

Subject - Science                              Subject leader - Jim Houldey

**The science department aims to engage pupils in activities that encourage them to question and understand the world around them.**

**Wherever possible, the activities should be active. Pupils should be involved in practical investigations, responding to stimulus, data collecting, demonstrations, discussions of ideas, mini projects, presenting, role playing and researching.**

**They are encouraged to collaborate wherever possible, gaining insight and understanding of how each of those they work with learn and make progress. Communication and sharing are very important, and empathy is encouraged.**

**It is hoped that by engaging learners with learning questions, and sharing success criteria that informs pupils of where they are, and where they need to go, will enable pupils in a mixed ability setting to aspire to make progress, take more responsibility for their own learning, and work to and above their potential.**

**This vision recognises that during the formative years that pupils attend this school, developing metacognition is as vitally important (or even more important) as developing short and long term memory recall. The ethos outlined above is also intended to educate in a manner that promotes our pupils' cultural capital.**

### Provision

The science curriculum is extensive, and also provides opportunities for cross-curricular learning, and the transfer of literacy and numeracy skills. For these reasons, pupils at KS2 (Years 5 and 6) have received 2 x 55 minute lessons a week, but this has now been reduced to 1 x 60 min lesson to allow more time for literacy and numeracy. Those at KS3 (Years 7 and 8) receive 3 x 60 minute (approx) lessons a week.

### How do we use success criteria?

**Success criteria are in place in order for pupils to see what can be achieved in any piece of work.**

It is expected that the success criteria is shared and outlined to pupils at the start of a piece of work, and then made available throughout that activity (either using the screen in the classroom or on activity sheets they may be using).

The reason the criteria are “stage tagged” is so that pupils can not only see the possible progression they can move through, but they can be aspirational and choose to try and meet the stage they want to achieve for that piece of work whatever their level. They can also use them during the course of activity to inform them how to develop or enhance their work.

**At the end of a course of lessons or an activity that the success criteria relate to, it is expected that pupils review their work according to the success criteria.** At this time, they will write (using green pen) what stage they believe their work meets either by their learning question, or at the end of the piece of work. Teachers will then tick show their agreement with this when they mark books, or give NOW targets or NS (next step) targets.

It is good practice for teachers to use models that illustrate what constitutes each of the success criteria, so that pupils have a clear idea of what stage they have met. Using examples of pupil responses from the lesson can help pupils understand the criteria, and understand how to take the work to the next stage.

Topic assessment grids are stuck into pupil books for each new topic. Here is an example.

Topic Assessment Grid.  
 Topic: Living things  
 (Life Cycles of a variety of living things) **BIG QUESTION: Do all living things have the same life cycles?**

Curriculum Content	Know (1/2)	Describe (3)	Apply or Extend (4/5)
The difference between Sexual and Asexual reproduction in plants, and name the parts of a flower.(2 lessons)			
Describe and compare reproduction and the life cycles of mammals.			
The work of Jane Goodall, and endangered species.			
Describe and compare the life cycles of amphibians and insects.			
Describe the life cycle of birds and compare to other animals.			

Working Scientifically. Observation over time- Observing and comparing the life cycles of plants and animals in their local environment with other animals around the world.Observe changes in an animal over a period of time **Classification and identification**-Compare how different animals reproduce and grow.

- Pupils use *lesson success criteria* (example will follow) to self/peer assess using Stage 2/Stage 3/Stage 4-5 at the end of each piece of work in their books. **This formative assessment is assessment for learning, and is designed to both inform pupils of how they can make progress, and how their work has progressed.**
- The assessment grid itself would be ticked by the teacher when they are satisfied as to what stage the pupil's work shows for each curriculum content statement, and is more formative in nature.
- **In basic terms, a pupil's work that shows they can remember learning for that curriculum statement would equate to Stage 2. If their work shows that they can describe that curriculum statement it would equate to Stage 3, which is the prime directive.** Pupil's work could show a 4 or a 5, depending on evidence of the level of application, or how they have shown extension to that learning.

# (LQ)Can I distinguish between Metals and Non-Metals?

<https://www.youtube.com/watch?v=6W9ReQa8Gd4>

## Success Criteria [https://www.youtube.com/watch?v=2z4Dd1L\\_f3Q](https://www.youtube.com/watch?v=2z4Dd1L_f3Q)

**(Stage 2)**- I can list characteristics/properties of metals that show whether an element is a metal or non-metal.

**(Stage 3)** - I can describe the properties of metals and non-metals (with examples) that allow me to identify elements as a metal or a non-metal. I know where the metals and non-metals are located on the periodic table.

**(Stage 4-5)**- I am able to use my knowledge of the properties of metals and non-metals to identify new substances. I can predict what properties an element will have based on where it is on the Periodic Table. I can explain what Metalloids are (with examples).



Activate Windows  
Go to Settings to activate Windows.

An integral part of teacher assessments of pupil progress is through questioning. The manner and content of pupil response can be measured according to the following.

What do the responses of learners look like 1-5?

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
<ul style="list-style-type: none"> <li>Struggle to take on new knowledge.</li> <li>Need "gap fill" type activities and support to show what they have learnt</li> <li>Need support to use or generate data/take results or readings</li> <li>Struggle to identify practical activities to do with the topic</li> </ul>	<ul style="list-style-type: none"> <li>Can complete "gap fill" activities without support.</li> <li>Can answer basic written questions. Multi choice.</li> <li>Verbal responses when prompted</li> <li>Can take simple readings/ record results with reasonable accuracy</li> <li>With support can plan simple activities to do with the topic</li> </ul>	<ul style="list-style-type: none"> <li>Can describe the content of the topic verbally and in written form.</li> <li>Can describe and use diagrams/relevant graphs/tables relating to their learning</li> <li>Can answer some higher level questions with support</li> <li>Can plan simple activities/ investigations to support the content of the topic</li> </ul>	<ul style="list-style-type: none"> <li>Can explain the content of the topic verbally and in written form</li> <li>Can identify/ create relevant diagrams/tables/ Graphs to support their explanations</li> <li>Can answer some higher level questions without support</li> <li>Can independently plan and carry out investigations relevant to the topic, that support predictions.</li> </ul>	<ul style="list-style-type: none"> <li>Can fully explain the content of the topic, and can apply the knowledge to the world around them</li> <li>Can identify and create diagrams/tables/ graphs that specifically support their explanations</li> <li>Can use more complex data to draw conclusions/ correlations/trends</li> <li>Can design relevant and more complex experiments that specifically address predictions</li> </ul>

Activate Windows  
Go to Settings to activate Windows.

As you can hopefully see, pupil responses can be in written form in exercise books; presentation; peer sharing; describing/explaining diagrams; as well as more traditional formal exam style questions.

**Historically, pupils have sat science GL tests in Year 4 prior to entry to St Mary's, and then at the following points in their time at St Mary's:**

- End of Year 5 (June)
- Entry to Year 7 (September)
- Exit of Year 8 (June)

The purpose of these tests was as follows-

**Initially as a measure of potential, and pupil's scores were compared to their CATs results in order to determine an "expected stage" for each individual. Teachers would then be able to clearly see how a pupil is working/performing in accordance to their potential using the questioning methods outlined above.** Teachers would then formally record pupils' stages at the end of each topic by the class teacher. These assessments were also monitored by the department leader, and could allow discussions with class teachers as to how best to aid pupils to work to their potential.

**In year 7, due to the change of key stage at that point the "expected stage" was reviewed due to different curriculum demands, and the entry to year 7 GI was used to support that.** The exit of Year 8 is a milestone in terms of the transition from middle school to upper school.

**This year these GI tests have been discontinued by Wessex MAT, and the MAT is working on ways to replace them**

## Implementation

These are guides to the order of topic delivery, and depending on the responses of pupils and circumstances that arise year to year (such as classes being taught by more than one teacher) and they may be subject to adjustments. The topics are delivered until the content has been covered and are not limited to finishing in line with term dates.

### St Marys 2024-25 Key Stage 2 Subject Curriculum Map

Year 5						
School	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
St.Mary's CE Puddletown	Investigating Science /Working Scientifically	Properties and changes in materials.	Earth and Space	Forces	Living things and their habitats (Life Cycles of a variety of living things)	Animals including humans

Year 6						
School	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
St.Mary's CE Puddletown	<b>Evolution and Inheritance</b> (NAC opportunity-DATA collection on inherited/environmental variations in pupils. LAC opportunity Mary Anning/Charles Darwin)	<b>Classification of Living things</b>  (LAC opportunity-Non-chron report on a curious creature. Balanced argument on microbes useful/harmful)	<b>Classification of Living things</b>  <b>Light</b>  (LAC using PASSIVE VOICE for writing a method)	<b>Light</b>  <b>Electricity</b>	<b>Electricity</b>  <b>Humans as Organisms</b>	<b>Humans as Organisms</b>

### St Marys 2024-25 Key Stage 3 Subject Curriculum Map

Year 7						
School	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
St.Mary's CE Puddletown	<b>KS3 Entry test (GL to be replaced)</b> <b>Cells</b>  <b>Body Systems</b> LAC - Letter to an alien - levels of organisation	<b>Body Systems</b> NAC - gas exchange bar graph.  <b>Reproduction</b>	<b>Forces and Gravity</b>  <b>Space</b>	<b>Particle Model</b>	<b>Elements and Compounds</b>  <b>Chemical reactions including Acids and Alkalis</b>	<b>Separation techniques</b>

### St Marys 2024-25 Key Stage 3 Subject Curriculum Map

Year 8						
School	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
St.Mary's CE Puddletown	<b>Separation Techniques</b> (Not complete in Year 7)  <b>The Periodic table</b>  <b>Chemical Reactions- Metals and reactivity</b>	<b>Earth structure, Rocks</b>  (Light and Sound Catch up from Yr 7)	<b>Energy</b>  Respiration and Digestion (Revise and reinforce from Body Systems)	<b>Electricity and magnetism</b>	Revision/ reinforcement	Variation  Ecosystem processes.

The curriculum is mapped and sequenced wherever possible to encourage a transition from one topic to another. For example, in year 7, pupils initially study the topic of Cells before going onto Body Systems, and the knowledge builds from one topic to another. This also follows on from pupils having studied “Humans as Organisms” in the Summer of Year 6.

There are Topic Overview Sheets (also available on the website) that outline what pupils will learn in each topic, as well as what they will have previously learned, and how that learning will relate to future learning. At the beginning of each new topic, a revision activity of prior learning takes place, and recovery activities can be required at this stage.

For each topic, the skills relating to “**Working Scientifically**” or working as a scientist, are also mapped on the topic overview sheets. It is expected that these skills are integrated as part of the practical and active learning that happens in science lessons.

Following a series of meetings with neighbouring middle school science leaders and from Hardy's, an agreement of the content of the National Curriculum to be delivered by middle schools prior to moving to upper school was made. The intention of this is to ensure consistency of National Curriculum content delivered by Year 8, as Key Stage 3 actually finishes at Year 9, and takes into account the "three tier" system in this part of Dorset.

From 2017 onwards, the delivery of science has been revised and the curriculum rewritten. The developments that have taken place have been recognised and commended by Ofsted, as well as our partners in feeder first schools, our Academy and at Hardy's school.

### CPD

Over the least three years all teaching staff have received ongoing CPD on providing appropriate inputs of English within science.

The important link between the curriculum and teaching and learning means that key principles are put into practice in classrooms. Teachers of science are actively encouraged to share good practice and planning. CPD continues to include how to make classroom practice as good as possible. This is also shared through science meetings for KS2 and 3 as part of the meeting schedule (Tuesdays and INSET days time)

**(Revised by Mr Houldey as of September 2024)**