



Overview of STEM at Eastbury Farm Primary School.



School Vision:

Children leave Eastbury Farm having been inspired to become confident and successful learners, ready to explore their future as resilient and responsible individuals.

STEM Vision:

Children leave us with the foundations required to understand the world around them and aware of the impact advances in STEM has upon technology. Through building up a body of foundational cross curricular knowledge, our children are encouraged to develop a sense of excitement and curiosity. Our children will then be able to use this knowledge, gained through research, experiments, critical thinking and investigations to be prepared for forward thinking, problem solving.

Intent:

The aim of teaching STEM is to inspire and engage our children and to prepare them for their future life and career aspirations. Our children are provided with the foundations required to understand the world around them and are encouraged to recognise the impact that Science, Technology, Engineering and Mathematics plays in their future. At Eastbury Farm we want to capitalise on children's natural curiosity through the inquiry process.

We want our children to develop a mastery of the following **skills**:

- **Independent**, self-directed learning
- **Collaborative** learning and **teamworking**
- **Critical and creative thinking** through complex and vigorous tasks
- Use STEM skills to **design solutions** to real-world problems
- **Hypothesise** and plan lines of **investigation** and **enquiry**
- **Apply** mathematics during engineering design challenges and when **scrutinising** data in science
- **Select** appropriate tools and techniques for making a product
- **Articulate** about how things work and draw plans and models for their ideas

These skills will be evident through the teaching of Science, Computing, Design and Technology, Art and Design and Mathematics:

Science

Cycle A In Reception Reception Autumn 1- All about me Autumn 2- Superheroes and me Spring 1- All creatures great & small Spring 2- Let's celebrate Summer 1- Once upon a time Summer 2- Me and my world In Year 1.2 Everyday Materials (Materials and Objects)	Cycle B In Reception Reception Autumn 1- All about me Autumn 2- Superheroes and me Spring 1- All creatures great & small Spring 2- Let's celebrate Summer 1- Once upon a time Summer 2- Me and my world In Year 1.2 Uses of Everyday Materials (Materials for Different Uses)
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Implementation:

How do we help children build STEM knowledge and skills into their long-term memory?
What is our teaching approach to delivering STEM?

- Throughout their time with us, the children will build upon and progressively develop their knowledge of and skills associated with all STEM areas through a variety of different topics.
- Throughout each unit each class will experience a 'Wow Day/Moment' which will bring the topic alive. This encourages the children to be inquisitive about their topic, to pose questions, seek answers, find out more and become lifelong learners.
- Adults delivering the topics are actively encouraged to consider opportunities to use the school's grounds and surrounding areas for fieldwork.
- We build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence
- Regular events such as STEM Week allow all pupils to come off-timetable, provide broader provision and allow for the acquisition and application of knowledge and skills.
- Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class; Where appropriate, members of the wider community are invited in to school to share their STEM expertise/knowledge with the children. In addition to this through the use of 'Skype a Scientist' experts will be invited to the school on a virtual basis to present on a wide variety of STEM related subjects. This enables children to base their learning on first-hand experiences and makes learning meaningful and relevant.
- Dedicated STEM Room with specialist equipment to enhance the teaching and children's enjoyment of STEM.

Our Teaching/Learning Sequence:

Impact:

Children do not only acquire the appropriate age-related knowledge in all areas of STEM but also the skills which equip them to progress from their starting points.

Children are immersed with enquiry skills, key scientific knowledge and investigation skills needed to create a culture of high STEM aspirations.

The children at Eastbury Farm are provided a platform to develop their STEM learning and articulate their understanding of key science, technology, engineering and mathematical concepts.

<p>Animals Including Humans (Common Animals, Plants, Diets)</p> <p>Seasonal Changes (Weather and Seasons)</p> <p>Plants (Wild and Garden)</p> <p>In Year 3.4</p> <p>States of Matters (Solid, Liquid, Gas)</p> <p>Rocks (Types, Rocks and Soils)</p> <p>Living Things & Their Habitats (Classification & Human Effect on Environment)</p> <p>Plants (Parts and Growth)</p> <p>Light (Shadows and Reflection)</p> <p>In Year 5.6</p> <p>Evolution & Inheritance (Evolution, Adaption & Inheritance)</p> <p>Forces (Gravity, Friction & Mechanisms) Inheritance)</p> <p>Animals Including Humans</p> <p>Light (How Light Travels) (Circulation and Health)</p> <p>Animals Including Humans (Growth, Development and Puberty)</p> <p>Animals Including Humans (Circulation & Health)</p>	<p>Living Things & Local Habitats (Living, Dead, Never Alive, Habitats)</p> <p>Animals Including Humans (Growth, Survival & Health)</p> <p>Plants (Seeds & Bulbs)</p> <p>In Year 3.4</p> <p>Electricity (Circuits & Components)</p> <p>Sound (Vibrations & Features)</p> <p>Forces & Magnets (Movement & Magnets)</p> <p>Animals Including Humans (Food, Diet, Skeletons & Muscles)</p> <p>Animals Including Humans (Digestion, Teeth & Food Chains)</p> <p>In Year 5.6</p> <p>Properties & Changes of Materials (Dissolving, Reactions & Separation)</p> <p>Earth & Space (Solar System, Movement of the Moon, Day & Night)</p> <p>Living Things & Their Habitats (Life Cycles, Reproduction of Plants & Animals)</p> <p>Living Things & Their Habitats (Classification: Plants, Animals & Microbes)</p> <p>Electricity (Changing Circuits and Symbols)</p>
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Computing

<p>Cycle A</p> <p>In Year 1.2</p> <p>Computing Systems & Networks: Technology Around Us</p> <p>Creating Media: Digital Literacy</p> <p>Programming A: Robot Algorithms</p> <p>Data & Information: Grouping Data</p> <p>Creating Media: Digital Music</p> <p>Programming B: Programming Quizzes</p> <p>In Year 3.4</p> <p>Computing Systems & Networks: Connecting Computers</p> <p>Creating Media: Audio Production</p> <p>Programming A: Sequencing</p> <p>Data & Information: Datalogging</p>	<p>Cycle B</p> <p>In Year 1.2</p> <p>Computing Systems & Networks: Information Technology Around Us</p> <p>Creating Media: Digital Painting</p> <p>Programming A: Moving a Robot</p> <p>Data & Information: Pictograms</p> <p>Creating Media: Digital Writing</p> <p>Programming B: Programming Animations</p> <p>In Year 3.4</p> <p>Computing Systems & Networks: The Internet</p> <p>Creating Media: Stop-frame Animation</p>
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Inspire

- Immerse the children in the subject/new learning theme and excite them about the unit ahead to make the learning more meaningful and relevant
- Find out what the children already know about the subject and how this links to what have they learnt in previous units
- Encourage the children to be curious and want to question and find out new information and apply their STEM knowledge to real-life solutions to a problem.
- Link to own local, national and global knowledge of the world



Enquiry

- Encourage the children to be curious, inspired and fascinated by the new topic
- Teach the skills children need to help them find out more about the unit. This could be building on previous learning from cross-curricular learning.
- Develop the children's knowledge and understanding, working both independently and collaboratively to hypothesise and articulate a solution to a problem posed.



Apply Skills

- Children will use the taught skills and resources to help them develop and deepen their understanding of the subjects associated with STEM.
- Children acquire the skills to understand, present, analyse and communicate a range of information in a variety of ways, selecting the most appropriate for the intended audience.
- Children can make relevant suggestions as to their results can be used and developed as a next step in learning
- Topics are relevant and taught in progressive way to build on previous learning, knowledge and skills
- Children know the key skills needed to be able to make their product, (i.e how to cut and sew for textile projects and cutting and joining skills for structural projects).
- Children use a variety of technology to help plan, present or make their project.



Connect it all Together

- Bring together the learning from STEM so that children are able to confidently talk about their learning
- Link this to existing knowledge and understanding



Concluding

- The children have learnt new knowledge and skills through the unit that has built on previous learning
- Children can apply their learning and understanding of STEM related subjects
- The children have been excited, engaged and curious to learn about real-world STEM project-based tasks

This will be evidenced through continuous monitoring carried out by the Subject Leader through:

- Learning Walks
- Pupil Voice
- Book Scrutiny
- Planning Scrutiny (that is progressive and builds upon children's existing skills and knowledge)
- Collaboration with the Subject Leaders for Science, Computing, Design and Technology, Art and Mathematics
- Feedback from Pupil Progress Meetings.

Creating Media: Desktop Publishing Programming B: Events & Actions in Programming In Year 5.6 Computing Systems & Networks: Systems & Searching Creating Media: Webpage Creation Programming A: Variables in Games Data & Information: Introduction to Spreadsheets Creating Media: 3D Modelling Programming B: Sensing Movement	Programming B: Repetition in Shapes Data & Information: Branching Database Creating media: Photo Editing Programming A: Repetition in Games In Year 5.6 Computing Systems & Networks: Communication & Collaboration Creating Media: Video Production Programming B: Selection in Quizzes Data & Information: Flat-file Databases Creating Media: Introduction to Vector Graphics Programming A: Selection in Physical Computing
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Design and Technology

Cycle A&B In Reception Autumn 1- All about me Autumn 2- Superheroes and me Spring 1- All creatures great & small Spring 2- Let's celebrate Summer 1- Once upon a time Summer 2- Me and my world	
Cycle A In Year 1.2 Gruffalo Crumble Puppets Adventure Playground In Year 3.4 Gift Packaging Roman Money Pouches Sushi Rolls In Year 5.6 Festive Microbits Toys Great Britain Forgot Mexican Fiesta	Cycle B In Year 1.2 Emergency Vehicles Weather Mobiles (sewing) Global Food (Chinese Spring Rolls) In Year 3.4 Light it Up Magnetic Board Games Exotic Fruit Smoothies In Year 5.6 Victorian Afternoon Tea (sandwiches & scones) Greek Structures Dragon's Den (TinkerCAD)

Mathematics

Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
-Number and Place Value -Addition and Subtraction -Multiplication and Division -Fractions -Measurement -Geometry-properties of shapes -Geometry-position and direction -Statistics	-Number and Place Value -Addition and Subtraction -Multiplication and Division -Fractions including decimals -Measurement -Geometry-properties of shapes -Geometry-position and direction -Statistics	-Number and Place Value -Addition and Subtraction -Multiplication and Division -Fractions including decimals and percentages -Ratio and proportion -Algebra -Measurement -Geometry-properties of shapes -Geometry-position and direction -Statistics

Subject Leader Expectations:

- Science - 1.5 hrs a week taught in KS1 and 2 hrs in KS2
- Computing – 1 hr per week across KS1 and KS2
- Design and Technology - 1hr per week in KS1 and KS2 taught for half term as a minimum
- Mathematics – 1 hr per day across KS1 and KS2
- Where possible, skills should be taught through investigation and enquiry and include practical 'hands on' activities
- Cross-curricular links are developed wherever possible and noted on planning
- Questioning to be used in marking to clarify or deepen understanding
- Clear adaptations to be evident for all learners
- Planning to show evidence of AfL, such as assessing prior knowledge, use of learning partners, peer and self-assessment
- Assessment of pupils' progress is carried out and recorded on Medium Term Plans at the end of each topic or HfL assessment trackers
- Tracking of pupil progress will take place termly and will be analysed by the Subject Leader
- Dedicated STEM Room to enhance the teaching and children's enjoyment of STEM
- Photos to evidence use of outdoor spaces and progression of projects when teaching STEM
- Visitors to school are encouraged in order to reinforce learning
- Science-based school trips encouraged in each year group
- Year groups encouraged to explore and enrich their topic through off-site visits e.g., Merchant Taylors school trips
- Outside learning and the use of the school grounds encouraged
- Class Teachers to inform relevant Subject Leaders when resources are missing or stock needs replenishing