Subject	Y9 Threshold Knowledge – Autumn/Spring/Summer term	How to support students' learning
Science – Chemistry	**Autumn Term** 1. Recall the structure of an atom. 2. Recall the distinction between elements, compounds and mixtures. 3. Describe the development of the model of the atom. 4. Describe relative charges of subatomic particles. 5. Describe the size and mass of atoms. 6. Understand relative atomic mass in relation to Carbon-12. 7. Represent electronic structure of the first 20 elements. 8. Understand how the modern Periodic Table is organised. 9. Describe the development of the Periodic Table over time. 10. Compare the properties of metals and non-metals. 11. Describe and explain the properties of group 0 elements. 12. Describe and explain the properties of group 1 elements. 13. Describe and explain the properties of group 7 elements. 14. Compare similarities and differences between group 1 metals and transition metals. **Spring Term** 15. Draw dot and cross diagrams of simple molecules. 16. Recall that a single covalent bond is represented as a line. 17. Describe the limitations of using different diagrams to represent molecules or giant structures. 18. Deduce the molecular formula of a substance. 19. Explain the idea that intermolecular forces are weak compared with covalent bonds. 20. Identify polymers from diagrams showing their bonding and structure. 21. Identify giant covalent structures from diagrams showing their bonding and structure. 22. Explain the properties of diamond in terms of its structure and bonding. 23. Explain the properties of graphite in terms of its structure and bonding.	• Use BBC bitesize: https://www.bbc.co.uk/bitesize/subjects/z4882hv • Get pupils to set themselves quizzes on Educake (The Science Department's homework platform) to help them revise topics they are trying to understand. • Talk about science at home and what students have learnt today. As well as discuss new scientific advances in the news. • Watch David Attenborough documentaries about the planet e.g., Blue planet. • Watch BBC Four's 'Chemistry: A volatile history' documentary. • Watch 'Into the universe with Stephen Hawking' documentary. • Use the link below to help find lessons you need to refresh and want to revise; https://continuityoak.org.uk/lessons • For topics that exceed the national curriculum you may need to look at the GCSE topics to.

	24. Know that graphite is similar to metals in that it has delocalised electrons. 25. Identify graphene and fullerenes from diagrams and descriptions. 26. Recall examples of uses of fullerenes, including carbon nanotubes. **Summer Term** 27. Draw dot and cross diagrams for ionic compounds formed by metals in Groups 1 and 2 with non-metals in Groups 6 and 7. 28. Work out the charge on the ions of metals and non-metals from the group number of the element, limited to the metals in Groups 1 and 2, and non-metals in Groups 6 and 7. 29. Deduce that a compound is ionic from a diagram of its structure in one of the specified forms. 30. Describe the limitations of using dot and cross, ball and stick, two and three-dimensional diagrams to represent a giant ionic structure. 31. Work out the empirical formula of an ionic compound from a given model or diagram that shows the ions in the structure. 32. Recognise substances as giant metallic structures from diagrams showing their bonding. 33. Explain why alloys are harder than pure metals in terms of distortion of the layers of atoms in the structure of a pure metal. 34. Describe exothermic and endothermic reactions. 35. Recall some examples of exothermic and endothermic reactions. 36. Draw the reaction profile for an exothermic and endothermic reaction and label overall energy change, activation energy. 37. Recall an experimental method to measure energy changes during neutralisation. 38. Draw a graph for a neutralisation and identify the point at which neutralisation occurs.	