Solutions

Each answer shows the steps, then the **result**.

2.1

- atoms of the same element (same proton number) with different numbers of neutrons

2.2

- protons = 11
- neutrons = $23 - 11 =$ **12**

3.1 B

- most passing straight through shows the atom is mostly empty space

3.2

(a) protons = 19

- neutrons = $40 - 19 =$ **21**
- electrons = 19

(b) it has one fewer neutron (20 instead of 21)

3.3

- the nucleus is very small, very dense and positively charged
- a head-on approach is strongly repelled, so the positive alpha particle bounces back