How Has STEM Changed the World?

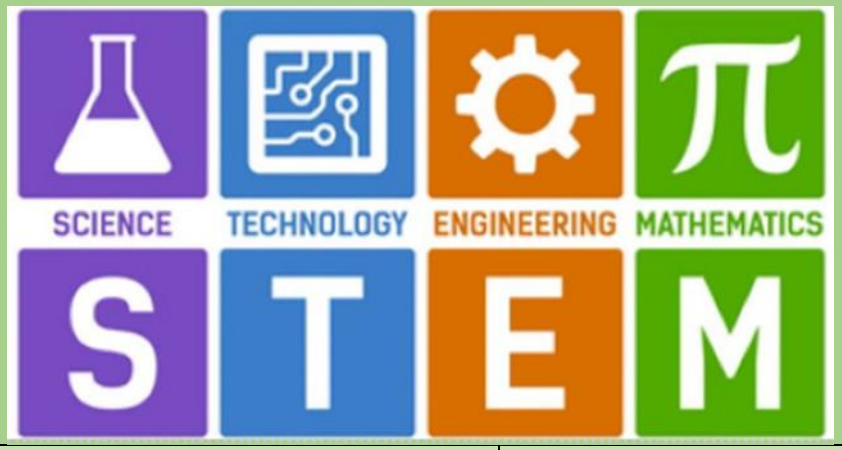
L earning Journey

E ngaging

A uthentic

R igorous

N ova Curriculum



Year 4	Terms 3 & 4	Big concept: Legacy and Design

Overview:

This enquiry enables learners to explore how each of the 4 areas of STEM have impacted upon our world and its development. Children will develop as scientists and engineers by asking questions, researching and drawing conclusions about their discoveries. As Scientists, the children will develop their knowledge of how sound travels and how we hear it, along with discovering how different light sources work, that darkness is the absence of light and also how shadows are formed. As artists, children will plan and create a self-portrait based on the skills they develop using light and shadow techniques. As designers, children will work in pairs to research, design and make electrical motorised cars.

Learning links (previous learning):	**Celebrating diversity and inspirational People:**
Science – Children will build their understanding of electricity and everyday materials. DT – Children will build on their knowledge of axles and how they move. Art – Children will develop their skills from year 3 by drawing from direct observation and using geometry and tonal shading.	Significant historical figures: Katherine Johnson, James Dyson, Tim Berners-Lee, Marie Curie, Otis Boykin, Neil deGrasse Tyson.
Launch and Landings	**Experiential learning opportunities:**
Launch: STEM Investigation Day **Mini-landing:** Filming of persuasive speeches linked to the world's greatest invention	STEM Investigation Day – hands on STEM activities Making bionic hands Trip to AES to explore engineering Magic Lantern presentation – Light and Dark

Landing: Make motorised vehicles **Showcase to Parents/Carers:** Showcase of children's motorised vehicles and drag race.	Making motorised vehicles
Enquiry Challenge	**Cross-Curricular Writing Opportunities**
Enquiry Challenge 1 See writing opportunities Enquiry Challenge 2 Make bionic hands Enquiry Challenge 3 Make bespoke motorised vehicles Enquiry Challenge 4 See writing opportunities	**Term 3: Writing persuasive speech on world's greatest invention** **Term 4: Create brochure for your bespoke motorised vehicle**

<table>
<tr><th colspan="2">NC Objectives – Skills, knowledge and vocabulary taught through Line of Enquiry</th></tr>
<tr><th>Science</th><th>D & T</th></tr>
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As scientists we will learn about Light and Animals, including Humans

We will study:

- Why we need light in order to see things and how dark is the absence of light.
- How light is reflected.
- How light from the sun can be dangerous.
- How shadows are formed.
- How shadows change.
- Function and parts of the digestive system in humans
- Identify types of teeth in humans and their functions
- Construct and interpret food chains

We will also:

- Learn about different STEM careers and significant figures who can inspire us.
- Consider the world's greatest invention
- Learn about the history of electricity
- Make circuits to power a motor
- Research how STEM has supported people with disabilities.
- Find out how STEM is contributing to combatting climate change – electric car development.

Vocabulary: Light, dark, shadow, reflect, transparent, translucent, opaque, light source, circuit, electrical components, digestive system, canine, molar, incisor, predator, prey, consumer

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As Designers and Engineers we will create motorised cars.

- Investigate existing products, including drawing them to analyse and understand how they work.
- Plan a sequence of actions to make a product.
- Develop more than one design.
- Develop prototypes.
- Generate designs with annotated sketches
- Refine work and techniques as work progresses, continually evaluating the product design.
- Identify strengths and weaknesses of their design ideas.
- Talk about how closely their finished product meets their design criteria.
- Cut materials accurately and safely by selecting appropriate tools.
- Measure and mark out to the nearest mm.
- Use axles, axle holders and wheels with an electrically powered pully.

Vocabulary: products, analyse, sequence, prototype, annotate, refine, evaluate, strengths/weaknesses, criteria, user, cut, accurately, safely, appropriate, tools, measure, mark, axles, wheels, pulley, chassis, motor.

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<tr><th></th><th>Art</th></tr>
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As artists, we will

- Discuss chiaroscuro and analyse techniques used by famous artists.
- Analyse and experiment with techniques used by Picasso through line drawing.
- Experiment with light, dark and tone using a variety of media.
- Explore form, space and perspective in a self-portrait.
- Apply shading techniques using different media.
- Plan and create a self-portrait using shading techniques to show light and shadow.

Vocabulary: Drawing, line, form, tone, techniques, light, dark, tone, form, space, perspective, shading.

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Opportunities for core subject learning across the curriculum	
As readers and writers we will:	**As mathematicians we will:**
Class texts: The Miraculous Journey of Edward Tulane, I Was a Rat, The Imaginary. **As Writers:** For fiction, children will innovate and invent a finding story and a meeting story, based on the T4W texts 'Scarlett and the Spy' and 'Adventure at Sandy Cove' In non-fiction, children will create explanations and reports inspired by T4W texts 'The Spy-Pen 3000' and 'Teacher Pleaser Machine'	• Learn formal methods for Multiplication and Division • Convert between Lengths and calculate Perimeter • Fractions

Discrete subject teaching - Skills, knowledge and vocabulary taught discretely	
Physical Education	**Music**
As fit and healthy citizens we will develop skills in: • Tag rugby • Swimming • Ultimate Frisbee	**As Musicians we will develop our musical skills and knowledge through Beacon Bristol music scheme:** - Singing - Indian Music- rhythm
Computing	**PSHE**
In computing we will develop skills through Teach Computing scheme: scheme: • Photo Editing (T3) • Data Logging (T4)	**As fit and healthy citizens we will develop our knowledge through** SCARF scheme unit: • Keeping Myself Safe • Rights and Responsibilities
RE and World Views	
As philosophers we will explore the question: What is the best way for a Sanatani to show commitment to God?	

Vocabulary: Purusharthas, Dharma, Pilgrimage, puja, vedas, gayatri mantra	
French	
As linguists we will learn: Vegetables Presenting Myself	