Learning Journey – 7C Energy, Fuels and Efficiency

What have I done previously in my learning journey?	
Previously….	**You have learnt previously about properties and changes in materials. This has involved:** • comparing and grouping together everyday materials based on their thermal conductivity You will also have worked scientifically to answer simple scientific questions for example, 'Which materials would be the most effective for making a warm jacket' or 'Which material would be the most effective for wrapping ice cream to stop it melting'.
In this topic…	You will learn about different stores of energy and how energy can be transferred between one store and another. You will then begin to think about energy use in the home and calculate the cost of that energy. You will learn about the fossil fuels that are used to generate electricity, their advantages, and disadvantages. You will research the alternatives to fossil fuels to limit environmental impact on planet Earth. As part of developing your skills in working scientifically you will investigate energy transfers in different materials which will involve planning an experiment, analysing data, and then forming a conclusion.

We will develop our learning by studying the following each lesson:	**RAG**	**Skills in Science checklist**
7C.01 Energy Stores • State examples of different energy stores • Describe how energy can be transferred between stores		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.02 Transferring Energy • Identify the energy transfers in a range of different situations. • Describe the energy transfers in a range of different situations.		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.03 Power • Describe what is meant by an appliance power rating • Calculate and compare power ratings for a range of appliances		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.04 Dissipation • State that energy is always conserved • Describe what is meant by energy dissipation • Calculate the amount of energy dissipated using an energy transfer diagram		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.05 Calculating Efficiency • Use energy diagrams to calculate energy efficiency		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.06 Comparing Efficiency • Compare and contrast energy efficiencies for a range of appliances. • Evaluate a range of appliances for use in the home.		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.07 Transferring Energy by Conduction • Describe how energy can be transferred by conduction. • Explain why gases do not conduct energy very well • Explain what is meant by thermal equilibrium		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.08 Investigating Insulators (Planning) • Identify dependent, independent and control variables in a scientific investigation • Plan an investigation to determine which material is the best insulator.		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication

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7C.09 Investigating Insulators (Results) • Carry out a safe investigation to test which material is the best insulator.		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.10 Investigating Insulators (Analysis) • Analyse the data to choose the best insulator • Explain the results of the investigation • Complete a question to demonstrate understanding of insulators		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.11 Transferring Energy by Radiation • Describe, using an example, how thermal energy is transferred by radiation • Describe how the colour of a material will affect how much energy it radiates and absorbs		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.12 Energy from Fossil Fuels • State the names of the fossil fuels and explain how oil is formed. • Describe how the energy stored in fossil fuels is used to generate electricity. • Evaluate the use of fossil fuels.		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.13 Energy from Other Sources • Describe how a range of renewable resources can be used to generate electricity • State the advantages and disadvantages of each resource.		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication
7C.14 Choosing Resources • Justify suggestions about which energy resources may be most suitable for a range of locations		☐ Scientific Methods ☐ Practical ☐ Number skills ☐ Application ☐ Communication

Key Vocabulary

Energy stores	**Joule**	**Kilojoule**	**Energy**	**Pathway**	**Transfer**	**Power**	**Watt**	**Kilowatt**
Rating	**Appliance**	**Conservation of energy**	**Dissipate**	**Energy transfer diagram**	**Efficiency**	**Thermal equilibrium**	**Conduction**	**Insulator**
Independent	**Dependent**	**Control**	**Uncertainty**	**Evaluate**	**Radiation**	**Absorb**	**Radiate**	**Reflect**
Fossil fuel	**Renewable**	**Wind turbine**	**Geothermal**	**Biogas**	**Solar**	**Tidal**	**Wave**	**Hydroelectric**

Future Learning	At GCSE you will learn that the concept of energy emerged in the 19th century. The idea was used to explain the work output of steam engines and then generalised to understand other heat engines. It also became a key tool for understanding chemical reactions and biological systems.
In careers	Limits to the use of fossil fuels and global warming are critical problems for this century. Physicists and engineers are working hard to identify ways to reduce our energy usage.