Y8 Science

Subject	Science
Term	Cycle 1
Duration (approx.)	9 Lessons
Module	Chemistry—Acids and Alkalis

Factual knowledge to be taught and assessed (including subject specific vocabulary).

Acids and Alkalis
The pH scale for measuring acidity/alkalinity; and indicators.
Defining acids and alkalis in terms of neutralisation reactions.

Skills and concepts to be developed

Present observations and data using appropriate methods, including tables and graphs.
Identify patterns and using observations, measurements and data to draw conclusions.
Evaluate data, showing awareness of potential sources of random and systematic error

Formative Assessment one:

Spellings and definitions of subject specific concepts

Formative Assessment two:

Strengthen vocabulary associated with topic.
Conduct a practical that compares antacids.
Use data from practical to draw conclusions of most effective substance for a neutralisation reaction.

Summative Assessment:

End of cycle test.
This test will cover questions from this topic and previous topics to check understanding.

Link to prior learning:

Properties and changes of materials -
Acids and alkalis not taught basic chemistry for example - explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including the action of acid on bicarbonate of soda.

Literacy and Numeracy:
How will high standards be promoted in this module?

Literacy: Vocabulary and definitions. Reinforce spellings by sorting out letter arrangement.
Numeracy: Use practical skills to gather data and then use data to create a graph and analyse the results.

Link Forward: Where next for learning?

KS4 GCSE Chemistry

C1 - Core Science
Rocks and Building Materials reactions of carbonates.

C2 - Additional Science
Salts and Electrolysis

C3 – Triple Science
Water

Y8 Science

Subject	Science
Term	Cycle 1
Duration (approx.)	11 Lessons
Module	Physics—Space

Factual knowledge to be taught and assessed (including subject specific vocabulary)

Space
Our Sun as a star, other stars in our galaxy, other galaxies
The seasons and the Earth's tilt, day length at different times of year, in different hemispheres
The light year as a unit of astronomical distance.

Vocabulary in Space resources.

Skills and concepts to be developed

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Formative Assessment one:

Spellings and definitions of subject specific concepts

Formative Assessment two:

Strengthen vocabulary associated with the topic. Follow instructions and complete a paper based task on the – Solar System to scale. Use data to draw conclusions to answer summary questions.

Summative Assessment:

End of cycle test

This test will cover questions from this topic and previous topics to check understanding.

Link to prior learning:

Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
Describe the movement of the Moon relative to the Earth
Describe the Sun, Earth and Moon as approximately spherical bodies

Literacy and Numeracy:
How will high standards be promoted in this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy -
Solar system to scale - graphs.

Link Forward: Where next for learning?

KS4 GCSE Physics

P1 - Core Science
The expanding universe and the Big Bang theory

P2 – Additional science
The early universe and life history of a star.

Y8 Science

Subject	Science
Term	Cycle 1
Duration (approx.)	13 Lessons
Module	Biology—Health and lifestyle

Factual knowledge to be taught and assessed (including subject specific vocabulary)

Health and Lifestyle

- the effects of recreational drugs (including substance misuse) on behaviour, health and life processes.
- content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed
- calculations of energy requirements in a healthy daily diet
- the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases
- the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)

Skills and concepts to be developed:

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Formative assessment one:

Spellings and definitions of subject specific concepts

Formative assessment two:

Select and process data from a pie chart on a balance diet and food groups.

Summative Assessment:

End of cycle test.

This test will cover questions from this topic and previous topics to check understanding.

Link to prior learning

- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Literacy and Numeracy:
How will high standards be promoted in this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy -
Pie charts and percentages

Link Forward: Where next for learning?

KS4 GCSE Biology

Keeping healthy – Diet and exercise

Enzymes and digestion

Y8 Science

Subject	Science
Term	Cycle 1
Duration (approx.)	10 Lessons
Module	Chemistry— Periodic Table

Factual knowledge to be taught and assessed (including subject specific vocabulary)

Periodic Table

- the varying physical and chemical properties of different elements
- the principles underpinning the Mendeleev Periodic Table
- the Periodic Table: periods and groups; metals and non-metals
- how patterns in reactions can be predicted with reference to the Periodic Table
- the properties of metals and non-metals
- the chemical properties of metal and non-metal oxides with respect to acidity.

Skills and concepts to be developed:

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Formative assessment one:

Spellings and definitions of subject specific concepts

Formative assessment two:

Select the relevant data from the periodic table. Describe patterns in given data. Describe the relationship between patterns in data and the organisation of the periodic table

Summative Assessment:

End of cycle test.

This test will cover questions from this topic and previous topics to check understanding.

Link to prior learning

Currently not studied.

Literacy and Numeracy:
How will high standards be promoted in this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy -
Patterns of numbers in the periodic table.

Link Forward: Where next for learning?

KS4 GCSE Chemistry

Structure of an atom
Periodic table
Groups on the periodic table.

Y8 Science

Subject	Science
Term	Cycle 2
Duration (approx.)	13 lessons
Module	Electricity and Magnetism

Factual knowledge to be taught and assessed (including subject specific vocabulary)

Magnetism

- magnetic poles, attraction and repulsion
- magnetic fields by plotting with compass, representation by field lines
- Earth's magnetism, compass and navigation
- the magnetic effect of a current, electromagnets, D.C. motors (principles only).

Current electricity

- electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge
- potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current
- differences in resistance between conducting and insulating components (quantitative).

Static electricity

- separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects
- the idea of electric field, forces acting across the space between objects not in contact.

Skills and concepts to be developed

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Formative Assessment one:

Spellings and definitions of subject specific concepts

Formative Assessment two: (Marking point)

Read through research. Suggest variables which affect the strength of an electromagnet. Design a method to test a single variable. Draw a suitable table to collect data and comment on its validity.

Summative Assessment:

End of cycle test

This test will cover questions from this topic and previous topics to check understanding.

Link to prior learning:

KS1 and 2 – Forces and magnets

- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.
- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors.

Literacy and Numeracy:
How will high standards be promoted in this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy –
Drawing a table for data

Link Forward: Where next for learning?

KS4 GCSE Physics
Electrical current
Motors
Magnetic Fields
Generators

Y8 Science

Subject	Science
Term	Cycle 2
Duration (approx.)	11 lessons
Module	Physics—Motion and Pressure

Factual knowledge to be taught and assessed (including subject specific vocabulary)

Forces and motion

- Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only)
- Change depending on direction of force and its size.

Pressure in fluids

- Atmospheric pressure, decreases with increase of height as weight of air above decreases with height.
- Pressure in liquid, increasing with depth; upthrust effects, floating and sinking.
- Pressure measured by ratio of force over area—acting normal to any surface.

Skills and concepts to be developed:

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world and abstract ideas to develop and evaluate explanations.

Formative assessment one:

Spellings and definitions of subject specific concepts

Formative assessment two (marking point):

Describe and explain what happens in the 'collapsing can' demonstration.

Summative Assessment:

End of cycle test.

This test will cover questions from this topic and previous topics to check understanding.

Link to prior learning

KS1 and 2
Not studies formally at this stage.

Literacy and Numeracy:
How will high standards be promoted in this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy -
STI units for pressure

Link Forward: Where next for learning?

KS4 GCSE Physics

Liquid and atmospheric pressure
Speed
Velocity
Acceleration

Y8 Science

Subject	Science
Term	Cycle 2
Duration (approx.)	14 lessons
Module	Biology— Ecosystems

Factual knowledge to be taught and assessed (including subject specific vocabulary)

Relationships in an ecosystem

- The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops
- The importance of plant reproduction through insect pollination in human food security
- How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.

Skills and concepts to be developed

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Formative Assessment one:

Spellings and definitions of subject specific concepts

Formative Assessment two: (Marking point)

Design a hypothesis for an investigation.
Present results as a graph and draw a conclusion.
Explain findings using your scientific knowledge.

Summative Assessment:

End of cycle test

This test will cover questions from this topic and previous topics to check understanding.

Link to prior learning:

KS1 and 2
Living things and their habitats

- explore and compare the differences between things that are living, dead, and things that have never been alive
- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals in their habitats, including micro -habitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Literacy and Numeracy:
How will high standards be promoted in this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy –
Graph skills

Link Forward: Where next for learning?

KS4 GCSE Biology

Adaptation
Interdependence
Competition.

Y8 Science

Subject	Science
Term	Cycle 3
Duration (approx.)	12 lessons
Module	Biology— Adaptation and Inheritance

Factual knowledge to be taught and assessed (including subject specific vocabulary)

Inheritance, chromosomes, DNA and genes

- heredity as the process by which genetic information is transmitted from one generation to the next
- a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model
- differences between species
- the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation
- the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection
- changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction
- the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.

Skills and concepts to be developed

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Formative Assessment/key piece of work prior to end of unit:

Formative Assessment one:
Spellings and definitions of subject specific concepts
Formative Assessment two: (Marking point)
Carry out a survey into eye colour, present data in both table and graphical from.

Summative Assessment
End of cycle test
This test will cover questions from this topic and previous topics to check understanding.

Building Retention: What prior learning must be built upon/revisited and how will it be assessed?

- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics.
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Spelling-Punctuation-Grammar
How will you promote high standards within this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy –
Graphical representation of data

Link forward: where next for the learning?

KS4 GCSE Biology
Evolution, inheritance and variation
• the genome as the entire genetic material of an organism
• how the genome, and its interaction with the environment, influence the development of the phenotype of an organism
• the potential impact of genomics on medicine
• most phenotypic features being the result of multiple, rather than single, genes
• single gene inheritance and single gene crosses with dominant and recessive alleles
• sex determination in humans
• genetic variation in populations of a species
• the process of natural selection leading to evolution
• the evidence for evolution
• developments in biology affecting classification
10
• the importance of selective breeding of plants and animals in agriculture
• the uses of modern biotechnology including gene technology; some of the practical and ethical considerations of modern biotechnology.

Y8 Science

Subject	Science
Term	Cycle 3
Duration (approx.)	13 lessons
Module	Physics—Energy

Factual knowledge to be taught and assessed (including subject specific vocabulary)

- comparing energy values of different foods (from labels) (kJ)
- fuels and energy resources.
- changes with temperature in motion and spacing of particles.

Skills and concepts to be developed

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Formative Assessment/key piece of work prior to end of unit:

Formative Assessment one:
Spellings and definitions of subject specific concepts
Formative Assessment two: (Marking point)
Decide and justify which prevention methods a homeowner should install to prevent heat loss due to conduction, convection and radiation.

Summative Assessment

End of cycle test
This test will cover questions from this topic and previous topics to check understanding.

Building Retention: What prior learning must be built upon/revisited and how will it be assessed?

Not currently covered.

Spelling-Punctuation-Grammar How will you promote high standards within this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy –
Equations

Link forward: where next for the learning?

KS4 GCSE physics

• energy changes in a system involving heating, doing work using forces, or doing work using an electric current: calculating the stored energies and energy changes involved
• power as the rate of transfer of energy,
• conservation of energy in a closed system, dissipation
• calculating energy efficiency for any energy transfers
• renewable and non-renewable energy sources used on Earth, changes in how these are used.

Y8 Science

Subject	Science
Term	Cycle 3
Duration (approx.)	11 lessons
Module	Chemistry— Separation techniques

Factual knowledge to be taught and assessed (including subject specific vocabulary)

- the concept of a pure substance
- mixtures, including dissolving
- diffusion in terms of the particle model
- simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography

Skills and concepts to be developed

Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience. They should be encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Formative Assessment/key piece of work prior to end of unit:

Formative Assessment one:
Spellings and definitions of subject specific concepts
Formative Assessment two: (Marking point)
Answer questions about patterns displayed in a complex graph.

Summative Assessment

End of cycle test
This test will cover questions from this topic and previous topics to check understanding.

Building Retention: What prior learning must be built upon/revisited and how will it be assessed?

- compare and group materials together, according to whether they are solids, liquids or gases
- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Spelling-Punctuation-Grammar
How will you promote high standards within this module?

Literacy -
Formative test 1 – spellings and descriptions
Formative test 2 – Descriptive and comparative extended answers.
Numeracy –
graphs

Link forward: where next for the learning?

KS4 GCSE Chemistry

Separating mixtures, Fractional distillation, chromatography, Fractional distillation of oil, Chemical analysis.