'An ambitious curriculum that meets the needs of all'

Medium Term Planning - Topic: Earth's resources

Curriculum Intent	
Skills/National Curriculum Links	**In addition to working further on objectives from Year __, pupils will be taught, following National Curriculum guidelines, the following this topic:** Earth and atmosphere • Earth as a source of limited resources and the efficacy of recycling • The order of metals and carbon in the reactivity series • The use of carbon in obtaining metals from metal oxides
Spiritual, moral, social, and cultural development	**SMSC:** This unit of work provides several opportunities for students to work together practically in groups, which encourages them to share views and opinions and take instructions from others. Group work opportunities encourage teamwork and respect for others. In practical lessons students follow laboratory rules for the safety of all. Our society has become dependent on scientific developments which we could not have foreseen 50 years ago but also our lives are likely to change significantly in the future because of our reckless damaging activities to the environment as a human society. Students must consider their impact on the world around them and start to look at what we can do to help the next generation have a habitable planet. **PSHE/British Values:** Students will complete teamwork, leadership and put science into everyday situations. They will show mutual respect during classwork. Students will also speak about the ethics of coal mining and extraction of metals and placement of such. **Skills Builder:** Listening (Receiving, retaining and processing info), Speaking (The oral transmission of info and ideas), Problem solving (Find a solution to a situation or challenge), Creativity (imagination and generation of new ideas), Staying positive (The ability to use tactics and strategies to overcome setbacks), aiming high (Set clear and tangible goals), Leadership and teamwork
Numeracy	Understanding of energy involved in extraction, e.g., 255MJ of energy needed to extract 1kg of aluminum from its ore.
Literacy	**Vocabulary Tier 2:** Extracting, justify, consider, suggest, generating, reduced, litre, separate. **Vocabulary Tier 3:** recycle**,** natural resources, mineral, ore, extraction, electrolysis, recycling, furnace, ingot, **Reading:** Following a written method and read risk assessments. Students may be directed to the textbook; this could be in lesson or at home on Kerboodle. **Writing:** Describing and explaining scientific phenomenon, free response writing for describing precautions taken, use of word mat to promote sentence formation. Converting diagrams into text. **Oracy:** Inclusion of BEST resources which are research evidence on common misunderstandings in science, effective diagnostic questioning and formative assessment, constructivist approaches to building understanding, and effective sequencing of key concepts that promote metacognitive talk and dialogue.
Becoming future ready	**Careers/Employability:** Climatologist Meteorologist Geologist Oil and gas engineer
Adaptation	Throughout this topic, quality first teaching will provide differentiation:

QFT/SEND Provision	**By product:** Linear assessments and differentiated practical work. **By resource:** Lessons are differentiated per class and students, worksheets are coloured blue if s and assessments are linear. **By Intervention**: by providing different levels of supervision and support **By Progressive Questioning:** exploring pupils' understanding through interactive dialogue. **By Grouping:** according to prior attainment, gender, social preference, preferred learning style. **By Task:** Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range. **By Offering Optional Activities:** In class or as homework, to extend learning. This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.
Implementation Curriculum Delivery **Learning Outcomes (Core Knowledge)**	To be able to: Securing Mastery Goals - 3.7.4 Most metals are found combined with other elements, as a compound, in ores. The more reactive a metal, the more difficult it is to separate it from its compound. Carbon displaces less reactive metals, while electrolysis is needed for more reactive metals. - 3.7.4 Describe how Earth's resources are turned into useful materials or recycled. - 3.7.4 Justify the choice of extraction method for a metal, given data about reactivity. - 3.7.4 Suggest factors to take into account when deciding whether extraction of a metal is possible. Exceeding Mastery Goals - 3.7.4 Suggest ways in which waste products from industrial processes could be reduced. Enquiry processes - 2.13 Identify features of a reaction that are hazardous. - 2.13 Identify control measures. Enquiry processes activity - 3.7.4 Predict the method used for extracting metal based on its position in the reactivity series. Securing Mastery Goals - 3.7.4 There is only a certain quantity of any resource on Earth, so the faster it is extracted, the sooner it will run out. Recycling reduces the need to extract resources. - 3.7.4 Explain why recycling of some materials is particularly important. - 3.7.4 Describe how Earth's resources are turned into useful materials or recycled. Exceeding Mastery Goals - 3.7.4 Suggest ways in which changes in behaviour and the use of alternative materials may limit the consumption of natural resources. - 3.7.4 Use data to evaluate proposals for recycling materials. Enquiry processes - 2.1 Identify a pattern in data from a results table or bar chart. - 2.4 Explain why different kinds of data are better displayed on different kinds of graphs. Red denotes interleaving; aspects of knowledge covered previously.
Current learning to be developed in the future within:	At GCSE You will learn more about sustainable development and nutrient cycles in biology, and more about extraction of metals in more detail in chemistry.
Assessment	Refer to assessment maps for formative and summative assessment opportunities.
Impact	Attainment and Progress – Refer to assessment results / data review documentation.