

Year 12 Transitions Programme 2021 Chemistry

Atomic Structure and the Periodic Table

Your Task

You need to research the arrangement of the modern periodic table (PT) and how it is linked to the atomic and electronic structure of the elements.

Pay particular attention to s, p and d orbitals; find out what they are, how many exist within each energy level and where their letters (s, p and d) come from. Use this to explain where the different blocks of the PT come from. Give examples of electronic structures of three elements using suborbital notation.

Legend for Periodic Table of the Elements:
ALKALI METAL, ALKALINE EARTH METAL, LANTHANIDE, ACTINIDE, TRANSITION METAL, POST-TRANSITION METAL, METALLOID, OTHER NONMETAL, HALOGEN, NOBLE GAS, UNKNOWN, SOLID, LIQUID, GAS, UNKNOWN.

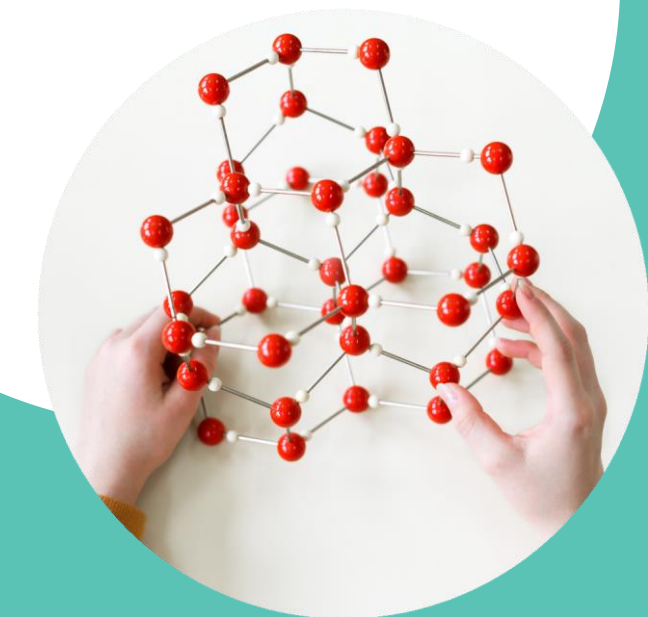
PERIODIC
TABLE OF THE
ELEMENTS



Explain what a periodic table tile can tell you about an element and where the data for the atomic mass has been obtained. Explain what an isotope is and how to calculate RAM of an element.

Explain what a group is, how elements are grouped and who first noticed the trends in groups. Describe the trends in melting point, reactivity and atomic radius in groups 1 and 7. Try to explain these trends in terms of nuclear charge, shielding and atomic radius.

You can choose what format to present your work in - Word, PowerPoint, etc. are both fine!



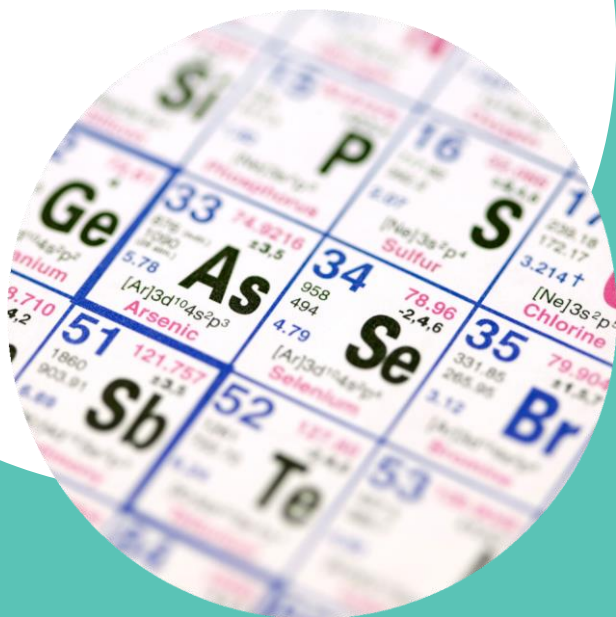
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Extension

Describe how the bonding within an element changes as you move across a period, what type of bonding do each of the elements contain, is it ionic, molecular covalent, giant covalent or metallic (use period 3 as your example)?

Explain how the different type of bonding within the elements leads to the trend in melting and boiling point across the period. Find a graph of the melting (and boiling) points across period 3 of the periodic table and use the link between the size of the melting point and the type of bonding in the element to describe the shape of the graph.



Useful Online Resources

- [Chem Guide](#)
- [Basic Chemistry Definitions](#) (Video)
- [Electronic Configuration 1](#) (Video)
- [PTable.com](#)

