Lesson Outline for Teaching

Lesson 1: Classifying Matter

A. Understanding Matter

1. Matter is anything that has mass and takes up space.
2. A(n) atom is a small particle that is a building block of matter.

B. Atoms

1. A(n) nucleus is at the center of the atom.
   - **a.** The nucleus is made up of protons, which have a(n) positive charge, and neutrons, which have no charge.
   - **b.** Electrons have a(n) negative charge and move quickly around the nucleus.
2. Not all atoms have the same numbers of protons, neutrons, and electrons.

C. Substances

1. A(n) substance is matter with a composition that is always the same.
2. One type of substance is a(n) element, which contains only one type of atom.
   - **a.** Each type of atom contains a different number of protons in its nucleus.
   - **b.** The number of protons in an atom is called the atomic number of the atom.
   - **c.** Most elements consist of individual atoms, but the atoms of some elements exist in groups.
3. A(n) compound is a type of substance containing atoms of two or more different elements chemically bonded together.
   - **a.** A chemical formula is the combination of symbols and numbers that represents a compound.
   - **b.** The symbols in a chemical formula show the different elements in the compound.
   - **c.** The number of each type of atom in a chemical formula is given by a(n) subscript.
   - **d.** If no subscript is written, only one atom of the element is in the chemical formula.
4. The properties of a(n) compound are different from the properties of the elements it contains.

D. Mixtures

1. A(n) mixture is matter that can vary in composition.
   - **a.** The components of a mixture are physically blended together, so they can be separated by physical means.
   - **b.** The amounts of different components of a mixture can vary from one sample to another.
2. In a(n) heterogeneous mixture, the individual substances are not evenly mixed.

Lesson Outline continued

3. In a(n) homogeneous mixture, the individual substances are evenly mixed.
   a. Another name for a homogeneous mixture is a(n) solution.
   b. In a solution, one or more solutes are dissolved in the solvent, which is the substance that is present in the largest amount.
   c. When something dissolves, it forms a solution by mixing evenly.

E. Compounds v. Solutions

1. Chemical formulas can be used to describe compounds but not solutions.
2. The components of a compound are chemically combined, but the components of a solution are physically combined.
3. The composition of a(n) solution can vary, but the composition of a(n) compound does not vary.

Discussion Question

Methane contains the elements carbon and hydrogen. What else do you need to know to find out whether methane is a compound or a mixture?

You need to know whether the elements are chemically combined or physically combined.