Great Horwood CE School

# Design Technology Skills and Knowledge Progression

November 2021

***Italics – Target Tracker Statements***

| National Curriculum Design Technology Key Stage 1 |
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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 and school, gardens and playgrounds, the local community, industry and the wider environment). |

When designing and making pupils should be taught to:

**Design**

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

**Make**

- select from and use a range of tools and equipment to perform practical tasks, (or example, cutting, shaping, joining and finishing)
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

**Evaluate**

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

**Technical knowledge**

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms, (for example levers, sliders, wheels and axles), in their products

**Cooking and Nutrition**

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from

| Key Stage 1 Cycle A | | Key Stage 1 Cycle B | |
|---|---|---|---|
| Food: Fruit and Vegetables: Smoothies | Structures: Constructing a windmill or Structures: Constructing Houses from 'The Great Fire of London/Great Horwood | Mechanisms: Wheels and axles, Design a moving toy/vehicle | Mechanisms: Making a moving alien monster |
| Cooking and Nutrition: Bakery products | Mechanisms: Making a moving story book | Textiles: Designing and making puppets | Food: a balanced diet. Design and make a picnic for a beach visit |
| Textiles: Designing and making pouches Cooking and Nutrition: Tudor Banquet | Lego Robotic Animals. WeDo2 Lego | Structures: Design and make a chair for Baby Bear | |

Great Horwood CE School

# Design Technology Skills and Knowledge Progression

November 2021

***Italics – Target Tracker Statements***

| National Curriculum Design Technology Key Stage 2 |
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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. |

At Great Horwood we study the following topics across a two year cycle.

When designing and making, pupils should be taught to:

**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, such as cutting, shaping, joining and finishing, accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

**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

**Technical knowledge**

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products, (for example as 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 programme, monitor and control their products

**Cooking and Nutrition**

- 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

| Year 3 and 4 Cycle A | Year 3 and 4 Cycle B | Year 5 and 6 Cycle A | Year 5 and 6 Cycle B |
|---|---|---|---|
| Food: Eating Seasonally Campfire- Stewed fruit<br>Christmas Cooking: Shortbread/Pudding | Moving Iron Man<br>Digital world: Mindful moments timer<br>Design, build, trial and evaluate a sports circuit training course<br>Food and Nutrition: Adapting a recipe | Structures - Bridges<br>Design and make shelters (outdoor learning)<br>Electrical systems - Electronics Greetings cards | Plan, design, create and evaluate a Viking brooch Textiles: Stuffed toys<br>Food: What could be healthier? |

***Italics – Target Tracker Statements***

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| | | Cooking and nutrition: Traditional Christmas cooking – Mince Pies | |
| Electrical systems: Torches<br>Digital world: Electronic Charm | Mechanical systems: Making a slingshot chariot (car)<br>Design a Roman Bust<br>Design and make a Roman meal<br>Outdoor Learning: Creating a habitat for minibeasts<br>Electrical systems: Static electricity Make an habitat themed electricity game | Food: Come dine with me Designing a nutritious three course meal<br>Textiles: Waistcoats | A new space invention - plan, design, market and evaluate your new design<br>Structure Playgrounds<br>Digital world: Navigating the world Food around the world- cooking and preparing food from different place |
| Mechanical systems: Pneumatic toys<br>Textiles: Making an Egyptian themed cushion<br>Structures: Construct an Egyptian hall/pyramid | Structures: Pavilions Create a decorated Greek pavilion<br>Textiles: Fastening make a fabric book sleeve | Making something from reused or recycled materials Mechanical Systems: automata toys<br>Digital world: Monitoring devices 3D CAD | Electrical systems: Steady hand game<br>Moving vehicles pulleys and levers, cams and cogs<br>Mechanical systems: Pop-up book |

## Design Technology: Structures

**As part of our two yearly cycle pupils will learn and be taught to:**

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|
| **Design:**<br>• Know the importance of a clear design criteria<br>• Include individual preferences and requirements in a design<br>**Make:**<br>• Make stable structures from card, tape and glue<br>• Follow instructions to cut and assemble the structure<br>• Make functioning turbines and axles which are assembled | **Design:**<br>• Generate and communicate ideas using sketching and modelling<br>• Know about different types of structures, found in the natural world and in everyday objects<br>**Make:**<br>• Make a structure according to design criteria<br>• Create joints and structures from paper/card and tape<br>**Evaluation:** | **Design:**<br>• Design a structure with key features to appeal to a specific person/purpose<br>• Draw and label a structure<br>• Design using 2D shapes, labelling: the 3D shapes that will create the features – materials, need and colours<br>• Design and/or decorating a structure/ castle on CAD software<br>**Make:**<br>• Construct a range of 3D | **Design:**<br>• Design a stable structure that is aesthetically pleasing and selecting materials to create a desired effect<br>• Build frame structures designed to support weight<br>**Make:**<br>• Create a range of different shaped frame structures<br>• Make a variety of free standing frame structures of different shapes and sizes<br>• Select appropriate materials | **Design:**<br>• Design a stable structure that is able to support weight<br>• Create a frame structure with focus on triangulation<br>**Make:**<br>• Make a range of different shaped beam bridges/structures<br>• Use triangles to create truss bridges/structures that span a given distance and supports a load<br>• Build a wooden bridge | **Design:**<br>• Design a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs<br>**Make:**<br>• Build a range of play apparatus structures drawing upon new and prior knowledge of structures<br>• Measure, mark and cut wood |

***Italics – Target Tracker Statements***

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| • into a main supporting structure<br>**Evaluation:**<br>• Evaluate according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't<br>• Suggest points for improvements<br>**Technical Knowledge:**<br>• Describe the purpose of structures,<br>• Know how to turn 2D nets into 3D structures<br>• Know that the shape of materials can be changed to improve the strength and stiffness of structures<br>• Understand that cylinders are a strong type of structure (often used for windmills and lighthouses)<br>• Understand that windmill turbines use wind to turn and make the machines inside work<br>• Understand that axles are used in structures and mechanisms to make parts turn in a circle<br>• Develop an awareness of different structures for different purposes | • Explore the features of structures<br>• Compare the stability of different shapes<br>• Test the strength of own structures<br>• Identify the weakest part of a structure<br>• Evaluate the strength, stiffness and stability of own structure<br>**Technical Knowledge:**<br>• Identify natural and man-made structures<br>• Identify when a structure is more or less stable than another<br>• Know that shapes and structures with wide, flat bases or legs are the most stable<br>• Understand that the shape of a structure affects its strength<br>• Use the vocabulary: strength, stiffness and stability<br>• Know that materials can be manipulated to improve strength and stiffness<br>• Build a strong and stiff structure by folding paper | geometric shapes using nets<br>• Create special features for individual designs<br>• Make facades from a range of recycled materials<br>**Evaluation:**<br>• Evaluate own work and the work of others based on the aesthetic of the finished product and in comparison to the original design<br>• Suggest points for modification of the individual designs<br>**Technical Knowledge:**<br>• Identify features of the structure<br>• Identify suitable materials to be selected and used considering weight, compression, and tension<br>• Extend the knowledge of wide and flat based objects are more stable<br>• Understand the terminology of strut, tie, span, beam<br>• Understand the difference between frame and shell structure | to build a strong structure and for the cladding<br>• Reinforce corners to strengthen a structure<br>• Create a design in accordance with a plan<br>• Create different textural effects with materials<br>**Evaluation:**<br>• Evaluate structures made by the class<br>• Describe what characteristics of a design and construction made it the most effective<br>• Consider effective and ineffective designs<br>**Technical Knowledge:**<br>• Know about different structures and their purpose<br>• Build on prior knowledge of net structures and broadening knowledge of frame structures<br>• Know that architects consider light, shadow and patterns when designing<br>• Implement frame and shell structure knowledge<br>• Consider effective and ineffective designs | structure Independently measuring and marking wood accurately<br>• Select appropriate tools and equipment for particular tasks<br>• Use the correct techniques to saw safely<br>• Identify where a structure needs reinforcement and using card corners for support<br>• Explain why selecting appropriating materials is an important part of the design process<br>• Understand basic wood functional properties<br>**Evaluation:**<br>• Adapt and improving own bridge structure by identifying points of weakness and reinforcing them as necessary<br>• Suggest points for improvements for own bridges and those designed by others<br>**Technical Knowledge:**<br>• Explore how to create a strong beam Identifying arch and beam bridges and understand the terms: compression and tension<br>• Identify stronger and weaker structures<br>• Find different ways to reinforce structures | to create a range of structures<br>• Use a range of materials to reinforce and add decoration to structures<br>**Evaluation:**<br>• Improve a design plan based on peer evaluation<br>• Test and adapt a design to improve it as it is developed<br>• Identify what makes a successful structure<br>**Technical Knowledge:**<br>• Know that structures can be strengthened by manipulating materials and shapes<br>• Identify the shell structure in everyday life (cars aeroplanes, tins, cans)<br>• Understand man-made and natural structures |

***Italics – Target Tracker Statements***

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| | | | | • Understand how triangles can be used to reinforce structures<br>• Articulate the difference between beam, arch, truss and suspension bridges | |

## Design Technology: Mechanisms/Mechanical systems

**As part of our two yearly cycle pupils will learn and be taught to:**

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|
| **Design:**<br>• Explain how to adapt mechanisms, using bridges or guides to control the movement<br>• Design a moving story book for a given audience<br>• Design a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move<br>• Create clearly labelled drawings which illustrate movement<br>**Make:**<br>• Follow a design to create moving models that use levers and sliders<br>• Adapt mechanisms<br>**Evaluation:**<br>• Test a finished product, seeing whether it moves as planned and if not, | **Design:**<br>• Create a class design criteria for a moving monster<br>• Design a moving monster for a specific audience in accordance with a design criteria<br>• Select a suitable linkage system to produce the desired motions<br>• Design a wheel selecting appropriate materials based on their properties<br>**Make:**<br>• Make linkages using card for levers and split pins for pivots<br>• Experiment with linkages adjusting the widths, lengths and thicknesses of card used<br>• Cut and assemble components neatly<br>• Select materials according to | **Design:**<br>• Design a toy which uses a pneumatic system<br>• Develop design criteria from a design brief<br>• Generate ideas using thumbnail sketches and exploded diagrams<br>• Know that different types of drawings are used in design to explain ideas clearly<br>**Make:**<br>• Create a pneumatic system to create a desired motion<br>• Build secure housing for a pneumatic system<br>• Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy<br>• Select materials due to their functional and aesthetic | **Design:**<br>• Design a shape that reduces air resistance<br>• Draw a net to create a structure from<br>• Choose shapes that increase or decrease speed as a result of air resistance<br>• Personalise a design<br>**Make:**<br>• Measure, mark, cut and assembling with increasing accuracy<br>• Make a model based on a chosen design<br>**Evaluation:**<br>• Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance<br>**Technical Knowledge:**<br>• Know that products change | **Design:**<br>• Design a pop-up book which uses a mixture of structures and mechanisms<br>• Name each mechanism, input and output accurately<br>• Storyboard ideas for a book<br>**Make:**<br>• Follow a design brief to make a popup book, neatly and with focus on accuracy<br>• Make mechanisms and/or structures using sliders, pivots and folds to produce movement<br>• Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result<br>**Evaluation:**<br>• Evaluate the work of others and receive feedback on own work | **Design:**<br>• •Experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement<br>• Understand how linkages change the direction of a force<br>• Make things move at the same time<br>• Understand and draw cross-sectional diagrams to show the inner-workings of the automata<br>**Make:**<br>• Measure, mark and check the accuracy of the jelutong and dowel pieces required<br>• Measure, mark and cut components accurately using a ruler and scissors<br>• Assemble components |

***Italics – Target Tracker Statements***

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| explaining why and how it can be fixed<br>• Review the success of a product by testing it with its intended audience<br>• Test mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move<br>**Technical Knowledge:**<br>• Know that levers and sliders are mechanisms and can make things move<br>• Identify whether a mechanism is a lever or slider and determining what movement the mechanism will make<br>• Use the vocabulary: up, down, left, right, vertical and horizontal to describe movement<br>• Identify what mechanism makes a toy or vehicle roll forwards<br>• Know that for a wheel to move it must be attached to an axle | their characteristics<br>• Follow a design brief<br>**Evaluation:**<br>• Evaluate own designs against design criteria<br>• Use peer feedback to modify a final design<br>• Evaluate different designs<br>• Test and adapt a design<br>**Technical Knowledge:**<br>• Know that mechanisms are a collection of moving parts that work together in a machine<br>• Know that there is an input and output in a mechanism<br>• Identify mechanisms in everyday objects<br>• Know that a lever is something that turns on a pivot<br>• Know that a linkage is a system of levers that are connected by pivots<br>• Explore wheel mechanisms<br>• Know how axels help wheels to move a vehicle | characteristics<br>• Manipulate materials to create different effects by cutting, creasing, folding, weaving<br>**Evaluation:**<br>• Use the views of others to improve designs<br>• Test and modify the outcome, suggesting improvements<br>• Understand the purpose of exploded-diagrams through the eyes of a designer and their client<br>**Technical Knowledge:**<br>• Know how pneumatic systems work<br>• Know that mechanisms are a system of parts that work together to create motion<br>• Know that pneumatic systems can be used as part of a mechanism<br>• Know that pneumatic systems force air over a distance to create movement | and evolve over time<br>• Know that all moving things have kinetic energy<br>• Know that kinetic energy is the energy that something (object person) has by being in motion | • Suggest points for improvement<br>**Technical Knowledge:**<br>• Know that an input is the motion used to start a mechanism<br>• Know that output is the motion that happens as a result of starting the input<br>• Know that mechanisms control movement<br>• Know and describe mechanisms that can be used to change one kind of motion into another | accurately to make a stable frame<br>• 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>• Select appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set<br>**Evaluation:**<br>• Evaluate the work of others and receive feedback on own work<br>• Apply points of improvements<br>• Describing changes they would make/do if they were to do the project again<br>**Technical Knowledge:**<br>• Use a bench hook to saw safely and effectively<br>• Explore cams, knowing that different shaped cams produce different follower movements<br>• Explore types of motions and direction of a motion |

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## Design Technology: Textiles

**As part of our two yearly cycle pupils will learn and be taught to:**

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|
| **Design:**<br>• Use a template to create a design for a puppet<br>**Make:**<br>• Cut fabric neatly with scissors<br>• Use joining methods to decorate a puppet<br>• Sequence steps for construction<br>**Evaluation:**<br>• Reflect on a finished product, explaining likes and dislikes<br>**Technical Knowledge:**<br>• Know different ways in which to join fabrics together: pinning, stapling, gluing | **Design:**<br>• Design a fabric product<br>**Make:**<br>• Select and cut fabrics for sewing<br>• Decorate product using fabric glue or running stitch<br>**Evaluation:**<br>• Troubleshoot scenarios posed by the teacher<br>• Evaluate the quality of the stitching on others' work<br>• Discussing as a class, the success of their stitching against the success criteria<br>• Identifying aspects of their peers' work that they particularly like and why<br>**Technical Knowledge:**<br>• Join items using fabric glue or stitching<br>• Identify benefits of these techniques: Threading a needle, Sewing running stitch, with evenly spaced, neat, even stitches to join fabric<br>• Neatly pin and cutting fabric using a template | **Design:**<br>• Design and make a template from an existing cushion and applying individual design criteria<br>**Make:**<br>• Follow criteria to create a cushion<br>• Select and cut fabrics with ease using fabric scissors<br>• Sew cross stitch to join fabric<br>• Decorate fabric using appliqué<br>• Complete design ideas with stuffing and sewing the edges<br>**Evaluation:**<br>• Evaluate an end product and thinking of other ways in which to create similar items<br>**Technical Knowledge:**<br>• Thread needles with greater independence<br>• Tie knots with greater independence<br>• Sewing cross stitch and appliqué<br>• Know the need to count the thread on a piece of even weave fabric in each direction to create uniform size and appearance | **Design:**<br>• Write design criteria for a product, articulating decisions made<br>• Design a personalised Book sleeve<br>**Make:**<br>• Make and test a paper template with accuracy and in keeping with the design criteria<br>• Measure, mark and cutting fabric using a paper template<br>• Select a stitch style to join fabric, working neatly sewing small neat stitches<br>• Incorporate fastening to a design<br>**Evaluation:**<br>• Test and evaluate an end product against the original design criteria<br>• Decide how many of the criteria should be met for the product to be considered successful<br>• Suggest modifications for improvement<br>**Technical Knowledge:**<br>• Know that there are different types of fastenings and what they are | **Design:**<br>• Design a stuffed toy considering the main component, shapes required and creating an appropriate template<br>• Consider the proportions of individual components<br>**Make:**<br>• Create a 3D stuffed toy from a 2D design<br>• Measure, mark and cut fabric accurately and independently<br>• Create strong and secure blanket stitches when joining fabric<br>• Using applique to attach pieces of fabric decoration<br>**Evaluation:**<br>• Test and evaluating an end product and giving point for further improvements<br>**Technical Knowledge:**<br>• Know how to sew blanket stitch to join fabric<br>• Apply blanket stitch so the space between the stitches are even and regular<br>• Thread needles independently | **Design:**<br>• Design a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme<br>• Annotate designs<br>**Make:**<br>• Use a template when pinning panels onto fabric<br>• Mark and cut fabric accurately, in accordance with a design<br>• Sew a strong running stitch, making small, neat stitches and following the edge<br>• Tie strong knots<br>• Decorate a waistcoat – attaching objects using thread and adding a secure fastening<br>**Evaluation:**<br>• Evaluate work continually as it is created<br>**Technical Knowledge:**<br>• Know different decorative stitches<br>• Know how to apply and know the outcome of the individual technique<br>• Sew accurately with even regularity of stitches |

***Italics – Target Tracker Statements***

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| | | • Know that fabrics can be layered for affect | • Know and articulate the benefits and disadvantages of different fastening types | | |

## Design Technology: Cooking and Nutrition

**As part of our two yearly cycle pupils will learn and be taught to:**

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|---|---|
| **Design:**<br>• Design smoothie carton packaging by-hand or on ICT software<br>**Make:**<br>• Chop fruit and vegetables safely to make a smoothie<br>• Identify if a food is a fruit or a vegetable<br>• Know where and how fruits and vegetables grow<br>**Evaluation:**<br>• Taste and evaluate different food combinations<br>• Describe appearance, smell and taste<br>• Suggest information to be included on packaging<br>**Technical Knowledge:**<br>• Know the difference between fruits and vegetables<br>• Describe and group fruits by texture and taste | **Design:**<br>• Design a healthy wrap based on a food combination which work well together<br>**Make:**<br>• Slice food safely using the bridge or claw grip<br>• Construct a wrap that meets a design brief<br>**Evaluation:**<br>• Describe the taste, texture and smell of fruit and vegetables<br>• Taste testing food combinations and final products<br>• Know and describe the information that should be included on a label<br>• Evaluate which grip was most effective<br>**Technical Knowledge:**<br>• Know what makes a balanced diet<br>• Know where to find the nutritional information on packaging<br>• Know the five food groups | **Design:**<br>• Create a healthy and nutritious recipe for a savoury dish using seasonal ingredients, considering the taste, texture, smell and appearance of the dish<br>**Make:**<br>• Know how to prepare themselves and a work space to cook safely in<br>• Know and follow the basic rules to avoid food contamination<br>• Following the instructions within a recipe<br>**Evaluation:**<br>• Establish and use design criteria to help test and review dishes<br>• Describe the benefits of seasonal fruits and vegetables and the impact on the environment<br>• Suggest points for improvement when making a seasonal dish<br>**Technical Knowledge:**<br>• Know that climate affects | **Design:**<br>• Design a product within a given budget, drawing upon previous taste testing<br>**Make:**<br>• Follow a baking recipe<br>• Cook safely, following basic hygiene rules<br>• Adapt a recipe<br>**Evaluation:**<br>• Evaluate a recipe, considering: taste, smell, texture and appearance<br>• Describe the impact of the budget on the selection of ingredients<br>• Evaluate and compare a range of products<br>• Suggest modifications<br>**Technical Knowledge:**<br>• Understand the impact of the cost and importance of budgeting while planning ingredients for the product<br>• Understand the environmental impact on future product and cost of production | **Design:**<br>• Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients<br>• Write an amended method for a recipe to incorporate the relevant changes to ingredients<br>• Design appealing packaging to reflect a recipe<br>**Make:**<br>• Cut and preparing vegetables safely<br>• Use equipment safely, including knives, hot pans and hobs<br>• Know how to avoid cross-contamination<br>• Follow a step by step method carefully to make a recipe<br>**Evaluation:**<br>• Identify the nutritional differences between different products and recipes<br>• Identify and describing | **Design:**<br>• Write a recipe, explaining the key steps, method and ingredients<br>• Include facts and drawings from research undertaken<br>**Make:**<br>• Following a recipe, including using the correct quantities of each ingredient<br>• Adapt a recipe based on research<br>• Work to a given timescale<br>• Work safely and hygienically with independence<br>**Evaluation:**<br>• Evaluate a recipe considering: taste, smell, texture and origin of the food group<br>• Taste testing and scoring final products<br>• Suggest and write up points of improvements in productions<br>• Evaluate health and safety in production to minimise cross contamination<br>**Technical Knowledge:** |

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| | | food growth<br>• Work with cooking equipment safely and hygienically<br>• Know that imported foods travel from far away and this can negatively impact the environment<br>• Know that vegetables and fruit grow in certain seasons<br>• Know that each fruit and vegetable gives us nutritional benefits<br>• use, store and clean a knife safely | | healthy benefits of food groups<br>**Technical Knowledge:**<br>• Know where food comes from - learning that beef is from cattle and how beef is reared and processed<br>• Know and describe what constitutes a balanced diet<br>• Know how to adapt a recipe to make it healthier<br>• Compare two adapted recipes using a nutritional calculator and then identifying the healthier option | • Know how to research a recipe by ingredient<br>• Record the relevant ingredients and equipment needed for a recipe<br>• Know the combinations of food that will complement one another<br>• Know where food comes from, describing the process of 'Farm to Fork' for a given ingredient |

## Design Technology: Digital World Key Stage 2

**As part of our two yearly cycle pupils will learn and be taught to:**

| Year 3 | Year 4 | Year 5 | Year 6 |
|---|---|---|---|
| **Design:**<br>• Problem solve by suggesting potential features on a Micro: bit and justifying ideas<br>• Develop design ideas for a technology pouch<br>• Draw and manipulate 2D shapes, using computer-aided design, to produce a point of sale badge<br>**Make:**<br>• Use a template when cutting and assembling the pouch<br>• Follow a list of design requirements<br>• Select and use the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch<br>• Apply functional features such as using foam | **Design:**<br>• Write design criteria for a programmed timer (Micro:bit)<br>• Explore different mindfulness strategies<br>• Apply the results of my research to further inform design criteria<br>• Develop a prototype case for a mindful moment timer<br>• Use and manipulate shapes and clipart, using computer-aided design (CAD), to produce a logo<br>• Follow a list of design requirements<br>**Make:**<br>• Develop a prototype case for a mindful moment timer | **Design:**<br>• Researching (books, internet) for a particular (user's) animal's needs<br>• Developing design criteria based on research<br>• Generating multiple housing ideas using building bricks<br>• Understanding what a virtual model is and the pros and cons of traditional and CAD modelling<br>• Placing and manoeuvring 3D objects, using CAD<br>• Changing the properties of, or combine one or more 3D objects, using CAD<br>**Make:**<br>• Understand the functional and aesthetic | **Design:**<br>• Writing a design brief from information submitted by a client<br>• Developing design criteria to fulfil the client's request<br>• Considering and suggesting additional functions for my navigation tool<br>• Developing a product idea through annotated sketches<br>• Placing and manoeuvring 3D objects, using CAD<br>• Changing the properties of, or combine one or more 3D objects, using CAD<br>**Make:**<br>• Consider materials and their functional |

***Italics – Target Tracker Statements***

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| to create soft buttons<br>**Evaluation:**<br>• Analyse and evaluate an existing product<br>• Identify the key features of a pouch<br>**Technical Knowledge:**<br>• Know and identify key product developments that occurred as a result of the digital revolution<br>• Write a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm<br>• Know what a loop is in programming<br>• Know and explaining the basic functionality of an eCharm program<br>• Know what is meant by 'point of sale display' | • Create a 3D structure using a net<br>**Evaluation:**<br>• Investigate and analyse a range of timers by identifying and comparing their advantages and disadvantages<br>• Evaluate own micro:bit program against points on design criteria and amending them to include any changes made<br>• Document and evaluate the project<br>• Know and understand what a logo is and why they are important in the world of design and business<br>**Technical Knowledge:**<br>• Write design criteria for a programmed timer (Micro:bit)<br>• Programme a micro:bit in the Microsoft Micro:bit editor, to time a set number of seconds/minutes upon button press<br>• Test the program for bugs (errors in the code)<br>• Find and fix the bugs (debug) in the code | properties of plastics<br>**Evaluation:**<br>• State an event or fact from the last 100 years of plastic history<br>• Know and explain how plastic is affecting planet Earth and suggest ways to make more sustainable choices<br>**Technical Knowledge:**<br>• Know and describe key developments in thermometer history<br>• Programme to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range<br>• Explain key functions in my program (audible alert, visuals)<br>• Explain how the product would be useful for an animal carer including programmed features | properties, especially those that are sustainable and recyclable (for example, cork and bamboo)<br>• Explain material choices and why they were chosen as part of a product concept<br>**Evaluation:**<br>• Explain how the program fits the design criteria and how it would be useful as part of a navigation tool<br>• Develop an awareness of sustainable design<br>• Identify key industries that utilise 3D CAD modelling and explain why<br>• Describe how the product concept fits the client's request and how it will benefit the customers<br>**Technical Knowledge:**<br>• Programme an N,E, S,W cardinal compass<br>• Explain the key functions in the program, including any additions<br>• Explain how the program fits the design criteria and how it would be useful as part of a navigation tool<br>• Explain the key functions and features of the navigation tool to the client as part of a product concept pitch<br>• Demonstrate a functional program as part of a product concept |

Great Horwood CE School

# Design Technology Skills and Knowledge Progression

November 2021

***Italics – Target Tracker Statements***

## Design Technology: Electrical Systems Key Stage 2

**As part of our two yearly cycle pupils will learn and be taught to:**

| Year 3 | Year 4 | Year 5 | Year 6 |
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| **Design:**<br>• Design a game that works using static electricity, including the instructions for playing the game Identifying a design criteria and a target audience<br>**Make:**<br>• Make an electrostatic game, referring to the design criteria<br>• Use a wider range of materials and equipment safely<br>• Use electrostatic energy to move objects in isolation as well as in part of a system<br>**Evaluation:**<br>• Know how to give constructive criticism on own work and the work of others<br>• Test the success of a product against the original design criteria and justifying opinions<br>**Technical Knowledge:**<br>• Know and understand what static electricity is and how it moves objects through attraction or repulsion<br>• Generate static electricity independently<br>• Use static electricity to make objects move in a desired way | • **Design:**<br>• Design a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas<br>**Make:**<br>• Make a torch with a working electrical circuit and switch<br>• Use appropriate equipment to cut and attach materials<br>• Assemble a torch according to the design and success criteria<br>**Evaluation:**<br>• Evaluate electrical products<br>• Test and evaluate the success of a final product and taking inspiration from the work of peers<br>**Technical Knowledge:**<br>• Know how electrical items work<br>• Identify electrical products<br>• Know what electrical conductors and insulators are<br>• Know and understand that a battery contains stored electricity and can be used to power products<br>• Identify the features of a torch<br>• Know how a torch works<br>• Articulate the positives and negatives about different torches | **Design:**<br>• Design an electronic greetings card with a copper track circuit and components<br>• Create a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery<br>• Write design criteria for an electronic greeting card<br>• Compile a mood board relevant to the chosen theme, purpose and recipient<br>**Make:**<br>• Make a functional series circuit<br>• Create an electronics greeting card, referring to a design criteria<br>• Map out where different components of the circuit will go<br>**Evaluation:**<br>• 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>• Know and state what Sir Rowland Hill invented and why it was important for greeting cards<br>• Analyse and evaluate a range of existing greeting cards.<br>**Technical Knowledge:**<br>• Know the key components used to create a functioning circuit<br>• Know that copper is a conductor and can be used as part of a circuit<br>• Know that breaks in a circuit will stop it from working | **Design:**<br>• Design a steady hand game - identifying and naming the components required<br>• Draw a design from three different perspectives<br>• Generate ideas through sketching and discussion<br>• Model ideas through prototypes<br>• Understand the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'<br>**Make:**<br>• Construct a stable base for a game<br>• Accurately cut, fold and assemble a net<br>• Decorate the base of the game to a high quality finish<br>• Make and test a circuit Incorporating a circuit into a base<br>**Evaluation:**<br>• Test own and others finished games, identifying what went well and making suggestions for improvement<br>• Gather images and information about existing children's toys<br>• Analyse a selection of existing children's toys<br>**Technical Knowledge:**<br>• Know that batteries contain acid, which can be dangerous if they leak<br>• Identify and naming the circuit components in a steady hand game |

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| | | • Explain how a series circuit will work in the card<br>• Identify the negative and positive leg of an LED<br>• Draw a series circuit diagram and symbols | |