Birches Head Academy

Part of the Frank Field Education Trust

Year 10 Science
Learning Programme 3

The LORIC skill focus for his LP is: RESILIENCE
The values for this LP are COMPASSION and HONESTY

Respect - treat others how you would wish to be treated yourself.
Justice - our College rules are fair and reasonable

What will I be learning about in this Learning Programme?
You will learn how energy works and how it affects the world around us. This includes understanding how energy is stored, transferred, and conserved, as well as calculating work done and different forms of energy such as gravitational, kinetic, and elastic potential energy. You'll explore efficiency, power in electrical appliances, and thermal concepts like conduction, specific heat capacity, and insulation. You will also look at energy demands, resources, and their environmental impacts, including fossil fuels and renewable energy. In chemistry, you'll study the reactivity series, displacement reactions, and methods of extracting metals. You'll learn about salts, neutralisation, the pH scale, and the differences between strong and weak acids. Advanced topics include electrolysis, aluminium extraction, and energy changes in reactions through exothermic and endothermic processes, finishing with bond energy calculations.

Where have I seen this learning before?
Many of the ideas in this program build on what you learned in earlier science lessons at Key Stage 3. You may have already explored energy transfers, conservation of energy, and different energy types when studying forces and motion. Concepts like conduction, insulation, and heating were introduced in thermal energy topics, and you've seen electricity and power in basic circuits. In chemistry, you've worked with acids, alkalis, neutralisation, and the pH scale, as well as simple reactions like displacement and making salts. You may also remember learning about energy resources, fossil fuels, and sustainability. This program takes those foundations further, adding new skills such as electrolysis, metal extraction, and detailed energy calculations.

What could I use it for?
The knowledge and skills you gain in this program are useful for understanding how the world works and solving real-life problems. You'll be able to explain everyday phenomena like how energy is transferred in appliances, why insulation saves money, and how chemical reactions power processes in industry. These concepts are essential for careers in science, engineering, technology, and environmental fields, and they also help you make informed decisions about energy use, sustainability, and the impact of chemicals in daily life. Beyond practical applications, this knowledge builds strong problem-solving and analytical skills that are valuable in many future studies and jobs.

Literacy Non-Negotiables:
- Capital letters must be used at the start of sentences and for the first letter of proper nouns
- Full stops must be used at the end of a sentence
- Question marks must be used at the end of a question
- Apostrophes should only be used for possession or omission
- Days of the week and months must be spelled correctly
- Key words must be spelled correctly
- Vocabulary to be taught using the Frayer model

In LP3.1, I will know: **05/01/26 - (WK 2)**	**Frayer Model Words**	**Homework**
IGNITION - How to complete the ignition activity to show the energy transfers in a pendulum the principle of conservation of energy how to calculate work done when a force moves an object	Transfer	Complete your weekly homework on https://sparxmaths.com/
In LP3.2, I will know: **12/01/26 - (WK 1)**	**Frayer Model Words**	**Homework**
how to calculate gravitational potential energy and explain its variables how to calculate kinetic energy and understand its relationship to mass and speed how to describe elastic potential energy and when it is stored	Potential	Complete your weekly homework on https://sparxmaths.com/
In LP3.3, I will know: **19/01/26 - (WK 2)**	**Frayer Model Words**	**Homework**
efficiency and explain how it measures useful energy output power and how it relates to the energy transfer rate in electrical appliances specific heat capacity and how it affects heating and cooling of materials.	Efficiency	Complete your weekly homework on https://sparxmaths.com/
In LP3.4, I will know: **26/01/26 - (WK 1)**	**Frayer Model Words**	**Homework**
the main energy demands in homes, industry, and transport. different energy resources, including renewable and non-renewable sources. the big energy issues around supply, demand, and environmental impact. Extended Task.	Resources	Complete your weekly homework on https://sparxmaths.com/
In LP3.5, I will know: **02/02/26 - (WK 2)**	**Frayer Model Words**	**Homework**
the reactivity series and predict outcomes of displacement reactions. the process of electrolysis and its role in breaking down compounds how aluminium is extracted using electrolysis	Electrolysis	Complete your weekly homework on https://sparxmaths.com/
In LP3.6, I will know: **09/02/26 - (WK 1)**	**Frayer Model Words**	**Homework**
exothermic and endothermic reactions and identify examples how to perform bond energy calculations to determine energy changes in reactions the difference between strong and weak acids and how this affects their properties.	Bond	Complete your weekly homework on https://sparxmaths.com/
LP3 RLW, I will: **23/02/26 - (WK 2)**	**Frayer Model Words**	**Homework**
review my learning, recalling and applying key knowledge, and focus on closing any gaps in my knowledge.	Concentrated	Complete your weekly homework on https://sparxmaths.com/
In LP3.7, I will know: **02/03/26 - (WK 1)**	**Frayer Model Words**	**Homework**
Complete Independent Tasks to demonstrate Practical Knowledge Complete Assessment and PRT Extended Task.	Variables	Complete your weekly homework on https://sparxmaths.com/

PRT Task 1

PRT Task 2

Resources to support learning:

Sparx Science, BBC Bitesize

FFET Award Challenge for this Learning Programme:

You are an engineer tasked with designing a sustainable transport system for a future city. Your design must consider energy efficiency, environmental impact, and chemical processes involved in energy storage and conversion