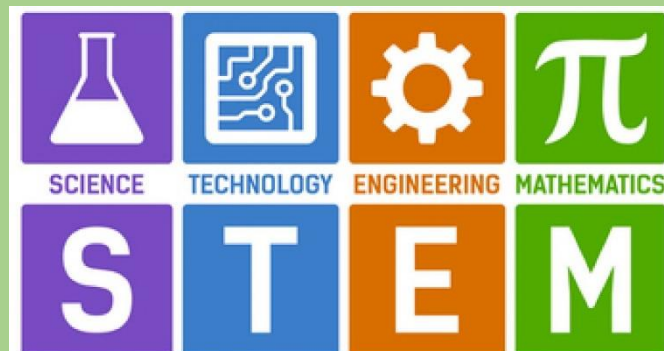




## How Has STEM Changed the World?



L earning Journey

E ngaging

A uthentic

R igoous

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):

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.

### Celebrating diversity and inspirational People:

Significant historical figures: Katherine Johnson, James Dyson, Tim Berners-Lee, Marie Curie, Otis Boykin, Neil deGrasse Tyson.

### Launch and Landings

**Launch:** STEM Investigation Workshop

**Landing:** Motorised Car Race

### Experiential learning opportunities:

- Class Train Workshop
- Class Train Trips to Severn Beach
- Class Minecraft Workshops

## NC Objectives – Skills, knowledge and vocabulary taught through Line of Enquiry

### Science:

#### As scientists we will learn about **light, sound and electricity.**

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.
- That sounds are made from vibrations and how they travel through our ears.
- Pitch and sound and the features of the object which produce it
- The link between volume and strength of vibrations.
- How distance affects sound.

We will also:

- Learn about different STEM careers and significant figures who can inspire us.
- Find out what Concorde is, who invented it and why is it significant?
- Visit the aerospace museum
- Investigate why Mars is the planet we hear about the most.
- Learn what significant figures are involved in space history?
- Research how STEM has supported people with disabilities.
- Learn why Rolls Royce is significant to Bristol.
- Find out how STEM is contributing to climate change – electric car development.

**Vocabulary:** Vibration, pitch, volume, frequency, loud, quiet, Light, dark, shadow, reflect, transparent, translucent, opaque, light source

### DT – Mechanics

#### As Designers and Engineers we will **create motorized 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 pulley.

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

### Art – Line, form & tone

#### 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.

Opportunities for core subject learning across the curriculum	
As readers and writers we will:	As mathematicians we will:
<p><b>Class texts:</b> The Miraculous Journey of Edward Tulane, Tales of Wisdom and Wonder, I Was a Rat, The Imaginary.</p> <p><b>Text Types:</b> Meeting Story. Non-fiction report.</p> <p><b>As writers:</b> 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'</p> <p>In non-fiction, children will create explanations and reports inspired by T4W texts 'The Spy-Pen 3000' and 'Teacher Pleaser Machine'</p> <p><b>Cross curricular writing in LOE books:</b> Science – children will write a recount of their trip to Severn Beach, paying particular attention to bridges and the workshop. Children may also write about significant STEM figures.</p>	<ul style="list-style-type: none"> <li>- Multiplication and Division</li> <li>- Length and Perimeter</li> <li>- Fractions</li> <li>- Decimals</li> </ul>

Discrete subject teaching - Skills, knowledge and vocabulary taught discretely	
Physical Education	Music
<p><b>As fit and healthy citizens we will develop skills in:</b></p> <ul style="list-style-type: none"> <li>• Tag Rugby</li> <li>• Swimming</li> <li>• Ultimate Frisbee</li> </ul>	<p><b>As Musicians we will develop our musical skills and knowledge through Beacon Bristol music scheme:</b></p> <ul style="list-style-type: none"> <li>• Singing</li> <li>• Unit 4 – Indian Music (rhythm) Singing</li> </ul>
Computing	PSHE
<p><b>In computing we will develop skills through Teach Computing scheme:</b></p> <ul style="list-style-type: none"> <li>• Photo Editing (T3)</li> <li>• Data Logging (T4)</li> </ul>	<p><b>As fit and healthy citizens we will develop our knowledge through SCARF scheme</b></p> <ul style="list-style-type: none"> <li>• Keeping Myself Safe</li> <li>• Rights and Responsibilities</li> </ul>
RE	French

<b>As philosophers we will explore the question:</b> RE enquiry question: What does it mean to be a Hindu in Britain today?	<b>Vegetables</b> ( <i>Early Language Teaching</i> ) <b>Presenting Myself</b> ( <i>Intermediate Language Teaching</i> )