



WE ARE ENGINEERS: Embracing Technology to Solve Problems

Focus Overview

YEAR 6: Alarms



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

A Wonderful World:
Appreciating God's
Creations



Peace and Conflict: Respect
for all Individuals



A Moment in Time:
Learning from the
Past for Our Future



We are Engineers:
Embracing Technology
to Solve problems



Nurturing Nature:
Engaging and Taking
Responsibility



**Our Place in the
World:** Identity and
Community



We are Engineers: Embracing Technology to Solve Problems Year 6 – Alarms



Throughout this focus, children will use skills of STEM (Science, Technology, Engineering and Maths) to solve problems and create products. All children will be given a design brief to follow in order to create their own alarms – they will then explore the 'design, make, evaluate process' to create their products. Some children will have the opportunity to combine their products with elements of computing to develop 21st century products.

Through **Computing**, children will understand how to create an alarm using a Micro bit. They will focus on creating it to sense movement and how it will react in particular, thinking about the target audience and problem to solve. They will explore how to link Micro bits to Scratch and how different inputs create different outputs. Children will explore how to use a timer and operators. They will combine their exploratory sessions to finally create a password-protected alarm. In **English**, children will write about the problem through their newspaper articles and write possible solutions. They will explain how their alarm system works, by creating explanation texts. Children will follow a design specification to design, make and evaluate a casing for their alarms in **Design & Technology**, thinking about how their design can be something that is hidden/visible depending on the purpose of the alarm. They will explore nets of 3D shapes and how their design complements their alarm. Finally, through **Art**, children will learn about the work of Warhol. Not only about the artist himself, but also about his works and techniques and how he created the famous printing of Marilyn Monroe. Children will learn about block printing and using colours to create effective pieces, often mixing colours themselves.

Theme Impact

Children will have a deeper understanding of how to use technology to solve real-life problems and how you have to consider various elements to meet the design criteria. Pupils will use creativity to create logical plans and solutions to the problem, and also use collaboration to work together with others to bring their ideas to reality. Children will have the opportunity to combine their products with elements of computing to develop 21st century products.

Catholic Social Teaching

Option for the poor and vulnerable: This means that God invites us to care in a special way for those who need the most help.

Through Collective Worship, children will explore the many various conditions and environments that people live in- both locally and globally and the reasons for this. They will think about how they can support people who are victims of things like famine, unjust oppression, prejudice and unemployment. This will be taught alongside the virtues of Compassionate and Loving; compassionate towards others, near and far, especially the less fortunate; and loving by their just actions and forgiving words.

Computing

National Curriculum Objectives

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

Knowledge and Skills Progression

- Recognise Microbit blocks in Scratch
- Recognise operator blocks in Scratch
- Know that input is when information goes into a computer

CS1 Recognise different kinds of input
 CS2 Sync a Microbit with Scratch
 CS3 Know how to add different extension blocks to Scratch
 CS4 Know how use Microbit blocks in Scratch
 CS5 Know how to work with Scratch's timer
 CS6 Use operator blocks to perform simple calculations with variables
 CS7 Know how to control and interact with physical systems
 CS8 Know how to Step through code and describe what is happening at each stage
 CS9 Know of ways technology solves real-life problems

DT

National Curriculum Objectives

- 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.
- Understand how key events and individuals in design and technology have helped shape the world
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
- Apply their understanding of computing to program, monitor and control their products.

Knowledge and Skills Progression

R1- Children safely use and critically explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

R2- Children use what they have learnt about media and materials in original ways, thinking about uses and purposes to benefit their design.

R3- Children represent their own ideas, thoughts and feelings through design and technology in a variety of ways using different forms of communication.

D1- Use their research to develop their own design criteria.

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.

D4- Write a detailed list of the materials/ ingredients/tools they will need- including sourcing their own materials where appropriate. Indicate where mechanisms will go and explain how they will function

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.

MC4- Improving - Apply their prior knowledge and understanding to make structures stiffer/ more stable as they work. Does it meet the design criteria? Who is the audience?

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.

Art

National Curriculum Objectives

Learn about the great artists, architects and designers in history – Andy Warhol

Knowledge and Skills Progression

E1 create sketch books to record their observations and use to review and revisit ideas.

E2 record and explore ideas from first hand observations, experience and imagination and ideas for different purposes.

E3 question and make thoughtful observations about starting points and select ideas for use in their work, recording and annotating in sketchbooks.

E4 think critically about their art and design work.

Painting and Printing

P1 develop a painting from a drawing.

P2 experiment with different media and materials for painting.

P3 create imaginative work from a variety of sources e.g. observational drawing, music, poetry, other artists

P4 mix and match colours to create atmosphere and light effects.

P5 identify, mix and use primary, secondary, complimentary and contrasting colours.

PR1 create printing blocks using sketchbook ideas.

PR2 develop techniques

PR5 experiment with overprinting motifs and colour.

Application

Design brief: I must design a password-protected portable alarm for adults that can make a sound alert when drawers are opened and closed.

Children to explore own ideas in groups – this will be completed through planning, design, making and evaluating final alarm.

Wider Curriculum Opportunities

Writing

Newspaper report:

- Glue sticks being stolen – create alarm

Explanation text:

- How alarms work

Instructions:

- Making alarm

First person diary:

- Write diary entry as detective

Reading

The Miraculous Journey of Edward Tulane - Kate DiCamillo
SeaBEAN – Sarah Holding
The Girl of Ink and Stars - Kiran Millwood Hargrave
Extracts: The Wright Brothers, Kensuke's Kingdom.

Computing

Using Scratch and Microbits – Computing unit

Application of previously taught skills - **Presentation of information**

Select, use and combine a variety of software on a digital device to design and create content that collects, analyses, evaluates and presents data and information.

Enrichment

Home Learning

Research:

Look for the types of alarms around your home, school, supermarkets –

- Are they visible/hidden?
- How are they activated?
- What do they do once they are activated?
- How can this research support you in meeting the design brief?

Evaluation Notes

Stand-alone objectives to be covered this term

PE

Athletics

- Accurately and confidently judge across a range of athletics activities
- Record accurately scores given in variety events
- Demonstrate accuracy and good technique when throwing for distance
- Show good technique and control for jumping activities
- Choose appropriate run up distance as an individual for athletic jumps
- Use appropriate pace for different running distances
- Demonstrate improvement when working with self and others
- Use appropriate language to deliver a taught activity to their peers

Netball

- Choose and implement a range of strategies to attack and defend such as restricting attackers space or goal side marking
- Suggest, plan and lead a warm up or drill and use STEP technique to modify
- Make quicker decisions in games (on and off the ball)
- Use and apply boundary rules such as corners, self pass and sideline in relevant game
- Build upon set plays such as in tag rugby, some suggest improvements to play
- Use a variety of techniques for passing, controlling, dribbling and shooting the ball in games
- Play in a variety of positions (attacking and defensive)
- Consistently catch/stop and control a ball
- Able to track and control a rebound from shot (penalty or open play)
- Work collaboratively in a team to play and keep possession of the ball

Science

National Curriculum Objectives

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Knowledge and Skills Progression

E1: plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

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,

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

E6: identify scientific evidence that has been used to support or refute ideas or arguments

Working Scientifically Suggestions

- decide where to place rear-view mirrors on cars;
- design and making a periscope and use the idea that light appears to travel in straight lines to explain how it works.
- investigate the relationship between light sources, objects and shadows by using shadow puppets
- extend their experience of light by looking a range of
- phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur)

Music

N/A

MFL

Unit: Core Vocabulary lesson: Days of the week and Little Red Riding Hood lessons 1 & 2 (E)

Lundi, Mardi, Mercredi, Jeudi, Vendredi, Samedi, Dimanche, Petit Chaperon Rouge, La tête, La maison, La bouche, La grand-mère, Le nez, Le loup, Les yeux, Le bûcheron, Les pieds, La forêt, Les oreilles, Les parents, Les genoux, Des gateaux, Les épaules, Le corps

Speaking

- Be able to say the days of the week
- Listen to model role-plays and infer meaning.
- Listen to familiar story and understand meaning.
- Match sound to picture / word / phrase. Understanding slightly longer text.

Listening

- Listen and respond to familiar spoken words, phrases and sentences (e.g. simple instructions).
- *repeat words and phrases modelled by the teacher*
- *remember a sequence of spoken words*
- *use physical response, mime and gesture to convey meaning and show understanding.*

Match sound to picture / word / phrase.

Reading

- Read familiar story and understand meaning.
- *read aloud a familiar sentence, rhyme or poem.*
- Recognise how sounds are represented in written form.
- *pronounce accurately the most commonly used characters, letters and letter strings*

Writing

- Write some familiar simple words from memory or using supported written materials (e.g. familiar nouns).
- *write simple, familiar words using a model*
- *write some single words from memory.*
- *create name labels and complete differentiated worksheets*
- Spell all new language as accurately as possible via tasks in each lesson.

Grammar

- To start to understand the concept of nouns and articles.

Cooking in the Curriculum

Vegetable lasagne – See cooking curriculum for recipe guidance and skills