



## Curriculum Planning KS3 Science

### Rationale

- Science is a fundamental part of our everyday lives. It helps to explain so much of the world around us and enables advances in many areas including health, communication, the environment and leisure.
- Students in KS3 study science for three hours per week. Students in KS3 are placed in mixed ability groups. All pupils follow the National Curriculum for science covering aspects from chemistry, physics and biology. Pupils in Y7 to Y9 follow a bespoke curriculum based on the activate scheme of work. Stem career lessons are incorporated into the science scheme of work.

### Intent

- The aims of KS3 Science at The Market Weighon School are to allow pupils to find out more about the world around them, to develop an interest and understanding of natural phenomena and prepare them for studying Science at Key Stage 4.
- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

### Pedagogical Methodology

In year 7 Students come in with varying experience of science knowledge and skills and some have developed preconceived misconception of the foundation of science. At TMWS a high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

- The KS3 curriculum is designed to suit the needs of all students at The Market weighon school. Each topic has numeracy, literacy and practical activities designed to develop all students' knowledge and key skills.
- Every lesson incorporates metacognition strategies designed with the aim of developing students' long and short term memory in relation to retrieving key scientific knowledge.

### Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop

secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

### **Literacy and Spoken language**

The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

- We have prioritised “disciplinary literacy” across the curriculum and identified the words and phrases used typically in science.
- We have identified what it means to read, write and speak like an expert science.
- We explicitly teach the etymology and morphology of words.
- We seeking out literacy misconceptions held by students.
- We have identified what the key tier 2 and 3 vocabulary is that students need to memorise and understand to succeed in each topic.
- We are developing students' ability to read complex academic texts through the super curriculum.
- We are displaying words in the presentations and explain definitions whilst students take notes or complete tasks seeking out the definitions.
- We are breaking down writing tasks using scaffolds to make sure all students can access.
- We are combining writing instruction with reading.
- We are exploring links with the same words in other subjects.
- We are providing opportunities for structured talk to develop oracy skills.

### **Scaffolding up not differentiating down**

Scaffolding refers to a method where teachers offer a particular kind of support to students as they learn and develop a new concept or skill. In the instructional scaffolding model, our teachers share new information or demonstrate how to solve a problem. The teacher then gradually steps back and lets students practice on their own. It also can involve group practice. The model of instructional scaffolding is also sometimes described as “I do. We do. You do.” In other words, the teacher shows how something is done, then the class practices together and, finally, students work individually.

## **Assessment**

At the start of year 7 and end of year 8 students complete GL assessments, this allows the science department to identify gaps in student knowledge and adapt our curriculum to ensure those gaps are filled. In Year 7, 8 and 9 students complete an assessment at the end of each unit. The assessments test students on their knowledge and understanding of the unit content as well as working scientifically. Students aim to master the unit by achieving 75% in each of the sections (Biology, Chemistry, Physics and working scientifically). All students receive feedback on the assessment and then improve areas where they under performed. If students don't master a unit they are given intervention and an opportunity to retake the assessment. At the end of KS3 students complete their final GL assessment which allows us to identify gaps for the next key stage.

## **Disadvantaged students.**

All staff are expected to respond to the needs of our most disadvantaged students. Please check the tiers and intervene accordingly. In the first incidence everyone should use Wave 1 Quality First Teaching: This emphasises high quality, inclusive teaching for all pupils in a class. High quality teaching that is challenging and well scaffolded will meet the individual needs of most children and young people including Focus First students and students with SEND. Using the Focus First strategy encourages a focus on pupils who most need our support first.

Prepare phase.

- Embedded routines waiting on corridor and meet and greet at classroom door
- Punctuality and attendance support.
- Identification of focus first pupil and seat in form room accordingly.
- Consistent Verbal praise, respect rewards and sanctions.
- Precise data collections to inform planning.
- High expectations of behaviour and work.

Purpose of the lesson.

- Objective and learning question driven lessons.
- Lessons broken down into 'chunks' to reduce strain on cognitive load.
- Planning the lesson that uncovers student's previous knowledge.
- Differentiation and scaffolding of tasks.
- Individual needs are met.
- Embedded metacognition theory amongst teachers and students.

Presenting information.

- Range of presenting strategies, discussion, text, media.
- Expert subject knowledge.
- Targeting misconceptions early.
- Inclusive questioning.
- Modelling and scaffolding.
- Provide enthusiasm and passion for subjects.

Practice knowledge.



- Students encouraged/praised.
- Engrossed in learning / on task.
- Independent, paired and group work.
- Developing discussion and debate skills.
- Teachers sharing subject passion.
- Use of strategies to aid learning e.g. concrete examples, word banks etc.

Students prove their learning.

- Adapted assessment for learning to suit learner needs.
- Pace allows for a 'no time wasted' ethos.
- Development of reading, literacy, maths and communication skills.
- Use of strategies to aid learning e.g. concrete examples, word banks.

Students ponder learning.

- Peer and Self-assessment.
- Written and verbal feedback to target improvement areas. (Focus first student prioritise first)
- Ponder Plenaries. Quizzing to check learning.
- All students meet expected targets.
- In-lesson progress checking.
- Identification of progress gaps
- Clarify misconceptions.
- Students aware of own learning and EVALUATE learning.

## **More able students.**

To provide highly able pupils with the degree of challenge that will allow them to flourish. By strategically building cognitive challenge into our teaching, pupils' learning expertise, their appetite for learning and their wellbeing will all improve.

Strategies that are used to

- Extension by resource- Using resources that are 'more challenging' than others. These include: workbooks with more complex text and/questions a tool or piece of equipment that requires more dexterity or technical expertise.
- Extension by work rate or pace - Highly Able students often think and work faster than their peers, and we need to take account of this. Those who are capable of working fast are encouraged to do so, without fear of having to complete more work than everyone else.
- Extension by dialogue - We use more difficult vocabulary and more complex language to extend More Able pupils. Challenge is extended by: effective discussion between teacher and pupil
- Extension by support - We plan our groups carefully also considering where more able students sit. Sometimes able pupils learn most productively together, sharing and extending their more developed thinking
- Extension by questioning – we ask questions that are more probing: Can you say a little more about that? Why do you think that?
- Extension by pupils own questions – Extension tasks include students thinking about what questions they can pose others in the room.

## **Numeracy**

In the Science Department we recognise the importance of Numeracy across the curriculum. For Science it would be impossible to learn, discover and share ideas and inventions without the use of Numeracy. All good scientists use these key skills on a daily basis.

- We create a positive and attractive environment that celebrates Numeracy within science.
- We ensure that all teaching staff are familiar with correct mathematical language, notation, conventions and techniques relating to science and encourage pupils to use these correctly
- We make sure Numeracy skills are taught consistently and systematically through and across the science curriculum. To facilitate this, teachers of science to refer and follow the TMWS Numeracy Policy 1.8.
- We are aware of appropriate expectations of pupils and difficulties that might be experienced with numeracy skills.
- We have Numeracy embedded throughout the science curriculum
- We communicate with the mathematics department to map out and link both curricula to ensure teachers of both subjects use correct terminology and have suitable expectations of ability and knowledge of students so that teachers are equipped to deal with numeracy issues in their subject both generically and specifically.
- We encourage after completing calculations, they should be asked to consider whether their answer is reasonable in the context of the question.
- We encourage students to show method working to discourage students from writing answers only and encourage them to show numerical working within the body of their work.
- We make sure that all learners should be helped using modelling to understand the method they are being asked to use or being taught - they are then more likely to be able to transfer this method and remember it rather than learning by rote.

## **Metacognitive Strategies**

Research by the Education Endowment Foundation has found that metacognition is key to effective pupil learning: it can add up to seven months of additional learning, and improve the outcomes of disadvantaged learners. The strategies we are implementing in the science department are:

- We are actively trying to teach students metacognitive strategies, including how to plan, monitor, and evaluate their learning.
- We model our own thinking to help students develop their metacognitive and cognitive skills.
- We set an appropriate level of challenge to develop students' self-regulation and metacognition.
- We are actively trying to promote and develop metacognitive talk in the classroom;
- We are getting more students how to organise, and effectively manage their learning independently.
- We continue to use of Google Classroom for any students to catch up any missed work

- We use lessons for DIT covering parts of the topic that need readdressing.
- We encourage students in good homework habits and the use of Epraise
- We have good communication with parents using Epraise

## **Foundation Learning**

Students in the foundation learning groups follow the KS3 curriculum which is bespoke adapted curriculum to suit each student's individual needs and is taught by a specialist SEND science specialist teacher. Students in the foundation learning group have the same opportunities for literacy, numeracy and practical opportunities as students in mainstream education.

## **Sequencing the content**

Working from the The Best Evidence Science Teaching (BEST) research evidence on learning pathways and on effective sequencing of ideas to develop our curriculum planning. It presents a possible route for progression through a five-year curriculum in chemistry and Earth science for age 11-16.

'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Teachers should feel free to choose examples that serve a variety of purposes, from showing how scientific ideas have developed historically to reflecting modern developments in science. Pupils should develop their use of scientific vocabulary, including the use of scientific nomenclature and units and mathematical representations.

## **Key knowledge and skills learned by the end of year 7**

### **Year 7 Topic 1, 'Working scientifically' then recurring throughout all topics)**

- pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility
- understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review
- evaluate risks.
- ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
- make predictions using scientific knowledge and understanding
- select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate
- use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety
- make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements
- apply sampling techniques.



- apply mathematical concepts and calculate results
- present observations and data using appropriate methods, including tables and graphs
- interpret observations and data, including identifying patterns and using observations,
- measurements and data to draw conclusions
- present reasoned explanations, including explaining data in relation to predictions and
- hypotheses
- evaluate data, showing awareness of potential sources of random and systematic error
- identify further questions arising from their results.
- understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature
- use and derive simple equations and carry out appropriate calculations
- undertake basic data analysis including simple statistical techniques.

## **Year 7 Topic 2, cells**

- cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope
- the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts
- the similarities and differences between plant and animal cells
- the role of diffusion in the movement of materials in and between cells
- the structural adaptations of some unicellular organisms

## **Year 7 Topic 3 'Levels of Organisation'**

- the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. the structure and functions of the human skeleton, to include support, protection, movement and making blood cells
- biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles
- the function of muscles and examples of antagonistic muscles.

## **Year 7 Topic 4 'Reproduction'**

- reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta
- reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms

## **Year 7 topic 5, 'Particles'**

- the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure



- changes of state in terms of the particle model.
- diffusion in terms of the particle model
- conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving
- similarities and differences, including density differences, between solids, liquids and gases
- diffusion in liquids and gases driven by differences in concentration
- the difference between chemical and physical changes.
- the differences in arrangements, in motion and in closeness of particles explaining
- changes of state, shape and density, the anomaly of ice-water transition
- energy in matter
- changes with temperature in motion and spacing of particles
- internal energy stored in materials.

## **Year 7 topic 6 'Elements and compounds'**

- a simple (Dalton) atomic model
- atoms and molecules as particles.
- differences between atoms, elements and compounds
- chemical symbols and formulae for elements and compounds
- conservation of mass changes of state and chemical reactions.

## **Year 7 topic 7 'Chemical reactions'**

- chemical reactions as the rearrangement of atoms
- representing chemical reactions using formulae and using equations
- combustion, thermal decomposition, oxidation and displacement reactions
- energy changes on changes of state (qualitative)
- exothermic and endothermic chemical reactions (qualitative).

## **Year 7 topic 9, 'Forces'**

- forces as pushes or pulls, arising from the interaction between two objects
- using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces
- forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water
- forces measured in newtons, measurements of stretch or compression as force is changed
- force-extension linear relation; Hooke's Law as a special case
- non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity.
- Pressure in fluids
- opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface.

## **Year 7 topic 10, 'Magnets and electromagnets'**

- 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)

### **Year 7 Topic 11, 'Energy'**

- Calculation of fuel uses and costs in the domestic context
- comparing energy values of different foods (from labels) (kJ)
- comparing power ratings of appliances in watts (W, kW)
- comparing amounts of energy transferred (J, kJ, kW hour)
- domestic fuel bills, fuel use and costs
- fuels and energy resources.
- energy changes and transfers
- 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
- other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.
- changes in systems
- energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change
- comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures, using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes.
- work done and energy changes on deformation

## **Key knowledge and skills learned by the end of year 8**

### **Year 8 Topic 13 'Health and Lifestyle'**

- 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)
- the importance of bacteria in the human digestive system
- the impact of exercise, asthma and smoking on the human gas exchange system
- the effects of recreational drugs (including substance misuse) on behaviour, health and life processes.

### **Year 8 Topic 14 'Ecosystem processes'**



- plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.
- the structure and functions of the gas exchange system in humans, including adaptations to function
- the mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume
- the role of leaf stomata in gas exchange in plants.
- the reactants in, and products of, photosynthesis, and a word summary for photosynthesis
- the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere
- the adaptations of leaves for photosynthesis.
- aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life
- a word summary for aerobic respiration
- the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration
- the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism.
- 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.

## **Year 8 topic 8 'Acids and Alkalis'**

- defining acids and alkalis in terms of neutralisation reactions
- the pH scale for measuring acidity/alkalinity; and indicators
- reactions of acids with metals to produce a salt plus hydrogen
- reactions of acids with alkalis to produce a salt plus water

## **Year 8 Topic 16, '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.

## **Year 8 topic 17, 'separation technique'**

- the concept of a pure substance, mixtures, including dissolving

- simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography
- the identification of pure substances.

### **Year 8 topic 18 'Materials'**

- the order of metals and carbon in the reactivity series
- the use of carbon in obtaining metals from metal oxides
- properties of ceramics, polymers and composites (qualitative).

### **Electricity (Year 8 topic 20, 'electricity')**

- 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 only).

### **Year 8 topic 21, 'Motion and pressure'**

- describing motion
- speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)
- the representation of a journey on a distance-time graph
- relative motion: trains and cars passing one another.
- 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.
- simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged
- atmospheric pressure, decreases with increase of height as weight of air above decreases with height
- pressure in liquids, increasing with depth; upthrust effects, floating and sinking
- pressure measured by ratio of force over area – acting normal to any surface.
- balanced forces
- moment as the turning effect of a force

### **Year 8 topic 12, 'Space'**

- gravity force, weight = mass x gravitational field strength (g), on Earth  $g=10$  N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only)
- 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.

## **Key knowledge and skills learned by the end of KS3**

### **Year 9 topic 15 'Inheritance'**

- 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.

### **Year 9 topic 19 'Earth and atmosphere'**

- the composition of the Earth
- the structure of the Earth
- the rock cycle and the formation of igneous, sedimentary and metamorphic rocks
- Earth as a source of limited resources and the efficacy of recycling
- the carbon cycle
- the composition of the atmosphere

the production of carbon dioxide by human activity and the impact on climate

### **Year 9 topic 22 'Sound'**

- waves on water as undulations which travel through water with transverse motion;
- these waves can be reflected, and add or cancel – superposition.
- frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound
- sound needs a medium to travel, the speed of sound in air, in water, in solids
- sound produced by vibrations of objects, in loud speakers, detected by their effects on
- microphone diaphragm and the ear drum; sound waves are longitudinal
- auditory range of humans and animals.



- pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound waves transferring information for conversion to electrical signals by microphone.

## Year 9 topic 23 'Light'

- the similarities and differences between light waves and waves in matter
- light waves travelling through a vacuum; speed of light
- the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface
- use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of
- light and action of convex lens in focusing (qualitative); the human eye
- light transferring energy from source to absorber leading to chemical and electrical
- effects; photo-sensitive material in the retina and in cameras
- colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.

## Long term planning grid

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7 Rotation A	7 F & 7S T1 T2	7 F & 7S T9 T5 T3	7 F & 7S T3 T10 T6	7 F & 7S T6 T4	7 F & 7S T4 T11	7 F & 7S T7
7 Rotation B	7P & 7R T1 T5 T2	7P & 7R T2 T9 T6	7P & 7R T6 T3 T10	7P & 7R T10 T7 T4	7P & 7R T4 T11	7P & 7R T11
7 Rotation C	7L & 7A T1 T9	7L & 7A T9 T5 T2 T10	7L & 7A T10 T6 T3	7L & 7A T3 T11	7L & 7A T11 T7 T4	7L & 7A T4
8 Rotation A	8S & 8P T13 T20	8S & 8P T8 T14	8S & 8P T14 T21 T16 T24	8S & 8P T24 T12	8S & 8P T17 T18	8S & 8P T18
8 Rotation B	8R & 8F T8 T13	8R & 8F T13 T20 T16	8R & 8F T14 T21 T17	8R & 8F T17 T18	8R & 8F T18 T24	8R & 8F T12
8 Rotation	8L T20	8L T13	8L T16	8L T12	8L T17	8L T24



C	T8	T21	T14 T12	T17	T18 T24	
9 Bio	Biology T15 KS3	Bio GCSE T15 KS3	GCSE	GCSE	GCSE	GCSE
9 Chem	Chemistry T19 KS3	Chem T19 KS3	GCSE	GCSE	GCSE	GCSE
9 Physics	Physics T22 KS3	Phys T23 KS3	GCSE	GCSE	GCSE	GCSE

## Short Term planning

The 6 part lesson layout of the 6 'P's is based on the principles laid out by Rosenshine (2012) incorporated into our practice, would substantially increase the quality of teaching and learning, improving outcomes for all students.

The 6'P's follow the familiar format to Rosenshine's principles

**Prepare** - Begin the lesson with a review of previous learning.

**Purpose** - Present new material in small steps.

**Present** - Ask a large number of questions (and to all students) and provide models and worked examples.

**Practice** - Practice using the new material and check for understanding frequently and correct errors.

**Prove** - Independent practice and provide scaffolds for difficult tasks

**Ponder** – Reviews work

## Prepare Activities

Checking and repairing prior knowledge is the first stage of learning. Without the prior knowledge, the new learning can't be understood and leads to recall as vaguely 'remembered'. Establishing the level of knowledge leads to the use of other effective methods, such as using analogies, to link the new learning to things which are already known. What strategies are we using?

1. Titles are coded so that can be referenced by students can use books to self-reflect and retrieve information
2. Different tasks that Focus on tier 3 key words and previous knowledge recall
3. Questions are spaced out, interleaved allowing student to use retrieval practice to look through previous work in book.
4. A learning journal allows students to be more reflective to record areas of improvement from the prepare activities
5. The revision lesson prepare activity allows students to recall level 3 key words throughout the topic
6. Some lessons that use an image to capture interest the interactive slides contain metacognitive questions to improve reflective thinking



7. General prepare activities - Recap questions, Define 5 tier 3 keywords, What am I?, Finish the sentences, Match the keywords, Anagram with clue, What is the picture?, Write questions to the keywords, True false quiz, Sketch me, Articulate, Review video, Kahoot.

## **Purpose**

Clear and specific lesson objectives and outcomes, teamed with effective checks for understanding and modifying instruction as needed, allow for students to know where they are going and when they have arrived. Students may want to know why they are spending time in school learning this. At this stage student can be asked if they understand the significance and real-world application of the concepts being taught. What strategies are we using?

1. Learning question displayed to be recorded into books.
2. Levelled outcomes displayed for students to reflect on what they may achieve in the lesson.
3. Tier 3 keywords displayed to be used throughout the lesson
4. Interactive metacognitive questions to engage student in reflective thinking on why this lesson is done and linked to real world application.

## **Present**

Presentation of the new learning by either teaching, or the students reading a textbook or watching a video, or the students watching a demonstration. The retention at this stage is about 5%, and it varies: some students learn a lot, whereas others learn nothing. What strategies are we using?

1. Improving presentation of student notes by using Cornell note taking. The note taking layout is shown on the slides and using example modelled worksheets
2. Using presentation slides that includes video clips, text, graphical and multi-sensory methods to engage students
3. Making sure the Tier 3 keywords are explicitly showed, discussed, and written in exercise books.
4. Making Links to prior knowledge and ideas that are more abstract linking it to more concrete examples
5. A interactive tackling misconception statement slide with metacognitive questions to be discussed
6. Presenting short pieces of new information recognising the limits of working memory. a strategy used to reduce the cognitive load as the learner processes information e.g. Exploring one idea at a time, one equation, skill to develop.
7. Asking a large number of questions and check for understanding. - Questions are the most powerful tool, they can highlight misconceptions, keep a lesson flowing and challenge students to think deeper into a subject. The greatest value of questioning though is that they force students to practice retrieval, this strengthens and deepens memory. Methods we use -Cold calling, Class vote, ABC, Brainstorming, Think-pair-share, Discussing images and text, Misconception, reflective questions on student's ideas.
8. Using more time to provide explanations. – Depending on the class you may need to readdress a particular area. Ideas - using students who have understood as experts to explain to others. We have extension work ready to

allow some students to move on but we can go over the material again for students 'who have struggled'

9. When presenting video, making sure students have a question sheet to take active notes.

### **Practice**

In this part of the lesson, the students become involved. Teachers and assistants get involved in helping students put into practice what they've learned. We use modelling, practical work, group or cooperative learning activities. We monitor and observe students, giving direction and over-come issues student have. The lessons are designed to model what we expect from students and lead student through each activity. What strategies are we using?

1. Using a diverse range of activities from practical, modelling, card sorts, research tasks, comprehension tasks, market places, circus activities. Making sure we use scaffolding up strategies and not differentiating down. Method of scaffolding - Print out of slides, checklists, cue cards, writing frames Show and Tell, Tap into individual prior knowledge, Student verbally giving ideas, Using visual aids, Vocabulary sheets, Giving more 'think' time.
2. Guiding students as they begin to practice. - The scaffolds can then be gradually removed as their competency grows. Teachers also anticipate commonly made errors and build tools into the scaffold tasks that reduce the chances of students making the same mistakes.
3. Using interactive metacognitive question slides to encourage reflective thinking. This slides are used for preparing for a task or practical and for writing conclusions.
4. Using 'Think aloud' and model steps. It allows teachers to diagnose students' strengths and weakness. Methods we use - The think-aloud strategy asks students to say out loud what they are thinking about when reading, solving problems, or simply responding to questions posed by teachers or other students. It allows teachers to diagnose students' strengths and weakness.
5. Providing a high level of active practice for all students. Concentration limit may dip between 10 and 20 minutes, Active learning promotes recall and deeper understanding of material, as students are engaging with the content rather than simply listening to it. What methods we use –; Question practice, reading, worksheets, news article, a particular skill.
6. Providing many examples - Delivering new information to students by linking it to something or some process they are familiar with allows students to gain an understanding quicker, it also gives them deeper retention. This is especially true of more conceptual ideas. Method we use – Short YouTube clips, images, text, news articles.
7. Providing models of worked-out problems. By working through a problem with students, modelling thinking and decision making at all points, students are made aware of the thought processes that we go through in order to solve it, thus reducing cognitive load. What we use- previous exam questions and answers
8. Checking the responses of all students. Assess whether the students can move on to more independent work Methods we use - hand up, white boards, Votes, asking a range of students





9. Each task has answers for quick feedback and self-assessment
10. Reteach material when necessary. – Depending on the students' responses, the teacher then can decide on whether any parts of the new information needs re-teaching.

## **Prove**

The students' have an opportunity work independently on what we have led them to in the input and guided practice parts of the lesson. This is a self, peer or teacher assessed challenging task. The aim our tasks is to exercise the pathways which connect the new material and the existing prior knowledge, so that the new learning goes into the long term memory. Our judgement of our students' prior knowledge is key in helping us to set an appropriate challenging task and therefore at this stage we have differentiated help sheets and extension work to go with the task. What strategies are we using?

1. Literacy questions to improve students extended responses to focussed questions.
2. Preparing students for independent activity. - Students should be competent in the task and therefore can practice the task independently. This repetition of the task will promote a deeper fluency. What we use – Series of questions, Exam question, extending writing, newspaper article, storyboard, showing a practical skill, Drawing, Conclusion, etc
3. Monitoring students when they begin independent activities. - Monitoring students' work in the classroom has been recognized as one of the key factors for successful teaching since only a good real-time assessment enables the teacher to give proper and timely feedback. What we do – Working around group, having target groups, Use of TA, Asking to see a sample of work, live marking
4. Challenging questions that are all peer or self-assessed answers
5. Numeracy focussed questions
6. Scaffolding tasks that include extension and help sheets

## **Ponder**

Using a range time-efficient strategies to give effective feedback. What strategies are we using?

1. Every written question has answers to go with it for effective feedback
2. Every literacy or numeracy assessments has success criteria.
3. Question slide/sheet has been assigned to self-assessment, peer assessment or teacher assessment so that the type of assessment is fairly assigned
4. The use of interactive metacognitive questioning slides in literacy tasks to encourage reflective thinking skills
5. Outcome slide shared again so students can reflect on what they have reached
6. The use of 'ponderwall'- interactive metacognitive questions wall to finish the lesson on reflecting on it.
7. Revision lessons have the 'ponderwall' revision metacognitive questions for student to engage in reflecting on their revision strategies
8. On test lessons there is an end of topic metacognitive reflective questions to reflect on how they have learned the topic.
9. Providing systematic feedback and corrections. To provide students with successes and gaps in their knowledge and addressing it. What we use -



Asking students to share answers, Self and Peer assessment (success criteria or solutions needs to be shared) Marking work (including SPAG) WWW, EBI, Whole class feedback sheet, Writing specific target question.

10. Asking students to explain what they have learned and how they have learned. Helping students “think about their thinking” is an important tool in helping them master course content as well as improve their strategies for learning. There are a number of approaches from simple to complex helping students acquire skills in “metacognition.” What we use – Ponderwall, Show hands, Ask sample students.

## **Repetition**

We value repetition as an essential aspect to secure the new learning as long-term memories. The repetitions tasks such as homework, half termly quizzes, end of topic revision and tests. What strategies are we using?

1. Homework activities are shared on Google classroom via epraise. Teachers have a selection of appropriate activities to set.
2. Starter (prepare) activities that have 5 level 3 keywords questioned in different ways that have been spaced and interleaved throughout the lessons
3. End of topic revision tasks, each revision lesson has a different task that encourages retrieval practice all with practice questioning.

## **DIT Lessons.**

A lesson dedicated after each end of topic test for students to reflect using their learning journals on their test answers and areas of strengths and weaknesses. Students fill out a Frayer model. This is a graphic organizer that helps students determine or clarify the meaning of vocabulary words encountered within the topic. It is also used to discuss and practice questions from the end of unit test.

## **Online learning platform**

The use of google classroom will:

- Enable students to have access to every lesson taught to consolidate learning.
- Pre topic quizzes to help analyse gaps in learning
- Students who are absent from the lesson not to miss lesson content
- End of topic practice quiz assignments
- A copy of any handed out homework if they misplace it
- Access to tutorial video clips for each lesson
- Access to revision material, past papers, revision strategies to prepare for assessment
- Allowing students to consolidate soft skills such as time management, organising revision, use of IT.

The use of GCSEpod for year 9 onwards allows student to access to have short videos on each lesson followed by short quiz and long exam type questions.

## **BAME in Science**

In the 2020 Biochemist journal titled BAME scientists: the hidden pioneers? Hanshikaa Shyamsundar questions why then is there still a lack of Black, Asian and minority ethnic (BAME) representation within Science, Technology, Engineering and Mathematics (STEM)?

Therefore In our science curriculum it is important that we provide an opportunity to feature the stories and voices of black scientists, engineers and mathematicians in the context of their science instruction. Helping students see the possibilities of careers in STEM fields means providing them with diverse role models. When students are educated to respect or appreciate the fact that people of BAME origin have always made good and valuable contributions to society. The value of teaching this is relevant to all students in their learning, development and in building a sense of identity and respect. Presentation of BAME pioneers have been produced and placed in appropriate topics.

- Y8 Sound topic - James E. West invention of the foil electret microphone, now the most commonly used microphone in the world.
- Y7 Space topic Katherine Johnson trailblazing mathematician whose work at NASA was critical for the first U.S. Crewed space missions, including the first moon landing
- Y7 Space topic - Christine Darden skilled mathematician, data analyst and aeronautical engineer. After working at NASA for over 40 years.
- Y7 How science works topic Annie Easley (1933-2011) was a "human computer," a computer scientist, an applied mathematician and a career NASA researcher.
- Y7 Organisation topic Rebecca Lee Crumpler (1831-1895) First African American woman to earn a medical degree.
- Y8 Health and lifestyle topic Marie M. Daly (1921-2003). While earning her Ph.D., Daly studied how compounds produced by organs such as the pancreas contribute to digestion
- Y7 working scientifically topic Dorothy Vaughn (1910-2008) Dorothy Vaughn, a skilled mathematician and "computer," became NASA's first Black manager
- Y7 Forces topic Mary Jackson (1921-2005) NASA's first Black female engineer
- Y7 Reproduction topic Ernest Everett Just (1883–1941) American biologist who conducted pioneering research in cell physiology, embryonic development and fertilization.
- Y7 Space topic Mae C. Jemison (born 1956) first African American woman to reach space
- Y7 Space topic Benjamin Banneker (1731-1806) successfully predicted the solar eclipse that occurred on April 14, 1789 SPACE

### **Super Curriculum.**

In science, we want to give students every opportunity to develop their love of learning. We have developed a Science Super Curriculum which provides students with a range of suggested activities that take their regular curriculum further. These activities take the student beyond what their teacher has taught them in the classroom.

These activities can take many forms including watching videos, completing individual, visiting museums or their websites and reading online articles with complementary quizzes.

Engaging in super curricular activities enables students to develop specialist knowledge in areas that already seize their interest, but it can also inspire curiosity about areas previously unknown and unventured.

All students need to do is click on the link browse which activity you may want to do. If students complete the articles, there is a short comprehension quiz to have a go



at. Students tell their teacher that you have completed it and collect the topic stickers!

There are multiple activities to achieve the relevant topic sticker. Each science teacher may add an extra opportunity in a particular topic that will be set on Epraise.

## Medium Term Planning

Topic	Big Questions	Lesson	Key Knowledge and Skills / Assessment	Links to other subjects
Unit 1 How science works	What hazards do we have in a laboratory?	1	<ul style="list-style-type: none"> <li>Hazard label – Questions to answer</li> <li>Circle on your sheet any hazards you see or things students are doing wrong</li> <li>Tackling Misconceptions: Its OK to drink and eat in the lab</li> <li>Presentation – Safety in the lab</li> <li>Activity: 1. Name as many pieces of equipment below, give uses of 3.</li> <li>Think pair share QUESTION: Why are symbols so good for communicating information?</li> <li>Activity: Use the words below to label each symbol</li> <li>Prove - Activity: Match the symbols to different situations. Self assessed</li> </ul>	
	What the variables that make up a scientific question ?	2	<ul style="list-style-type: none"> <li>Retrieval starter - Complete the quick questions.</li> <li>Tackling misconceptions - Science facts that we know today can never change</li> <li>Presentation – What scientist question.</li> <li>Task: What scientific questions could we ask from these pictures? Write your own down. Peer assessed</li> <li>Presentation – Vague questions</li> <li>Task: What scientific questions could we ask from these pictures? Write your own down. Peer assessed</li> <li>Presentation – what are variables</li> <li>Activity: Using your knowledge of variables write down the different variables for this investigation below.</li> <li>Prove – Complete the worksheet questions. Peer assessed</li> </ul>	Maths
	What are the components	3	<ul style="list-style-type: none"> <li>Retrieval starter - Complete the quick questions. <i>What are the independent</i></li> </ul>	Maths



	of a scientific investigation		<p><i>and dependent variables of these 3 investigations?</i></p> <ul style="list-style-type: none"> <li>• Presentation – Parts of an investigation</li> <li>• Activity: From what you have learnt today describe in order what must go into a scientific investigation plan</li> <li>• Presentation – Precise and accuracy</li> <li>• Activity: For each target comment on whether it is accurate or precise</li> <li>• Presentation – Risk assessment</li> <li>• Activity: Broken glass is another hazard. Write a risk assessment row into your book</li> <li>• Prove: literacy 6 marker – peer assessment</li> </ul>	
	What are the components and function of the Bunsen burner.	4	<ul style="list-style-type: none"> <li>• Retrieval starter – Matching keywork to definition</li> <li>• Activity: Watch this video and make some notes about who created the Bunsen burner.</li> <li>• Task: Label your Bunsen as the teacher shows you the parts</li> <li>• Presentation – fire triangle</li> <li>• Activity: Explain to your friend why when you open the air hole fully on a Bunsen burner the flame becomes hotter.</li> <li>• Activity – Using Bunsen – burning magnesium.</li> <li>• Prove – Questions – self assessment</li> </ul>	
	How data is recorded in science.	5	<ul style="list-style-type: none"> <li>• Retrieval starter – Starter: Calculate the mean for the set of results Mini Quiz Review: below (add each test for the type of flame and divide by 3)</li> <li>• Presentation – types of data.</li> <li>• Write the numbers 1 □ 5 and the letter C for continuous, D for discrete and G for categorical for the answer.</li> <li>• Presentation – anomalies.</li> <li>• Activity: Answer these quick questions</li> <li>• Presentation – Types of graph</li> <li>• Activity – graph results</li> <li>• Prove – Literacy 6 marker teacher assessment.</li> </ul>	Maths
	How do we Interpret data to draw a conclusion	6	<ul style="list-style-type: none"> <li>• Retrieval starter – Starter: Answer these three review questions below.</li> <li>• Presentation – analyzing data</li> </ul>	Maths



			<ul style="list-style-type: none"> <li>• Think pair share - Activity: Look at the data below, can you work out what it is telling us?</li> <li>• Presentation – what graphs show.</li> <li>• Task: Can you put a line of best fit onto my graph? What do you have to remember?</li> <li>• Activity: On your worksheet first plot the points onto graph one. Then add you line of best fit with your ruler.</li> <li>• Presentation – Relationships from graphs</li> <li>• Prove - Activity: On your worksheet first plot the points onto graph two. Then add you line of best fit with your ruler.</li> </ul>	
How do we evaluate data.	7	<ul style="list-style-type: none"> <li>• Retrieval starter – What is my scientific name?</li> <li>• Presentation – Two steps to evaluating</li> <li>• Activity: 1. Find the outliers that are for each question</li> <li>• Activity: Watch this video. Think of ways that this experiment could be improved</li> <li>• Presentation – types of error.</li> <li>• Prove - Activity: Match the keyword on the left to the meaning on the right.</li> </ul>	Maths	
	8	<ul style="list-style-type: none"> <li>• Retrieval starter – Where can you find me?</li> <li>• Think pair share – why do people chew gum?</li> <li>• Watch the video again. See if you can identify the variables in the experiment.</li> <li>• Prove – Writing out an investigation on holding heavy books.</li> <li>• Self assessment questions.</li> </ul>	Maths	
What is the role of an architect?	9	Job role, attributes and qualifications needed.	STEM	
Revision	10	Use metacognition strategies – Planning an investigation		
Test	11	End of topic test		
DIT	9	Reflecting using journals on QLA, completing Frayer model		



Unit 2 Cells	What are the parts of the microscope?	1	<ul style="list-style-type: none"> <li>• Biology retrieval starter Answer the 5 questions.</li> <li>• Misconception discussion on cells smaller than atoms?</li> <li>• Presentation on what living things are made from, Robert Hooke and how microscopes work.</li> <li>• Video and questions on worksheet - how to use a microscope</li> <li>• Model and practice questions on magnification</li> <li>• Practical on preparing onion cell.</li> <li>• Prove questions on comparing microscopes 6 mark literacy - Self assessment</li> </ul>	
	What makes up an animal cell?	2 + 3	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What am I.</li> <li>• Misconception discussion on cells are flat?</li> <li>• Video – students to name all the organelles</li> <li>• Presentation- What is inside a cell</li> <li>• Discussion question on similarities and difference between the two models.</li> <li>• Comprehension task on both type of cell.</li> <li>• Information gathering task on finding out the functions of each organelle</li> <li>• Practical on cheek cell slide</li> <li>• Team work poster on both cells</li> <li>• Prove- 6 mark literacy on cell differences - Teacher assessed.</li> </ul>	
	What does a Cancer researcher need to specialize in?	3 b	<ul style="list-style-type: none"> <li>• Video – question what they are seeing, Discuss that models are used to help learn parts that we cannot see.</li> <li>• Misconception discussion on Research into cells is pointless. What has cancer research done?</li> <li>• Presentation on Cancer researchers need to be experts in cell structure You are going to be an expert in a plant cell</li> <li>• Discussion questions on cancer researcher role</li> <li>• Activity on - You are going to build your own show box cell</li> <li>• Students vote for the best show box cell</li> <li>• Prove questions on labels and function of each part.</li> </ul>	STEM



How are different cells adapted to their function?	4	<ul style="list-style-type: none"><li>• Biology retrieval starter – What is it?</li><li>• Discussion question on what is specialised and what is a specialised cell?</li><li>• Presentation- on the different cells</li><li>• Video – students to note as many different cells and functions as possible</li><li>• Misconception discussion on Root hair cells suck water in with that straw like appendage</li><li>• Activity Information gathering task on finding out the functions of each cell and adaptations.</li><li>• Prove- Exam style questions – Peer assessment</li><li>• Job advert plenary.</li></ul>	
How do substances move in and out of cells?	5	<ul style="list-style-type: none"><li>• Biology retrieval starter – What is my scientific name.</li><li>• Misconception discussion on Cell's cell membrane is like the outside of a rubber ball</li><li>• Presentation- What enters and is waste to a cell</li><li>• Task – students to draw cell and the substances that are absorbed and released</li><li>• Presentation- Diffusion modelling</li><li>• Task – student to write definition</li><li>• Activity – Drawing and labelling stages of diffusion.</li><li>• Think pair share on how diffusion rate can be changed</li><li>• Practical on diffusion of a tea bag – students draw and describe observation.</li><li>• Conclusion question</li><li>• Summary paragraph.</li><li>• Prove- 6 mark literacy on cell differences – Peer assessment</li></ul>	
What are unicellular organisms?	6	<ul style="list-style-type: none"><li>• Biology retrieval starter – What is the picture</li><li>• Misconception discussion on There are only 2 types of cell- plant and animal cells</li><li>• Presentation- What is an amoeba?</li><li>• Task – Describing structure, feeding and reproduction in amoeba and euglena</li></ul>	





			<ul style="list-style-type: none"> <li>• Prove- Summary blanks</li> <li>• Keyword bingo.</li> </ul>	
	Revision	7	Use metacognition strategies.- Retrieval circus	
	Test	8	End of topic test	
	DIT	9	Reflecting using journals on QLA, completing Frayer model	
Unit 3 Organi sation	What is the relationship between cells, tissues, organs and organ systems?	1	<ul style="list-style-type: none"> <li>• Biology retrieval starter – 5 quick questions</li> <li>• Misconception- Organisms grow because cells get larger</li> <li>• Presentation- multicellular organisms</li> <li>• Task – Put different parts of the body into order of size. – Self assessment</li> <li>• Task questions - How is the body organized?</li> <li>• Task: Brainstorm in your books different examples of organ systems in the human body – self assessment</li> <li>• Task: From the selection of organs below select the ones you think make up the following organ systems: - self assessment</li> <li>• Task: Match each of the following organ systems to their function: - self assessment</li> <li>• Task: 1. Fill in the blanks using the following key words:</li> <li>• Task 2 – Match the name of the cells/tissue/organ to the images – self assessment</li> <li>• Prove- self assessment 6 marker literacy</li> </ul>	PE
	How are the lungs adapted for breathing?	2	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What am I?</li> <li>• Presentation- What happens when we breathe in.</li> <li>• Activity – memory game – how many labels can student remember after 3 minutes</li> <li>• Task – Video with question – self assessment</li> <li>• Think pair share – Why do we breathe in and out?</li> <li>• Presentation on keeping the lungs clean</li> <li>• Prove - Complete the worksheet on the composition of inhaled and exhaled air</li> </ul>	PE



What changes to the body happen during breathing?	3	<ul style="list-style-type: none"> <li>• Biology retrieval starter – Define 5 keywords?</li> <li>• Presentation- How do you breathe</li> <li>• Task – Video with question – self assessment</li> <li>• Task: Complete the cartoon strip to demonstrate what happens to the lungs during inhalation and exhalation</li> <li>• Demo – Bell jar</li> <li>• Presentation – How do we measure lung volume/Comparing composition of air</li> <li>• Prove - Complete the worksheet – Self assessment</li> </ul>	PE
What the parts and function of the human skeleton?	4	<ul style="list-style-type: none"> <li>• Biology retrieval starter – Match the key word to definition</li> <li>• Task – watch video label bones.</li> <li>• Presentation – what are bones</li> <li>• Think pair share function of skeleton</li> <li>• Task – fill gaps to the sentences</li> <li>• Task: Read the information sheet and answer the following questions:</li> <li>• Prove literacy 6 marker – Teacher assessed</li> </ul>	PE
How do joints help us move	5 a	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What is it?</li> <li>• Presentation – Type of joints</li> <li>• Task – Link the type of joint to the example</li> <li>• Task: Read information sheet about the tissues found within a joint complete the summary table using the information.</li> <li>• Task – Match the part to their function</li> <li>• Prove – Wordsearch work out the words to fill it – Peer assessment</li> </ul>	PE
What is the role of a chemical engineer?	5 b	Job role, attributes and qualifications needed. Make glue	
what is the role of a quality assurance technician	5 c	Job role, attributes and qualifications needed. test glue	
How do muscles work	6 a	<ul style="list-style-type: none"> <li>• Biology retrieval starter – Decode the title</li> </ul>	PE



	together to help us move?		<ul style="list-style-type: none"> <li>• Task – recap – keyword match</li> <li>• Task – Brainstorm major muscle groups</li> <li>• Task: Label the diagram of the body to identify the different muscles and then match the muscle group to the correct function – Peer assessment</li> <li>• Presentation – Antagonistic</li> <li>• Task: Copy and complete the sentences on muscles</li> <li>• Presentation how the upper arm moves</li> <li>• Student model it.</li> <li>• Investigation into muscle fatigue then conclude as group</li> <li>• Prove – Progress check questions - Peer assessment</li> </ul>	
	What is role of a physiotherapist?	6 b	<p>Job role, attributes and qualifications needed.</p> <p>Make a model of muscles in the arm.</p>	
	Revision	7	Use metacognition strategies.Creating flash cards	
	Test	8	End of topic test	
	DIT	9	Reflecting using journals on QLA, completing Frayer model	
Unit 4 Reproduction	How are the gametes adapted to aid reproduction ?	1	<ul style="list-style-type: none"> <li>• Biology retrieval starter – 5 quick questions</li> <li>• Activity – Video sperm and egg, Students fill in worksheet 1 – answers then continue video for worksheet 2</li> <li>• Misconception discussion on sperm are males and eggs are females</li> <li>• Presentation- Watch clip students take notes on features and function of both sperm and egg</li> <li>• Thank pair share - Why would egg wall hardening affect fertility?</li> <li>• Activity worksheet label both gametes</li> <li>• Prove- self assessment questions on sperm and egg adaptations and function</li> </ul>	
	What are the functions of the parts of the sex organs	2	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What am I?</li> <li>• Misconception discussion In all organisms sexual intercourse is used to reproduce</li> <li>• Presentation- Function of both male and females reproductive organs</li> </ul>	



		<ul style="list-style-type: none"> <li>• Task – Video students label the structure of the female reproductive system.</li> <li>• Task – Video students label the structure of the male reproductive system.</li> <li>• Task – Student draw heading in book and sort functions of each part.</li> <li>• Task – Progress questions.</li> <li>• Prove- Matching the part to the function worksheet - Peer assessment</li> </ul>	
How does fertilisation occur?	3	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What am I?</li> <li>• Misconception discussion on Fertilisation occurs in the vagina</li> <li>• Presentation- What are gametes how do animals reproduce sexually</li> <li>• Task – Connect use keywords to provide definition of each</li> <li>• Presentation- What happens during intercourse</li> <li>• Progress check – self assessment</li> <li>• Activity – Video students complete a cartoon strip of fertilisation</li> <li>• Prove- 6 mark literacy on job description a gametes – self assessment</li> </ul>	
How does the foetus develop in the uterus?	4	<ul style="list-style-type: none"> <li>• Biology retrieval starter – keyword match</li> <li>• Misconception discussion on the mothers blood passes through the placenta.</li> <li>• Presentation- Placenta function</li> <li>• Task – students match days to picture of gestation period</li> <li>• Think pair share advice to a midwife</li> <li>• Task – Students answer questions on worksheet using information around the room – Peer assessed</li> <li>• Prove- 12 question squares– Peer assessment</li> </ul>	Child development
How does lifestyle choices effect a foetus?	5	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What is it?</li> <li>• Presentation- recap video on development of baby.</li> <li>• Think pair share on 5 factors that can harm the development of a baby</li> <li>• Task – Video - Alcohol and foetus worksheet</li> <li>• Misconception discussion on smoking has no effect on the baby</li> </ul>	Child development



			<ul style="list-style-type: none"> <li>• Task – Video - Smoking and foetus worksheet</li> <li>• Prove- 6 mark literacy on lifestyle of Sandra – Teacher assessment</li> </ul>	
How does our bodies change during puberty?	6	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What is my scientific name.</li> <li>• Misconception discussion on adolescence and puberty are they same.</li> <li>• Task – Student use an information sheet and answer the questions – peer assessment</li> <li>• Task – Mind map of changes during puberty</li> <li>• Activity – card sort on difference in boys and girls changes</li> <li>• Presentation – What causes puberty</li> <li>• Prove- 6 mark literacy examining data – Peer assessment</li> </ul>	Child development	
What are the events of the menstrual cycle?	7	<ul style="list-style-type: none"> <li>• Biology retrieval starter – Where am I found</li> <li>• Misconception discussion – women always get pregnant after sex</li> <li>• Presentation- What are periods</li> <li>• Task – 1<sup>st</sup> Video – answer the questions on the worksheet</li> <li>• Task – 2<sup>nd</sup> Video – answer the questions on the worksheet</li> <li>• Presentation- Animation of menstrual cycle</li> <li>• Activity – Info sheet on contraception – students answer questions</li> <li>• Prove- key word match up – Self assessment</li> </ul>		
What are the parts of a flower?	8a	<ul style="list-style-type: none"> <li>• Biology retrieval starter – How do I move?</li> <li>• Think pair share – Why are flowers so important?</li> <li>• Misconception discussion on flowers are both female and male</li> <li>• Task – students label flower worksheet and describe function from the information around the room.</li> <li>• Presentation- Stamen and carpel</li> <li>• Task – Video – student to write definition for pollination</li> <li>• Activity – Drawing and labelling stages of diffusion.</li> </ul>		



		<ul style="list-style-type: none"> <li>• Practical on diffusion of a tea bag – students draw and describe observation.</li> <li>• Conclusion question</li> <li>• Summary paragraph.</li> <li>• Prove- 6 mark literacy on cell differences – Peer assessment</li> </ul>	
	8 b	<ul style="list-style-type: none"> <li>• Misconception discussion on “Pollination and fertilisation are the same.”</li> <li>• Task – Video – describe the differences in structure to wind and flowering plants</li> <li>• Task – Students to sort out statements into the two types of flowers</li> <li>• Activity – 2 videos students to describe the difference between the flowers</li> <li>• Prove- students to explain the need for parts of a wind pollinated flower – Peer assessment</li> </ul>	
How does the seed develop and grow?	9	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What is it?</li> <li>• Misconception discussion on Pollen and seeds are the same thing?</li> <li>• Task – Video – completing the questions on fertilisation</li> <li>• Presentation- What is inside a seed?</li> <li>• Task – Label the seed</li> <li>• Think pair share on what conditions do seeds need.</li> <li>• Prove-Spot the mistake – Peer assessment</li> </ul>	
How are seeds dispersed?	1 0	<ul style="list-style-type: none"> <li>• Biology retrieval starter – Anagrams with clues</li> <li>• Misconception discussion on Seeds won't grow if you take the fruit away.</li> <li>• Task – Recap worksheet on fertilisation</li> <li>• Task – students to discuss to questions on seed dispersal</li> <li>• Activity – Video – questions on worksheet</li> <li>• Presentation on the types of dispersal</li> <li>• Prove- Progress check blanks – Peer assessment</li> </ul>	
What allows winged seeds to travel	1 1	<ul style="list-style-type: none"> <li>• Biology retrieval starter – What is happening in each picture?</li> <li>• Task – students to plan an investigation in paper helicopter wing length.</li> </ul>	



	further?		<ul style="list-style-type: none"> <li>Task complete the results in a table</li> <li>Prove- Writing up the conclusion – Peer assessment</li> </ul>	
	Revision	1 2	<ul style="list-style-type: none"> <li>Use metacognition strategies.</li> <li>Completing revision sheet questions in pairs</li> </ul>	
	Test	1 3	End of topic test	
	DIT		Reflecting using journals on QLA, completing Frayer model	
Topic 5 Parti cles	What are the 3 states of matter?	1	<ul style="list-style-type: none"> <li>Chemistry retrieval starter – 5 quick questions</li> <li>Misconception discussion on Gases are not matter because most are invisible. Task – Recap worksheet on fertilisation</li> <li>Presentation on what is matter</li> <li>Task – Keyword gaps to fill</li> <li>Activity – Sorting information of states of matter information into the correct headings</li> <li>Activity – Video Students complete the Venn diagram of the 3 states of matter.</li> <li>Prove- Literacy 6 mark question – Self assessment</li> </ul>	
	What happens when a substance turns from a solid to a liquid?	2	<ul style="list-style-type: none"> <li>Chemistry retrieval starter – What am I?</li> <li>Misconception discussion on Materials in the universe only have 1 of the 3 states of matter</li> <li>Presentation on freezing</li> <li>Task – Watch the video and write an explanation for how a solid melts into a liquid when heated.</li> <li>Presentation – What are melting points.</li> <li>Practical – Measuring the Melting Point of Stearic Acid</li> <li>Prove- keyword fill sentences- Peer assessment</li> </ul>	Maths - Plot a graph.
	What happens when a substance turns from a liquid to a gas?	3	<ul style="list-style-type: none"> <li>Chemistry retrieval starter – What am I?               <ul style="list-style-type: none"> <li>Misconception discussion on The boiling point of pure water is?</li> <li>What is the condensation point?</li> </ul> </li> <li>Task – Watch the video and write an explanation for how a solid melts into a liquid when heated.</li> </ul>	



			<ul style="list-style-type: none"><li>• Progress check – fill the gaps – self assessment</li><li>• Think &gt; Pair &gt; Share: Why do we add salt to boiling water when we cook pasta?</li><li>• Practical – The effect of salt on the boiling point of water</li><li>• Task: Plot your results onto a graph and write a conclusion of your investigation:</li><li>• Prove – thumbs up/down questions.</li></ul>	
How do particles interact during evaporation?	4		<ul style="list-style-type: none"><li>• Chemistry retrieval starter – key word – meaning match</li><li>• Misconception discussion on When you get out of a bath, you feel cold because the room is cold.</li><li>• Task – Watch the video and answer questions – peer assessment</li><li>• Task: Copy and complete the diagram below to show the changes of state, match the numbers to the correct process.</li><li>• Presentation on explaining evaporation</li><li>• Task: Sort the statements into the correct columns:</li><li>• Think &gt; Pair &gt; Share: Why is it quicker to dry your hair with a hair dryer?</li><li>• Prove – 6 marker rates on evaporation – Teacher assessment.</li></ul>	
How do liquids and gases spread?	5		<ul style="list-style-type: none"><li>• Chemistry retrieval starter – Sketch me!</li><li>• Misconception discussion on Smells are just smells. They are not particles are they?</li><li>• Presentation on diffusion and concentration gradient</li><li>• Task – Diffusion word fill definition</li><li>• Task: Draw the particle diagrams and match the correct statements to the correct diagram to demonstrate the sequence of diffusion</li><li>• Think &gt; Pair &gt; Share: What factors might affect the rate of diffusion?</li><li>• Think &gt; Pair &gt; Share: How do you think temperature might affect the rate of diffusion?</li><li>• Think &gt; Pair &gt; Share: Do you think diffusion happens more quickly in gases, liquids or solids? Explain your answer!</li></ul>	





			<ul style="list-style-type: none"><li>• Practical – diffusion of potassium manganate in different temperatures</li><li>• Conclusion</li><li>• Task: Sort the statements into the correct columns:</li><li>• Prove – 6 mark literacy question – peer assessment</li></ul>	
	How can gas pressure can cause a can to collapse?	6	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What is happening?</li><li>• Demo – collapsing can</li><li>• Presentation – increasing pressure</li><li>• Task: Answer the questions on PRESSURE on the worksheet</li><li>• Think &gt; Pair &gt; Share: How does temperature affect pressure?</li><li>• Misconception discussion on Materials in the universe only have 1 of the 3 states of matter</li><li>• Presentation on freezing</li><li>• Task – Watch the video and write an explanation for how a solid melts into a liquid when heated.</li><li>• Task: You have each got a question, you need to read the question and the answer and teach it to your neighbour.- self assessment</li></ul>	
	Revision	7	Use metacognition strategies.- Retrieval squares	
	Test	8	End of topic test	
	DIT		Reflecting using journals on QLA, completing Frayer model	
Unit 6 Elements	What is an element and can you identify examples?	1	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – 5 quick questions.</li><li>• Presentation – Video the elements song</li><li>• Think &gt; Pair &gt; Share: What other elements can you name?</li><li>• Task – Watch the video answer questions on atoms and elements. - self assessment</li><li>• Misconception discussion- Do we have the element iron in our blood?</li><li>• Task – Diffusion word fill definition</li><li>• Task: Draw the particle diagrams and match the correct statements to the correct diagram to demonstrate the sequence of diffusion</li></ul>	



			<ul style="list-style-type: none"><li>• Presentation on atoms, periodic table and symbols</li><li>• Activity – Find the symbols worksheet</li><li>• Activity Research 7 elements</li><li>• Prove – Summary questions – self assessment</li></ul>	
What does an atom look like?	2	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What am I?</li><li>• Presentation – Video what are atoms</li><li>• Think &gt; Pair &gt; Share: How many different substances are there?</li><li>• Presentation atoms and elements</li><li>• Task –Match key word to definition to particle model. - Peer assessment</li><li>• Task – Complete table matching symbols under the headings</li><li>• Activity – Atoms model explained – Students complete the labels of their atom</li><li>• Presentation – Using the numbers from the periodic table</li><li>• Misconception discussion- Between the nucleus and electrons its just air?</li><li>• Task – Complete the table of numbers of electrons protons and neutrons</li><li>• Prove – Label the atom– Peer assessment</li></ul>		
How are the electrons arranged on an atom?	3	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What is it?</li><li>• Quick recap: True or false on atom structure</li><li>• Presentation – Electron structure models</li><li>• Task: Complete the electron diagram- self assessment.</li><li>• Activity – Video and questions</li><li>• Presentation – Electrons rules</li><li>• Activity – Electron structure worksheet for first 20 elements</li><li>• atom</li><li>• Prove – Literacy question 6 marker– Peer assessment</li></ul>		
How are compounds named?	4	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – Matching key words to definition</li><li>• Activity – Video and questions</li><li>• Misconception discussion - All molecules are compounds.</li><li>• Task: Are these elements or compounds – diagrams to match?</li></ul>		



			<ul style="list-style-type: none"><li>• Think &gt; Pair &gt; Share: Which of the images below is showing a compound and which is showing a mixture?</li><li>• Task: Copy and complete using the word bank – worksheet on compounds.</li><li>• Presentation – How do we name compounds</li><li>• Activity – Filling the blank names on the worksheet</li><li>• Prove – Exam question– Peer assessment</li></ul>	
Are compound properties different to their elements?	5 a	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What is it?</li><li>• Presentation – Compound properties</li><li>• Activity – Video and questions</li><li>• Investigation: Iron &amp; Sulphur Practical – Fill the table of observation</li><li>• Presentation – What have we made?</li><li>• Prove – Teacher assessment – Application literacy 6 marker.</li></ul>		
What is the role of an analytical chemist	5 b	Job role, attributes and qualifications needed. Drug testing		
How do you write and interpret formulae?	6	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What is my scientific name?</li><li>• Misconception discussion - H<sub>2</sub>O There is 1 hydrogen and 2 oxygen atoms</li><li>• Presentation – Chemical formulae</li><li>• Activity – Student to identify number of atoms in each formulae.</li><li>• Task – Worksheet – identify the name of a formula and vice versa</li><li>• Activity – Modelling elements and compounds</li><li>• Presentation – Conservation of mass and state symbols</li><li>• Prove – Peer Assessment – Application 6 marker</li></ul>		
Revision	7	Use metacognition strategies. Retrieval circus		
Test	8	End of topic test		
DIT		Reflecting using journals on QLA, completing Frayer model		



Unit 7 Reactions	What is a chemical reaction and a physical change?	1 a	<ul style="list-style-type: none"><li>• Chemistry retrieval starter –5 Quick questions</li><li>• Misconception discussion - Melting is a chemical reaction</li><li>• Presentation – What are chemical reactions</li><li>• Task – 3 comprehension Questions to answer – Self assessment</li><li>• Activity – Video – answer questions</li><li>• Task – Keywords to fill into sentences</li><li>• Activity – Are all chemical reactions useful – Sort into two columns</li><li>• Investigation – 6 reactions students observe and decide if it's a chemical reaction or physical change.</li><li>• Presentation – Conservation of mass and state symbols</li><li>• Prove – 6 marker literacy – Self assessment</li></ul>	
	What is the role of a food technologist ?	1 b	Job role, attributes and qualifications needed. Food tests.	
	How do you represent chemical equations?	2	<ul style="list-style-type: none"><li>• Chemistry retrieval starter –5 What am I?</li><li>• Recap – student identify particle diagrams as element compound or mixture</li><li>• Presentation – Representing reactions</li><li>• Misconception discussion - Chemicals that burn disappear into the atmosphere</li><li>• Task: The word equations need to be sorted into two columns – reactants and products</li><li>• Task: Read the description carefully, think about which are reactants and which are products and for each one write the word equation.</li><li>• Task – Worksheet writing out word equations from sentences – Peer assessment</li><li>• Investigation – Reactions with oxygen – peer assessment</li><li>• Prove – word and symbol equation worksheet– Peer assessment</li></ul>	
	What is combustion and what are	3	<ul style="list-style-type: none"><li>• Chemistry retrieval starter –5 What is it?</li></ul>	



the chemicals involved?		<ul style="list-style-type: none"><li>• Task mind-map of what is a fuel</li><li>• Presentation – What do you think is needed for things to burn</li><li>• Misconception discussion - When burning fuels the chemicals turn into energy</li><li>• Task: Watch the video and answer the following questions: Combustion</li><li>• Investigate: Which fuel releases the most energy? – conclusion self assessment</li><li>• Task: Keyword gaps to fill in sentences on combustion – self assessment</li><li>• Working out combustion equations</li><li>• Prove – 6 mark literacy write up of investigation – Teacher assessment</li></ul>	
What are the products of thermal decomposition	4	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – Key word match?</li><li>• Task mind-map of what is a fuel</li><li>• Presentation – What do you think is needed for things to burn</li><li>• Misconception discussion - All chemicals break down at the same rate</li><li>• Task: Watch the video and answer the following questions: Decomposition – Self assessment</li><li>• Think &gt; Pair &gt; Share: What do you think happens during a thermal decomposition reaction?</li><li>• Task: Finish off the word equations to show the products of the following decomposition reactions:</li><li>• Think &gt; Pair &gt; Share: Will we present our results as a bar graph or a line graph? Explain your answer!</li><li>• Prove: Draw a bar graph of your results – self assessment</li></ul>	
What happens to atoms in chemical reactions?	5	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What is it?</li><li>• Misconception discussion - In reactions atoms are destroyed or new one created</li><li>• Demo: Conservation of Mass – Magnesium ribbon</li><li>• Task – Complete the gaps of the masses then conclude</li><li>• Presentation – Modelling balancing equations</li></ul>	



			<ul style="list-style-type: none"><li>• Prove: Balancing some example questions peer - assessment</li></ul>	
	What happens to energy in chemical reactions?	6 a	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – State what ‘conservation of mass’ means</li><li>• Presentation – Example exothermic reactions</li><li>• Think &gt; Pair &gt; Share: Discuss your ideas for a definition of an ‘endothermic’ reaction and come up with any examples if you can!</li><li>• Task: Watch the video and answer the following questions: Endo and exo</li><li>• Quick Check – Deciding on endo or exo reactions from temperature change</li><li>• Prove: 6 marker literacy peer - assessment</li></ul>	Maths - addition
	What does a chemical analyst do?	6 b	Job role, attributes and qualifications needed. Hand warmer investigation.	
	Revision	7	Use metacognition strategies.- Retrieval squares	
	Test	8	End of topic test	
	DIT		Reflecting using journals on QLA, completing Frayer model	
Unit 8 Acids and alkalis	What is the difference between an acid and an alkali?	1	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – Quick questions</li><li>• Misconception discussion - Acids and alkalis are really dangerous chemicals</li><li>• Presentation – Acid and alkalis</li><li>• Activity Task: Read the information on acids and alkalis, answer the questions in your books – Self assessment.</li><li>• Think &gt; Pair &gt; Share: Why are hazard symbols important to us?</li><li>• Activity – Haz-splat game</li><li>• Presentation – Concentrated or dilute</li><li>• Task: Decide whether A or B is the most concentrated solution and explain why you think this.</li><li>• Task What is concentration key word gap fill?</li><li>• Task – Particle diagram match to description</li><li>• Presentation Calculating concentration</li><li>• Prove: Calculate concentration – self assessment</li></ul>	



How do you use an indicator to identify acids and alkalis?	2	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What am I?</li><li>• Presentation – Testing acids and alkali</li><li>• Misconception discussion - All acids and alkali are strong</li><li>• Task – Watch the video fill in the table</li><li>• Task – Watch the video fill in the table – self assessment</li><li>• Investigate: Using Universal Indicator</li><li>• Prove: 6 marker literacy – self assessment</li></ul>	
How do we neutralise acids?	3 a	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – Key word match?</li><li>• Presentation – Recap pH scale</li><li>• Misconception discussion - Neutralisation means an acid breaking down something.</li><li>• Task: Sort the substances into two columns – acids and alkali – Self assess</li><li>• Investigating what happens when an acid is added to an alkali</li><li>• Conclusion – self assessment</li><li>• Presentation neutralisation</li><li>• Task – Watch the video answer questions</li><li>• Prove: 6 marker literacy – Teacher assessment</li></ul>	
What is the role of a pharmacist	3 b	Job role, attributes and qualifications needed. Substances to treat wasp stings investigation.	
How do acids and alkalis form salts	4	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What is it?</li><li>• Presentation – Recap pH scale</li><li>• Misconception discussion - There is only one salt. The one that's put on chips!</li><li>• Task: Complete the questions in books, write in full sentences – peer assessment</li><li>• Task – Watch the video answer questions</li><li>• Presentation – Acids and bases</li><li>• Task - Copy and complete sentences fill the gaps</li><li>• Task: Sort the substances into two columns – acids and alkali – Self assess</li><li>• Investigate: Making Salt Crystals</li></ul>	



			<ul style="list-style-type: none"><li>• Prove: Equations – Peer assessment</li></ul>	
	How are salts made from metals oxides and acid?	5	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – What is my scientific name?</li><li>• Misconception discussion - The acid we mainly use in the lab is hydraulic acid</li><li>• Task: What are salts recap?</li><li>• Task – Watch the video answer questions – self assessment</li><li>• Presentation – Acids and metal oxides</li><li>• Task - Copy and complete sentences fill the gaps – self assessment</li><li>• Investigate: Making Salt Crystals</li><li>• Prove: Equations – Self assessment</li></ul>	
	Are salts made from metals carbonates and acid	6 a	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – Complete the sentence</li><li>• Misconception discussion - Fizzing in chemical reactions is just air coming out!</li><li>• Task – Watch the video answer questions – self assessment</li><li>• Presentation – Acids and bases</li><li>• Task - Copy and complete sentences fill the gaps – self assessment</li><li>• Investigate: Reacting carbonates and acids – completing observation sheet</li><li>• Prove: Equations – Peer assessment</li></ul>	
	What is a role of a product designer?	6 b	Job role, attributes and qualifications needed. Making bathbombs	
	How is acid rain produced and what problems does it cause?	7	<ul style="list-style-type: none"><li>• Chemistry retrieval starter – Anagrams with clues</li><li>• Misconception discussion - Acid rain is a strong corrosive acid</li><li>• Task – Watch the video answer questions – self assessment</li><li>• Thank pair share – effects of acid rain</li><li>• Task – Watch the video answer questions – self assessment</li><li>• Task – causes and effects flow diagram to complete</li><li>• Task - Copy and complete sentences fill the gaps – self assessment</li><li>• Investigation on the acidity of rainwater – Complete questions – self assessment</li></ul>	





			<ul style="list-style-type: none"> <li>• Prove: Order the sentences– self assessment</li> </ul>	
	Revision	8	Use metacognition strategies. Creating a revision leaflet	
	Test	9	End of topic test	
	DIT	10	Reflecting using journals on QLA, completing Frayer model	
Unit 9 Forces	What is the difference between contact and non-contact forces?	1a	<ul style="list-style-type: none"> <li>• Physics retrieval starter –5 Quick questions</li> <li>• Activity – Video – answer questions – self assessment</li> <li>• Presentation – Types of forces</li> <li>• Task: Sort these forces into either contact or non-contact forces</li> <li>• Presentation – identifying forces</li> <li>• Task: Add 'Force arrows' to show the direction and the size of the forces acting upon the following objects:worksheet</li> <li>• Task: Add 'Force arrows' to show the direction and the size of the forces acting upon the following objects:worksheet</li> <li>• Prove – Task: Copy and complete the following sentences to summarise what you have learned this lesson: - Self assessment</li> </ul>	
	What shape does a bridge engineer decide for a bridge?	1b	Job role, attributes and qualifications needed. Make a bridge.	STEM
	What is the effect of drag forces and friction	2a	<ul style="list-style-type: none"> <li>• Physics retrieval starter – What am I?</li> <li>• Misconception - Friction always hinders motion. Thus, you always want to eliminate friction.</li> <li>• Think &gt; Pair &gt; Share: How might we reduce friction?</li> <li>• Task: Complete the worksheet on frictional forces</li> <li>• Investigation – force to pull different amount of mass on block</li> <li>• Conclusion – gap fill.</li> <li>• Presentation – what is drag?</li> <li>• Task – Brainstorm drag forces</li> </ul>	



			<ul style="list-style-type: none"> <li>• Prove - Task: Sort the following statements into two columns – ‘True’ or ‘False’</li> </ul>	
What happens to a spring when it gets stretched?	3	<ul style="list-style-type: none"> <li>• Physics retrieval starter – Match keywords to definition?</li> <li>• Task: Match the image with the correct force. Identify whether this force is contact or non-contact.</li> <li>• Misconception - Solid objects cannot squash or deform</li> <li>• Presentation – stretching particle diagram models</li> <li>• Presentation – Hooke’s law</li> <li>• Task: Follow the instructions on the investigation sheet to complete the practical investigation. Once you have drawn a graph of your results, try to identify Hooke’s Law!</li> <li>• Presentation – Hooke’s law calculation</li> <li>• Task – Calculate 3 example</li> <li>• Prove -Literacy 6 marker teacher assessment.</li> </ul>	Maths – rearranging formulae	
How do we work out gravity on other planets?	4 a	<ul style="list-style-type: none"> <li>• Physics retrieval starter – Finish the sentence</li> <li>• Task – Contact or non-contact force separate the list into the two columns</li> <li>• Presentation – Non-Contact force and what are force fields?</li> <li>• Misconception - Mass and weight are the same thing</li> <li>• Presentation – Gravitational force calculation</li> <li>• Investigation – working out gravity using newton meters and masses.</li> <li>• Task: Given the gravitational field strengths of Earth, Jupiter &amp; Mars. Work out the weights of the students on the following planets:- Peer assessment</li> <li>• Prove – Progress check gap fill- peer assessment</li> </ul>	Maths – rearranging formulae	
What is the role of a structural engineer	4 b	Job role, attributes and qualifications needed. Design and build a ramp	STEM	
What are balanced and	5	<ul style="list-style-type: none"> <li>• Physics retrieval starter – What would happen?</li> </ul>	Maths – addition and	



	unbalanced forces?		<ul style="list-style-type: none"> <li>• Misconception- An object is not moving if all forces around it are equal</li> <li>• Think &gt; Pair &gt; Share: Look at this tug of war, which side do you think would win? Why? Explain in terms of forces.</li> <li>• Investigation - Forces Circus – use worksheet – peer assessment</li> <li>• Task – model questions on force arrows on examples – peer assessment</li> <li>• Presentation - How do unbalanced forces change the direction of an object?</li> <li>• Task – Questions on identifying direction of motion using force arrows</li> <li>• Prove – 6 marker literacy – peer assessment</li> </ul>	subtraction.
	Revision	6	Use metacognition strategies. Using different partners to help answer questions	
	Test	7	End of topic test	
	DIT		Reflecting using journals on QLA, completing Frayer model	
Unit 10 Magnets	What is magnetism and what does magnetic field line look like?	1	<ul style="list-style-type: none"> <li>• Physics retrieval starter – 5 quick questions.</li> <li>• Think &gt; Pair &gt; Share: What do we already know about magnets?</li> <li>• Presentation - What is Magnetism?</li> <li>• Investigate: Testing Magnetic Materials</li> <li>• Task: Get two magnets. See what happens when you put poles together. Draw a table and fill it in. Write down what 'Attract' and 'Repel' mean. – Self assessment</li> <li>• Presentation – Magnetic field</li> <li>• Task: Using a compass we are going to plot the magnetic field of a bar magnet</li> <li>• Presentation – What is Earth's magnetic field.</li> <li>• Prove - Task: Fill in the blanks on your worksheet, using the key words provided below: - Self assessment</li> <li>• Or Self assessment 6 marker literacy</li> </ul>	
	How are magnets	2	<ul style="list-style-type: none"> <li>• Physics retrieval starter – What am I?.</li> </ul>	



	used to recycle metals?		<ul style="list-style-type: none"> <li>Misconceptions - All metals are attracted to magnets!</li> <li>Task - Identify which four materials are magnetic.</li> <li>Presentation – What might be magnetic?</li> <li>Presentation – What is recycled</li> <li>Task - Advantages and Disadvantages of Recycling statement sort. Peer assessment</li> <li>Teacher assessment literacy 6 marker.</li> </ul>	
	How do you make and strengthen an electromagnet?	3	<ul style="list-style-type: none"> <li>Physics retrieval starter – What is it?.</li> <li>Presentation – What is an electromagnet?</li> <li>Task: Watch the video and answer the following questions: electromagnets.</li> <li>Investigation whether the number of coils in the wire and the current make an electromagnet stronger.</li> <li>Task write a conclusion.</li> <li>Quick check questions – Peer assessment.</li> <li>Prove - Task: Copy and correct the sentences – Peer assessment.</li> </ul>	
	How are electromagnets used to move objects?	4 a	<ul style="list-style-type: none"> <li>Physics retrieval starter – Match keywords with definitions.</li> <li>Presentation – Using electromagnets</li> <li>Video - Take notes on how electromagnets help in the braking of theme park rides</li> <li>Video - Activity: Watch the video and think how the job was managed to be performed.</li> <li>Prove – Answer questions - Self assessments.</li> </ul>	
	What is the role of an Electrical engineer	4 b	Job role, attributes and qualifications needed. Make a relay switch.	STEM
	Revision	5	Use metacognition strategies. Retrieval squares	
	Test	6	End of topic test	
	DIT	7	Reflecting using journals on QLA, completing Frayer model	
Unit 11	How is energy in	1	<ul style="list-style-type: none"> <li>Physics retrieval starter – 5 quick questions.</li> </ul>	Maths – calculate



Energy	food measured?		<ul style="list-style-type: none"> <li>• Think &gt; Pair &gt; Share: Why do explorers use such large quantities of energy?</li> <li>• Misconception - All the energy we take in we store in our body</li> <li>• Task: Look at different food labels, complete tasks 1-4.</li> <li>• Task: Place the following activities in order, from the activity that requires the most energy – self assessment.</li> <li>• Investigation – energy in food.</li> <li>• Prove – literacy 6 marker analysing data – self assessment</li> </ul>	energy in food
	<p><i>Do different fuels have different amount of stored energy?</i></p> <p><i>What happens to stored energy in transfers?</i></p>	2 + 3	<ul style="list-style-type: none"> <li>• Physics retrieval starter – What am I?</li> <li>• Misconception - An object that doesn't move has no energy! Right?</li> <li>• Presentation – Conservation of energy.</li> <li>• Image match to different types of energy. – Peer assessment</li> <li>• Task: Finish the words and then match with the correct description of each type of energy! Peer assessment</li> <li>• Presentation – Energy transfers</li> <li>• Task: Match the correct statement to the correct box to show how energy is transferred in different objects</li> <li>• Investigate: The height a ball bounces back compared to the height it was dropped from.</li> <li>• Conclusion – questions – peer assessment</li> <li>• Prove – 6 marker literacy – Teacher assessed</li> </ul>	Maths – calculate energy in fuels
	<p><i>What is the difference between energy and temperature?</i></p>	4	<ul style="list-style-type: none"> <li>• Physics retrieval starter – What is it?</li> <li>• Misconception - There is no heat energy in cold object like icebergs</li> <li>• Think &gt; Pair &gt; Share: What is the difference between heat and temperature?</li> <li>• Recap video and answer questions on particle theory</li> <li>• Discuss: What affects the amount of heat energy stored in something?</li> <li>• Task: Sort the following out into order from most energy stored to least energy stored:</li> </ul>	



			<ul style="list-style-type: none"> <li>• Prove – 6 marker literacy question – peer assessed.</li> </ul>	
<p><i>How do solids transfer energy?</i></p> <p><i>How do liquids and gases transfer energy ?</i></p>	5 + 6		<ul style="list-style-type: none"> <li>• Physics retrieval starter – What is my scientific name?</li> <li>• Presentation – what is a conductor?</li> <li>• Task: Can you name some examples of materials which make:</li> <li>• Presentation – particles in conduction - Discuss: Conduction occurs best in solids – why do you think that is?</li> <li>• Misconception - Metals conduct, insulator don't conduct at all</li> <li>• Task: Draw a cartoon strip of an object being heated up, include a zoomed in section to show what is happening to the particles in the object as more heat energy is applied.</li> <li>• Investigate Demo : Testing conductors.</li> <li>• Video – Particles and convection – Answer questions – self assessment</li> <li>• Prove - Task: Draw a cross-section of a room in a house with a radiator on. Show how a convection current might occur with the air particles in this room – Self assessment</li> </ul>	
<p><i>How does the energy from the sun reach Earth?</i></p>	7		<ul style="list-style-type: none"> <li>• Physics starter – What is my scientific name?</li> <li>• Misconception - There is only one form of light, the one we see!</li> <li>• Video – what is infrared radiation – write definition of infrared – Peer assessment.</li> <li>• Demo Leslie cube.</li> <li>• Investigate: Cooling and colour</li> <li>• Presentation - Absorbing &amp; reflecting infrared</li> <li>• Prove Task: Copy and complete the following sentences using the key words – Peer assessment</li> </ul>	
<p>What are the issues of fossil fuel power stations?</p>	8 a		<ul style="list-style-type: none"> <li>• Physics starter – What happens?</li> <li>• Task: Watch the video and answer the following questions: self assessment.</li> <li>• Misconception Nuclear energy resources are going to last a long time, it must be renewable!</li> </ul>	



What is the pros and cons of renewable energy resources?		<ul style="list-style-type: none"> <li>• Task: Sort these energy resources into two columns – renewable and non-renewable energy resources</li> <li>• Task: Use the posters on renewable and non-renewable energy resources to complete table of how it works and the pros and cons.</li> <li>• Prove - You have been given a list of jumbled up advantages and disadvantages of various power stations – read through them and summarise the information the information in a table. Self assessment</li> </ul>	
Know how to calculate electricity?	9 a	<ul style="list-style-type: none"> <li>• Prepare – Code breaker.</li> <li>• Misconception - Electrical devises on standby do not transfer energy</li> <li>• Presentation – What is power.</li> <li>• Task – Keyword definition blank fills</li> <li>• Presentation – Calculation of power</li> <li>• Watch the footage of Bolt and Farah who produces the most power?</li> <li>• Task – Calculating power table</li> <li>• Task: Copy and complete the following sentences:</li> <li>• Presentation – Calculating cost of electricity</li> <li>• Prove – Calculating cost questions – Self assessment</li> </ul>	Maths – rearrange formulae
What does a materials engineer - packing operative do?	9 b	Job role, attributes and qualifications needed. Making wind turbine blades	STEM
How do we use solar energy?	9 c	Job role, attributes and qualifications needed. Make a solar car	STEM
How does a solar power station work?.	9 d	Job role, attributes and qualifications needed. Make a solar tower	STEM
How do you calculate the work done?	1 0	<ul style="list-style-type: none"> <li>• Starter: A microwave has a power rating of 800W, how much energy does it use if it is left on for 10 minutes?</li> </ul>	Maths – rearrange formulae



			<ul style="list-style-type: none"> <li>• Task: Produce a mind map in your books of some other activities, other than pedalling a bike, where you need to do work in order for something to happen</li> <li>• Misconception - I'm working when I'm revising. Is this work done?</li> <li>• Presentation- Work done calculation</li> <li>• Investigating – doing work</li> <li>• Task – Calculating work done questions</li> <li>• Presentation – Levers and gears.</li> <li>• Prove Task: A student completed the following calculations, go through each and mark their work, making corrections where necessary: Peer assessment</li> </ul>	
	Revision	1 1	Use metacognition strategies. Question mat	
	Test	1 2	End of topic test	
	DIT	1 3	Reflecting using journals on QLA, completing Frayer model	
Unit 12 Space	What does our night sky consist of?	1	<ul style="list-style-type: none"> <li>• Physics starter – 5 Quick questions</li> <li>• Misconception - The solar system and galaxies are very "crowded." (Objects are relatively close together.)</li> <li>• Task - When you look at the sky you do not see them as they are today, the light has taken years to get here! You are looking back in time!!</li> <li>• Task: You are each going to get a bit of information about an object that I found in space. Draw the table below and discuss your cards with each other to complete the table. – self assessment</li> <li>• Presentation – lights in the sky</li> <li>• Progress Check questions – self assessment</li> <li>• Prove – Ask 3 questions on the solar system with answers – Self assess.</li> </ul>	
	What are the planets of our solar system?	2	<ul style="list-style-type: none"> <li>• Physics starter – What am I?</li> <li>• Misconceptions - The earth is the centre of the solar system and is the largest object in the solar system.</li> <li>• Task: Watch the video and answer the following questions: Peer assessment</li> </ul>	Maths - distances





			<ul style="list-style-type: none"> <li>• Task: Around the room are different information points on the Solar System, Stars &amp; Galaxies. Read the information and use this to answer the questions on your worksheet.</li> <li>• Task: Read the information and use this to answer the questions on your worksheet.</li> <li>• Prove self assessment 6 mark literacy</li> </ul>	
	How and why do we have seasons?	3	<ul style="list-style-type: none"> <li>• Physics starter – What is it?</li> <li>• Presentation – What causes day and night</li> <li>• Task: Watch the video and answer the following questions:</li> <li>• Misconception Seasons are caused by changing distance between the earth and sun (the two are closer in the summer and further apart in the winter).</li> <li>• Presentation – Seasons</li> <li>• Demo: Earth’s orbit around the Sun</li> <li>• Task: Complete the worksheet on ‘Seasons’</li> <li>• Task – summary key word fill of sentences.</li> <li>• Prove – teacher assessed 6 marker literacy.</li> </ul>	
	<i>What are the phases of the moon and how does it affect tides?</i>	4	<ul style="list-style-type: none"> <li>• Physics starter – Keyword match</li> <li>• Misconception - The moon can only be seen during the night and the phases of the moon are caused by shadows cast by the Earth</li> <li>• Presentation – Pioneers of science</li> <li>• Presentation – Pioneers of the moon.</li> <li>• Task - 2 minutes to study the names of the phases of the Moon!</li> <li>• Task: Shade the circles in to show the phases of the Moon at these different positions. Number 3 has been complete for you.</li> <li>• Task: Watch the video and answer the following questions: Peer assessment</li> <li>• Task: Fill in the gaps in these sentences using keywords</li> <li>• Prove – 6 mark literacy peer assessment</li> </ul>	



	how do you 3D print a moon base	5	Job role, attributes and qualifications needed. Make a geodesic moon base	STEM
	How do you design a mission badge/patch	6	Job role, attributes and qualifications needed. Design a mission badge	STEM
	How can I make a model rocket	7 & 8	Job role, attributes and qualifications needed. Make a rocket and perform a test flight.	STEM
	Revision	9	Use metacognition strategies.- keyword chips.	
	Test	10	End of topic test	
Unit 13 health lifestyles	What nutrients does your body need?	1a	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Construct a food triangle, research roles of food groups and where they are found.</li> <li>• Group work - Energy in food investigation, reading task energy in foods,</li> </ul> Writing task exam question self-assessed	Food and technology, Health and social care.
	What does a dietician need to know?	1b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> </ul> Group work -Energy in food investigation.	Stem
	How do we test for nutrients in foods?	2	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Group work - Food test investigation for lipids, protein, glucose, and starch.</li> </ul> Food test investigation peer assessed	Food and technology
	What are the consequences of an unhealthy diet?	3	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Malnourished definition,</li> <li>• Mind map why people lose weight,</li> <li>• Summary word fill,</li> <li>• True or false quiz,</li> <li>• How much fat do you eat quiz,</li> <li>• Writing task what's wrong with Jonny V's diet</li> </ul>	Food and technology, Health and social care.



		Self assessed scaffolded literacy task	
What are the parts of the digestive system?	4 a	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Memory test- complete digestive system diagram,</li> <li>• Reading task what is the function of the digestive organs.</li> </ul> Writing task exam question digestive system adaptations peer assessed	Food and technology, Health and social care.
To tell a patient how the digestive system works	4 b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> </ul> Model the digestive system.	Stem
What is the role of bacteria and enzymes in the digestive system?	5	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Comprehension task about digestive enzymes and what they break down,</li> <li>• Emulsification demo,</li> </ul> Exam style question digestive enzyme function self-assessed.	Health and social care.
What is the role of bacteria and enzymes in the digestive system?	5 b	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Group work - Enzyme investigation, Teacher assessed scaffolded writing task.</li> </ul>	
What are the different types of drugs?	6	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Mind map reasons why people take drugs, card sort drugs into medicinal and recreational,</li> <li>• Reading and writing task smoking,</li> <li>• Sort viewpoints about drugs into for or against,</li> <li>• Group work - Drug test investigation, Self-assessed summary questions</li> </ul>	Health and social care. PSHE
What are the effects of alcohol?	7	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Mind map how does alcohol affect your body from video clip,</li> <li>• Sort health effects into short and long term, writing word fill health effects,</li> </ul>	Health and social care. PSHE



			Exam question graph analysis deaths caused by alcohol peer assessed	
	What are the effects of smoking?	8	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Definition – drug,</li> <li>• Information gathering to complete literacy task,</li> <li>• Peer-assessed exam style graph analysis question</li> </ul>	Maths – interpreting data PSHE
	Revision	9	Use metacognition strategies.	
	Test	10	End of topic test	Test
Unit 13 ecosystems and processes	How do plants make glucose for respiration?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Progress check exam style question,</li> <li>• Group work - Leaf starch investigation,</li> <li>• Literacy sentence link up the keywords. Self-assessed</li> </ul>	
	How is a leaf adapted for photosynthesis?	2	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Word fill leaf adaptations, Label and describe role of cells in a leaf cross section,</li> <li>• Group work - Microscope to view stomata,</li> <li>• Exam style question peer assess</li> </ul>	
	What happens when plants do not get the minerals they need?	3	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Oracy task different types of farming methods,</li> <li>• Produce a pamphlet about plant deficiencies self-assessed</li> </ul>	
	How do organisms make glucose without sunlight?	4	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Definition of chemosynthesis,</li> <li>• Construct word equation</li> <li>• Draw diagram to show types of chemosynthetic organisms and a volcanic vent,</li> </ul>	



			<ul style="list-style-type: none"> <li>Literacy reading about chemosynthetic organisms and answering questions,</li> <li>Complete a Venn diagram differences between chemosynthesis and photosynthesis,</li> <li>Exam style question about chemosynthesis.</li> <li>Self-assessed scaffolded literacy task.</li> </ul>	
How do we get energy from respiration?	5	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions</li> <li>Cell structure and function recap,</li> <li>Reading task working in pairs to answer questions, peer assess</li> </ul>	PE	
How does our body produce energy in the absence of oxygen?	6	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions</li> <li>Word fill why muscles cant continuously carry out aerobic respiration,</li> <li>True or false quiz, exam style question,</li> <li>Teacher assessed scaffolded literacy task</li> </ul>	PE	
How are food chains and food webs interpreted?	7	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions</li> <li>Match up keyword to definition,</li> <li>Construct food chain including arrows and key words, show how energy is lost,</li> <li>Analyse food web and answer questions self-assessed</li> </ul>	Geography	
How are food chains disrupted?	8	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions</li> <li>Mind map how animals depend on each other,</li> <li>Working in pairs answer questions what affects animal populations,</li> <li>Analyse marine food web to answer questions,</li> <li>Reading task- stable communities answer questions,</li> <li>Reading task killer whales article to define the word bioaccumulation peer assessed</li> </ul>	Geography	



	How do organisms co-exist?	9	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Define keywords whilst watching video clip,</li> <li>• Group work how do different species of woodpecker survive,</li> <li>• Summary word fill,</li> <li>• Peer assessed scaffolded literacy task.</li> </ul>	Geography
	Revision	10	Use metacognition strategies.	
	Test	11	End of topic test	
Unit 15 Inheritance and evolution	How do animals survive in extreme conditions?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Sort resources into plant or animal.</li> <li>• Summary word fill.</li> <li>• Reading task, complete profile cards for different animals and their adaptations self-assessed.</li> </ul>	
	How does an astrobiologist decide what alien life would look like?	1b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Design an alien to live in a specific environment.</li> <li>• Create an alien</li> </ul>	Stem
	How are we searching for alien life	1c	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed</li> <li>• Design a habitat for an alien based on its adaptations</li> </ul>	STEM
	What is a predator/prey relationship	2	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Jack rabbits and coyotes, adaptations and relationship questions.</li> <li>• Summary word fill task, peer assess</li> </ul>	
	What makes us all different?	3	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Mind map – inherited features.</li> <li>• Venn diagram, sort features into inherited, environmental or both self assess.</li> </ul>	Maths – data analysis and drawing graphs.



	How does genetic and environmental factors make us different?	4	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• The big class survey, collating data.</li> <li>• HSW Drawing appropriate graphs</li> <li>• HSW Graph analysis questions, self-assessed</li> <li>• Teacher assessed scaffolded literacy task</li> </ul>	Maths – data analysis and drawing graphs.
	What is responsible for variation?	5	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Memory task, label genetic structures.</li> <li>• Key word match up</li> <li>• Progress quiz , self-assess</li> </ul>	
	How do we extract DNA from cells?	6	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Group work - DNA extraction of peas investigation.</li> <li>• Self-assess word fill</li> </ul>	
	How do animals evolve to survive?	7	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Evolution cartoon strip and word fill.</li> <li>• Exam style question, peppered moths, peer assess</li> </ul>	
	How do organisms become extinct and how can we protect endangered ones?	8	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Mind map causes of extinction.</li> <li>• Reading task, animal extinction information cards, collate information in a table.</li> <li>• Oracy task - Gene bank expert, read piece of information, circulate, and teach others.</li> <li>• Exam question, self-assess</li> </ul>	geography
	Revision	9	Use metacognition strategies.	
	Test	10	End of topic test	
Topic 15 The periodic table	What are the properties of metals and non-metals?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Distinguish metals /non-metals using the periodic table</li> </ul>	DT



			<ul style="list-style-type: none"><li>• Complete information table of properties using resources.</li><li>• Complete word equations for metals and no-metals in water.</li><li>• True or false quiz, self assess</li></ul>	
How are materials tested?	1 b		<ul style="list-style-type: none"><li>• Job role, attributes and qualifications needed.</li><li>• Group work - Metal testing investigation</li></ul>	Stem
What are the patterns on the periodic table?	2		<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions.</li><li>• HSW predicting patterns of group 1 data</li><li>• HSW Construct graphs to display group 1 &amp; 3 data and write conclusion</li><li>• Correct the teacher literacy task.</li><li>• Self assess scaffolded literacy task</li></ul>	
What are the properties and patterns of group 1 – alkali metals?	3		<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions.</li><li>• Complete word equations to show the reactants and products of group 1 metals with water</li><li>• Group 1 metals in water demo, record observations in a table.</li><li>• Reading and writing task, properties of group 1 metals.</li><li>• True or false quiz</li></ul> Teacher assessed summary questions.	
What are group 7 halogens properties?	4		<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions.</li><li>• Oracy task - Become an expert, students given group 7 property information, circulate the room teaching others.</li><li>• HSW describing patterns in group 7 data.</li><li>• Demo displacement investigation, students collate observations in a table.</li><li>• Write word equations for displacement reactions.</li><li>• Peer assessed scaffolded literacy task</li></ul>	





	What are the noble gas properties?	6	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions.</li> <li>HSW describing patterns in group 0 data.</li> <li>Oracy task - Become an expert, students given group 7 property information, circulate the room teaching others.</li> <li>Correct the teacher literacy task.</li> <li>Progress quiz, self-assessed</li> </ul>	
	Revision	7	Use metacognition strategies.	
	Test	8	End of topic test	
Topic 17 Separation techniques	What are pure and impure substances?	1	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions.</li> <li>Recap particle arrangement</li> <li>Distinguish statements as a mixture or a compound</li> <li>Pure water investigation</li> <li>Quick check questions on mini whiteboards</li> <li>Self-assessed scaffolded literacy task</li> </ul>	
	How do substances dissolve?	2	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions.</li> <li>Group work – role play dissolving</li> <li>Literacy word fill and label diagram</li> <li>Group work - Dissolving investigation.</li> <li>Numeracy – calculating dissolved substances</li> <li>Peer-assessed summary questions</li> </ul>	Maths – line graph interpretation
	How can solubility be increased?	3	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions.</li> <li>Keyword match up</li> <li>Group work - Solubility investigation</li> <li>HSW plot graph and describe patterns</li> <li>Correct the teacher literacy task</li> <li>Teacher assess scaffolded literacy task</li> </ul>	
	How do you separate soluble and insoluble substances?	4	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions.</li> <li>Label filtration equipment diagram</li> <li>Making crystals investigation</li> </ul>	



			<ul style="list-style-type: none"> <li>• Distillation demo</li> <li>• Distillation word fill</li> <li>• Sort distillation steps into correct order</li> <li>• Peer-assessed scaffolded literacy task</li> </ul>	
	How do you separate a solvent and retrieve it?	5 a	<ul style="list-style-type: none"> <li>• Define keyword evaporation,</li> <li>• Demo distillation.</li> <li>• Peer assess literacy.</li> </ul>	STEM
	What is the role of a chemical production manager	5 b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Produce ethanol from fermenting grapes investigation.</li> </ul>	STEM
	What is the role of a lab technician?	5 c	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Distillation of ethanol from wine</li> </ul>	STEM
	How do you separate the different colours in ink?	6 a	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Sort chromatography steps in order</li> <li>• Group work - Chromatography investigation</li> <li>• Quick check quiz – analysing chromatograms</li> <li>• Oracy task – become an expert read use of chromatography and circulate the room teaching others</li> <li>• Self-assessed exam style question.</li> </ul>	
	How does forensics use chromatography	6 b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Identification of dyes investigation.</li> </ul>	STEM
	Revision	7	Use metacognition strategies.	
	Test	8	End of topic test	
Topic 18 Materials	What is produced when metals react with acid?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Literacy task – what are salts</li> <li>• Construct word equations</li> <li>• Group work - Metals and acids investigation</li> </ul>	



			<ul style="list-style-type: none"><li>• Progress quiz self-assessed</li></ul>	
What is produced when metals react with oxygen?	2		<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions.</li><li>• Burning magnesium demo</li><li>• Construct word equations for metals and oxygen</li><li>• Balance symbol equations</li><li>• Role play chemical reactions</li><li>• Progress quiz peer assess</li></ul>	
How do metals react with water	3		<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions.</li><li>• Alkali metals demo, students record observations in a table</li><li>• HSW make predictions about group 1 reactivity</li><li>• Construct word equations for the reaction between metals and water</li><li>• Match up – metal to their reactions.</li><li>• Recap metals and acid reactions and compare to metals in water</li><li>• Distinguish between metals and their reactivity self assess</li></ul>	
What is a displacement reaction?	4		<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions.</li><li>• Recap reactions with oxygen, water, and acid</li><li>• Construct word equations and distinguish if a reaction has occurred or not based on students' knowledge of metal reactivity</li><li>• Group work - Displacement investigation</li><li>• True or false quiz</li><li>• Scaffolded literacy task self-assessment</li></ul>	D&T
How are metals extracted?	5 a		<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions.</li><li>• Research task when metals were discovered</li><li>• Construct word equations for metal reduction reactions</li><li>• Numeracy task – calculate percentage mass of metal peer-assessment</li></ul>	D&T



	How does a Manufacturing operative produce steel	5 b	<ul style="list-style-type: none"> <li>Job role, attributes and qualifications needed.</li> </ul> Group work - Making steel.	STEM
	What are composites and what properties do they have?	6	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions.</li> <li>Group work - Composite properties investigation</li> <li>Making concrete</li> <li>Oracy task – become an expert on a composite and teach others</li> <li>Literacy – scaffolded writing task teacher assessed</li> </ul>	D&T
	What are polymers and what are their properties?	7 a	<ul style="list-style-type: none"> <li>Metacognition quiz.</li> <li>Present new information, video clip, discussion, address misconceptions.</li> <li>Oracy task – become an expert on a polymer and teach others</li> <li>Sort polymers in to synthetic or natural</li> <li>HSW using data select function of polymer</li> <li>Summary questions self-assessed</li> </ul>	D&T
	How are polymers are produced by a chemical process engineer?	7 b	<ul style="list-style-type: none"> <li>Job role, attributes and qualifications needed.</li> <li>Group work - Make and test plastics</li> </ul>	STEM
	How does a testing engineer measure a balls bounce	8 b	<ul style="list-style-type: none"> <li>Job role, attributes and qualifications needed.</li> <li>Group work - Test a variety of balls</li> </ul>	STEM
	How do we test the suitability of a smart plastic	8 c	<ul style="list-style-type: none"> <li>Job role, attributes and qualifications needed.</li> <li>Group work - Test a variety of nappies</li> </ul>	STEM
	Revision	9	Use metacognition strategies.	
	Test	1 0	End of topic test	



Topic 19 Earth	What does the Earth and atmosphere comprise of?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Memory task -the structure of the Earth</li> <li>• Math's skills – drawing pie charts of atmospheric data</li> <li>• HSW – describing data and drawing pie charts, self-assessment</li> </ul>	Geography
	<i>What are sedimentary rocks like and how are they formed?</i>	2	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Define weathering keywords</li> <li>• Sort order of sedimentary rock formation</li> <li>• Literacy scaffolded task self-assessed</li> </ul>	Geography
	<i>What are metamorphic rocks like and how are they formed</i>	4	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions.</li> <li>• Oracy task – become an expert on a type of colling and teach others</li> <li>• Correct the teacher literacy task</li> <li>• Teacher assessed scaffolded literacy task</li> </ul>	Geography
	How do the rocks change into each type of rock?	4	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Annotate rock cycle diagram</li> <li>• Literacy task – word fill</li> <li>• True or false quiz</li> <li>• Complete rock cycle diagram. Self assess</li> </ul>	Geography
	How does carbon get recycled?	5	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Literacy task – word fill</li> <li>• Construct the rock cycle diagram, Peer assess</li> </ul>	Geography
	What are consequences of climate change?	6 a	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Construct diagram to show greenhouse effect</li> <li>• Oracy task – become a expert on one effect of global warming and teach other</li> <li>• Self-assessed scaffolded literacy task.</li> </ul>	Geography



	How does a an agriculture help produce more food	6 b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Make and explain how a greenhouse works.</li> </ul>	STEM
	Why do we need to reduce, reuse and recycle?	7	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Pair work – sort statements in to advantages and disadvantages</li> <li>• Pair work – discuss and decide to reduce, recycle or reuse a number of objects. Peer assess scaffolded literacy task</li> </ul>	D&T, Geography
	Revision	8	Use metacognition strategies.	
	Test	9	End of topic test	
Topic 20 Elect ricity	How is static electricity created?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Draw diagrams to show attraction and repulsion</li> <li>• Label diagram of an atom and identify charges</li> <li>• Draw electric field diagrams</li> <li>• Literacy word fill task</li> <li>• Progress quiz peer-assessed</li> </ul>	D&T
	What are the uses of static electricity	2	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Oracy task – become an expert on a use of static and teach others.</li> <li>• Self-assessed scaffolded literacy task.</li> </ul>	
	What is current and how is it measured?	3 a	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Draw circuit diagrams including symbols</li> <li>• Group work - Constructing circuits and measuring current investigation</li> <li>• Key word match up</li> <li>• Progress quiz self-assessed</li> </ul>	D&T
	How does an electrician make a	3 b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Make a series and parallel circuit from conductive dough</li> </ul>	



	working circuit?			
	How can the flow of current can be affected by the length of wire	4	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Literacy task – key word fill</li> <li>• Peer assessment literacy task.</li> <li>• Calculating resistance worksheet</li> <li>• Group work - Resistance investigation</li> <li>• Literacy task – correct the teacher.</li> <li>• Peer-assessed scaffolded literacy task.</li> </ul>	D&T
	How is potential difference measured in a circuit?	5 a	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Group work - Voltage investigation</li> <li>• Literacy task – word fill</li> <li>• Numeracy task calculating voltage, current and resistance</li> <li>• Exam style question self-assessed</li> </ul>	D&T
	How does an electrical engineer know how to build a cell	5 b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Make a battery using citrus fruits</li> </ul>	
	What is the difference between series and parallel circuits?	6	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Series or parallel quiz</li> <li>• Calculate ammeter readings for series and parallel circuits</li> <li>• Calculate voltmeter readings for series and parallel circuits</li> <li>• Teacher assessed scaffolded literacy task</li> </ul>	D&T
	Revision	7	Use metacognition strategies.	
	Test	8	End of topic test	
Topic 21 Motion and pressure	How is speed calculated?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Numeracy – calculate speed worksheet</li> <li>• Group work - Speed investigation</li> <li>• HSW – construct appropriate graph to display data</li> <li>• Exam style question self-assessed</li> </ul>	Maths



What does a mechanical engineer do?	1 b	<ul style="list-style-type: none"><li>• Job role, attributes and qualifications needed.</li><li>• Group work - Make the fastest wind sail car.</li></ul>	Engineering
How do we represent a journey on a graph?	2	<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions</li><li>• Quick quiz- lines on a graph</li><li>• Group work - Distance time graph investigation</li><li>• HSW – construct appropriate graph to display data</li><li>• Exam style question</li><li>• Self-assessed scaffolded literacy/numeracy task</li><li>• Peer assess</li></ul>	Maths
What is gas pressure and how does it change?.	3	<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions</li><li>• Literacy task – increasing pressure</li><li>• Group work - Bouncy ball investigation</li><li>• HSW draw appropriate graph to display data and describe patterns</li><li>• Comprehension task – atmospheric pressure, self-assessed</li></ul>	Maths - drawing graphs
What happens to liquid pressure the further you sink (2)	4	<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions</li><li>• Recap particle model</li><li>• Water pressure demo and student observation questions</li><li>• Self-assessed summary questions</li><li>• Exam style questions – complete diagram to show pressure on diver self-assess</li></ul>	Maths - drawing graphs
How do you calculate pressure in solids?	5 a	<ul style="list-style-type: none"><li>• Metacognition quiz.</li><li>• Present new information, video clip, discussion, address misconceptions</li><li>• Quick check – simple pressure calculations</li><li>• Calculations – different parts of the body and your own pressure</li><li>• Literacy – key word fill</li><li>• Teacher assessed scaffolded literacy task</li></ul>	
Why are deep sea divers concerned	5 b	<ul style="list-style-type: none"><li>• Job role, attributes and qualifications needed.</li><li>• Group work - Make a Cartesian diver</li></ul>	





	about pressure?			
	How do I calculate a moment? (2)	6	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Moment's calculations</li> <li>• Identify types of levers</li> <li>• Moments key word fill.</li> <li>• Exam style moments calculations, peer-assessed</li> </ul>	
	Revision	7	Use metacognition strategies.	
	Test	8	End of topic test	
Topic 22 Sound	How is speed calculated?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Numeracy – calculate speed worksheet</li> <li>• Group work - Speed investigation</li> <li>• HSW – construct appropriate graph to display data</li> <li>• Exam style question self-assessed</li> </ul>	Maths
	What does a mechanical engineer do?	1b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Make the fastest wind sail car.</li> </ul>	Engineering
	How do we represent a journey on a graph?	2	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Quick quiz- lines on a graph</li> <li>• Group work - Distance time graph investigation</li> <li>• HSW – construct appropriate graph to display data</li> <li>• Exam style question</li> <li>• Self-assessed scaffolded literacy/numeracy task</li> <li>• Peer assess</li> </ul>	Maths
	What is gas pressure and how does it change?.	3	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Literacy task – increasing pressure</li> <li>• Group work - Bouncy ball investigation</li> <li>• HSW draw appropriate graph to display data and describe patterns</li> <li>• Comprehension task – atmospheric pressure, self-assessed</li> </ul>	Maths - drawing graphs



	What happens to liquid pressure the further you sink (2)	4	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Recap particle model</li> <li>• Water pressure demo and student observation questions</li> <li>• Self-assessed summary questions</li> </ul> Exam style questions – complete diagram to show pressure on diver self-assess	Maths - drawing graphs
	How do you calculate pressure in solids?	5 a	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Quick check – simple pressure calculations</li> <li>• Calculations – different parts of the body and your own pressure</li> <li>• Literacy – key word fill</li> <li>• Teacher assessed scaffolded literacy task</li> </ul>	
	Why are deep sea divers concerned about pressure?	5 b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Make a Cartesian diver</li> </ul>	
	How do I calculate a moment? (2)	6	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Moment's calculations</li> <li>• Identify types of levers</li> <li>• Moments key word fill.</li> <li>• Exam style moments calculations, peer-assessed</li> </ul>	
	Revision	7	<ul style="list-style-type: none"> <li>• Use metacognition strategies.</li> </ul>	
	Test	8	<ul style="list-style-type: none"> <li>• End of topic test</li> </ul>	
Topic 23 Light	How does light travel?	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Sort luminous and non-luminous objects</li> <li>• Literacy task -Write definitions for key words and give examples</li> <li>• Group work – light investigation</li> <li>• Literacy task – word fill</li> <li>• True or false quiz</li> <li>• Self-assessed scaffolded literacy task.</li> </ul>	D&T
	How are images	2	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> </ul>	D&T Maths



	formed in a mirror?		<ul style="list-style-type: none"> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Group work – reflection investigation</li> <li>• Literacy exam question periscopes</li> <li>• Progress quiz peer-assessment</li> </ul>	
	How is light refracted in water?	3	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Group work – refraction investigation</li> <li>• HSW – Predictions and conclusions.</li> <li>• Literacy task – word fill</li> <li>• Progress check – lenses self-assessed questions</li> </ul>	D&T Maths
	Is the structure of the eye is similar to a camera?	4	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Label eye diagram</li> <li>• Literacy word fill – vision</li> <li>• Literacy task – functions of structures of the eye peer assessed</li> <li>• Label camera diagram</li> <li>• Literacy task – how a camera works word fill</li> <li>• Literacy task compare the eye and camera self-assessed.</li> </ul>	D&T
	How are coloured objects seen	5 a	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Label dispersion diagram</li> <li>• Demo – using filters</li> <li>• Comprehension task – how we see colour</li> <li>• Progress check peer assess questions</li> </ul>	D&T
	What is the role of a research and development scientist	5 b	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Group work - Make a rainbow using chemicals.</li> </ul>	
	How was color in light explained	5 c	<ul style="list-style-type: none"> <li>• Job role, attributes and qualifications needed.</li> <li>• Build a newton's color wheel.</li> </ul>	History
	Revision	6	Use metacognition strategies.	
	Test	7	End of topic test	
Topic 24	What are microbes	1	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> </ul>	H&SC PSHE



Microbes and disease	and how do some cause diseases?		<ul style="list-style-type: none"> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Literacy task - Sort statements about bacteria and viruses into a Venn diagram</li> <li>• True or false quiz</li> <li>• Literacy task - Mind map how do pathogens spread</li> <li>• Exam style questions self-assessed</li> </ul>	
	What are some common diseases?	2	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Research task bacterial diseases</li> <li>• True or false quiz</li> <li>• Research task viral diseases</li> <li>• Literacy task – quick check questions</li> <li>• Comprehension task malaria and rose black spot</li> <li>• Literacy task – quick quiz peer-assessed.</li> </ul>	H&SC PSHE
	What uses do microbes have?	3	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Literacy task – mind map uses of microbes</li> <li>• Research task – uses of microbes</li> <li>• True or false quiz</li> <li>• Group work – making yogurt</li> <li>• Literacy task – progress check conditions needed for microbes to reproduce self-assessed questions</li> </ul>	H&SC Cooking
	What is the first line of defense to pathogens?	4	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Literacy task - Label and annotate body diagram with body defenses,</li> <li>• Literacy task – white blood cells cartoon strip self</li> <li>• Progress check self-assessed questions</li> </ul>	
	How do diseases spread and how can we prevent it?	5	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Research task – how to prevent the spread of disease</li> <li>• Literacy task – write a newspaper article about Ignaz Semmelweis peer-assessed.</li> </ul>	PSHE



	How do vaccinations work?	6	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Recap white blood cell action</li> <li>• Literacy task – vaccination cartoon strip</li> <li>• Comprehension task herd immunity peer-assessed</li> </ul>	History - small pox
	How do bacteria become resistant to antibiotics?	7	<ul style="list-style-type: none"> <li>• Metacognition quiz.</li> <li>• Present new information, video clip, discussion, address misconceptions</li> <li>• Define keyword - painkiller, antibiotic.</li> <li>• Progress quiz</li> <li>• Literacy task – antibiotic resistance cartoon strip.</li> <li>• Literacy task – word fill antibiotic resistance self assess summary</li> </ul>	H&SC
	Revision	8	Use metacognition strategies.	
	Test	9	End of topic test	

Sharing of medium term plans will allow each subject to reflect and re-order content to support colleagues in other subjects or teach content making links to other subjects explicit.

### Short Term Planning

Individual lesson resources and assessments to include high quality texts and images. Lessons should promote the explicit teaching of vocabulary and give opportunities to speak, read and write extensively using high-level subject vocabulary. Core numeracy skills should be incorporated into lessons where they can be covered in a real world context.

Opportunities should be created to support the wider curriculum:

- PSHE / RSE
- Careers
- Citizenship and British Values
- Financial Education

Planning should be shared across the department.

Teachers can adapt lessons to match needs to students.