KS4 Learning overview

Subject: Combined Science

Exam board: AQA

Year 10		
Term	Topics	Extra learning opportunities
Autumn 1	1. Electricity (continues from Y9) 2. Infection and response	**Magazines and journals:** Physics World- The Institute of Physics own magazine covering current Physics research and latest developments New Scientist- Reports on current developments from across the world of science BBC Science News- the latest news in science from around the world Science Daily- Website featuring the latest Science developments, with a specific area for Physics research Specific Topic resources: Common Physics Misconceptions - YouTube Circuit Construction Kit: DC - Series Circuit | Parallel Circuit | Ohm's Law - PhET Interactive Simulations (colorado.edu) What is electricity? - Electricity Explained - (1) - YouTube What conclusions were drawn from the vaccines testing for COVID 19? https://www.imperial.nhs.uk/about-us/news/results-from-the-imperial-vaccine-trial-suggest-new-covid-19-vaccine-technology-is-safe-in-humans
Autumn 2	1. Bioenergetics 2. Quantitative Chemistry	What are the pigments involved in photosynthesis? https://sciencing.com/four-accessory-pigments-necessary-photosynthesis-carried-out-10064523.html Using the graph in the link, describe how the wavelength of light affect photosynthesis https://www.khanacademy.org/science/biology/photosynthesis-in-plants/the-light-dependent-reactions-of-photosynthesis/a/light-and-photosynthetic-pigments Make three models of reactants and the products using skittles: 1. Oxygen + Nitrogen 2. Carbon + oxygen 3. Water+ carbon dioxide

	3. Chemical changes	A lot of chemical changes happen at home and all around us. Observe and record examples of some chemical changes happening at home and around you for one week. Examples of Chemical Changes in Everyday Life (yourdictionary.com) Fun experiment: to observe a chemical change. Carry out and take pictures. Put some mentos into a bottle of coke.
Spring 1	1. Energy changes 2. Particle model	Exothermic and endothermic reactions When a chemical reaction occurs, energy is transferred to or from the surroundings. Research some examples of these types of reactions that occur in everyday Life. Exothermic and Endothermic Reactions In Everyday Life by Lydia D'souza (prezi.com) Specific Heat Capacity Demonstration with Balloons - GCSE Physics - YouTube – practical at home
Spring 2 Summer 1 & 2	1. Radioactivity	**Magazines and journals:** Physics World- The Institute of Physics own magazine covering current Physics research and latest developments New Scientist- Reports on current developments from across the world of science BBC Science News- the latest news in science from around the world Science Daily- Website featuring the latest Science developments, with a specific area for Physics research Specific Topic resources: Watch Chernobyl 1986 | Netflix Official Site What Caused the Catastrophic Nuclear Accident in Chernobyl? - YouTube • Watch Batman Dark knight Rises Spiderman 2 • Chain reaction 1996 Is the scientific technology regarding nuclear fusion scientific accurately in these films ? Do we Need Nuclear Energy to Stop Climate Change? - YouTube Worst Nuclear Accidents in History - YouTube Fusion Power Explained – Future or Failure - YouTube What can happen when homeostasis fails?

	2. Homeostasis and response	http://www.enetlearning.org/wp-content/uploads/2015/01/HBS3-8.-Disruption-of-homeostasis.pdf Students could visit the Natural History Museum and search for examples of natural selection: Why did the animals/plants on display develop the adaptations they have?
	3. Inheritance, variation and evolution	There is a particularly impressive gallery on human evolution - https://www.nhm.ac.uk/visit/galleries-and-museum-map/human-evolution.html Students with an interest in domesticated animals (dogs, cats, horses, cows) could research how, and why, specific breeds were created – e.g. Yorkshire Terriers. Students could look into the origin of cattle - https://www.ucl.ac.uk/news/2012/mar/dna-traces-cattle-back-small-herd-domesticated-around-10500-years-ago Students could use the "sampling" techniques they are taught for Required Practical 7 (p.179 of this spec: https://filestore.aqa.org.uk/resources/science/specifications/AQA-8464-SP-2016.PDF) to estimate the population of any organism in a certain area (the number of daisies in a park; number of snails on a path; number of ants on a patio).
	4. Ecology	Using what they learn about the Water Cycle in Lesson 10 of Ecology, students could produce a research project on where North London's potable water comes from, both historically (The New River) and today (e.g. Thames Water, the George V reservoir in Enfield). https://londonist.com/london/features/where-s-my-tap-water-from