Hunslet Carr Primary School
Leeds

Hunslet Carr Primary School D&T Scheme of work

Year 1 and 2			
	Autumn	**Spring**	**Summer**
Topic	***Where were the fire engines during the Great Fire of London?***	***How can we care for all living things?***	***How do we explore new places?***
Focus	Food and Nutrition	Freestanding structures	Mechanical systems (wheels and axles)
Outcome		**To create a bug hotel for the allotment.**	**To create an exploration vehicle for children.**
Framework progression:			
Design knowledge and skills:	**Across KS1 pupils should:** work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • state what products they are designing and making • say whether their products are for themselves or other users • describe what their products are for • say how their products will work • say how they will make their products suitable for their intended users • use simple design criteria to help develop their ideas. generate ideas by drawing on their own experiences • use knowledge of existing products to help come up with ideas • develop and communicate ideas by talking and drawing • model ideas by exploring materials, components and construction kits and by making templates and mock-ups • use information and communication technology, where appropriate, to develop and communicate their ideas		
Making knowledge and skills:	**Across KS1 pupils should:** plan by suggesting what to do next • select from a range of tools and equipment, explaining their choices • select from a range of materials and components according to their characteristics follow procedures for safety and hygiene • use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components • measure, mark out, cut and shape materials and components • assemble, join and combine materials and components • use finishing techniques, including those from art and design		
Evaluation skills:	**Across KS1 pupils should explore:**		

	talk about their design ideas and what they are making • make simple judgements about their products and ideas against design criteria • suggest how their products could be improved what products are • who products are for • what products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products		
Technical skills:		How freestanding structures can be made stronger, stiffer and more stable.	Understanding the movement of simple mechanisms such as wheels and axles.
Key vocabulary:		Design, make, evaluate, user, purpose, product, criteria. Freestanding structure, cut, fold, join, fix, weak, strong, base, top, side, edge, surface. Square, triangle, cube, cuboid.	Design, make, evaluate, user, purpose, product, criteria. Vehicle, wheel, axle, axle holder, mechanism, join, assemble.
Designer of interest (not a requirement)			
Content of sessions			
Evaluate and investigative activities:		Evaluating existing products for FS – specific questions based around the evaluation of objects with a purpose. Investigate and evaluate a range of existing structures for example – physical structures in the allotment, bug hotels to be bought. Tables and chairs etc. Introduce the language. What makes the structure stable? Explore how structures have a solid base and are wider at the bottom. What is the purpose of the structure? Who is the user? What materials have been used and why? How have they been made strong and stable? Children to draw and photograph things that they can see and label with the correct vocabulary – allotment and iPads.	Evaluating existing products for moving vehicles e.g. fire engine, cars, buses, tractors, ambulances etc. What do they all have in common? Why do vehicles have wheels? Are they the same size? Same amount? Who is it for? What is it for? What do you think will move? How can we make it move? What part of the product moved? How well does it work? Children work in groups to complete evaluation sheet. Explore the school and look for and evaluate a range of moving vehicles for example – balance bikes, small world vehicles, ride-on toys etc. Children to draw and photograph things that they can see and label with the correct vocabulary. How does the product move? What is the purpose of the toy? Who is the user? What materials have been used and why?

Focused Tasks:		Experiment using blocks, lego, bricks and construction kits to make structures. How can you stop it from falling down? How can you make it stronger? How can you make it stiffer? Practice joining card together in a variety of ways. Practice joining techniques for example use of masking tape. Practice using paper straws to create a structure. Does our structure need securing to the ground? Can you use pipe cleaners to join the two straws together? Making their own design decisions and being creative.	Explore products that move and look at ramps – how the vehicle moves down the slope. Demonstrate how wheels and axels can be assembly as free or fixed axels. Opportunities for children to mark holes, cut and join opponents correctly. Allow children to explore samples and materials that children will use in their final products. Draw out of card.
Design, make, evaluate: 		Share the design brief with the children. Who is the intended user? What is the purpose of the product? What features does your product have? What strengthening techniques are you going to use? Children to create a detailed plan – KS1 – draw a plan and label. Children to write which order they are going to make the final product in. Children to use taught vocabulary and label and annotate their drawings/ plan. Make the final product. Evaluate the final product against the success criteria. Experiment, peer evaluation.	Share with the children what the finished product will be. Have a discussion about the intended user and the purpose and together generate a simple criteria for example: • Wheels need to go around. • It needs to be the right size for a reception child to hold/use. Children to draw out their design. Then have a go at making it. How Can we add finishing techniques? This could be done through decoration or adding a number plate to our cars. Before evaluating our finished product.

Resources		Paper, card, paper straws, twigs, wood, glue, tape, string, blue tac.	Wheels, axles, cardboard boxes, blue tac, tape, glue, axle holder, a range of moving vehicles.

Year 3			
	Autumn	**Spring**	**Summer**
Topic	***How do we know about the Stone Age?***	***How can we secure out future?***	***Who would you live by a river?***
Focus	Textiles (2D to 3D)	Mechanical systems (levers and linkages)	Food and nutrition
Outcome	**To make a teddy of a stone age animal for the Year 1 children.**	**To create an interactive display for a building spreading a message about sustainability.**	**To create savoury healthy picnic items (sandwiches, wraps, rolls)**
Design knowledge and skills:	**Across KS2 pupils should:** • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work **In early KS2 pupils should also**: • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas **Across KS2 pupils should:** • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas In early KS2 pupils should also: • generate realistic ideas, focusing on the needs of the user • make design decisions that take account of the availability of resources		
Making knowledge and skills:	**Across KS2 pupils should:** • select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities **In early KS2 pupils should also:** • order the main stages of making		

	Across KS2 pupils should: • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components **In early KS2 pupils should also:** • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy • apply a range of finishing techniques, including those from art and design, with some accuracy		
Evaluation skills:	**Own ideas / products across KS2 pupils should:** • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work **In early KS2 pupils should also**: • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products **Existing products across KS2 pupils should investigate and analyse:** • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants **In early KS2 pupils should also investigate and analyse**: • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused		
Technical skills:		**Across KS2 pupils should know:** • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking	**Across KS2 pupils should know:** • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking

		In early KS2 pupils should also know: • how mechanical systems such as levers and linkages or pneumatic systems create movement	**In early KS2 pupils should also know:** that food ingredients can be fresh, pre-cooked and processed
Key vocabulary:		User, product, purpose, function, mechanism, lever, linkage, pivot, slot, bridge, system, input, output, process.	Nutrition, sugars, carbohydrates, dairy, calcium, fats, vitamins, minerals, protein.
Designer of interest:			
Content of the sessions			
Evaluate and investigative activities:		Evaluate and look at a range of books and card with moving parts. What is the purpose? Who is it for? Which bit is going to move? How will you make it move? How do you think the mechanism works? Looking at the book/card or product what else could move? How could it move? Evaluate a range of existing products what do you like about the product? What would you include in your own product?	Examine and investigate a range of existing products. What is it called? Have you ever eaten this before? Where is it grown? What does it taste like? How does it smell? How does it feel? What are the different parts called? What happens if we cut it in half? Consider how we can store our product. Evaluate the packaging of pre-existing products. Who is the user for our product? Can you conduct some research and find out what the user requires from the product and include this in our own designs? Evaluate a variety of different types of bread.
Focused Tasks:		Children to be provided with opportunities to practice making leavers and linkages. Provide children with opportunities to explore how they move.	Complete activities around a healthy balanced diet. Explore where the products come from.

		Children to create their own teaching aids. Adults to ask specific questions- which bit is the leaver? Which is the linkage? What is the input? What is the output? Explore and experiment how to link the two parts together using a linkage. Provide children with opportunities to practice cutting, marking and measuring. Explore creating fixed pivot- fitted to the card. Loose- Not fitted. Explore how- If all fixed wouldn't move. But need one fixed as it would be moving to freely.	Explore a variety of bread types- baguettes, wraps and different types of bread. Practice a range of chopping techniques. Explore food hygiene and food safety.
Design, make, evaluate: 		Discuss the design brief with the children. Design a success criteria. What is the purpose? What features if your card going to have? Which part is going to move? Children to design which part of the card is going to move. How is it going to relate to the picture? Plan out the different stages. What are you going to do first? Children to draw/ annotate and map out their ideas in a book prior to completing the final piece. Evaluate the finished product against the success criteria.	Discuss the design brief with the children. Design criteria- think about the user? What does our product need to have? How is our product going to be packaged? How are we going to present our product? Generate some success criteria together based upon the user and the purpose of the product. In small groups children to plan out their final products. Label and annotate. Children to make final product. Children to evaluate final product against the success criteria.
Resources	Needles, fabric (add to), threads, wool, scissors, different types of fastenings (glue, staples), buttons and beads (for decoration).	Card, paper fasteners, scissors, rulers, pencils and paper, pens and pencils (for decoration).	Knives, chopping boards, food, grater, bowls, spoons, peelers.

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Year 4			
	Autumn	**Spring**	**Summer**
Topic	***Would you rather live in Athens or Sparta?***	***How can I be the best me?***	***Do we live in Roman Times?***
Focus	Food and nutrition	Electrical systems.	Shell structures
Outcome	To create a Greek salad.		To create a jewellery box using a shell structure.
Framework progression:			
Design knowledge and skills:	**Across KS2 pupils should:** • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work **In early KS2 pupils should also**: • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas **Across KS2 pupils should:** • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas **In early KS2 pupils should also:** • generate realistic ideas, focusing on the needs of the user • make design decisions that take account of the availability of resources		
Making knowledge and skills:	**Across KS2 pupils should:** • select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities **In early KS2 pupils should also**: • order the main stages of making **Across KS2 pupils should:** • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components.		

	In early KS2 pupils should also: • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy • apply a range of finishing techniques, including those from art and design, with some accuracy		
Evaluation skills:	**Own ideas / products across KS2 pupils should:** • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work **In early KS2 pupils should also:** • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products **Existing products across KS2 pupils should investigate and analyse:** • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants **In early KS2 pupils should also investigate and analyse**: • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused		
Technical skills:		**Across KS2 pupils should know:** • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking **In early KS2 pupils should also know:** • how simple electrical circuits and components can be used to create functional products	**Across KS2 pupils should know:** • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking **In early KS2 pupils should also know:** • how to make strong, stiff shell structures.

Key vocabulary:		User, product, battery, bulb, buzzer, cell component, conductor, electricity, function, insulator, series circuit, switch, test, torch, wire.	Shell structure, 2D shapes, 3D shapes, net, tab, cuboid, prism, laminating, corrugating, ribbing, stiffen, scoring, assemble.
Designer of interest:			
Content of sessions:			
Evaluative and investigative activities:		Evaluate and investigate a range of existing products this may include: solar lights, heard torches, light boxes where you can write message. What is the purpose? Who is it for? Which bit is going to light up? How do you think it works? What features does it have? What do you like about the product? What would you include in your own? Provide children with opportunities to explore different types of switches and push buttons. Evaluate and investigate how a simple circuit works.	Investigate a range of different shell structures including exploring packaging. What is the purpose? To protect? To contain? Present? What material is it made from? How is it constructed? Can the material be used or recycled? Is there any information on the packaging? How has the material been strengthened? How attractive is the design? Investigate/ explore taking boxes apart and labelling the different parts for example faces and tabs. **Evaluation:** **Group 1-** Sandwich box. **Group 2-** Pizza box **Group 3:** Cardboard box **Group 4** Cereal Box Children to evaluate different boxes with different users/purposes. Reflect upon how takeaways boxes have changed. There has become a need for food packaging due to the need of takeaways and ready-made food. People are busy and may not have time to cook.

Focused tasks:		Provide children with opportunities to have a go at creating simple circuits with batteries, lights and buzzers. Explore input and output. Provide children with different opportunities to make different types of switches using card and paper clips. Provide children with opportunities to make switches that operate in different ways.	Construct/Assemble nets. Join faces together using masking tape. Create 3D shapes. Using pre-drawn nets children to practice cutting out and assembling them. Challenge- Can you cut in a window? Explore ways of strengthening the structure. This could be through layering/folding of the product. Can use a computer to design the net.
Design, make and evaluate. 		Discuss and share the design brief with the children. Together discuss the purpose and the user along with the intent- what is it for? As a class generate a success criteria. If your product is for someone younger consider if you need to include safety features? Create a design plan with detailed drawings and annotations. Outline and plan the different stages of the design. What are you going to do first? Children to make the final product. Children to complete an evaluation of the final product using their success criteria.	To create a box with a clear user and purpose in mind. What does it need to do? Who is it aimed at? How would the purpose/user inform their design decisions? Creating a jewellery box. Draw sketches and annotate them. List the materials that they will need. Design- Put the making aspects in order for example: • Draw on card • Then cut out • Strengthen the base so that if we put something heavy in it, it will not fall out. Fix the tabs.

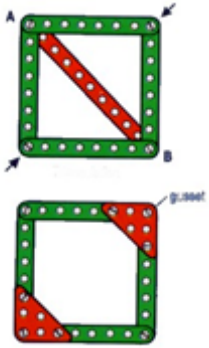
			Lesson 1: Investigate shell structures and their packaging. Children in groups to investigate and explore products and complete the evaluations sheet. **Lesson 2:** Take apart different boxes and look at the nets and label the different parts- faces/ tabs. Provide children with opportunities to construct/assemble nets. Children to practice joining faces together. Explore ways of strengthening the structure. This could be through layering/folding of the product. This may look like: Making a net using a printed template on paper. Making a box out of card. Making a box out of card- How can we strengthen the box? Corrugated card. Could use art straws to create an additional layer. **Lesson 3:** Design Allow children to draw sketches and annotate them. Make a list of the different materials that they are going to need to make the box. Children to put the making aspects in order and include this in their design plan. **Lesson 4:** Making the box following their design plan.

			Lesson 5: Decorating the box using the Mosaic arts (This element is Art and Design) Evaluate the final product (box) using their design criteria.
Resources	Knives, chopping boards, food, grater, bowls, spoons, peelers.	Batteries, wires, croc clips, switch mechanism.	Card, rulers, scissors, tape, glue, pens and pencils (for decoration).

Year 5			
	Autumn	**Spring**	**Summer**
Topic	***How did Vikings and Anglo Saxons change Britain?***	***How can we make Britain great?***	***Is Yorkshire a wonder of the world?***
Focus	Food and nutrition	Mechanical systems	Frame structures
Outcome		To create an Automata toy to narrate a story about diversity.	To create a frame structure for the school children.
Framework progression:			
Design knowledge and skills:	**Across KS2 pupils should:** • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work **In late KS2 pupils should also**: • carry out research, using surveys, interviews, questionnaires and web-based resources • identify the needs, wants, preferences and values of particular individuals and groups • develop a simple design specification to guide their thinking **Across KS2 pupils should:** • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas		

	In late KS2 pupils should also: • generate innovative ideas, drawing on research • make design decisions, taking account of constraints such as time, resources and cost
Making knowledge and skills:	**Across KS2 pupils should:** • select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities **In late KS2 pupils should also:** • produce appropriate lists of tools, equipment and materials that they need • formulate step-by-step plans as a guide to making **Across KS2 pupils should:** • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components. **In late KS2 pupils should also:** • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design • use techniques that involve a number of steps • demonstrate resourcefulness when tackling practical problems
Evaluation skills:	**Own ideas / products across KS2 pupils should:** • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work **In late KS2 pupils should also**: • critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • evaluate their ideas and products against their original design specification **Existing products across KS2 pupils should investigate and analyse:** • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants

	In late KS2 pupils should also investigate and analyse: • how much products cost to make • how innovative products are • how sustainable the materials in products are • what impact products have beyond their intended purpose		
Technical skills:		**Across KS2 pupils should know:** • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking **In late KS2 pupils should also know:** • how mechanical systems such as cams or pulleys or gears create movement	**Across KS2 pupils should know:** • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking **In late KS2 pupils should also know:** • how to reinforce and strengthen a 3D framework
Key vocabulary:		Computer-aided-design (CAD), design, design brief, function, input, linkage, mechanism, motion, output, pivot, prototype, slider, structure, template, pulleys, cams, axles.	Design brief, strength, stable, annotations, prototype, framework, reinforcing, jinks' corner (see below) 
Designer of interest:			
Content of sessions:			
Evaluative and investigative activities:		Evaluate and investigate a range of moving vehicles that are more sophisticated toys. For example, lego toys, train sets and remote-control cards. You could also look at a children's garage where the pulley can move the vehicle to the top of the building.	Look at different type of frame structures both in real life and through photos from the internet. (pop up tents) How well does it meet the purpose? Who is the intended user? What methods of construction have been used? How does the shape of the

		What is the purpose? Who is it for? How do you think it works? What features does it have? What do you like about the product? What would you include in your own?	framework affect its strength? How innovative is the design? When was it made? Who made it? Research key events and individuals related to structures. For example the Eifel tower or the designer of the iron bridge.
Focused tasks:		Look at a range of construction kits and pulleys. There are some DT kits available on the DT Shop. Allow children to have opportunities to investigate a range of gears and how they work. Provide children with the opportunity to have a go at creating a circuit with a switch. Look at and explore a variety of mechanical system focusing on how pulleys, gears and cams work.	Using plastics strips and fasteners to create a 3D framework. This can build on children's knowledge of leavers and linages. Using card and split pins to make the frame more secure. (Children to understand triangulation aspect)  Use resources such as paper tubes and newspaper to create frames. How can it be made stronger?
Design, make, evaluate: 		Discuss and share the design brief with the children. Together discuss the purpose and the user along with the intent- what is it for? As a class generate a success criteria. Create a design plan with detailed drawings and annotations.	Discuss the brief. Who is the user? What is the purpose? What materials are you going to use? How are you going to do the joins? How are you going to reinforce this?

		Outline and plan the different stages of the design. What are you going to do first? Children to make the final product. Children to complete an evaluation of the final product using their success criteria.	Create a detailed plan- which lists the tools/ materials required. Children to annotate their design plans. Children to evaluate the finished product against the design criteria. **Lesson 1:** Look at a range of different frame structures. Then in groups children to complete the evaluations. **Lesson 2:** Complete some research based on different structures. Look at the Eifel tower and the designer of the iron bridge. Complete some writing based around this. A non-fiction report. Could be completed by labelling an image annotating this. Others could use sentences writing a non-fiction report. **Lesson 3:** Explore using a few plastic straws and sellotape to create 3D frame. How can it be made stronger? Explore the triangulation approach. **Lesson 4:** Discuss the design brief and create a detailed plan and complete with annotations. How are you going to make the frame? What are you going to use to make the boat? Refer back to evaluations done previously of different products. Children to complete cross sectional sketches- what would the product look like if it was cut in half. Test out paper, card, and plastic bags for the boat. How are they going to join this to the structure? Inside or outside? Pipe cleaners for joins.

			What ways can they cut the straws so that they can slot them together. Groups how can you join the straws together- coming up with different ways- what is the most effective way? Detail this in design brief. **Lesson 5:** Children to make their long boats using straws and sellotape DT focus is on the frame itself. Children to complete an evaluation based on their design criteria. The evaluation is based on the frame structure of the boat.
Resources	Knives, chopping boards, food, grater, bowls, spoons, peelers.	Axles, cams, cardboard boxes, scissors, rulers, plasticine, blue tac.	Cardboard, paper straws, paper fasteners, wood dowelling, pipe cleaners (for joins), tape, glue, rulers, pens and pencils.

Year 6			
	Autumn	**Spring**	**Summer**
Topic	***Why do we still remember WWII?***	***How can we spread love not hate?***	***How is life different in the Himalayas?***
Focus	Electric systems	Food and nutrition	Textiles (use of CAD)
Outcome	To create a sensor night light.		To create a phone case for adults.
Framework progression:			
Design knowledge and skills:	**Across KS2 pupils should:**		

	• work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work **In late KS2 pupils should also**: • carry out research, using surveys, interviews, questionnaires and web-based resources • identify the needs, wants, preferences and values of particular individuals and groups • develop a simple design specification to guide their thinking **Across KS2 pupils should:** • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas **In late KS2 pupils should also:** • generate innovative ideas, drawing on research • make design decisions, taking account of constraints such as time, resources and cost
Making knowledge and skills:	**Across KS2 pupils should:** • select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities **In late KS2 pupils should also:** • produce appropriate lists of tools, equipment and materials that they need • formulate step-by-step plans as a guide to making **Across KS2 pupils should:** • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components. **In late KS2 pupils should also:** • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design • use techniques that involve a number of steps • demonstrate resourcefulness when tackling practical problems
Evaluation skills:	**Own ideas / products across KS2 pupils should:** • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to

	improve their work **In late KS2 pupils should also**: • critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • evaluate their ideas and products against their original design specification **Existing products across KS2 pupils should investigate and analyse:** • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants **In late KS2 pupils should also investigate and analyse:** • how much products cost to make • how innovative products are • how sustainable the materials in products are • what impact products have beyond their intended purpose		
Technical skills:		**Across KS2 pupils should know:** • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking **In late KS2 pupils should also know:** • that a recipe can be adapted by adding or substituting one or more ingredients	**Across KS2 pupils should know:** • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking **In late KS2 pupils should also know:** • how to program a computer to monitor changes in the environment and control their products
Key vocabulary:			Template, prototype, accurately, fastenin, functional, measurement, blanket stitch, specification, seam.

Designer of interest:			
Content of sessions:			
Evaluative and investigative activities:		Examine and investigate a range of existing products. What is it called? Have you ever eaten this before? Where is it grown? What does it taste like? How does it smell? How does it feel? Consider how we can store our product. Evaluate the packaging of pre-existing products. Who is the user for our product? Can you conduct some research and find out what the user requires from the product and include this in our own designs?	Evaluate existing products that are produced by combining product shapes- Laptop case, bags, freezer bags Who would use it? How have they made this product/ design appealing? Does the fabric match the purpose eg keeping it dry? What has the designer done to enhance the appearance of the product? Take this knowledge and make a mobile phone case- temperature. Freezer bag etc.
Focused tasks:		Explore where the products come from. Provide opportunities for children to practice the different techniques required for their age group. Explore food hygiene and food safety.	Practice threading needles. Practice completing a range of stitches. Practice hand sewing. Develop skills of joining correct sides together in order to create the seam. Have a go at creating a pattern using paper. Pin onto fabric and cut round this. Creating an authentic brief. (Children do research- questionnaire interview- what would like in a phone case) using this to create the design specification.
Design, make, evaluate:		Discuss and share the design brief with the children. Together discuss the purpose and the user along with the intent- what is it for? As a class generate a success criteria.	Detailed annotated drawings from different perspectives with design decisions. Step by step what equipment going to use.

		Create a design plan with detailed drawings and annotations. Outline and plan the different stages of the design. What are you going to do first? Children to make the final product. Children to complete an evaluation of the final product using their success criteria.	Comparing product against the initial criteria. Did we use the correct materials that were listed on the brief? Communicating evaluations in various forms- writing or in an oral evaluation. **Lesson 1:** Evaluate different products and complete the evaluation sheet. **Lesson 2:** Practice threading needles and completing a range of stitches and hand sewing. **Lesson 3:** Design decisions create a detailed annotated plan. What patterns are you going to use? Children to draw pattern on paper so that they can later use this to transfer onto their phone case. Could interview an adult and see what qualities and characteristics they would like in a phone case and use this to inform their design brief. **Lesson 4:** Making of the phone case. **Lesson 5:** Evaluating the product. Could return to the adult that they had interviewed regarding what qualities they would like in a phone case and ask them to complete an emulation with them and receive feedback.
Resources	Batteries, wires, croc clips, switch mechanism, programmable elements (sensor)	Knives, chopping boards, food, grater, bowls, spoons, peelers.	Needles, fabric (add to), threads, wool, scissors, different types of fastenings (glue, staples), buttons and beads (for decoration), paper for patterns, pins, wadding/insulating fabric.