Learning Journey – 9C Houses – Energy Transfers

What have I done previously in my learning journey?	
Previously….	You have learnt previously about energy. This has involved: • Comparing power ratings of appliances in watts (W, kW) • Comparing amounts of energy transferred (j, kJ, kW hour) • Fuels and energy resources You have also learnt about energy changes and transfers. This has involved learning about: • Heating and thermal equilibrium • Temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tending to reduce the temperature difference • Use of insulators
In this topic…	You will learn more about energy stores and how energy can be transferred from one store to another. Using the context of houses, you will carry out investigations to look at how energy is transferred and provide solutions to reduce unwanted energy transfers.

We will develop our learning by studying the following each lesson:	RAG	Skills in Science checklist
9C.01 Energy Stores in the Home • Define the term 'system' • State examples of changes in the way energy is stored and transferred in a system		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.02 Wasted Energy in the Home • Understand that energy can be transferred usefully, stored or dissipated, but cannot be created or destroyed • Calculate the efficiency by recalling and applying the equations		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.03 Specific Heat Capacity 1 • Define the term specific heat capacity • Calculate the amount of energy stored or released in a system as its temperature changes, by applying the specific heat capacity equation		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.04 Specific Heat Capacity 2 • Investigate the specific heat capacity of different material (using data from a joulemeter).		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.05 Specific Heat Capacity 3 • Present secondary data from the specific heat capacity investigation in a graph • Calculate the gradient of the graph to determine the specific heat capacity		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.06 Power in the Home • Define power as the rate at which energy is transferred or the rate at which work is done • Calculate power by recalling and applying the equation (P=E/t and P=W/t) • Explain using examples how to systems transferring the same amount of energy can differ in power output due to time taken		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.07 Reducing Wasted Energy • Explain ways of reducing unwanted energy transfers • Explain the relationship between thermal conductivity and energy transferred		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.08 Investigating Wasted Energy 1 • Describe how the rate of cooling of a building is affected by the thickness and thermal conductivity of its walls		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication

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9C.09 Investigating Wasted Energy 2 • Carry out a safe investigation to test which material is the best insulator		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.10 Investigating Wasted Energy 3 • Present data from the investigation in a graph to determine the best insulator • Write a conclusion for the investigation • Evaluate different energy efficient appliances		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.11 Ceramics and Composites in the Home • Describe the properties of ceramics • Explain why the properties of ceramics make them suitable for their uses • Describe the properties of composites • Explain why the properties of composites make them suitable for their uses		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.12 Renewable and Non-Renewable Energy Resources 1 • List the main renewable energy and non-renewable energy resources • Define what a renewable energy resource is • Compare ways that different energy resources are used, including uses in transport, electricity generation and heating		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.13 Renewable and Non-Renewable Energy Resources 2 • Explain why some energy resources are more reliable than others • Explain patterns and trends in the use of energy resources		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication
9C.14 Renewable and Non-Renewable Energy Resources 3 • Evaluate the use of different energy resources • Justify the use of energy resources		☐ Scientific Methods ☐ Practical ☐ Number Skills ☐ Application ☐ Communication

Key Vocabulary

Kinetic	**Thermal**	**Chemical**	**Magnetic**	**Nuclear**	**Electrostatic**	**Gravitational potential**	**Elastic potential**	**Heating**
Radiation	**Electrical**	**Mechanical**	**Energy**	**Efficiency**	**Disspated**	**Specific heat capacity**	**Mass**	**Temperature**
Power	**Energy**	**Time**	**Work done**	**Watts**	**Joules**	**Disspated**	**Conductivity**	**Insulation**
Conduction	**Convection**	**Ceramics**	**Composites**	**Properties**	**Renewable**	**Non-renewable**	**Resources**	**Transport**
Electricity	**Trends**	**Environmental**	**Political**	**Economic**				

Future Learning	Continued study to A-level Physics involves the further study of thermal energy transfer. This topic also involves investigating the factors that affect the change in temperature of a substance.
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. New, renewable ways of generating electricity are the focus of new development in Science and technology to help reduce environmental impact on the planet.