Harrietsham Church of England Primary School:
Subject Specific Concepts and the reasons for our choices
Subject: Science

Within our Science curriculum two distinct types of knowledge are taught:

- Substantive Knowledge.
- Disciplinary Knowledge: Working Scientifically - how scientists work and learn.

Key skills which are developed throughout the entire Science Curriculum:

- Vocabulary and language development.

Concept	Why learn about this concept?	Year group studied
Disciplinary Concepts		
Questioning	Research and questioning with a creative mind is the ability to look at concepts in a wide variety of ways, discussing new ways of thinking, acting or implementing. Research and questioning are the skills needed to enthusiastically show engagement with knowledge and use sources to find answers to those 'big questions'. Children are able to use their questions to delve deeper into a concept, exploring the processes, knowledge and the systems behind it. Researching allows children to discuss what they already know and what they have yet to discover, taking their specific interests into key consideration. Research is a Harrietsham key concept because we believe that children should be free to carve their own paths into scientific discovery. Questioning makes Science meaningful as children are able to discover and share knowledge that is important to them.	All
Making predictions	Making predictions involves children taking measurements or recording observations to explore situations where there are variables that they can't easily control. In this type of enquiry, children are trying to answer 'big questions' by identifying patterns in the measurements and observations they record. Initial enquiries may be preliminary tests that lead on to more systematic enquiries, such as fair tests or comparative tests. The key difference here is that children are making predictions based on their scientific understanding. They will be considering if their enquiries are 'fair tests' or comparative tests, because certain variables can't be controlled. Children may still identify a possible causal relationship from their data, such as 'the more you wind up a clockwork mouse, the further it will run', but they may find links between variables that can't be explained by cause and effect, such as 'children with longer arms can jump higher'.	All
Observing and measuring	Observing over time enquiries are a fantastic way for children to be curious about the world around them. The changes they observe can take place in seconds, minutes, hours, or days, or over longer periods of time, such as weeks or months. This type of enquiry lends itself to observing the natural world, but can also be used when comparing materials and observing physical processes. There are many opportunities to take children outdoors when carrying out these types of enquiries, and children's observations will often lead on to other, different, types of enquiries.	All

Testing	Like comparative tests, fair test enquiries are an opportunity for children to explore cause and effect relationships in science. Children find the answers to 'big questions' in fair test enquiries by planning tests to collect data through changing, measuring and controlling variables. Fair tests involve making systematic changes and analysing data to identify how one variable influences another. Due to the increased challenge in this type of enquiry they are introduced in KS2. The ability to develop experiments is to be able to choose the most reliable and accurate way to test and measure a prediction or hypothesis. Experiments are used to challenge existing knowledge or discover something new. Developing experiments is a Harrietsham key concept because we believe that children should be able to acquire scientific knowledge for themselves. The ability to design and develop their own experiments allow our children at Harrietsham to take ownership of their learning. The thrill of discovering something for yourself also makes that learning memorable and can help to embed it easily.	All
Identifying and Classifying	Children begin identifying and classifying objects in the world around them from a very young age; this type of enquiry comes very naturally as young learners try to make sense of the world around them. In this type of enquiry, children make observations and measurements to help them look for similarities and differences. This will help them to organise things into groups and make connections. Identifying and classifying enquiries are fantastic for promoting discussion and collaborative learning. In revisiting this type of enquiry regularly, teachers can support children in becoming more highly skilled in making and recording detailed observations.	All
Problem solving	Problem solving happens when scientific knowledge is used to provide explanations for their findings. This is taken further when children use their problem solving to think about more efficient ways of working as they evaluate their learning. Problem solving can also occur throughout the scientific process, when children make adaptations as the acquisition of knowledge is fluid. Forward thinking allows children to think about the future impact of their knowledge and what they may do because of this. Children at Harrietsham will be given plentiful opportunities to reflect upon what they have learnt already and discuss and direct how this informs their decisions for the future. This could be through making adaptations to an experiment or reflecting upon a conclusion that still needs exploring or developing.	All