Year 11 | Science | Curriculum Knowledge Map - 2023/2024



Knowledge

- CP9: Electricity and Circuits
- CC13: Groups in the periodic table.
- CC14: Rates of reaction.
- CC15: Heat Energy Changes in Chemical Reactions.
 - CB7 Animal control and homeostasis
- CP10: Magnetism and the Motor Effect
- CP11: Electromagnetic Induction
- CC16 Fuels
- CC17 Earth and Atmospheric Science
- CB8 Exchange and Transport in Animals.
- CP12 Particle Model
- CP13 Forces and Matte
- CB9 Ecosystems and Material Cycles

Skills

- Experimental skills and strategies
- a) Use scientific theories and explanations to develop hypotheses.
- b) Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.
- c) Apply a knowledge of a range of techniques, instruments, apparatus and materials to select those appropriate to the experiment.
- d) Carry out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.
- e) Recognise when to apply a knowledge of sampling techniques to ensure any samples collected are representative.
- f) Make and record observations and measurements using a range of apparatus and methods.
- g) Evaluate methods and suggest possible improvements and further investigations.

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Cross Curricular and Curriculum Enrichment Opportunities

Maths

- Application and rearrangement of equations.
- Drawing and interpreting graphs.

Food Technology

• Energy in Food.

PSHE

- Physical Health
- Reproduction
- Misuse of drugs

Knowledge and Knowledge Extension

Building On

Assessment

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Autumn 1

CP9: Electricity and Circuits

- About current, charge and potential difference
- how to calculate resistance, power and energy transferred
- About components with changing resistance
- About UK domestic supply and electrical safety features
- Core practicals:
- Investigating resistance

CC13: Groups in the periodic table.

CC14: Rates of reaction.

CC15: Heat Energy Changes in Chemical Reactions.

- about the properties of the elements in groups 1,7 and 0.
- how changes in conditions can affect the rates of reactions.
- about the energy transfers that occur during chemical reactions.

Core practicals:

• Investigating rates of reaction.

CP9: Electricity and Circuits

Y7: Electricity

- That electric current is measured in amps and voltage is measured in volts.
- that circuits can be connected with components in series or parallel.
- that conductors have low resistance and insulators have high resistance.

CP9: Electricity and Circuits

A4L:

- Electric circuits
- Resistance
- Power and safety.

Summative: EoU test

- Higher
- Foundation

CC13: Groups in the periodic table.

CC14: Rates of reaction.

CC15: Heat Energy Changes in Chemical Reactions.

Y7: Elements, compounds and molecules.

Y7: Energy

• about fuels and energy resources.

Y8: The Periodic table.

- Elements compounds and the Periodic table.
- What happens during chemical reactions.

CC3 & CC5

• the nature of atoms and ions.

CC13: Groups in the periodic table.

CC14: Rates of reaction.

CC15: Heat Energy Changes in Chemical Reactions.

A4L:

- Groups in the periodic table
- Rates of reaction
- Energy in reactions.

Summative: EoU test

- Higher
- Foundation

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CB7 Animal control and homeostasis

- About endocrine glands
- how hormones are transported to their target organs.
- How the menstrual cycle is controlled by hormones and how hormones are used in contraception
- About diabetes and how blood glucose levels are controlled
- [H] How hormones thyroxine and adrenaline affect the body.
- [H] What a negative feedback system is

CC8

• how to write balanced symbol equations with state symbols.

CB7 Animal control and homeostasis

- Y7 Reproduction
- Y8 Digestion
- How obesity is caused
- About the structure of the human reproductive system
- About the menstrual cycle

CB7 Animal control and homeostasis

- A4L:
- Hormones
- Blood glucose level
- •
- •
- Summative: EoU test
- Higher
- Foundation

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Autumn 2

Time table Collapse – Mock Revision Paper 1 1 Week 2 Weeks of Mock Exams

CP10: Magnetism and the Motor Effect CP11: Electromagnetic Induction

- About permanent and induced magnets and how to represent a magnetic field
- About the magnetic field around a wire and the factors that affect it
- how the field from the individual coils in a solenoid interact
- [H] How current can be induced in a wire and the factors that affect it.
- [H] How to calculate the size of the force on a wire carrying a current in a magnetic field
- [H] How to work out the direction of this force

CP10: Magnetism and the Motor Effect CP11: Electromagnetic Induction

Y8 Force Fields

- How to plot the shape of a magnetic field and that the earth has a magnetic field
- That electric currents cause magnetic fields, including in electromagnets and motors

CP10: Magnetism and the Motor

Effect

CP11: Electromagnetic Induction

AL4

- Magnets and Motor effect
- [H] Electromagnetic induction

Summative: EoU test

- Higher
- Foundation

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Spring 1

CC16 Fuels CC17 Earth and Atmospheric Science

- about the hydrocarbons found in crude oil and natural gas.
- how crude oil is separated into useful fractions.
- about the alkanes homologous series.
- about the problems caused by some atmospheric pollutants.
- how and why the cracking of oil fractions is carried out.
- about the advantages and disadvantages of different fuels for cars.
- about how the Earth's atmosphere has changed in the past and how it is changing now.
- more about the causes and effects of climate change.

CC16 Fuels CC17 Earth and Atmospheric Science

Y7: Elements, compounds and molecules. Y8: The Periodic table.

- Elements compounds and the Periodic table.
- What happens during chemical reactions.

Y7: Energy

• about fuels and energy resources.

Y7: Acids and Alkalis

• about the acidity of non-metal oxides.

CC1

• mixtures can be separated using fractional distillation.

CC8

• how to write balanced symbol equations with state symbols.

CC16 Fuels CC17 Earth and Atmospheric Science

A4L:

- Hydrocarbons and Fractional distillation.
- Combustion of Hydrocarbons.
- The Earth's Atmosphere.

Summative: EoU test

- Higher
- Foundation

CB8 Exchange and Transport in Animals.

• more about diffusion, gas exchange and the surface area: volume ratio.

CB8 Exchange and Transport in Animals.

Y8: Food and Nutrition.

• how digestion gets glucose and other food molecules into the blood.

CB8 Exchange and Transport in Animals.

A4L:

Circulation system

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•	more about the different types of
	respiration.

- how the lungs, heart, blood vessels and blood are adapted for their functions.
- how to calculate cardiac output.

Core practicals:

• Respiration rates.

Y8: Breathing and Respiration.

- how the respiratory system gets oxygen into the blood.
- about aerobic and anaerobic respiration.

CC1.

- about diffusion.
- about different animal cells and their adaptations.

• Respiration

Summative: EoU test

- Higher
- Foundation

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Spring 2

CB9 Ecosystems and Material Cycles

- how ecosystems are organised.
- how communities are affected by abiotic and biotic factors.
- how the abundance and distribution of organisms are measured.
- about parasitism and mutualism.
- how humans can affect ecosystems.
- about the benefits of maintaining biodiversity.
- how materials cycle through ecosystems.
- about the importance of the carbon cycle, the water cycle and the nitrogen cycle.

Core practicals:

Quadrats and transects.

CP12 Particle Model CP13 Forces and Matter

- How to explain and calculate different densities of substances
- About specific heat capacity and specific latent heat heat and how to calculate them
- How changing the temperature of a gas affects its pressure

CB9 Ecosystems and Material Cycles

Y7: Ecosystems.

- about the interdependence of organisms including food webs and insect pollination.
- how organisms affect and are affected by their environments including the accumulation of toxic materials.

Y8: Plants Growth.

• how almost all life on Earth depends on photosynthesis in plants and algae.

CB9 Ecosystems and Material Cycles

A4L:

- Ecosystem
- Biodiversity
- material cycles

Summative: EoU test

- Higher
- Foundation

CP12 Particle Model
CP13 Forces and Matter

Y7 Particles

- That mass is conserved during a change of state
- About the properties of solids, liquids and gases

CP12 Particle Model
CP13 Forces and Matter

AL4

- Particles and energy
- Gas laws
- Springs

Summative: EoU test

Higher

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	 About Kelvin and Celsius temperature scales About elastic and inelastic distortion About the relationship between force and extension How to calculate the work done when stretching a spring Core practicals: Investigating density investigating SHC of water investigating Springs 	 How particles are arranged in a solid, liquid and a gas and how this is affected by temperature CP2 Forces and Motion Some of the effects that forces have on objects 	• Foundation
Summer 1	Revision for GCSE Examination		
Summer 2	GCSE Examination		