



## Curriculum Learning Guide

# Design Technology

## How is DT taught at St Philip's CE Primary Academy?

*To be read alongside EYFS Programmes of Study for Curious Minds*

## How is DT taught at St Philip's CE Primary Academy?

### Curriculum Intent:

#### What do we want to achieve with our DT curriculum?

At St Philip's we intend for our DT curriculum to support the children to be prepared to deal with tomorrows rapidly changing world. It will encourage children to become independent, innovative, and creative problem solvers and thinkers, both as individuals and part of a team.

Our DT curriculum will develop an appreciation for the product design cycle through ideation, creation, and evaluation.

Our pupils will develop confidence to take risks, through drafting design concepts, modelling and testing, and to be reflective learners who evaluate their work and the work of others. Through our DT curriculum we aim to build awareness of impact of DT on our lives and encourage pupils to become resourceful, enterprising citizens who will have the skills to contribute to future design advancements.

Children will understand that **DT** is exploring how things are made and designing and making your own.



## Implementation:

### How will this be achieved?

Our DT curriculum outlines the 3 main stages of the design process: design, make, evaluate. Each stage of the design process is underpinned by technical knowledge which encompasses the contextual, historical, and technical understanding required for each strand. Cooking and nutrition, has a focus on specific principles, skills and techniques in food, including where food comes from, diet and seasonality.

The National Curriculum organises the DT attainment targets under five strands:

- ✚ Design
- ✚ Make
- ✚ Evaluate
- ✚ Technical Knowledge
- ✚ Cooking and nutrition

Our progression of skills shows the skills that are taught within each year group and how these skills develop to ensure that attainment targets are securely met, the end of each key stage.

Throughout St Philip's the children will respond to design briefs and scenarios that require consideration of the needs of others, developing their skill in six key elements:

- ✚ Mechanisms
- ✚ Structures
- ✚ Textiles
- ✚ Cooking and nutrition (Food)
- ✚ Electrical systems (KS2)
- ✚ Digital world (KS2)

Each of the key elements follows the design process (design, make, evaluate) and has a particular theme and focus from the technical knowledge or cooking and nutrition section of the curriculum. This is a planned spiral curriculum, with key elements visited again and again with increasing complexity, allowing pupils to revisit and build on their previous learning. DT lessons at St Philip's will incorporate a range of teaching strategies from independent tasks, paired and group work, including practical hands on, computer based and inventive tasks. Knowledge organisers for each unit support the children in building a foundation of factual knowledge by encouraging recall of key facts and vocabulary.

Oracy is one of our key curriculum drivers and a language rich curriculum is essential to the successful acquisition of knowledge and understanding in history. We use dialogic talk techniques in KS2 to discuss and debate questions related to design and evaluation, using appropriate vocabulary and language. We encourage children to be independent in thought and confident in reasoning, justifying and challenging.

## **Unit Structure & Lesson Structure**

Pupils are taught through whole class delivery of a unit, set within a specific DT week across school, agreed with the class teacher and the DT subject leader. Pupils will work together on the same lesson content at the same time. Lessons are sequenced so that revisited concepts are built upon across the primary years and developed in logical steps with particular attention given to fundamental concepts and vocabulary.




**Knowledge Organisers** for each unit support pupils in building a foundation of factual knowledge by encouraging recall of key facts and vocabulary. These will be introduced to the children at the start of each unit and put into each child's Music book for the pupils to refer.

## **Lesson Model & Timetable**

Lesson 1 – Exploring, Lesson 2 – Design, Lesson 3 – Construction, Lesson 4 – Testing & evaluation. Each year group from Y1-6 is timetabled for a unit of work 5 out of 6 half terms per academic year. (See Long Term Plan). In EYFS DT activities will be available in enhanced provision. The Y1 classroom will have DT enhanced provision activities on occasion, as these will be rotated with Art.

## **Impact:**

Kapow DT curriculum is designed to build on prior learning as part of a spiral curriculum. Lessons are sequenced throughout the Primary phase for progression of skills (& knowledge) where all learning builds towards clearly defined end points.

-  End of unit
-  End of year
-  End of Key Stage

The curriculum, assessment model and comprehensive expert guidance offered enables the subject lead to ensure that all pupils learn the curriculum.

Assessment data collected at the start of the units gives a clear picture of pupils starting points, assessment then collected as part of the teaching enables each pupils' progress to be monitored. Assessment at the end of the unit measures progress from children's starting points and can therefore directly inform next steps in future teaching for skills, knowledge and understanding.

The Kapow curriculum offers equity for all groups, and it is intended that all pupils access it. By following and monitoring the curriculum and its delivery, the subject leader is supported in ensuring that all teachers teach the full range of lessons for each year group and that they are taught in accordance with the planning to ensure rigor, challenge, and inclusion.

## Design Technology Elements

### **Mechanisms/Mechanical systems**

Mimic natural movements using mechanisms such as cams, followers, levers and sliders.

### **Structures**

Material functional and aesthetic properties, strength and stability, stiffen and reinforce structures.

### **Textiles**

Fastening, sewing, decorative and functional fabric techniques including cross stitch, blanket stitch and appliqué.

### **Cooking and Nutrition**

Where food comes from, balanced diet, preparation and cooking skills. Kitchen hygiene and safety. Following recipes.

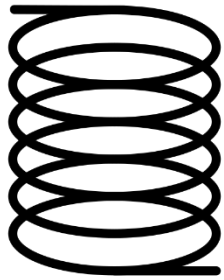
### **Electrical Systems (KS2)**

Operational series circuits, circuit components, circuit diagrams and symbols, combined to create various electrical products.

### **Digital world**

Program products to monitor and control, develop designs and virtual models using 2D and 3D CAD software.

## Spiral Curriculum



The scheme of work has been designed as a spiral curriculum with the following key principles in mind:

- ✓ Cyclical: Pupils return to the key strands again and again during their time in primary school.
- ✓ Increasing depth: Each time the key strand is revisited it is covered with greater complexity.
- ✓ Prior knowledge: Upon returning to each key strand, prior knowledge is utilised so pupils can build upon previous foundations, rather than starting again.

## Key Drivers at St Philip's

	Oracy Rich	Relevant Content	Experiential Learning	Future Proof	Inclusive & Supportive
<b>Design Technology</b>	<ul style="list-style-type: none"> <li>• Group discussions of designs and products.</li> <li>• Key vocabulary identified in the progression documents, MTPs and Kos.</li> <li>• Evaluating and designing products.</li> </ul>	<ul style="list-style-type: none"> <li>• Coverage of most skills.</li> <li>• Matched to progression of skills document from EYFS- Y6.</li> <li>• Suits needs and interests.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing products that can be used in school/ at home.</li> <li>• Allow time for “unpacking” the products available on the market.</li> <li>• No set outcomes for designs – open ended.</li> </ul>	<ul style="list-style-type: none"> <li>• Looking at the designs of the future.</li> <li>• Product placement across the globe, environmentally friendly.</li> <li>• DT LAP networks.</li> </ul>	<ul style="list-style-type: none"> <li>• Resources available to suit the need.</li> <li>• Differentiation</li> <li>• Subject is developmental and progressive</li> <li>• Variety of topics covered.</li> </ul>

## Design Technology – Pedagogy

DT gives children the opportunity to develop skills, knowledge and understanding of designing and making functional products. We feel it is vital to nurture creativity and innovation through design, and by exploring the designed and made world in which we all live and work.

Design and Technology education involves two important elements - learning about the designed and made world and how things work and learning to design and make functional products for particular purposes and users.

Children acquire and apply knowledge and understanding of materials and components, mechanisms and control systems, structures, existing products, quality and health and safety.

The skills learned in DT also help with learning across the curriculum. Knowledge about the properties of materials helps in science and the practice of measuring accurately helps in maths. These skills help in IT through the children's use of computer control and, naturally, in art and design.

Design and Technology education helps develop children's skills through collaborative working and problem-solving, and knowledge in design, materials, structures, mechanisms, and electrical control. They are encouraged to be creative and innovative and are actively encouraged to think about important issues such as sustainability and enterprise. There are three core activities children engage with in Design and Technology:

- Activities which involve investigating and evaluating existing products
- Focused tasks in which children develop aspects of knowledge and skills
- Designing and making activities in which children design and make 'something' for 'somebody' for 'some purpose'.

## Weaving knowledge, skills and understanding together in the DT Curriculum

### EYFS: Physical Development + Exploring media and materials

#### Expressive Arts and Design

The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe

#### Physical Development

Physical activity is vital in children's all-round development, enabling them to pursue happy, healthy and active lives<sup>7</sup>. Gross and fine motor experiences develop incrementally throughout early childhood, starting with sensory explorations and the development of a child's strength, co-ordination and positional awareness through tummy time, crawling and play movement with both objects and adults. By creating games and providing opportunities for play both indoors and outdoors, adults can support children to develop their core strength, stability, balance, spatial awareness, co-ordination and agility. Gross motor skills provide the foundation for developing healthy bodies and social and emotional well-being. Fine motor control and precision helps with hand-eye co-ordination, which is later linked to early literacy. Repeated and varied opportunities to explore and play with small world activities, puzzles, arts and crafts and the practice of using small tools, with feedback and support from adults, allow children to develop proficiency, control and confidence.

EYFS

Designing	Making	Evaluating	Technical Knowledge	Food Technology
<p>To design and make a greeting card using a variety of techniques including beginning to use sliders.</p>	<p>Learn to use scissors to cut out regular shapes, e.g. square, rectangle, triangle and circle.</p> <p>Learn to handle and use equipment and tools effectively, e.g. hammers, clay tools, scissors etc.</p> <p>Learn to peel carrots using a vegetable peeler independently and safely.</p> <p>To learn to use scissors to cut out regular shapes.</p> <p>To use tape without losing the end.</p> <p>To learn to apply appropriate amounts of glue.</p> <p>To design and make a greeting card using a variety of techniques including beginning to use sliders.</p>	<p>Discuss what has been made and with prompts I am beginning to identify good points and bad points.</p>	<p>Structures Build with a variety small scale construction adapting to make them more stable.</p> <p>Mechanisms Make a moving vehicle using a range of construction independently.</p>	<p>Learn to peel carrots using a vegetable peeler independently and safely.</p>

Vocabulary

Planning, Investigating, Design, Evaluate, Make, Cut, Fold, Join, Fix, Structure, Wall, Tower, Weak, Strong, Base, Top, Underneath, Side, Edge, Thinner, Thicker, Corner, Straight, Curved, Metal, Wood, Plastic, Circle, Triangle, Square, Rectangle, Cuboid, Cube, Cylinder, Slot, Card, Masking Tape, Paper fastener, Join, Pull, Push, Up, Down, Straight, Curve, Forwards, Backwards, joining and finishing techniques, Tools, Fabrics, Join, Decorate, Fruit and vegetable names, Names of equipment and utensils, Seed, Slicing, Peeling, Cutting, Squeezing, Healthy diet, ingredients

<b>Structures</b>	
<b>Mechanisms/Mechanical systems</b>	
<b>Textiles</b>	
<b>Cooking and Nutrition</b>	
<b>Electrical systems</b>	
<b>Digital World</b>	

DT: Key Stage 1				
Designing	Making	Evaluating	Technical Knowledge	Food Technology
<p><i>Design - purposeful, functional, appealing products for themselves and other users based on design criteria</i></p> <p><i>Design - generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</i></p>	<p><i>select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</i></p> <p><i>select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</i></p>	<p><i>explore and evaluate a range of existing products</i></p> <p><i>evaluate their ideas and products against design criteria</i></p>	<p><i>build structures, exploring how they can be made stronger, stiffer and more stable</i></p> <p><i>explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</i></p>	<p><i>use the basic principles of a healthy and varied diet to prepare dishes</i></p> <p><i>understand where food comes from</i></p>

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**Year 1**

**Unit 1 Food: Fruit & Vegetables**

OUTCOME – Describe fruit & vegetables & explain why they are a fruit or vegetable. Name a range of places that fruit & vegetables grow. Describe basic characteristics of fruit & vegetables. Prepare fruit & vegetables to make a smoothie.

<b>Designing</b>	<b>Making</b>	<b>Evaluating</b>	<b>Technical Knowledge</b>	<b>Food Technology</b>
<ul style="list-style-type: none"><li>➤ Designing smoothie carton packaging by-hand or on ICT software.</li></ul>	<ul style="list-style-type: none"><li>➤ Chopping fruit and vegetables safely to make a smoothie</li><li>➤ Identifying if a food is a fruit or a vegetable</li><li>➤ Learning where and how fruits and vegetables grow</li></ul>	<ul style="list-style-type: none"><li>➤ Tasting and evaluating different food combinations</li><li>➤ Describing appearance, smell and taste</li><li>➤ Suggesting information to be included on packaging</li></ul>	<p>N/A</p>	<ul style="list-style-type: none"><li>➤ Understanding the difference between fruits and vegetables</li><li>➤ To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber)</li><li>➤ To know that a blender is a machine which mixes ingredients together into a smooth liquid</li><li>➤ To know that a fruit has seeds and a vegetable does not</li><li>➤ To know that fruits grow on trees or vines</li><li>➤ To know that vegetables can grow either above or below ground</li></ul>

				<p>➤ To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber)</p>
<p><b>Vocabulary:</b> <i>blender, carton, fruit, healthy, ingredients, peel, peeler, recipe, slice (verb), smoothie, stencil, template, vegetable.</i></p>				

Year 1

Unit 2 Structures: Constructing Windmills

OUTCOME – Design and construct a windmill that is stable to stand up on its own, have 3 parts and move in the wind.

Designing	Making	Evaluating	Technical Knowledge	Food Technology
<ul style="list-style-type: none"> <li>➤ Learning the importance of a clear design criteria</li> <li>➤ Including individual preferences and requirements in a design.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Making stable structures from card, tape and glue</li> <li>➤ Learning how to turn 2D nets into 3D structures</li> <li>➤ Following instructions to cut and assemble the supporting structure of a windmill</li> <li>➤ Making functioning turbines and axles which are assembled into a main supporting structure</li> </ul>	<ul style="list-style-type: none"> <li>➤ Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't</li> <li>➤ Suggest points for improvements</li> </ul>	<ul style="list-style-type: none"> <li>➤ To understand that the shape of materials can be changed to improve the strength and stiffness of structures</li> <li>➤ To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses)</li> <li>➤ To understand that axles are used in structures and mechanisms to make parts turn in a circle</li> <li>➤ To begin to understand that different structures are used for different purposes</li> <li>➤ To know that a structure is something that has been made and put together.</li> </ul>	<p style="text-align: center;">N/A</p>

**Vocabulary:** *client, design, design criteria, evaluation, net, stable, strong, structure, test, weak, windmill, windmill axle, windmill structure, windmill turbine.*

**Year 1**

**Unit 4 Mechanisms: Wheels & Axles**

OUTCOME – Know that wheels move because they are joined to an axle. Know that wheels & axles are used in everyday life not just in cars.  
Design a vehicle that includes functioning wheels, axles, and axle holders. Make a moving vehicle with wheels & axles.

<b>Designing</b>	<b>Making</b>	<b>Evaluating</b>	<b>Technical Knowledge</b>	<b>Food Technology</b>
<ul style="list-style-type: none"><li>➤ Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move</li> <li>➤ Creating clearly labelled drawings which illustrate movement.</li></ul>	<ul style="list-style-type: none"><li>➤ Following a design to create moving models</li></ul>	<ul style="list-style-type: none"><li>➤ Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed</li></ul>	<ul style="list-style-type: none"><li>➤ To know that a mechanism is the parts of an object that move together</li></ul>	<p style="text-align: center;">N/A</p>

**Vocabulary:** *accurate, axle, axle holder, chassis, design, fix, mechanic, mechanism, model, test, wheel.*

**Year 2**

**Unit 2 Cooking & Nutrition: A balanced diet**

OUTCOME – To know what hidden sugars are. To know where to find nutritional information on food. To know the 5 food groups. Design & make a healthy wrap & know how to prepare food safely.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<ul style="list-style-type: none"> <li>➤ Designing a healthy wrap based on a food combination which work well together</li> </ul>	<ul style="list-style-type: none"> <li>➤ Slicing food safely using claw or bridge grip.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Describing the taste, texture and smell of fruit and vegetables</li> <li>➤ Taste testing food combinations and final products</li> <li>➤ Describing the information that should be included on a label</li> <li>➤ Evaluating which grip was most effective</li> </ul>	<p>N/A</p>	<ul style="list-style-type: none"> <li>➤ To know that 'diet' means the food and drink that a person or animal usually eats</li> <li>➤ To understand what makes a balanced diet</li> <li>➤ To know where to find the nutritional information on packaging</li> <li>➤ To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar</li> <li>➤ To understand that I should eat a range of different foods from each food group, and roughly how much of each food group</li> </ul>

- To know that nutrients are substances in food that all living things need to make energy, grow and develop
- To know that 'ingredients' means the items in a mixture or recipe
- To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy
- To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'

**Vocabulary:** *Diet, Alternative diet, balanced diet, evaluation, expensive, healthy, ingredients, nutrients, packaging, refrigerator, sugar.*

**Year 2**

**Unit 4 Textiles: Pouches**

OUTCOME – Sew a running stitch with regular-sized stitches and understand that both ends must be knotted. Prepare and cut fabric to make a pouch from a template. Use a running stitch to join the two pieces of fabric together. Decorate their pouch.

<b>Designing</b>	<b>Making</b>	<b>Evaluating</b>	<b>Technical Knowledge</b>	<b>Food technology</b>
<ul style="list-style-type: none"> <li>➤ Designing a pouch</li> </ul>	<ul style="list-style-type: none"> <li>➤ Selecting and cutting fabrics for sewing</li> <li>➤ Threading a needle</li> <li>➤ Sewing running stitch, with evenly spaced, neat, even stitches to join fabric</li> <li>➤ Neatly pinning and cutting fabric using a template</li> </ul>	<ul style="list-style-type: none"> <li>➤ Troubleshooting scenarios posed by teacher</li> </ul>	<ul style="list-style-type: none"> <li>➤ To know that sewing is a method of joining fabric</li> <li>➤ To know that different stitches can be used when sewing</li> <li>➤ To understand the importance of tying a knot after sewing the final stitch</li> <li>➤ To know that a thimble can be used to protect my fingers when sewing</li> </ul>	<p align="center">N/A</p>
<p><b>Vocabulary:</b> <i>accurate, fabric, knot, pouch, running stitch, sew, shape, stencil, template, thimble.</i></p>				

**Year 2**

**Unit 5 Mechanisms: Moving Monsters**

OUTCOME – Make linkages by connecting levers & pivots. Materials are selected according to their characteristics. Design & make the features of my monster. Evaluate how functional my monster is & whether it meets the Design Criteria

<b>Designing</b>	<b>Making</b>	<b>Evaluating</b>	<b>Technical Knowledge</b>	<b>Food technology</b>
<ul style="list-style-type: none"> <li>➤ Creating a class design criteria for a moving monster</li>   <li>➤ Designing a moving monster for a specific audience in accordance with a design criteria</li> </ul>	<ul style="list-style-type: none"> <li>➤ Selecting materials according to their characteristics</li>   <li>➤ Following a design brief</li>   <li>➤ Making linkages using card for levers and split pins for pivots</li>   <li>➤ Experimenting with linkages adjusting the widths, lengths and thicknesses of card used</li>   <li>➤ Cutting and assembling components neatly</li> </ul>	<ul style="list-style-type: none"> <li>➤ Evaluating different designs</li>   <li>➤ Testing and adapting a design</li>   <li>➤ Evaluating own designs against design criteria</li>   <li>➤ Using peer feedback to modify a final design</li> </ul>	<ul style="list-style-type: none"> <li>➤ To know that different materials have different properties and are therefore suitable for different uses</li>   <li>➤ To know that mechanisms are a collection of moving parts that work together as a machine to produce movement</li>   <li>➤ To know that there is always an input and output in a mechanism</li>   <li>➤ To know that an input is the energy that is used to start</li> </ul>	<p align="center">N/A</p>

			<p>something working</p> <ul style="list-style-type: none"><li>➤ To know that an output is the movement that happens as a result of the input</li><li>➤ To know that a lever is something that turns on a pivot</li><li>➤ To know that a linkage mechanism is made up of a series of levers</li></ul>	
<b>Vocabulary:</b> <i>design criteria, evaluation, input, linkage, mechanical, mechanism, output, pivot, survey.</i>				

**DT: Lower Key Stage 2**

Designing	Making	Evaluating	Technical Knowledge	Food Technology
<p>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</p>	<p>select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities</p>	<p>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</p>	<p>apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] apply their understanding of computing to program, monitor and control their products.</p>	<p>understand and apply the principles of a healthy and varied diet prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed</p>

### Year 3

#### Unit 3 **Cooking & Nutrition: Eating seasonally**

OUTCOME – Explain that fruits and vegetables grow in different countries based on their climates. Understand that 'seasonal' fruits and vegetables are those that grow in a given season and taste best then. Know that eating seasonal fruit and vegetables has a positive effect on the environment. Design their own tart recipe using seasonal ingredients. Understand the basic rules of food hygiene and safety. Follow the instructions within a recipe.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<ul style="list-style-type: none"> <li>➤ Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination</li> <li>➤ Following the instructions within a recipe</li> </ul>	<ul style="list-style-type: none"> <li>➤ Establishing and using design criteria to help test and review dishes</li> <li>➤ Describing the benefits of seasonal fruits and vegetables and the impact on the environment</li> <li>➤ Suggesting points for improvement when making a seasonal tart</li> </ul>	<p>N/A</p>	<ul style="list-style-type: none"> <li>➤ To know that not all fruits and vegetables can be grown in the UK</li> <li>➤ To know that climate affects food growth</li> <li>➤ To know that vegetables and fruit grow in certain seasons</li> <li>➤ To know that cooking instructions are known as a 'recipe'</li> <li>➤ To know that imported food is food which has been brought into the country</li> <li>➤ To know that exported food is food which has been sent to another country.</li> <li>➤ To understand that imported foods travel from far away and this can</li> </ul>

negatively impact the environment

- To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre
- To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health
- To know safety rules for using, storing and cleaning a knife safely
- To know that similar coloured fruits and vegetables often have similar nutritional benefits

**Vocabulary:** *climate, dry climate, exported, imported, Mediterranean climate, nationality, nutrients, polar climate, recipe, seasonal food, seasons, temperature climate, tropical climate.*

**Year 3**

**Unit 4 Digital world: Electronic charm**

OUTCOME – Analyse & evaluate an existing product. Write a program to control (button press) and/or monitor (sense light) to initiate a flashing LED algorithm. Understand what a loop is in programming. Explain the basic functionality of an eCharm program. Create & decorate a foam pouch for own eCharm storage.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<p>Problem solving by suggesting potential features on a Micro:bit and justifying my ideas</p> <p>Developing design ideas for a technology pouch</p> <p>Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge</p>	<ul style="list-style-type: none"> <li>➤ Using a template when cutting and assembling the pouch</li> <li>➤ Following a list of design requirements</li> <li>➤ Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch</li> <li>➤ Applying functional features such as using foam to create soft buttons</li> </ul>	<ul style="list-style-type: none"> <li>➤ Analysing and evaluating an existing product</li> <li>➤ Identifying the key features of a pouch</li> </ul>	<ul style="list-style-type: none"> <li>➤ To understand that in programming a 'loop' is code that repeats something again and again until stopped</li> <li>➤ To know that a Micro:bit is a pocket-sized, codeable computer</li> <li>➤ Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm</li> </ul>	<p>N/A</p>

**Vocabulary:** control, electronic, function, initiate, programming loop, monitor, program, sensor, stimulator, user.

**Year 3**

**Unit 5 Mechanical system: Pneumatic toys**

OUTCOME – Create a pneumatic system to create a desired motion. Build secure housing for a pneumatic system. Know that syringes and balloons can be used to create different types of pneumatic systems. Use these components to make a functional and appealing pneumatic toy.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<p>Designing a toy which uses a pneumatic system</p> <p>Developing design criteria from a design brief</p> <p>Generating ideas using thumbnail sketches and exploded diagrams</p> <p>Learning that different types of drawings are used in design to explain ideas clearly</p>	<p>Creating a pneumatic system to create a desired motion</p> <p>Building secure housing for a pneumatic system</p> <p>Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy</p> <p>Selecting materials due to their functional and aesthetic characteristics</p> <p>Manipulating materials to create different effects by cutting, creasing, folding, weaving.</p>	<p>Using the views of others to improve designs</p> <p>Testing and modifying the outcome, suggesting improvements</p> <p>Understanding the purpose of exploded-diagrams through the eyes of a designer and their client</p>	<p>To understand how pneumatic systems work</p> <p>To understand that pneumatic systems can be used as part of a mechanism</p> <p>To know that pneumatic systems operate by drawing in, releasing and compressing air</p>	<p>N/A</p>

**Vocabulary:** *exploded diagram, function, input, linkage, mechanism, motion, net, output, pivot, pneumatic system, thumbnail sketch.*

**Year 4**

**Unit 1 Mechanical system: Making a slingshot car**

OUTCOME – Measure, mark and cut panels (nets) against the dimensions of a chassis. Including tabs on a net so it can secure to the panels of a chassis. Evaluate the speed of design based on the understanding that some cars are faster than others because of: Body shape/Stored energy in the elastic band/Accuracy of the angle in the chassis & axle.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<p>Designing a shape that reduces air resistance</p> <p>Drawing a net to create a structure from</p> <p>Choosing shapes that increase or decrease speed because of air resistance</p> <p>Personalising a design</p>	<p>Measuring, marking, cutting and assembling with increasing accuracy</p> <p>Making a model based on a chosen design</p>	<p>Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance</p>	<p>To know that air resistance is the level of drag on an object as it is forced through the air</p> <p>To understand that the shape of a moving object will affect how it moves due to air resistance.</p>	<p>N/A</p>

**Vocabulary:** *aesthetic, air resistance, chassis, design, design criteria, function, graphics, kinetic energy, mechanism, net, structure.*

**Year 4**

**Unit 2 Textiles: Fastenings**

OUTCOME – Identify the features, benefits and disadvantages of a range of fastening types. Write design criteria and design a sleeve that satisfies this. Make a template for a book sleeve. Assemble a case using any stitch comfortable with.

<b>Designing</b>	<b>Making</b>	<b>Evaluating</b>	<b>Technical Knowledge</b>	<b>Food technology</b>
<p>Writing design criteria for a product, articulating decisions made</p> <p>Designing a personalised book sleeve</p>	<p>Making and testing a paper template with accuracy and in keeping with the design criteria</p> <p>Measuring, marking and cutting fabric using a paper template</p> <p>Selecting a stitch style to join fabric, working neatly sewing small neat stitches</p> <p>Incorporating fastening to a design</p>	<p>Testing and evaluating an end product against the original design criteria</p> <p>Deciding how many of the criteria should be met for the product to be considered successful</p> <p>Suggesting modifications for improvement</p> <p>Articulating the advantages and disadvantages of different fastening types</p>	<p>To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and Velcro</p> <p>To know that different fastening types are useful for different purposes</p> <p>To know that creating a mockup (prototype) of their design is useful for checking ideas and proportions</p>	<p align="center">N/A</p>

**Vocabulary:** *aesthetic, assemble. Book sleeve, design criteria, evaluation, fabric, fastening, prototype, net, running stitch, stencil, target audience, target customer, template.*

**Year 4**

**Unit 4 Cooking & Nutrition: Adapting a recipe**

OUTCOME – Know basic hygiene routines. Cook to a recipe and adapt some ingredients. Evaluate & compare biscuit prototypes. Design and make a biscuit that would sell for £1.99. Create branding for the final product.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<p>Designing a biscuit within a given budget, drawing upon previous taste testing</p>	<p>Following a baking recipe</p> <p>Cooking safely, following basic hygiene rules</p> <p>Adapting a recipe</p>	<p>Evaluating a recipe, considering: taste, smell, texture and appearance</p> <p>Describing the impact of the budget on the selection of ingredients</p> <p>Evaluating and comparing a range of products</p> <p>Suggesting modifications</p>	<p>N/A</p>	<p>To know that the amount of an ingredient in a recipe is known as the 'quantity'</p> <p>To know that it is important to use oven gloves when removing hot food from an oven</p> <p>To know the following cooking techniques: sieving, creaming, rubbing method, cooling</p> <p>To understand the importance of budgeting while planning ingredients for biscuits</p>

**Vocabulary:** *adapt, budget, building hire, equipment, evaluation, ingredients, flavour, method, net, packaging, prototype, quantity, recipe, target audience, unit of measurement, utilities.*

**DT: Upper Key Stage 2**

<b>Designing</b>	<b>Making</b>	<b>Evaluating</b>	<b>Technical Knowledge</b>	<b>Food Technology</b>
<p>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</p>	<p>select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities</p>	<p>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</p>	<p>apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] apply their understanding of computing to program, monitor and control their products.</p>	<p>understand and apply the principles of a healthy and varied diet prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed</p>

Year 5

Unit 1 Food: What could be healthier?

OUTCOME – Understand the ethical issues around cattle farming. Have made healthy substitutions to a Bolognese sauce. Can safely chop an onion. Design appealing packaging for own recipe.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<ul style="list-style-type: none"> <li>➤ Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients</li> <li>➤ Writing an amended method for a recipe to incorporate the relevant changes to ingredients</li> <li>➤ Designing appealing packaging to reflect a recipe</li> </ul>	<ul style="list-style-type: none"> <li>➤ Cutting and preparing vegetables safely</li> <li>➤ Using equipment safely, including knives, hot pans and hobs</li> <li>➤ Knowing how to avoid cross-contamination</li> <li>➤ Following a step by step method carefully to make a recipe</li> </ul>	<ul style="list-style-type: none"> <li>➤ Identifying the nutritional differences between different products and recipes</li> <li>➤ Identifying and describing healthy benefits of food groups</li> </ul>	<p style="text-align: center;">N/A</p>	<ul style="list-style-type: none"> <li>➤ To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues</li> <li>➤ To know that I can adapt a recipe to make it healthier by substituting ingredients</li> <li>➤ To know that I can use a nutritional calculator to see how healthy a food option is</li> <li>➤ To understand that 'cross-contamination' means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.</li> </ul>

**Vocabulary:** *beef, cross contamination, farm, method, packaging, research, welfare, farm to fork process, food groups (dairy, carbohydrate, protein, fruits & vegetables, fats & sugars).*

**Year 5**

**Unit 2 Electrical systems: Electronic greetings cards**

OUTCOME – Design & make an electronic greetings card which incorporates a working series circuit. Have the ability to identify a positive & negative leg of an LED.

<b>Designing</b>	<b>Making</b>	<b>Evaluating</b>	<b>Technical Knowledge</b>	<b>Food technology</b>
<ul style="list-style-type: none"> <li>➤ Designing an electronic greetings card with a copper track circuit and components</li> <li>➤ Creating a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery</li> <li>➤ Writing design criteria for an electronic greeting card</li> <li>➤ Compiling a moodboard relevant to my chosen theme, purpose and recipient</li> </ul>	<ul style="list-style-type: none"> <li>➤ Making a functional series circuit</li> <li>➤ Creating an electronics greeting card, referring to a design criteria</li> <li>➤ Mapping out where different components of the circuit will go</li> </ul>	<ul style="list-style-type: none"> <li>➤ Evaluating a peer's product against design criteria and suggesting modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component</li> </ul>	<ul style="list-style-type: none"> <li>➤ To know the key components used to create a functioning circuit</li> <li>➤ To know that copper is a conductor and can be used as part of a circuit</li> <li>➤ To understand that breaks in a circuit will stop it from working</li> <li>➤ To understand that a series circuit only has one path for the electrical current to flow from</li> </ul>	<p style="text-align: center;">N/A</p>

			<p>positive to negative</p> <ul style="list-style-type: none"> <li>➤ To know that we use symbols to represent components in a circuit diagram</li> <li>➤ To know the names of the components in a basic series circuit: crocodile wires, LED (light-emitting diode), battery holder, battery, cell</li> </ul>	
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**Vocabulary:** *battery, buzzer, circuit, component, conductor, copper, design, design criteria, function, graphite, innovative, insulator, LED, Modify, parallel circuit, series circuit, switch, target audience, test, wire.*

**Year 5**

**Unit 5 Structures: Bridges.**

**OUTCOME** – Understand what truss, beam & arch bridges consist of & how to reinforce & strengthen a structure. Measure & mark out accurately on wood. Select & use appropriate tools & equipment for particular tasks. Understand health & safety rules.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<ul style="list-style-type: none"> <li>➤ Designing a stable structure that is able to support weight</li> <li>➤ Creating frame structure with focus on triangulation</li> </ul>	<ul style="list-style-type: none"> <li>➤ Making a range of different shaped beam bridges</li> <li>➤ Using triangles to create truss bridges that span a given distance and supports a load</li> <li>➤ Building a wooden bridge structure</li> <li>➤ Independently measuring and marking wood accurately</li> <li>➤ Selecting appropriate tools and equipment for particular tasks</li> <li>➤ Using the correct techniques to saws safely</li> <li>➤ Identifying where a structure needs</li> </ul>	<ul style="list-style-type: none"> <li>➤ Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary</li> <li>➤ Suggesting points for improvements for own bridges and those designed by others</li> </ul>	<ul style="list-style-type: none"> <li>➤ To understand some different ways to reinforce structures</li> <li>➤ To understand how triangles can be used to reinforce bridges</li> <li>➤ To know that properties are words that describe the form and function of materials</li> <li>➤ To understand why material selection is important based on their properties</li> <li>➤ To understand the material (functional and aesthetic) properties of wood</li> </ul>	<p style="text-align: center;">N/A</p>

	<p>reinforcement and using card corners for support</p> <ul style="list-style-type: none"><li>➤ Explaining why selecting appropriating materials is an important part of the design process</li><li>➤ Understanding basic wood functional properties</li></ul>			
<p><b>Vocabulary:</b> <i>accurate, arch bridge, beam bridge, bench hook, compression, coping saw, file, mark out, reinforce, sand paper, set square or try square, shape, structure, suspension bridge, tenon saw, tension, truss bridge.</i></p>				

**Year 6**

**Unit 3 Electrical systems: Steady hand game**

**OUTCOME** – Analyse a selection of existing children's toys. identify and name the components in a steady hand game. design a game and draw it from three different perspectives design reflects the design criteria. accurately cut and assemble a net using tabs to secure in place. Make & test a circuit which is incorporated into a base & naming the electrical components.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<ul style="list-style-type: none"> <li>➤ Designing a steady hand game - identifying and naming the components required</li> <li>➤ Drawing a design from three different perspectives</li> <li>➤ Generating ideas through sketching and discussion</li> <li>➤ Modelling ideas through prototypes</li> </ul>	<ul style="list-style-type: none"> <li>➤ Constructing a stable base for a game</li> <li>➤ Accurately cutting, folding and assembling a net</li> <li>➤ Decorating the base of the game to a high quality finish</li> <li>➤ Making and testing a circuit Incorporating a circuit into a base</li> </ul>	<ul style="list-style-type: none"> <li>➤ Testing own and others finished games, identifying what went well and making suggestions for improvement</li> </ul>	<ul style="list-style-type: none"> <li>➤ To know that batteries contain acid, which can be dangerous if they leak</li> <li>➤ To know the names of the components in a basic series circuit including a buzzer</li> </ul>	<p align="center">N/A</p>

**Vocabulary:** *backboard, battery, bulb, buzzer, circuit, conductor, copper, function, insulator, LED, magnetic field, net, pliers, prototype, series circuit, side view drawing, top view drawing, switch, test.*

**Year 6**

**Unit 4 Digital world: Navigating the world**

**OUTCOME** – Write a program that displays an arrow to indicate cardinal compass directions with an ‘On start’ loading screen. Identify errors (bugs) in the code & suggest ways to fix (debug) them. Self & peer evaluate a product concept against a list of design criteria with basic statements. Identify key industries that use 3D CAD modelling & why. Recall & describe the name & use of key tools used in Tinkercad (CAD) software. Combine more than one object to develop a finished 3D CAD model in Tinkercad. Complete a product pitch plan that includes key information.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<ul style="list-style-type: none"> <li>➤ Writing a design brief from information submitted by a client</li> <li>➤ Developing design criteria to fulfil the client's request</li> <li>➤ Considering and suggesting additional functions for my navigation tool</li> <li>➤ Developing a product idea through annotated sketches</li> <li>➤ Placing and manoeuvring 3D objects, using CAD</li> <li>➤ Changing the properties of, or combine one or more 3D objects, using CAD</li> </ul>	<ul style="list-style-type: none"> <li>➤ Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo)</li> <li>➤ Explaining material choices and why they were chosen as part of a product concept</li> <li>➤ Programming an N,E, S,W cardinal compass</li> </ul>	<ul style="list-style-type: none"> <li>➤ Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool</li> <li>➤ Developing an awareness of sustainable design</li> <li>➤ Identifying key industries that utilise 3D CAD modelling and explain why</li> <li>➤ Describing how the product concept fits the client's request and how it will benefit the customers</li> <li>➤ Explaining the key functions in my program, including any additions</li> <li>➤ Explaining how my program fits the design criteria and how it would be</li> </ul>	<ul style="list-style-type: none"> <li>➤ To know that accelerometers can detect movement</li> <li>➤ To understand that sensors can be useful in products as they mean the product can function without human input</li> </ul>	<p style="text-align: center;">N/A</p>

		<p>useful as part of a navigation tool</p> <ul style="list-style-type: none"><li>➤ Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch</li><li>➤ Demonstrating a functional program as part of a product concept</li></ul>		
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**Vocabulary:** *biodegradable, Boolean, environmentally friendly, finite, if statement, mouldable, product lifecycle, product lifespan, smart, sustainable.*

Year 6

Unit 5 **Cooking & Nutrition: Come dine with me**

**OUTCOME** – Prepare ingredients & follow a recipe safely & sensibly. Describe the process of 'Farm to Fork' for a given ingredient using a storyboard. Contribute a well-written recipe page to a class cookbook using imperative verbs, adjectives & illustrations. Create a 3 course meal as a class.

Designing	Making	Evaluating	Technical Knowledge	Food technology
<ul style="list-style-type: none"> <li>➤ Writing a recipe, explaining the key steps, method and ingredients</li>   <li>➤ Including facts and drawings from research undertaken</li> </ul>	<ul style="list-style-type: none"> <li>➤ Following a recipe, including using the correct quantities of each ingredient</li>   <li>➤ Adapting a recipe based on research</li>   <li>➤ Working to a given timescale</li>   <li>➤ Working safely and hygienically with independence</li> </ul>	<ul style="list-style-type: none"> <li>➤ Evaluating the work of others and receiving feedback on own work</li>   <li>➤ Applying points of improvements</li>   <li>➤ Describing changes they would make/do if they were to do the project again</li> </ul>	<p style="text-align: center;">N/A</p>	<ul style="list-style-type: none"> <li>➤ To know that 'flavour' is how a food or drink tastes</li>   <li>➤ To know that many countries have 'national dishes' which are recipes associated with that country</li>   <li>➤ To know that 'processed food' means food that has been put through multiple changes in a factory</li>   <li>➤ To understand that it is important to wash fruit and vegetables before eating to remove any</li> </ul>

				dirt and insecticides  ➤ To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork)
<b>Vocabulary:</b> <i>accompaniment, cookbook, cross-contamination, equipment, farm, flavour, imperative verb, ingredients, method, nationality, preparation, processed, reared, recipe, target audience, unit of measurement.</i>				

## Monitoring and Evaluation

In all subjects at St Philip's CE Primary Academy, the teaching and learning will be monitored and evaluated by both individual Subject Leaders and members of the Senior Leadership Team.

As a Subject Leader, the following activities will be undertaken and used to inform understanding of the subject. Evidence and information from these activities will then be used to inform each subject Plan of Action and the CPD needs of all staff and individuals.

<p><b><u>AUTUMN 1</u></b></p> <p><b>Audit Subject</b></p> <p><b>Create Action Plan</b></p> <p><b>Pupil Surveys</b></p>	<p><b><u>SPRING 1</u></b></p> <p><b>Lesson Observations</b></p> <p><b>Website Update and Review</b></p> <p><b>Assessment Analysis</b></p> <p><b>Review Action Plans</b></p>	<p><b><u>SUMMER 1</u></b></p> <p><b>Planning Scrutiny</b></p> <p><b>Book/Work Scrutiny</b></p> <p><b>Website Update and Review</b></p>
<p><b><u>AUTUMN 2</u></b></p> <p><b>Planning Scrutiny</b></p> <p><b>Book/Work Scrutiny</b></p> <p><b>Triangulation of M&amp;E</b></p> <p><b>Identify CPD Requirements</b></p>	<p><b><u>SPRING 2</u></b></p> <p><b>Target CPD Requirements</b></p> <p><b>Review Action Plan</b></p>	<p><b><u>SUMMER 2</u></b></p> <p><b>Pupil Surveys</b></p> <p><b>Triangulation of M&amp;E</b></p> <p><b>Review Action Plan</b></p>

In supporting individuals, it is expected that Subject Leaders will follow the programme of support below to give all staff the opportunity to gain the knowledge and understanding to deliver the curriculum to the best of their ability:

- Ensure the member of staff has a good understanding of the subject and units to be delivered, using the subject documentation, Medium Term Plans, individual lesson plans and Knowledge Organisers.
- CPD given to individuals through video tutorials, one-to-one support in planning and preparing etc.
- Modelling expectations through demonstration lessons in own or colleague's class.
- Further coaching and discussion of how to implement strategies or modify lessons for the needs of pupils etc.

DT: Long Term Plan Project Outline 2024/2025	Autumn 1 Autumn 2	Spring 1 Spring 2	Summer 1 Summer 2
EYFS	Enhanced Provision		
Year 1	Unit 1 Food: Fruit and vegetables	Unit 2: Structures: Constructing windmills	Unit 4 Mechanisms: Wheels and axles
Year 2	Unit 2 Food: A balanced diet	Unit 4 Textiles: Pouches	Unit 5 Mechanisms: Moving monster
Year 3	Unit 3 Food: Eating seasonally	Unit 4 Digital world: Electronic charm	Unit 2 Mechanical Systems: Pneumatic toys
Year 4	Unit 4 Food: Adapting a recipe	Unit 2 Textiles: Fastenings	Unit 1 Mechanical Systems: Making a slingshot car
Year 5	Unit 1 Food: What could be healthier?	Unit 5 Structures: Bridges	Unit 2 Electrical systems: Doddlers
Year 6	Unit 5 Food: Come dine with me	Unit 4 Digital world: Navigating the world	Unit 3 Electrical systems: Steady hand game