Curriculum Leadership – Subject Vision

Subject / Curriculum Area: Science

Vision

Our aim is to provide a Science curriculum in which all children are encouraged to make links to, explore and form questions about the world around them. These opportunities are provided through exciting and practical Science lessons which inspire curiosity. Our annual Science / STEM day offers the children a chance for hands on learning across all year groups. We believe that these opportunities will ensure that our children are confident, life-long learners who will engage with the world around them!

What does your subject area offer the Dovers children?

An opportunity to use scientific thinking to help us make sense of the world around us. It encourages the children to ask questions and provides opportunities to take part in practical engaging learning opportunities.

How does your subject enhance the curriculum?

It encourages the children to always ask questions
It helps children to have a better understanding of the world around them and make contextual links
Provides practical opportunities for children who may find other areas of the curriculum challenging

What use is it to children later in life?

Science provides an in depth understanding of how processes work and relates the abstract to everyday life events. It helps give the children the vocabulary tools to be able to ask deeper questions and evaluate what they have learnt.

What are the main skills and knowledge (overarching objectives) you want teachers to focus on?

- To ensure investigations are carried out at least half termly to embed working scientifically objectives
- To focus on the use of technical scientific vocabulary (lab coats) and placing it into real life scenarios.
- Children to witness the purpose of science over a period of time (e.g. planting bulbs, lifecycles)
- To plan for all children to have opportunities to show skills through lesson planning that does not focus solely on writing. This includes provision for both SEN and greater depth children and knowing how to create the learning opportunities.
- To use Forest School sessions to enhance scientific learning

	Current Situation	Vision
Vision and Direction	The long term planning, mapping of topic and working scientifically objectives and weekly lessons throughout the year has had a great impact on coverage. This has resulted in available time to revisit areas of learning that the children find particularly difficult and have previously shown lower results such as animals including humans. The use of retrieval starters in lessons has also helped to ensure that teachers have a god understanding of pupils who may struggle to recall certain areas or analysis gaps that may have occurred due to the amount of time since previous coverage.	The 2022-23 vision for science includes further provision to focus on the working scientifically statements including 'broken down' investigations. This will be further enhanced through the use of STEM tables available for independent learning in each Year group setting. We are also continuing to focus on the availability and use of technical vocabulary to provide the children with the tools to begin to question and follow scientific processes. It is further important that we are ensuring the children are aware of what each term means in a real world setting.
Standards, Progress and Achievement	Monitoring of progress through TT has improved and teachers are confident using this assessment From 2021-22 data the previous year ones as showing a great trajectory to achieving expected and greater depth in science with last year levels exceeding national average.	Provide further opportunities for practical learning to ensure all children have the opportunity to present their skills in ways that are not writing based. A push towards number of greater depth children at end of KS1.
Quality of Learning & Teaching	Planned in lesson observations, book looks, planning monitoring. All year groups provide STEM opportunities in their outside area to promote exploration. All KS1 classes use lab coats to enrich vocabulary.	To complete learning walks and book looks, focusing on points of development. Working scientifically skills will be embedded within lessons (able to see objectives on the planning). Lab coats will be used and revisited regularly to promote vocabulary.
Assessment	All of KS1 have science books. Target tracker termly assessments.	Formative assessment to be documented termly on target tracker across KS1.

	Termly data reports to monitor the subject and ensure gaps are highlighted.	All working scientifically skills will be embedded within topics and assessed for termly.

Curriculum Leadership – Intent, Implementation and Impact

Subject/Curriculum Area: Science

Intent

What is being taught?

EYFS:

In Early Years the children are encouraged to experience 'working scientifically' through structured play and exploration tasks. The children are provided with a carousel of targeted activities as well as having ongoing access to continuous provisions which are planned to meet the key areas relating to science within the curriculum; 'The natural world' and 'Managing self'. On a weekly basis the children are provided with access to varying science based activities introduced through structured teacher led learning or through encouragement to engage independently within the classroom environment. Activities are explained and modelled prior to independent learning to provide visuals and scaffolding to help the child's exploration meet the intended learning outcome. The children's scientific knowledge will be expanded throughout the year to cover similarities and differences, environmental features, observations of animals and plants, staying healthy / exercising and personal hygiene. Throughout the year these key scientific concepts will be taught within the termly topic, focused upon investigative and question based tasks. In addition to classroom activities EYFS children have access to weekly forest school sessions, whereby further investigations and practical aspects of science, such as exploring the changes in nature as a result of the seasons, can take place.

Key Stage 1:

The continuous science provision beginning in EYFS will follow through to Year 1 in a gradually phased process whereby the children can continue to explore and investigate scientific concepts through planned independent learning. The Year One and Two science curriculum is taught through weekly lessons and at least half termly investigations that embed both topic and working scientifically skills. The long term overview dictates when each topic and working scientifically skill is covered to ensure that the children have an opportunity to explore each topic and skill when it is most relevant to the season / cross curricular links. It also allows for appropriate skills from previous years to be revisited and planned into each part of the curriculum as it is taught to support metacognition. Retrieval starters are used to revisit previous learning. Science is further taught through cross curricular activities such as measurement in Maths, to help make scientific skills relevant to the children's daily lives and encourage them to discover links. Opportunities for scientific learning in the wider school environment include weekly forest school lessons where children are encouraged to explore and investigate using key working scientifically skills and practical lessons involving seasonal changes, animals, habitats and plants. As a school we organise a yearly STEM week, specifically focused on covering the working scientifically skills. Every year each year group takes on the care of animals, including chicks, butterflies and tadpoles to demonstrate lifecycles in a relevant and visual context as well as planting bulbs to observe the growth process.

How does it cater for PP/SEND and higher attainers?

As a core subject science is an interesting entity as it allows children who may struggle with more academic learning processes such as reading and writing, to take part in more practical, visual and explorative styles. These are shown to better engage them as they feel more confident in their abilities, able to ask questions and verbalise their findings creating more interest and leading to better progressive outcomes. SEN children are supported through visuals, practical activity and investigations as well as modelling of the process. PP children are supported by allowing them opportunities to create links and experience worldly knowledge they may be lacking through exploration. Both groups are also offered pre-teaching where necessary for both discrete and cross curricular science concepts.

What is Mastery?

A child's ability to skilfully **apply** their learning in more in-depth ways is called **Mastery.** Mastery is not just knowing a fact, but it is using that fact in increasingly more complex situations to extend their learning. Mastery also enables children to work in ways which show a deeper understanding of a given task.

Mastery in Science.

Higher attaining children are challenged through higher level questioning, richer vocabulary, encouraging deeper thinking and explanation as well as encouraging consistent use of working scientifically skills such as predictions.

Implementation

In EYFS aspects of science are taught through the areas of learning 'The natural world' and 'Managing self'. In Key Stage One the science curriculum is split into Year One and Year Two topics. Both Year groups in KS1 are expected to cover the working scientifically statements additionally throughout the year through investigation, practical science and exploration. Teachers have been provided with skills and knowledge documents that break down the progression of skills and knowledge in science across all three years. This allows the teachers to understand the start and end points of the journey to meet end of year expectations in Science. This is broken down through the long term overview, where all topic and working scientifically skills are placed to show termly curriculum progression as well as where prior knowledge can be applied and revisited. Furthermore the prepared scheme of work used to inform the application of working scientifically skills into planned investigations, is broken down within this document to show when it can be used to plan for investigations within each term. The teaching of science is encouraged to be integrated within cross curricular learning in subjects such as maths, for example investigating measurement using working scientifically skills. Through every year group the learning is differentiated with further scaffolds, visual and modelled support for SEN and challenge such as higher level questioning and reasoned answers for those that are demonstrating a deeper understanding of the skill being taught. In Early Years science provision is made available through continuous provision activities and structured teacher led work relating to the termly topic. In KS1 science is through weekly lessons. Each science topic and working scientifically is planned to best fit cross curricular, keeping in mind other entities such as the season. Science data is reviewed termly through target tracker alongside other core subjects. This data is then formatted into a report to monitor progress across all areas and any gaps that may be prominent from topics or working scientifically that have already been covered are accounted for. Further monitoring of the science curriculum across all year groups is completed termly through lesson observations, book looks and planning monitoring. Pupil voice is used as a monitoring activity to ensure that what the children are learning is embedded, they are using appropriate vocabulary and show key areas that may need revisiting. Information from science courses and network meetings is shared in staff meetings and information from monitoring is shared with SLT.

Impact

Assessment of children's learning in Science is an ongoing monitoring of children's understanding, knowledge and skills. This assessment is then used to inform differentiation, support and challenge required by the children. Assessment is carried out by KS1 teachers after a block week by highlighting the statements taught on Target Tracker. Assessment is collected twice a year by subject leaders on Target Tracker to inform progress or skills and knowledge still to be embedded. An action plan for the following year is written from this. It also informs part of the yearly report for children.

EYFS assess using assessment statements put together each term, to judge whether a child is 'on track' or 'not on track' for this time in the year. This information is then put on Target Tracker as a 'Point in time assessment' (known as PITA). Subject leaders can then analyse this as part of the end of year report.

COIN unit children are assessed using Target Tracker under EYFS for EYFS and Year 1 children and when the children get to Year 2, if and when it is appropriate they are assessed under Band 1. Their data is analysed by the subject leader along with data from KS1.

Looking at the data from a previous three year trajectory, the previous two years dips in data seemed to coincide with the loss of coverage through COVID restrictions. With the use of the 'target tracker' assessment system from which core data is scrutinised termly, we were able to target more specific areas that lacked coverage or benefitted from being revisited in 'retrieval' starters. Teachers are now using gap analysis yearly to look carefully at each of the areas of working scientifically and ensure that they are covered at the appropriate times as suggested in the long term overviews.
The 2021-22 data is clearly showing that the areas of coverage that were previously as worry such as working scientifically and animals including humans in KS1 have benefitted significantly from the use of an appropriate long term plan allowing for all areas to be covered. This has been further befitted by the weekly science lessons and push on investigations within KS1. There are still areas that need further development such as continuing to focus on the working scientifically learning objectives alongside topic and a push on scientific vocabulary that will in turn benefit this. In EYFS children are continuing to meet the ELG at a greater rate than is nationally expected. Though there was a slight dip in the 2021-22 data this may be due to the cohort including a substantial amount of children with greater need. This year they continue to plan for independent activities that help the children to meet the statements and are setting up science based continuous provisions to engage the children practically.