Subject	Y8 Threshold Knowledge – Autumn/Spring/Summer term	How to support students' learning
Science	**Autumn Term** **Energy costs -** 1. Calculate power and demonstrate understanding of the efficiency equation. Recall information provided on an energy bill and describe advantages and disadvantages for a range of energy resources. **Plant reproduction -** 2. Understand how plants reproduce. Describe the structure and function of a flower and how this links to pollination and fertilisation as well as seed dispersal**.** **Human reproduction -** 3. Understand the structure and function of human reproductive organs and describe the process of the menstrual cycle, fertilisation and foetal development. Describe and explain solutions to fertility issues. **Metals and non-metals -** 4. Recall physical and chemical properties of metals and non-metals. Demonstrate an understanding of displacement, metal/acid and oxidation/ reduction reactions through equations and describe how metals are extracted from their ores. **Current -** 5. Demonstrate an understanding of current and describe the difference between a series and parallel circuit as well as recalling circuit symbols. Recall different types of insulators and conductors and explain the dangers of static electricity. **Sound -** 6. Recall and explain how sound travels through different mediums and is produced by vibrations. Describe and explain the structure of the ear and demonstrate an understanding of the speed of sound through calculations. **Inheritance -** 7. Describe the structure of DNA and it's function. Describe what dominant and recessive alleles are and how they determine characteristics and inherited diseases.	• **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

	Spring Term **Light -** 8. Demonstrate an understanding of light properties including the primary and secondary colours of light forming a spectrum from white light that can be seen due to the structure of the eye. Explain the law of reflection and refraction. **Variation -** 9. Describe continuous and discontinuous variation and how these differ between vertebrates and invertebrates. Explain why variation is important for species survival and how data is collected and represented for populations. **Universe -** 10. Demonstrate an understanding of the components of the universe and how stars are formed. Explain why we have day and night and different seasons whilst demonstrating an understanding of the different phases of the moon. **Gravity -** 11. Define the difference between mass and weight and demonstrate an understanding of how these are related to gravitational field strength through a equation. Recall that weight of objects is different on different planets. **Acids and bases -** 12. Recall what an acid, a base, an indicator and the pH scale are and how they are linked. Describe what neutralisation is and how it can be used to make a salt from an insoluble solid and base. **Magnetism -** 13. Describe the structure of a magnetic field around a bar magnet and the Earth, highlighting where the field is at its strongest and weakest and recall different materials that are classed as magnetic. Describe what temporary and permanent induced magnets are and how to make a compass. **Summer Term** **Evolution -** 14. Describe and explain how different organisms are adapted to their environment and how these have led to evolution through natural selection. Describe what biodiversity and extinction are and how they are linked.	

	Pressure – 15. Recall factors that affect pressure and demonstrate an understanding calculating it through an equation. Explain what causes objects to sink and float. **Potential difference -** 16. Define potential difference and recall the rules for potential difference in series and parallel circuits. Define resistance and demonstrate an understanding of it through calculations using an equation and carrying out practicals. **Earth structure -** 17. Recall and describe the properties of the layers of the Earth. Understand what global warming is and the factors that contribute to it. Explain how the three types of rock; igneous, sedimentary and metamorphic are formed and describe their properties. **Electromagnetism -** 18. Describe how to make electromagnets and what they are used for. Explain how to change the strength of an electromagnet and describe the advantages and disadvantages of electromagnets compared to bar magnets. **Speed -** 19. Demonstrate an understanding of speed through calculating an equation and drawing distance-time graphs accurately. Plan and carry out an investigation of the factors that affect speed and explain the term relative motion. **Interdependence -** 20. Describe the link between food chains and food webs and how populations within these species vary due to predators, disease, pollution and competition. Explain the effects of environmental changes and toxic materials on a species population.	