**ST. MARY'S CE PRIMARY SCHOOL, PUTNEY**
Vision: Delivering excellence, allowing all to flourish
Mission: Creating a culture of wonder, guided by faith
Values: Endurance, Compassion, Thankfulness

# DESIGN AND TECHNOLOGY CURRICULUM STATEMENT AND CURRICULUM BREAKDOWN
## SUBJECT LEADER: AMELIA DE SOUZA

# Our Design and Technology Curriculum

**Vision: Delivering excellence, allowing all to flourish**
**Mission: Creating a culture of wonder, guided by faith**
**Values: Endurance, Compassion, Thankfulness**

At St Mary's the Design and Technology (DT) curriculum makes a valuable contribution to an excellent, broad and balanced curriculum which allows all pupils to flourish.  DT is many pupils' favourite subject, and we seek to use this to boost pupil wellbeing, inspiring children to further engage them with their learning in other subjects too, through many cross curricular links in DT teaching.  DT puts learning into context, as pupils apply their knowledge, skills and understanding into real situations, making it easier to understand and leading to mastery.  The subject offers many valuable opportunities to create a culture of wonder and growing sense of curiosity, as pupil gain a greater understanding of the designed and made world around them, and how it works.

The DT curriculum is designed to equip pupils with the knowledge, key skills and understanding they will need for a variety of jobs in the future, and to raise awareness of STEM careers.  DT helps form lifelong learners by developing their skills through problem solving and collaborative working.  It also stimulates pupils' creativity and innovation.  Children are taught the iterative design process, which encourages learners to reflect positively on success and failures, and helps build pupils' endurance.

DT involves two elements: learning about the designed and made world and how things work, and learning to design and make functional products.  Children are taught these in the following areas: mechanisms, textiles, structures, as well as cooking and nutrition.  Pupils engage in a variety of projects, working with a range of contexts, techniques, tools, and materials over their time at St Mary's, using the Kapow Primary scheme of work.  We encourage learning outside the classroom through workshops, as well as trips around our local area, e.g. to Gail's Bakery, enabling pupils to see the subject in real life, encounter experts in the field, and build the children's understanding of their place in the wider community.

*About DT: "Creative things.  It's fun!  Making stuff."  Ella Y2*
*"I love DT.  It's so creative and it's so fun.  We learn how to make our minds go further and explore more and our imaginations to run free." Adam Y5*
*"Great pupil voice feedback received, clearly an enjoyable subject for all" DT Link Governor (June 2018 visit)*



*Bicentenary Community Quilt completed by the whole school and sewed together by a parent.*



*Y4 in DT Architecture Workshop*

*"the best workshop yet": Y5 Class Teacher*

# Year 1

## DEVELOPMENT OF KNOWLEDGE, SKILLS AND UNDERSTANDING IN DESIGN AND TECHNOLOGY – YEAR 1

### NATIONAL CURRICULUM SUBJECT CONTENT FOR KEY STAGE ONE

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, (for example the home and school, gardens and playgrounds, the local community, industry and the wider environment).

| ITERATIVE PROCESS | TECHNICAL KNOWLEDGE | COOKING AND NUTRITION |
|---|---|---|
| **DESIGN**<br>• Design purposeful, functional, appealing products for themselves and other users based on design criteria<br>• Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology<br><br>**MAKE**<br>• Select from and use a range of tools and equipment to perform practical tasks, [for example, cutting, shaping, joining and finishing]<br>• Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics<br><br>**EVALUATE**<br>• Explore and evaluate a range of existing products | **MECHANISMS**<br>• Explore and use mechanisms, [for example levers, sliders, wheels and axles], in their products.<br><br>**TEXTILES**<br>• [See Make section]<br><br>**STRUCTURES**<br>• Build structures, exploring how they can be made stronger, stiffer and more stable | • As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.<br><br>• Use the basic principles of a healthy and varied diet to prepare dishes<br>• Understand where food comes from. |

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| • Evaluate their ideas and products against design criteria | | | |

## CURRICULUM COVERAGE & PROGRESSION OF LEARNING FOR YEAR 1

| DESIGN PROCESS: DESIGN | DESIGN PROCESS: MAKE | DESIGN PROCESS: EVALUATE | TECHNICAL KNOWLEDGE |
|---|---|---|---|
| **STRUCTURES**<br>• WALT: Learn the importance of a clear design criteria.<br>• WALT: Include individual preferences and requirements in a design. | **STRUCTURES**<br>• WALT: Make stable structures from card, tape and glue<br>• WALT: Follow instructions to cut and assemble the supporting structure of a windmill<br>• WALT: Made functioning turbines and axles which are assembled into a main supporting structure<br>• | **STRUCTURES**<br>• WALT: Evaluate a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't<br>• WALT: Suggest points for improvements.<br>• WALT: Evaluate what we have made, and think about what we would do better next time.<br>•<br>• | **STRUCTURES**<br>• WALT: Describe the purpose of structures, including windmills<br>• WALT: Know how to turn 2D nets into 3D structures<br>• WALT: Know that the shape of materials can be changed to improve the strength and stiffness of structures<br>• WALT: Understand that cylinders are a strong type of structure that are often used for windmills and lighthouses<br>• WALT: Understand that windmill turbines use wind to turn and make the machines inside work<br>• WALT: Understand that axles are used in structures |

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| | | | and mechanisms to make parts turn in a circle<br>• WALT: Be increasingly aware of different structures for different purposes |
| **MECHANISMS**<br>• WALT: Explain how to adapt mechanisms, using bridges or guides to control the movement<br>• WALT: Design a moving story book for a given audience<br>• WALT: Design a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move<br>• WALT: Create clearly labelled drawings which illustrate movement. | **MECHANISMS**<br>• WALT: Follow a design to create moving models that use levers and sliders.<br>• WALT: Adapt mechanisms. | **MECHANISMS**<br>• WALT: Test a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed<br>• WALT: Review the success of a product by testing it with its intended audience<br>• WALT: Test mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move | **MECHANISMS**<br>• WALT: Learn that levers and sliders are mechanisms and can make things move<br>• WALT: Identify whether a mechanism is a lever or slider and determining what movement the mechanism will make<br>• WALT: Use the vocabulary: up, down, left, right, vertical and horizontal to describe movement<br>• WALT: Identify what mechanism makes a toy or vehicle roll forwards<br>• WALT: Know that for a wheel to move it must be attached to an axle. |
| **COOKING AND NUTRITION**<br>• WALT: Design smoothie carton packaging by-hand or on ICT software. | **COOKING AND NUTRITION**<br>• WALT: Chop fruit and vegetables safely to make a smoothie. | **COOKING AND NUTRITION**<br>• WALT: Taste and evaluate different food combinations.<br>• WALT: Describe appearance, smell and taste.<br>• WALT: Suggest information to be included on packaging. | **COOKING AND NUTRITION**<br>• WALT: Understand the difference between fruits and vegetables. |

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| | • WALT: Identify if a food is a fruit or a vegetable.<br>• WALT: Learn where and how fruits and vegetables grow. | | • WALT: Describe and group fruits by texture and taste. |
| **TEXTILES**<br><br>• WALT: Use a template to create a design for a puppet | **TEXTILES**<br><br>• WALT: Cut fabric neatly with scissors.<br>• WALT: Use joining methods to decorate a puppet.<br>• WALT: Sequence steps for construction. | **TEXTILES**<br><br>• WALT: Reflect on a finished product, explaining likes and dislikes | **TEXTILES**<br><br>• WALT: Know different ways in which to join fabrics together: pinning, stapling, gluing |

# Year 2

## DEVELOPMENT OF KNOWLEDGE, SKILLS AND UNDERSTANDING IN DESIGN AND TECHNOLOGY – YEAR 2

### NATIONAL CURRICULUM SUBJECT CONTENT FOR KEY STAGE ONE

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, [for example the home and school, gardens and playgrounds, the local community, industry and the wider environment].

| ITERATIVE PROCESS | TECHNICAL KNOWLEDGE | COOKING AND NUTRITION |
|---|---|---|
| **DESIGN**<br><br>• Design purposeful, functional, appealing products for themselves and other users based on design criteria<br>• Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology<br><br>**MAKE**<br><br>• Select from and use a range of tools and equipment to perform practical tasks, [for example, cutting, shaping, joining and finishing]<br>• Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics | **MECHANISMS**<br><br>• Explore and use mechanisms, [for example levers, sliders, wheels and axles], in their products.<br><br>**TEXTILES**<br><br>• [See Make section]<br><br>**STRUCTURES**<br><br>• Build structures, exploring how they can be made stronger, stiffer and more stable | • As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.<br><br>• Use the basic principles of a healthy and varied diet to prepare dishes<br>• Understand where food comes from. |

## CURRICULUM COVERAGE & PROGRESSION OF LEARNING FOR YEAR 2

| DESIGN PROCESS: DESIGN | DESIGN PROCESS: MAKE | DESIGN PROCESS: EVALUATE | TECHNICAL KNOWLEDGE |
|---|---|---|---|
| **STRUCTURES** | **STRUCTURES** | **STRUCTURES** | **STRUCTURES** |
| • WALT: Generate and communicating ideas using sketching and modelling.<br>• WALT: Know about different types of structures, found in the natural world and in everyday objects. | • WALT: Make a structure according to design criteria<br>• WALT: Create joints and structures from paper/card and tape<br>• | • WALT: Explore the features of structures<br>• WALT: Compare the stability of different shapes<br>• WALT: Test the strength of own structures<br>• WALT: Identify the weakest part of a structure<br>• WALT: Evaluate the strength, stiffness and stability of own structure | • WALT: Identify natural and man-made structures<br>• WALT: Identify when a structure is more or less stable than another<br>• WALT: Know that shapes and structures with wide, flat bases or legs are the most stable<br>• WALT: Understand that the shape of a structure affects its strength<br>• WALT: Use the vocabulary: strength, stiffness and stability<br>• WALT: Know that materials can be manipulated to improve strength and stiffness<br>• WALT: Build a strong and stiff structure by folding paper |

| MECHANISMS | MECHANISMS | MECHANISMS | MECHANISMS |
|---|---|---|---|
| • WALT: Create a class design criteria for a moving monster<br>• WALT: Design a moving monster for a specific audience in accordance with a design criteria<br>• WALT: Select a suitable linkage system to produce the desired motions<br>• WALT: Design a wheel selecting appropriate materials based on their properties. | • WALT: Make linkages using card for levers and split pins for pivots.<br>• WALT: Experiment with linkages adjusting the widths, lengths and thicknesses of card used.<br>• WALT: Cut and assemble components neatly.<br>• WALT: Select materials according to their characteristics.<br>• WALT: Follow a design brief. | • WALT: Evaluate our own designs against design criteria<br>• WALT: Use peer feedback to modify a final design<br>• WALT: Evaluate different designs<br>• WALT: Test and adapt a design<br>• | • WALT: Know that mechanisms are a collection of moving parts that work together in a machine<br>• WALT: Know that there is an input and output in a mechanism<br>• WALT: Identify mechanisms in everyday objects<br>• WALT: Know that a lever is something that turns on a pivot<br>• WALT: Know that a linkage is a system of levers that are connected by pivots<br>• WALT: Explore wheel mechanisms<br>• WALT: Learn how axels help wheels to move a vehicle |
| COOKING AND NUTRITION | COOKING AND NUTRITION | COOKING AND NUTRITION | COOKING AND NUTRITION |
| • WALT: Design a healthy wrap based on a food combination which work well together. | • WALT: Slice food safely using the bridge or claw grip.<br>• WALT: Construct a wrap that meets a design brief. | • WALT: Describe the taste, texture and smell of fruit and vegetables<br>• WALT: Taste test food combinations and final products<br>• WALT: Describe the information that should be included on a label<br>• WALT: Evaluate which grip was most effective | • WALT: Understand what makes a balanced diet<br>• WALT: Know where to find the nutritional information on packaging<br>• WALT: Know the five food groups |

| TEXTILES | TEXTILES | TEXTILES | TEXTILES |
|---|---|---|---|
| • WALT: Design a pouch. | • WALT: Select and cut fabrics for sewing.<br>• WALT: Decorate a pouch using fabric glue or running stitch. | • WALT: Troubleshoot scenarios posed by teacher<br>• WALT: Evaluate the quality of the stitching on others' work<br>• WALT: Discuss, as a class, the success of our stitching against the success criteria<br>• WALT: Identify aspects of our friends' work that we particularly like and why | • WALT: Join items using fabric glue or stitching, identifying benefits of these techniques<br>• WALT: Thread a needle<br>• WALT: Sew running stitch, with evenly spaced, neat, even stitches to join fabric<br>• WALT: Neatly pin and cut fabric using a template |

# Year 3

# DEVELOPMENT OF KNOWLEDGE, SKILLS AND UNDERSTANDING IN DESIGN AND TECHNOLOGY – YEAR 3

## NATIONAL CURRICULUM SUBJECT CONTENT FOR KEY STAGE TWO

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, [for example the home, school, leisure, culture, enterprise, industry and the wider environment].

| ITERATIVE PROCESS | TECHNICAL KNOWLEDGE | COOKING AND NUTRITION |
|---|---|---|
| **DESIGN**<br><br>• 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<br>• Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design<br><br>**MAKE**<br><br>• Select from and use a wider range of tools and equipment to perform practical tasks, [for example, cutting, shaping, joining and finishing], accurately<br>• 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 | **MECHANISMS**<br><br>• Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]<br>• Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]<br>• Apply their understanding of computing to program, monitor and control their products.<br>•<br><br>**TEXTILES**<br><br>• [See Make section]<br><br>**STRUCTURES**<br><br>• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures | • As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.<br><br>• Understand and apply the principles of a healthy and varied diet<br>• Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques<br>• Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. |

## CURRICULUM COVERAGE & PROGRESSION OF LEARNING FOR YEAR 3

| DESIGN PROCESS: DESIGN | DESIGN PROCESS: MAKE | DESIGN PROCESS: EVALUATE | TECHNICAL KNOWLEDGE |
|---|---|---|---|
| **STRUCTURES** | **STRUCTURES** | **STRUCTURES** | **STRUCTURES** |
| • WALT: Design a castle with key features to appeal to a specific person/purpose<br>• WALT: Draw and label a castle design using 2D shapes, labelling:<br>-the 3D shapes that will create the features<br>- materials need and colours<br>• WALT: Design and/or decorate a castle tower on CAD software | • WALT: Construct a range of 3D geometric shapes using nets<br>• WALT: Create special features for individual designs<br>• WALT: Make facades from a range of recycled materials | • WALT: Evaluate our work and the work of others based on the aesthetic of the finished product and in comparison to the original design<br>• WALT: Suggest points for modification of the individual designs | • WALT: Identify features of a castle<br>• WALT: Identify suitable materials to be selected and used for a castle, considering weight, compression, tension<br>• WALT: Extend the knowledge of wide and flat based objects are more stable<br>• WALT: Understand the terminology of strut, tie, span, beam<br>• WALT: Understand the difference between frame and shell structure |

| MECHANISMS | MECHANISMS | MECHANISMS | MECHANISMS |
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| • WALT: Design a toy which uses a pneumatic system<br>• WALT: Develop design criteria from a design brief<br>• WALT: Generate ideas using thumbnail sketches and exploded diagrams<br>• WALT: Know that different types of drawings are used in design to explain ideas clearly | • WALT: Create a pneumatic system to create a desired motion<br>• WALT: Build secure housing for a pneumatic system<br>• WALT: Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy<br>• WALT: Select materials due to their functional and aesthetic characteristics<br>• WALT: Manipulate materials to create different effects by cutting, creasing, folding, weaving | • WALT: Use the views of others to improve designs<br>• WALT: Test and modify the outcome, suggesting improvements<br>• WALT: Understand the purpose of exploded-diagrams through the eyes of a designer and their client | • WALT: Understand how pneumatic systems work<br>• WALT: Know that mechanisms are a system of parts that work together to create motion<br>• WALT: Understand that pneumatic systems can be used as part of a mechanism<br>• WALT: Know that pneumatic systems force air over a distance to create movement |
| **COOKING AND NUTRITION** | **COOKING AND NUTRITION** | **COOKING AND NUTRITION** | **COOKING AND NUTRITION** |
| • WALT: Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish. | • WALT: Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination<br>• Follow the instructions within a recipe | • WALT: Establish and use design criteria to help test and review dishes<br>• WALT: Describe the benefits of seasonal fruits and vegetables and the impact on the environment<br>• WALT: Suggest points for improvement when making a seasonal tart | • WALT: Know that climate affects food growth<br>• WALT: Work with cooking equipment safely and hygienically<br>• WALT: Know that imported foods travel from far away and this can negatively impact the environment<br>• WALT: Know that vegetables and fruit grow in certain seasons |

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| | | | • WALT: Know that each fruit and vegetable gives us nutritional benefits<br>• WALT: Use, store and clean a knife safely |
| **TEXTILES**<br>• WALT: Designing and making a template from an existing cushion and applying individual design criteria. | **TEXTILES**<br>• WALT: Follow design criteria to create a cushion<br>• WALT: Select and cut fabrics with ease using fabric scissors<br>• WALT: Sew cross stitch to join fabric<br>• WALT: Decorate fabric using appliqué<br>• WALT: Complete design ideas with stuffing and sewing the edges | **TEXTILES**<br>• WALT: Evaluate an end product and think of other ways in which to create similar items | **TEXTILES**<br>• WALT: Thread needles with greater independence<br>• WALT: Tie knots with greater independence<br>• WALT: Sew cross stitch and appliqué<br>• WALT: Understand the need to count the thread on a piece of evenweave fabric in each direction to create uniform size and appearance<br>• WALT: Understand that fabrics can be layered for effect |
| **ELECTRICAL SYSTEMS**<br>• WALT: Design a game that works using static electricity, including the instructions for playing the game, identifying a design criteria and a target audience | **ELECTRICAL SYSTEMS**<br>• WALT: Make an electrostatic game, referring to the design criteria<br>• WALT: Use a wider range of materials and equipment safely<br>• WALT: Use electrostatic energy to move objects in isolation as well as in part of a system | **ELECTRICAL SYSTEMS**<br>• WALT: Give constructive criticism on our own work and the work of others<br>• WALT: Test the success of a product against the original design criteria and justifying opinions | **ELECTRICAL SYSTEMS**<br>• WALT: Understand what static electricity is and how it moves objects through attraction or repulsion<br>• WALT: Generate static electricity independently<br>• WALT: Use static electricity to make objects move in a desired way |

| DIGITAL WORLD | DIGITAL WORLD | DIGITAL WORLD | DIGITAL WORLD |
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| • WALT: Problem solve by suggesting potential features on a Micro: bit and justify my ideas<br>• WALT: Develop design ideas for a technology pouch<br>• WALT: Draw and manipulate 2D shapes, using computer-aided design, to produce a point of sale badge | • WALT: Use a template when cutting and assembling the pouch<br>• WALT: Follow a list of design requirements<br>• WALT: Select and use the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch<br>• WALT: Apply functional features such as using foam to create soft buttons | • WALT: Analyse and evaluate an existing product<br>• WALT: Identify the key features of a pouch | • WALT: Identify key product developments that occurred as a result of the digital revolution<br>• WALT: Write a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm<br>• WALT: Understand what a loop is in programming<br>• WALT: Explain the basic functionality of my eCharm program<br>• WALT: Understand what is meant by 'point of sale display' |

| Year 4 | DEVELOPMENT OF KNOWLEDGE, SKILLS AND UNDERSTANDING IN DESIGN AND TECHNOLOGY – YEAR 4 |
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| NATIONAL CURRICULUM SUBJECT CONTENT FOR KEY STAGE TWO |
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| Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, [for example the home, school, leisure, culture, enterprise, industry and the wider environment]. |

| ITERATIVE PROCESS | TECHNICAL KNOWLEDGE | COOKING AND NUTRITION |
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## DESIGN

- 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

## MAKE

- 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 wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

## EVALUATE

- 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

## MECHANISMS

- 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.
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## TEXTILES

- [See Make section]

## STRUCTURES

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures

- As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

- 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.

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| • Understand how key events and individuals in design and technology have helped shape the world | | | |

## CURRICULUM COVERAGE & PROGRESSION OF LEARNING FOR YEAR 4

| DESIGN PROCESS: DESIGN | DESIGN PROCESS: MAKE | DESIGN PROCESS: EVALUATE | TECHNICAL KNOWLEDGE |
|---|---|---|---|
| **STRUCTURES**<br>• WALT: Design a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect<br>• WALT: Build frame structures designed to support weight | **STRUCTURES**<br>• WALT: Creating a range of different shaped frame structures<br>• WALT: Make a variety of free standing frame structures of different shapes and sizes<br>• WALT: Select appropriate materials to build a strong structure and for the cladding<br>• WALT: Reinforce corners to strengthen a structure<br>• WALT: Create a design in accordance with a plan<br>• WALT: Create different textural effects with materials | **STRUCTURES**<br>• WALT: Evaluate structures made by the class<br>• WALT: Describe what characteristics of a design and construction made it the most effective<br>• WALT: Consider effective and ineffective designs | **STRUCTURES**<br>• WALT: Know what pavilions are and their purpose<br>• WALT: Build on prior knowledge of net structures and broadening knowledge of frame structures<br>• WALT: Know that architects consider light, shadow and patterns when designing<br>• WALT: Implement frame and shell structure knowledge<br>• WALT: Consider effective and ineffective designs |
| **MECHANISMS**<br>• WALT: Design a shape that reduces air resistance<br>• WALT: Draw a net to create a structure from | **MECHANISMS**<br>• WALT: Measure, mark, cut and assemble with increasing accuracy<br>• WALT: Make a model based on a chosen design. | **MECHANISMS**<br>• WALT: Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance | **MECHANISMS**<br>• WALT: Know that products change and evolve over time<br>• WALT: Know that all moving things have kinetic energy |

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| • WALT: Choose shapes that increase or decrease speed as a result of air resistance<br>• WALT: Personalise a design | | | • WALT: Understand that kinetic energy is the energy that something (object person) has by being in motion |
| **COOKING AND NUTRITION**<br>• WALT: Design a biscuit within a given budget, drawing upon previous taste testing | **COOKING AND NUTRITION**<br>• WALT: Follow a baking recipe<br>• WALT: Cook safely, following basic hygiene rules<br>• WALT: Adapt a recipe | **COOKING AND NUTRITION**<br>• WALT: Evaluate a recipe, considering: taste, smell, texture and appearance<br>• WALT: Describe the impact of the budget on the selection of ingredients<br>• WALT: Evaluate and compare a range of products<br>• WALT: Suggest modifications | **COOKING AND NUTRITION**<br>• WALT: Understand the impact of the cost and importance of budgeting while planning ingredients for biscuits<br>• WALT: Understand the environmental impact on future product and cost of production |
| **TEXTILES**<br>• WALT: Write design criteria for a product, articulating decisions made<br>• WALT: Design a personalised book sleeve | **TEXTILES**<br>• WALT: Make and test a paper template with accuracy and in keeping with the design criteria<br>• WALT: Measure, mark and cut fabric using a paper template<br>• WALT: Select a stitch style to join fabric, working neatly sewing small neat stitches<br>• WALT: Incorporate fastening to a design | **TEXTILES**<br>• WALT: Test and evaluate an end product against the original design criteria<br>• WALT: Decide how many of the criteria should be met for the product to be considered successful<br>• WALT: Suggest modifications for improvement | **TEXTILES**<br>• WALT: Understand that there are different types of fastenings and what they are<br>• WALT: Articulate the benefits and disadvantages of different fastening types |
| **ELECTRICAL SYSTEMS**<br>• WALT: Design a torch, giving consideration to the target audience and creating both design and success criteria | **ELECTRICAL SYSTEMS**<br>• WALT: Make a torch with a working electrical circuit and switch | **ELECTRICAL SYSTEMS**<br>• WALT: Evaluate electrical products<br>• WALT: Test and evaluate the success of a final product and | **ELECTRICAL SYSTEMS**<br>• WALT: Know how electrical items work<br>• WALT: Identify electrical products |

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| focusing on features of individual design ideas | • WALT: Use appropriate equipment to cut and attach materials<br>• WALT: Assemble a torch according to the design and success criteria | taking inspiration from the work of peers | • WALT: Know what electrical conductors and insulators are<br>• WALT: Understand that a battery contains stored electricity and can be used to power products<br>• WALT: Identify the features of a torch<br>• WALT: Understand how a torch works<br>• WALT: Articulate the positives and negatives about different torches |
| **DIGITAL WORLD**<br>• WALT: Write design criteria for a programmed timer (Micro:bit)<br>• WALT: Explore different mindfulness strategies<br>• WALT: Apply the results of my research to further inform my design criteria<br>• WALT: Develop a prototype case for my mindful moment timer<br>• WALT: Use and manipulate shapes and clipart, using computer-aided design (CAD), to produce a logo<br>• WALT: Follow a list of design requirements | **DIGITAL WORLD**<br>• WALT: Develop a prototype case for my mindful moment timer<br>• WALT: Create a 3D structure using a net | **DIGITAL WORLD**<br>• WALT: Investigate and analyse a range of timers by identifying and comparing their advantages and disadvantages<br>• WALT: Evaluate my micro:bit program against points on my design criteria and amending them to include any changes I made<br>• WALT: Document and evaluate my project<br>• WALT: Understand what a logo is and why they are important in the world of design and business | **DIGITAL WORLD**<br>• WALT: Write design criteria for a programmed timer (Micro:bit)<br>• WALT: Program a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press<br>• WALT: Test my program for bugs (errors in the code)<br>• WALT: Find and fix the bugs (debug) in my code |

# Year 5

## DEVELOPMENT OF KNOWLEDGE, SKILLS AND UNDERSTANDING IN DESIGN AND TECHNOLOGY – YEAR 5

### NATIONAL CURRICULUM SUBJECT CONTENT FOR KEY STAGE TWO

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, [for example the home, school, leisure, culture, enterprise, industry and the wider environment].

| ITERATIVE PROCESS | TECHNICAL KNOWLEDGE | COOKING AND NUTRITION |
|---|---|---|
| **DESIGN**<br><br>• 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<br>• Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design<br><br>**MAKE**<br><br>• Select from and use a wider range of tools and equipment to perform practical tasks, [for example, cutting, shaping, joining and finishing], accurately<br>• 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 | **MECHANISMS**<br><br>• Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]<br>• Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]<br>• Apply their understanding of computing to program, monitor and control their products.<br>•<br><br>**TEXTILES**<br><br>• [See Make section]<br><br>**STRUCTURES**<br><br>• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures | • As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.<br><br>• Understand and apply the principles of a healthy and varied diet<br>• Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques<br>• Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. |

## EVALUATE

- 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

## CURRICULUM COVERAGE & PROGRESSION OF LEARNING FOR YEAR 5

| DESIGN PROCESS: DESIGN | DESIGN PROCESS: MAKE | DESIGN PROCESS: EVALUATE | TECHNICAL KNOWLEDGE |
|---|---|---|---|
| **STRUCTURES** <br><br> • WALT: Design a stable structure that is able to support weight <br> • WALT: Create frame structure with focus on triangulation | **STRUCTURES** <br><br> • WALT: Make a range of different shaped beam bridges <br> • WALT: Use triangles to create truss bridges that span a given distance and supports a load <br> • WALT: Build a wooden bridge structure independently measuring and marking wood accurately <br> • WALT: Select appropriate tools and equipment for particular tasks <br> • WALT: Use the correct techniques to saws safely <br> • WALT: Identify where a structure needs reinforcement | **STRUCTURES** <br><br> • WALT: Adapt and improve our own bridge structure by identifying points of weakness and reinforcing them as necessary <br> • WALT: Suggest points for improvements for own bridges and those designed by others | **STRUCTURES** <br><br> • WALT: Explore how to create a strong beam identifying arch and beam bridges and understanding the terms: compression and tension <br> • WALT: Identify stronger and weaker structures <br> • WALT: Find different ways to reinforce structures <br> • WALT: Understand how triangles can be used to reinforce bridges <br> • WALT: Articulate the difference between beam, arch, truss and suspension bridges |

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| | and using card corners for support<br>• WALT: Explain why selecting appropriating materials is an important part of the design process<br>• WALT: Understand basic wood functional properties | | |
| **MECHANISMS**<br>• WALT: Design a pop-up book which uses a mixture of structures and mechanisms<br>• WALT: Name each mechanism, input and output accurately<br>• WALT: Storyboard ideas for a book | **MECHANISMS**<br>• WALT: Follow a design brief to make a pop up book, neatly and with focus on accuracy<br>• WALT: Make mechanisms and/or structures using sliders, pivots and folds to produce movement<br>• WALT: Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result | **MECHANISMS**<br>• WALT: Evaluate the work of others and receiving feedback on our own work<br>• WALT: Suggest points for improvement | **MECHANISMS**<br>• WALT: Know that an input is the motion used to start a mechanism<br>• WALT: Know that output is the motion that happens as a result of starting the input<br>• WALT: Know that mechanisms control movement<br>• WALT: Describe mechanisms that can be used to change one kind of motion into another |
| **COOKING AND NUTRITION**<br>• WALT: Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients<br>• WALT: Write an amended method for a recipe to incorporate the relevant changes to ingredients | **COOKING AND NUTRITION**<br>• WALT: Cut and prepare vegetables safely<br>• WALT: Use equipment safely, including knives, hot pans and hobs<br>• WALT: Know how to avoid cross-contamination<br>• WALT: Follow a step by step method carefully to make a recipe | **COOKING AND NUTRITION**<br>• WALT: Identify the nutritional differences between different products and recipes<br>• WALT: Identify and describe healthy benefits of food groups | **COOKING AND NUTRITION**<br>• WALT: Understand where food comes from - learning that beef is from cattle and how beef is reared and processed<br>• WALT: Understand what constitutes a balanced diet<br>• WALT: Adapt a recipe to make it healthier<br>• WALT: Compare two adapted recipes using a nutritional |

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| • WALT: Design appealing packaging to reflect a recipe | | | calculator and then identifying the healthier option |
| **TEXTILES**<br>• WALT: Design a stuffed toy considering the main component shapes required and creating an appropriate template<br>• WALT: Consider the proportions of individual components | **TEXTILES**<br>• WALT: Create a 3D stuffed toy from a 2D design<br>• WALT: Measure, mark and cut fabric accurately and independently<br>• WALT: Create strong and secure blanket stitches when joining fabric<br>• WALT: Use applique to attach pieces of fabric decoration | **TEXTILES**<br>• WALT: Test and evaluate an end product and giving point for further improvements<br>• | **TEXTILES**<br>• WALT: Sew blanket stitch to join fabric<br>• WALT: Apply blanket stitch so the space between the stitches are even and regular<br>• WALT: Thread needles independently |
| **ELECTRICAL SYSTEMS**<br>• WALT: Design an electronic greetings card with a copper track circuit and components<br>• WALT: Create a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery<br>• WALT: Write design criteria for an electronic greeting card<br>• WALT: Compile a moodboard relevant to my chosen theme, purpose and recipient | **ELECTRICAL SYSTEMS**<br>• WALT: Make a functional series circuit<br>• WALT: Create an electronics greeting card, referring to a design criteria<br>• WALT: Map out where different components of the circuit will go<br>• | **ELECTRICAL SYSTEMS**<br>• WALT: Evaluate 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<br>• WALT: State what Sir Rowland Hill invented and why it was important for greeting cards<br>• WALT: Analyse and evaluate a range of existing greeting cards. | **ELECTRICAL SYSTEMS**<br>• WALT: Know the key components used to create a functioning circuit<br>• WALT: Know that copper is a conductor and can be used as part of a circuit<br>• WALT: Understand that breaks in a circuit will stop it from working<br>• WALT: Explain how a series circuit will work in my card<br>• WALT: Identify the negative and positive leg of an LED<br>• WALT: Draw a series circuit diagram and symbols |

| DIGITAL WORLD | DIGITAL WORLD | DIGITAL WORLD | DIGITAL WORLD |
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| • WALT: Research (books, internet) for a particular (user's) animal's needs<br>• WALT: Develop design criteria based on research<br>• WALT: Generate multiple housing ideas using building bricks<br>• WALT: Understand what a virtual model is and the pros and cons of traditional and CAD modelling<br>• WALT: Place and manoeuvre 3D objects, using CAD<br>• WALT: Change the properties of, or combine one or more 3D objects, using CAD | • WALT: Understand the functional and aesthetic properties of plastics | • WALT: State an event or fact from the last 100 years of plastic history<br>• WALT: Explain how plastic is affecting planet Earth and suggesting ways to make more sustainable choices | • WALT: Describe key developments in thermometer history<br>• WALT: Program to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range<br>• WALT: Explain key functions in my program (audible alert, visuals)<br>• WALT: Explain how my product would be useful for an animal carer including programmed features |

| Year 6 | DEVELOPMENT OF KNOWLEDGE, SKILLS AND UNDERSTANDING IN DESIGN AND TECHNOLOGY – YEAR 6 |
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## NATIONAL CURRICULUM SUBJECT CONTENT FOR KEY STAGE TWO

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, [for example the home, school, leisure, culture, enterprise, industry and the wider environment].

| ITERATIVE PROCESS | TECHNICAL KNOWLEDGE | COOKING AND NUTRITION |
|---|---|---|
| **DESIGN**<br><br>• 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<br>• Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design<br><br>**MAKE**<br><br>• Select from and use a wider range of tools and equipment to perform practical tasks, [for example, cutting, shaping, joining and finishing], accurately<br>• 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 | **MECHANISMS**<br><br>• Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]<br>• Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]<br>• Apply their understanding of computing to program, monitor and control their products.<br><br>•<br><br>**TEXTILES**<br><br>• [See Make section]<br><br>**STRUCTURES**<br><br>• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures | • As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.<br><br>• Understand and apply the principles of a healthy and varied diet<br>• Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques<br>• Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. |

## EVALUATE

- 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

## CURRICULUM COVERAGE & PROGRESSION OF LEARNING FOR YEAR 6

| DESIGN PROCESS: DESIGN | DESIGN PROCESS: MAKE | DESIGN PROCESS: EVALUATE | TECHNICAL KNOWLEDGE |
|---|---|---|---|
| **STRUCTURES**<br>• WALT: Design a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs | **STRUCTURES**<br>• WALT: Build a range of play apparatus structures drawing upon new and prior knowledge of structures<br>• WALT: Measure, mark and cut wood to create a range of structures<br>• WALT: Use a range of materials to reinforce and add decoration to structures | **STRUCTURES**<br>• WALT: Improve a design plan based on peer evaluation<br>• WALT: Test and adapt a design to improve it as it is developed<br>• WALT: Identify what makes a successful structure | **STRUCTURES**<br>• WALT: Know that structures can be strengthened by manipulating materials and shapes<br>• WALT: Identify the shell structure in everyday life (cars, aeroplanes, tins, cans)<br>• WALT: Understand man made and natural structures |
| **MECHANISMS**<br>• WALT: Experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement | **MECHANISMS**<br>• WALT: Measure, mark and check the accuracy of the jelutong and dowel pieces required | **MECHANISMS**<br>• WALT: Evaluate the work of others and receiving feedback on our own work<br>• WALT: Apply points of improvements | **MECHANISMS**<br>• WALT: Use a bench hook to saw safely and effectively<br>• WALT: Explore cams, learning that different shaped cams |

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| • WALT: Understand how linkages change the direction of a force<br>• WALT: Make things move at the same time<br>• WALT: Understand and draw cross-sectional diagrams to show the inner-workings of the automata | • WALT: Measure, mark and cut components accurately using a ruler and scissors<br>• WALT: Assemble components accurately to make a stable frame<br>• WALT: Understand that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles<br>• WALT: Select appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set | • WALT: Describe changes they would make/do if they were to do the project again | produce different follower movements<br>• WALT: Explore types of motions and direction of a motion |
| **COOKING AND NUTRITION**<br>• WALT: Write a recipe, explaining the key steps, method and ingredients<br>• WALT: Include facts and drawings from research undertaken | **COOKING AND NUTRITION**<br>• WALT: Follow a recipe, including using the correct quantities of each ingredient<br>• WALT: Adapt a recipe based on research<br>• WALT: Work to a given timescale<br>• WALT: Work safely and hygienically with independence | **COOKING AND NUTRITION**<br>• WALT: Evaluate a recipe, considering: taste, smell, texture and origin of the food group<br>• WALT: Taste test and score final products<br>• WALT: Suggest and write up points of improvements in productions<br>• WALT: Evaluate health and safety in production to minimise cross contamination | **COOKING AND NUTRITION**<br>• WALT: Research a recipe by ingredient<br>• WALT: Record the relevant ingredients and equipment needed for a recipe<br>• WALT: Understand the combinations of food that will complement one another<br>• WALT: Understand where food comes from, describing the process of 'Farm to Fork' for a given ingredient |
| **TEXTILES** | **TEXTILES** | **TEXTILES** | **TEXTILES** |

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| • WALT: Design a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme<br>• WALT: Annotate designs | • WALT: Use a template when pinning panels onto fabric<br>• WALT: Mark and cut fabric accurately, in accordance with a design<br>• WALT: Sew a strong running stitch, making small, neat stitches and following the edge<br>• WALT: Tie strong knots<br>• WALT: Decorate a waistcoat - attaching objects using thread and adding a secure fastening | • WALT: Evaluate work continually as it is created<br>• | • WALT: Know different decorative stitches<br>• WALT: Apply an individual technique<br>• WALT: Sew accurately with even regularity of stitches |
| **ELECTRICAL SYSTEMS**<br>• WALT: Design a steady hand game - identifying and naming the components required<br>• WALT: Draw a design from three different perspectives<br>• WALT: Generate ideas through sketching and discussion<br>• WALT: Model ideas through prototypes<br>• WALT: Understand the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function' | **ELECTRICAL SYSTEMS**<br>• WALT: Construct a stable base for a game<br>• WALT: Accurately cut, fold and assemble a net<br>• WALT: Decorate the base of the game to a high quality finish<br>• WALT: Make and Test a circuit, incorporating a circuit into a base | **ELECTRICAL SYSTEMS**<br>• WALT: Test own and others finished games, identifying what went well and making suggestions for improvement<br>• WALT: Gather images and information about existing children's toys<br>• WALT: Analyse a selection of existing children's toys | **ELECTRICAL SYSTEMS**<br>• WALT: Know that batteries contain acid, which can be dangerous if they leak<br>• WALT: Identify and name the circuit components in a steady hand game |
| *DIGITAL WORLD*<br>• *WALT: Write a design brief from information submitted by a client* | *DIGITAL WORLD*<br>• *WALT: Consider materials and their functional properties, especially those that are* | *DIGITAL WORLD*<br>• *WALT: Explain how my program fits the design criteria and how it would be* | *DIGITAL WORLD*<br>• *WALT: Program an N,E, S,W cardinal compass* |

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| • WALT: Develop design criteria to fulfil the client's request<br>• WALT: Consider and suggest additional functions for my navigation tool<br>• WALT: Develop a product idea through annotated sketches<br>• WALT: Place and manoeuver 3D objects, using CAD<br>• WALT: Change the properties of, or combine one or more 3D objects, using CAD | sustainable and recyclable (for example, cork and bamboo)<br>• WALT: Explain material choices and why they were chosen as part of a product concept | useful as part of a navigation tool<br>• WALT: Develop an awareness of sustainable design<br>• WALT: Identify key industries that utilise 3D CAD modelling and explain why<br>• WALT: Describe how the product concept fits the client's request and how it will benefit the customers | • WALT: Explain the key functions in my program, including any additions<br>• WALT: Explain how my program fits the design criteria and how it would be useful as part of a navigation tool<br>• WALT: Explain the key functions and features of my navigation tool to the client as part of a product concept pitch<br>• WALT: Demonstrate a functional program as part of a product concept |