



Ditchling St Margaret's CE Primary and Nursery School



'Living life in all its fullness' John 10:10

Design and Technology Curriculum





Kindness



Respect



Perseverance



'Living life in all its fullness' John 10:10

Design and Technology Curriculum at Ditchling CE Primary and Nursery School

Planned Curriculum

INTENT

Design and Technology is an inspiring, rigorous and practical subject. Design and Technology encourages children to learn to think and intervene creatively to solve problems both as individuals and as members of a team. At Ditchling, we encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. We aim to, wherever possible, link work to other disciplines such as mathematics, science, engineering, computing and art. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and are encouraged to become innovators and risk-takers.

IMPLEMENTATION

Through a variety of creative and practical activities, we teach the knowledge, understanding and skills needed to engage in an iterative process of designing and making. The children design and create products that consider function and purpose and which are relevant to a range of sectors (for example, the home, school, leisure, culture, enterprise, industry and the wider environment).

When designing and making, the children are 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 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, as well as chopping and slicing) accurately.
- select from and use a wider range of materials, ingredients and components, including construction materials, textiles and ingredients, according to their functional properties, aesthetic qualities and, where appropriate, taste.
- 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.

Develop, Use and Apply Technical Knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
- understand and use mechanical systems in their products.
- understand and use electrical systems in their products.
- apply their understanding of computing to program, monitor and control their products
- understand some of the ways that food can be processed and the effect of different cooking practices (including baking and grilling).



Key skills and key knowledge for D and T have been mapped across the school to ensure progression between year groups including EYFS. The context for the children's work in Design and Technology is also well considered and children learn about real life structures and the purpose of specific examples, as well as developing their skills throughout the programme of study. Design and technology lessons are also taught as a block so that children's learning is focused throughout each unit of work.

Each new unit of work begins with a recap of the previous related knowledge from previous years. This helps children to retrieve what they have learnt in the earlier sequence of the programme of study, and ensures that new knowledge is taught in the context of previous learning to promote a shift in long term memory. Key vocabulary for the new topic is also introduced as part of this 'unit introduction'. Once children know the new vocabulary for the unit and how it relates to previous learning, the children are asked what they already know specifically about the new topic. This provides the teacher with an insight into the children's 'starting points' for the topic, to enable the use of assessment to inform planning.

Within all sequences of lessons, teachers plan a phase of progressive questioning which extends to and promotes the higher order thinking of all learners. Questions initially focus on the recall or retrieval of knowledge. Questions then extend to promote application of the knowledge in a new situation and are designed to promote analytical thinking, such as examining something specific. In design and technology, an example of this level of questioning might ask children to consider how a mechanical system (such as gears and pulleys) might speed up, slow down or change the direction of movement. The questions that teachers ask within the same lesson phase, then focus on the children's own work and how they might change or create an outcome and justify a choice they have made which is based on their evaluation.

IMPACT

Assessed and Learned Curriculum

We ensure the children:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users and critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook. Children will design and make a range of products. A good quality finish will be expected in all design and activities made appropriate to the age and ability of the child

Children learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.



EYFS

DT Association – Developing Design and Technology in EYFS 2021

Food - Preparing Fruit
and Vegetables
Spring Fruit salad

Freestanding
Structures – chair for
baby bear

Year 1

Mechanisms Sliders and
Levers
Dolphin Boy Card

Year 2

Food - Preparing Fruit and
Vegetables. Healthy
Rainbow Seasonal Pizza

Textiles –
Templates and
Joining. Build a
Bear Swimming
costume

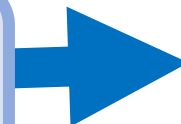
Structures –
Shell Structures
using CAD
Christmas Gift
Box

Year 3

Mechanisms – Wheels
and Axles
Beach Wagon

Textiles – 2D and 3D Product
Tool bag

Food – Healthy and
Varied Diet
Healthy Stir Fry





Year 4

Food – Healthy and
Varied Diet
Sustainable Lunch

Electrical Systems – Simple
Programming and control
Electronic Quiz

Textiles - Combining
different fabric shapes
Bags – sewing machines

Year 5

Mechanisms – Pneumatics
Toy for Year 1

Structures – Frame
Structures
Trojan Horse

Mechanisms – Cams
Toy for Tibetan Child

Food – celebrating culture and
seasonality
Royal Academy Culinary Arts

Electrical Systems – more complex
switches and circuits
Museum alarm for an artefact

Year 6

Structures
Frame structures using CAD
Book Stand

Food – celebrating culture and seasonality
Hosting and providing Fairtrade food at
Community Tea Party



Design Technology and Art and Design Overview

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
EYFS	Structures Junk Modelling	Drawing – Marvellous Marks	Painting and Mixed Media: Paint My World	Sculpture and 3D: Creation Station	Textiles: Bookmarks	Structures: Boats
Year 1	Freestanding Structures – chair for baby bear	Drawing – Make your Mark	Food - Preparing Fruit and Vegetables Spring Fruit salad	Painting and Mixed Media: Colour Splash	Mechanisms Sliders and Levers - Dolphin Boy Card	Sculpture and 3D: Paper Play
Year 2	Food - Preparing Fruit and Vegetables. Healthy Rainbow Seasonal Pizza	Drawing – Tell A Story	Painting and Mixed Media: Life in Colour	Sculpture and 3D: Clay Houses	Textiles – Templates and Joining. Build a Bear Swimming costume	Mechanisms Wheels and Axles - Beach Wagon
Year 3	Sculpture – Abstract Shape and Space	Structures Shell Structures using CAD - Christmas Gift Box	Painting – Prehistoric Painting	Drawing – Growing Artists	Textiles 2D and 3D Product - Tool bag	Food: Healthy and Varied Diet - Healthy Stir Fry
Year 4	Healthy and Varied Diet - Sustainable Lunch	Craft and Design – Fabrics of Nature	Painting and mixed media: Light and Dark	Mechanisms Pneumatics - Toy for Year 1	Drawing – Power prints	Electrical Systems Simple Programming and control - Electronic Quiz
Year 5	Textiles: Combining different fabric shapes – Bags – Sewing Machines	Drawing – I Need Space	Sculpture and 3D – Interactive Installation	Structures: Frame Structures - Trojan Horse	Painting and Mixed Media: Portraits	Mechanisms – Cams -Toy for Tibetan Child
Year 6	Electrical Systems: more complex switches and circuits - Museum alarm for an artefact	Drawing: Make My Voice Heard	Structures: Frame structures using CAD – Book Stand	Painting: Artist Study	Sculpture and Mixed Media: Making Memories	Food – celebrating culture and seasonality Fairtrade food at Community Tea Party

Progression of Skills and Knowledge

<u>EYFS</u>	
Expressive A Creating with Materials Being Imaginative and Expressive Painting, 3D modelling, messy play, collage, cutting, drama, role play, threading, moving to music, clay sculptures, following music patterns with instruments, singing songs linked to topics, making instruments, percussion. Work will be displayed in the classroom. Lots of links to Fine Motor Skills. Children to explain their work to others. Children will have opportunities to learn and perform songs, nursery rhymes and poetry linked to their work / interests and passions. The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe. Give children an insight into new musical worlds. Invite musicians in to play music to children and talk about it. Encourage children to listen attentively to music. Discuss changes and patterns as a piece of music develops.	
Autumn 1	
All About Me	Join in with songs Beginning to mix colours Build stories around toys (small world) use available props to support role play Build models using construction equipment. Junk modelling, take picture of children's creations and record them explaining what they did. Exploring sounds and how they can be changed, tapping out of simple rhythms. Play pitch matching games, humming or singing To draw a self-portrait (enclosing lines): draw definite features Observational drawings Feelings: taking photos of children acting out emotions Drama conventions through literacy
Autumn 2	
Out and About	Use different textures and materials to make firework pictures Listen to music and make their own dances in response. Christmas decorations, Christmas cards, Christmas songs/poems



	The use of story maps, props, puppets & story bags will encourage children to retell, invent and adapt stories. Shadow Puppets Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue Role Play of The Nativity Music: Christmas Songs Drama conventions through literacy
Spring 1	
Back In Time	Children produce a piece of artwork using an artists style as a stimulus Explore how colour can be changed Talk about a famous artist. Making lanterns, Chinese writing, puppet making, Chinese music and composition I can recognise, create and describe pattern: tiger skin Drama conventions through literacy
Spring 2	
Through the Keyhole	Make different textures; make patterns using different colours Children will explore ways to protect the growing of plants by designing scarecrows. Mother's Day crafts Easter crafts printing, patterns on Easter eggs Rubbings of leaves/plants Children combine media to make a collage natural art Drama conventions through literacy
Summer 1	
Whatever the Weather	Weather vane Collage Pastel drawings, Artist focus Junk modelling, houses, bridges boats and transport. Provide children with a range of materials for children to construct with. Create collaboratively: papier mache: working in pairs I can use various construction materials Drama conventions through literacy Exploration of other countries – dressing up in different costumes Learn a traditional song and dance and perform it / Encourage children to create their own music.



Summer 2	
Ship Ahoy!	Water pictures, collage, shading by adding black or white, colour mixing. Colour mixing Father's Day Crafts Boat making – floating and sinking Making models from recycled materials Using clay to make a coil pot Drama conventions through literacy

Year 1	Learning Outcomes	Key Knowledge	Key Skills	Evaluate
Autumn				
<u>Freestanding Structures</u> <u>Chair for Baby Bear</u>	Identify some features that would appeal to the client and create a suitable design. Explain how their design appeals to their audience. Make stable structures out of card, tape and glue. Make functioning axles that are assembled into the main supporting structure. Say what is good about their structure and what they could do better.	Know how to make freestanding structures stronger, stiffer and more stable. Know and use technical vocabulary relevant to the project. To understand that the shape of materials can be changed to improve the strength and stiffness of structures. To understand that cylinders are a strong type of structure To begin to understand that different structures are used for different purposes.	Learning the importance of a clear design criteria. Including individual preferences and requirements in a design. Making stable structures from card, tape and glue. Learning how to turn 2D nets into 3D structures. Following instructions to cut and assemble the supporting structure	Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.



		To know that a structure is something that has been made and put together.	Making functioning axles which are assembled into a main supporting structure.	
<u>Vocabulary:</u> cut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved axle bridge design design criteria model net packaging structure template unstable stable strong weak				
Spring				
Food: A balanced diet Spring Fruit Salad	- Name the main food groups and identify foods that belong to each group. Describe the taste, texture and smell of a given food. - Construct a fruit salad that meets the design brief and their plan.	- To know that 'diet' means the food and drink that a person or animal usually eats. - To understand what makes a balanced diet. - To know where to find the nutritional information on packaging. - To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. - To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. - To know that nutrients are substances in food that all living things need to make energy, grow	- Name the main food groups and identify foods that belong to each group. Describe the taste, texture and smell of a given food. Think of four different wrap ideas, considering flavour combinations. - Construct a fruit salad that meets the design brief and their plan.	Taste and evaluate a range of fruits to determine the intended user's preferences. Evaluate ideas and finished products against design criteria, including intended user and purpose.



		and develop. - To know that 'ingredients' means the items in a mixture or recipe. - To know that I should only have a maximum of 5 teaspoons of sugar a day to stay healthy. - To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.		
<u>Vocabulary:</u> balanced diet, balance, carbohydrate, dairy fruit, ingredients, oils sugar, protein, vegetable, design, criteria				
Summer				
<u>Mechanisms - Sliders and Levers</u> <u>Dolphin Boy Card</u>	- Identify whether a mechanism is a side-to-side slider or an up-and-down slider and determine what movement the mechanism will make. - Clearly label drawings to show which parts of their design will move and in which direction. - Make a picture, which meets the design criteria, with parts that move purposefully as planned.	- To know that a mechanism is the parts of an object that move together. - To know that a slider mechanism moves an object from side to side. - To know that a slider mechanism has a slider, slots, guides and an object. - To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.	- Explaining how to adapt mechanisms, using bridges or guides to control the movement. - Designing a moving story book for a given audience. - Following a design to create moving models that use levers and sliders. - Testing a finished product, seeing whether it moves as planned and if not,	Explore a range of existing books and everyday products that use simple sliders and levers. Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.



	Evaluate the main strengths and weaknesses of their design and suggest alterations.		explaining why and how it can be fixed. Reviewing the success of a product by testing it with its intended audience.	
--	---	--	---	--

Vocabulary:

sliders
levers
mechanism adapt
design criteria design
input, model, template, assemble, test

Year 2	Learning Outcomes	Key Knowledge	Key Skills	Evaluation
Autumn				
Food: A balanced diet Healthy Rainbow Seasonal Pizza	- Name the main food groups and identify foods that belong to each group. Describe the taste, texture and smell of a given food. - Construct a seasonal pizza that meets the design brief and their plan.	- To know that 'diet' means the food and drink that a person or animal usually eats. - To understand what makes a balanced diet. - To know where to find the nutritional information on packaging. - To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy	- Name the main food groups and identify foods that belong to each group. Describe the taste, texture and smell of a given food. Think of four different wrap ideas, considering flavour combinations. - Construct a pizza that meets the design brief and their plan.	Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. Evaluate ideas and finished products against design criteria, including intended user and purpose.



		and foods high in fat and sugar. • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that nutrients are substances in food that all living things need to make energy, grow and develop. • To know that 'ingredients' means the items in a mixture or recipe. • To know that I should only have a maximum of 5 teaspoons of sugar a day to stay healthy. • To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.		
<u>Vocabulary:</u> balanced diet, balance, carbohydrate dairy, fruit, ingredients, oils sugar, protein, vegetable, design, criteria				
Spring				
<u>Textiles</u>	• Sew a running stitch with regular-sized stitches and	• To know that sewing is a method of joining fabric.	• Designing a pouch. Selecting and cutting fabrics for sewing.	Explore and evaluate a range of existing textile products



<u>Templates and Joining</u> Swimming Costume for Build a Bear	understand that both ends must be knotted. • Prepare and cut fabric to make a pouch from a template. • Use a running stitch to join the two pieces of fabric together. • Decorate their pouch using the materials provided.	• To know that different stitches can be used when sewing. • To understand the importance of tying a knot after sewing the final stitch. • To know that a thimble can be used to protect my fingers when sewing.	• Decorating a pouch using fabric glue or running stitch. • Threading a needle. • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template. • Troubleshooting scenarios posed by teacher. • Evaluating the quality of the stitching on others' work. • Discussing as a class, the success of their stitching against the success criteria. • Identifying aspects of their peers' work that they particularly like and why.	relevant to the project being undertaken. • Evaluate their ideas throughout and their final products against original design criteria.
<u>Vocabulary:</u> Decorate, fabric fabric glue, knot, needle Joining, needle, threader running stitch sew, template thread				
Summer				
<u>Mechanisms – Wheels and Axles</u>	• Analyse popular toys with the correct terminology. • Create functional mechanisms that produce	• To know that mechanisms are a collection of moving parts that work together as a machine to produce	• Creating a design criteria a mode of transport. • Designing a moving vehicle for a specific audience in	Explore and evaluate a range of products with wheels and axles.



Beach Wagon for Brighton	the desired input and output motions. • Design transport suitable for children, which satisfy most of the design criteria. • Evaluate their two designs against the design criteria, using this information and the feedback of their peers to choose their best design. • Select and assemble materials to create their planned transport features. • Assemble the transport according to design and evaluate.	movement. • To know that there is always an input and an output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input.	accordance with a design criteria. • Experimenting with axles and wheels adjusting the widths, lengths and thicknesses used. • Cutting and assembling components neatly. • Evaluating own designs against design criteria. • Using peer feedback to modify a final design.	• Evaluate their ideas throughout and their products against original criteria.
<u>Vocabulary</u> axle design criteria input mechanical output pivot wheel chassis				

Year 3	Learning Outcomes	Key Knowledge	Key Skills	Evaluation
Autumn				



<u>Shell Structures</u> <u>CAD</u> Christmas Gift Box	• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. • Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas.	• Technical knowledge and understanding • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. Develop and use knowledge of how to construct strong, stiff shell structures. • Know and use technical vocabulary relevant to the project.	• Plan the order of the main stages of making. • Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use computer-generated finishing techniques suitable for the product they are creating. Evaluating Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria.	Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.
<u>Vocabulary:</u> shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating • font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype				
Spring				
<u>Textiles 2D and 3D products</u>	• Generate realistic ideas through discussion and design criteria for an	• Know how to strengthen, stiffen and reinforce existing fabrics.	• Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.	Investigate a range of 3-D textile products relevant to the project.

Tool bag	appealing, functional product fit for purpose and specific user/s. Produce annotated sketches, prototypes, final product sketches and pattern pieces	- Understand how to securely join two pieces of fabric together. - Understand the need for patterns and seam allowances. - Know and use technical vocabulary relevant to the project.	- Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern. Evaluating - Investigate a range of 3-D textile products relevant to the project. - Test their product against the original design criteria and with the intended user. Take into account others' views. Understand how a key event/individual has influenced the development of the chosen product and/or fabric.	- Test their product against the original design criteria and with the intended user. - Take into account others' views. - Understand how a key event/individual has influenced the development of the chosen product and/or fabric.
-----------------	---	---	---	--

Vocabulary:

fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance, user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces

Summer

<u>Food</u> <u>Healthy</u> <u>and Varied</u> <u>Diet</u> Healthy Stir Fry	- Follow a recipe, with some support. - Describe some of the features of a stir fry based on taste, smell, texture and appearance. - Adapt a recipe by adding extra ingredients to it. - Plan a stir fry recipe	- Designing a stir fry within a given budget, drawing upon previous taste testing. - Following a recipe. - Cooking safely, following basic hygiene rules. - Adapting a recipe. - Evaluating a recipe, considering: taste, smell, texture and appearance. - Describing the impact of the	- To know that the amount of an ingredient in a recipe is known as the 'quantity'. - To know that it is important to use oven gloves when removing hot food from an oven. - To know the following cooking techniques: sieving, creaming, rubbing method, cooling. - To understand the importance of budgeting while planning	- Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. - Evaluate the ongoing work and the final product with reference to the design
--	--	--	---	---



	within a budget.	budget on the selection of ingredients. - Evaluating and comparing a range of products. - Suggesting modifications.	ingredients for a stir fry.	criteria and the views of others.
--	------------------	--	-----------------------------	-----------------------------------

Vocabulary:

design criteria research texture innovative aesthetic measure

cross-contamination diet

processed packaging

Year 4	Learning Outcomes	Key Knowledge	Key Skills	Evaluate
Autumn				
<u>Food Healthy and Varied Diet</u> Sustainable lunch	- Follow a recipe, with some support. - Describe some of the features of a sustainable lunch based on taste, smell, texture and appearance. - Adapt a recipe by adding extra ingredients to it. - Plan a lunch recipe within a budget.	- Designing a lunch within a given budget, drawing upon previous taste testing. - Following a recipe. - Cooking safely, following basic hygiene rules. - Adapting a recipe. - Evaluating a recipe, considering: taste, smell, texture and appearance. - Describing the impact of the budget on the selection of ingredients. - Evaluating and comparing a range of products. - Suggesting modifications.	- To know that the amount of an ingredient in a recipe is known as the 'quantity'. - To understand the importance of budgeting while planning ingredients for a sustainable lunch.	- Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. - Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.

**Vocabulary:**

design criteria research texture innovative aesthetic measure

cross-contamination diet

processed packaging

Spring**Electrical
Systems –
simple
programming
and control****Electronic
Quiz**

- To create a nightlight or an illuminated sign that flashes on and off, using a light emitting diode (LED) as the output device.

- Understand and use computing to program and control products containing electrical systems, such as series circuits incorporating switches, bulbs and buzzers.
- Know and use technical vocabulary relevant to the project.

- Gather information about users' needs and wants, and develop design criteria to inform the design of products that are fit for purpose.
- Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.
- Order the main stages of making.
- Select from and use tools and equipment to cut, shape, join and finish with some accuracy.
- Connect simple electrical components and a battery in a series circuit to achieve a functional outcome.

Investigate and analyse a range of existing battery-powered products, including pre-programmed and programmable products.

- Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.



			• Program a standalone control box, microcontroller or interface box to enhance the way the product works. Investigate and analyse a range of existing battery-powered products, including pre-programmed and programmable products. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.	
--	--	--	---	--

Vocabulary:

series circuit, fault, connection, toggle switch, push to-make switch, push-to-break switch, battery, battery holder, light emitting diode (LED), bulb, bulb holder, USB cable, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, process user, purpose, function, prototype, design criteria, innovative, appealing, design brief

Summer

<u>Mechanisms</u> <u>– Pneumatics</u> <u>Toy for Year</u> <u>1</u>	• Draw accurate diagrams with correct labels, arrows and explanations. • Correctly identify definitions for key terms. • Identify five appropriate design criteria.	• Understand and use pneumatic mechanisms. • Know and use technical vocabulary relevant to the project.	• Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.	• Investigate and analyse books, videos and products with pneumatic mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make.
--	---	--	--	--



- Communicate two ideas using thumbnail sketches.
- Communicate and develop one idea using an exploded diagram.
- Select appropriate equipment and materials to build a working pneumatic system.
- Assemble their pneumatic system within the housing to create the desired motion.
- Create a finished pneumatic toy that fulfils the design brief.

- Select from and use finishing techniques suitable for the product they are creating.
- Investigate and analyse books, videos and products with pneumatic mechanisms.
- Evaluate their own products and ideas against criteria and user needs, as they design and make.
- Order the main stages of making.
- Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.
- Select from and use finishing techniques suitable for the product they are creating.
- Investigate and analyse books, videos and products with pneumatic mechanisms.
- Evaluate their own products and ideas against criteria and user needs, as they design and make.

Vocabulary:



components, fixing, attaching, tubing, syringe, plunger, split pin, paper fastener, pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight, linear, rotary, oscillating, reciprocating, user, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate

Year 5	Learning Outcomes	Key Knowledge	Key Skills	Evaluate
Autumn				
<u>Textiles – Combining different fabric shapes</u> Bags – using sewing machines.	• Ensure children have a basic understanding of stitching techniques, threading needles, starting and finishing off. • Make mock-ups, then alter and refine and go back to initial design ideas to amend as necessary e.g. change measurements. Ensure the children keep all their modifications as part of the ongoing evaluation and for their final evaluation.	• A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate.	• Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer-aided design. • Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. • Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. • Investigate and analyse textile products linked to their final product.	Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work



			• Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work.	
--	--	--	---	--

Vocabulary:

seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces, name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper, design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype

Spring

**Structures –
Frame
Structures**

Trojan Horse

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> • Identify stronger and weaker shapes. • Recognise that supporting shapes can help increase the strength, allowing it to hold more weight. • Identify beam, arch and truss bridges and describe their differences. • Use triangles to create simple truss bridges that support a load (weight). • Cut beams to the correct size, using a cutting mat. • Smooth down any rough cut edges with sandpaper. • Follow each stage of the truss bridge creation as instructed by their teacher. | <ul style="list-style-type: none"> • Understand how to strengthen, stiffen and reinforce 3D frameworks. • Know and use technical vocabulary | <ul style="list-style-type: none"> • Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches. • Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making. | <p>Investigate and evaluate a range of existing frame structures.</p> <ul style="list-style-type: none"> • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures. |
|--|---|--|---|



	- Complete a bridge, with varying ranges of accuracy and finish, supported by the teacher. - Identify some areas for improvement, reinforcing their bridges as necessary.		- Investigate and evaluate a range of existing frame structures. - Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. - Research key events and individuals relevant to frame structures.	
--	--	--	---	--

Vocabulary:

Frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent, design brief, design, truss, specification, prototype, annotated sketch, purpose, user, innovation, research, functional

Summer

<u>Mechanisms</u> <u>CAMS</u> Toy for a Tibetan Child	- When making a cam and lever mechanism, remember the distance between the cam and the pivot point of the lever will affect the amount of movement, with more movement close to the pivot. - When making a cam and slider mechanism, position the cam, slider and guides correctly. Measure where the cam will go to at the base of its cycle so that it does not overlap the bottom of the board. The guides	- Understand that mechanical systems have an input, process and an output. - Understand how cams can be used to produce different types of movement and change the direction of movement. - Know and use technical vocabulary	- Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. - Develop a simple design specification to guide their thinking. - Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. Making - Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. - Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work	Compare the final product to the original design specification. - Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. - Consider the views of others to improve their work. - Investigate famous manufacturing and
--	--	---	--	--



	should be positioned so that there is enough clearance for the cam to turn at the top of its cycle.	relevant to the project.	within the constraints of time, resources and cost. • Compare the final product to the original design specification. • Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. Investigate famous manufacturing and engineering companies relevant to the project. •	engineering companies relevant to the project.
--	---	--------------------------	--	--

Vocabulary:
cam, snail cam, off-centre cam, peg cam, pear shaped cam, follower, axle, shaft, crank, handle, housing, framework, rotation, rotary motion, oscillating motion, reciprocating motion, annotated sketches, exploded diagrams, mechanical system, input movement, process, output movement, design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

EXTRA – Culinary Chef Experience for Year 5

<u>Food – Celebrating culture and seasonality</u> <u>Royal Academy Culinary Arts</u>	• Demonstrate how to measure out, cut, shape and combine e.g. knead, beat, rub and mix ingredients. • Demonstrate how to use appropriate utensils and equipment that the children may use safely and hygienically. • Techniques could be practised following a basic recipe to prepare and cook a savoury food product. • Ask questions about which ingredients could be changed or	• Know how to use utensils and equipment including heat sources to prepare and cook food.	• Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. • Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas. Making Write a step-by-step recipe,	Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/ charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others
--	--	---	---	---



	added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance and smell. When using a basic dough recipe, explore making different shapes to change the appearance of the food product e.g. Which shape is most appealing and why?	• Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary	including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present the food product appropriately for the intended user and purpose. Evaluating • Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/ charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets.	when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets.
--	---	---	---	---

Vocabulary

Ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs, fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality, utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble, design specification, innovative, research, evaluate, design brief

Year 6	Learning Outcomes	Key Knowledge	Key Skills	Evaluate
--------	-------------------	---------------	------------	----------

Autumn

Electrical – more complex switches and circuits

Museum Alarm for Artefact

- Discuss the difference between products that rely upon timed events, such as traffic lights, and those that depend upon monitoring to make something happen such as a security alarm.
- Some children will be ready to use parallel circuits in their electrical systems and this enables two or more sensors or switches to be incorporated in their products.
- Have a 'working' circuit set up so that children can test suspect components. Some components e.g. buzzers and light emitting diodes (LEDs) need to be connected the right way round in a circuit, ensuring positive and negative match the poles of the battery.
- Make sure electrical components and batteries match e.g. 1.5v bulb with a 1.5v battery.

- Understand and use electrical systems in their products. Apply their understanding of computing to program, monitor and control their products.
- Know and use technical vocabulary relevant to the project.

- Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost. Generate and develop innovative ideas and share and clarify these through discussion.
- Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.
- Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.
- Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.
- Continually evaluate and modify the working features of the product to match the initial design specification.
- Test the system to demonstrate its effectiveness for the intended user and purpose.
- Investigate famous inventors who developed ground-breaking electrical systems and components.

- Continually evaluate and modify the working features of the product to match the initial design specification.
- Test the system to demonstrate its effectiveness for the intended user and purpose.
 - Investigate famous inventors who developed ground-breaking electrical systems and components.

Vocabulary:



series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart, function, innovative, design specification, design brief, user, purpose

Spring

<u>Frame Structures</u> <u>– CAD</u> <u>Book Stand</u>	• Use the simulation tools in Tinkercad to experiment with different structural designs, materials and forces. • Start with the Tinkercad 'Basic Shapes' then use copy and paste to create a range of similar support elements. • Ensure that the children have a good understanding of the associated vocabulary and of 2D and 3D shapes in maths before carrying out this project. • When using Tinkercad, give	• Develop and use knowledge of box and frame structures and, where appropriate, more complex 3D structures. • Develop and use knowledge of how to construct strong, stiff frame structures. • Know and use technical vocabulary relevant to the project.	• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. • Develop ideas through the analysis of existing frame structures and use computer aided design to model and communicate ideas. • Plan the order of the main stages of making. • Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use computer-generated models suitable for the product they are creating. • Investigate and evaluate a range of frame structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.	Investigate and evaluate a range of frame structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.
---	---	--	--	---

Vocabulary:

frame structure, three-dimensional (3D) shape, triangulation, compression, tension, bending, torsion, load, capacity, marking out, measuring, shaping, joining, assembly, accuracy, material, strong, reduce, reuse, recycle, reinforce, function, performance, decision, evaluating, design brief, design criteria, innovation, prototype, CAD related terms e.g. handle, workplane etc.

Summer

Food – Celebrating culture and seasonality

Providing Fairtrade food at the Thank You Tea Party.

- Demonstrate how to measure out, cut, shape and combine e.g. knead, beat, rub and mix ingredients.
- Demonstrate how to use appropriate utensils and equipment that the children may use safely and hygienically.
- Techniques could be practised following a basic recipe to prepare and cook a savoury food product.
- Ask questions about which ingredients could be changed or added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance and smell. When using a basic dough recipe, explore making different shapes to change the appearance of the food product e.g. Which shape is most appealing and why?

- Know how to use utensils and equipment including heat sources to prepare and cook food.
- Understand about seasonality in relation to food products and the source of different food products.
- Know and use relevant technical and sensory vocabulary

- Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.
- Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose.
- Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas. Making Write a step-by-step recipe, including a list of ingredients, equipment and utensils
- Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.
- Make, decorate and present the food product appropriately for the intended user and purpose. Evaluating
- Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/ charts such as star diagrams.
- Evaluate the final product with reference back to the design brief and design

- Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/ charts such as star diagrams.
- Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements.
 - Understand how key chefs have influenced eating habits to promote varied and healthy diets.



			specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets.	
--	--	--	--	--

Vocabulary:

Ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs, fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality, utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble, design specification, innovative, research, evaluate, design brief

Transition in to year 7 – KS3 Curriculum

After liaising with secondary colleagues who deliver KS3 Design and Technology curriculum at our local primary school, these are the skills they believe children need to come into year 7 having experienced:

- Students need to learn to research existing products and solutions to inform their design ideas.
- Students need to be able to evaluate the development of engineered products.
- Students need to use sketching and modeling techniques to create products and solve problems.
- Students should be able to use technical vocabulary relevant to their projects.
- Students should know how to use computing to program, monitor, and control their products.
- Student should have experience learning to plan and construct their designs.
- Students should know how to assemble and disassemble their designs.
- Students know how to join, fix, and use materials effectively.



Quality First Teaching in D&T

To deliver quality first teaching at Ditchling Primary it is essential to integrate a comprehensive curriculum that balances theoretical understanding with practical application. This includes fostering a passion for art and design through engaging activities, incorporating diverse media and cultural perspectives, and providing ample opportunities for active participation.

Furthermore, fostering a supportive and inclusive environment, including Pupil Premium, SEND and high attaining pupils, where every child feels empowered to explore their creative abilities is paramount. By prioritising the development of foundational skills, encouraging creativity, and nurturing a love for design and technology, teachers at Ditchling can ensure that all students receive a high-quality design and technology education that enriches their learning experience and cultivates lifelong appreciation for design and technology.

It is crucial to implement strategies that challenge pupils and promote continuous growth. This is achieved at Ditchling by offering differentiated learning experiences tailored to individual abilities, encouraging students to explore more complex design concepts and techniques as they progress. Additionally, incorporating opportunities for collaborative design and technology, such as the Hurst DT Dyas, encourages teamwork and creativity while pushing students to refine their skills. By setting high expectations and providing scaffolded support, we inspire our pupils to push their boundaries, develop resilience, and achieve their full creative potential.

Enrichment Experiences for D&T

Royal Academy of Culinary Arts

DT Workshops at Hurst

Little Foodies

Creative Arts Week

Hurst DT Workshop

Sewing Club

