Foxford Learning Plan

YEAR 13 - Unit 3 Aim G

Energy content of fuels

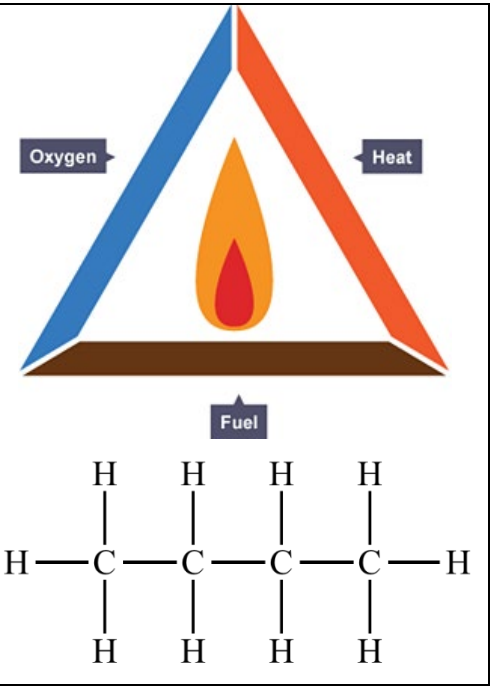
Summer 1

Key Vocabulary

Fuel	A material used to produce heat or power by burning
Hydrocarbon	An organic chemical compound composed of exclusively hydrogen and carbon atoms. They are highly combustible and are an effective source of fuel. Naturally occurring and form the basis of crude oil, natural gas and coal
Hazard	a potential source of harm, probability of that harm occurring, combined with the magnitude of potential harm, make up its risk
Joules (J)	A unit of work or energy
Heat energy	Heat is the form of energy that is transferred between systems or objects with different temperatures, measured in joules or calories
Specific heat capacity	The energy required to raise one kilogram (kg) of the material by one degree Celsius (°C)
Risk assessment	The process of evaluating risks to workers' safety and health from workplace hazards
Combustion	Occurs when the supply of oxygen is plentiful *hydrocarbon + oxygen → carbon dioxide + water*
Incomplete combustion	Occurs when the supply of oxygen is poor. *hydrocarbon + oxygen → carbon monoxide + carbon + water*

Over the course of the topic, I will be able to:

Key Skills	Demonstrate knowledge and understanding of scientific concepts, procedures, processes and techniques and their application in a practical investigative context
	Interpret and analyse qualitative and quantitative scientific information to make reasoned judgements and draw conclusions based on evidence in a practical investigative context
	Evaluate practical investigative procedures used and their effect on the qualitative and quantitative scientific information obtained to make reasoned judgements
	Be able to make connections between different scientific concepts, procedures, processes and techniques to make a hypothesis and write a plan for a practical investigation



I will understand how to:

Identify a range of fuels such as petrol, paraffin, food, cooking oil, methanol, ethanol, propan-1-ol, butan-1-ol, pentan-1-ol
Create a risk assessment to describe the hazards associated with fuels including flammability, toxicity, risk of explosion, harmful effects of products of incomplete combustion and pollution from sulphur impurities
Define – joules, kJ, calories (1 g by 1 ^{o}C), kilocalories, kWh
Calculate heat energy supplied by a fuel to water using: *heat energy = mass of water × specific heat capacity of water × temperature rise of water*
Calculate heat energy released from a fuel in kJ mol^{-1}