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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 developmentStudents 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 reactionsEnergy 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 cellsCells 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) |