CLASSIFYING MATTER

Syllabus reference 8.2.1

1 **Read the following and construct a flowchart to summarise the information presented on classifying the different types of matter.**

Most of the matter around us consists of mixtures of pure substances. Wood, petrol, wine, soil and air are all mixtures. The main characteristic of a mixture is that it has variable composition. For example, wood is a mixture of many substances, the proportions of which vary depending on the type of wood and where it grows. Mixtures can be classified as homogeneous (the same throughout) or heterogeneous (containing regions with different properties).

Mixtures may be solid, liquid or gas. Air is a mixture of gases. Wine is a complex liquid mixture. Brass is a solid mixture of copper and zinc. Sand in water, dust suspended in air and iced tea with ice cubes are all examples of mixtures.

Mixtures can be separated into pure substances by physical methods. A pure substance is one with constant composition. Water is a good example of these ideas. Pure water is composed solely of H_2O molecules, but the water found in nature (ground water or the water in the ocean) is really a mixture. Sea water, for example, contains large amounts of dissolved minerals.

Pure substances are composed of compounds or elements. A compound is a substance with constant composition that can be broken down into elements by chemical processes. An example is the refining of alumina in which the aluminium is separated from other elements to produce pure aluminium.

Now construct the flowchart in the space provided. Start with the section labelled 'Matter'.

2 For each of the types of matter identify one or more example from the text above.

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3 Classify each of the following statements as true or false. For those that are false, rewrite them so they are true.

    a   A mixture is an impure substance that can be separated into two or more pure substances.

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    b   An element is a pure substance that has a variable composition.

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    c   Pure water is an example of a heterogeneous mixture.

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    d   A compound is made up of two or more different elements combined together in a fixed ratio.

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    e   The properties of a mixture depend on the substances making it up.

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    f   The properties of a compound are the same as the elements of which it is composed.

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    g   A homogeneous mixture has a uniform composition throughout the mixture.

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    h   Bauxite is a compound which contains the element aluminium.

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4 Classify each of the following as either a heterogeneous mixture, a homogenous mixture, an element or a compound.

    a Air

    b sea water

    c table salt

    d oxygen

    e a gold ring

    f copper wire

    g milk

    h sugar

    i nitrogen