4.1 CHECK YOUR UNDERSTANING ANSWER KEY

Checking Concepts

- 1. (a) Both protons and neutrons are about the same mass. Students may have also mentioned that they are both subatomic particles and are both found in the nucleus.
 - (b) Protons and neutrons have different electric charges.
- 2. Proton and neutron
- 3. The neutron is nearly equal to the mass of the proton plus the mass of the electron.
- 4. (a) Protons and neutrons
 - (b) Electrons
- 5. The charges of all the subatomic particles in an atom add up to zero.
- 6. (a) 2+
 - (b) The nuclear charge equals the number of protons in the nucleus.

7.

| | Element | Atomic Number | Number of Protons | Number of Electrons |
|-----|---------|------------------|----------------------|------------------------|
| (a) | Pb | 82 | 82 | 82 |
| (b) | 0 | 8 | 8 | 8 |
| (c) | Zn | 30 | 30 | 30 |
| (d) | Fe | 26 | 26 | 26 |
| (e) | Ag | 47 | 47 | 47 |
| (f) | Cl | 17 | 17 | 17 |

8.

| Element | (a) Period | (b) Group |
|---------|------------|-----------|
| Cs | 6 | 1 |
| S | 3 | 16 |
| Kr | 36 | 36 |
| С | 2 | 14 |

Pause and Reflect Answer

Students may include some of these points in their answer.

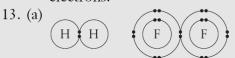
- Illustrate an atom with protons and neutrons in the centre and with electrons arranged around it in the pattern 2, 8, 8,
- Illustrate an atom using a Bohr diagram.
- · Distinguish number of protons, neutrons, electrons, atomic number, and mass number.
- Show simple compounds using Bohr diagrams.
- Show simple compounds using Lewis diagrams.

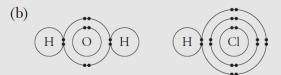
| Element | (a) Period | (b) Group |
|---------|------------|-----------|
| Fe | 4 | 8 |
| Hg | 6 | 12 |

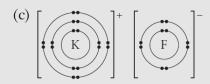
9. For example: alkali metals, alkaline earth metals, halogens, noble gases

Understanding Key Ideas

- 10. (a) Electron
 - (b) Proton, electron
 - (c) Electron
 - (d) Neutron
 - (e) Proton, neutron
 - (f) Proton
- 11. In a covalent compound, atoms bond together by sharing a pair of electrons. In an ionic compound, ions form as a result of the transfer of electrons, and then ions of opposite charge attract each other.
- 12. (a) Bohr and Lewis diagrams are similar in that they show the valence electrons and how they result in bond formation.
 - (b) They are different in that Bohr diagrams show all the atoms in each atom or ion, while Lewis diagrams show only valence electrons.









- 14. (a) H-H
- (b) H-Ö-H H-Cl:

(c) $\begin{bmatrix} Na \end{bmatrix}^+ \begin{bmatrix} \vdots \vdots \end{bmatrix}^- \begin{bmatrix} Li \end{bmatrix}^+ \begin{bmatrix} \vdots \vdots \end{bmatrix}^{2-} \begin{bmatrix} Li \end{bmatrix}^+$ $\begin{bmatrix} \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \end{bmatrix}^{-} \begin{bmatrix} \text{Be} \end{bmatrix}^{2+} \begin{bmatrix} \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \end{bmatrix}^{-}$