SCIENCE DEPARTMENT HANDBOOK

2022-23

ROCKWOOD
ACADEMY

"A place where students always come first"

COLLABORATION · OPPORTUNITY · RESPECT · EXCELLENCE

Department Vision:

Curriculum intent:

Our vision is to promote a love of learning in Science which enables pupils to understand, enjoy and be fascinated at the world in which we live in. We aim to cultivate curiosity through delivering engaging lessons that challenges thinking. We encourage our pupils to be curious learners and to develop a positive and practical approach to scientific learning. We build understanding of the '*Big Ideas*' in science that are relevant to pupils' lives during and beyond school. *Our purpose is to develop pupils who are equipped with both theoretical knowledge and the practical skills needed to thrive in any STEM-related field.*

At Rockwood Academy we teach our pupils that using critical thinking and evidence to create solutions might be the key to help solve some of the world problems.

Science offers opportunities to work independently at home or with other people performing experiments, to develop the skills of evaluation and analysis. Making links between ideas and understanding the big picture that is the world past, present and future.

Science provides opportunities to develop cultural capital through STEM and wider university links. STEM education is well established at Rockwood Academy and has gone from strength to strength since its introduction in September 2018. The provision offered at Rockwood Academy is led and supported by the Science department. All members of the team are actively involved in delivering the STEM curriculum internally and supporting with the external activities that are pupils are involved with.

Our programme of STEM activities embodies the values of the CORE trust and echoes our school values. We work closely with industry partners as well as FE and HE institutions to support our pupils to acquire the skills base, knowledge and confidence to excel in an increasingly STEM dependent job market.

The aims of our STEM programme are to:

- Develop key life skills in our learners.
- Develop knowledge of STEM in the context of our Science curriculum.
- Improve pupil progression to STEM subjects post 16.
- Increase the appeal of STEM careers amongst females and other underrepresented groups.

Over the last three academic years, the Science team at Rockwood Academy has offered a staggering 56 external STEM opportunities to our pupils. Naturally, the COVID-19 pandemic caused disruption to our STEM enrichment calendar, however where possible we have modified and adapted our plans to offer events in house; for example, our Christmas "Chemistree" show. Following the pandemic, we have now incorporated a range of in-house experiences to ensure all students are offered the chance to engage with STEM.

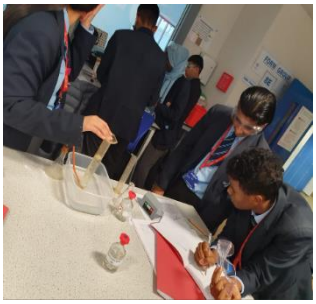
One of the key strengths of the STEM provision at Rockwood Academy, is that we actively work to raise participation amongst our female cohort. Our destinations data shows that each year since 2018, the number of female's pupils pursuing STEM subjects at FE is increasing, with the 2018/19 showing 52% of female pupils entering STEM courses at FE level. This increase in numbers is due to the STEM enrichment programme as well as the opportunities that pupils have to engage with female STEM ambassadors.

Rockwood Academy has also been certified as part of Teach Chemistry from the *Royal Society of Chemistry*, which is an organisation supporting the delivery of inspirational chemistry teaching.

*"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less." — **Marie Curie***

CORE values:

COLLABORATION

*"The meeting of two personalities is like the contact of two chemical substances: If there is any reaction, both are transformed." — **C.G. Jung***

As a practical subject, there is ample opportunity for collaborative work, -whether it's pupils collaboratively planning or pupils working together during science practical's. We continue to work with external provides such as the University of Birmingham & Teach First to form links where subject specialists can deliver bespoke sessions to our pupils.

OPPORTUNITY

*"If I have seen further it is by standing on the shoulders of Giants." — **Isaac Newton***

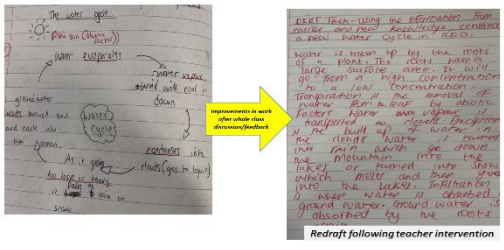

Pupils at Rockwood thrive as a result of the STEM opportunities provided to them, feedback from pupil voice survey's shows that all pupils see the importance of STEM in the curriculum, in particular they recognise STEM skills will help them access certain jobs & careers as well as *"being aware of the world around us".* Feedback from female pupils highlighted that our pupils felt "**empowered**" & "**confident**" by participating in the programmes; our KS3 girls' also articulated how they felt about the gender imbalance in STEM careers, with one pupil commenting "*STEM should be for **everyone**, I enjoyed having this opportunity*". Breaking down stereotypes around the STEM sector early means that we are more successful in supporting our young men & women ignite their interests in these fields.

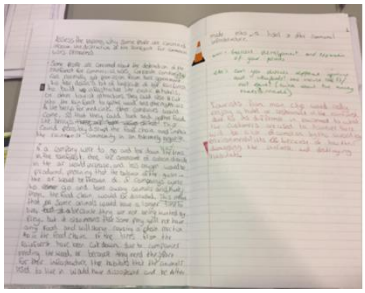
RESPECT


*"The beauty of a living thing is not the atoms that go into it, but the way those atoms are put together." — **Carl Sagan***

Learning in Science encompasses tolerance and respect of different views and opinions. Pupils cover the depth and breadth of curriculum, including evolution, genetic engineering, stem cells and The Human Genome Project. This enables them to grow and develop the skills to be tolerant and reflective members of the local and wider community.

EXCELLENCE



*"You cannot teach a man anything; you can only help him discover it in himself." – **Galileo***

The Science department aims to raise the aspirations of pupils and foster a culture where everyone succeeds and achieve to the best of their potential. This is accomplished through promoting positive and safe working environments where pupils are empowered to be confident, creative and outspoken learners.

Curriculum:

Key stage 3: OVERVIEW

Throughout Key stage 3, pupils will study Biology, Chemistry and Physics units. All units include planning investigations, recording and analysing data, drawing graphs, writing conclusions and evaluations. Pupils will also need to use their maths skills in Science lessons. During the course of the year, pupils will also partake in *How Science Works* investigations focusing on science-specific skills. Pupils will regularly review content and knowledge throughout their studies.

The Year 7 & 8 curriculum is designed to be engaging, contextual and assessable to all pupils and builds the foundations for later study of the sciences as it covers key concepts of all three disciplines which are revisited in more detail at GCSE level.

YEAR 7 Programme of Study [Aligned with CORE Trust Academies]

AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
a. Introduction to Science b. Particle model c. Separating technique	a. Cells & movement b. Introduction to forces c. Metals & non-metals	a. Variation	a. Plant reproduction b. Acids & alkalis	a. Energy costs b. Earth structure c. Voltage & resistance	a. Sound

YEAR 8 Programme of Study

AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
a. Reactions b. Health & lifestyle	a. Energy b. Acids & alkalis	a. Ecosystems b. Waves [sounds & light]	a. Metals & Acids	a. Electricity & magnetism b. Adaptation & inheritance	a. The earth

YEAR 9 Programme of Study

AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
a. Adaptation & inheritance b. The Earth	a. Turning points in Biology b. New technology in Chemistry	a. Turning points in Physics	a. Fundamentals in Biology	a. Fundamentals in Chemistry	a. Fundamentals in Physics b. Transition curriculum

Key Stage 4 OVERVIEW:

In the GCSE Science curriculum, students will to develop the skills, knowledge and understanding of working scientifically, including:

1 Development of scientific thinking

2 Experimental skills and strategies

3 Analysis and evaluation

4 Scientific vocabulary, quantities, units, symbols and nomenclature

Students will be expected to develop their Scientific enquiry skills and will be expected to have completed specific required practical experiments for each of the Science; Biology, Chemistry and Physics. They will be examined on their understanding and knowledge of these experiments in the exam papers at the end of their GCSE course. In addition to completing these required practical experiments in the classroom, they will be expected to keep a clear record as evidence of having completed them.

Legacy curriculum- delivered to 2022/23 Y11 cohort only)

Triple Science

We teach the Pearson Edexcel GCSE (9-1) Separate Sciences 3 Year route split into the 3 different disciplines (Biology, Chemistry & Physics) that are taught alongside each other by specialist teachers within that area of study allowing crossing-over of ideas, concepts and principles throughout the pupils' academic journey at GCSE level.

Students will be taught by three separate teachers over five lessons. The Biologist is allocated 2 hours per week, whilst the Chemistry & Physics is led by multidisciplinary teachers in 3 hours per week.

Students will sit x2 papers per discipline, each paper is 1 hr 45 minutes in length. The papers are available at foundation tier and higher tier containing a mixture of different question styles, including multiple-choice questions, short answer questions, calculations and extended open-response questions.

Combined Science

We teach the Pearson Edexcel GCSE (9-1) Separate Sciences 3 Year route split into the 3 different disciplines (Biology, Chemistry & Physics). Students are taught by two teachers over five lessons, with one teacher leading Chemistry (2 hrs) and the other Biology (3 hrs). The Physics curriculum is split amongst the two teachers.

GCSE study in the sciences provides the foundation for understanding the material world. Scientific understanding is changing our lives and is vital to the world's future prosperity. All pupils should learn essential aspects of the knowledge, methods, processes and uses of science. They should gain appreciation of how the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas that relate to the sciences and that are both inter-linked and of universal application.

The Pearson Edexcel GCSE (9–1) in Combined Science consists of six externally examined papers. These are available at foundation tier and higher tier containing a mixture of different question styles, including multiple-choice questions, short answer questions, calculations and extended open-response questions.

Biology	Chemistry	Physics
Combined: CB6-CB9 Triple: SB6-SB9	Combined: CC8-CC17 Triple: SC14-SC26	Combined: CP7-CP13 Triple: SP7-SP15

Y10 Edexcel Curriculum [Launching September 2022]

Separate Science

Students in Y10 opted for Triple Science as part of their options process. Students will be studying the Edexcel Separate Science curriculum over two years. The Y10 cohort consists of a single class of Separate Science students, in subsequent years we intend to increase this to two groups.

Students will be taught by three separate teachers over eight lessons. In Y10, the Biology & Physics leads will be each allocated 3 hours per week in Y10 & the Chemistry lead will be allocated 2 hours per week. This will be adjusted as the cohort moves into Y11, all changes will be driven by students' performance and data.

Students will sit x2 papers per discipline, each paper is 1 hr 45 minutes in length. The papers are available at foundation tier and higher tier containing a mixture of different question styles, including multiple-choice questions, short answer questions, calculations and extended open-response questions.

Combined Science

All remaining students in Y10 will cover the Edexcel Combined Science curriculum. Students will cover this programme of study over two academic years, receiving 5 hours of Science teaching per week. The curriculum will be split into the three Science disciplines, with two teachers being appointed to each group. The Biology lead will deliver 3 hours of lessons per week, whilst the Chemistry lead delivers 2 hours. The Physics curriculum will be carefully split between the two lead teachers, to promote effective cross disciplinary skills.

Students will sit x2 papers per discipline. Each exam paper is 1 hr 15 minutes in length, worth 70 marks and count towards 16.7% of the GCSE. The papers are available at foundation tier and higher tier containing a mixture of different question styles, including multiple-choice questions, short answer questions, calculations and extended open-response questions.

Biology	Chemistry	Physics
Combined: CB1- CB5 Triple: SB1- SB5	Combined: CC1- CC10 Triple: SC1- SC11	Combined: CP1- CP6 Triple: SP1- SP7

Assessment:

In the context of building big ideas, assessment of pupils' learning serves two important purposes:

1. To provide feedback that helps teachers to regulate teaching and pupils to direct their efforts more effectively (*formative assessment*)
2. To keep track of pupils' progress towards the various goals of science education (*summative assessment*).

Aligned Cohorts:

The Y7 cohort is aligned with the Trust schools, so will be assessed cumulatively at the end of each schema building unit, via a centrally agreed assessment. These will be marked internally, and QLA's will be input on the departmental spreadsheet. There are two cumulative testing periods [CT] in each year.

Within each teaching topic, students will be formatively assessed via low stakes "Mastery Quizzes". Two quizzes will be interleaved in each topic. For example:

Y7: Particle model

L1- L4: Teaching of content.
L5: Do Now Activity is "Mastery Quiz 1"
Teacher to use emerging trends to plan in class interventions/re-teach as required
L5- L8: Teaching of content.
L9: Do Now Activity is "Mastery Quiz 2"
Teacher to use emerging trends to plan unstructured lessons/consolidation time activities

Alongside the trust wide cumulative assessment points, Rockwood Academy Science teachers **will** continue to assess students summatively at the end of each topic. Standardised Kerboodle assessments will be used and results will be recorded on the departmental spreadsheet.

Non-aligned Cohorts:

In Y8 & Y9 Internal assessments will take place at the end of each topic sequence. Exams will be assessed at two levels; foundation tier and higher tier to achieve:

Foundation tier	Higher tier
Novice	Novice
Developing	Developing
Securing	Securing
	Extending

The assessments in Y10 and Y11 will consist of End of topic papers (EOT's) and mock exams. For each round of mock exams students will sit three written papers, one for each of the Science disciplines.

- All pupils studying Separate Science will be entered for Higher tier. Each exam paper will last 1 hour 45 minutes and will be scored out of 100 marks.
- Pupils entered for the combined science course will sit either Higher or Foundation tier. Each exams lasting 1 hour 10 minutes and will be scored out of 60 marks.
- Students will be graded as per the GCSE 9-1 grading system.
- For cumulative testing [CT] examinations, students will be provided with a comprehensive QLA of their performance.
- Y10 and U11 will complete two CT examinations [CT1 and CT2] in the 2022/23 academic year.

Marking & feedback policy:

It is important that as Science teachers we provide constructive feedback to students, both written and orally, focusing on success and improvement needs against learning intentions. This enables students to become more independent, reflective learners, helping them to close the gap between what they can do currently and what we would like them to do. As a result of effective marking and feedback, students will *know more, remember and do more* in their Science lessons.

In Science, marking and feedback should:

- ✓ Be manageable for the teachers and accessible to the students.
- ✓ Relate to the driving question & learning intention.
- ✓ Involve the teaching team working with the students.
- ✓ Give recognition and praise for achievement and clear actions for improvement.
- ✓ Allow specific time for pupils to read, reflect and respond to marking where appropriate.
- ✓ Respond to individual learning needs - taking opportunities to feedback visually/face-to-face where appropriate.
- ✓ Inform future planning.
- ✓ Use consistent codes to improve literacy across the curriculum.
- ✓ Ultimately, be seen by students as a positive approach to improving their learning.

The methodology of marking students' work in Science:

Note: All teacher marking must be completed in green pen, students must respond in red pen.

Oral Feedback:

It is important for all students to have oral feedback from members of the teaching team from time to time. This dialogue should focus upon student successes, areas for development and to set immediate targets/tasks to improve understanding and address any misconceptions. Oral feedback should be accompanied with visualiser work to demonstrate "what a good one looks like [WAGOLL] examples.

Summative Feedback/Marking:

This is associated with closed tasks or exercises where the answer is either right or wrong. The students, as a class or group, should self or peer mark in red pen.

Formative Feedback/Marking:

Not all pieces of work can be quality marked and there is no expectation that teachers should quality mark every piece of work. Teachers should use their professional judgement to decide whether work will simply be acknowledged or given detailed attention. Acknowledgement should always relate to the learning intention.

Marking and feedback given by support staff/Teaching Assistants:

Where a member of the teaching team, other than the class teacher, has been involved in the student's learning, the work should be initialled and commented on where appropriate.

Teachers Quality Marking [Yellow feedback sheet]:

Teachers must quality mark a significant piece of work or assessments once every 8-10 lessons. The work should be quality marked using a yellow feedback sheet [shown below] with appropriately selected tasks. The feedback sheets are a form of whole class feedback, and therefore should not name any individual students.

Teachers should focus first and foremost upon the learning intention/driving question of the task and ensure feedback provided corresponds with the learning intention/driving question. The emphasis should be on successes against the learning intention and/or the improvement needs of the student

When providing *quality yellow sheet* feedback teacher should:

1. Read a cross selection of work from the class OR mark the class assessments.
2. Identify up to 3 examples of where the students have commonly met the learning intention [WWW- What went well]. Using these points devise a focused comment, which will help the student extend future learning.
3. Identify up to 3 examples of where students have commonly **not** met the learning intention [EBI- Even Better If]. Using these points devise a focused comment, which will help the student improve their future learning.
4. Spelling, punctuation and grammar need not be marked in every piece of work. Teachers should take 2-3 spelling errors and ask students to rewrite them correctly 3 times.

When students receive *quality yellow sheet feedback*, they should:

- ✓ Spend time assessing what they did well and then look at the task set by the teacher to extend their thinking or attempt the task to show improvement from their original work. Consequently, they should be able to *"know more, remember more, do more"*
- ✓ Students' must respond to the DIRT in red pen. Self-marking and evaluation: When required, students should be given time at the start of a lesson, to read and consider the written feedback the teacher has provided (as appropriate).
- ✓ Students should be encouraged to ask for clarification, if they do not understand a comment and should be clear about what they need to do in their next piece of work, as a result of the feedback they have received.
- ✓ Students should be encouraged, where appropriate, to respond to any additional written feedback, either verbally or by writing a reply.

Example of marking and feedback in Science:

Class	7X/SC4	Date
Topic	REPRODUCTION TEST	25/05/22

WWW:
- ☐ Most students can identify adaptations for seed dispersal.
- ☐ Most students can identify changes that happen in puberty.
- ☐ Some students can identify parts of a flower.

EBI:
- ☐ Students need to know the structures in the female reproductive system.
- ☐ Students need to know what the placenta does.
- ☐ Students need to learn the stages in the menstrual cycle.

Misconceptions/errors
- *Menstruation is not the same as ovulation.*
- *Sperm is not the female gamete.*
- *The menstrual cycle stops when a woman is pregnant.*
- *Placenta is not a muscle keeping the baby in place, that is the cervix.*

Next Steps in Learning (ANSWER INDEPENDENTLY, IN SILENCE & USING RED PEN)

Re-draft your answer to the 6-mark question using the prompts.

"The weather is a key factor in growing crops. Water is one factor needed for successful germination (growth). Design a practical that will investigate whether the amount of rainfall in an area will affect germination of the seeds in a crop."

To investigate how the amount of .....

affects the.....

you will need to use .....

.....

.....

.....

You need to change .....

.....

You need to measure .....

.....

.....

To make it a fair test, you need to keep .....

.....

..... the same.

After ..... days, work out the number of germinated seeds by .....

Peer-assessment: / 6

WWW:

EBI:

Marking for literacy:
- ☐ Sp Spelling (write the correct spelling in margins)
- ☐ T Task incomplete (complete the task in full using red pen)
- ☐ C Capitals (Use capital letters where appropriate)
- ☐ D Date (Add the date to your work)
- ☐ U Underline (Underline date and title)
- ☐ ^ missing word (Reread your work and add the missing word)

Marking for Numeracy/Science
- ☐ UN Units
- ☐ W Show Working out

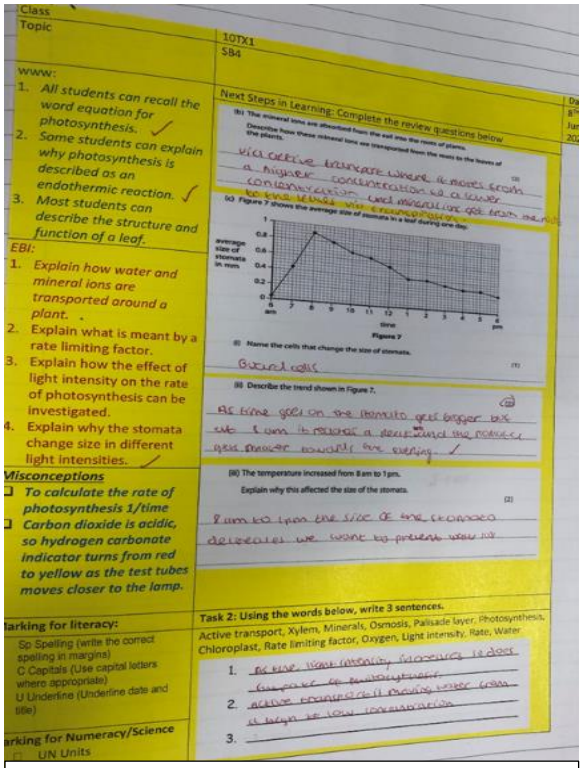
Key vocabulary focus: (these are words you need to develop your knowledge in:

Placenta –

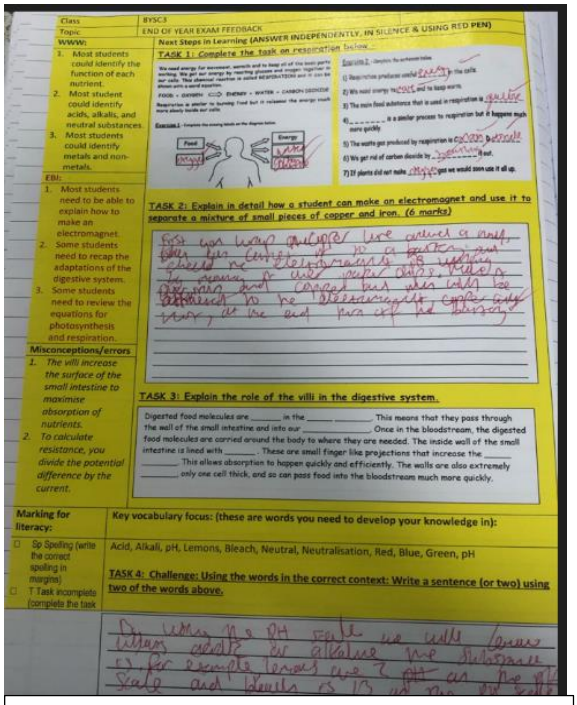
Ovulation –

Fertilisation –

Function –



Example of making and feedback at KS4



Example of making and feedback at KS3

Monitoring and Evaluating this Policy:

The policy will be monitored through further consultation with staff and through the planned reviews. Pupils' workbooks will be monitored by the SLT, TLR holders & Head of Department, during QA visits and book scrutinies; with written and verbal feedback given to individual members of staff.

Literacy in Science policy:

☐ ***Why is literacy important in Science?***

Purposefully and systematically improving children and young people's literacy in science is key to narrowing the gap in attainment and participation between pupils from high and low SES backgrounds [EEF, 2017]

☐ ***What is disciplinary literacy?***

Disciplinary literacy in science focuses on how reading, writing, speaking, and listening are used to develop sense-making in science. It emphasises the content knowledge, experiences and skills, and ability to acquire new knowledge that experts within science disciplines use to apply and generate new knowledge.

☐ ***How do we incorporate literacy into our Science curriculum at Rockwood Academy?***

As a Science department, we aim to embed literacy in Science through four strands:

- Developing *vocabulary* in science
- Developing *oracy* in science
- Developing *comprehension* in science
- Developing *writing* in science

To achieve this, we have reviewed our departmental practice and approaches to ensure all students are given explicit opportunities to develop in all four categories of Science. Lesson sequences will be customised by the classroom teacher to ensure students are receiving purposeful and meaningful activities to promote their literacy in Science.

1. **Lesson format**: All lessons resources/PowerPoint material, will feature a keyword bank for the lesson. These are carefully selected words which will be taught or reviewed over the course of the lesson. All science teaching classes will have a tier three word of the week; this word has been identified by the class teacher, Explicit reference will be made to the "word of the week" during lessons & where appropriate Do Now & lesson activities will be linked to this keyword.

2. **Medium term plan [MTP]:** All students will be given a medium term plan at the start of each topic. The medium term plan will identify all scientific keywords that will be covered over the course of the topic. This is a useful starting point for classroom support assistants to pre-teach required vocabulary & for students to refer to as they progress through the topic.

3. **Purposeful activities with a literacy focus:** Teachers will design lessons sequences to incorporate explicit opportunities to focus on embedding & enhancing literacy in Science, both in a written and oral format.

4. **Introducing Scientific terminology**: Within Science lessons, literacy is used on a consistent basis with students being given key words and needing to learn their definitions. In KS3 there is a clear focus on acquiring & understanding new scientific terminology which students will continue to use during the rest of their time studying Science. In KS4 students will be building upon the literacy foundations constructed in KS3. During their GCSE course, students will be able to understand what is meant by the command words used in exam style questions, use tier two & three vocabulary in the correct context and be able to decode unfamiliar vocabulary using their prior knowledge.

To effectively embed the new terminology all students will be:

- ***a.*** Given keyword spelling and definition explaining quizzes on regular basis as part of their AfL checks & Do Now Activities. *These activities will be differentiated according to the needs and ability of students.*
- **b.** Completing appropriate DART [Directed Activities Related to Text] activities to demonstrate understanding through use and modification of the text.
- **c. Interpreting images and data,** scientific writing is often accompanied by images (illustrations, photos) and data (tables, graphs).
- **d.** Understanding complex scientific vocabulary [tier 3 words] through reading scientific articles/passages for meaning.
- **e.** Developing as metacognitive learners by incorporating scientific keywords for the lesson or topic in their extended writing tasks. As part of Do Now & plenary activities students will be encouraged to write summaries of their learning using topic keywords.
- **f.** Developing their practical skills by utilising keywords in the correct scientific during verbal discussions.
- **g.** Immediately responding to live feedback/marking to correct any spelling or grammatical errors in their work.
- **h.** Utilising writing scaffolds to plan out their extended written responses.

i. Writing scientific reports, students will be trained in how to write scientific reports and will learn how to structure them properly throughout their scientific learning. A scientific report would normally take the following structure:

- Hypothesis and prediction
- Plan (method)
- Risk Assessment
- Results
- Graphs and data analysis
- Conclusion
- Evaluation

During Key Stage 3 and 4 students will develop a detailed understanding of all of the above terminology and what is expected to be included in each of the sections. During lessons/homework tasks, students will be directed to focus on one or all of these sections during an investigative write up.

When new terminology is introduced to students, the staff member/teacher will:

a. Identify & explicitly teach the relevant tier two and three vocabularies as part of the lesson. *[Tier two words are commonly found in an academic book or exam paper, whereas tier three words are subject specific].*
b. Take time to **decode** the terminology and enable students to make sense of the word in a scientific context. *For example, during delivery of the "ecosystems" topic; students will be taught the word photosynthesis is a combination of 'photo' meaning light and 'synthesis' meaning to make and the word is the term for plants using light energy to make glucose.*
c. Use mini whiteboards to check spelling & understanding of keywords.
d. Embed choral responses to check for pronunciation & definitions.
e. Anchor new vocabulary to concrete knowledge or examples.
f. Model pronunciation and contextualisation of new scientific terminology.
g. Design purposeful literacy focussed tasks to incorporate new terminology [concept cartoons, data analysis tasks, word wheel, structure strips, comprehension tasks, use of words banks & extended writing tasks].
h. Provide students with graphic models, scaffolds and writing frames to support the acquisition and embedding of scientific terminology.
i. Use the visualiser to model expectations for literacy tasks & provide feedback on student responses.
j. Incorporate live marking to provide timely feedback on spelling, grammar and writing structure.
k. Select appropriate reading (consider student reading ages) material to read **with** students. Ensure students are clear on **why they are reading it** before they begin the reading and provide students with comprehension questions to consolidate understanding. Assess understanding gained from the comprehension task and intervene where necessary.
l. Develop DART activities to encourage students to actively engage with a task.
m. Promoting etymology *[the study of words],* through spending time helping students to understand the origin of words and their morphology (roots, prefixes and suffixes).
n. Looking at the morphology of key words in science, so students can see how scientific keywords are constructed.

Monitoring and Evaluating this Policy:

The policy will be monitored through fortnightly developmental drop in's, lesson observations & through showcasing good departmental practice. Pupils' exercise books will be monitored by the SLT, TLR holders & the Head of Department during fortnightly QA visits and planned book scrutinies; with written and verbal feedback given to individual members of staff. Student feedback & views on embedding Literacy in Science will be sought during the annual student voice questionnaires.

Teaching Model:

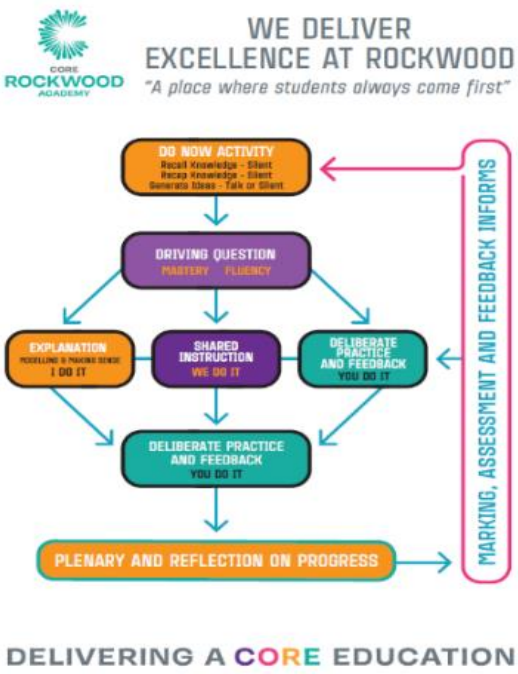
Teaching and learning in Science:

It is important to have a classroom routine & culture which pupils can count on every day. Having the routine procedures and practice every lesson cuts down wasted learning time significantly.

Our classroom routines aim promote a positive environment where all pupils can learn.

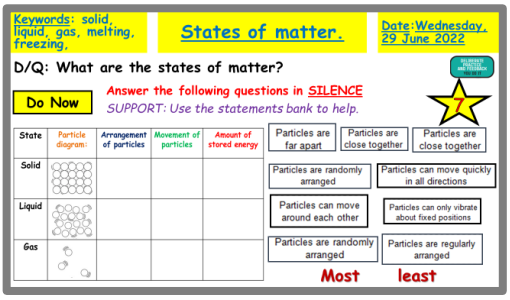
Our daily routines in Science include:

- ✓ High classroom expectations.
- ✓ Meeting and greeting pupils at the door.
- ✓ Having the date, title, driving question and "DO NOW" activity on the interactive whiteboard as pupils walk in and settle.
- ✓ Well planned and sequenced lessons which promote positive engagement from all pupils and lead to clear students' progress
- ✓ As a result of our lessons, students "know more, remember more and do more".

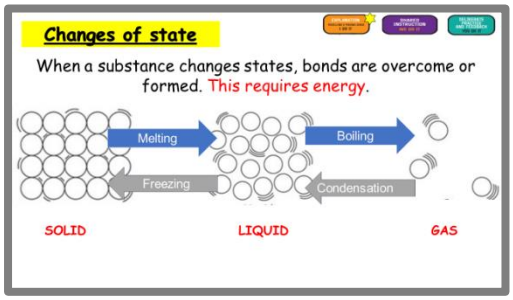


Example of what a typical science lesson would look like at Rockwood:

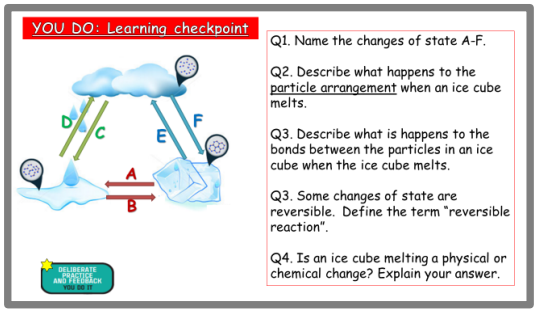
Pupils settle into a silent DO NOW activity at the beginning of the lesson which assess prior knowledge or involves consolidation:



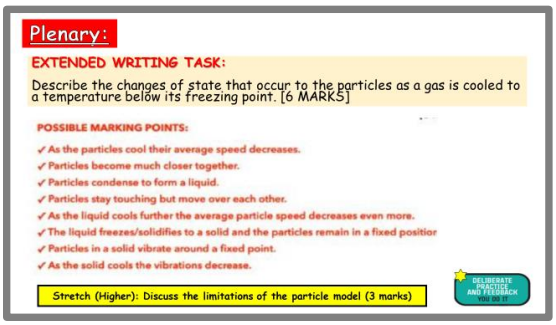
Pupils transition into an "I DO/ WE DO" part to the lesson where the teacher delivers new instruction/theory or ideas. At this stage a practical demonstration may be carried out or pupils may watch a video link followed by a discussion and Q & A:



Pupils will then apply the skills they have acquired to a "YOU DO" activity (mini-plenary/ progress task/assessment for learning (AfL)) task either independently (if instructed) or with their work partner. This is usually time restricted and instant feedback is provided where pupils will then self/peer assess in red



Finally, pupils will end the lesson with a plenary task which allows them to test their newly learned skills in novel, unfamiliar contexts. This helps further strengthen and develop knowledge, understanding and application.



Note: All lesson should be planned on the Rockwood lesson planning template, utilising the same format & incorporating teaching model icons as appropriate.

Homework policy:

Homework is an integral part of the Science curriculum. It enhances learning, develops students' study skills and improves achievement. The department uses an online learning platform to issue homework to students [KayScience]. This additional study is essential to help students achieve or exceed their target level or grade in Science. Automatic software based AI marking of students retrieval homework helps teachers make a judgement about a student's level of knowledge, understanding, skills, progress and attainment in Science. This granular level feedback is used to plan subsequent lessons and consolidation lessons.

A half termly overview of curriculum topics and potential homework tasks will be shared with teachers & parents via the school website. Teachers will use these topic to set retrieval based homework tasks on KayScience.

Homework tasks should:

- Have clear learning outcomes, which are understood by students.
- Be retrieval based.
- Be able to be completed within the timescale set and with accompanying resources readily available/easily accessible.

Types of Homework:

Homework should be varied in terms of tasks and be relevant, challenging and rewarding for students. Homework tasks will feature retrieval and consolidation questions. Students will complete all homework's through the online plaform. Students in Y7-Y11 will be issued with KayScience software logins to complete retrieval quizzes & targeted online revision activities.

The frequency of homework:

The following time allocations should be regarded as guidelines, the precise time spent on homework will depend upon the nature of the task and the student's level of ability. The quality of the homework is more important than the quantity of work produced. It is an expectation that Science homework should be set and completed at least once per week.

The time that students spend on homework will naturally vary depending upon both the nature of the task and the ability of the student, but the departmental guidelines are:
Y7 & Y8- 20 minutes per homework.
Y9- Y11- 30 minutes per homework.

Responsibilities:

The student will:

- listen to homework instructions in the Science lesson.
- write instructions for the HW task and the deadline date into their planner.
- attempt all parts of the homework to the best of their ability.
- whenever possible inform their Science teacher of any difficulties regarding homework, in advance of the deadline.
- ensure that homework is fully completed and handed in to meet the deadline.

The Science teacher will:

- allocate time to setting homework in lesson.
- set regular homework according to the Science homework schedule.
- provide the relevant stimulus materials for the Science homework.
- give full and comprehensive instructions to students, also upload instructions onto ClassCharts for parents & students.
- set deadlines for completed work and ensure that they are met.
- reward students appropriately, in line with whole school policy, when they produce high quality homework.
- sanction students appropriately, in line with whole school policy, for lack of homework, incomplete or poor quality homework.

References:

Content specific websites:
BBC Bitesize – **https://www.bbc.com/education**
www.edexcel.com/science
www.kerboodle.com
https://www.aqa.org.uk/subjects/science
http://www.bbc.co.uk/schools/gcsebitesize/science/edexcel/
http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/
http://www.biologyinfo.co.uk/
http://www.kayscience.com

YouTube:
https://www.youtube.com/channel/UCBgvmal8AR4QIK2e0EfJwaA
https://www.youtube.com/channel/UCqbOeHaAUXw9Il7sBVG3_bw

Printed revision material:
KS4:
Pearson 9-1 Combined Science textbook
Pearson 9-1 Biology textbook
Pearson 9-1 Chemistry textbook
Pearson 9-1 Physics textbook
CGP GCSE Revision guide

KS3:
Activate 1
Activate 2
CGP KS3 Revision guide

Staffing:

Roles and responsibilities:

Miss S. Mahmood- Head of Department *[Responsible for Y11]*
Mr J. Hamula- Second in Department *[Responsible for Y9 & Y10]*
Mrs R. Begum- KS3 Co-ordinator *[Responsible for Y7 & Y8]*
Miss F. Bibi- Assistant Headteacher
Mrs. J. Wu- Head of Year 9
Mr W. Chung- Teacher of Science
Miss F. Kayani- Teacher of Science
Mrs S. Perveen- Head of Year 8
Miss M. Sheikh- Teacher of Science
Mrs S. Hussain- Science Technician
Mr D. Chan- Science Technician
Miss J Lovelace- Academic mentor.