Science at Ravenscliffe High School

Purpose of this Document	This document has been written in order to provide key Science policy and curriculum information to all key stakeholders, including teaching staff, school governors, parents and other interested parties. It reflects the school values and philosophy in relation to the teaching and learning of Science and draws together National Curriculum guidelines and statutory requirements for Key Stages 3 and 4, but also includes elements of Key Stages 1 and 2 as well as promoting the Spiritual, Moral, Social and Cultural (SMSC) development which includes British Values. The document seeks to address the individual learning needs of our young people and sets out a framework within which teaching staff can operate and provides guidance on planning, teaching and assessment. It outlines the following: • The **Intent** – The purpose of the Science Curriculum at Ravenscliffe. • The **Implementation** – How we meet this purpose through the delivery of a broad, balanced and robust Science Curriculum • The **Impact** – Our intended outcomes in Science and how we assess, evaluate and monitor these over time. This document also contains key information about Leadership, Cross Curricular Opportunities and links to other relevant documentation
Intent	**Intent Statement** This section outlines the purpose of the Science Curriculum at Ravenscliffe and what we aim to achieve in order to help all students to learn and make expected progress or above in Science. At Ravenscliffe, we encourage students to be inquisitive throughout their time at the school and beyond. The Science curriculum fosters a healthy curiosity in students about our universe and promotes respect for the living and non-living. Through a richly diverse, interesting and challenging curriculum we aim to encourage students develop a love of science, nurtured through a whole school ethos. Our Science curriculum encompasses the acquisition of knowledge, concepts, skills and positive attitudes through a range of broad and balanced schemes of learning, where the students can acquire and develop the key **Scientific knowledge** and skills of **Working Scientifically** that have been identified within each unit, across each year group/key stage and each learning pathway. These 2 strands make up the key areas of teaching, learning and assessment in the Science Curriculum. The curriculum aims to achieve this through practical experiences; using equipment, conducting experiments, building arguments and explaining concepts confidently. <u>Scientific Knowledge</u> The key **Scientific Knowledge** identified by each year group/key stage is informed by the **National Curriculum** and is a means of motivating students to achieve their **EHC outcomes**. Through a clearly planned 'spiral' approach, the **Science learning overview** ensures that all students revisit and consolidate key concepts each year through explicit Biology, Chemistry and Physics topics before moving on to learn new concepts within that topic. <u>Working Scientifically</u> The development of key Scientific Working skills teaches students to ask questions, find ways to investigate answers, plan experiments and draw conclusions. These skills are mapped for each year group and are progressive throughout the school. Each new year starts with a half term of **'Working Scientifically'** sessions – 6 practical investigation lessons designed to baseline and consolidate previously learnt skills and knowledge, before the teaching of topics commences. These skills are then developed and enhanced in practical sessions throughout all schemes of learning. <u>Cross Curricular Links</u> Cross curricular opportunities are also identified to ensure contextual relevance. Students are encouraged to ask questions and be curious about their surroundings and develop a love of science through a whole school ethos and a varied science curriculum.

Implementation	**Implementation Statement** This section outlines how we meet our Intent, through the delivery of a broad, balanced and robust Science Curriculum. <u>Meeting the needs of all learners</u> Our learners at Ravenscliffe High School have Moderate, Severe and / or Profound and Multiple Learning Difficulties including other associated difficulties such as Autism, Multi-Sensory, Visual & Hearing Impairment(s). The wide range of needs of our learners holds no barrier to accessing the learning opportunities within the Science curriculum. To enable the staff at Ravenscliffe High School to fully address the range of needs of the pupils and to enable us to show progression within the activities for the appropriate Key Stage; the Programmes of Study as outlined in the Schemes of Learning for Science have been differentiated into 4 broad descriptions of learners or 'Pathways': • **Formal learners** are able to communicate with fluency and who are able to make reasoned choices, work and act cooperatively in a small group and with varying support, work independently. • **Semi formal learners** communicate in a simpler, supported way e.g. using PEC's, AAC, Signing and who need a moderate amount of support to access learning. • **Emergent learners** are students whose learning is supported through structured patterns of communication and social activity to enable them to develop positive social behaviour. • **Sensory learners** are students who require their needs to be met primarily through direct experiences and activities, which are multisensory. For pupils who have sensory impairments and/ or physical disabilities and for those who experience developmental delay, Science is based upon a multisensory approach, which starts from direct experience and progresses to structured activities and experiences using concrete materials. <u>Time Allocation</u> The subject of Science is allocated the appropriate amount of time, taking into account NC guidance, to provide all learners with a broad and balanced curriculum which is appropriate for their needs. For the majority of students in the Formal, Semi-formal and Emergent pathways, this equates to 1 double session or 2 single sessions that add up to approximately 90 minutes per week. Sensory Science is taught discretely through a range of sensory topics and experiences designed to engage our learners in the pathway. <u>The Curriculum Overview</u> To facilitate effective teaching and learning in Science, a Curriculum Overview for each pathway (exc. Sensory) outlines the key programmes of study *(see Appendices A B & C).* In Year 7, Formal & Semi Formal students are grouped by ability and taught units from the Primary National Curriculum to help teachers to baseline their scientific knowledge, understanding and skill whilst develop new scientific concepts to ensure progress is made in their first year at Ravenscliffe. In Years 8 and 9, these students are grouped by ability and begin a 2 year rolling programme of study to build on prior knowledge and skill by accessing a curriculum based on the KS3 National Curriculum, but adapted for our learners and their ability. When these students go to Key Stage 4, they are grouped by ability again and begin a new 2 year rolling programme of study. Units are taught in the key Scientific disciplines of Biology, Physics and Chemistry and allow for a spiral approach, meaning that new units revisit key scientific knowledge and concepts taught in previous units. This allows teachers to ensure that learning is made more concrete over time, students can recall and build on previous learning and that misconceptions can be ironed out before new learning occurs. Emergent students are taught science in units that last for a whole term and change each year on a rolling 5 year cycle to match the rest of the Emergent Curriculum that is arranged this way. <u>Knowledge & Skills</u> The Science Curriculum at Ravenscliffe is delivered and monitored through the 2 main strands of **Scientific Knowledge** and **Working Scientifically**. These strands are then further broken down into the key Scientific disciplines of: **Biology**, **Physics** and **Chemistry**, each of which is taught through a wide range of different units, as outlined in the Curriculum Overview *(Appendices A, B & C)*

The specific Scientific Knowledge relating to each unit has been catalogued into key level descriptors and arranged to show progression for all our learners from the Emergent Pathway right through to some of our more Formal learners, some of whom might be working around Upper KS2 Age Related Expectations. Teachers assess against these level descriptors following each unit of learning. *(An example of these Descriptors can be seen in Appendix D).*

Scientific skills are taught through the Working Scientifically strand which, as mentioned above, is taught explicitly in the first half term of every year for Semi Formal and Formal students. After this, the strand is taught and assessed more implicitly through each Scheme of Learning by incorporating practical investigations where appropriate. During their time at Ravenscliffe, students are encouraged to develop their problem-solving skills and to learn to work increasingly independently. Some of these key skills include:

- Asking questions
- Exploring ways to find answers and planning an investigation
- Gathering and using the right equipment in the correct way
- Collecting, recording and interpreting information
- Drawing diagrams and graphs
- Drawing conclusions

(Level descriptors for Working Scientifically can be seen in Appendix E)

All students participate in scientific enquiry at a level appropriate to their needs, ensuring that activities, equipment and expectations are adapted so every learner can engage meaningfully in practical science. Students develop social communication skills by engaging in collaborative science activities, with structured support enabling all learners to participate, contribute and share ideas with peers.

<u>Resources</u>

Most lessons are taught in a bespoke Science classroom at Ravenscliffe. The room is spacious and allows for whole class teaching or for groups to work in separately with plenty of room to move around during practical investigations. Ample storage allows for good management of resources and for adequate Health and Safety measures. Access to sinks, computers and a good outdoor space means that Science lessons have the scope to meet the requirements of every unit of learning.

Our outdoor areas offer a range of learning environments to access. They include:

- Open learning spaces
- Kitchen garden
- Polytunnel
- Wooded area
- Pond area
- Flowers and plants
- Grassed area
- Small animal enclosure

Learning beyond the classroom provides equitable opportunities for all students—especially those with sensory or physical needs—to access real-world science in ways that are motivating, meaningful and personalised.

We use a wide range of high-quality resources to aid teaching and learning in Science at Ravenscliffe. As well as offering an extensive science library, we understand that a practical, hands-on approach best suits our learners. A substantial budget allowance is used alongside donations from governors and Friends of School to ensure that each unit has the best resources that are fit for purpose and that engage our students on their level. Recent large purchases include:

- A life sized skeleton
- 2 digital microscopes
- A desktop digital camera for projecting experiments onto a large screen
- The full range of plastic measuring cylinders/beakers etc

<u>Safeguarding in Science</u>

Science teaching at Ravenscliffe prioritises safety and wellbeing. All practical activities are risk-assessed, staff are trained in safe practice, and adaptations are made for pupils with physical, sensory, or communication needs. Staff remain alert to safeguarding indicators during practical and outdoor activities, following whole-school procedures to escalate concerns

<u>Further opportunities in Science</u>

At Ravenscliffe we have had the opportunity to explore the world of Science in other contexts. Some of these have included:

- Trips to local places e.g. Eureka, Ogden wind farm, Magna Science museum, Shibden Park, Skircoat Green for surveys (traffic, urban environments, trees etc), Ogden reservoir and nature reserve, local farms (lambing, minibeasts, plants).
- Residential trips – London (Science museum, Natural History Museum), Beamsley (Thornton Hall Farm).
- Visits to Ramsen Farm to see a working sheep farm and explore a new environment
- Sessions with experts e.g. woodland team at Ogden reservoir or Eureka staff members.
- Gifted and Talented sessions in Calderdale High Schools as part of enrichment (TBC).

Celebration of achievement

We celebrate all achievement in Science through the school rewards system that includes stickers and Personal Development Certificates. Celebration of achievement is inclusive, ensuring that every learner—regardless of pathway—has their contributions recognised through displays and assemblies.

Science Week

National Science Week takes place in the Spring term each year and offers the opportunity to celebrate our subject and the achievements made by students. Every teacher takes part in offering Science lessons in all of the different subject lessons during the week, making cross curricular links for every at student. We aim to ensure that every student understands that '**Science is everywhere, every Day'** and that **'everyone is a scientist!'** The week always culminates in a celebration assembly to promote the subject, recognise the hard work that everyone has done and to give one student the Annual Science Award. *(An example of the cross curricular planning for Science week can be seen in Appendix F)*

List of Appendices

Appendix A – Formal Curriculum Overview
Appendix B – Semi Formal Curriculum Overview
Appendix C – Emergent Curriculum Overview
Appendix D – Example of Scientific Knowledge Level Descriptors
Appendix E – Working Scientifically Level Descriptors
Appendix F – Example of Science Week Cross Curricular planning

Key Strands	
Working Scientifically	**Scientific Knowledge**

Links to:

Reading	**British Values**	**Character Education**	**SMSC**
Reading worksheets, labels, equipment, textbooks, identifying symbols, sequencing symbols / pictures, group reading session on topic books.	Democracy, the rule of law, individual liberty and choice, mutual respect and tolerance of those with different faiths and beliefs, understanding of the world, other cultures, diversity and empathy for other.	Evaluating our findings and our method, working together, respect, resilience, compassion and integrity taught throughout all sessions.	Encouraging awe & curiosity Reflecting on the wonder of life, Safe and responsible choices, Considering ethical issues, Working collaboratively, Developing communication skills, Taking roles to build confidence and cooperation, Exploring cultures and historical periods, Recognising impact on diverse communities.
Maths Capacity, weight, measure, time, correspondence when using equipment.	**PSHE** Reproduction, the human body, science in the home, safety.	**ICT** Recording findings and evaluating results, use of AAC, iPads to aid observation.	

Impact

Impact statement

This section outlines our intended measurable outcomes in Science and how we assess, evaluate and monitor these over time to evident the impact of our implementation towards the development of our students.

The successful approach at Ravenscliffe results in a fun, engaging, high-quality science education, that provides students with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that students learn through varied and first hand experiences of the

world around them. Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. Through various workshops, trips and interactions with experts and local charities, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity.

Assessment - Attainment

Students are assessed in different ways in Science at Ravenscliffe. All teachers make regular formative assessments during each lesson, through targeted open and closed questions and observation. These assessments are used to inform the progression of the lesson as well as future planning and they support more formal, recorded assessments through the year.

Students show their understanding through diverse means, including spoken language, signing, symbol exchange, AAC, facial expression, body movement and independent or supported action.

Teachers may wish to complete more summative assessments to evaluate teaching and learning across a unit through the means of a low stakes quiz or game. We understand that many of our students don't always perform well under test conditions, so results need to be supported or corrected with evidence from formative assessments as well as video or photographic evidence.

Formal assessments are recorded each term using the level descriptors outlined above. Baselines are completed for new Year 7 students in October, then assessment data is added at the end of each term. Teachers use the **Evidence for Learning** Programme to record attainment as well as to measure and monitor progress during the year. Assessments for **Scientific Knowledge** are only recorded following the teaching of that specific unit each term, whilst assessments for **Working Scientifically** are updated termly.

Each strand has 10 overarching level descriptors with 10 specific descriptors for each unit which students are assessed against. For each descriptor, one of the following achievement levels can be selected; **Experienced, Emerging, Developing, Secure or Mastered**. Students need to have achieved 90% or more to progress to the next level e.g. from RPS7 up to RPS8.

Appropriate Science evidence in the form of a photograph, video or a picture of work is added to **Evidence for Learning** with a supportive description of the task, how it shows progress and 'next steps' for each student throughout the year.

Our assessment methods are fully inclusive, allowing every learner to demonstrate progress through a range of accessible formats such as photographs, signing, AAC, sensory responses and practical demonstration, this is recorded as evidence on EfL.

Assessment – Progress

Progress is measured in a way that values each student's starting point and learning pathway, ensuring that all achievements—academic, sensory, experiential or communicative—are recognised and celebrated.

Progress is measured against RPS Levels across the year as well as against EHCP Outcomes. These are monitored by the subject lead each term to identify those students that are making expected, above or below expected progress so that the correct measures can be implemented to support all students moving forward.

The subject lead also identifies groups that might be making unexpected progress, such as teaching groups, boys/girls, FSM, Minority groups etc. These groups will be supported based on monitoring evidence.

KS4 Accreditation

Currently, Semi Formal students in KS4 complete the CREST: Star Award, which is a 6-8 part programme involving various challenges or problems to solve. This accreditation scheme is aimed at students working at the EYFS level and has been fully planned with great ideas to engage our students. After 6-8 lessons, students will have earned enough stickers to receive the certificate, which we present to them in the Science Week Assembly.

This is the first year of delivery for CREST Awards, but its success will mean that it will be rolled out for other students in future years. CREST offers lesson planning for all of our Semi Formal and Formal Pathways to use at their ability.

Preparation for Adulthood

By fulfilling all of our Intent and Implementation aims, we aim to prepare our students for the next stage in their lives. This could mean that our formal students are in a position to move to college with a broad understanding of the world around them that will help them apply their knowledge and understanding towards furthering their education or it could simply meant that our students have gained more independence to undertake specific activities with reduced support, e.g. choosing healthy food options,

	staying safe when working with electrical appliances, measuring and mixing when using recipes etc. We aim to equip our students with everything they need for the next step on their journey. Overall Achievement By fulfilling all of our Intent and Implementation aims, we expect all of our students to have developed a new curiosity for the world around them, and with that, new skills to find answers for themselves. We expect students to leave Ravenscliffe with knowledge that will equip them for their next stage in life, whatever that may be. Our inclusive approach ensures that scientific learning contributes to each student's independence, confidence and ability to apply scientific ideas to everyday life, regardless of cognitive, physical or communication needs.
Leadership and Review	The Science Team Tom Greensides is the Science lead (TLR) and takes overall responsibility for the implementation of all aspects of this document. He has experience of teaching Science at mainstream Primary level and leading foundation subjects for several years at Ravenscliffe. Tom regularly reports to the Deputy Headteacher to review all aspects of this document as well as the **Science Development Plan**. Tom is supported by a team of 2 other Science teachers, both of whom come from a the mainstream Science background with many years of teaching experience between them. Both teachers take various responsibilities throughout the year to aid the implementation of the Science Curriculum, e.g. leading assemblies, procuring resources etc. Curriculum Review This Curriculum structure is in its 2nd year of delivery following a full Curriculum overhaul in 2024. Regular reviews have taken place during the course of its implementation through team meetings and meetings with the DHT. Once the full programme of study has been delivered, a full review of each unit, Scheme of Learning, Planning and Resources will take place in order to make any necessary changes before the second phase begins. Development Plan The **Science Development Plan** is a working document that outlines key aims of development for the subject across the forthcoming 12 month period and relates directly to the **School Development Plan**. It highlights key tasks, personnel, dates and success criteria and is reviewed termly with the DHT. Supporting Teachers Regular team meetings alongside more informal 'chats' ensure that all Science teachers are supported and kept abreast of key developments within the subject. CPD is ongoing and there are plans to provide specific Science training in the near future. All teachers at Ravenscliffe are supported through regular lesson observations by SLT and by their peers. In Science, teachers have all agreed to regular informal 'drop-in' visits from every member of the team so that we can all learn from each other and there is one formal 'learning walk' scheduled in early Summer term each year. Teachers receive constructive feedback on the lesson which is aimed to help them develop and build upon good practice. It also ensures that the key aspects of Science Intent, Implementation and Impact are being delivered. Work scrutiny is also scheduled for the Summer term, which provides evidence that teachers are meeting the requirements of this document and that the team are following school policy and procedure regarding marking, presentation and the collecting of high quality evidence. Moderation of planning and students' work each year ensures that teachers are aware of each level of attainment, as presented in the level descriptors *(See Appendix D & E)* and that we all agree on how each level can be evidenced. This ensures that all students are assessed fairly and accurately on Evidence for Learning. Supporting Science Leadership As mentioned previously, the Science Lead meets regularly with the DHT to monitor key aspects of the **Science Development Plan** alongside the **School Development Plan**. The Science Lead is also part of a **Science Cluster Group**, made up of teachers from other Special Needs schools across the Local Authority as well as an Education Consultant who coordinates and facilitates the sessions. These meetings offer the opportunity to share good practice and provide support for the development of Science from different perspectives.

Linked documents	This document should be read in conjunction with the **Whole School Curriculum and Assessment Policy**. Other documents that can be read for further information with specific relation to Science and this document are: • Self Evaluation Form • School Development Plan • Science Development Plan • Science Subject Risk Assessment Form • CREST Awards Website • Science Curriculum Overview (Appendix A, B & C) • All Science Schemes of Learning
Date:	6th March 2026
Author:	T Greensides – Science Lead
Reviewed by:	J Lough – DHT
Next Review:	March 2027

Nurture, Believe, Achieve, Succeed

Appendix A - Science Curriculum Overview - Formal

Topics have been arranged in Half-Termly Units and cover Science themes from KS3 that will be adapted to suit the needs of Formal learners at RHS. Topics also allow for differentiation for more advanced learners. **Key – Biology Units, Physics Units, Chemistry Units**

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	Working Scientifically: taught though different topics to revisit last year's learning and establish baseline assessments before adapting / building on plans for teaching topics across the year.	Our Body	Weather	States of Matter	Living Organisms	Science at Home*
8/9 A		Skeletons & Muscles	Earth & Space	Changing States	Habitats and ecosystems	Light & Sound
8/9 B		Nutrition & Digestion	Waves	Our Earth & Atmosphere	Photosynthesis	Forces & Magnets
10/11 A		Circulatory & Respiratory Systems	Motion & Forces	Changing States	Reproduction & Health	Assess and revisit areas that need covering again.
10/11 B		Cells	Electricity & Energy	Mixtures, Compounds & Chemical reactions	Genetics & Evolution	

**Science at Home is an opportunity to link prior learning to real life application and can include areas previously covered where there was opportunity for deeper learning.*

Appendix B - Science Curriculum Overview – Semi Formal

Topics mirror those in the Formal Pathway, but headings are simplified to suggest a more accessible curriculum for our SF learners.
These headings could also be used for Formal learners who might be working at a slightly lower level e.g. Formal 3 groups.
Key – Biology Units, Physics Units, Chemistry Units

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	Working Scientifically: taught though different topics to revisit last year's learning and establish baseline assessments before adapting / building on plans for teaching topics across the year.	5 Senses	Weather	Properties of Materials	Animals vs Plants	Science at Home*
8/9 A		Our Bodies Bones & Muscles	Earth, Moon & Sun	Melting, Freezing, Boiling & Condensing	Animals & their Homes	Light & Sound
8/9 B		Our Bodies Food & Drink	Floating & Sinking	Planet Earth	Growing Plants	Forces & Magnets
10/11 A		Our Bodies Exercise	Moving	Melting, Freezing, Boiling & Condensing	Keeping Healthy	Assess and revisit areas that need covering again.
10/11 B		Living Things	Energy	Amazing Experiments!	Similarities & Differences	

**Science at Home is an opportunity to link prior learning to real life application and can include areas previously covered where there was opportunity for deeper learning.*

Appendix C **- Science Curriculum Overview – Emergent**

Emergent groups will work on a topic for a whole term. The following is a rolling programme of activities to be covered each year.

Key – Biology Units, Physics Units, Chemistry Units

Year	Autumn	Spring	Summer
1	Science at Home	Senses	Forces
2	Animals & Humans	Light & Sound	Melting, Freezing, Boiling & Condensing
3	Our Bodies Food & Drink	Floating & Sinking	Amazing Experiments!
4	Our Bodies Exercise & Keeping Healthy	Weather	Planet Earth
5	Earth & Space	Energy & Electricity	Growing Plants

Appendix D – Example of Scientific Knowledge Level Descriptors. Key: Biology Units, Physics Units, Chemistry Units

	RPS4	RPS5	RPS6	RPS7	RPS8	RPS9	RPS10	RPS11	RPS12
Our Body	Our Body - Imitates the action or joins in with familiar actions involving the main body parts. E.g. Extending the arm, closing the palm, stamping their feet, etc.	Our Body - Enjoys using their 5 senses to stimulate their enquiring minds into the stimulus and reactions to the stimulus. E.g. touching cold ice and being curious to why it is cold to the touch.	Our Body - Is becoming aware of the features of the human body parts. E.g. the face, hands, legs, feet, etc. Will join in with games and songs involving body parts.	Our Body - Is becoming aware of how the organs within the body provide functions for the body. E.g. the lungs are for breathing, the brain is for thinking, the tongue is for tasting. Has an awareness of the skeleton.	Our Body - Knows the organs location within the body. E.g. the heart and lungs are within the chest. Knows the skeleton consists of different bones and that muscles move our bones	Our Body - Can talk about the lungs, heart and the digestive system. Can talk about the different bones of the skeleton and the they are attached muscles to make them move.	Our Body - Can use diagrams and/or pictures to name the human organs and their relative position. Can use diagrams and/or pictures to name the different bones of the skeleton and the muscles, such as the biceps and triceps.	Our Body - Can describe and/or explain what these organs do to aid the body. Can explain that bones allow movements in combination with joints and muscles to produce movements.	Our Body - Can explain the organs, their use and location within the body. Can observe/demonstrate breathing moves the chest from the lungs expanding to draw air in. Can explain the skeleton works in the arms, explain which muscle is the tricep and bicep and demonstrate them by flexing their arms in two positions.
Earth & Space	Earth & Space - Anticipates the effect of gravity on an object e.g. knows that a tower will fall down if pushed, will throw a ball to someone etc. Is aware of and responds to light and dark in different ways.	Earth & Space - Enjoys building and watching things fall and will anticipate what happens when we throw or drop an item. Will respond to questions about the sun, the planets or the stars e.g. point to the sun, is the sun hot or cold? Recognises the sky at night with stars and a shining moon.	Earth & Space - Is becoming aware of the term gravity and can explain what will happen if we drop an object. Knows that the sun, the moon and the stars are all in outer space and that Earth is a planet in the solar system	Earth & Space - Is becoming aware of the movement of the planets and the moon in the solar system and can name at least some of the planets. Knows that the moon goes around the earth.	Earth & Space - Knows the sequesnce of the seasons of the year and the reason we have night and day and that the Earth goes around the sun in a year and that the moon orbits the earth and changes is shape over a month.	Earth & Space - Can talk about what they know, explaining the movement of the Earth and the moon and their places in the solar system; knows that the sun is a source of light	Earth & Space - Can use diagrams or pictures to explain the movement of the Earth in the solar system and name all of the planets with some of their key features; is aware of the effects of gravity and knows that there is no gravity in outer space	Earth & Space - Can describe the movement of the earth and the moon in more detail. Can give evidence to support their understanding. Can explain why we have seasons in the year and why objects fall to earth at the same speed.	Earth & Space - Can describe the movement of the earth and moon in space in detail, using key vocabulary and identifying key phases or lengths of time, citing supporting evidence for their observations. Can explain the effects of gravity on earth and in space, talking about orbitts and the differences
States of Matter	States of Matter - Enjoys playing and interacting with different materials. Explores what happens with solids and liquids during play. Will squash, throw and play with a balloon with some support.	States of Matter - Will sort materials by their properties of shape, size, colour etc. Indicate the before and after of material changes. Will respond to scientific questions about states - e.g. which one can pour? Is it wet/dry? With close support, is beginning to sort by temperature and texture.	States of Matter - Recognises distinctive features of solids, liquids and gases and can sort them into 3 groups with simple explanations. Begins to make generalisations from experience - e.g. ice cream will melt. Closely observe changes in materials when heated, cooled or mixed and can communicate simply what they see.	States of Matter - Begins to use simple scientific vocabulary to describe states of matter and changes e.g. solid, liquid, gas, feeze, melt. Is beginning to ask questions about changes in state and explore through simple investigations. Will observe and discuss findings with increasing independence and record through sequenced pictures.	States of Matter - Is aware of changes to materials and uses correct vocabulary to describe including evaporation and condensation through simple examples. The can describe properties of materials and sort objects to determine their state. Can answer direct questions about states of matter and changes in state.	States of Matter - Will recognise and describe in more detail the properites of materials in different states. Is becoming aware of basic particle theory in simple terms. Understands that heating and cooling affects the state of matter and can explain how, giving examples.	States of Matter - Can use simple particle theory to explain why materials behave how they do in their different states of matter, describing the properites of a range of similar materials. Can explain in detail the 4 main changes of state and how they occur giving real life examples and how we can use them in everyday life.	States of Matter - Can describe materials and their properties with confidence and exlain why these properties make them suitable for differnet purposes. They classify changes in materials as reversible, such as water freezing, and non-reversible, such as baking of cakes. use simple scientific ideas with evidence they have collected to give explanations of their observations, linking cause and effect, for example the evaporation of water.	States of Matter - Can describe some processes and phenomena related to materials and their properties, drawing on scientific knowledge and understanding and using appropriate terminology, for example separation methods. Recognise that evidence can support or refute scientific ideas, such as the classification of reactions as reversible and irreversible. They recognise some applications and implications of science, such as the safe use of solids, liquids and gases.

Appendix E – Working Scientifically Level Descriptors.

Key: Biology Units, Physics Units, Chemistry Units

R4 - Pupils explore objects and materials provided, changing some materials by physical means and observing the outcomes. They know certain actions cause predictable results. Pupils communicate their awareness of change and can cause change through their actions. They imitate actions. Pupils show interest in science through handling and observing.
Explores a range of different materials using different senses.
Responds to objects, sounds, movement, texture.
Can choose a single word / sign / symbol to name familiar object.
Follows simple instructions to explore in new ways
Watches objects as they move or track sound as it moves
Explores various materials observing how they change through cause and effect.
Anticipates an event e.g. object will fall, musical instrument makes a sound, water will pour
Can find or locate a favourite object / material / sound etc. when **out of sight**
Copies actions / sounds / movement from modelling
Shows understanding of uses of a familiar object, material or tool
R5 - Pupils anticipate and join in activities focused on enuiry into specific environments. They indicate the before and after changes. They engage in experimentation with a range of equipment in familiar and relevant situations.
Responds to a simple question about an object / sound / material etc**.**
Helps to carry out part of an experiment with support by following simple instructions
Explores items independently
Anticipates outcomes to scientific changes e.g. water will get hot when heated, car will roll when pushed
When describing observations, begins to use simple descriptive terms e.g. hard, cold, wet using **1-3 words/signs/symbols**
Explores objects presented to them in an appropriate way e.g. rolls a ball, tries to find switch on toy.
Shows awareness of changes in materials or the environment e.g. changes to the weather, ice melting.
Shows interest in effects upon items e.g. watches and explores the effects of gravity, heat, magnetism, electricity etc.
Imitates actions of others e.g. Playing a musical instrument.
Uses a familiar object, material or tool in the appropriate way e.g pours a watering can
R6 - Pupils explore objects and materials provided in an appropriate way. They begin to make generalisations, coonections and predictions from regular experience. They closely observe the changes that occur. They can follow simple verbal instructions.
Describes their action with a simple word / sign / symbol e.g. push, roll, drop, squeeze
Manipulates different objects, materials or tools appropriately for their function
Carries out a simple experiment with support
Begins to make simple predictions
Use correct vocabulary for scientific equipment
Can say which sense they are exploring - taste, touch, sound, sight and smell
Says how something has changed when given a choice of 2 options.
Follows simple instructions with less support.
Repeats actions and makes changes e.g. adds more water to flour to make better dough.
Gives a clear preference for items or materials when given a choice of up to 5 e.g. musical instruments, fabrics.
R7 - Pupils actively join in scientific investigations. They understand some simple, scientific vocabulary and can communicate related ideas and observations using simple phrases. They begin to record their findings. They begin to make suggestions for planning and evaluating their work.
Predicts what might happen with more skills and independence
Repeats actions to see if the result is the same.
Discusses what they observe with peers and staff with less support.
Describes the actions of something they see
Gives a simple reason why when observing an experiment.
Talks simply about their findings.
Compares results simply.
Experiments to see if they can cause a change to an object / material
Notices changes during observations
Follows simple instructions for using unfamiliar objects, materials or tools.
R8 - Pupils explore and observe similarities, differences, patterns and changes in features of objects, living things and events. They begin to make their own contributions to planning and evaluation and to recording their findings in different ways. Pupils make their own observations of changes that result from actions. They can describe the changes when questioned directly.
Wants to find out why something happens.
Makes predictions independently and can give a reason why.
Experiments with various materials, substances or unfamiliar objects to see effects they make.
Can complete a simple experiment / investigation with scaffolded support
Fills in a chart to record findings.
Is aware of changes they observe and can simply describe them with minimal support.
Explores in more detail using scientific equipment, magnifying glass, microscope, models etc.
Tries to give a reason for their ideas and observations.
Begins to explains their findings and gives a reason why e.g. it went fast because it's slippy.
Chooses simple equipment appropriately for the task e.g. measuring jug for liquids, spoon for solids.
R9 - Pupils describe or respond appropriately to simple features of objects, living things and events they observe, communicating their findings in simple ways. They can make simple suggestions and communicate simple observations.
Discusses with classmates about how they could plan an experiment.
Can suggest a reason why when asked directly e.g. "why did the spoon sink?"
Tests to see which processes may be used on different objects, materials, substances with anticipation or predictions about the effects.
Contributes to a class recording chart e.g. daily weather chart.
Chooses equipment for a task with more independence and skill
Labels a diagram or picture using the correct vocabulary.
Measures lengths, weights, times etc in an experiment e.g. the car went 20cm.
Compares and evaluates results of a test, giving possible reasons for the outcomes.
Can describe how the test was fair, what was changed and what was kept the same.
Describes their findings with more detail and using scientific vocabulary e.g. the warmest egg was insulated by more layers.

R10 - Pupils respond to suggestions about how to find things out and, help, make their won suggestions about how to collect data to answer questions. They use simple texts, with help, to find information. Tey use simple equipment provided and make observations related to their task. They observe and compare objects, living things and events. They describe their observations using scientific vocabulary and record them, using simple tables where appropriate. They say whether what happened was what they expected.
Makes predictions or develops a theory based on previous experience and scientific reasoning.
Plans an experiment or investigation to test out predictions or theories with reducing support
Sets up an experiment with minimal support.
Makes suggestions about what could be changed when having a group discussion.
Collects appropriate equipment and uses appropriately when conducting an experiment
Records data in a table or graph using observations with minimal support.
Checks results against predictions.
Repeats experiments to make sure it is a fair test.
Is beginning to understand the need for variables and constants when planning a fair investigation.
Makes conclusions based on what their findings show.
R11 - Pupils respond to suggestions and put forward their own ideas about how to find the answer to a question. They recognise why it is important to collect data to answer questions. They use simple texts to find information. They make relevant observations and measure quantities, such as length or mass, using a range of simple equipment. Where appropriate, they carry out a fair test with some help, recognising and explaining why it is fair. They record their observations in a variety of ways. They provide explanations for observations and for simple patterns in recorded measurements. They communicate in a scientific way what they have found out and suggest improvements to their work.
Plans an experiment to test a given theory.
Creates their own method of data collection independently.
Makes generalisations when related to an experiment e.g. larger musical instruments will be lower in pitch.
Can carry out a full experiment independently e.g. plan, predict, observe, collect data, evaluate.
Takes careful measurements in standard units.
Identifies what is fair about the test.
Makes independent predictions when testing their own theory.
Uses scientific terms to describe what they see e.g. the water from a puddle evaporates.
Understands the use of variables and constants when conducting an investigation or experiment
Can draw and label a diagram independently
R12 - Pupils recognise that scientific ideas are based on evidence. In their own investigative work, they decide on an appropriate approach for example, using a fair test to answer a question. Where appropriate, they describe, or show in the way they perform their task, how to vary one factor while keeping others the same. Where appropriate, they make predictions. They select information from sources provided for them. They select suitable equipment and make a series of observations and measurements that are adequate for the task. They record their observations, comparisons and measurements using tables and bar charts. They begin to plot points to form simple graphs, and use these graphs to point out and interpret patterns in their data. They begin to relate their conclusions to these patterns and to scientific knowledge and understanding, and to communicate them with appropriate scientific language. They suggest improvements in their work, giving reasons.
Uses research, experience and scientific reasoning to develop a theory or prediction
Asks quality questions about a scientific problem to develop a better understanding
Plan an experiment to test a given theory and discuss with detail, explaining the use of variables and constants.
Can label, explain and present a diagram.
Reports their findings as graphs, diagrams and an oral presentation.
Subdivides things into smaller groups during classification.
Takes accurate measurements using equipment e.g. weighing scales, measuring cylinders, thermometers. Repeats measurements.
Reports their findings, relating to data, in their conclusions.
Uses scientific terms in the correct context e.g. dissolved, compressed.
Explains clearly using scientific vocabulary why something occurs

Appendix F - 2026 Science Week Planning Matrix and example Plan showing Cross-Curricular Links

Pathway / Subject	Emergent	Semi-Formal	Formal
English	All Emergent Science activities are Dr Seuss themed. Use the ideas if you want – I apologise if you're doing much of this already, so do what you do anyway and please take loads of pictures! **Activities** • **Object of Reference Story Boxes** ○ Include: stripey hat, toy fish, coloured eggs, feathers, mini umbrellas, pompoms. ○ Students explore objects as adults tell very simple 1-sentence story chunks. • **Sensory Storytelling** ○ *Blue fish* = spray gentle water mist ○ *Red fish* = shine red torch ○ *Green eggs* = smell "egg" aroma or use mint smell for "green" ○ *Cat in the Hat* = place soft furry glove on student's hand • **Cause & Effect Speech/Communication Devices** ○ Students press a Big Mac switch that says: ▪ "Go fish!" ▪ "Hat on!" ▪ "Eggs!" ▪ "More!"	**KS3 - Rhyme & Rhythm – Themed Poetry** Recap knowledge of Chemicals and Mixtures, George's Marvellous Medicine, Witches potions etc. Read poems about witches and Wizards. Compose a class rhyming poem about a magic potion – linked to our previous science topic. **KS4 - Macbeth** See Semi-Formal lesson plan idea below **4** **KS5 – Theatre & Performance** See Semi-Formal lesson plan idea below **4** See Semi-Formal alternative plan idea below **16**	**KS3 - Rhyme & Rhythm** Recap knowledge of Chemicals and Mixtures, George's Marvellous Medicine, Witches potions etc. Read poems about witches and Wizards. Compose a class rhyming poem about a magic potion – linked to our previous science topic. Students could write their own. **KS4 - Macbeth** See Formal lesson plan idea below **3** **KS5 – Theatre & Performance** See Formal lesson plan idea below **3** See alternative plan idea below **15**
Maths	**Activities** • **Sorting & Matching Colours (Science link: colour recognition)** ○ "One red fish here, one blue fish there!" ○ Students post matching fish into colour-coded buckets of water. • **Big & Small** ○ Explore big/small hats, big/small fish, big/small footprints in sand/foam. • **Counting Through Sensory Experience** ○ Adults count aloud 1–2 only. ○ Students drop 1 fish into water, then 2 fish, to see splash differences (science: water displacement).	**Linked to measures – Weight** Weight and Density of Liquids investigation – see Semi-Formal Lesson plan ideas below. **2**	**Linked to measures – weight** Weight and Density of Liquids investigation – see Formal Lesson plan ideas below. **1**
Humanities	**Dr Seuss, Ocean and Science Lesson** **See Emergent Lesson Plan idea below 19**	**Y7 comparing Halifax to Scotland** – See Semi-Formal Humanities Lesson plan idea below. **6** **Y8/9 – Modern Explorers – See Semi-Formal lesson plan idea below. 8** **KS4 India – See Semi-Formal lesson plan idea below. 10**	**Y7 comparing Halifax to Scotland** - See Formal Humanities Lesson plan idea below. **5** **Y8/9 – Modern Explorers – See Formal lesson plan idea below. 7** **KS4 Local Heritage – See Formal lesson plan idea below. 9**
Outdoors/PE		In PE please offer opportunities for students to consider how the human body has adapted to exercise. Discuss heart rate, breathing, sweating to cool, muscles stretching and bones/joints moving – all linked to our previous Science topics	

PSHCE		**Y7 - healthy eating –** this is science anyway! Do what you do and link to science week where poss and take pics please! **Y8/9 - sex ed/hygiene –** the hygiene side would be a useful link to science and could give useful videos/pictures **KS4 - Sex Ed / relationships –** maybe no pictures unless you can get some good appropriate ones?	**Y7 - healthy eating –** this is science anyway! Do what you do and link to science week where poss and take pics please! **Y8/9 - sex ed/hygiene –** the hygiene side would be a useful link to science and could give useful videos/pictures **KS4 - Sex Ed / relationships –** maybe no pictures unless you can get some good appropriate ones?
Cooking		Any mixing or using the cooker – discuss changes they can see. Mixing is different to cooking – there is a permanent change with cooking. Please offer opportunities for students to consider how the human body has is prepared and adapted for digestion	
Music		Explore changing pitch and volume – please collect lots of pictures/videos	
Art	**Dr Seuss and Science linked Art** See various Emergent Lesson Plan ideas below **20**	**Y9SF- Gaudi -** See Semi-Formal Lesson Plan idea below **16** **KS4 – See Formal lesson as this is adaptable for SF** See Semi-Formal Lesson Plan idea below **17**	**Y7F – shape –** See Formal Lesson Plan idea below **11** **Y8F – Landscapes -** See Formal Lesson Plan idea below **12** **Y9F-Banksy -** See Formal Lesson Plan idea below **13** **KS4 – The Seaside** - See Formal Lesson Plan idea below **17**
WRL		**The Food industry –** See Lesson Plan idea below **18**	

1 FORMAL MATHS/SCIENCE LESSON - Weight and Density of Different Liquids

Objective: To compare the weight and density of different liquids through a simple investigation.

1. Introduction (10 mins) – What is Density?

- Begin with a simple explanation:
  - "Density is how heavy something is for its size. Some liquids are heavier than others even if we use the same amount."
- Show two bottles—one with water and one with honey. Ask:
  - “Which one do you think is heavier?”
  - “What happens if we pour both into a cup?”
- Explain that today, we will test different liquids to see which is denser.

2. Prediction Activity (5 mins)

- Show the liquids:
  - Water
  - Cooking oil
  - Honey
  - Dish soap
  - Milk
- Ask students to predict which liquid is the heaviest and which is the lightest.

3. Practical Investigation (20 mins)

- **Step 1:** Give each student a clear cup.
- **Step 2:** Carefully pour each liquid into the cup, one at a time. Start with the heaviest (honey) and move to the lightest (oil).
- **Step 3:** Watch how the liquids form layers instead of mixing.
- **Step 4:** Discuss:
  - “Which liquid is at the bottom? Why?”
  - “Which liquid stays on top?”

4. Simple Weight Comparison (10 mins)

- Using a small scale, weigh equal amounts (e.g., 100ml) of each liquid in plastic cups.
- Record and compare the weights.
- Discuss if their predictions were correct.

5. Conclusion & Discussion (10 mins)

- Review key findings:
  - “Honey is the heaviest/densest, so it sinks.”
  - “Oil is the lightest, so it floats.”
- Ask:
  - “Why do you think this happens?”
  - “What other liquids could we test next time?”

6. Extension (if time allows)

- Drop small objects (e.g., a grape, a bead) into the layers and see where they stop.
- Discuss how different objects might float in different layers based on density.