlike plant cells, animal cells lack a cell wall made of cellulose, which gives them greater flexibility. Another distinctive feature of animal cells is their inability to perform photosynthesis. This is because they lack chloroplasts, which are organelles found in plant cells that are responsible for photosynthesis. nstead, animal cells must consume organic materials produced by other living creatures to obtain the nutrients they need to survive.

They store carbohydrates in the form of glycogen, which is a complex sugar that can be broken down and used for energy.

In terms of nervous coordination, animal cells have specialized cells called neurons that allow them to communicate and coordinate their activities. This allows them to respond to changes in their environment and move from one location to another. Overall, animal cells have unique features that allow them to carry out their essential functions and survive in their respective environments.

Understanding these features can help us gain a greater appreciation for the complexity and diversity of life on Earth.

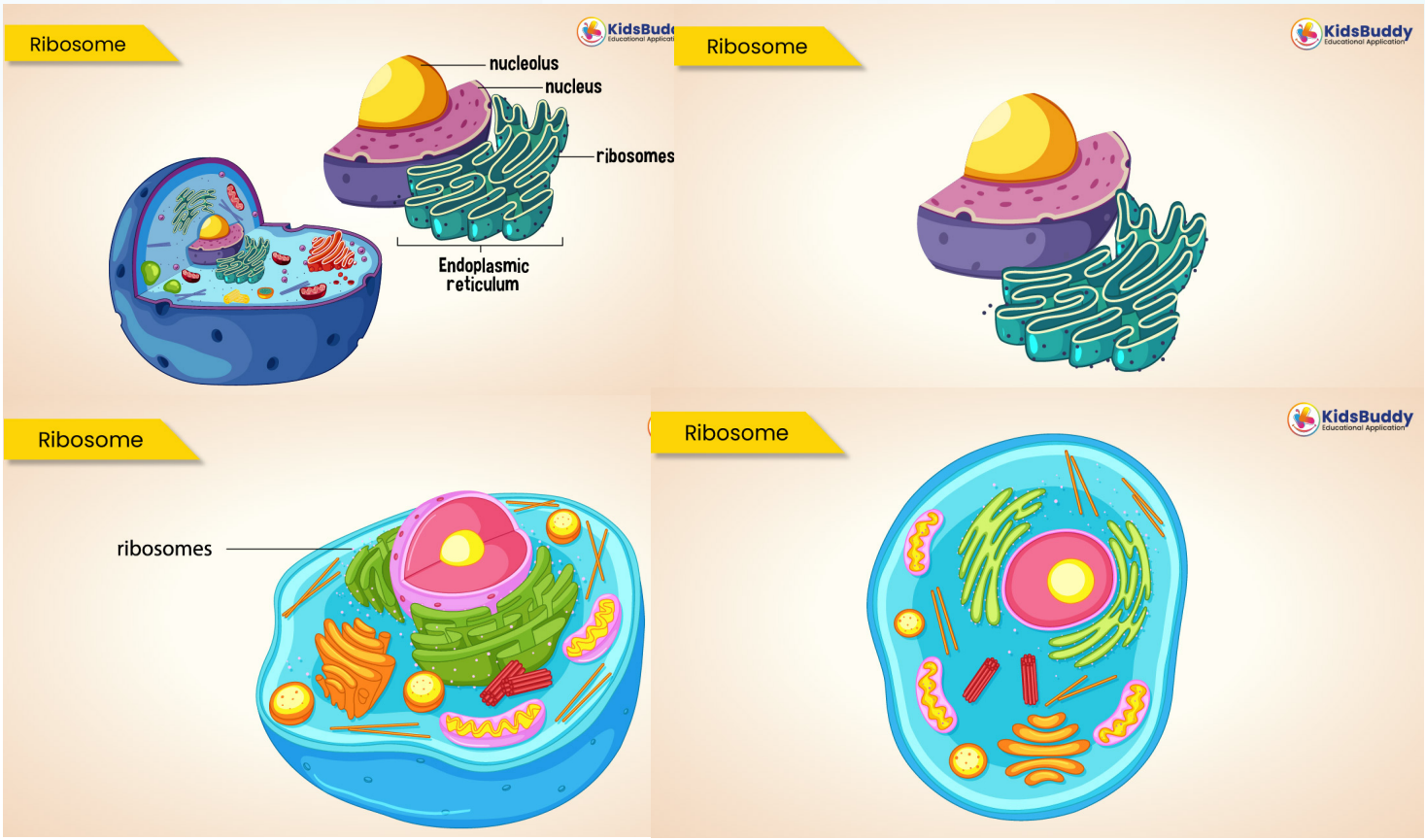
3.1 Animals are have _____ cells

- Single cell
- Many cells
- Both of them
- None of these

3.2 They lack _____ cell walls in their cells.

- Cell membrane
- Cellulose
- Nucleus
- None of the above

4 RIBOSOME



Ribosomes are tiny structures found inside our cells that play a crucial role in making proteins. Proteins are essential for our bodies as they help us grow, repair our tissues, and carry out important functions. Think of ribosomes as tiny protein factories. They receive instructions from our DNA, which is like a blueprint or recipe book for making proteins. The DNA provides the instructions in a special code called RNA.

Ribosomes take these instructions and use them to assemble amino acids in a specific order to create proteins. They link the amino acids together like building blocks to form long chains, which then fold into complex shapes to become functional proteins. The amazing thing is that ribosomes are found in all living cells, from tiny bacteria to plants and animals, including us humans! They work tirelessly, making thousands of proteins every second.

Some ribosomes float freely in the cell's cytoplasm, while others are attached to a structure called the endoplasmic reticulum. These different types of ribosomes make different kinds of proteins. Some proteins stay inside the cell to carry out important tasks, while others are sent outside the cell to help with various functions in our bodies.

4.1 What is the main role of ribosomes in cells?

- Producing energy
- Regulating cell division
- Making proteins
- Storing genetic information

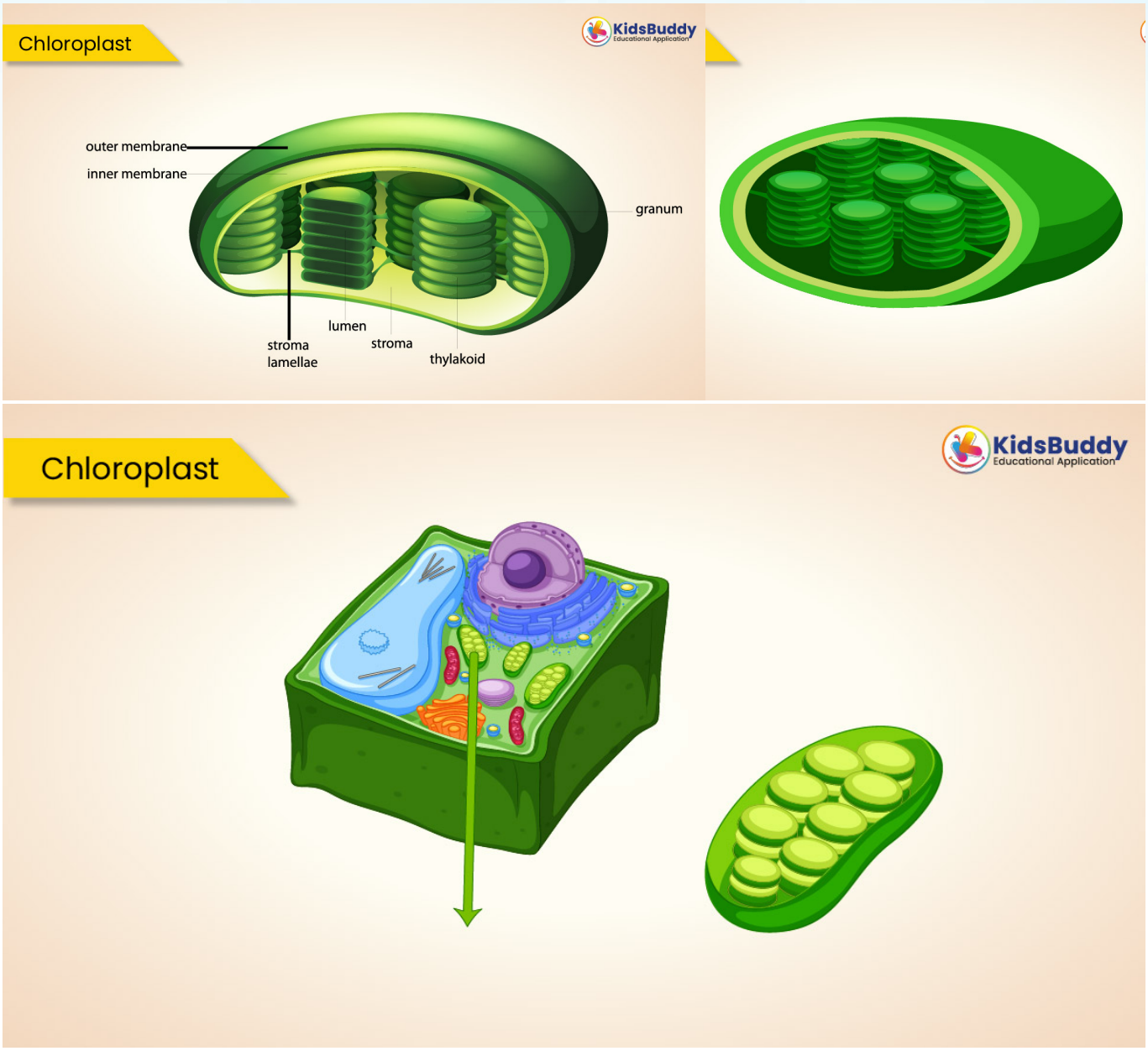
4.2 Where are ribosomes found in a cell?

- Nucleus
- Cell membrane
- Cytoplasm
- Mitochondria

4.3 Which of the following best describes the function of ribosomes?

- Breaking down waste materials
- Producing hormones
- Carrying out photosynthesis
- Assembling amino acids to make proteins

5 CHLOROPLAST



Chloroplasts are incredible organelles found in plant cells. They have a green pigment called chlorophyll, which gives plants their green colour. Chloroplasts play a vital role in the process of photosynthesis, which is how plants make their own food. During photosynthesis, chloroplasts capture sunlight and convert it into energy.

They absorb light energy and use it to combine carbon dioxide and water to produce glucose, a type of sugar. Glucose is like fuel for the plant, providing energy for growth and other important functions. Chloroplasts are also responsible for releasing oxygen into the air as a byproduct of photosynthesis. This oxygen is essential for all living things on Earth, including animals and humans, as we need it to breathe and survive.In addition to photosynthesis, chloroplasts help plants store energy in a molecule called ATP. ATP acts like a battery, storing energy that the plant can use whenever it needs it. So, in summary, chloroplasts are the powerhouses of plants. They capture sunlight, use it to make food (glucose), release oxygen, and store energy. Without chloroplasts, plants wouldn't be able to grow, and life on Earth would be very different.

5.1 chloroplasts serve a crucial role in life on Earth.

Yes

No

5.2 Where did the chlorophyll contain?

Ribosome

Chloroplast

Answer key

1.1 Cell

1.2 have

2.1 3

2.2 Cell membrane

3.1 Many cells

3.2 Cellulose

4.1 Making proteins

4.2 Cytoplasm

4.3 Assembling amino acids to make proteins

5.1 Yes

5.2 Chloroplast

QUIZ

Chapter- 1
Cells

1 Which of the following are known as the suicide bags of cells?

- Golgi bodies
- Ribosomes
- Lysosomes
- Nucleoli

2 State True/False?

Plant cells have fixed, rectangular shapes.

- True
- False

3 What is the structural and functional unit of living organisms?

- Bones
- Cells
- Tissues

4 Which is the controlling cell organelle?

- Golgi bodies
- Ribosomes
- Lysosomes
- Nucleus

5 State True/False?

Mitochondria are often referred to as the powerhouses of the cell.

- True
- False

6 The movement of water in and out of cells is called what?

- Osmosis
- Photosynthesis
- Waterfalling
- None of these

7 The part of the cell which gives shape and rigidity to the cell is _____

- Cell wall
- Protoplast

8 What structure is in a plant cell but not a animal cell?

- A cell wall
- A large central vacuole
- Chloroplasts
- All of these

9 What regulates which enters and leaves the cell and provides protection and support in Animal cells?

- Cell Membrane
- Ribosome
- Vacuole
- Golgi Body

10 What cell part directs all cell activities?

- Vacuole
- Cell wall
- Protoplast
- Nucleus

11 _____ is a gel-like fluid that fills plant and animal cells. It holds the organelles in place and gives each cell its shape.

- Vacuole
- cytoplasm

12 _____ is a tiny cellular structure that performs specific functions within a cell.

- Nucleus
- cytoplasm
- Organelles
- Chloroplasts

13 Which organelles capture energy from sunlight and use it to produce food for the cell in plant cells?

- Nucleus
- cytoplasm
- Organelles
- Chloroplasts

14 What is the purpose of Mitochondria ?

- Produces energy
- Causes cell division
- Is not an organelle
- None of these

15 State True/False?

Animal cells are mostly round and irregular in shape.

- True
- False

16 Which of the following is called as the brain of the cell?

- Vacuole
- Cell wall
- Protoplast
- Nucleus

17 What is the storage area in a plant cell?

- Cell Membrane
- Ribosome
- Vacuole
- None of these

18 State True/False?

All cells look and act the same.

- True
- False

19 Robert Hooke discovered the ____ of a cell

- Nucleus
- cytoplasm
- Cell Wall
- Chloroplasts

20 What tool do you use to view the cells?

- Microscope
- Magnifying glass
- Microruler
- None of these

Answer key

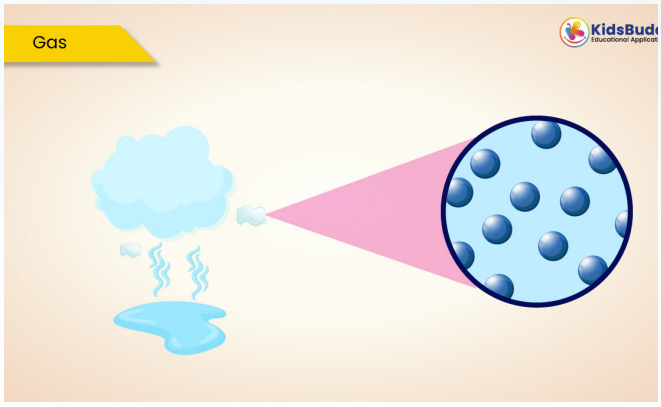
1. Lysosomes
2. True
3. Cells
4. Nucleus
5. True
6. Osmosis
7. Cell wall
8. All of these
9. Cell Membrane (Plasma Membrane)
10. Nucleus
11. cytoplasm
12. Organelles
13. Chloroplasts
14. Produces energy
15. Round
16. Nucleus
17. Vacuole
18. False
19. Cell wall
20. Microscope

KNOWLEDGE CARDS

Chapter- 2

Materials and their structure

1 STATES OF MATTER



Matter can be defined as anything that has mass and takes up space. It is made up of atoms, which are the smallest particles that retain the chemical properties of an element.

There are three main states of matter: solid, liquid, and gas.

Solids have a fixed shape and volume because the intermolecular forces of attraction between their particles are very strong. They cannot be compressed easily into a smaller space, and their particles are closely packed together.

Liquids, on the other hand, do not have a fixed shape but have a fixed volume. They cannot be compressed easily into a smaller space, and their particles are closely packed together but have more space between them than in solids.

Gases do not have a fixed shape or volume. They have a slower density as compared to liquids or solids and contain more empty space between particles. These particles move very fast and spread out to fill any container they are in. The intermolecular forces of attraction between their particles are weaker than in solids and liquids.

Plasma is another state of matter that occurs at extremely high temperatures and is made up of ionized particles. Bose-Einstein condensates are another form of matter that occurs at extremely low temperatures and is made up of atoms that are so close together that they behave as a single entity.

Understanding the properties of matter is important in fields such as chemistry, physics, and materials science, as it helps us understand how matter behaves and interacts with its environment.

1.1 _____have a fixed shape.

Solid | Liquid | Gas

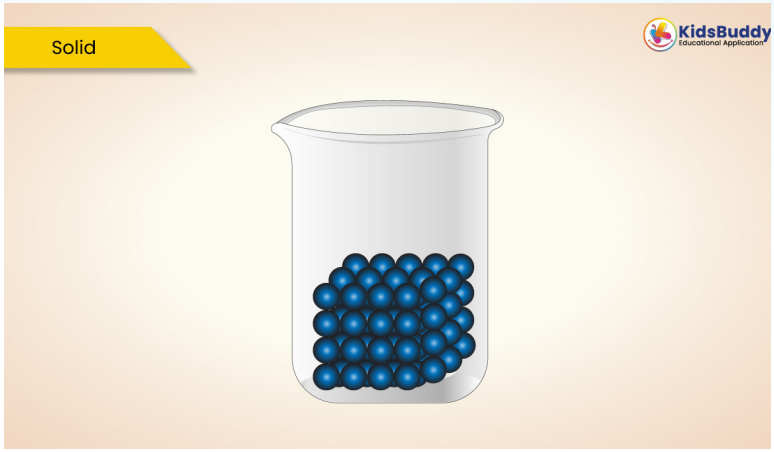
1.2 _____does not have any fixed shape or fixed volume.

Solid | Liquid | Gas

1.3 Which is the other state of matter that occurs at extremely high temperatures?

Solid | Liquid | Gas | plasma

2 SOLID



Solids are a state of matter in which particles are closely packed and held together by strong intermolecular forces. Due to the small spaces between the particles, compression is difficult, and the volume and shape of a solid are fixed. Unlike liquids and gases, the particles in solids can only vibrate about their mean location and cannot move freely due to their hard nature.

This vibration determines the thermal energy of the solid, and as the temperature increases, the particles vibrate more rapidly, leading to an increase in the solid's temperature. In solids, the rate of diffusion is incredibly low due to the fixed positions of the particles.

Therefore, solids do not readily mix with each other, and their chemical reactions are slower than those of liquids or gases. Examples of solids include ice, sugar, rock, wood, and many others. The properties of solids make them useful in various applications, such as construction, electronics, and manufacturing.

2.1 State True/False?

In solids, particles are tightly or closely packed.

True | False

2.2 State True/False?

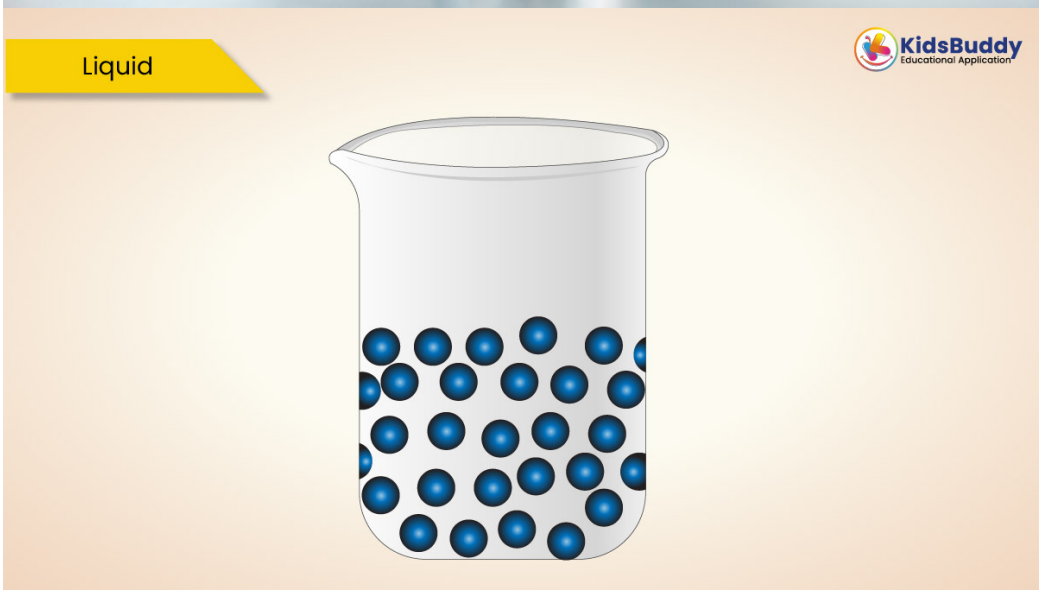
Solid has a fixed shape and volume.

True | False

3 GRAVITY


Liquid
KidsBuddy
Educational Application


Liquid
KidsBuddy
Educational Application


Liquid
KidsBuddy
Educational Application

Liquids are states of matter in which particles are less densely packed than in solids, allowing for more space between them. When placed in a container, liquids take on the shape of the container due to the ability of the particles to move and flow past each other.

However, like solids, liquids are also difficult to compress due to the reduced space between particles. While liquids have a fixed volume, they do not have a fixed shape, which makes them distinct from solids. Compared to solids, liquids exhibit a higher rate of diffusion due to the increased freedom of movement of the particles. This allows for easier mixing of liquids with each other and with other substances. The force of attraction between particles in liquids is weaker than in solids, which accounts for their ability to flow and take the shape of a container. Examples of liquids include water, milk, blood, coffee, and many others. Liquids have many applications in various fields, such as the food and beverage industry, medicine, and chemistry.

3.1 **State True/False?**

Liquids have fixed volume but no fixed shape.

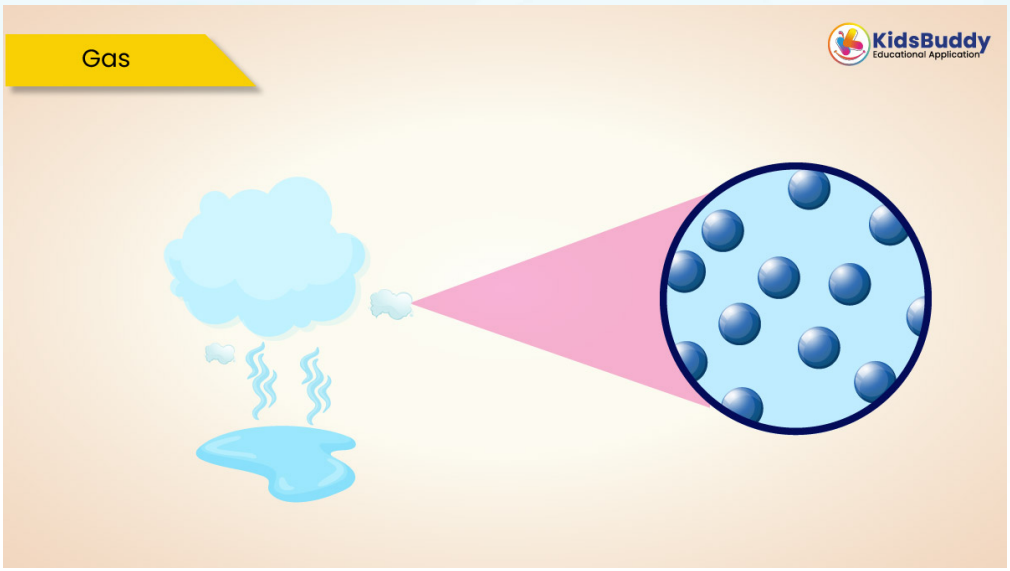
True False

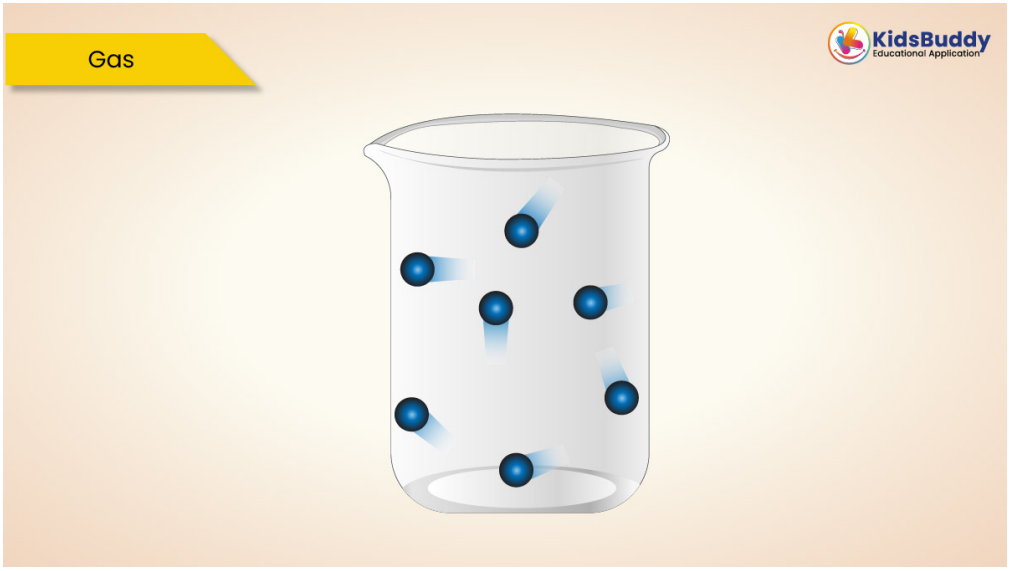
3.2 **State True/False?**

The force of attraction between particles in liquids is weaker than in solids

True False

4 GASES


Gas
KidsBuddy
Educational Application


Gas
KidsBuddy
Educational Application


Gas
KidsBuddy
Educational Application

Gases are one of the three states of matter, along with solids and liquids. Unlike solids and liquids, gases have particles that are widely separated from one another and have almost no force of attraction. As a result, gas particles can move freely and rapidly in any direction. Unlike solids and liquids, the volume and shape of a gas are not fixed and can be changed easily by applying pressure or changing the temperature. Gases can also be compressed more than any other state of matter, making them useful for many applications such as refrigeration systems, gas storage tanks, and aerosol cans. Diffusion, which is the process by which particles mix and spread out over time, occurs at a faster rate in gases compared to solids and liquids due to the high kinetic energy of gas particles. In fact, gases can diffuse so quickly that they can quickly fill a container, even if the container is much larger than the amount of gas present. Common examples of gases include air, which is a mixture of several gases, including nitrogen, oxygen, and carbon dioxide, as well as individual gases such as helium, nitrogen, and oxygen.

4.1

State True/False?

Gases are the third form of State of matter.

True | False

4.2

State True/False?

The force of attraction between the particles is negligible, and they can move freely.

True | False

Answer key

1.1 Solid

1.2 Gas

1.3 plasma

2.1 True

2.2 True

3.1 True

3.2 True

4.1 True

4.2 True

KIDS CHALLENGES

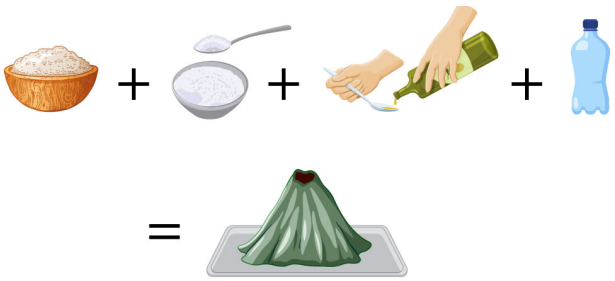
Chapter- 2

Materials and their structure

1 Salt dough volcano

Aim:

The aim of this activity is to demonstrate the working of a volcano using child-friendly materials.



Materials used :

To conduct this experiment, you will need 6 cups of flour, 2 cups of salt, 3 tablespoons of cooking oil, baking soda, a narrow-neck plastic bottle, vinegar, red food color, and hand wash. Please ensure that you have proper hand-eye protection before conducting this experiment.

Procedure:

Step 1: Mix the flour, salt, and cooking oil to make a hard dough. Wrap the dough around the bottle to form a mountain shape. Inside the bottle, add 3 tablespoons of baking soda, 5 drops of red food color, and 2 tablespoons of liquid hand wash.

Step 2: Allow the dough mountain to dry for some time. Make a small hole at the top of the mountain and the bottle opening to add the materials.

Step 3: Once everything is set, add vinegar to the bottle. The amount of vinegar added should be approximately one-third of the bottle. The dough mountain volcano will then erupt, and you will see red-colored lava bursting out of it.

Task Output

Complete the activity and share it with us

Principle:

The reaction between baking soda and vinegar produces carbon dioxide, which creates pressure and leads to the eruption of the dough mountain volcano.

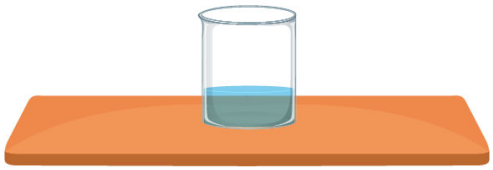
Benefits

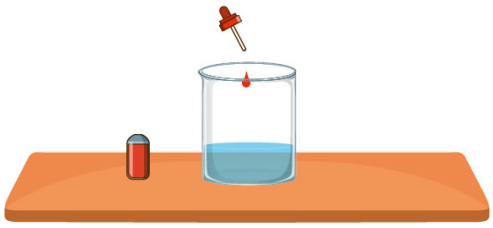
This activity helps children understand the working of a volcano and the chemical reaction between baking soda and vinegar. It is also a fun and interactive way to learn about science.

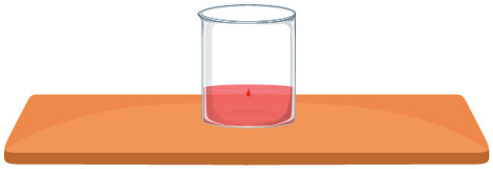
2 Invisible movement

Aim:

To observe the process of diffusion in water.







Materials used :

Dark food color, tall clear glass jar, water.

Procedure:

Step 1: Fill the glass jar with water and let it sit undisturbed for 24 hours.

Step 2: Hold the food color above the water surface and add two drops of it into the water.

Step 3: Observe the jar immediately and note the initial appearance of the color drops.

Step 4: After 24 hours, observe the jar again and note the changes in the color distribution in the water.

Expected result:

Initially, the drops of food coloring will sink to the bottom of the jar and form colored streaks in the water as they fall due to gravity. After 24 hours, the water should be evenly colored due to the process of diffusion.

Task Output

Complete the task and take video. Send this video to us.

Benefits

This experiment helps students understand the process of diffusion and how it affects the distribution of molecules in a liquid.

Principle:

Diffusion is the movement of molecules from an area of higher concentration to an area of lower concentration. In this experiment, the food coloring molecules diffuse throughout the water until they are evenly distributed.

3 FORCE OF AIR

Aim:

To investigate the force of air and its effects on water displacement.

Materials used :

A narrow-neck bottle A funnel A small piece of clay A glass of water

Procedure:

Step 1: Take a narrow-neck bottle and insert a tunnel into its opening.

Step 2:Use a small piece of clay to make a seal around the tunnel and the bottleneck to make the bottle airtight. Slowly pour water into the bottle, making sure to add it in small amounts.

Step 3: Keep pouring water until the bottle is completely full, and note any changes that occur during this process.

Expected result:

Initially, the drops of food coloring will sink to the bottom of the jar and form colored streaks in the water as they fall due to gravity. After 24 hours, the water should be evenly colored due to the process of diffusion.

Task Output

This experiment demonstrates the force of air and its effects on water displacement. As the water level inside the bottle rises, the air molecules become more compressed and exert a force that opposes the entry of more water. This results in the water flow being restricted, eventually leading to the funnel becoming filled with water and no more water entering the bottle.

Benefits

Develop observation skill

4 CHANGE OF MATTER

Aim:

To observe the changes in matter during the process of heating ice.

Materials used :

Ice cubes Saucepan with lid

Procedure:

Step 1: Place ice cubes in a pot and heat them on a stove until the ice melts and turns into water.

Step 2: Once the water starts boiling, put a lid on the pot and let it boil for a few minutes. Turn off the heat and let the pot cool down.

Step 3: Observe the water drops on the underside of the lid when you lift it.

Expected result:

When you heat the ice cubes, their molecules start moving faster, causing the ice to melt and turn into water. Further heating causes the water molecules to move even faster, leading to the water boiling and turning into steam or water vapor. The water drops on the inside of the lid are a result of this steam condensing back into liquid as the pot cools down. This process is known as condensation.

Task Output

This experiment demonstrates the changes in matter that occur during the heating of ice. As the ice melts, it turns into liquid water. Further heating causes the water to boil and turn into steam or water vapor, which can then condense back into liquid water as the pot cools. This process of changing from a solid to a liquid to a gas and back into a liquid is an example of the different states of matter and the transitions between them.

Benefits

Develop Observation Skills
Enthusiastic About Science Experiments

QUIZ

Chapter- 2

Materials and their Structure

1 What is the symbol for potassium on the periodic table?

- P
- C
- K
- Po

2 Which is the most common element found in our universe ?

- Hydrogen
- Oxygen
- Helium
- Nitrogen

3 Sodium metal is stored in _____

- Water
- Soil
- Kerosene
- Petrol

4 Which of the following metals remains in liquid form under normal conditions?

- Uranium
- Mercury
- Radium
- Zinc

5 Litmus paper used in laboratory obtained from:

- Bacteria
- Bauxite
- Lichen
- Earth crust

6 _____ is used in balloons as it is lighter than air.

- Helium
- Argon
- Oxygen
- Nitrogen

7 Which of the following gases is known as Marsh gas?

- Methane
- Nitrous acid
- Sulfur dioxide
- Methyl Isocyanide

8 Solid → Liquid :: _____

- Freezing
- Melting
- Condensation
- None of these

9 **State True/False?**

Baking of cake is a physical change. State that True or False ?

True | False

10 _____ :: Freezing.

Solid → Gas | Liquid → Solid

Liquid → Gas | None of these

11 **Pick the odd one out.**

Hydrogen | Oxygen

Milk | Nitrogen

12 **Mass and volume are two physical properties of _____ .**

Matter | Volume

Energy | None of these

13 Which of the following can be compressed easily?

- Piece of wood
- Glass of milk
- Balloon filled with air
- All of these

14 Which of the following process is used for the manufacture of Ammonia?

- Claude's process
- Contact process
- Haber process
- Linde's process

15 Which is the alkaloid that contains in cola drinks?

- Morphine
- Mescaline
- Caffeine
- Tryptamine

16 The temperature at which water gets converted into water vapour is known as ___

- Melting
- Condensation
- Freezing
- Boiling Point

17 Ice cream melting is a chemical change. Say Yes or No.

Yes

No

18 0 degree Celsius : Freezing point of water ;____ : Boiling point of water

100 degree Celsius

1000 degree Celsius

10 degree Celsius

10000 degree Celsius

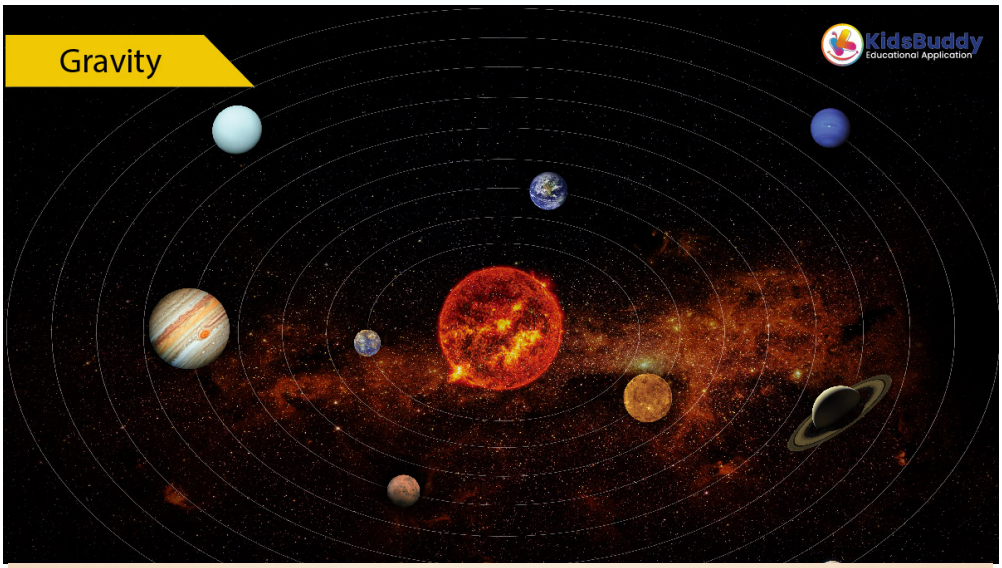
Answer key

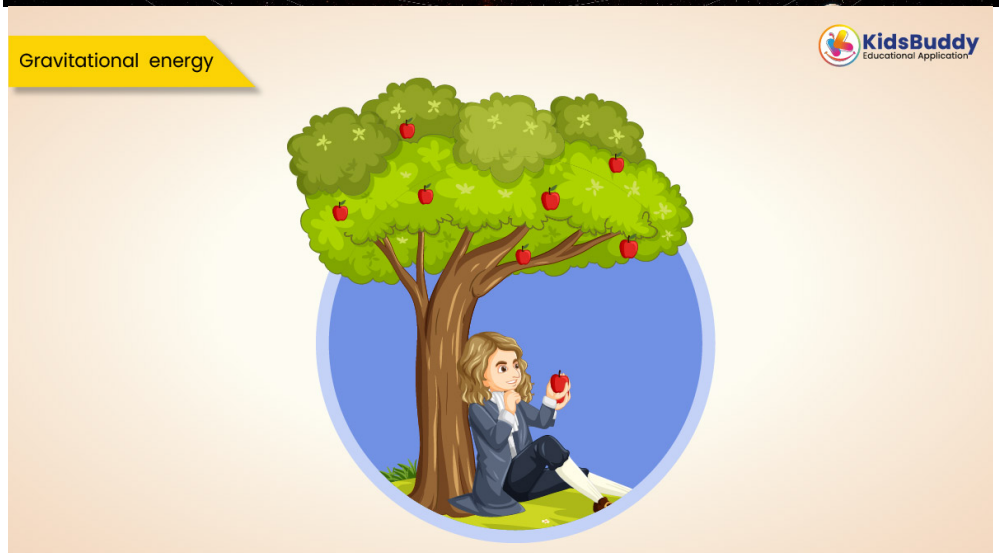
1. K
2. Hydrogen
3. Kerosene
4. Mercury
5. Lichen
6. Helium
7. Methane
8. Melting
9. False
10. Liquid → Solid
11. Milk
12. Matter
13. Balloon filled with air
14. Haber process
15. Caffeine
16. Boiling point
17. No
18. 100 degree Celsius

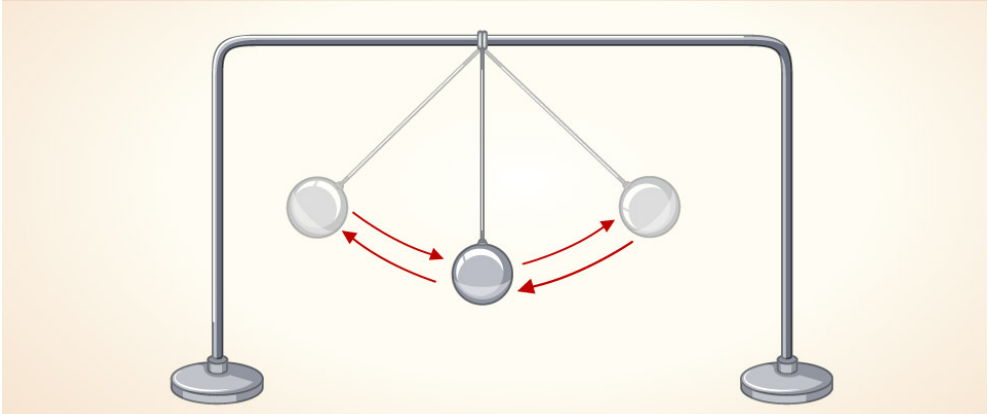
KNOWLEDGE CARDS

Chapter- 3
Forces and Energy

1 GRAVITATIONAL ENERGY







Gravitational energy, also referred to as gravitational potential energy, is a form of potential energy that an object possesses due to its position in a gravitational field. It is the energy that an object possesses as a result of its position relative to another object, which exerts a gravitational force on it. When two objects are attracted to each other by gravity and move closer together, the potential energy associated with their position in the gravitational field decreases. This energy is then transformed into kinetic energy as the objects move faster due to their gravitational attraction. This conversion of potential energy to kinetic energy is known as the gravitational potential energy.

Gravitational energy is a type of potential energy that depends on the mass, separation distance, and position of the objects in the gravitational field. The greater the mass of an object and the closer it is to another massive object, the more gravitational potential energy it possesses. For example, consider a pen held over a table. The pen has a higher gravitational potential energy than a pen placed on the table because it is at a greater distance from the center of the Earth, which exerts a gravitational force on the pen. In summary, gravitational energy is a type of potential energy that arises due to the gravitational force between two objects.

It is an important concept in physics and plays a crucial role in many natural phenomena, including the formation of planets and stars, the motion of celestial bodies, and the behavior of objects on Earth.

1.1 **The potential energy that an object holds due to its higher position in relation to a lower position is Known as _____**

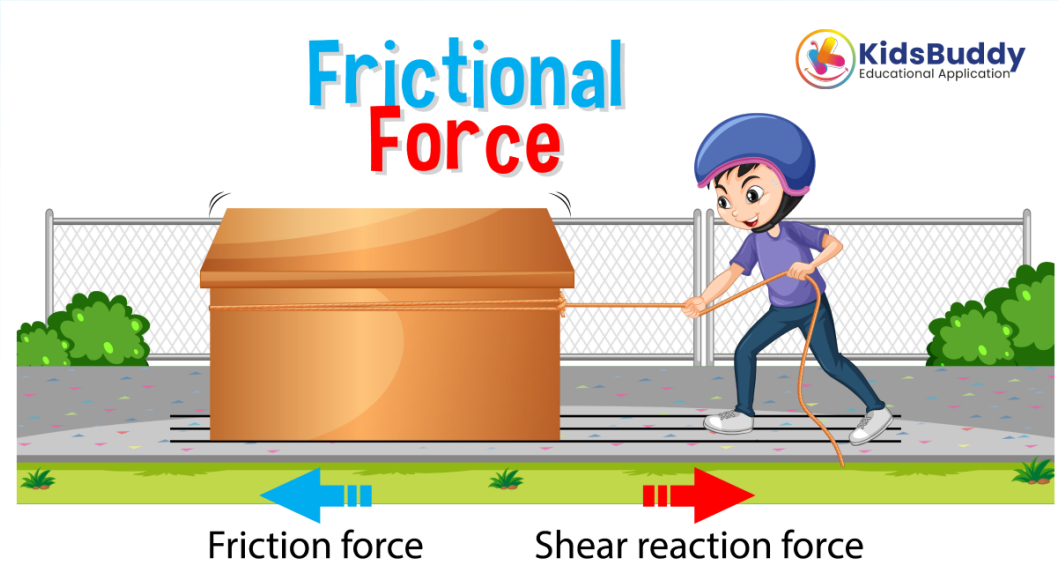
- Thermal energy
- Sound energy
- Gravitational energy
- Chemical energy

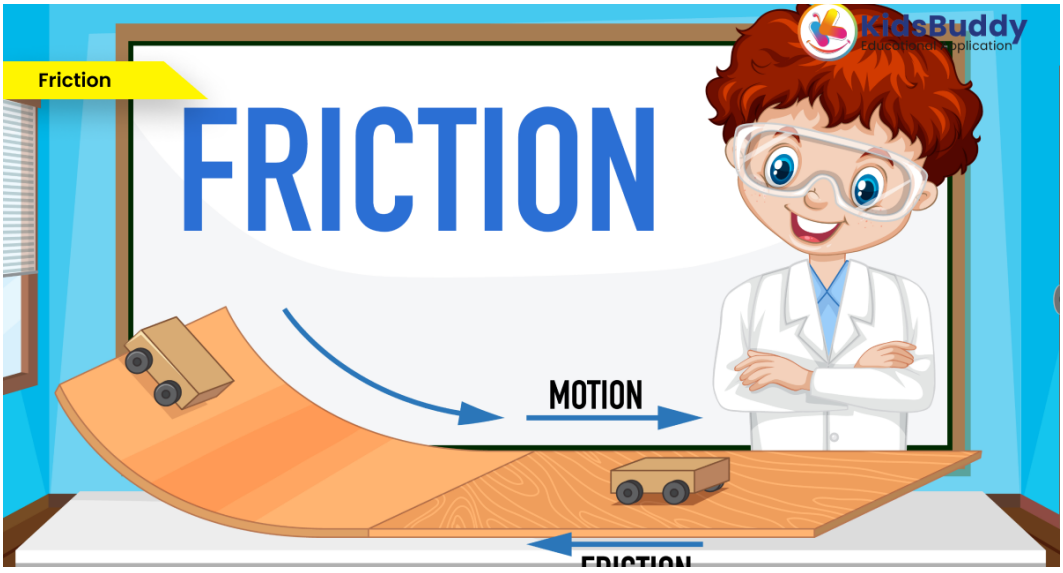
1.2 **State True/False?**

Gravitational force is therefore energy related to gravity or the gravitational force.

- True
- False

2 FRICTIONAL FORCE





In science, we learn about something called "force". Force is like a push or a pull that can make things move or change direction. Sometimes, force can make things go faster or slower.

One important type of force is called "friction". Friction happens when two things rub against each other, like when we walk on the floor. Friction can help us grip things better, but sometimes it can make things harder to move.

When we walk, the friction between our shoes and the floor helps us stay on our feet. But if we try to slide on the floor, the friction makes it harder to move. That's because friction always works against the direction we're trying to go.

Friction can also make things hotter. When two things rub against each other, they create heat. That's why you might feel your hands getting warmer if you rub them together really fast. So remember, force and friction are important ideas in science. They help us understand how things move and why things might be hard to move sometimes.

2.1 If the objects are moving in the opposite direction, frictional force becomes _____

Maximum

Minimum

2.2 The velocity of a body at rest will be_____ meter per second.

One

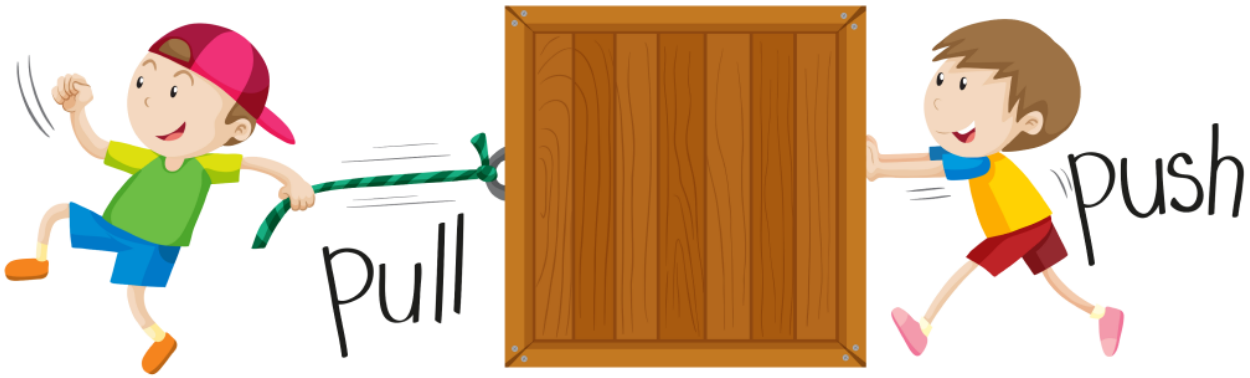
Two

Four

Zero

3 FORCE

Force



Push

Pull

Magnetism

Force is something that can change how an object moves. It can make something that is already moving go faster or slower, or it can even make something that was not moving start moving. When something is not moving, we say it is at "rest," and its speed is zero. There are many different types of forces, each with its unique properties. Some of the common types of forces are electromotive force, nuclear force, electrostatic force, centripetal force, centrifugal force, and frictional force. These forces come from different sources and can act in different directions. Force is like an arrow that has both size and direction. The size of the force is usually measured in units called newtons, named after Sir Isaac Newton, who was one of the first scientists to study force. The direction of the force is indicated by the arrow's direction.

When two forces are pushing or pulling on an object in opposite directions, they can cancel each other out. This means that the object will not move in either direction. When two forces act on an object in the same direction, they can add together to create a bigger force. Understanding force is an important concept in science, and it helps us understand how objects move and interact with each other.

3.1 Force is an influence that can alter the motion of an object. Say Yes or No.

Yes

No

3.2 Force is treated as a _____ quantity.

Vector

Scalar

4 THERMAL ENERGY

Thermal energy, also known as heat energy, is generated when the molecules and atoms in a material vibrate more quickly as a result of temperature increases. This movement of particles produces thermal energy, which is a type of kinetic energy since it is produced by moving particles. There are several sources of thermal energy, including solar energy, geothermal energy, fuel cell energy, and heat energy from oceans. These sources all harness the power of heat to generate energy.

Thermal energy is an essential form of energy since it is the power that a body or system possesses as a result of the movement of its internal particles. Energy is the capacity to perform work, and the ability of something to perform work as a result of the movement of its particles can also be referred to as thermal energy. In summary, thermal energy is a type of kinetic energy that is generated by the movement of particles in a material. It is an essential form of energy that is harnessed from various sources to generate power. Understanding thermal energy is crucial in several fields, including engineering, physics, and energy production.

4.1 _____ is produced by materials whose molecules and atoms vibrate more quickly as a result of a rise in temperature

- Thermal energy
- Sound energy
- Gravitational energy
- Chemical energy

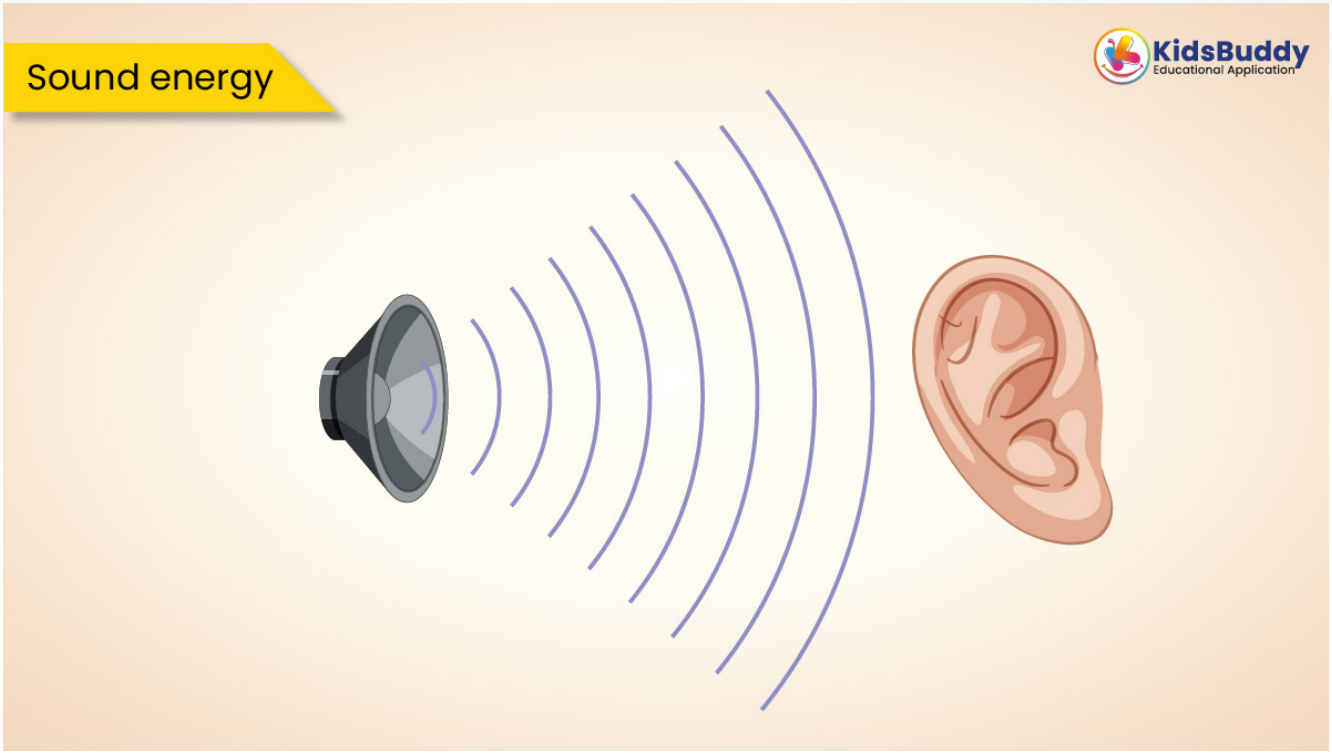
4.2 Which are examples of Thermal energy?

- Solar energy
- Fuel cell energy
- Geo-Thermal energy
- All of the above

4.3 _____ is a metal that is recovered from iron ore.

- Thermal energy
- Sound energy
- Gravitational energy
- Chemical energy

5 SOUND ENERGY



Sound energy is a type of energy that we can hear. It is produced when objects vibrate or move back and forth very quickly. These vibrations create waves that travel through the air, water, or other materials, and they reach our ears, allowing us to hear different sounds. Sound energy travels in waves, similar to the way water waves move in the ocean. These sound waves are made up of compressions and rarefactions. When an object vibrates, it pushes and compresses the air molecules in front of it, creating a compression. As the object moves back, it creates a rarefaction, which is a region where the air molecules are spread out.

Different sounds have different characteristics, such as loudness and pitch. Loudness is how soft or loud a sound is, and it depends on the energy of the vibrations. The more energy, the louder the sound. Pitch is how high or low a sound is, and it depends on the frequency of the vibrations. Higher-frequency vibrations produce higher-pitched sounds, while lower-frequency vibrations produce lower-pitched sounds.

Sound energy can travel through different mediums, like air, water, or solids. It travels fastest through solids because the molecules are closer together and can transmit vibrations more efficiently. That's why you can hear sounds better when you put your ear on a wall or a table.

5.1 **The type of energy that people can hear is called_____**

- Thermal energy
- Sound energy
- Gravitational energy
- Chemical energy

5.2 What are the uses of sound energy?

- Communication
- Entertainment
- In medical field
- All of the above

Answer key

1.1 Gravitational energy

1.2 True

2.1 Maximum

2.2 Zero

3.1 Yes

3.2 Vector

4.1 Thermal energy

4.2 All of the above

4.3 Kinetic Energy

5.1 Sound energy

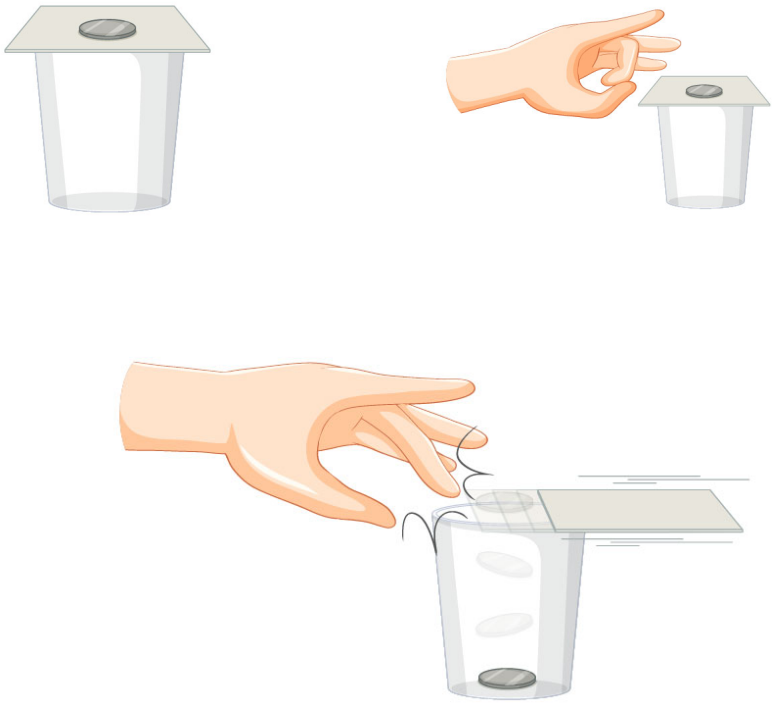
5.2 All of the above

KIDS CHALLENGES

1 Experiment on first law of motion

Aim:

To demonstrate the law of motion using simple materials.



Materials used :

Paper glass, cardboard piece, coin.

Procedure:

Step 1: Take a paper glass and place a cardboard piece on top of it.

Step 2: Place a coin on the cardboard piece.

Step 3: Quickly remove the cardboard piece and observe the coin's motion.

Expected result:

After removing the cardboard piece, the coin will fall straight into the glass due to the inertia of motion.

Task Output

Complete the activity and share the results with us.

Benefits

This simple experiment helps to understand the concept of inertia and the law of motion in a fun and interactive way. It also helps to develop observation skills and a scientific mindset.

Principle:

According to the law of motion, an object at rest will remain at rest and an object in motion will remain in motion with the same speed and direction, unless acted upon by an external force. In this case, the coin remains in its state of motion, which is horizontal, until acted upon by the force of gravity pulling it straight down into the glass.

2 The Bouncing Ball Experiment

Aim:

To demonstrate the conversion of potential energy to kinetic energy using balls of different size.

Materials used :

A big heavy ball (like a football), a small light ball (like a tennis ball), ruler, marker

.

Procedure:

Step 1: Fix a height from which the balls will be released and mark it. Drop both the balls separately from this height and measure the height of their first bounce approximately.

Step 2: Keep the small ball on top of the heavy ball and drop them together from the same height as before.

Step 3: Observe and measure the height of the first bounce of the small ball.

Expected result:

The height of the first bounce of the small ball will be significantly higher when dropped on top of the heavy ball compared to when dropped separately.

Task Output

Complete the activity and share the results with us.

Benefits

This experiment helps to understand the conversion of potential energy to kinetic energy in a simple and interesting

Principle:

An object at a height possesses potential energy due to its position. When it is dropped, this potential energy is converted to kinetic energy. When the heavy ball and small ball are released together, the potential energy of the heavy ball is transferred to the small ball, resulting in a higher bounce.

3 IDENTICAL SPEED

Aim:

To investigate whether all objects fall at the same speed due to gravity.

Materials used :

Paper, Book

Procedure:

Step 1: Hold a paper and a book in each hand. Drop the book and the paper at the same time.

Step 2: Observe how the paper and the book fall and hit the floor. Place the paper on top of the book.

Step 3: Hold the book waist-high and drop it. Observe how the paper and the book fall and hit the floor.

Expected result:

When the paper and the book are dropped separately, the book hits the floor before the paper. This is because air resistance slows down the paper more than the book. However, when the paper is placed on top of the book and the two are dropped together, they fall and hit the floor at the same time. This is because gravity pulls both objects with the same force and the combined weight of the two objects overcomes air resistance.

Task Output

The experiment demonstrates the importance of considering both gravity and air resistance when studying the motion of objects in free fall.

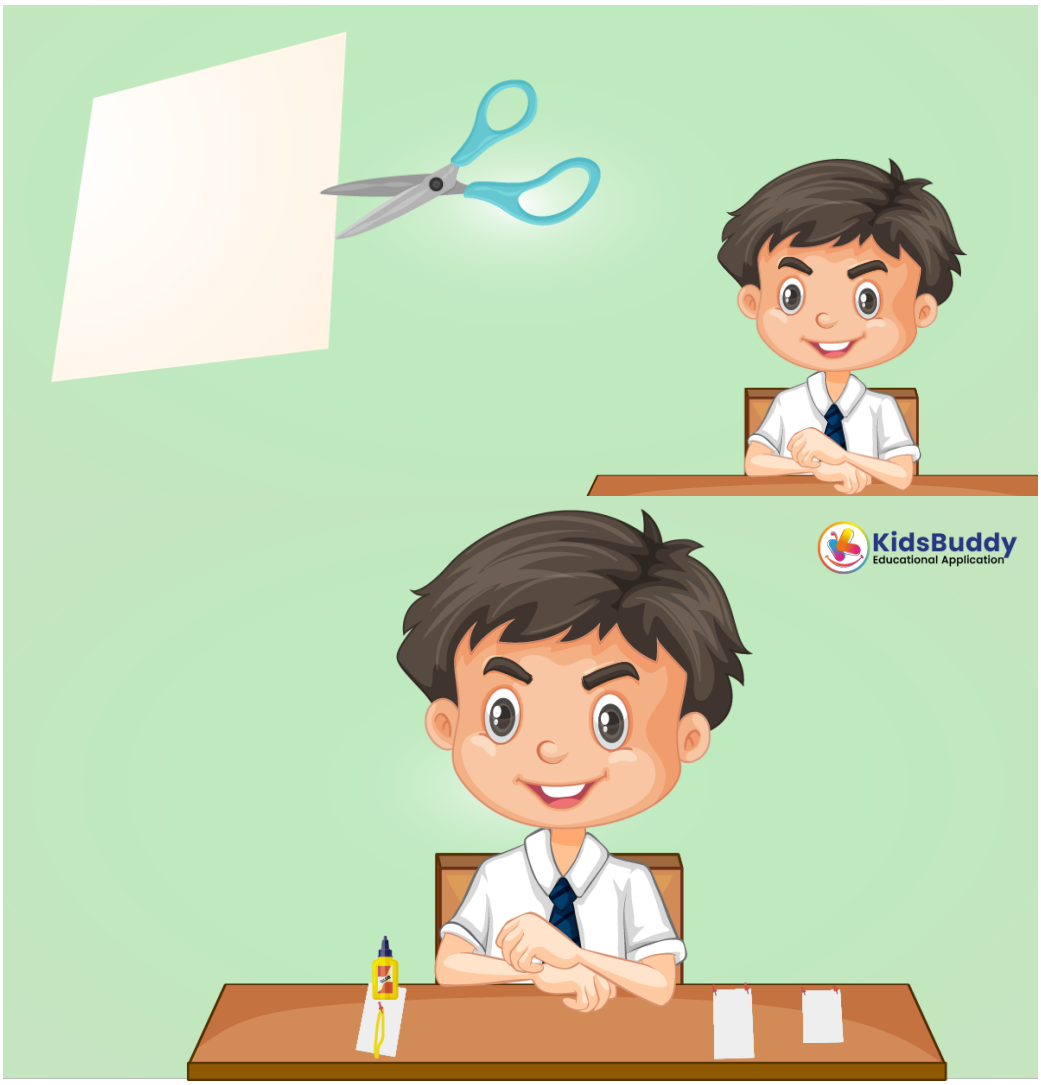
Benefits

Develop observation skill

4 MOTION OF OBJECT

Aim:

In this experiment, we aim to investigate if the texture of a surface affects the motion of an object. We will be using a simple setup to measure the friction force between a card and different surfaces.



Materials used :

Poster board Ruler Paper clip Rubber band Scissors Bottle of glue String Pen Wax paper Sandpaper

Procedure:

Step 1: Cut a 12cm * 25cm card from the poster board. Fold the card and cut a slit about 1cm long and 5cm from the end of the card.

Step 2: Place the paper clip in the slit and slip the rubber band on the paper clip. Cut a 25cm piece of string and loop it through the rubber band.

Step 3: Place the card on a table. Position the bottle of glue at the end of the card. Gently pull on the string to straighten the rubber band.

Step 4: Mark the card at the end of the rubber band and label this mark as START.

Step 5: Pull on the string until the card begins to move. Note how much the rubber band stretches.

Step 6: Tape a sheet of wax paper and a sheet of sandpaper to the table.

Step 7: Move the card with the glue bottle across the wax paper and sandpaper by pulling on the string. Repeat step 6 for each surface.

Expected result:

The weight of the glue bottle pushes the card down against the surface it sits on. The card is more easily pulled across the wax paper than across the sandpaper because of friction. Friction is a force that opposes the motion of an object. The frictional force increases with the roughness of the surfaces moving against each other. The surface of the wax paper is smoother than that of the sandpaper or table and thus applies less frictional force to the card. Therefore, the rubber band stretches the least when the card is placed on the wax paper and stretches the most on the sandpaper.

Benefits

Enthusiastic to science experiments

Task Output

This experiment shows that the surface of an object can significantly affect its movement, which is an essential consideration in designing structures and machines that require efficient motion.

QUIZ

Chapter- 3
Forces and Energy

1 Unit of heat energy ?

- Kilogram
- Meter
- Joule
- Degree

2 What kind of instrument is used to measure wind speed?

- Barometer
- Anemometer
- Thermometer
- Lactometer

3 Gravity on the moon is _____the gravity on Earth.

- Less than
- More than
- The same as
- Twice greater

4 Conventional energy: Coal :: Non conventional energy: _____

- Natural gas
- Coal
- Solar energy
- None of these

5 Which lever has a fulcrum in between effort and resistance?

- Second lever
- First lever
- Third lever
- Fourth lever

6 Which instrument is used to measure heat of chemical reaction?

- Barometer
- Anemometer
- Geiger counter
- Calorimeter

7 Pascal is the unit of:

- Force
- Pressure

8 Which scientist invented dynamite?

- Nicolaus Copernicus
- Charles Darwin
- Alfred Nobel

9 In an electric kettle water becomes hot by:

- Conduction
- Convection
- Moving particles
- Radiation

10 In hydel power station, the motion produced in turbines is due to:

- Burning of coal
- Flow of water
- Burning of diesel

11 Which of these is an example of an irreversible change?

- Due to gravitational force
- Because it likes the ground
- Tree is pushing the apple
- Throwing stone

12 Very small time intervals are accurately measure by:

- Atomic clocks
- Quartz clocks
- Pulsars
- White dwarfs

13 One horse power is equal to:

- 745 watts
- 800 watts
- 746 watts
- 850 watts

14 When a hanging carpet is beaten with a stick, the dust particles in it start coming out of it. This phenomenon can be explained by making use of:

- Newton's first law of motion
- Newton's second law of motion
- Newton's third law of motion
- Newton's law of gravitation

15 _____ is the famous scientist who discovered gravity.

- Isaac Newton
- Albert Einstein
- Michael Faraday
- Alexander Fleming

16 _____ was born on 15th September. This day is celebrated as Engineers Day in India.

- Isaac Newton
- Sir M. Visvesvaraya
- Michael Faraday
- Alexander fleming

17 Which force brings the pieces of paper near the charged balloon?

- Magnetic force
- Electrostatic force
- Mechanical force
- Gravitational force

18 Who invented the battery?

- Isaac Newton
- Alessandro Volta
- Michael Faraday
- Alexander fleming

19 Which of the following is used in fire alarm?

- Photo cell
- Water
- Solar cell
- Magnetic cell

20 Escape velocity of a rocket fired from the earth towards the moon is a velocity to get rid of the:

- Earth's gravitational pull
- Mar's gravitational pull
- Pressure of the atmosphere
- Moon's gravitational pull

Answer key

1. Joule
2. Anemometer
3. Less than
4. Solar Energy
5. First lever
6. Calorimeter
7. Pressure
8. Alfred Nobel
9. Convection
10. Flow of water
11. Due to gravitational force
12. Atomic clocks
13. 746 watts
14. Newton's first law of motion
15. Issac Newton
16. Sir M. Visvesvaraya
17. Electrostatic force
18. Alessandro Volta
19. Photo cell

KidsBuddy
Educational Application

KidsBuddy is an educational application platform designed for schools, teachers, and students to improve student learning outcomes in a measurable and visible way.

DOWNLOAD THE APP

GET IT ON
PLAY STORE

DOWNLOAD ON THE
APP STORE

kidsbuddyapp.com admin@kidsbuddyapp.com +971556688495