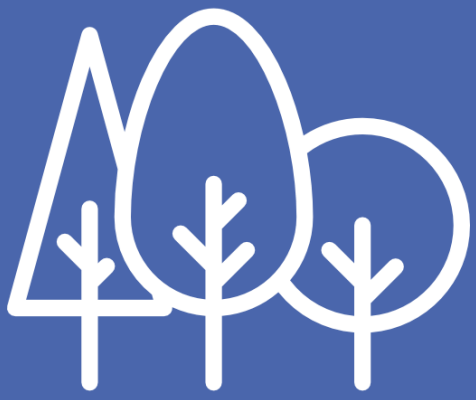
WE ARE ENGINEERS:
Appreciating God's Creations

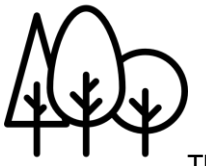
Focus Overview



At Our Lady and St. Hubert's, home, school and parish work together, knowing that God is with us in all we do

YEAR 5:

We Are Engineers: Appreciating God's Creations
Year 5 – Space



Throughout this focus, children will explore space and learn about how space works.
Through ***Art*** children will explore a range of fabrics to create 3D astronauts. They will draw annotated sketches, think about their choice of materials and create instructions on how to make their astronaut. They will then draw on their sewing skills to make a stuffed 3D astronaut, which will use a range of sewing skills.
In ***Science*** children will explore the earth, sun and moon, investigating gravity, air resistance and comparing day and night. They will work scientifically to create shadows and understand how shadows work too.
In ***Computing*** children will design scratch games using sequencing, selection and their critical thinking skills to solve problems.
In ***D.T.*** children will design, make and evaluate rockets which they will need to launch without an electrical component. It will need to carry an egg securely and land safely.
Finally, in ***English*** children will write a sci-fi narrative, focusing on an alien landing and will draw on key concepts they have learnt throughout Science to help them understand how space works.

Theme Impact

Children will explore in depth the exciting wonders of space and will learn about how the Earth rotates, the effect of gravity and how the movement of the sun and moon create day and night. Children will draw on their knowledge of space to design, create and evaluate how to make rockets, while exploring the forces needed to allow this to happen. Children will further enhance their creative skills by linking their English theme of an alien lost in space to their own creative textile project where they will design their own planets.

Catholic Social Teaching

Embracing technology to solve problems.

- Looking at the God given talents of scientists and inventors who have enhanced our understanding of difficult concepts
- How have scientists and inventors acted in the image of God?
- How have scientists followed in God's footsteps to contribute towards the common good of our world
- How can we use their examples to become more faith-filled, generous, grateful and wise?

Curriculum Drivers

Art

National Curriculum Objectives

Textiles Unit

- Develop and share ideas in a sketchbook and in finished products.
- Improve mastery of techniques including drawing, painting and sculpture – Textiles

- Learn about the great artists, architects and designers in history.

Knowledge and Skills Progression

- **E3** question and make thoughtful observations about starting points and select ideas for use in their work, recording and annotating in sketchbooks.
- **T1** use fabrics to create 3D designs
- **T2** experiment with a range of media to overlap and layer creating textures, effects and colours.
- **C2** use different techniques, colours and textures when designing and making pieces of work.

Prior Learning

- **E3** question and make thoughtful observations about starting points and select ideas for use in their work, recording and annotating in sketchbooks
- **T1** use a variety of techniques e.g. printing, dyeing, weaving and stitching to create different textural effects.
- **T2** develop skills in stitching, cutting and joining
- C2 use collage as a means of collecting ideas and information and building up a visual vocabulary.

Science

National Curriculum Objectives

Earth, sun and moon

- Look at the effect of gravity
- Investigate drag forces; air resistance, water resistance and friction.
- Look at the movement of the Earth and the Moon, relative to each other, then relative to the Sun and other planets
- Explain day and night.

- Compare how things move on different surface

Working Scientifically Suggestions

- compare the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system;
- construct simple shadow clocks and sundials, calibrated to
- show midday and the start and end of the school day

Knowledge and Skills Progression

- describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- describe the movement of the Moon relative to the Earth
- describe the Sun, Earth and Moon as approximately
- spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
- E2: take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- E3: record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- E4: using test results to make predictions to set up further comparative and fair tests
- E5: report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

Computing

National Curriculum Objectives

Programming, Scratch game

- Design and write programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.
- Use sequence, selections and repetition in programs; work with variables and various forms of input and output; generate appropriate inputs and predicted outputs to test programs.
- Use logical reasoning to explain how a simple algorithm works, detect and correct errors in algorithms and programs.

- IT skills recap/consolidation

Knowledge and Skills Progression

- CS2 Know how to use sensing blocks to read key presses
- CS3 Know how to use sensing blocks to register collision
- CS6 Know how to ask questions of code that doesn't work

Prior learning:

- CS2 Know that variables are data that can be held and altered in a program
- CS3 Know how to design an algorithm including selection
- CS6 Know how to use variable blocks for assigning and changing variables in Scratch

DT

National Curriculum Objectives

Creation of rockets of moving vehicles using non-electrical mechanisms

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.
- Select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately.
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.

- Investigate and analyse a range of existing products.
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
- Understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages.

- Understand how key events and individuals in design and technology have helped shape the world – Space Travel NASA

Knowledge and Skills Progression

- D2 Draw a fully labelled/annotated sketch/diagram of their product, including measurements and cross-sections- some may use computer aided design.
- D3 Choose the materials/ ingredients /tools they will use, based on their suitability for the task. Indicate where/how materials will be joined in order to create a stable structure.
- D6 Write (brief) instructions for how they intend to make their product.
- MC2 Joining- Join a range of materials using a variety of suitable methods.
- MC3 Testing- Test their product as they work, making informed adjustments and striving to address any anticipated problems.
- MC5 Extra component- Create a working mechanism (pulleys and gears) and incorporate it into their product
- MC6 Finishing- Create a polished and well-finished product.
- E1 Positive- Identify and discuss the strengths of their product.
- E2 Critique- Identify any areas for development/ improvements that could be made.
- E3 Audience- Discuss whether the product meets the requirements of the brief/the needs of the user – is it fit for purpose?
- E4 Improve- Suggest how their product could be improved. Take part in peer evaluation, giving and receiving feedback from fellow pupils.

Prior Learning:

- R1- Children safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
- D1- Use their research to develop some of their own design criteria.
- D2- Draw a fully labelled sketch/diagram of their product, including some measurements- some may use computer aided design.
- D3- Choose the materials/ ingredients /tools they will use, based on their suitability for the task.
- D4- Write a detailed list of the materials/ ingredients/tools they will need.
- D6- Order the main stages of their making process
- MC2- Joining- Join a range of materials using a variety of methods, usually choosing the method most suited to the task.
- MC3- Testing- Test their product as they work, making informed adjustments to ensure their product meets the design criteria.
- MC5- Extra component- Create a basic electrical circuit/simple mechanical component (e.g- cams, pop up) and incorporate it into their product.
- MC6- Finishing- Pay attention to the finishing of their product.
- E1- Positive- Identify and discuss the strengths of their product.
- E2- Critique- Identify any areas for development/ improvements that could be made.
- E3- Audience- Discuss whether the product meets the requirements of the brief/the needs of the user – is it fit for purpose?
- E4- Improve- Suggest how their product could be improved. Take part in peer evaluation, giving and receiving feedback from fellow pupils.

Application

Lots of research went into how to safely launch and land Apollo 9 to help scientists gather additional information about space. How can we safely launch a rocket outside with an egg inside that lands safely and is undamaged?

Children will draw on their knowledge of rockets from DT and think about how they can use different materials to help keep their egg safe. They will need to use their understanding of forces, including air resistance to make their launch successful.

Wider Curriculum Opportunities	
Writing	**Reading**
Sci-Fi Narrative Explore an alien landing and the unknown adventures. Children to then explore being lost in space,. Children will then write their own alien landing, possibly landing on their own unknown planet and discovering something. **Persuasive Letter (Partly linked to space)** Explore why we should explore space and send humans up to space. Children will then use this structure to form their own persuasive letter about the topic of mobile phones.	**Harry Potter – Reading Challenge (stand alone)** **Reading Explorers Poem – Colour Blind** **Reading Explorers – Space Attack**  **Moon ladder**  **Melvin the sad-ish robot**

Computing – application of previously taught skills
Conduct a search using a search engine **Be able to look up a child focused video**

Enrichment
Space Centre Leicester – Children will explore the Solar system, planets and can experience what it likes to be inside a space dome

Home Learning
• **Draw the planets in the correct order from the sun.** • **Research why Pluto is no longer a 'registered' planet** • **Create a fact file on NASA** • **Research an astronaut, explore how they survived in space and create an astronaut survival guide.** • **Research black holes and why they exist**

Evaluation Notes

Stand-alone objectives to be covered this term
PE
Hockey
Music

MFL
Cooking in the Curriculum
Sausage and bean hot pot