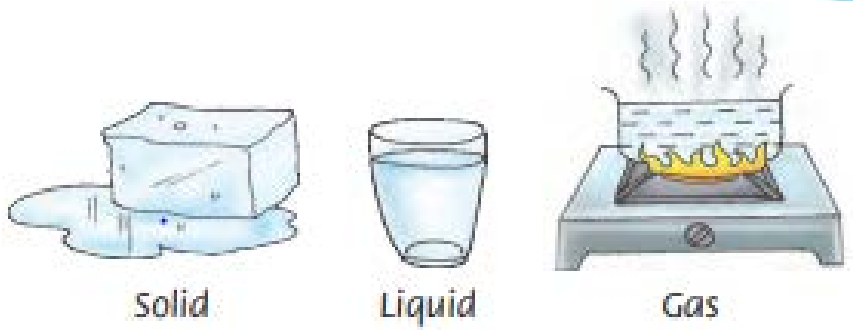
Chapter – 4 States of Matter

Class – 5

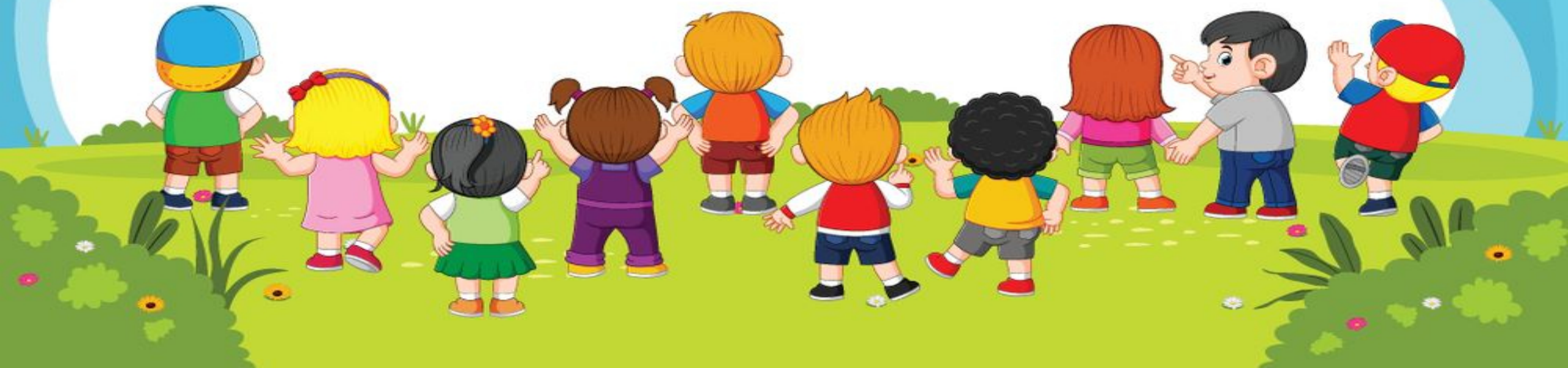
E.V.S

Things occupy space and have weight. Anything which occupies space and has some weight is called Matter .

Matter is made of molecules.



Molecule is a tiny particle. It is the smallest unit of matter having the same properties of that matter. Each molecule of a substance has all the properties of that substance. For example, a sugar molecule is the smallest particle of sugar.



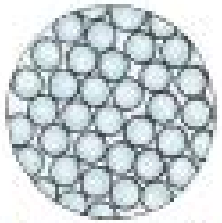
Molecule can be divided into atoms. Atom is the smallest indivisible particle. They are also known as the building blocks of the matter.


There are 117 types of known atoms. Atoms of same kind, together form an element. When two or more elements combine, they form a compound.

There are three different states of matter. They are solid , liquid and gas .

SOLIDS

Molecules in solid are closely packed to each other. They have strong force of attraction between them. For this reason solids are hard and rigid and cannot be compressed easily.



Molecules of solid

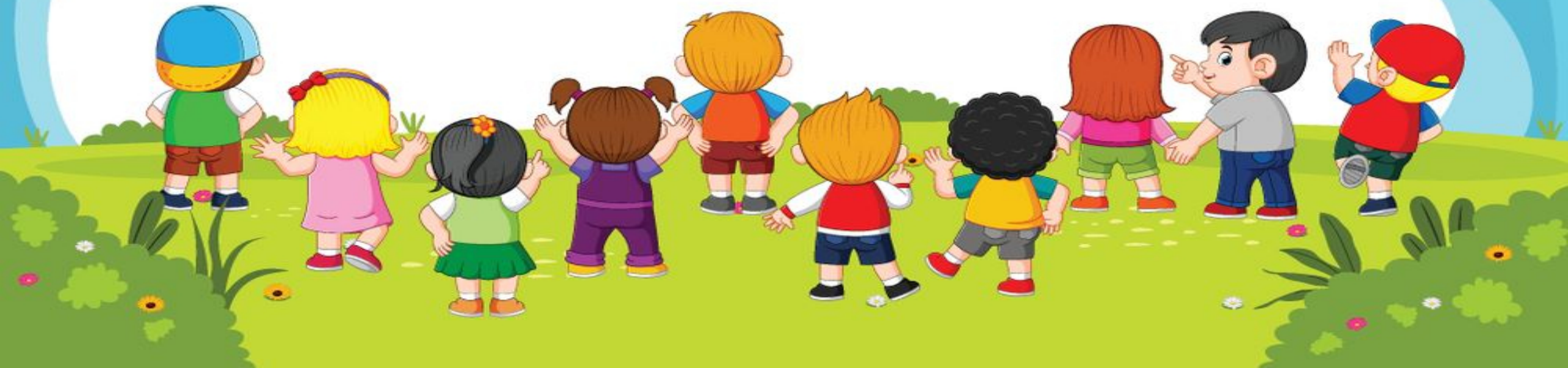
Solids have definite shape and volume. The significant examples of solid are chalk, wood, iron, sugar, salt etc.

LIQUIDS

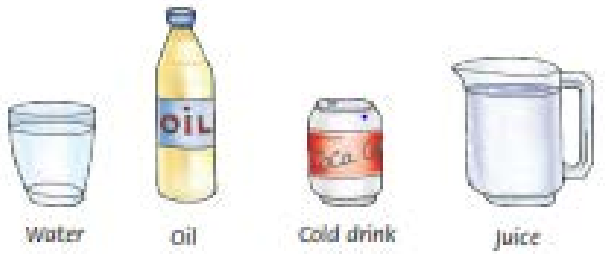
In liquid, molecules are loosely packed and have less force of attraction between them as compared to solids. Therefore, liquids can flow easily. Liquids can be compressed but are nearly incompressible.

Molecules of liquid

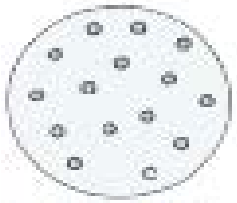
Liquids do not have any fixed shape and take the shape of its container, but they have a fix volume.



Some examples of liquids are water, oils, cold drinks, juices etc.



GASES



Molecules of gases have more space between them. They can move freely at a faster speed. Gases are compressible in nature

Gases do not have fixed shape and volume.

Oxygen, carbon dioxide, water vapour etc. are the significant examples of gases.

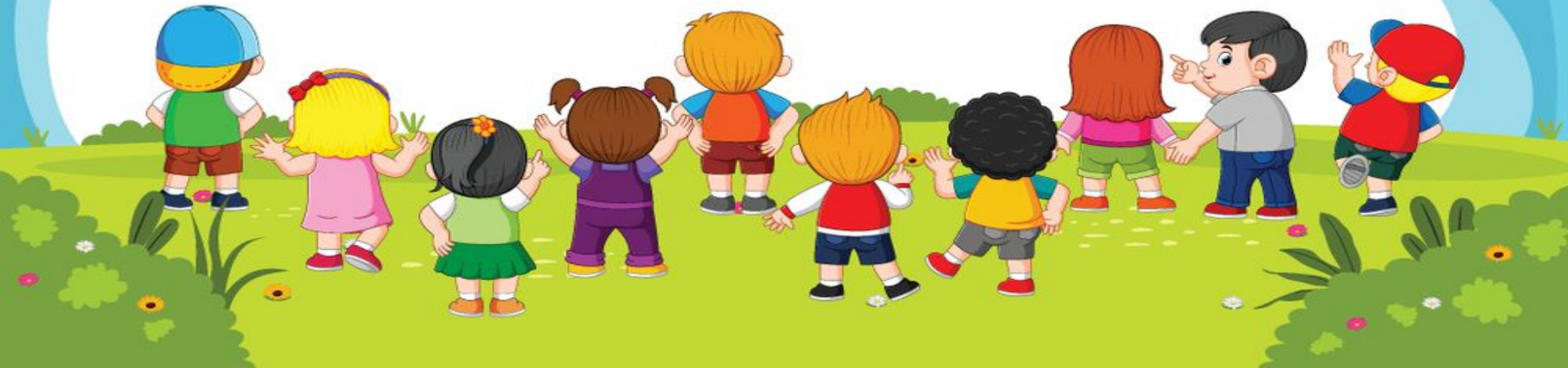
SOLUBILITY

Solubility is the property of a solid, liquid or gaseous chemical substance, to dissolve in the solvent, to form a solution of the solute. The solvent is generally a liquid, which can be a pure substance or a mixture. One may also speak of solid solution, but rarely of solution in a gas.

Sugar in water

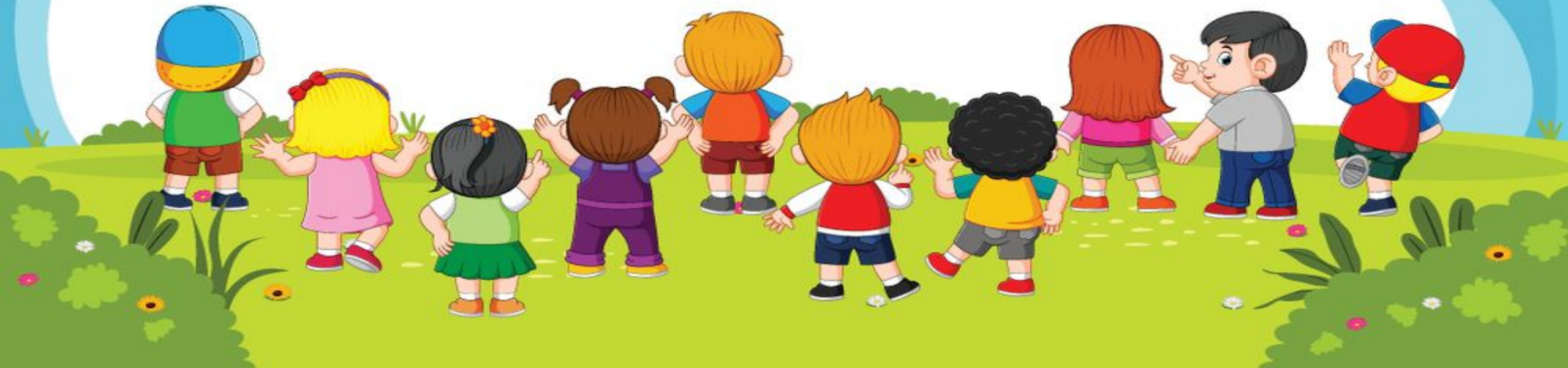
The extent of solubility ranges widely from infinitely soluble, i.e. miscible such as ethanol in water, to poorly soluble, such as silver chloride in water.

The term insoluble is often applied to poorly or very poorly soluble compounds.

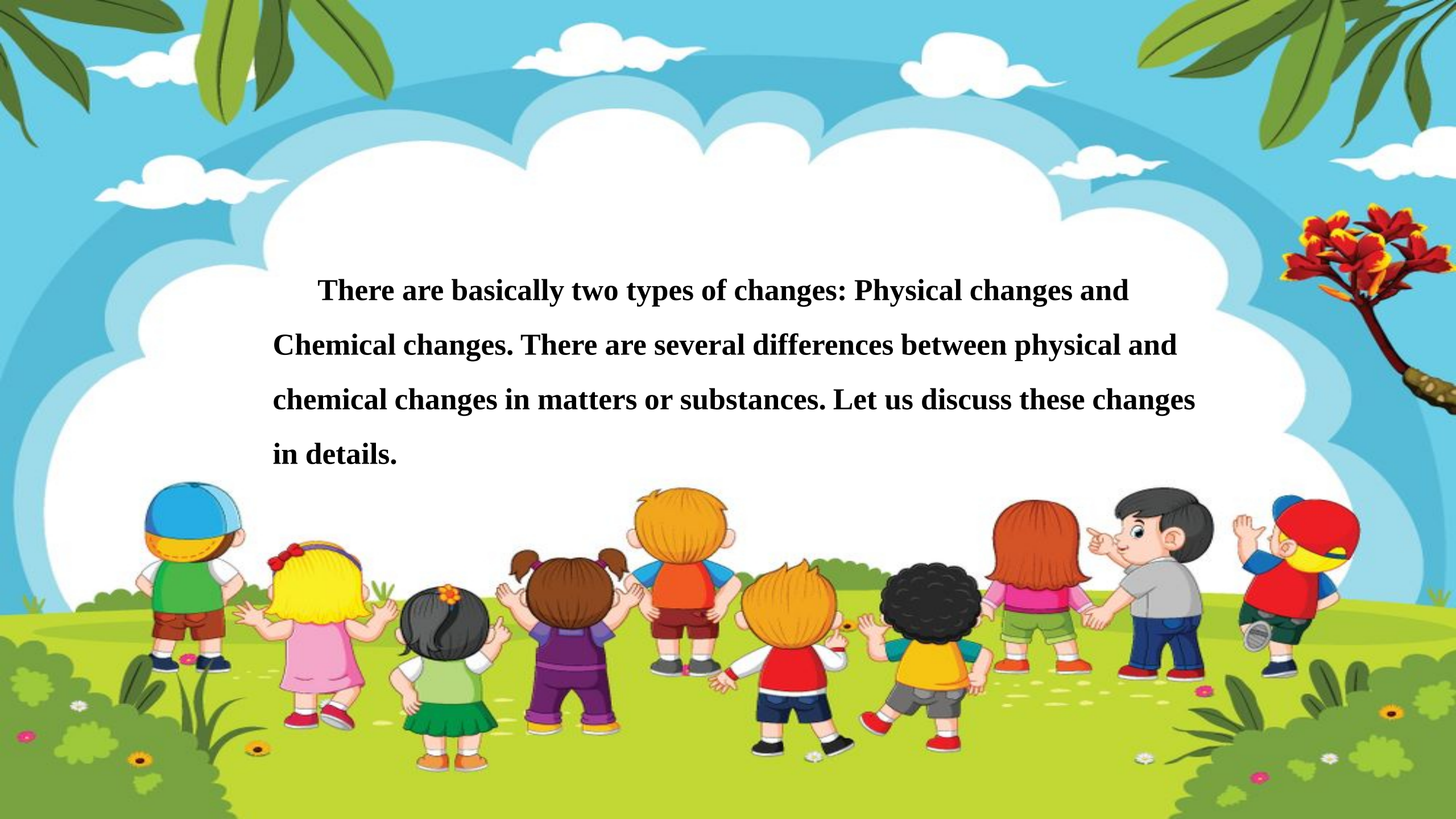


CHANGES IN MATTER

Matters can be changed from one form to another. They can be changed to produce a totally different kind of substance. When we burn coal, it changes into ash. Water changes into ice when freezed.



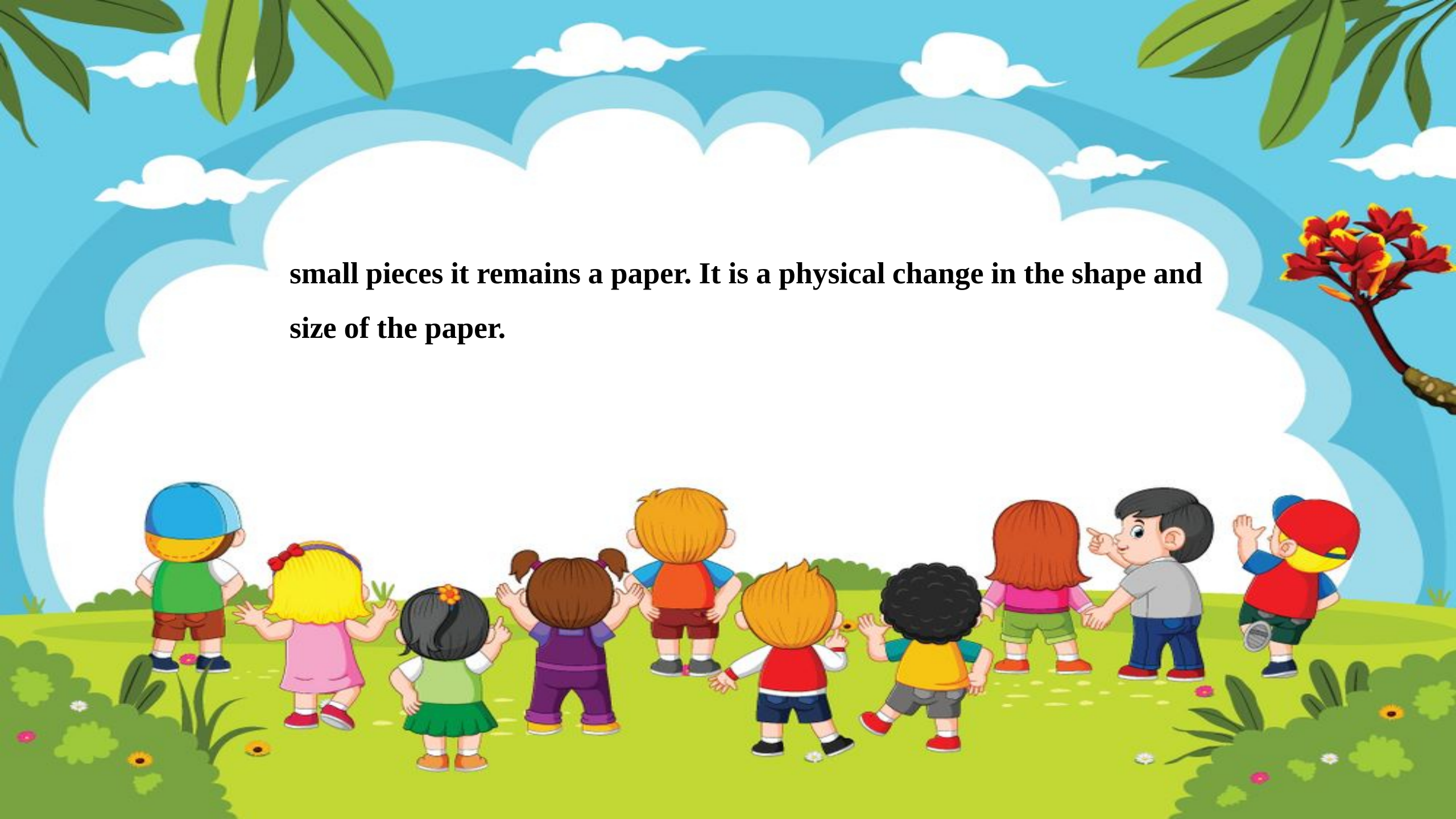

Coal
Ash
Water
Ice


There are basically two types of changes: Physical changes and Chemical changes. There are several differences between physical and chemical changes in matters or substances. Let us discuss these changes in details.

Physical Changes

A physical change in a substance doesn't change the substance. Physical changes can be reversed. For example, if a piece of paper is cut into

small pieces it remains a paper. It is a physical change in the shape and size of the paper.



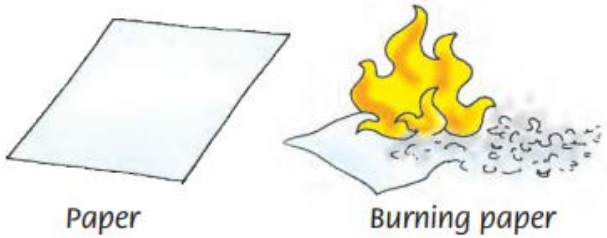
Also a cup of water can be frozen when cooled and when heated it can be returned to a liquid form. This example shows the reversibility.

Some other examples are: Melting of butter, ripped paper, boiling water, pumping oil, melting iron, smashing your car, shattering a light bulb and cutting iron.

Chemical Changes

In a chemical change where there is a chemical reaction, a new substance is formed and energy is either given off or absorbed.

If the same piece of paper is burned, it will change into different substance that is not paper.

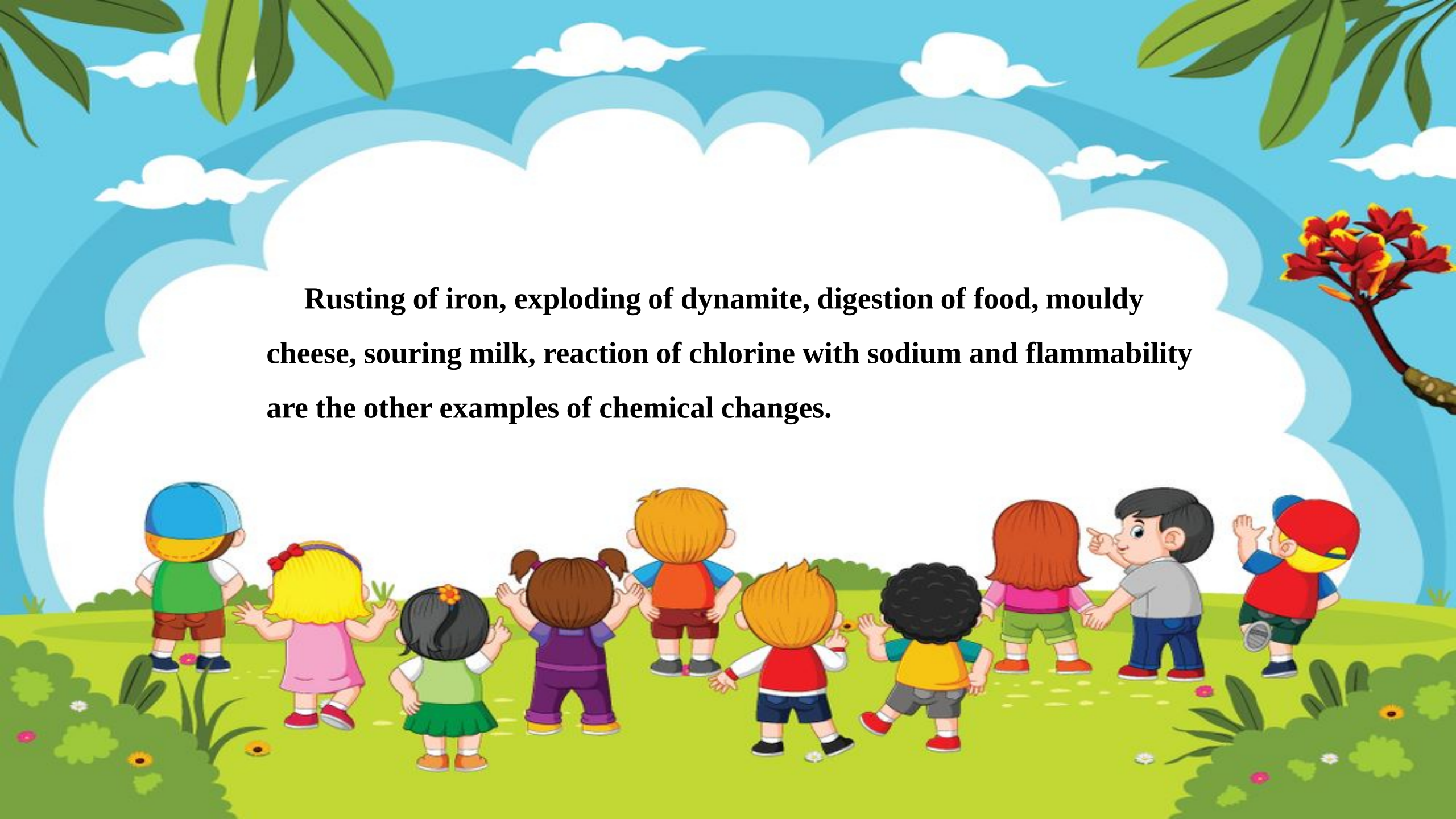


Paper

Burning paper

Chemical changes cannot be reversed. If a recipe for cake is made with flour, water, sugar and other ingredients and baked, we cannot separate the various ingredients to their original form.


Flour
Water
Sugar
Bread



Rusting of iron, exploding of dynamite, digestion of food, mouldy cheese, souring milk, reaction of chlorine with sodium and flammability are the other examples of chemical changes.

Fact File

- **Anything that occupies space and has some weight is known as matter.**
- **Solubility is the property of a solid, liquid or gaseous chemical substance to dissolve.**
- **There are 117 types of known atoms.**

Things to Remember

- **Matter is made of molecules.**
- **There are basically two types of changes: physical and chemical.**
- **Physical changes can be reversed.**
- **Chemical changes cannot be reversed.**


Thank you