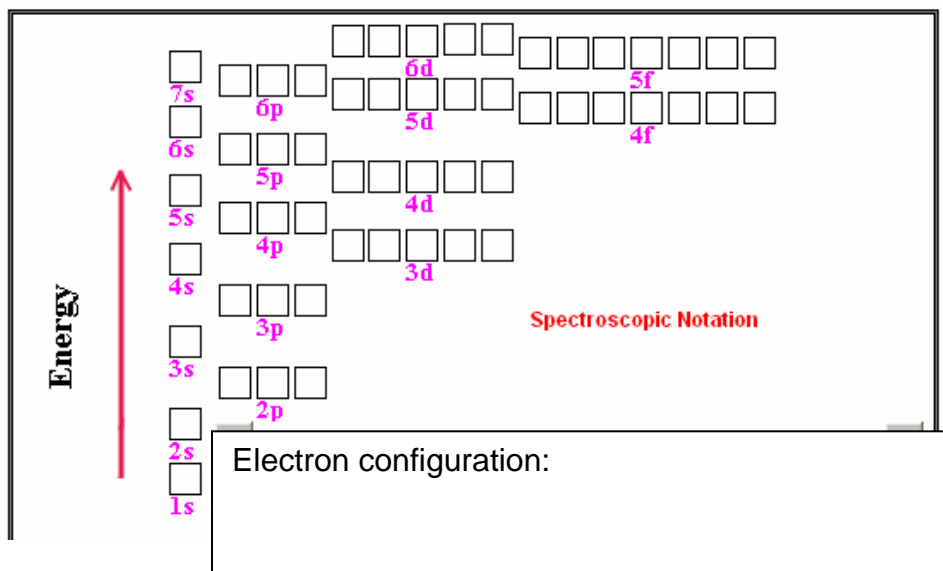


## Writing Electron Configurations and Drawing Orbital Diagrams

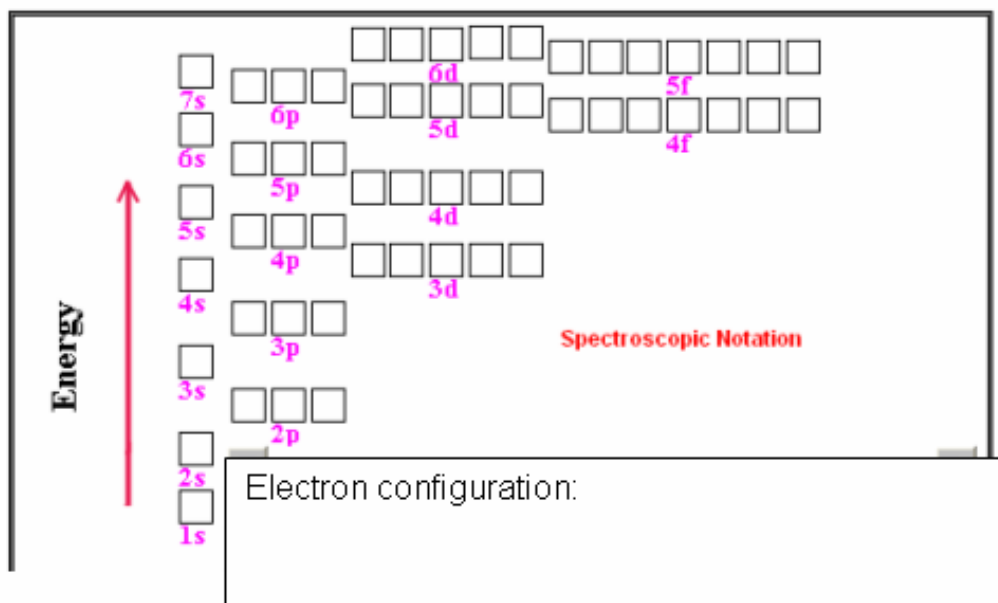
**Directions:** You are responsible for writing the electron configurations and drawing orbital diagrams for any element that contains **ONLY s and p orbitals**. We will not examine the d and f block elements due to the promotion principle.

1. Draw the electron configuration configuration and orbital diagram for: **Hydrogen**



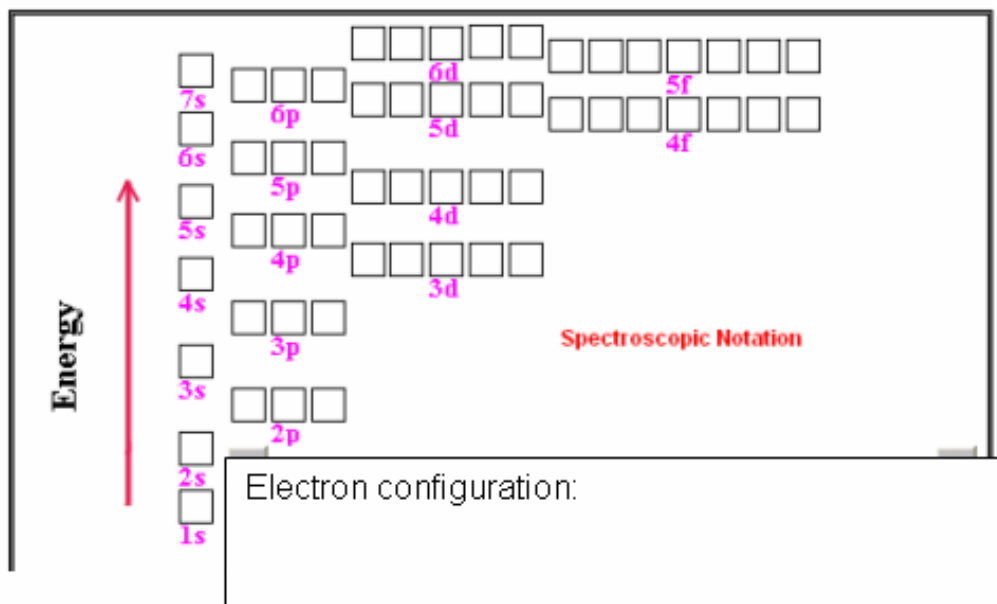
The diagram shows a vertical axis labeled "Energy" with an upward-pointing red arrow. To the right of the axis are boxes representing orbitals, grouped by principal quantum number (n) and subshell type (s, p, d, f). The orbitals are labeled as follows: 1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p, 6s, 5d, 6p, 4f, 5f, 6d, 7s. The boxes are arranged in a way that shows the relative energy levels, with s orbitals generally lower in energy than p orbitals of the same n, and d and f orbitals higher in energy than s and p orbitals of the same n. The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

2. Draw the electron configuration configuration and orbital diagram for: **Nitrogen**



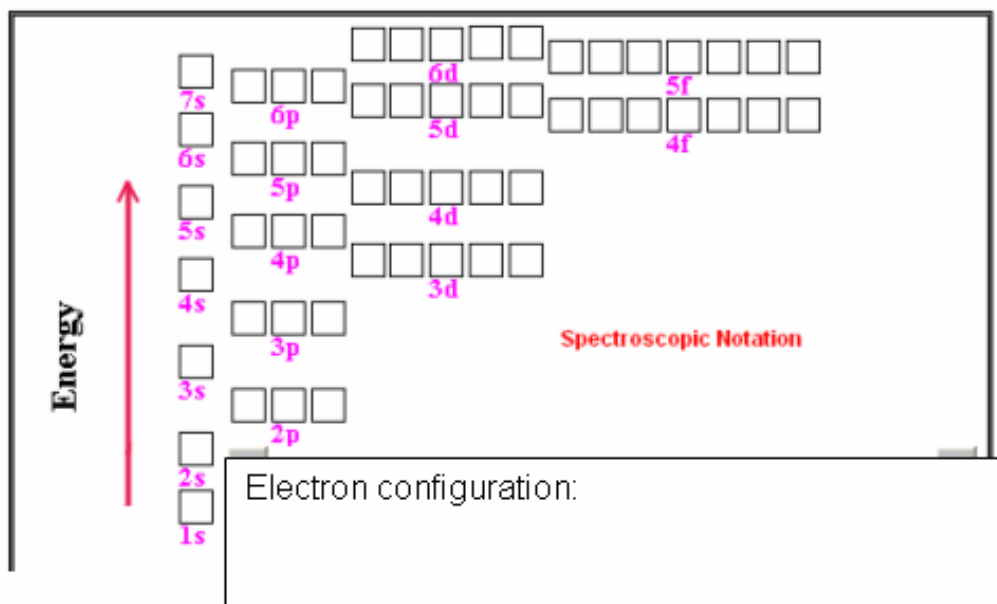
The diagram is identical to the one for Hydrogen, showing a vertical axis labeled "Energy" with an upward-pointing red arrow. To the right of the axis are boxes representing orbitals, grouped by principal quantum number (n) and subshell type (s, p, d, f). The orbitals are labeled as follows: 1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p, 6s, 5d, 6p, 4f, 5f, 6d, 7s. The boxes are arranged in a way that shows the relative energy levels, with s orbitals generally lower in energy than p orbitals of the same n, and d and f orbitals higher in energy than s and p orbitals of the same n. The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

3. Draw the electron configuration configuration and orbital diagram for: **Potassium**



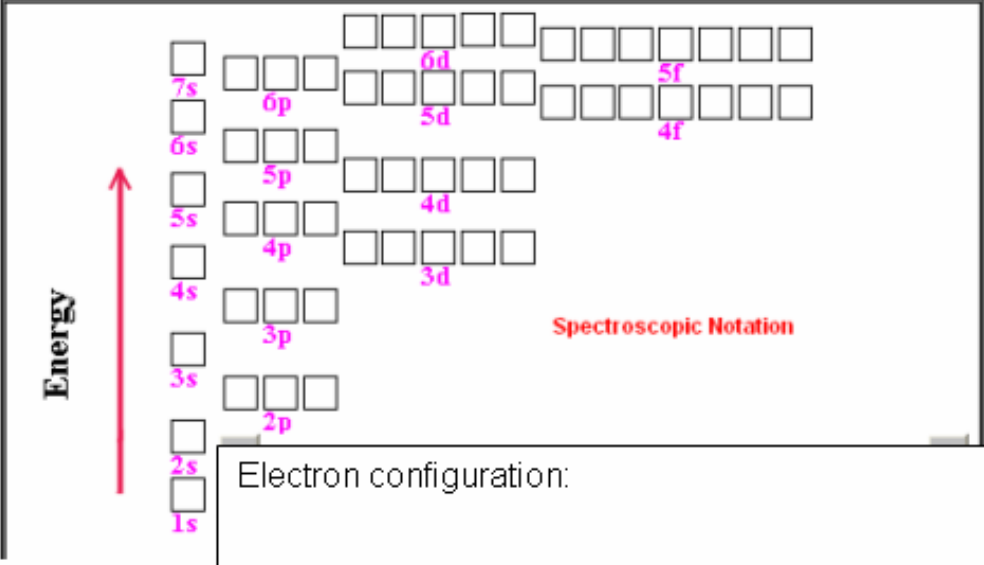
The diagram shows the relative energy levels of atomic orbitals from 1s to 7s. A vertical red arrow on the left is labeled "Energy". Orbitals are represented by boxes: s orbitals have 1 box, p orbitals have 3 boxes, d orbitals have 5 boxes, and f orbitals have 7 boxes. The orbitals are arranged in rows corresponding to their principal quantum number n. The labels for the orbitals are: 1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p, 6s, 5d, 6p, 4f, 5f, 6d, 7s. The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

4. Draw the electron configuration configuration and orbital diagram for: **Sulfur**



The diagram shows the relative energy levels of atomic orbitals from 1s to 7s. A vertical red arrow on the left is labeled "Energy". Orbitals are represented by boxes: s orbitals have 1 box, p orbitals have 3 boxes, d orbitals have 5 boxes, and f orbitals have 7 boxes. The orbitals are arranged in rows corresponding to their principal quantum number n. The labels for the orbitals are: 1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p, 6s, 5d, 6p, 4f, 5f, 6d, 7s. The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

5. Draw the electron configuration configuration and orbital diagram for: **calcium**

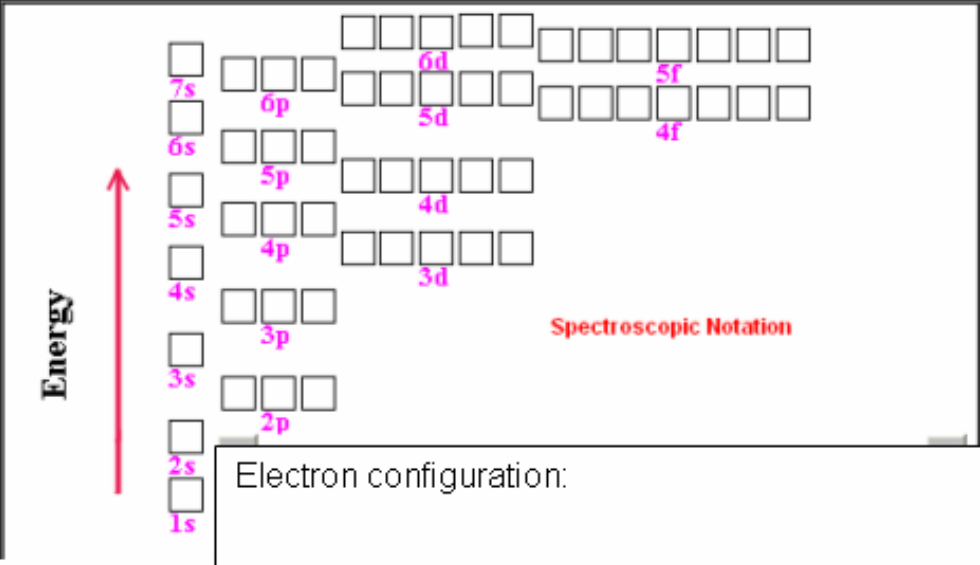


The diagram shows the relative energy levels of atomic orbitals for Calcium (atomic number 20). The orbitals are arranged in a periodic table-like structure, with energy increasing from bottom-left to top-right. The orbitals are labeled as follows:

- 1s: 1 box
- 2s: 1 box, 2p: 3 boxes
- 3s: 1 box, 3p: 3 boxes, 3d: 5 boxes
- 4s: 1 box, 4p: 3 boxes, 4d: 5 boxes, 4f: 7 boxes
- 5s: 1 box, 5p: 3 boxes, 5d: 5 boxes, 5f: 7 boxes
- 6s: 1 box, 6p: 3 boxes, 6d: 5 boxes, 6f: 7 boxes
- 7s: 1 box, 7p: 3 boxes, 7d: 5 boxes, 7f: 7 boxes

A red arrow on the left points upwards, labeled "Energy". The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

6. Draw the electron configuration configuration and orbital diagram for: **Bromine**

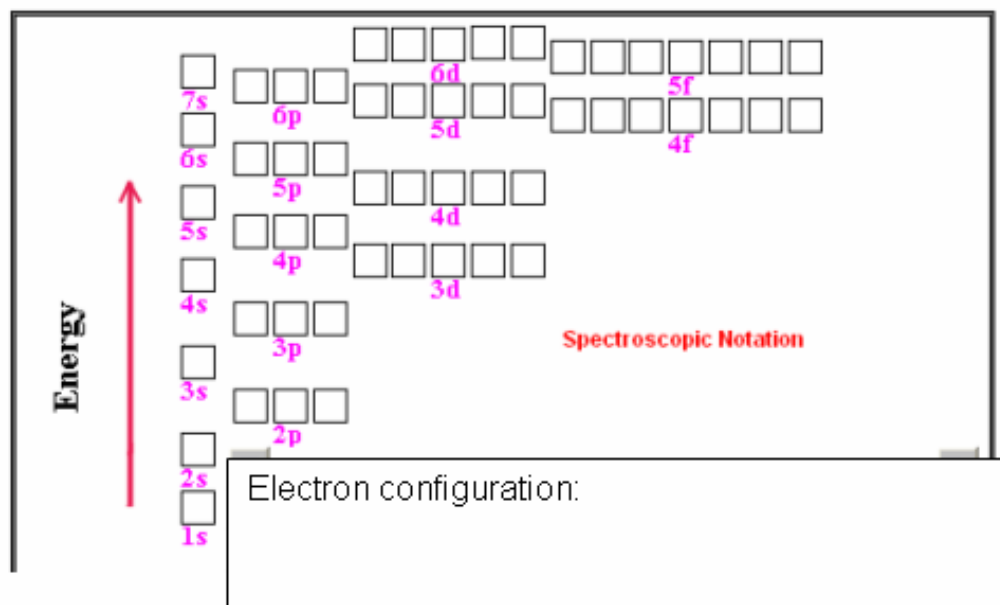


The diagram shows the relative energy levels of atomic orbitals for Bromine (atomic number 35). The orbitals are arranged in a periodic table-like structure, with energy increasing from bottom-left to top-right. The orbitals are labeled as follows:

- 1s: 1 box
- 2s: 1 box, 2p: 3 boxes
- 3s: 1 box, 3p: 3 boxes, 3d: 5 boxes
- 4s: 1 box, 4p: 3 boxes, 4d: 5 boxes, 4f: 7 boxes
- 5s: 1 box, 5p: 3 boxes, 5d: 5 boxes, 5f: 7 boxes
- 6s: 1 box, 6p: 3 boxes, 6d: 5 boxes, 6f: 7 boxes
- 7s: 1 box, 7p: 3 boxes, 7d: 5 boxes, 7f: 7 boxes

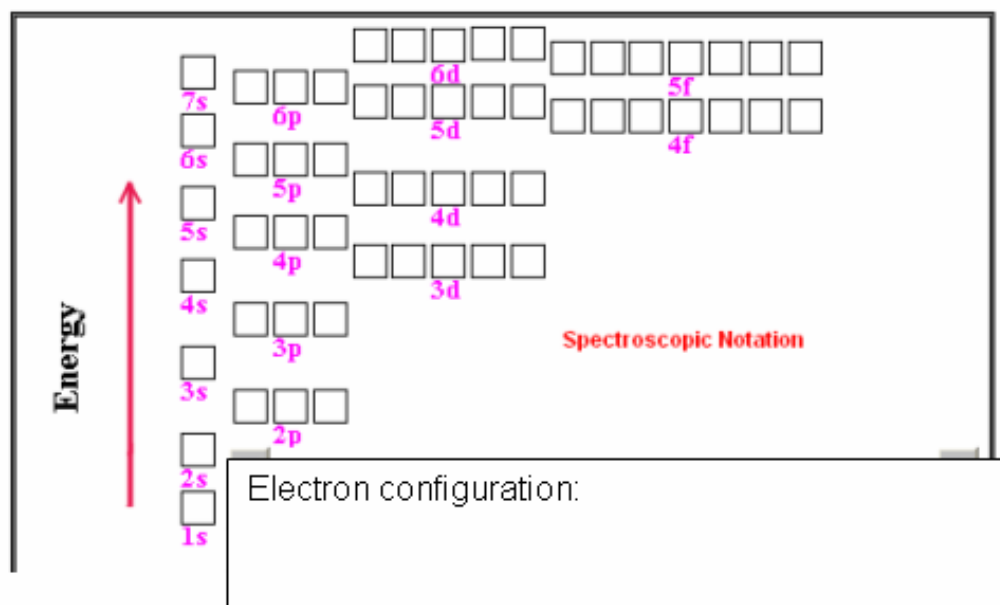
A red arrow on the left points upwards, labeled "Energy". The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

7. Draw the electron configuration configuration and orbital diagram for: **Sodium**



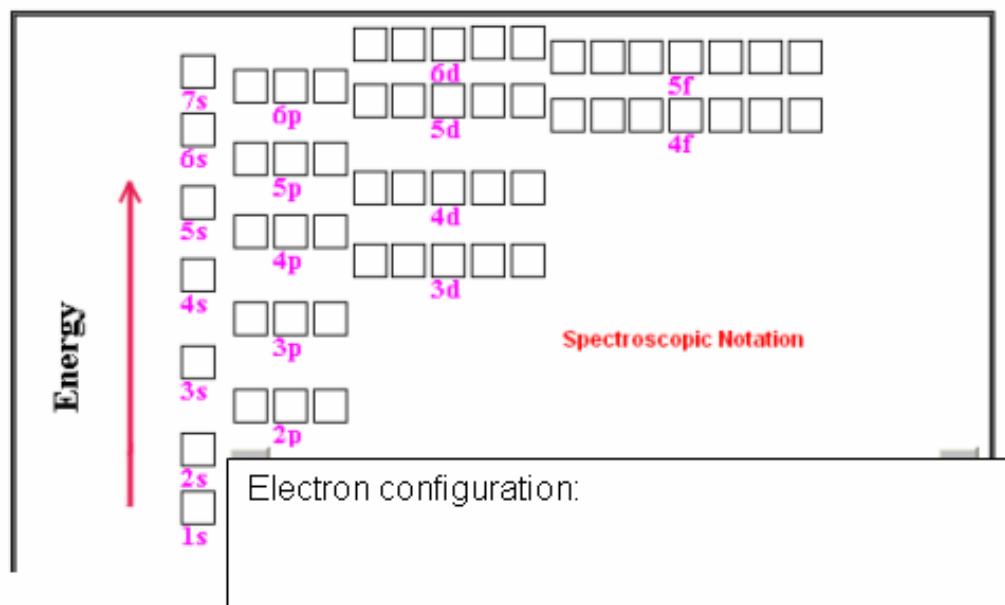
The diagram shows a periodic table of orbitals arranged by energy levels. The orbitals are represented by boxes, and their labels are in pink: 1s, 2s, 2p, 3s, 3p, 3d, 4s, 4p, 4d, 4f, 5s, 5p, 5d, 5f, 6s, 6p, 6d, and 7s. A red arrow on the left points upwards, labeled "Energy". The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

8. Draw the electron configuration configuration and orbital diagram for: **helium**



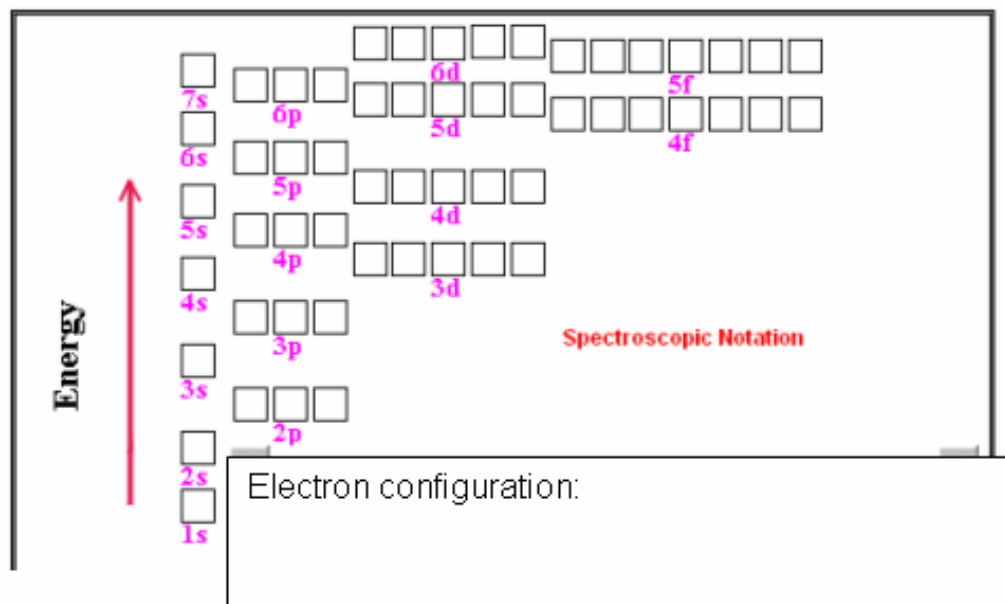
The diagram shows a periodic table of orbitals arranged by energy levels. The orbitals are represented by boxes, and their labels are in pink: 1s, 2s, 2p, 3s, 3p, 3d, 4s, 4p, 4d, 4f, 5s, 5p, 5d, 5f, 6s, 6p, 6d, and 7s. A red arrow on the left points upwards, labeled "Energy". The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

9. Draw the electron configuration configuration and orbital diagram for: **Strontium**



The diagram shows a periodic table of orbitals arranged by energy levels. The orbitals are represented by boxes, and their labels are in pink: 1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p, 6s, 5d, 6p, 4f, 5f, 6d, 7s. A red arrow on the left points upwards, labeled "Energy". The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".

10. Draw the electron configuration configuration and orbital diagram for: **carbon**



The diagram shows a periodic table of orbitals arranged by energy levels. The orbitals are represented by boxes, and their labels are in pink: 1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p, 6s, 5d, 6p, 4f, 5f, 6d, 7s. A red arrow on the left points upwards, labeled "Energy". The text "Spectroscopic Notation" is written in red. Below the diagram is a box labeled "Electron configuration:".