Guiding Question revisited

What determines the metallic nature and properties of an element?

In this chapter we have used the metallic model to show:

- [ ] Metallic elements contain delocalized electrons and a lattice of cations. The electrostatic attraction between these electrons and cations is the metallic bond.
- [ ] The metallic model helps explain a number of characteristic properties:
  - Electrical conductivity – due to the mobility of delocalized electrons across the metal structure.
  - Thermal conductivity – due to the efficient transfer of heat energy via delocalized electrons and closely packed cations.
  - Malleability – related to the non-directional nature of delocalized electron movement which allows for conformation changes without the breaking of the metallic bond.
- [ ] Trends in the properties of metals can be explained by the charge and radius of cations. A stronger metallic bond, caused by ions with smaller radii and greater magnitudes of charge, will have a higher melting point and lower degree of reactivity.