## Vision Empower & XRCVC

Teacher Instruction KIT

# **Elements, Compounds and Mixtures**

Syllabus: Karnataka State Board Subject: Environmental Studies Grade: 5 Textbook Name: Environmental Studies- Text cum work book-English medium- Fifth standard Chapter Number & Name: 12. Elements, compounds and mixtures

## **1. OVERVIEW**

**1.1. OBJECTIVE & PREREQUISITES** 

#### Objective

- To understand the classification of matter into elements, compounds and mixtures.
- To know the differences between elements, compounds and mixtures.

#### **Prerequisite Concept**

• Matter, EVS- Grade 5, chapter 11: Nature of Matter

#### **Content Index**

Kindly Note: Activities marked with \* are mandatory

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4.1 EXERCISES & REINFORCEMENT

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# 2. LEARN

## 2.1 KEY POINTS

- Elements: All matter is made of elements that are fundamental substances that cannot be broken down by chemical means. An element is a substance that cannot be further reduced to simpler substances by ordinary processes. In essence, an element is a substance consisting of one type of atom. Common examples include carbon, sulfur, oxygen, iron, copper, aluminium. Elements are represented by symbols.
- Compounds: A compound is a pure substance composed of two or more different atoms chemically bonded to one another. That means that it cannot be separated into its constituents by mechanical or physical means and can only be destroyed by chemical means. Common examples are water (H2O), salt (sodium chloride, NaCl), methane (CH4)
- Mixtures: A mixture is a material containing two or more elements or compounds that are in close contact and are mixed in any proportion. For example, air, sea water, crude oil, etc. The constituents of a mixture can be separated by physical means like filtration, evaporation, sublimation and magnetic separation. The constituents of a mixture retain their original set of properties.

2.2 LEARN MORE None

# **3 ENGAGE**

**3.1 INTEREST GENERATION ACTIVITY** 

## **Atoms and Molecules**

## **Activity 1: Atoms and molecules**

Materials Required: None Prerequisites: matter

## Activity Flow

- Revise with the students, what is matter?
- After they share, tell students that everything they can see and touch is called matter. Explain that all matter on Earth exists in the form of a solid, liquid, or gas. These forms are all made of extremely tiny particles called atoms and molecules.
- Tell students that an atom is the smallest building block of matter and a molecule is two or more atoms connected together. Atoms and molecules are so small that we can't see them with our naked eyes.
- Tell the students that in this lesson we will learn about classification of matter as per the composition. (Elements, compounds and mixtures)

# **3.2 CONCEPT INTRODUCTION ACTIVITIES**

## **Elements**

## **Activity 2: Elements**

*Materials Required:* Tactile diagram of elements Examples of elements:

- aluminum (one small sheet of foil)
- copper (a small piece of wire or tubing)
- iron (filings or a magnet)
- carbon (in the form of a pure carbon pencil or graphite)

# Prerequisites: None

Activity Flow

- Ask the students if they know what an element is and if they know the names of any of the common elements.
- Explain to them what elements are. Then show them the real items as examples which are made up of elements. Make sure that these concepts do not remain abstract for the students.
- After that give them the tactile diagram of an element having one type of atom only.

# Compounds

## Activity 3: Compounds

Materials Required: Tactile diagram of compounds

Examples of compounds:

- water, or  $H_20$  (~100 mL)
- table salt, or NaCl (~10g)
- baking soda, or NaHCO<sub>3</sub> (~10g)
- eggshell or a seashell, or CaCO<sub>3</sub>

Prerequisites: None

Activity Flow

- Explain the students what compounds are. Then show them the real items as examples of compounds.
- After that give them the tactile diagram of compounds, in which two or more atoms combined in a fixed proportion.

# Mixtures

# **Activity 4: Mixtures**

Materials Required: Tactile diagram of mixtures

Examples of mixture:

- inflated Ziploc bag (as an example of air)
- bottle of Coke or other soda
- salt water
- o **soil**

Prerequisites: None

# Activity Flow

- Explain the students what mixtures are. Then show them the real items as examples of mixtures.
- After that give them the tactile diagram of mixtures, in which two or more atoms mixed in any proportion.

# Difference between compounds and mixtures

# Activity 5: Difference between compounds and mixtures

Materials Required: None Prerequisites: Compounds and mixtures

# Activity Flow

• Explain to the students the differences between compounds and mixture: (from Karnataka State Textbook)

**Compounds:** When two or more elements combine chemically compounds are formed.

• The constituents of compounds are combined in definite ratio or proportion.

- The constituent substances of a compound do not retain their original properties after combination.
- The constituents of compounds cannot be separated by simple methods (without chemical reactions)

Mixtures: When two or more substances mix physically, mixtures are formed.

- The constituents of a mixture may be mixed in any proportion.
- The constituent substances of a mixture retain their individual properties.
- The constituents of mixtures can be separated by simple methods.

# 3.3 LET'S DISCUSS: RELATE TO DAILY LIFE\*

Examples of elements:

- aluminum (one small sheet of foil)
- copper (a small piece of wire or tubing)
- iron (filings or a magnet)
- carbon (in the form of a pure carbon pencil or graphite)

Examples of compounds:

- $\circ$  water, or H<sub>2</sub>0 (~100 mL)
- table salt, or NaCl (~10g)
- baking soda, or NaHCO<sub>3</sub> (~10g)
- eggshell or a seashell, or CaCO<sub>3</sub>

Examples of mixture:

- inflated Ziploc bag (as an example of air)
- bottle of Coke or other soda
- o salt water
- o soil

# 4 EXERCISES & REINFORCEMENT

# 4.1 EXERCISES & REINFORCEMENT

# Identifying elements, compounds and mixtures

# Activity 6: Identifying elements, compounds and mixtures

*Materials Required:* cards with examples of elements, compounds and mixtures *Prerequisites:* elements, compounds, mixtures.

## Activity Flow

• Form 2 /3 groups and distribute cards to each group. Each card should have an example of either elements or compounds or mixtures. Teachers can pick the examples from the list which is given in the above activities also.

- Ask each group to sort the cards into 3 piles (elements, compounds and mixtures).
- Once all the groups are done, they can check others piles as well whether according to them the piles formed are correct or not.
- Ask the students to share how they formed these 3 piles.

## 4.2 IMPORTANT GUIDELINES\*

#### **Exercise Reading**

It is very important that the children practice their learnings as well as their reading. Hence have the children read out the newly learned concepts from their textbooks or other available resources.

#### **Perform Textbook Activity**

It is good practice to have the children perform the textbook activities. Your textbook activities might not be accessible hence go through this resource to learn how to make textbook content accessible

#### **Provide Homework**

To evaluate their understanding and to help the student revise and implement the new learnt concept ensure to provide them with homework. Students should perform one or two of the questions mentioned above or from the textbook exercises with the teacher in Class and the remaining may be given for homework. Also, ensure that the student knows their special skills linked to independently using their accessible books as it will be critical to doing homework independently

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