



## LESSON 15 Composition of Air:

Grade Level: 7-9

### Let us Find Out

#### 1. Grades 7-9

**2. Overview** Earlier in our work, we had identified air as a very important substance. It is free for all to use. Here we are concerned about the composition of air. Air has been found to be a mixture of substances. These substances which make up air can be individually identified. They are, oxygen, nitrogen, carbon dioxide, noble gases, water vapour and dust particles. These substances have special characteristics.

**3. Purpose** Although air is invisible, it is possible to show its presence. The purpose of the lesson therefore is to show how each component of air can be identified.

**4. Objectives** Students will be able to:

- i. Demonstrate that air is present in their environment
- ii. Show that air is made up of more than one substance
- iii. Identify the presence of the various parts of air.
- iv. List the various uses of the parts of air.

#### 5. Resources/materials

- Glass jars, candles
- Chemicals for testing-lime water, anhydrous copper sulphate.

**6. Activities and Procedures** Air is a mixture of gases. Some of these gases are elements, e.g. Oxygen, nitrogen and others are compounds, e.g. Carbon dioxide. The main gases in the air are nitrogen, 78%. Oxygen, 21%, others, 1%. Among the others are carbon dioxide, about 0.03%, noble gases, about 0.9% and varying amounts of water vapour depending on the weather.

The gases making up air can be separated by physical means. When a lighted candle is allowed to burn in a specified amount of air, part of the air is used up during the burning. The part of air which is used up during burning is oxygen. The other part which does not support burning is largely nitrogen. The test therefore for oxygen is to burn a substance in it. A glowing splint for instance is rekindled when plunged into a jar of oxygen. Carbon dioxide when bubbled into clear lime water makes it turn milky. The presence of water vapour in the air is shown by allowing white anhydrous

copper sulphate to be exposed to damp air. After some time, the white substance becomes blue due to the water vapour in the air. It is therefore possible to demonstrate the presence of the named constituent of air. It is suggested that the series of experiments on air is preferably done by teacher demonstration.

The uses of the various parts of air can be summarised:

- Oxygen supports burning
- Nitrogen useful in the manufacture of fertilisers.
- Carbon dioxide is used by plants to manufacture their food
- Noble gases used in advertising lamps

**7. Tying it all together** Air is a mixture of gases and it is essential for life. The constituent gases of air are important to us. Simple chemical tests could be done to show the presence of the gases which make up air.

**8. Assessment** Teacher made tests to test the knowledge of the students about the composition of air.

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**10. References** Ministry of Education and Culture (2000). **Step Ahead New Secondary Science Student's Book 1 Zimsci** Harare: Longman Zimbabwe (Pvt) Ltd.

Bajah, Sam. Tunde et al (1996) **Integrated Science: A New Approach for Junior Secondary Schools. Book One** [New Edition] Ibadan: University Press, Plc.