St. Andrews Scots School

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Session: 2026-2027
Subject: Science
Class :VIII

Chapter: 8 - Nature of Matter: Elements, Compounds and Mixtures

(Answer Key)

Big Question: Page No. 107

Some things mix easily because their particles can move freely and have enough space between them. When two substances have similar kinds of particles and the forces between them are weak, their particles move into each other's spaces easily — like salt or sugar mixing in water. However, some things do not mix because their particles are very different or the forces of attraction between them are too strong or too weak to combine — for example, oil and water do not mix as their particles do not attract each other. Thus, whether substances mix or not depends on the movement, spacing and attraction between their particles.

Self-Assessment: Page No. 112

A. Multiple Choice Questions:

Tick (√) the correct options:

1. (b) 2. (b) 3. (a)

B. Assertion-Reason Based Questions:

1. (d) Explanation: The Assertion is false because air is a mixture of gases. Reason is true as air contains oxygen, nitrogen, carbon dioxide, water vapour and argon.

2. (a)

Critical Thinking: Page No. 113

This is a chemical change because new substances — hydrogen and oxygen — are formed. The change cannot be reversed by simple physical means and the composition of water is permanently altered.

Self-Assessment:

A. Multiple Choice Questions: Tick (√) the correct options:

1. (b) 2. (b)

B. Assertion-Reason Based Questions:

1. (a) 2. (a)

EXERCISE

SECTION-A

A. Oral Questions:

1. Hydrogen and oxygen

2. Mixtures: milk, fruit juice, soil

Pure substances: sugar, hydrogen, oxygen, baking soda

B. Multiple Choice Questions:

Tick (√) the correct options:

1. (b) 2. (b) 3. (a)

C. Assertion-Reason Based Questions:

1. (a)

2. (c) Explanation: The Assertion is true because salt is a compound, but the Reason is false since the elements of a compound can only be separated by chemical methods, not physical ones.

D. Case-Based Questions:

1. A chemical change occurred because a new substance (iron sulphide) was formed that had properties different from the original elements.

2. This activity shows that in a mixture, the components retain their properties, but in a compound, elements combine chemically and form a new substance with different properties.

SECTION-B

A. Very Short Answer Questions:

1. A mixture is a combination of two or more substances that are mixed physically and can be separated easily.

2. Gaseous element: Oxygen Solid element: Iron

3. Alloys are homogeneous mixtures of two or more metals or of a metal and a non-metal.

4. The major component of air is nitrogen, which controls combustion and supports plant growth. Oxygen supports respiration and burning.

B. Short Answer Questions:

1. Uniform (homogeneous) mixtures have the same composition throughout, e.g. salt water. Non-uniform (heterogeneous) mixtures have uneven composition, e.g. sand and water.

2. Air contains oxygen because a glowing splint burns more brightly when placed in a jar of air, showing the presence of oxygen.

3. Pure substances consist of only one kind of particle. Example: Water is a pure substance as it always contains hydrogen and oxygen in a fixed ratio.

C. Long Answer Questions:

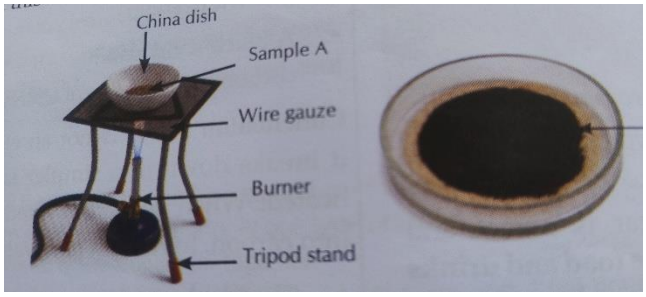
1. Activity to differentiate between a mixture and a compound:

• Mix iron filings and sulphur. The mixture shows both yellow and grey particles and iron can be separated using a magnet.



Iron filing Sulphur

• When heated, a black compound (iron sulphide) forms that is not attracted by a magnet and has different properties.



Heating of sulphur and iron



Magnetic test

Conclusion: Mixtures can be separated physically, while compounds are formed by chemical change and have new properties.

2. Elements are pure substances made up of only one kind of atom, e.g. iron, oxygen. Compounds are formed when two or more elements combine chemically in fixed proportions, e.g. water (H_2O), carbon dioxide (CO_2).

Difference: Elements cannot be broken down, while compounds can be separated by chemical means.

D. Application-Based Questions:

1. The most suitable element is aluminium because it is lightweight, strong and resistant to corrosion, making it ideal for aeroplane parts.

2. The company should use alloys because they are stronger, harder and more durable than pure metals. For example, steel (an alloy of iron and carbon) is tougher than pure iron.