Our Design Technology Curriculum

From tiny seeds beautiful minds blossom and grow…

Developed with reference to

Design Technology Curriculum Intent

At East Herrington Primary Academy, we strongly believe that DT should provide our children with a real life context for learning. We want all of our children to be inspired by the experiences they have in DT lessons and to make the valuable link to the opportunities available in the wider world. To realise that they, like some of their family members, could be future engineers, chefs, designers or architects. Through mini and extensive projects our children can create a range of structures, mechanisms, textiles, electrical systems and food products with real life purpose.

Design Technology Curriculum Implementation

- As a school we ensure a range of skills are taught and then built upon later in the children's school career. Teaching and learning should show progression across all key stages.
- Each year group completes 3 focused units of DT per year, with specific skills mapped and taught to allow for progression as the children move up the school. This enables children to build upon prior knowledge and progress in ability and understanding of different techniques.
- An emphasis is placed on cooking and nutrition which is taught in each year group (1 of the focused units mentioned above) with specific age-appropriate skills embedded.
- We currently follow the 'Projects on a Page' scheme which clearly organises specific skills and knowledge into appropriate year groups. It also provides key information without being too prescriptive, to allow teachers to plan projects which will capture children's interests, whilst enhancing learning in other curriculum areas by making meaningful links.
- The curriculum promotes practical learning as well as research. Each unit provides children the chance to experiment with current products in order to be able to make informed decisions about the design process.
- All teaching of DT follows the design, make and evaluate cycle.

Design Technology Curriculum Impact

- Children will achieve age related expectations and build upon sticky knowledge.
- Children will develop and build upon the skills needed to carry out DT throughout the school.
- Children will be given numerous opportunities to become inquisitive about the way products work. They will be encouraged to ask and answer questions in order to deepen their understanding of product and product design.
- Teachers will assess children at the end of units of work and feed this information into the next unit of work ensuring all children are making progress.
- Children will know that DT skills can open doors to various career opportunities now and in the future.
- Opportunities for children in upper Key Stage 2 to attend STEM club, allow them to further see the relevance and value of DT within the real world.

Talk like a Theologian
Sentence Stems

- I like / dislike...
- I wonder...

- Overall, I think that...
- I agree / disagree with… as...
- I wonder why...

- Some … believe that,
- This teaches others that...
- This has influenced others, by...
- From my own reflection,
- I have noticed that...
- It is a view that...
- Some people agree / disagree with this belief, because...
- This view is persuasive because...

- One interpretation of this text is...
- This could mean that...
- The greatest effect of this is...
- One impact of this belief is...
- In contrast, it could be argued...
- Therefore, we can conclude that...
- I can see why … might think that... but has it been considered that...
- It is possible that... results in...
- Ethically, this makes me feel...due to the...

EYFS

Our main link to design technology is within our ‘Expressive Arts and Design’ area of learning

3-4 year olds	Expressive Arts and design		Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures. Create closed shapes with continuous lines, and begin to use these shapes to represent objects. Draw with increasing complexity and detail, such as representing a face with a circle and including details. Use drawing to represent ideas like movement or loud noises. Show different emotions in their drawings and paintings, like happiness, sadness, fear, etc. Explore colour and colour mixing. Continues to explore colour and how colours can be changed Develops an understanding of using lines to enclose a space, and begins to use drawing to represent actions and objects based on imagination,
Reception	Expressive Arts and design		Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills. **Develops their own ideas through experimentation with diverse materials, e.g. light, projected image, loose parts, watercolours, powder paint, to express and communicate their discoveries and understanding.**
ELG	Expressive Arts and Design	Creating with Materials	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used

Other areas of learning that may link to Design Technology:

3-4 year olds	Physical Development		Use large-muscle movements to wave flags and streamers, paint and make marks. Choose the right resources to carry out their own plan. Use one-handed tools and equipment, for example, making snips in paper with scissors. Use a comfortable grip with good control when holding pens and pencils. Manipulates a range of tools and equipment in one hand, tools include paintbrushes, scissors, hairbrushes, toothbrush, scarves or ribbons
Reception	Physical Development		Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor. Develop overall body-strength, balance, coordination and agility
ELG	Physical Development :	Fine Motor	Hold a pencil effectively in preparation for fluent writing - using the tripod grip in almost all cases. • Use a range of small tools, including scissors, paintbrushes and cutlery. • Begin to show accuracy and care when drawing.
ELG	Understanding the World	The Natural World	Explore the natural world around them, making observations and drawing pictures of animals and plants.

How might we do this in our provision?

Provide interesting objects to draw and paint, pointing out key features.

Observe and talk about famous designer's work or well known products.

Work collaboratively to both use tools and materials and to tidy up.

Talk about colour names and shades.

Investigate and explore colour mixing.

Express their ideas through a variety of mediums including clay, playdough, loose parts, collage and paint.

Use and explore a variety of tools everyday including chalks, pens, pencils and paintbrushes.

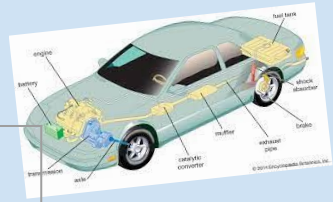
Talk about their own work, evaluate and reflect.

Visits to generate inspiration and conversation about design and designers.

Year 1

Design Technology

Wheels and Axles



Investigative and Evaluative Activities	**L.O. to explore and evaluate a range of existing wheeled products** Explore and evaluate a range of wheeled products such as toys and everyday objects. Through questioning, direct children's observations e.g. the number, size, position and methods of fixing wheels and axles. How do you think the wheels move? How do you think the wheels are fixed on? Why do you think the product has this number of wheels? Why do you think the wheels are round? Draw an example of a wheeled product, stating the user and purpose, and labelling the main parts e.g. body, chassis, wheels, axles and axle holders. Walk around the school building and grounds, recording how wheels and axles are used in daily life. Read a story or non-fiction book that includes a wheeled product. Use this to introduce relevant vocabulary and to emphasise user and purpose.
Focused Tasks	Using construction kits with wheels and axles, ask children to make a product that moves. • Demonstrate to children how wheels and axles may be assembled as either **fixed axles or free axles.** • Show different ways of making axle holders and stress the importance of making sure the axles run freely within the holders. Ensure that children are taught how to mark out, hold, cut and join materials and components correctly. • Using samples of materials and components they will use when designing and making, ask the children to assemble some examples of wheel, axle, axle holder combinations. Display the work completed as a reference for their DMEA.
Design	**L.O. to discuss and plan what product we will make, identifying its user and purpose** **L.O. to draw and/or label a drawing of our design** Discuss with the children what they will be designing, making and evaluating within an authentic context. • With the children identify a user and purpose for the product and generate simple criteria. • Ask children to generate, develop and communicate their ideas as appropriate e.g. through talk and drawing. Talk about, evaluate and share ideas with other children/adults.
Make	**L.O. to make a wheel and axle product that moves** **L.O. to use simple finishing techniques to enhance our product** Make their wheel and axle product using their design ideas and criteria as an ongoing guide. Discuss how the children might add finishing techniques to their product with reference to their design ideas and criteria. Direct the children to information and communication technology opportunities such as clip art, word processing, paint or simple drawing programs.
Evaluate	**L.O. to evaluate our finished product** Ask children to evaluate their finished product, communicating how it works and how it matches their design criteria, including any changes they made.

Vocabulary

vehicle, wheel, axle, axle holder, chassis, body, cab

assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism

names of tools, equipment and materials used

design, make, evaluate, purpose, user, criteria, functional

Design Technology

Freestanding Structures

Investigative and Evaluative Activities	**L.O. to investigate and evaluate structures found in the local area** Go on a walk and/or look at photographs of the local area to explore structures such as playground equipment, street furniture, walls, towers and bridges e.g. What are the structures called and what is their purpose? Who might use them? What materials have been used? Why have these been chosen? How have the parts been joined together? How have the structures been made strong enough? How have they been made stable? Where possible, ask the children to draw or photograph the structures they have been exploring and label with the correct technical vocabulary in relation to the structure, materials used and shapes e.g. wall, tower, framework, base, joint, metal, wood, plastic, brick, triangle, square, rectangle, cuboid, cube.
Focused Tasks	**L.O. to investigate a range of materials *to determine which are more suitable for the product and why*** Demonstrate measuring, marking out, cutting, shaping, joining and finishing techniques with a range of tools and new and reclaimed materials that children are likely to use to make their structures. Discuss the suitability of materials for their products according to their characteristics. **L.O. to build and explore a variety of freestanding structures** Ask the children to build and explore a variety of freestanding structures using construction kits, such as wooden blocks, interconnecting plastic bricks and those that make frameworks e.g. How can you stop your structures from falling over? How they can be made stronger and stiffer in order to carry a load? Children could make models of the structures they have seen in school and the local area. Ask children to fold paper or card in different ways to make freestanding structures, using masking tape where necessary to make joins. Encourage them to think about how folding materials can make them stronger, stiffer, stand up and be more stable e.g. Can they support an object on top of their structures without it falling over or breaking?
Design	**L.O. to discuss and plan what structure we will make, identifying its user and purpose.** **L.O. to draw and/or label diagrams to show what our structure will look like.** Discuss with the children what structure they will be designing, making and evaluating e.g. Who will your product be for? What will be its purpose? What materials will you use? How will you make it strong and stable? Generate some simple design criteria with the children e.g. the structure should stand up on its own, it should be strong enough to carry Teddy.Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with construction kits and other materials. As a whole class, plan the order in which the structures will be made.
Make	**L.O. to use appropriate materials and tools to build our freestanding structure** **L.O. to use simple finishing techniques suitable for the structure we have made** Children could make their final products from construction kits, new and reclaimed materials or any combination of these, according to their characteristics. Children to add simple finishing techniques such as adding paint to enhance their design.
Evaluate	**L.O. to discuss and evaluate our structures** Ask children to evaluate their developing ideas and final products against original design criteria.

Vocabulary:

cut, fold, join, fix

structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved

metal, wood, plastic

circle, triangle, square, rectangle, cuboid, cube, cylinder design,

make, evaluate, user, purpose, ideas, design criteria, product, function

Design Technology

Preparing Fruit and vegetables.

Investigative and Evaluative Activities	**L.O. to identify and evaluate a range of fruit** Children examine a range of fruit. Use questions to develop children's understanding e.g. What is this called? Who has eaten this fruit before? Where is it grown? When can it be harvested? What are its taste, smell, texture and appearance? What will it look like if we peel it or cut it in half? What are the different parts called? Provide opportunities for children to handle, smell and taste fruit in order to describe them through talking and drawing. e.g. What words can we use to describe the shape, colour, feel, taste? Evaluate existing products to determine what the children like best; provide opportunities for the children to **investigate preferences of their intended users/suitability for intended purposes** e.g. What do you prefer and why? What might we want to include in our product to meet our user's preferences? Which fruit might be the best for our product to match the occasion/purpose?
Focused Tasks	Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. What should we do before we work with food? Why is following instructions important? **L.O. to use appropriate tools to practice food processing skills** Demonstrate how to use simple utensils and provide opportunities for the children to practise food processing skills such as washing, grating, peeling, slicing, squeezing e.g. Do we eat the whole fruit? Why or why not? Which parts do we eat? What might we have to do before eating this? Why do we cut, grate, peel and slice in this way? Discuss different effects achieved by different processes. **L.O. to discuss and explain the importance of fruit in our balanced diet** Discuss healthy eating advice, including eating more fruit and vegetables; using The eatwell plate model talk about the importance of fruit and vegetables in our balanced diet e.g. Why is it good to eat fruit and vegetables? How many pieces of fruit/vegetables do you eat per day? Why is it important to wash fruit/vegetables before we eat them?
Design	**L.O. to discuss and plan what product we will make, identifying its purpose and intended user** **L.O. to draw and label diagrams to show what our design will look like.** Set a context for designing and making which is authentic and meaningful. Discuss with the children the possible products that they might want to design, make and evaluate and who the products will be for. Agree on design criteria that can be used to guide the development and evaluation of children's products e.g. Who/what is the product for? What will make our product unique/different? How will we know that we designed and made a successful product? Use talk and drawings when planning for a product; ask the children to develop, model and communicate their ideas e.g. What will you need? What fruit/vegetable will you need? How much will you need? How will you present the product?
Make	**L.O. to work safely and hygienically using appropriate tools, techniques and ingredients to make a fruit salad/skewer** Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs.
Evaluate	**L.O. to discuss and evaluate our product** Evaluate as the children work through the project and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

Vocabulary

fruit names, names of equipment and utensils

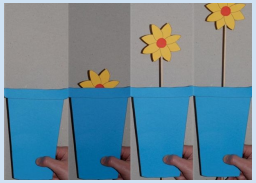
sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard

flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria

Year 2

Design Technology

Sliders and Levers



Investigative and Evaluative Activities	**L.O. to explore and evaluate a collection of books and everyday products that have moving parts,** *including those with levers and sliders. e.g. What is it? Who is it for? What is it for?* Use questions to develop children's understanding e.g. What do you think will move? How will you make it move? What part of the product moved and how did it move? How do you think the mechanism works? What else could move in the product? How well does it work? Introduce and develop vocabulary e.g. lever, pivot, slider, left, right, push, pull, up, down, forwards, backwards, in, out.
Focused Tasks	**L.O. to use the correct tools and materials to replicate a slider and lever teaching aid** Demonstrate simple levers and sliders to the children using prepared teaching aids. It is helpful if these are also used in context e.g. the slider is used to show a snail appearing from behind a stone, the lever is used to show a butterfly flying to a flower. Use questions to develop children's understanding e.g. How does the slider move? How does the lever move? Which part of the mechanism is the pivot? What does the movement of the slider and lever remind you of? Following teacher demonstration of the correct use of tools and materials, children should develop their knowledge and skills by replicating the slider and lever teaching aids. Encourage children to add pictures to their mechanisms
Design	**L.O. to discuss and plan what product we will make, identifying its purpose and intended user.** **L.O. to draw and or label diagrams to show what our design will look like.** Discuss with the children what they will be designing, making and evaluating e.g. Who will your product be for? What will be its purpose? How do you want it to move? Will you use a lever or a slider? Generate simple design criteria with the children e.g. the mechanism should work smoothly, it should make the right type of movement. Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with paper and card.
Make	**L.O. to use appropriate tools correctly to cut, shape and join materials and use simple finishing techniques to enhance our product.** **L.O. to follow safety rules** As a whole class, talk about the order in which the mechanisms will be made. Discuss the finishing techniques the children might use e.g. using digital text and graphics, paint, felt tipped pens or collage.
Evaluate	**L.O. to discuss and evaluate our product** *discussing how well it works in relation to its purpose and the user and whether it meets design criteria.* Ask children to evaluate their developing ideas and final products against the original design criteria. Ask the children to recognise good and bad points and how they could improve next time.

Vocabulary

slider, lever, pivot, slot, bridge/guide

card, masking tape, paper fastener, join

pull, push, up, down, straight, curve, forwards, backwards

design, make, evaluate, user, purpose, ideas, design criteria, product, function

Design Technology

Templates and Joining

Investigative and Evaluative Activities	**L.O. to investigate and evaluate a range of existing products** (*similar to the one to be made to give starting point for a design)* Children investigate and evaluate existing products linked to the chosen project. Explore and compare e.g. fabrics, joining techniques, finishing techniques and fastenings used. Use questions to develop children's understanding e.g. How many parts is it made from? What is it joined with? How is it finished? Why do you think these joining techniques have been chosen? How is it fastened? Who might use it and why? Make drawings of existing products, stating the user and purpose. Identify and label, if appropriate, the fabrics, fastenings and techniques used.
Focused Tasks	**L.O. to investigate fabrics to determine which is best for the purpose of the product they are creating** **L.O. to use the appropriate tools to mark out, tape or pin fabric to templates and cut out the relevant fabric pieces for the product** Using prepared teaching aids, demonstrate the use of a template or simple paper pattern. Children could make their own templates or paper patterns. If necessary, they can use ones provided by the teacher. Using prepared teaching aids, demonstrate the correct use of appropriate tools to mark out, tape or pin the fabric to the templates or paper patterns and cut out the relevant fabric pieces for the product. **L.O. to investigate, use and evaluate a range of joining techniques** Using prepared teaching aids, demonstrate appropriate examples of joining techniques for children to practise in guided groups e.g. running stitch including threading own needle, stapling, lacing and gluing. Talk about the advantages and disadvantages of each technique. Using prepared teaching aids, demonstrate examples of finishing techniques for children to practise in guided groups e.g. sewing buttons, 3-D fabric paint, gluing sequins, printing.
Design	**L.O. to discuss and plan what product we will make, identifying its purpose, intended user and select materials** **L.O. to draw and or label diagrams to show what our design will look like.** Provide the children with a context that is authentic. Discuss with children the purpose and user of the products they will be designing, making and evaluating. Design criteria developed with the teacher should be used to guide the development and evaluation of the children's products. Ask the children to generate a range of ideas e.g. What parts will the product need to have and what will it be made from? What size will it be? How will it be joined and finished? Through talk, drawings and mock-ups, ask the children to develop and communicate their ideas. Information and communication technology could be used for symmetry and pattern ideas. Choose one idea to follow through.
Make	**L.O. to use appropriate tools to join materials together and use simple finishing techniques to create a Paddington Puppet.** **L.O. to follow safety rules** Talk with the children about the stages in making before assembling quality products, applying the knowledge, understanding and skills learnt through the IEAs and FTs.
Evaluate	**L.O. to discuss and evaluate our product** *discussing how well it works in relation to its purpose and the user and whether it meets design criteria.* Evaluate ongoing work and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed

<u>Vocabulary</u>

names of existing products, joining and finishing techniques, tools, fabrics and components

template, pattern pieces, mark out, join, decorate, finish

features, suitable, quality mock-up, design brief, design criteria, make, evaluate, user, purpose, function

Design Technology

Preparing Fruit and Vegetables

Investigative and Evaluative Activities	**L.O. to identify and evaluate a range of vegetables** Children examine a range of fruit/vegetables. Use questions to develop children's understanding e.g. What is this called? Who has eaten this fruit/vegetable before? Where is it grown? When can it be harvested? What are its taste, smell, texture and appearance? What will it look like if we peel it or cut it in half? What are the different parts called? Provide opportunities for children to handle, smell and taste fruit and vegetables in order to describe them through talking and drawing. e.g. What words can we use to describe the shape, colour, feel, taste? Evaluate existing products to determine what the children like best; provide opportunities for the children to **investigate preferences of their intended users/suitability for intended purposes** e.g. What do you prefer and why? What might we want to include in our product to meet our user's preferences? Which fruit/vegetables might be the best for our product to match the occasion/purpose?
Focused Tasks	Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. What should we do before we work with food? Why is following instructions important? **L.O. to use appropriate tools to practice food processing skills** Demonstrate how to use simple utensils and provide opportunities for the children to practise food processing skills such as washing, grating, peeling, slicing, squeezing e.g. Do we eat the whole fruit? Why or why not? Which parts do we eat? What might we have to do before eating this? Why do we cut, grate, peel and slice in this way? Discuss different effects achieved by different processes. **L.O. to discuss and explain the importance of vegetables in our balanced diet** Discuss healthy eating advice, including eating more fruit and vegetables; using The eatwell plate model talk about the importance of fruit and vegetables in our balanced diet e.g. Why is it good to eat fruit and vegetables? How many pieces of fruit/vegetables do you eat per day? Why is it important to wash fruit/vegetables before we eat them?
Design	**L.O. to discuss and plan what product we will make, identifying its purpose and intended user (ensuring we include the principles of a balanced diet)** **L.O. to draw and label diagrams to show what our design will look like.** Set a context for designing and making which is authentic and meaningful. Discuss with the children the possible products that they might want to design, make and evaluate and who the products will be for. Agree on design criteria that can be used to guide the development and evaluation of children's products e.g. Who/what is the product for? What will make our product unique/different? How will we know that we designed and made a successful product? Use talk and drawings when planning for a product; ask the children to develop, model and communicate their ideas e.g. What will you need? What fruit/vegetable will you need? How much will you need? How will you present the product?
Make	**L.O. to work safely and hygienically using appropriate tools, techniques and ingredients to make a healthy seaside salad** Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs.
Evaluate	**L.O. to discuss and evaluate our product** Evaluate as the children work through the project and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

Vocabulary

vegetable names, names of equipment and utensils

sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard

flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria

Year 3

Design Technology

Shell Structures

Investigative and Evaluative Activities	**Topic Hook (Rainforest)** Discuss the foods which are produced in the rainforest. Why might they grow here? Children to have the opportunity to taste a range of juices made from fruits of the rainforest (passion fruit, papaya, coconut water, lemon, grapefruit, mango, orange, pineapple) The analysis grid is to be completed as they taste and select the juices they would use in their tropical drink (groups) **L.O. to research products (similar to the one to be made to give starting point for a design)** Children investigate a collection of different shell structures including packaging. Use questions to develop children's understanding e.g. What is the purpose of the shell structure – protecting, containing, presenting? What material is it made from? How has it been constructed? Are the materials recyclable or reusable? How has it been stiffened i.e. folded, corrugated, ribbed, laminated? What size/shape/colour is it? What information does it show and why? How attractive is the design? Children take a small package apart identifying and discussing parts of a net including the tabs e.g. How are different faces of the package arranged? How are the tabs used to join the 'free' edges of the net?Evaluate existing products to determine which designs children think are the most effective. Provide opportunities for the children to judge the suitability of the shell structures for their intended users and purposes. Discuss graphics including colours/impact of style/logo/size of font e.g. What do you prefer and why? What style of graphics and lettering might we want to include in our product to meet users' preferences and its intended purpose? Which packaging might be the best for…?
Focused Tasks	Children use kit parts with flat faces to construct nets. Practise making nets out of card, joining flat faces with masking tape to create 3-D shapes. Experiment with assembling in nets in numerous ways. Demonstrate skills and techniques of scoring, cutting out and assembling using pre-drawn nets. Then allow children to practise by constructing a simple box. Show how a window could be cut out and acetate sheet added. Demonstrate how to use different ways of stiffening and strengthening their shell structures e.g. folding and shaping, corrugating, ribbing, laminating. Provide opportunities for the children to practise these and to carry out tests to find out where their structures might need to be strengthened or stiffened. Children discuss and explore the graphics techniques and media that could be used to achieve the desired appearance of their products. Practise using (CAD) software to design the net, text and graphics for their products according to purposes.
Design	**L.O. to discuss and plan what product we will make, identifying its intended user and purpose** **L.O. to use annotated sketches to show what our product will look like and to identify what materials and tools are needed for our design** Develop a design brief with the children within a context which is authentic and meaningful.Discuss with the children the uses and purposes of their shell structures e.g. What does the product need to do? Who is it aimed at? How will the purpose and user affect your design decisions? Agree on design criteria that can be used to guide the development and evaluation of children's products e.g. How will we know that we have designed and made successful products? Ask the children to use annotated sketches and prototypes to develop, model and communicate their ideas for the product e.g. What will you need to include in your design? How can you improve it? What materials will you use? How will you make sure your product works well and has the right appearance?
Make	**L.O. to select and use appropriate materials, tools and skills learnt through focused tasks to create our final product** **L.O. to follow safety rules** Ask children to identify and order the main stages of making. Select and use appropriate tools to measure, mark our, cut, score, shape and assemble with some accuracy. Explain their choice of materials according to functional properties and aesthetic qualities. Use finishing techniques suitable for the product they are creating (Encourage the children to work with accuracy, using computer-aided design (CAD) where appropriate).
Evaluate	**L.O. to discuss and evaluate our finished product** Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed i.e. recognising what has gone well, suggest which elements they could improve in the future, discuss how well the product meets the design criteria Evaluate food by taste, flavour, texture etc. Children have the opportunity to mix their tropical drinks.Have a taste test – Taste each groups juice and write a comment on their feedback sheet.

Vocabulary:

shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity

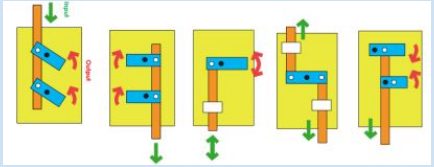
marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating

font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype

Design Technology

Levers and Linkages

Investigative and Evaluative Activities	**L.O. to investigate, analyse and evaluate a range of existing products that contain lever and linkage mechanisms** Children investigate, analyse and evaluate books and, where available, other products which have a range of lever and linkage mechanisms.Use questions to develop children's understanding e.g. Who might it be for? What is its purpose? What do you think will move? How will you make it move? What part moved and how did it move? How do you think the mechanism works? What materials have been used? How effective do you think it is and why? What else could move? Introduce new learning related to nature of movement: linear, rotary, oscillating, reciprocating
Focused Tasks	**L.O. to use the correct tools and materials to replicate lever and linkage mechanisms (following teaching aids)** Demonstrate a range of lever and linkage mechanisms to the children using prepared teaching aids. Use questions to develop children's understanding e.g. Which card strip is the lever? Which card strip is acting as the linkage? Which part of the system is the input and which part the output? What does the type of movement remind you of? Which are the fixed pivots and which are the loose pivots? Demonstrate the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques. Children should develop their knowledge and skills by replicating one or more of the teaching aids.
Design	**L.O. to discuss and plan what product we will make, identifying its intended user and purpose** **L.O. to use annotated sketches and prototypes to develop, model and communicate ideas** Develop a design brief with the children within a context which is authentic and meaningful. Discuss with children the purpose of the products they will be designing and making and who the products will be for. Ask the children to generate a range of ideas, encouraging creative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's products. Using annotated sketches and prototypes, ask the children to develop, model and communicate their ideas.
Make	**L.O. to select and use appropriate tools to accurately cut, shape and join paper and card to create our final product** **L.O. to select use finishing techniques to enhance our final product** Ask the children to consider the main stages in making before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs.
Evaluate	**L.O. to discuss and evaluate our final product** Evaluate the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.



Vocabulary

mechanism, lever, linkage, pivot, slot, bridge, guide

system, input, process, Output

linear, rotary, oscillating, reciprocating

user, purpose, function

prototype, design criteria, innovative, appealing, design brief

Design Technology

Healthy and Varied Diet

Investigative and Evaluative Activities	**L.O. to investigate similar products to the one to be made to give starting point for a design (Focus on type of breads for design).** Children investigate a range of food products e.g. the content of their lunchboxes over a week, a selection of foods provided for them, food from a visit to a local shop. Link to the principles of a varied and healthy diet using The eatwell plate e.g. What ingredients have been used? Which food groups do they belong to? What substances are used in the products e.g. nutrients, water and fibre? Carry out sensory evaluations on the contents of the food from e.g. a variety of bought food products such as a range of wraps or sandwiches. Record results, for example using a table. Use appropriate words to describe the taste/smell/texture/appearance e.g. How do the sensory characteristics affect your liking for the food? Gather information about existing products available relating to your product. Visit a local supermarket and/or use the internet. Find out how a variety of ingredients used in products are grown and harvested, reared, caught and processed e.g. Where and when are the ingredients grown? Where do different meats/fish/cheese/eggs come from? How and why are they processed?
Focused Tasks	**L.O. to select and use a range of utensils and techniques to combine and prepare food** **L.O. to identify and explain ways in which we can work hygienically when handling food** Learn to select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically including the bridge and claw technique, grating, peeling, chopping, slicing, mixing, spreading, kneading and baking. Food preparation and cooking techniques could be practised by making a food product using an existing recipe. Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. What should we do before we work with food? Why is following instructions important?
Design	**L.O. to discuss and plan our final product using the principles of a healthy and varied diet** **L.O. to plan a sequence of actions to make a product with labelled sketches** Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for.Develop and agree on design criteria with the children within a context that is authentic and meaningful. This can include criteria relating to healthy eating and a varied diet e.g. What do you need to consider to make it part of a balanced diet? How do we select the ingredients? How could we make it appealing to eat? Ask children to generate a range of ideas encouraging realistic responses. Using discussion, annotated sketches and information and communication technology if appropriate, ask the children to develop and communicate their ideas.
Make	**L.O. to select and use a range of tools and equipment which are appropriate for making our healthy sandwich** **L.O. to work safely and hygienically** Plan the main stages of a recipe, listing ingredients, utensils and equipment.Select and use appropriate utensils and equipment to prepare and combine ingredients. Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.
Evaluate	**L.O. to discuss and evaluate our final product** Evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria previously agreed. Consider what others think of the product when considering how the work might be improved.

Vocabulary:

name of products, names of equipment, utensils, techniques and ingredients

texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, Savoury

hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet

planning, design criteria, purpose, user, annotated sketch, sensory evaluations

Year 4

Design Technology:
2D Shape to 3D product,

Investigative and Evaluative Activities	**L.O. to** Children investigate a range of textile products that have a selection of stitches, joins, fabrics, finishing techniques, fastenings and purposes, linked to the product they will design, make and evaluate. Think about products from the past and what changes have been made in textile production and products e.g. the invention of zips and Velcro.
Focused Tasks	**L.O. to** Demonstrate a range of stitching techniques and allow children to practise sewing two small pieces of fabric together, demonstrating the use of, and need for, seam allowances. Provide a range of fabrics – children to consider whether fabrics are suitable for the chosen purpose and user. The fabrics also can be used for demonstrating and testing out a range of decorative finishing techniques e.g. appliqué, embroidery, fabric pens/paints, printing. Use questioning to develop understanding e.g. Which joining technique makes the strongest seam? Why? Which stitch is appropriate for the purpose? Which joining techniques are suitable for the fabric and purpose? How can you stiffen your fabric? What is the purpose of the fastenings? Which one is most suited to the purpose and user? What decorative techniques have been used? What effect do they have?

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

Design Technology:
2D Shape to 3D product,

Design	Children to create a design brief, supported by the teacher, set within a context which is authentic and meaningful. Discuss the intended user, purpose and appeal of their product. Create a set of design criteria. Ask children to sketch and annotate a range of possible ideas, constantly encouraging creative thinking. Produce mock-ups and prototypes of their chosen product. Plan the main stages of making e.g. using a flowchart or storyboard.
Make	Children to assemble their product using their existing knowledge, skills and understanding from IEAs and FTs. Encourage children to think about the aesthetics and quality finish of their product.
Evaluate	Evaluate as the process is undertaken and the final product in relation to the design brief and criteria. The product should be tested by the intended user and for its purpose and others' views sought to help with identifying possible improvements.

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

Design Technology:
Simple Circuits and switches

Investigative and Evaluative Activities	Discuss, investigate and, where practical, disassemble different examples of relevant battery-powered products, including those which are commercially available e.g. Where and why they are used? How does the product work? What are its key features and components? How does the switch work? Is the product manually controlled or controlled by a computer? What materials have been used and why? How is it suited to its intended user and purpose? Ask children to investigate examples of switches, including those which are commercially available, which work in different ways e.g. push-to-make, push-to-break, toggle switch. Let the children use them in simple circuits e.g. How might different types of switches be useful in different types of products? Remind children about the dangers of mains electricity.
Focused Tasks	Recap with the children how to make manually controlled, simple series circuits with batteries and different types of switches, bulbs and buzzers. Discuss which of the components in the circuit are input devices e.g. switches, and which are output devices e.g. bulbs and buzzers. Demonstrate how to find a fault in a simple circuit and correct it, giving pupils opportunities to practise. Ask the children to make a variety of switches by using simple classroom materials e.g. card, corrugated plastic, aluminium foil, paper fasteners and paper clips. Encourage children to make switches that operate in different ways e.g. when you press them, when you turn them, when you push them from side to side. Ask the children to test their switches in a simple series circuit. Teach children how to avoid making short circuits.

series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip

control, program, system, input device, output device

user, purpose, function, prototype, design criteria, innovative, appealing, design brief

Design Technology:
Simple Circuits and switches

Design	Develop a design brief with the children within a context which is authentic and meaningful. Discuss with children the purpose of the battery-powered products that they will be designing and making and who they will be for. Ask the children to generate a range of ideas, encouraging realistic responses. Agree on design criteria that can be used to guide the development and evaluation of the children's products, including safety features. Using annotated sketches, cross-sectional and exploded diagrams, as appropriate, ask the children to develop, model and communicate their ideas.
Make	Ask the children to consider the main stages in making and testing before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs.
Evaluate	Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip

control, program, system, input device, output device

user, purpose, function, prototype, design criteria, innovative, appealing, design brief

Design Technology:
Healthy and Varied Diet

Investigative and Evaluative Activities	Children investigate a range of food products e.g. the content of their lunchboxes over a week, a selection of foods provided for them, food from a visit to a local shop. Link to the principles of a varied and healthy diet using The eatwell plate e.g. What ingredients have been used? Which food groups do they belong to? What substances are used in the products e.g. nutrients, water and fibre? Carry out sensory evaluations on the contents of the food from e.g. a variety of bought food products such as a range of wraps or sandwiches. Record results, for example using a table. Use appropriate words to describe the taste/smell/texture/appearance e.g. How do the sensory characteristics affect your liking for the food? Gather information about existing products available **relating to your product**. Visit a local supermarket and/or use the internet. Find out how a variety of ingredients used in products are grown and harvested, reared, caught and processed e.g. Where and when are the ingredients grown? Where do different meats/fish/cheese/eggs come from? How and why are they processed?
Focused Tasks	Learn to select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically including the bridge and claw technique, grating, peeling, chopping, slicing, mixing, spreading, kneading and baking. Food preparation and cooking techniques could be practised by making a food product using an existing recipe. Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. What should we do before we work with food? Why is following instructions important?

name of products, names of equipment, utensils, techniques and ingredients

texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury

hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet

planning, design criteria, purpose, user, annotated sketch, sensory evaluations

Design Technology:
Healthy and Varied Diet

Design	Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for. Develop and agree on design criteria with the children within a context that is authentic and meaningful. This can include criteria relating to healthy eating and a varied diet e.g. What do you need to consider to make it part of a balanced diet? How do we select the ingredients? How could we make it appealing to eat? Ask children to generate a range of ideas encouraging realistic responses.Using discussion, annotated sketches and information and communication technology if appropriate, ask the children to develop and communicate their ideas.
Make	Ask children to consider the main stages in making the food product, before preparing/cooking the product including the ingredients and utensils they will need.
Evaluate	Evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria previously agreed. Consider what others think of the product when considering how the work might be improved.

name of products, names of equipment, utensils, techniques and ingredients

texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury

hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet

planning, design criteria, purpose, user, annotated sketch, sensory evaluations

Year 5

Design Technology:
Celebrating culture and seasonality.

Investigative and Evaluative Activities	Children use first hand and secondary sources to carry out relevant research into existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a local bakery, farm, farm shop or supermarket e.g. What ingredients are sourced locally/in the UK/from overseas? What are the key ingredients needed to make a particular product? How have ingredients been processed? What is the nutritional value of a product? Research **key chefs** and how they have promoted seasonality, local produce and healthy eating. Children carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. The ingredients could include those that could be added to a basic recipe such as herbs, spices, vegetables or cheese. These could be locally sourced, seasonal, Fair Trade or organic. Present results in e.g. tables/graphs/charts and by using evaluative writing.Use a range of questions to support children's ability to evaluate food ingredients and products e.g. What ingredients help to make the product spicy/crisp/crunchy etc? What is the impact of added ingredients/finishes/shapes on the finished product?
Focused Tasks	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?

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

Design Technology:
Celebrating culture and seasonality.

Design	Develop a design brief and simple design specification with the children within a context that is authentic and meaningful. This can include design criteria relating to nutrition and healthy eating. Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for. Ask children to generate a range of ideas encouraging innovative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's product. Using annotated sketches, discussion and information and communication technology if appropriate, ask children to develop and communicate their ideas.
Make	Ask children to record the steps, equipment, utensils and ingredients for making the food product drawing on the knowledge, understanding and skills learnt through IEAs and FTs.
Evaluate	Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed.

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

Design Technology:

Using computer aided design in textiles

Investigative and Evaluative Activities	Children investigate and evaluate a range of existing textiles products and how they have been constructed using disassembly, and evaluate what the fabric shapes look like, how the parts have been joined, how the product has been strengthened and stiffened, what fastenings have been used and why. Investigate work by designers and their impact on fabrics and products. Use questions to develop understanding e.g. Is the product functional or decorative? Who would use this product? What is its purpose? What design decisions have been made? Do the textiles used match the intended purpose? How has it been made? What has been used to enhance the appearance? Is the design innovative? Children investigate properties of textiles through investigation e.g. exploring insulating properties, water resistance, wear and strength of textiles.
Focused Tasks	Develop computer-aided design (CAD) skills by using pattern making software to generate, modify, scale, save and print pattern pieces. Recognise that designs can be easily modified and repeated on the computer without the need for a physical product. Investigate using art packages on the computer to design prints that can be applied to textiles using iron transfer paper. Develop skills of 2-D paper pattern making using CAD and create a 3-D paper or Dipryl mock-up of a chosen product. Remind/teach how to pin a pattern on to fabric ensuring limited wastage, how to leave a seam allowance and use different cutting techniques. Develop skills of threading needles and joining textiles using a range of stitches, building upon children's earlier experiences of stitches e.g. improving appearance and consistency of stitches and introducing new stitches. If available, demonstrate and allow children to use sewing machines to join fabric with close adult supervision. Develop skills of sewing textiles by joining right side together and making seams. Children should investigate how to sew and shape curved edges by snipping seams, how to tack or attach wadding or stiffening and learn how to start and finish off a row of stitches.

computer aided design (CAD), computer aided manufacture (CAM) font, lettering, text, graphics, menu, scale, modify, repeat, copy, flip design brief, design criteria, design decisions, innovative, prototype seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces names of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper annotate, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype

Design Technology:

Using computer aided design in textiles

Design	Set an authentic and meaningful design brief. Children generate ideas by carrying out research using surveys, interviews, questionnaires and the internet. Develop a design specification for their product. Communicate ideas through detailed, annotated drawings from different perspectives. Drawings should indicate the design decisions made, methods of strengthening, the type of fabrics to be used and the types of stitching that will be incorporated. Produce step-by-step plans, lists of tools equipment, fabrics and components needed. Allocate tasks within a team if appropriate. Develop their design using CAD software to produce pattern pieces and art programmes to produce decoration and design prints that can be applied to textiles.
Make	Make high quality products applying knowledge, understanding and skills from IEAs and FTs. Incorporate simple computer-aided manufacture (CAM) if appropriate e.g. printing on fabric. Use a range of techniques to ensure a well-finished final product that matches the intended user and purpose.
Evaluate	Evaluate both as the children proceed with their work and the final product in use, comparing the final product to the original design specification. Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for intended user and purpose, considering others' opinions. Communicate the evaluation in various forms e.g. writing for a particular purpose, giving a well-structured oral evaluation, speaking clearly and fluently.

computer aided design (CAD), computer aided manufacture (CAM) font, lettering, text, graphics, menu, scale, modify, repeat, copy, flip design brief, design criteria, design decisions, innovative, prototype seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces names of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper annotate, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype

Design Technology:

Cams

Investigative and Evaluative Activities	Discuss with the children different types of movement: rotary, oscillating and reciprocating. Make simple models of different types of cams or have toys in which the cam mechanisms can be seen. Use videos, photographs and computer animations of products that cannot be explored through first-hand experience. Encourage children to look for different types of movement in the home and in school. Use observational drawings and questions to develop understanding of the products in the handling collection and those that children have researched e.g. How innovative is the product? What design decisions have been made? What type of movement can be seen? What types of mechanical components are used and where are they positioned? What are the input movement, process and output movement of the system? How well does the product work? Why have the materials and components been chosen? How well has it been designed? How well has it been made? Children could research and, if possible, visit engineering and manufacturing companies that are relevant to the product they are designing and making e.g. car engine manufacturers
Focused Tasks	Give children pre-cut cams made from MDF or wooden wheels to mount on a piece of board and observe their movement with a follower. Demonstrate how to use a hand drill safely to make an off-centre cam and position it accurately in a housing. Ensure children secure the wheel with a G-clamp and use a piece of scrap wood under the wheel to avoid drilling through the bench hook or table. Stress the importance of measuring accurately and checking before cutting any holes or gluing. It is important to line up the cam and follower otherwise the mechanism may not work smoothly. How high will the cam lift the follower?

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

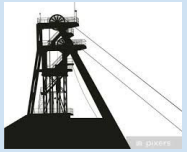
annotated sketches, exploded diagrams

mechanical system, input movement, process, output movement

design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

Design Technology:

Cams



Design	Develop an authentic and meaningful design brief with the children. Children generate innovative ideas by carrying out research including surveys, interviews and questionnaires and develop a design specification for their product, carefully considering the purpose and intended user for their product. Communicate ideas through detailed, annotated sketches from different views and/or exploded diagrams. The drawings should indicate the design decisions made, including the location of the components, how they work as a system and the appearance and finishing techniques for the product. Produce detailed step-by-step plans and lists of tools, equipment and materials needed. If appropriate, allocate tasks within a team.
Make	Make high quality products, applying knowledge, understanding and skills from IEAs and FTs. Children should use a range of decorative finishing techniques to ensure a well finished final product that matches the intended user and purpose.
Evaluate	Evaluate throughout and the final product in use, comparing it to the original design specification. Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for the intended user and purpose.

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

Year 6

Design Technology:

Frame structures

Investigative and Evaluative Activities	Children investigate and make annotated drawings of a range of portable and permanent frame structures, e.g. tents, bus shelters, umbrellas. Use photographs and web-based research to extend the range e.g. How well does the frame structure meet users' needs and purposes? Why were materials chosen? What methods of construction have been used? How has the framework been strengthened, reinforced and stiffened? How does the shape of the framework affect its strength? How innovative is the design? When was it made? Who made it? Where was it made? Children could research key events and individuals related to their study of frame structures e.g. Stephen Sauvestre – a designer of the Eiffel Tower; Thomas Farnolls Pritchard – designer of the Iron Bridge. They could also learn about locally important design and technology activity related to their project.
Focused Tasks	Use a construction kit consisting of plastic strips and paper fasteners to build 2-D frameworks. Compare the strength of square frameworks with triangular frameworks. Ask the children to reinforce square frameworks using diagonals to help develop an understanding of using triangulation to add strength to a structure. Demonstrate how paper tubes can be made from rolling sheets of newspaper diagonally around pieces of e.g. dowel. Ask children to use these tubes and masking tape or paper straws with pipe cleaners to build 3-D frameworks such as cubes, cuboids and pyramids. How could each of the frameworks be reinforced and strengthened? Demonstrate the accurate use of tools and equipment. Develop skills and techniques using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames, as appropriate. Demonstrate skills and techniques for accurately joining framework materials together e.g. paper straws, square sectioned wood. Ask children to practise these, mounting their joints onto card for future reference.

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

Design Technology:

Frame structures

Design	Discuss the brief of designing and making a small-scale frame structure e.g. Who is the intended user and what is the purpose of the frame structure? Will it be permanent, or can it be easily dismantled? What materials will you use? How will it be joined? How will it be reinforced? How will it be finished? Children should be encouraged to generate innovative ideas, drawing on their research. Ask children to develop a simple design specification to guide their thinking. Children should produce a detailed, step-by-step plan, listing tools and materials. Children's sketches should be annotated with notes to help develop and communicate their ideas. Encourage children to model their ideas first using materials such as paper, card and paper straws e.g. How will you make it stable? How will it stand up? How could you make it stronger? Where are the weak points? How could you reinforce them? What tools and materials will you need? How can you improve the design?
Make and Evaluate	Encourage children to make their products with accuracy. They should regularly evaluate their work and their completed product, drawing on their design specification, and thinking about the intended purpose and user.

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

Design Technology:

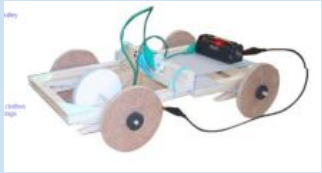
Complex switches and circuits

Investigative and Evaluative Activities	Using research, discuss a range of relevant products that respond to changes in the environment using a computer control program such as automatic nightlights, alarm systems, security lighting e.g. Who have the products been designed for and for what purpose? How and why is a computer control program used to operate the products? What input devices, e.g. switches, and output devices, e.g. bulbs, have been used? Investigate electrical sensors such as light dependent resistors (LDRs) and a range of switches such as push-to-make switches, push-to-break switches, toggle switches, micro switches and reed switches. To gain an understanding of how they are operated by the user and how they work, ask the children to use each component to control a bulb in a simple circuit. Remind children about the dangers of mains electricity. Children could research famous inventors related to the project e.g. Thomas Edison – light bulb
Focused Tasks	Through teacher demonstration and explanation, recap measuring, marking out, cutting and joining skills with construction materials that children will need to create their electrical products. Demonstrate and enable children to practise methods for making secure electrical connections e.g. using automatic wire strippers, twist and tape electrical connections, screw connections and connecting blocks. Drawing on science understanding, ask the children to explore a range of electrical systems that could be used to control their products, including a simple series circuit where a single output device is controlled, a series circuit where two output devices are controlled by one switch and, where appropriate, parallel circuits where two output devices are controlled independently by two separate switches. Drawing on related computing activities, ensure that children can write computer control programs that include inputs, outputs and decision making. Test out the programs using electrical components connected to interface boxes or standalone boxes. Teach children how to avoid making short circuits.

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

Design Technology:

Complex switches and circuits



Design	Develop an authentic and meaningful design brief with the children. Ask the children generate innovative ideas by drawing on research and develop a design specification for their product, carefully considering the purpose and needs of the intended user. Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams. Drawings should indicate the design decisions made, including the location of the electrical components and how they work as a system with an input, process and output. Produce detailed step-by-step plans and lists of tools, equipment and materials needed. If appropriate, allocate tasks within a team.
Make	Make high quality products, applying knowledge, understanding and skills from IEAs and FTs. Create and modify a computer control program to enable the product to work automatically in response to changes in the environment.
Evaluate	Critically evaluate throughout and the final product, comparing it to the original design specification. Test the system to demonstrate its effectiveness for the intended user and purpose.

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

Design Technology:

Celebrating culture and seasonality

Investigative and Evaluative Activities	Children use first hand and secondary sources to carry out relevant research into existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a local bakery, farm, farm shop or supermarket e.g. What ingredients are sourced locally/in the UK/from overseas? What are the key ingredients needed to make a particular product? How have ingredients been processed? What is the nutritional value of a product? Children carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. The ingredients could include those that could be added to a basic recipe such as herbs, spices, vegetables or cheese. These could be locally sourced, seasonal, Fair Trade or organic. Present results in e.g. tables/graphs/charts and by using evaluative writing. Use a range of questions to support children's ability to evaluate food ingredients and products e.g. What ingredients help to make the product spicy/crisp/crunchy etc? What is the impact of added ingredients/finishes/shapes on the finished product? Research key chefs and how they have promoted seasonality, local produce and healthy eating.
Focused Tasks	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?

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Design	Develop a design brief and simple design specification with the children within a context that is authentic and meaningful. This can include design criteria relating to nutrition and healthy eating. • Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for. • Ask children to generate a range of ideas encouraging innovative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's product. • Using annotated sketches, discussion and information and communication technology if appropriate, ask children to develop and communicate their ideas. • Ask children to record the steps, equipment, utensils and ingredients for making the food product drawing on the knowledge, understanding and skills learnt through IEAs and FTs.
Make and Evaluate	Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed.

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