Priory's Science – INTENT & IMPLEMENTATION

Key Stage 3

At key stage 1 and 2 pupils should have learnt to understand the basic principles of:

- Plants
- Animals including humans
- Everyday materials
- Seasonal Changes
- Living things and habitats
- Rocks
- Light
- Forces and magnets
- States of matter
- Sound
- Electricity
- Earth and Space
- Evolution and inheritance
- Properties and changes of materials

The key stage 3 curriculum is therefore designed to build on prior learning that has taken place. The KS3 program of study is split into multiple schemes of learning, the majority starting with a lesson revisiting content that should have been previously learned. From there, new scientific ideas will be added to existing knowledge and understanding, including both scientific ideas and scientific methods/processes. Most schemes of learning end with a revision lesson, consolidating the new content, and lessons which provide the opportunity to revisit the content of previous units, offering the opportunity for retrieval and linking with newly learned ideas.

When	What will I learn and what skills will I develop?	Why do I need to know this?	How will I learn this?
Year 7	**1. Introduction to science:** **What do scientific diagrams show?** **What do hazard symbols represent?** **How are measurements taken?** **How do we write scientific methods?** **2. Particles:** **What does matter consist of?** **How do different materials differ?** **3. Energy** **How is energy stored?** **How is energy transferred?** **4. Cells** **What are cells?** **Are all cells the same?** **5. Reactions** **What happens during chemical reactions?** **What happens during physical reactions?**	All scientific content taught is considered to be important in its own right and the knowledge students acquire will ultimately help to make them cleverer and better equipped for life in the modern world. Incorporated within these units where relevant will be teaching on data presentation and data analysis techniques, e.g. drawing and interpreting graphs, drawing and interpreting data tables.	• All lessons will start with a short knowledge retrieval task, activating prior learning to ease the addition of new material to the schema. • New knowledge will be gained in small, manageable and carefully planned chunks. • Questioning will be used systematically, in large volume, incorporating all students and probing to the appropriate depth to check for understanding and misconceptions. • Tier 2 and 3 scientific literacy will be taught explicitly, allowing it to become automatized in long term memory. This will be done using etymology, Frayer models, choral response, etc. Literacy will be

Year 8	**6. Space, light and sound** **What is our solar system?** **How does light travel?** **How does sound travel?** **7. Relationships between organisms** **How do organisms interact in their environment? How do organisms reproduce?**		incorporated into retrieval starters as appropriate to ensure mastery of scientific vocabulary. • Practical work will be used as appropriate to enhance and

	8. Periodic table **How is the periodic table structured?** **What happens during different types of chemical reactions?** **9. Forces** **How do forces act on objects?** **10. Organisms** **How are organisms structured?** **What is respiration?** **11. Earth chemistry** **What is the structure of the Earth?** **What is the atmosphere made from?**		consolidate understanding of both ideas and processes. • Modelling will be used (I do, we do, you do, etc) to support students as necessary, building all students up to be able to complete work independently. Homework will typically be retrieval-based and linked to classroom learning. • You'll make links to other subjects as appropriate.

Year 9	**12. Electromagnetism** **What happens in an electrical circuit?** **What are magnets and what do they do?** **13. Genetics** **What is DNA?** **How are genes inherited?** **14. Atomic Structure and the Periodic Table What is the structure of atoms?** **How has the atomic model changed over time? How do we use the periodic table?** **15. Energy** **How is energy stored and transferred?** **How can we calculate the amount of energy stored?** **How are power and efficiency calculated?**		
	16. Cell Biology **What is the structure of different types of cell?** **How do cells become specialised?** **How can we observe cells?**		

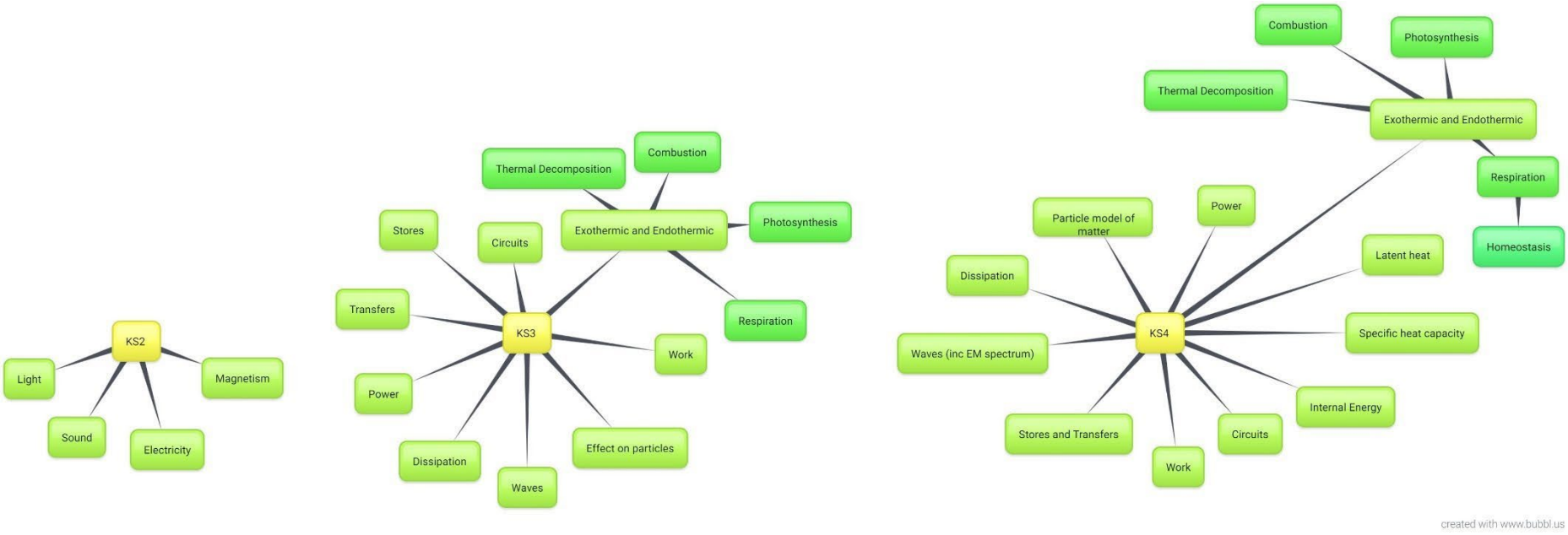
Practical skills are taught throughout KS3 as appropriate to the unit content. This will cover things such as using equipment safely, risk assessments, method writing and planning, collecting results, presenting results, drawing conclusions, and evaluating data.

During the course of Year 9, students will have the option to select the Separate Science route (three GCSEs), or continue with the compulsory element of Combined Science (two GCSEs).

Recurring themes

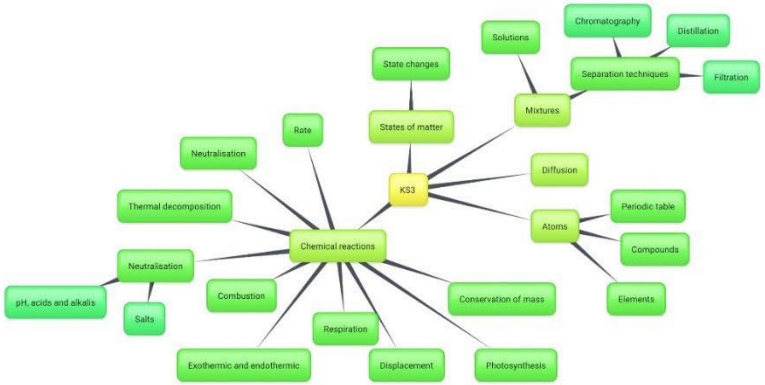
NB this is not exhaustive - not all detail is shown on these diagrams; each nodule represents nested knowledge of that particular concept.

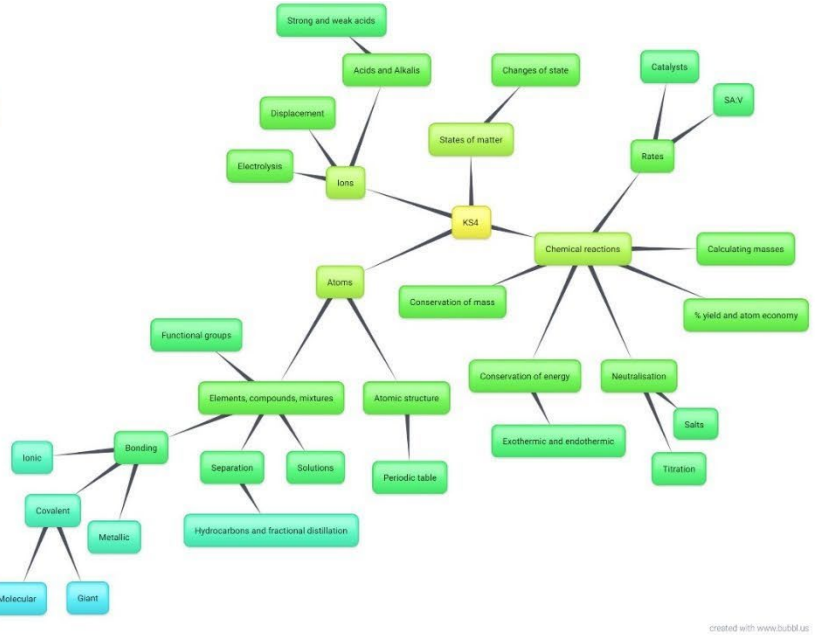
Energy:



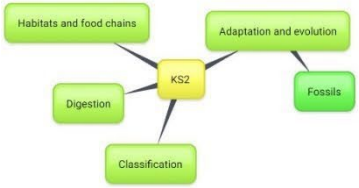
Particles:

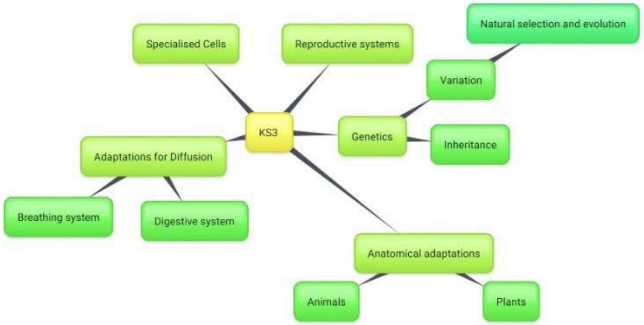

Squashing and stretching
Materials
Solutions and mixtures
KS2
Simple separation
Solids, liquids and gases

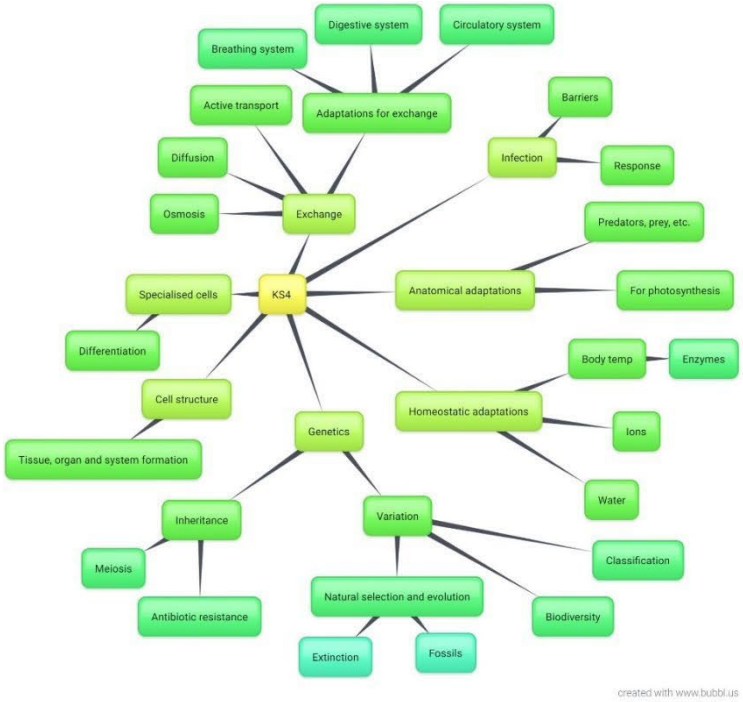

Chromatography
Distillation
Solutions
State changes
Separation techniques
Filtration
Mixtures
States of matter
Rate
Neutralisation
KS3
Diffusion
Thermal decomposition
Periodic table
Atoms
Chemical reactions
Compounds
Neutralisation
Combustion
Conservation of mass
Elements
pH, acids and alkalis
Salts
Respiration
Exothermic and endothermic
Displacement
Photosynthesis


Strong and weak acids
Acids and Alkalis
Changes of state
Catalysts
SA:V
Displacement
States of matter
Rates
Electrolysis
Ions
KS4
Chemical reactions
Calculating masses
Atoms
Conservation of mass
% yield and atom economy
Functional groups
Conservation of energy
Neutralisation
Elements, compounds, mixtures
Atomic structure
Salts
Exothermic and endothermic
Ionic
Bonding
Separation
Solutions
Titration
Periodic table
Covalent
Metallic
Hydrocarbons and fractional distillation
Molecular
Giant
created with www.bubbl.us

Adaptation and natural selection:







Key Stage 4

At key stage 4 students will following either AQA Combined Science Trilogy, or opt for the AQA Separate Science route. Those on Combined will have 5 hours per week in year 10, 6 hours per week in year 11. Those who opt for separate science will have an additional 3 hours per week in both years, to allow the extra content to be covered.

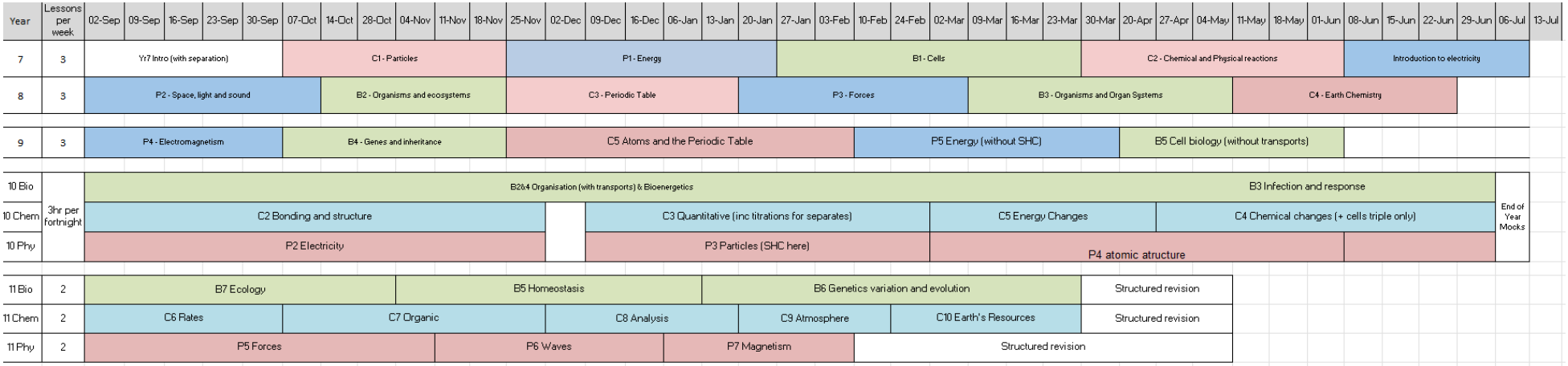
Further details of these can be found here: AQA | Subjects | Science | GCSE

Key stage 4 is terminally assessed. There is no coursework or internally assessed component. There are 6 exam papers for science, as detailed below:

Subject	Specification units	Time	Marks
Biology paper 1	B1 B2 B3 B4	Combined Science 1hr 15mins Separate Science 1hr 45 mins	Combined Science 70 Separate Science 100
Biology paper 2	B5 B6 B7		
Chemistry paper 1	C1 C2 C3 C4 C5		
Chemistry paper 2	C6 C7 C8 C9 C10		
Physics paper 1	P1 P2 P3 P4		
Physics paper 2	P5 P6 P7 (P8 Separate Phys only)		

Curriculum Overview

The below is an overview of what is covered when in the science curriculum at Priory. The dates should be taken as rough estimates rather than absolutes.



Literacy

At both key stages, literacy should be developed. This is done in several ways but should be explicit. Each scheme contains reading/comprehension tasks as well as writing opportunities.