

Exercise walk-through

Elements, compounds and mixtures ■ 2.1

eXercise

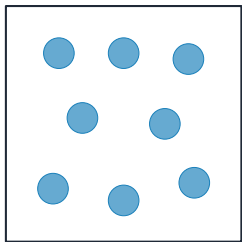
You must be able to

- define element, compound and mixture
- recognise each from a particle diagram
- explain that a compound is bonded (chemical separation) but a mixture is not

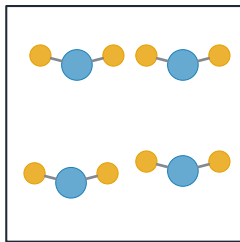
Method — Three types of substance

- **element:** one type of atom (e.g. copper).
- **compound:** elements chemically bonded in a fixed ratio (e.g. water); different properties from its elements.
- **mixture:** not bonded; separated by physical methods (e.g. air).

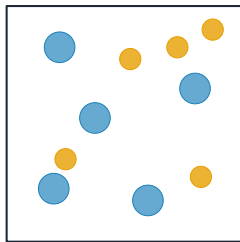
Method — Three types of substance



element
only one
type of atom



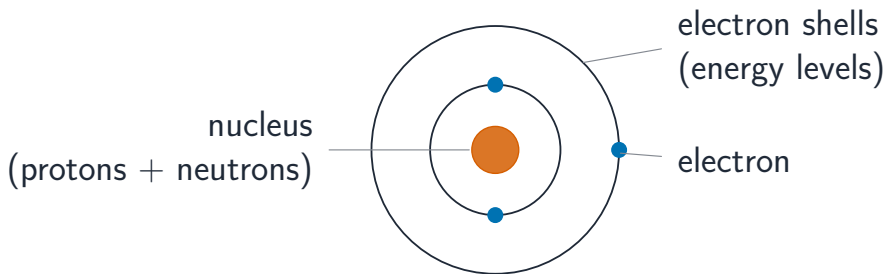
compound
different
atoms bonded
in a fixed ratio



mixture
not bonded,
easy to separate

Particle boxes: one-atom element, bonded fixed-ratio compound, unbonded mixture

Method — Three types of substance



lithium, Li: 3 protons, 4 neutrons
electron configuration 2,1

Atoms are the building blocks of elements and compounds

Practice 2.1 ■ 1 mark

Define a compound.

Solution 2.1

Worked steps

two or more elements chemically joined (bonded) together in a fixed ratio **B1**.

Practice 2.2 ■ 1 mark

State how a mixture can be separated.

Solution 2.2

Method: Three types of substance

Worked steps

by physical methods (e.g. filtering, distillation) **B1**.

Exam-style 3.1 ■ 1 mark

Which is a compound?

A oxygen, O_2

B water, H_2O

C air

D copper

Solution 3.1

A oxygen, O_2

B water, H_2O



C air

D copper

Worked steps

B. Water is two elements chemically bonded — a compound.

Exam-style 3.2 ■ 1 mark

A particle diagram shows two different atoms always joined together in pairs.

- (a) State whether this represents an element, a compound or a mixture.
- (b) Explain your answer.

Solution 3.2

Method: Three types of substance

Worked steps

- (a) a compound **B1**.
- (b) two different atoms are present, chemically bonded together in a fixed ratio **M1 A1**.

Exam-style 3.3 ■ 2 marks

State the main difference between a compound and a mixture of the same elements.

Solution 3.3

Method: Three types of substance

Worked steps

in a compound the elements are chemically bonded and need a chemical reaction to separate **M1**; in a mixture they are not bonded and are easily separated by physical means **A1**.