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| **Subject** | **Year 10 Chemistry Threshold Concepts – Spring Term** | **How to support students’ learning** |
| Using resources  Energy changes | **Using the Earth's resources and obtaining potable water**  Using the Earth's resources and sustainable development  Students should be able to: • State examples of natural products that are supplemented or replaced by agricultural and synthetic products • Distinguish between finite and renewable resources given appropriate information  • Extract and interpret information about resources from charts, graphs and tables  **Potable water**  • Distinguish between potable water and pure water • Describe the differences in treatment of ground water and salty water • Give reasons for the steps used to produce potable water  **Waste water treatment**  •  Students should be able to comment on the relative ease of obtaining potable water from waste, ground and salt water  ***Alternative methods of extracting metals (HT only)***  *•  Students should be able to evaluate alternative biological methods of metal extraction, given appropriate information*  **Life cycle assessment and recycling**  Life cycle assessment  •  Students should be able to carry out simple comparative LCAs for shopping bags made from plastic and paper  **Ways of reducing the use of resources**  •  Students should be able to evaluate ways of reducing the use of limited resources, given appropriate information  **Exothermic and endothermic reactions Energy transfer during exothermic and endothermic reactions**  • Distinguish between exothermic and endothermic reactions on the basis of the temperature change of the surroundings • Evaluate uses and applications of exothermic and endothermic reactions given appropriate information  **Reaction profiles**  • Draw simple reaction profiles (energy level diagrams) for exothermic and endothermic reactions showing the relative energies of reactants and products, the activation energy and the overall energy change, with a curved line to show the energy as the reaction proceeds • Use reaction profiles to identify reactions as exothermic or endothermic • Explain that the activation energy is the energy needed for a reaction to occur  ***The energy change of reactions (HT only)***  *• Students should be able to calculate the energy transferred in chemical reactions using bond energies supplied*  **Triple only**  **Chemical cells and fuel cells Cells and batteries**  **• Interpret data for relative reactivity of different metals and evaluate the use of cells**  **Fuel cells**  **• Evaluate the use of hydrogen fuel cells in comparison with rechargeable cells and batteries • Write the half equations for the electrode reactions in the hydrogen fuel cell** | Encourage your child to watch this video on finite and renewable resources [Natural Resources: Finite & Renewable Resources | GCSE Chemistry(9-1) | kayscience.com - YouTube](https://www.youtube.com/watch?v=3MoKIM3HpeM)  Encourage your child to visit BBC bitesize to read about potable water and how water is treated [Potable water - Water - AQA Synergy - GCSE Combined Science Revision - AQA Synergy - BBC Bitesize](https://www.bbc.co.uk/bitesize/guides/zcsn2nb/revision/2)  Encourage your child to watch this video on life cycle assessments [GCSE Chemistry - Life Cycle Assessments (LCAs) #73 - YouTube](https://www.youtube.com/watch?v=ScY_Yb1V8AY)  Encourage your child to visit this website to learn about energy change reactions and reaction profile diagrams [Exothermic and Endothermic Reactions (AQA) — the science hive](https://www.thesciencehive.co.uk/exothermic-and-endothermic-reactions-aqa)  Encourage your child to watch this video on calculating bond energies [GCSE Chemistry - Bond Energies #44 (Higher tier) - YouTube](https://www.youtube.com/watch?v=it0HGXhxD-s)  Encourage your child to visit this website to learn about hydrogen fuel cells [GCSE CHEMISTRY - What is a Hydrogen Fuel Cell? - What are the Advantages of a Hydrogen Fuel Cell? - What are the Disadvantages of a Hydrogen Fuel Cell? - GCSE SCIENCE.](https://www.gcsescience.com/o82.htm) |