

OUR DESIGN AND TECHNOLOGY CURRICULUM



Our Assessment Overview linked to detailed adapted Schemes of Work Assessed using triangulated assessment three times a year and against end of year						
Assessment strands	Strand 1	Strand 2	Strand 3	Strand 4	Strand 5	Strand 6
DT 1-2blocked	milepost skills	User and purpose	Design and make	Tools and skills	Safety	Big Ideas
History 1-2blocked	milepost skills	Chronological understanding	Historical depth and knowledge	Historical Enquiry Interpretations of history		Big Ideas
Geography 1-2 blocked	milepost skills	Locational Knowledge	Place Knowledge	Human and physical Geography	Fieldwork and geography skills	Big Ideas Linking concepts across multiple subjects
Art 1-2blocks	milepost skills	Colour Pattern Tone	Technique	Texture and form	Artists and Art from around the world	Big Ideas
Music Ongoing Skills focus	Singing /Play	Listen and appreciation History of music *Key composer knowledge linked to historical periods	Interrelated dimensions Rhythm Pulse Pitch Texture Timbre Dynamics *Chords	Composition and notation	Improvisation	Performance
Science 2-3 Per year	milepost skills	Working scientifically	Biology Anatomy Adaptation Botany	Physics and Chemistry	Materials, states rock and soil formation	Big Ideas
PSHE Ongoing	Changes	Relationships	Differences	Healthy me	Aspirations (dreams and goals)	RSE SEP: 2020
GAMES Ongoing Skills focus	Running /Jumping /Throwing /Catching				Participation and applying skills Competitive games Attack and defence	Health and fitness including mental health and lifestyle choices
GYM/ Dance Ongoing	Movement, pattern Balance		Agility Coordination and flexibility		Personal performance /Group performance Health, Fitness and Lifestyle	
Swim Blocked	Swimming to NC; stand-alone block					
MFL KS2 Ongoing	Oracy		Literacy		Intercultural understanding	
RE Ongoing	AT 1: LEARNING ABOUT RELIGIONS This attainment target refers to how pupils develop their knowledge, skills and understanding with reference to: beliefs, teachings and sources; practices and ways of life; forms of expression.			AT 2: LEARNING FROM RELIGION This attainment target refers to how pupils, in the light of their learning about religion, express their responses and insights with regard to questions and issues about: identity and belonging; meaning, purpose and truth; values and commitments.		
Computing Ongoing	Computer science online safety			Information technology online safety		Digital Literacy –including online safety
Our curriculum must: - Have International/SMSC/British values dimensions - Be cyclical - Build in first hand experiences - Reinforces the schools values : AFTER - Have a heavy focus on subject specific vocabulary, learning vocabulary (Blooms WoW) and expected vocabulary (related to spelling) Pupil Discussion in groups and 1:1 Because this is how we know our children learn best				Assessment methodology: - Ongoing assessment via short summative low stakes tests/tasks - Focussed practical activities and sequenced activities observed (FPTs) - Cumulative work individual or group piece, including project based on task centric - Collaborative work/Performance/Demonstration 1:1 or group discussion -questioning - Ongoing assessment formative-including home study or targeted observation		

DESIGN TECHNOLOGY: Intent

General Statement

Design and Technology prepares children to take part in the development of tomorrow's rapidly changing world. Creative thinking encourages children to make positive changes to their quality of life. The subject encourages children to make positive changes to their quality of life. The subject encourages children to become autonomous and creative problem-solvers, both as individuals and as part of a team. It enables them to identify needs and opportunities and to respond by developing ideas and eventually making products and systems. Through the study of Design and Technology, they combine practical skills with an understanding of aesthetic, social and environmental issues, as well as functions and industrial practices. This allows children to reflect on and evaluate present and past Design and Technology, its uses and its impacts. Design and Technology helps all children to become discriminating and informed consumers and potential innovators.

We are living in a highly developed technological society where children are constantly using and controlling a wide range of technology in everyday life. From light switches to computers, design and, indeed, technology is all around us.

Aims

- To develop imaginative thinking in children and to enable them to talk about what they like and dislike when designing and making;
- To enable children to talk about how things work and to draw and model their ideas;
- To encourage children to select appropriate tools and techniques for making a product, whilst following safe procedures;
- To explore attitudes towards the modern world and how we live and work within it;
- To develop an understanding of technological processes, product and their manufacture and contribution to our society;
- To foster enjoyment, satisfaction and purpose in design and making;
- To identify the cross-curricular capabilities of Design and Technology through curriculum opportunities in a topic or thematic approach.

Our D&T Curriculum at The Valley Community School

At The Valley, we appreciate and understand the importance of Design and Technology for our pupils in today's ever-changing world. We strive to deliver an inspiring, practical and rigorous curriculum, enabling our pupils to use creativity and imagination to solve real life problems within a variety of contexts.

We use an adapted scheme, drawing from the D&T Association's 'Project on a Page' medium term plans and linking our projects to the , which runs throughout the school. This enables us to deliver a broad and balanced D&T offer. Our adapted spiral curriculum builds upon prior learning and skills.

Each D&T unit is process driven and has a project title, which ensures the user, purpose and product. Throughout the unit, children will investigate/disassemble, design, create and evaluate their finished products. Each unit is meaningful, relevant to a real-life scenario and builds upon pupils prior knowledge and skills.

Statement of Implementation

Teachers create a positive attitude to D&T learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards. Our whole school approach to the teaching and learning of D&T involves the following;

- There is a vision for D&T teaching across school that closely allies to broader school vision.
- D&T will be taught in planned and arranged blocks (D&T days) by the class teacher. This is a strategy to enable the achievement of a greater depth of knowledge.
- D&T teaching embraces the wider "Theories of Action" used across school and is linked to the teaching toolkit.
- Through our planning, we involve problem solving opportunities that allow children to find out for themselves.
- Children are encouraged to ask their own questions and be given opportunities to use their skills and research to discover the answers. This curiosity is celebrated within the classroom.
- Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge.
- Teachers use precise questioning in class to test conceptual knowledge and skills, and assess children regularly to identify those children with gaps in learning, so that all children keep up.
- We build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using their skills and choosing materials, they become increasingly confident in their growing ability plan, create and evaluate meaningful products.
- D&T specific skills and 'Firsts' are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Teachers demonstrate how to use practical and subject-specific equipment and skills in order to embed understanding.

Statement of Impact

- The core function of our curriculum is to make changes to pupils' long term memory so that they learn and remember more. This enables them to make excellent progress through the D&T curriculum.
- The successful approach results in a fun, engaging, high-quality D&T education, that provides children with the foundations for understanding our modern and changing world.
- Our focus on inventors and existing products enables the children to gather a vast and deep understanding of the importance of D&T and how much of a part it plays in our everyday lives. Children learn the possibilities for careers in Design and Technology.
- Pupil voice is used to further develop the D&T curriculum, through questioning of pupil's views and attitudes to Science to support the children's enjoyment of science and to motivate learners.
- Pupils and families appreciate the cultural capital of STEM subjects and these are often the favourite chosen career routes for our families for both boys and girls.

Design & Technology in relation to the National Curriculum

Design & Technology is organised according to the guidelines set out in the National Curriculum. Pupils will design and make a range of products. A good quality finish will be expected in all design and make activities appropriate to the age and ability of the pupil.

The work covered in each year group ensures a balance of:

- investigative, disassembly and evaluative activities,
- focused practical tasks
- designing and making assignments.

Recommended Activities

Units of work includes three types of activities:

- investigate, disassembly and evaluative activities,
- focused practical tasks,
- designing and making assignments.
- focused practical tasks are used to teach correct use of tools and equipment.

Relationship to other Subjects

Design & Technology is taught as a subject specific activity through a combination of whole class teaching, group work and individual work. Cross-curricular links are detailed on the Project on a Page medium term planning sheets. The school is progressively working towards delivering technology skills through the Creative Curriculum initiative. The coverage of skills is monitored by the head of planning through the half-term skills coverage audit completed by teachers.

Inclusion opportunities:

- Teachers ensure that pupils have access to the range of Design & Technology activities and use opportunities within Design & Technology to challenge stereotypes.

- Pupils are encouraged and supported to develop their Design & Technology capability using a range of materials.
- Teachers differentiate activities within Design & Technology to ensure that the specific needs of individual children are best met.

How we make suitable adaptations to support the learning of Disadvantaged and Pupils with Special Educational Needs

“At The Valley School we adapt the curriculum to make it accessible to all pupils. This involves adapting the curriculum content, methods by which it is taught, teaching sequence or resources. Our highly trained and dedicated staff know that true inclusion does not just happen in core subjects, but throughout the whole curriculum.

Our Inclusion practices include:

- Schemes of work in the short, mid and long-term, with clearly defined expectations and practical objectives exemplified clearly.
- Pre-teaching key concepts and language.
- Post-teaching to consolidate.
- Supporting accessibility by understanding by focussing on key vocabulary.
- Using hands on drama, making and the arts, rather than defaulting to reading/written content only.
- Using ICT technology, apps, video and computer based technologies where appropriate.
- Waves of intervention that focus on Basic Skills and language proficiency that supports wider curriculum accessibility”.

Resource Management

Each Year Group has access to a supply of tools and materials appropriate to their technology projects.

- Food resources, tools and equipment are kept in the Food Technology Area. No resources, from any area, should be collected or returned by pupils.

Time Allocation

Design & Technology should be allocated approximately an hour per week or the equivalent, alternatively it can be blocked.

British Values

- Approached through studying British inventions and inventors.

SMSC

- Approached through various projects that help others e.g. products sold for charity.

Cultural Capital

- Work related to the development of technologies through time (standing collections)

The Valley Community Primary School DT Subject Map (6-8 hour blocks)

DT Spiral Curriculum: construction, food, textiles, computer control(KS2), computer aided design (KS2/CAD)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
1	<u>Super Humans</u>	<u>Magic Toymaker</u> Puppets	<u>People of the Past</u>	<u>A to B</u> Vehicles	<u>Green Fingers</u>	<u>All Dressed Up</u> Weaving boxes
2	<u>Flowers and Insects</u>	<u>What's it Made of?</u> Classroom design	<u>Time Travellers</u>	<u>How Are You?</u> Salad	<u>Celebrations</u> Purses	<u>Hooray..Let's Go On Holiday!</u>
3	<u>How Humans Work</u> Healthy sandwich	<u>Bright Sparks</u> Electric game (& CC)	<u>Different Places</u> <u>Similar Lives</u>	<u>Active Planet</u> Buildings (& CAD)	<u>Scavengers, Settlers</u>	<u>Let's Plant It</u>
4	<u>Turn it Up</u>	<u>Save the World</u> Rainforest drinks	<u>Shake It</u> Boxes (& CAD)	<u>Nature of Life</u>	<u>Painting, Pictures</u> <u>photos</u>	<u>Temples, Tombs, Treasure</u> Moveable cards (CAMS)
5	<u>Great, Bold, Brave</u> Roman Temples	<u>Water for Everyone</u>	<u>Existing...</u> <u>Endangered...Extinct</u>	<u>Fascinating Forces</u>	<u>Space Explorers</u> Space rovers (& CC)	<u>What Price Progress?</u> Toy for the classroom (CAMS)
6	<u>Full Power</u> Programming robots, (& CC)(& CAD)	<u>Out of Africa</u>	<u>Look Hear!</u>	<u>AD 900 Mayans</u> Mayan food	<u>Look Hear!</u>	<u>Going Global</u> Eco bags

Our Progression, Spiral D&T Curriculum Map						Elements of:	
	Food technology	Textiles	Construction	Computer Control (KS2)	CAD (KS2)	CAMS	Electrical specific
<u>Little Learners</u>	Fantastic food	Bear's picnic rug	Cups exploration Chairs for three bears			Toys exploration Box and locks	
<u>Nursery</u>	Fantastic food	Bear's picnic rug	Product safety Chairs for three bears			Toys exploration Box and locks	
<u>Reception</u>	Fantastic food	Bear's picnic rug Slippers	Chairs for three bears			Toys exploration Box and locks	
<u>Year 1</u>		Woven box	Vehicle Puppet			Vehicle Puppet	
<u>Year 2</u>	Healthy Sandwich	Money wallet	Classroom prototype				
<u>Year 3</u>	Vegetable burger		Stable Structures Buildings	Educational game			Educational game
<u>Year 4</u>	Rainforest fruit drink		Greeting card		Gift packaging	Greeting card	
<u>Year 5</u>			Roman building Mars Rover Educational game	Mars Rover		Educational game	
<u>Year 6</u>	Heritage food	Functional bag	Programming robots	Programming robots	Programming robots	Programming robots	Programming robots

In planning and guiding what children learn, practitioners must reflect on the different rates at which children are developing and adjust their practice appropriately, referring to the Characteristics of Effective Teaching and Learning

These are: **playing and exploring** – children investigate and experience things, and ‘have a go’; **active learning** – children concentrate and keep on trying if they encounter difficulties, and enjoy their achievements for their own sake; **creating and thinking critically** – children have and develop their own ideas, make links between ideas, and develop strategies for doing things.

In addition, the **Prime Areas of Learning (Personal, Social and Emotional Development, Communication and Language and Physical Development)** underpin and are an integral part of children’s learning in all areas.

EYFS Expressive Arts and Design Educational Programme (Statutory)

The development of children’s artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the design and technology, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate about DT. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

EYFS Expressive Arts and Design (DT) Skills

Cooking and Nutrition	Design: Developing, Planning and Communicating Ideas	Make	Evaluate	Technical Knowledge
• Talk about healthy and unhealthy foods. • Talk about having a balance of these. • Talk about likes and dislikes. • Use a range of tools with care and precision.	• Provide opportunities to work together to develop and realise creative ideas. • Encourage them to think about and discuss what they want to make. • Look at products to generate inspiration and conversation about users and purpose.	• Provide children with a range of materials for children to construct with.	• Discuss problems and how they might be solved as they arise. • Reflect with children on how they have achieved their aims.	• Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue. • Provide a range of materials and tools and teach children to use them with care and precision.

Children are learning to:-

Explore, use and refine a variety of media and materials to build their understanding of user and purpose.

Return to and build on their previous learning, refining ideas and developing their ability to represent them.

Create collaboratively, sharing ideas, resources and skills.

Assessment

- Can children discuss what they want to make? Can they talk about why a product is designed this way?
- Can children work independently, choosing their own materials and tools?
- Can children reflect on their product, talking about any issues they encountered and how these were overcome?

Vocabulary (see also Long term EYFS vocabulary map and project on a page)

Plan, ideas, design, make, build, construct, join, shape, tools, change, like, dislike, different, improve, healthy, unhealthy, fruit, vegetable, clean, safe, ingredients, cut, sew.

ELG: Creating with Materials (Statutory)

Children at the expected level of development will:

- 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;
- Make use of props and materials when role playing characters in narratives and stories.

Little Learners

Autumn 1	Autumn 2
Marvellous ME! – Let's look at products - CUPS	No place like home – CHAIRS FOR THREE BEARS
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - What is the product made from? - What is the purpose of the product? - Who is the product for?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - How can I join pieces in my model? - What materials can I use to join materials?
Vocabulary : glass, plastic, spill, safe	Vocabulary : heavy, light, wobbly
Spring 1	Spring 2
Food Glorious Food – FANTASTIC FOOD	Amazing Animals – TOYS
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - What is this called? Who has eaten it before? - What are its taste, smell, texture and appearance? - Which parts do we eat?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - How can I join pieces in my model? - What materials can I use to join materials?
Vocabulary : knife, fork, spoon, bowl, plate, fruit & veg names	Vocabulary : up down bend
Summer 1	Summer 2
Come Outside! – MECHANISMS – BOX AND LOCKS	Let's Pretend – BEAR'S PICNIC RUG
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - What is the hinge/catch for?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - How many parts is it made from? - What is it joined with? - Who might use it?
Vocabulary : up, down, open, close, scissors	Vocabulary: stick, glue, join

Nursery

Autumn 1	Autumn 2
Fantastic Families, Fabulous ME! – LET’S LOOK AT PRODUCTS – slippers	Local Heroes, Superheroes– TOYS
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - What is the product made from? - What is the purpose of the product? - Why is it made this way? - Who is the product for?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - Who do you think would like to play with this? Why? - Does the toy move? What is the mechanism called? - What materials is it made from? Why? - What do you like/dislike about this product?
Vocabulary : heavy light user purpose comfort fabric materials pair function	Vocabulary forwards backwards hinge joint join cut fold connect
Spring 1	Spring 2
Our Wonderful World – TEXTILES - BEAR’S PICNIC RUG	Let’s go on an adventure – FANTASTIC FOOD
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - How many parts is it made from? - What is it joined with? - How is it finished? - Who might use it and why?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - Is this healthy or not healthy? - Where is it grown/sold? - What are its taste, smell, texture and appearance? - Which parts do we eat?
Vocabulary: fabric, materials, re-use	Vocabulary taste, smell, sweet, sour, pull, peel, mix, stir, soft, smooth, hard
Summer 1	Summer 2
If you go down to the woods – CHAIRS FOR THREE BEARS	All creatures great and small – MECHANISMS – BOX AND LOCKS
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - How can I join pieces in my model? - What materials can I use to join materials? - Which material works best in my moving model? - What design will I use for my model?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - What is the hinge/catch for? - How does it work? - Where will we find hinges/catches?
Vocabulary strong, purpose, user	Vocabulary : hinge, joint, join, cut

Reception

Autumn 1 RECEPTION	Autumn 2
Our place in space – LET’S LOOK AT PRODUCTS – glasses (eyewear)	Fantasy and Fairy Tales– TOYS
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - What is the product made from? - What is the purpose of the product? - Why is it made this way? - Who is the product for? How do we know? - What do you like/dislike about this product?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - Who do you think would like to play with this? Why? - Does the toy move? What is the mechanism called? - What materials is it made from? Why? - What do you like/dislike about this product? - How successful is your design?
Vocabulary user purpose materials function design hinge lens	Vocabulary hole punch, catch, design, make, evaluate, purpose, user
Spring 1	Spring 2
Dinosaur Dig – TEXTILES – BEAR’S PICNIC RUG	Superheroes – FANTASTIC FOOD
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - How many parts is it made from? - What is it joined with? - How is it finished?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - Is this healthy or unhealthy? What makes it healthy or unhealthy? - Where is it grown/sold? What ingredients have we used? - What are its taste, smell, texture and appearance?
Vocabulary: cotton, man-made, pattern, staple, evaluate, user, purpose	Vocabulary measure, cut out, tear, bitter, scoop, touch, feel, juicy,crunchy
Summer 1	Summer 2
Explorers – CHAIRS FOR THREE BEARS	Pirates! – MECHANISMS – BOX AND LOCKS
Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - How can I join pieces in my model? - What materials can I use to join materials? - Which material works best in my moving model? - What design will I use for my model? - How could I improve my product?	Adult led exploration - Independent learning in continuous provision Pupils consider and learn key components - What is the hinge/catch for? - How does it work? - Which hinge/catch works the best? - Where will we find hinges/catches?
Vocabulary : stable, wide base, collapse, plan, model, stapler	Vocabulary : hole punch, catch, design, make, evaluate, purpose, user

Design and Technology - Year 1					
Project title (Product/User/Purpose)	Areas of DT covered	Design/Make/Evaluate	Tools and Skills	Firsts	Vocabulary
Design, make and evaluate a <u>puppet for children to perform a puppet show.</u> DT Association Project on a Page: Year1/2 Mechanisms – siders and levers Link: Magic Toymaker	Construction	Design: Labelled design drawing of puppet with push/pull head (forces), and lever arms (lever/hinge) and tubular body-strength. Make: making session(s). First/second iterations (prototype) or modifications.	Use of brass split pins in making levers with hinges.	In this year group pupils will be : Using this process for the first time: Use of independent safe use of brass split pins	lever, hinge, process, evaluate, design
	Investigate		Focussed Practical Tasks	Making this for the first time: Construction of puppets for public show/use.	
	Investigate a variety of toys (wooden toys/Mamod steam engines) online and in person. Looking at a variety of different real puppets.	Evaluate: Evaluate for design criteria: Is it fit for purpose? Is it robust enough for the puppet show? How did it use pushes/pulls? How did it use levers and hinges? How did we improve their appearance for the puppet show? (aesthetics)	FPT: Investigation of pushes, pulls, lever demonstration boards and making simple levers from perforated construction cardboard.	Using these tools for the first time: Brass split pins, Techcard. Need to understand these safety aspects for the first time: Uses of brass split pins safely, i.e. not to go under nail!	
Design, make and evaluate a <u>vehicle for children to transport an object from A to B.</u> DT Association Project on a Page: Year1/2 Mechanisms – Wheels and Axles Link: A to B	Construction Investigate: Looking at a variety of different real vehicles (Cars, trucks, bikes etc) Use real wheel and axle available in DT store-allow children to fix the real wheel to the axle. Allow children to play with the real wheel bearings supplied. Record investigative activity photographically.	Design: Labelled design drawing of vehicle with labels for chassis, axle and wheel. Some simple CAD of a vehicle (Purple Mash software). Control-“Beebots” – computer control link. Make: Having completed the focussed practical task (basic model) the children make modifications with Techcard strips and brass split pins.	Using saw, bench hook, construction card and brass split pins. FPT: Using brass split pins, assembly of cuboidal boxes, which act as “chassis” of vehicle. Use of saw and bench hook (under supervision) to cut their own dowel (not to be cut by TA)	Using this process for the first time: Supervised use of saw and bench hook. CAD (non-statutory)-“Purple Mash” Computer control (non-statutory) “Beebots” Making this for the first time: Construction of vehicles able to transport an object.	saw, bench hook, chassis, axle, wheel

	Use Lego to try out ideas.	Add modifications so as to enable the vehicle to carry an object from A to B. Evaluate: Evaluate for design criteria: Is it fit for purpose, against the design criteria? i.e. can it carry an object from A to B? Did the children make modifications to reduce friction (i.e. enlarge hole for axle to run freely?)		Using these tools for the first time: Bench hook, saw Need to understand these safety aspects for the first time: Bench hook with saw (under supervision). PRACTICAL NOTE: 50% saw blades are supplied fitted the wrong way round! Staff to check saws are correct.	
Design, make and evaluate a <u>woven box</u> for the <u>children/teachers</u> to use within the <u>classroom for storage</u>. DT Association Project on a Page: N/A – standalone unit Link: All Dressed Up	Textiles – Weaving Investigate: Look at a variety of products that have been woven in some way.	Design: Design the colour design of their weaving-board (show them available materials first.) Make: Complete their weaving on weave-boards (30 available). Combine their weave-boards to make a storage box for the classroom.) Connect sides together to create a storage box. Evaluate: Evaluate for design criteria: Is it fit for purpose, against the design criteria? I.e. is their product attractive? Will it store something? Could it be left outside?	Weaving to create the side of a box. FPT: The children practise weaving using a variety of papers.	Using this process for the first time: Weaving Making this for the first time: Woven fabric Using these tools for the first time: Weaving board Need to understand these safety aspects for the first time: Scissors	Textiles, weave, paper, cloth, plastic
International dimension: Puppets from different cultures around the world and vehicles around the world/textiles from around the world. British Values: Appreciation of cultures of others and how they have contributed to design. SMSC: (Spiritual) Finding the beauty in design, simple mechanics understand how design can be influenced by a range of factors i.e. art, religion and different cultures.					

Design and Technology - Year 2

Project title (Product/User/Purpose)	Areas of DT covered	Design/Make/Evaluate	Tools and Skills	Firsts	Vocabulary
Design, make and evaluate a <u>model of their classroom</u> for the <u>headteacher</u> to <u>suggest design improvements</u>. DT Association Project on a Page: Year1/2 Structures – freestanding structures	Construction Structures	Design: Design of product via model making and annotated drawings Make: Make model classroom from a variety of materials.	Use of scoring and forming sheet materials.	Using this process for the first time: Accurate scoring of sheet materials Making this for the first time: Use of sheet plastics	structure, framework, weak, strong, base, surface
	Investigate	Evaluate: Evaluate for design criteria:	Focussed Practical Tasks	Using these tools for the first time:	
	Investigation of the different materials used within their own classroom.	Is it fit for purpose? Do the materials chosen suit their use? e.g. tubular materials used in chair and table legs, or plastic sheet materials for wipe-able table etc.	Scoring and cutting a variety of sheet materials (card, polystyrene foam board, plastic sheet)	Open scissors for scoring Need to understand these safety aspects for the first time: Use of open scissors for scoring.	
Design, make and evaluate a <u>money wallet</u> for a <u>family member</u> to <u>receive as a gift</u>. DT Association Project on a Page: Year1/2 – Templates and joining techniques	Textiles Templates and joining techniques Investigate: Investigation of different purses/wallets by function and by material.	Design: Design of product via labelled diagram. Make: Using stiff binca and coloured cottons, make wallet with sewing designs joining two pieces of material together. Evaluate: Evaluate for design criteria: Is it fit for purpose? Do the materials chosen suit their use? Is it suitable for the chosen recipient? Is it appealing?	Cutting cotton, threading needle, avoiding “pull through” when sewing FPT: Cutting binca, threading a needle, running stitch, cross stitch, joining two pieces of material.	Using this process for the first time: Running and cross stitch Making this for the first time: Textile product using sewing skills Using these tools for the first time: Threaded needle Running stitch Cross stitch Need to understand these safety aspects for the first time: Careful use of needle-careful storage.	joining and finishing techniques, tools, fabrics

Design, make and evaluate a <u>healthy salad</u> for <u>themselves</u> to <u>eat</u> as part of a <u>healthy and balanced diet</u>. DT Association Project on a Page: Year1/2 – Preparing fruit and vegetables	Food Investigate a healthy and balanced diet. Eat well plate, food groups and science link.	Design: Design recipe for a healthy salad to promote a balanced diet. Make: Prepare and make a healthy salad. Evaluate: Evaluate for design criteria: Is it fit for purpose? Edible? Which do they prefer and why? Which is healthiest? What could be improved (taste/health)	Cutting with a knife (under supervision) FPT: Preparing foods e.g. cutting (under supervision).	Using this process for the first time: Cutting/mixing/spreading ingredients. Making this for the first time: Meal contrasting past and present. Using these tools for the first time: Knife (supervision) Need to understand these safety aspects for the first time: Super vision of use of utensils.	healthy diet, choosing, ingredients, planning, investigating tasting.
International dimension: Designs from a range of cultures and places and understanding of global sharing of ideas. British Values: Appreciation of cultures of others and how they have contributed to design. SMSC: (Spiritual) Finding the beauty in design, simple mechanics understand how design can be influenced by a range of factors i.e. art and religion.					

Design and Technology - Year 3

Project title (Product/User/Purpose)	Areas of DT covered	Design/Make/Evaluate	Tools and Skills	Firsts	Vocabulary
Design, make and <u>evaluate a vegetable burger for themselves</u> to eat as part of a <u>healthy and balanced diet</u>. DT Association Project on a Page: Year 3/4 Food – Healthy and Varied diet Link: How Human's Work	Food Healthy and varied diet	Design: Design recipe for a healthy vegetable burger to promote a balanced diet. Make: Prepare and make a healthy vegetable burger. Evaluate: Evaluate for design criteria Is it fit for purpose? Is it edible? What makes it healthy? What could be improved (taste/health)?	Cutting with a knife Focussed Practical Tasks FPT: Select and use a range of utensils, prepare ingredients hygienically, using the bridge and claw technique, grating, peeling, chopping, slicing, mixing, spreading, kneading and baking.	Using this Process for the first time: Considering ratios of major food groups in a meal (protein, carbohydrate, fat/oil) Making this for the first time: Meal considered to be "balanced" nutritionally. Using these tools for the first time: Cutting (under supervision). Grating Mixing foods Need to understand these safety aspects for the first time: Independently using kitchen utensils.	hygienic, edible, grown, annotated sketch, sensory evaluations
	Investigate				
	Investigate different meals in terms of their nutrition and how healthy they are. Eat well plate, food groups and science link.				
Design, make and evaluate an <u>educational, electrical game</u> for <u>Year 2 children</u> to <u>help them to learn their times tables</u>. DT Association Project on a Page: Year 3/4 - Electrical Systems – simple circuits and switches Link: Bright Sparks	Construction (with electricity) <u>Computer Control</u> Investigate the commercial electrical game 'Emergency Room/Operation.' and the 'Simon' game. Leads onto the concept of using electrical motors in their own electrical game design (see game). Science link.	Design: Design of product (electrical game) using diagram and labels explaining functions. Make: Make a functioning, educational, electrical game. Evaluate: Evaluate for design criteria Purpose: does it work? Is it educational? Is it attractive?	Using of saws, bench hooks, application of electrical circuits, LKS2 computer control units. FPT: Using paperclips, drawing pins, saw and bench hook to cut strip-wood to make their own switch. Also, construction of working electrical circuit before fitting to game.	Using this process for the first time: Use of testing of electrical circuit. Programming a crumble board. Making this for the first time: An electrical circuit A switch Using these tools for the first time: Crumble board	circuit, fault, connection, switch, insulator, conductor,

		Have you improved using first/second iterations or modifications?		Mounted hand drill for drilling holes (supervised) Need to understand these safety aspects for the first time: Short circuit of batteries will cause heating up of battery pack. PRACTICAL NOTE: No use of rechargeable batteries due to low internal resistance.	
Design, make and evaluate a <u>stable structure for people in earthquake zones to test for earthquake resistant buildings.</u> DT Association Project on a Page: N/A – standalone unit Link: Active Planet	Construction Computer control (shaker table) Investigate: Research and watch videos on earthquake zones and earthquake resistant buildings. Discuss factors e.g. they are flexible, symmetrical, lower to ground/centre of gravity, strong joints, stability, have a large base.	Design: Design a stable structure using “jelly beans and cocktail sticks”. Make: Make a stable structure using “jelly beans and cocktail sticks”. Evaluate: Evaluate for design criteria and stability) on computer controlled “shaker table” Like to to fair testing in science. Is it fit for purpose? Stable? Flexible? Symmetrical Strong?	Using a process of testable models FPT: Look at “stable structures” standing collection from D.T. room. Use Knex model materials to make stable structures prior to FPT.	Using this process for the first time: Process of testable models Making this for the first time: Stable structures Using these tools for the first time: Test model design materials (Knex, jelly beans, cocktail sticks). Computer control-shaker table. Need to understand these safety aspects for the first time: Care with sharp modelling materials.	structure, stiffen, strengthen, reinforce, shape, join

International dimension: Designs and food technology, from a range of cultures and places and understanding of global sharing of ideas. Exploring earthquake and volcanic regions.

British Values: Appreciation of cultures of others and how they have contributed to design and specifically diet-changing face of British cuisine.

SMSC: (Spiritual) Finding the beauty in design, simple mechanics understand how design can be influenced by a range of factors i.e. art and religion. Making products for others.

Design and Technology - Year 4

Project title (Product/User/Purpose)	Areas of DT covered	Design/Make/Evaluate	Tools and Skills	Firsts	Vocabulary
Design, make and evaluate a <u>greeting card</u> for the <u>elderly care home residents</u> to <u>receive as a gift</u>. DT Association Project on a Page: Year 3/4 Mechanical Systems Levers and Linkages	Construction CAMS (Linkages and Levers)	Design: Design of a moveable card using levers and linkages to give to a family member to celebrate Eid.	Joining, finishing, designing.	In this year group pupils will be: Using this Process for the first time: Exploring lever and linkage processes and creating their own.	mechanism, lever, linkage, pivot, slot
	Investigate	Make: First/second iterations (prototype) or modifications.	Focussed Practical Tasks	Making this for the first time: A moveable card.	
	Children investigate, analyse and evaluate cards, books and, where available, other products which have a range of lever and linkage mechanisms Maths link to measure accurately.	Evaluate: Evaluate for design criteria. Is it fit for purpose? Purpose: does it work? Is it professional looking? Is it attractive? How could it be improved?	FPT: Using card strips, split pins, scissors, glue, children create a greeting card. Demonstrate the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques.	Using these tools for the first time: measuring for accuracy	
Design, make and evaluate a <u>rainforest fruit drink</u> for <u>themselves</u> to drink as part of a <u>healthy and balanced diet</u>. DT Association Project on a Page: Year 3/4 - Food – Healthy and varied diet Link: Saving the World	Food Healthy and varied diet Investigate: Investigation of different rainforest products through taste testing.	Design: Design of the product using proportions and choices of fruit. Make: Blending juices in correct amounts to create a smoothie. Evaluate: Evaluate for design criteria. Is it fit for purpose? How does it taste? Is it attractive? How could it be improved? How could it be marketed and packaged?	Using maths fractions/ratios FPT: Using maths skills decide upon various ratios for fruit drink blend using fractions.	Using this process for the first time: Blending fruit juices. Making this for the first time: Drink product. Using these tools for the first time: Measuring jugs in ml Food processor/hand whisk.	texture, appearance, preference, seasonal, sensory evaluations

				Need to understand these safety aspects for the first time: Food hygiene.	
Design, make and evaluate <u>packaging for their gifts for their dad's/relatives for Father's Day.</u> DT Association Project on a Page: Year 3/4 - Structures – Shell Structures using CAD Link: Shake It	Construction CAD Investigate: Disassemble packaging to look at nets. Evaluate and explore packaging of similar types of products.	Design: Design of a net using CAD. Make: Create a net using CAD. Assembling the net, lining the net and adding a window. Evaluate: Evaluate for design criteria. Is it fit for purpose? Is window placed in best position to advertise cake? Is it greaseproof? Is it similar to your CAD design. Is it attractive? How could it be improved? How could it be marketed? (refer to English persuasive writing)	Using CAD FPT: Assemble a variety of nets to make children familiar with cubes, cuboid, cylinders. Explore properties of card, aluminium paper, greaseproof paper and acetate sheets for the boxed window. Create their own net for their product.	Using this process for the first time: CAD of cuboids, cubes and cylinders with window. Making this for the first time: Packaging which is fit for purpose against design criteria. Using these tools for the first time: CAD to create a net. Need to understand these safety aspects for the first time: Food hygiene after the boxes have been lined.	shell structure, three-dimensional (3-D) shape, net, cube,
International dimension: Musical instruments from around the world. British Values: Appreciation of cultures of others and how they have contributed to design. SMSC: (Spiritual) Finding the beauty in design, understand how design can be influenced by a range of factors, art/religion. Production of a product for younger children. Production of a product to raise charity funds.					

Design and Technology - Year 5

Project title (Product/User/Purpose)	Areas of DT covered	Design/Make/Evaluate	Tools and Skills	Firsts	Vocabulary
Design, make and evaluate <u>Mars Rover models</u> for <u>NASA</u> to <u>test functional ideas</u> for <u>future Mars missions</u>. DT Association Project on a Page: Years 5/6 – Electrical Systems – More complex circuits and switches Link: Space Explorers	Construction (levers) Computer control Electrical systems – more complex circuits and switches	Design: Design of Mars Rover 1. Create a diagram with labels explaining functions of levers e.g. pointing satellite dish or soil sampler. Link with clear exploratory design criteria.	Computer control using UKS 2 equipment: Lego Mindstorms (x3)	In this year group pupils will be : Designing through models. Testing ideas through computer control.	series circuit, parallel circuit, names of switches and components, input device, output device
	Investigate	Make: Make a prototype of a Rover. Children use Techcard and other components to create a model of a proposed Mars Rover. COMPUTER CONTROL: While constructing their models, subsets of children make and program three Mars Rovers using Lego Mindstorms and Bluetooth transmission. These will use sensors to navigate e.g. light sensors.	Focussed Practical Tasks	Using this Process for the first time: Computer control to test ideas.	
	Investigate present Mars Rovers via Nasa.		FPT: Investigate levers using levers boards. Make levers using perforated card, brass split pins and A3 foam board. Construction of a box chassis (robust) to act as the basis for their design ideas.	Making this for the first time: Computer controlled models. Using these tools for the first time: Lego Mindstorms. Need to understand these safety aspects for the first time: Careful use of computer controlled models as they are expensive.	
Design, make and evaluate a <u>fun feedback tool</u> for <u>children</u> to use to <u>tell their teachers</u>	Construction CAMS and levers	Design: Design of “Learning to Learn” device.	Using a variety of lever and cam mechanisms	Using this process for the first time:	CAM, axle, rotation, rotary motion,

<u>how confident they are about their learning.</u> DT Association Project on a Page: Years 5/6 – Mechanical systems – Cams Link: What Price Progress?	Mechanical systems – CAMS Investigate: Look at the standing collection of Victorian cam and lever mechanisms (sewing machine cam treadle, 2 Mamod steam engines, Victorian vacuum pump, Victorian water pump and Victorian paper brick maker.)	Create a diagram with labels explaining the functions. In pairs, the children will design a mechanism to give feedback to their teacher about their understanding in lessons. Make: Use a lever or cam mechanism to raise up positive/negative feedback. Evaluate: Evaluate for design criteria. Does their mechanism give constructive feedback to their teacher?	FPT: Children assemble cam mechanisms.	Understanding of CAMS. Making this for the first time: Working in pairs to create a mechanism for a given purpose. Using these tools for the first time: Victorian CAM mechanisms. Need to understand these safety aspects for the first time: CAM mechanisms.	oscillating motion, reciprocating motion
Design, make and evaluate a <u>shelter</u> for <u>historians</u> to <u>explore how the Romans lived.</u> DT Association Project on a Page: Y5/6 Shell Structures	Construction Investigate: 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. Research Roman buildings and structures. Children research key events and individuals related to their study of frame structures (Marcus Vitruvius Pollio)	Design: Children to design a Roman building drawing inspiration from research. (Corinthian, Doric and Ionic.) Make: Create a stable structure that will withstand various weather, battles and natural disasters. Evaluate: How well does the frame structure meet users' needs and purposes? 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?	Using: card, paper straws, newspaper, square sectioned wood (saws and bench hooks), masking tape, PVA glue, wooden poles FPT: Pupils will create a stable structure similar to a Roman building. Demonstrate skills and techniques for accurately joining framework materials together e.g. paper straws, square sectioned wood, wooden poles. Ask children to practise these, mounting their joints onto card for future reference.	Using this process for the first time: Making a stable structure without a base Making this for the first time: A realistic, prototype of a structure Using these tools for the first time: square sectioned wood to strengthen	frame structure, stiffen, strengthen, reinforce, stability

		How innovative is the design?			
International dimension: Designs and food technology from a range of cultures and places and understanding of global sharing of ideas. British Values: Appreciation of cultures of others and how they have contributed to design and specifically the diet-changing face of British cuisine. SMSC: (Spiritual) Finding the beauty in design, simple mechanics understand how design can be influenced by a range of factors i.e. art and religion.					

Design and Technology - Year 6

Project title (Product/User/Purpose)	Areas of DT covered	Design/Make/Evaluate	Tools and Skills	Firsts	Vocabulary
Design, make and evaluate <u>Heritage Food</u> (soup and bread) for <u>themselves to learn about the ingredients available to ancient civilisations.</u> DT Association Project on a Page: Years 5/6 – Food – Celebrating culture and seasonality Link: Mayans	Food Celebrating culture and seasonality	Design: Design in the form of a recipe, which attempts to replicate a Mayan meal. Design the food packaging aimed at marketing for a company called “Heritage Foods”.	Cutting, blending, timing, measuring, mixing.	In this year group pupils will be : Using blenders and sharp knives to prepare food. Application of maths and science knowledge on nutrition.	ingredients, source, seasonality, utensils, combine,
	Investigate	Make: Blending and cooking of the Mayan meal/Roman bread.	Focussed Practical Tasks	Using this Process for the first time: Using food technology as part of historical research and making a potential commercial product.	
	Investigate: Research Mayan diets and whether foods available to them are still available to us today. Research whether the foods are healthy. Maths link through measuring. Science like through a healthy and balanced diet.	Evaluate: Evaluate for design criteria. Did it fit the design criteria by replicating a Mayan meal? Does this food technology provide evidence for Mayans eating a healthy balance diet? Could this meal be marketed to people as a Historical Meals” line?	FPT: The children prepare all foods, focusing on safe use of sharp knives for chopping foods.	Making this for the first time: “Heritage Food” products. Using these tools for the first time: Blender, sharp knives during food preparation. Technology as research. Need to understand these safety aspects for the first time: Using sharp knives safely. Using a blender safely.	
Design, make and evaluate a <u>robot which has been</u>	Computer control Electrical construction	Design: Design a face for your robot.	Using ‘Blockly’ programming language,	Making this for the first time: Use of microbits	Microbit, Blockly, program, code

<u>programmed, for ourselves to develop our coding skills.</u> Bolton SICT project Link: Full Power	Electrical systems – monitoring and control Investigate: <u>Unplugged activity</u> Use a Steam Starter Construction Kit (Strawbees) to construct a catapult, test, evaluate and improve. Use the kit to create a robot (friendbot). Science link with circuits and electrical systems.	Using 'Blockly' programming language, create a simulation for an emoji that the robot will display using the 'show icon' block and adding an emoji (still) (basic-show icon) or an animation (moving). Make: Choose which programs will be used in the final robot and test them using the microbit. Attach the microbit to the robot and test that the programs work as they should. Adapt and refine. Evaluate: Evaluate for design criteria. Did it fit the design criteria? Is it in educational in any way? Robust enough to be used by Reception children? How could it be improved? One child from each pair move round the classroom evaluating others' work. One child presents their design to the rest of the class.	create a simulation so that the robot will wave its hand using the Strawbees commands. FPT: Using a planning sheet, test out ideas for the design of the control panel. Decide which designs to use and what information to include.	Using these tools for the first time: Blockly programming language, microbits, USB connector. Need to understand these safety aspects for the first time: Appropriate handling and use of microbits.	
Design, make and evaluate a <u>functional bag</u> using <u>recycled fabrics</u> for a <u>family member to use to carry their belongings.</u> DT Association Project on a Page: Years 5/6 – Textiles – Combining different fabric shapes	Textiles – combining different fabric shapes Investigate: Investigate a variety of bags and their function. Research upcycling and explore accessories that are made from recycled materials.	Design: Design their product in paper. Make: construct their bag from paper (1st iteration). Then make the final product from fabric. Evaluate: Evaluate for design criteria. Did it fit the design criteria?	Using use a sewing machine under supervision for particular stitching. FPT: Children will create a functional bag using recycled materials to promote recycling and upcycling.	Using this process for the first time: Using a sewing machine. Making this for the first time: A practical and functional bag. Using these techniques for the first time: Running stitch, back	seam, seam allowance, wadding, reinforce name of textiles and fastenings used

		Is it robust enough to be used daily? How could it be improved?		stitch, cross stitch, over sew stitch, blanket stitch. Need to understand these safety aspects for the first time: Safety when using a sewing machine.	
International dimension: Designs and food technology from a range of cultures and places and understanding of global sharing of ideas. British Values: Appreciation of cultures of others and how they have contributed to design and specifically diet-changing face of British cuisine. SMSC: (Spiritual) Finding the beauty in design, simple mechanics understand how design can be influenced by a range of factors i.e. art and religion.					

Questioning in Design Technology

Based on Bloom's Revised Taxonomy and including Metacognition

Bloom's Taxonomy of cognitive objectives was originally developed in the 1950s by Benjamin Bloom and revised by Anderson and Krathwohl. This resource has been designed to support teachers in developing effective questioning based on these revisions and utilising the 'Knowledge Dimension' as it has been applied to each stage of the taxonomy. Focusing on the acquisition of knowledge recognises the recent Ofsted demand that schools ensure pupils are taught knowledge, as well as skills, in all subjects.

The format also acknowledges metacognition as a proven way to rapidly improve pupils' learning and progress. The Education Endowment Foundation's 'Teaching and Learning Toolkit' states, "Metacognition and self-regulation approaches have consistently high levels of impact..."

The questions in the following pages are designed as a starting point for adults and are provided as examples to be adapted.

Ideally, the pupils will also be involved in asking their own questions and developing an awareness of their own learning, following the principles of metacognition.

Where applicable, the questions are based on the National Curriculum Programme of Study (2014).

The Knowledge Dimension

concrete knowledge		abstract knowledge	
Factual	Conceptual	Procedural	Metacognitive
Knowledge of terminology Knowledge of specific details and elements	Knowledge of classifications and categories Knowledge of principles and generalisations Knowledge of theories and, models and structures	Knowledge of subject-specific skills, techniques and methods Knowledge of when to use appropriate procedures	Strategic knowledge Self-knowledge Knowledge about cognitive tasks including appropriate contextual and conditional knowledge.

Questioning in DT

"They (*teachers*) use questioning highly effectively and demonstrate understanding of the ways pupils think about subject content. They identify pupils' common misconceptions and act to ensure they are corrected."

"Teachers check pupils' understanding systematically and effectively in lessons, offering clearly directed and timely support."

"Pupils love the challenge of learning and are resilient to failure. They are curious, interested learners who seek out and use new information to develop, consolidate and deepen their knowledge, understanding and skills."

"They (*teachers*) use questioning skilfully to probe pupils' responses and they reshape tasks and explanations so that pupils better understand new concepts. Teachers tackle misconceptions and build on pupils' strengths."

Supplementary subject-specific guidance

The Ofsted subject-specific grade descriptors, that were used for subject survey visits, are still useful for self-evaluation.

For DT the descriptors for Outstanding and Good teaching included these statements:

"Pupils explain their ideas and concepts clearly, use technical language...because teachers employ a very wide range of innovative and imaginative resources and teaching strategies to stimulate pupils' active participation in their learning." (Outstanding)

"Teachers use questioning and manage discussions skilfully to check pupils' understanding and to challenge their thinking." (Good)

Questioning in DT	The Knowledge Dimension			
	Factual	Conceptual	Procedural	Metacognitive
Remember	What ingredients did you use? What fabric is this? Who is this designer? What is the tool called?	Can you name some healthy foods? How did you reinforce the structure? What did you learn about diet? What happened to the prototype?	What happened next? What are the steps we follow designing and making a product? How do you use this tool safely? Can you remember the next stage in the design process?	What are your design criteria? Is there a way of helping you remember each stage of the design process? What have you learned about in other DT lessons that could help you? What construction skills do you already have?
Understand	What does a pulley used for? What is the function of the gears? Can you give me a definition of 'flexible'? How does the computer control the device?	Why did we design and make a prototype first? Why did you reinforce the structure? How can you strengthen the join? What do we mean applying 'finish' to the product?	What are the stages in the design process? What are the stages in the production process? Why do we develop a prototype before the final product? Why is it important to use tools carefully?	Why do designers often try different versions before choosing one? Why do you think this is the best option? Can you explain the design in your own words? What might help you to better understand the way pulleys work?
Questioning in DT	The Knowledge Dimension			
	Factual	Conceptual	Procedural	Metacognitive

Apply	How is the product used? What do you already know about this component or device? How have you met the design criteria? Which technical words would best describe the working of the mechanism?	Are there any similarities between the two materials? How could you use electrical components in your design to make it 'hands free'? What factors would you change in the next stage of the design process? Can you offer advice based on your own work?	How will you develop your prototype? How do you use this tool with this material? What safety rules do you need to follow? How will you record the feedback you receive about your design?	What questions would you ask a designer? How might a famous designer approach this design brief? Do you need to adapt a task to fit your preferred learning style? What technological methods and techniques did you use?
Analyse	What do your testing of the prototype tell you? What did you learn from feedback about your product? How local are the ingredients you have chosen? Are there similar products already available?	Can you think of another instance where this product could be useful? What makes your design distinctive and different? How is it functional / practical? How would it be marketed as a saleable product?	Which step of the production process will you have to improve? Can you explain what must have happened when...? Can you explain how to use all the components in the kit? How could you change how the cam moves without changing the whole structure?	What do you already know about this aspect of DT that might be useful? Which tools can you use particularly well? How would finding out more information help you? Does everyone share your opinion about your product?
Questioning in DT	The Knowledge Dimension			
	Factual	Conceptual	Procedural	Metacognitive
Evaluate	How does the product meet the design brief?	What are the positive and the negative aspects of the design?	Why did you choose this approach to construct your product?	If you were learning about this aspect of DT again, what would you do differently and why?

	What technical vocabulary best describes this? Which menu is the healthiest? What materials have the best properties for the task?	Why is that element of the structure so crucial? What elements would you copy from existing products? How has that designer influenced us?	How will you evaluate your ideas? How will you gather the views of other people about your design? If you built it again, what would you change?	What helps you learn in DT and why? What do you find most difficult in DT lessons and why? Which are the most useful techniques to remember and why?
Create	Can you develop an advert promoting your product? Can you prove you have met and even exceeded the design brief? Can you list the benefits of your design or meal? How many ways could the product be used?	How could you combine elements of both designs? How will you convince someone your design is best? How could you show the nutritional benefits of your chosen recipe? Where will you find the expert knowledge you need?	Could you make an instruction or recipe booklet on how to make your product? Can you explain to the class the process you went through to arrive at your final design? Could you devise your own way to make it work? How could the process be more efficient?	What do you want to learn in this unit of work and why is it useful? Can you select work that demonstrates your learning? What links can you make between DT and science, English, art, computing or maths? How will you develop your DT skills and knowledge next?

Appendix 7: Teaching Modules into practice

From observation and results over time we know that the majority of pupils at The Valley like structure, this creates a degree of *ubiquitous understanding* for “peer coaching” and “supported development” in methods that work. Many of our teaching methods employ a range of teaching modules. However, we do not stifle creativity and consider teaching to be a creative craft not a process of ticking boxes.

Here are our components that we look for in high quality lesson delivery:

High degrees of vocabulary reinforcement

High degree of first hand experiences and enquiry

High degree of structured and scaffolded conversation

Structured recall of prior learning

Our 10 Theories of Action are embedded and evident

Guides to teaching models:

- Comprehend the concept of Models of Teaching
- Understand the various essential elements of Models of Teaching
- Acquire information about various families of Models of Teaching
- See how this applies in a real life context

A model of teaching can be defined as the depiction of teaching and learning environment, including the behaviour of teachers and students, while the lesson is presented through that model.

Models of teaching enable the students to engage in robust, cognitive and social task and teach the student how to use them productively. Models of teaching are the specific instructional plans which are designed according to the concerned learning theories. It provides a comprehensive blue print for curriculum to design instructional materials, planning lessons, teacher pupil roles, supporting aids and so forth. Joyce & Weil (2014) defines A model of teaching is a description of a learning environment, including our behavior as teachers when that model is used, outcome of instruction may be the student's increased capabilities to learn more easily and effectively in the future. Hence the main aim of models of teaching is to *create powerful learners*.

CHARACTERISTICS OF A GOOD AND BETTER TEACHING MODEL

The following are the chief characteristics of a good teaching model

- Each model has built up based on particular learning theory
- Creation of congenial learning environment in the classroom
- Effective interaction between the teacher and students
- Planned use of appropriate strategies
- Teaching process are systematically, sequentially and logically arranged

- Clear and specified roles for teachers and students
- Large scope for supporting material
- Ensure active participation of entire students in the class
- It raises the students' level of aspiration, motivation and interest in learning
- Every model foster and strengthen the cognitive structure of the student

ELEMENTS OF MODELS OF TEACHING

Element of a model of teaching represent its structure, process and teaching aids of the instruction. A model of teaching consists of syntax, social system, principle of reaction and support system. The detailed descriptions are as follows.

Syntax

It is the steps or phases of the model being presented before the class. It illustrates the logical and sequential order of the teacher student activities of the instruction procedure. It describes the complete programme of action of the model.

Social system

Social system of a model explains its nature of learning environment. It describes the role and relationship of the teacher and students through the phases as well as designing the lesson. As each and every model is unique, the role of teacher and students in every model may vary according to the respective learning theory of the model is built. It also varies in phases to phases.

Principle of Reaction

This is the extension of social system. It deals with the rules of reaction to the students responses in the classroom interaction. The reaction of the teacher must be in accordance with the theory of which model has been built. The teacher reaction is desired when the students' responses/ behavior are untouched with expected level responses and for giving reinforcement. It depends the family of the model is presented.

Effect of models of Teaching

Models of teaching have a very positive effect on students' behavior. Bruce Joyce classified the effect as Instructional effect and Nurturant Effect. Instructional effects are the direct effect of an instruction on students' cognitive, affective and psychomotor domain. Nurturant effects are the indirect effect other than the teacher intends to achieve through the model. It is the additional achievement gained by the students through the unique nature classroom interaction. Examples are the development of problem solving ability, analytical thinking, critical thinking, social skill, tolerance etc.

FAMILIES OF MODELS OF TEACHING

Joyce & Weil (2014) categorized the models of teaching in to four families. The classification has been made in accordance with the theoretical basis and fundamental aim of the teaching model. The four families explained below in detail.

THE INFORMATION PROCESSING FAMILY

Models in the information processing family focus on the cognitive activity of child. It includes scientific inquiry for collecting original information, organizing and properly storing of the information. Some models provide the learners with information and concept, some emphasis concept formation and hypothesis testing and still other generate creative thinking. Joyce & Weil (2014) listed eight models in Information Processing Model.

Inquiring and investigating: (problem solving and enquiry focused)

Models	Developers (Redevelopers)
1. Inductive Thinking Model (Classification Oriented)	Hilda Taba (Bruce Joyce)
2. Concept Attainment Model	Jerome Bruner (Fred Lighthall), (Tennyson and Cocchiarella), (Bruce Joyce)
3. The Picture-word inductive Model	Emily Calhoun
4. Scientific Inquiry Model	Joseph Schwab
5. Inquiry Training Model	Richard Suchman (Howard Jones)
6. Mnemonics Model (Memory assists)	Michael Pressley (Joel Levin,, Richard Anderson)
7. Synectics Model	William Gordon
8. Advance Organizer Model	David Ausubel (Lawton and Wanska)

THE SOCIAL FAMILY (Discursive activities) The focus of the social model family is to build synergy (collective energy) in the classroom for addressing ongoing problems of personal, social, national as well as international importance. Social models help the students to develop Self-directed problem solving ability, sense of belongingness towards the society and make them responsible citizens of the country.

Models	Developers (Redevelopers)
1. Partners in Learning	David Johnson, Roger Johnson
2. Structured Inquiry	Robert Salvin (Aronson)
3. Group Investigation	John Dewy, Herbert Thelen
4. Role Playing	Fannie Shafte
5. Jurisprudential Inquiry	Donald Oliver, James Shaver

THE PERSONAL FAMILY: (Reflection PSHE/RE/RSE/International understanding)

The personal models begin from the perspective of the selfhood of the individual. Individual consciousness and development of unique personality is the chief focus of this family. The models in personal family attempt to make them understand their self and thereby students can shape their future. The cluster of personal models pays great attention to the individual perspective and seeks to encourage productive interdependence, increasing people's self-awareness and sense of responsibility for their own destinies.

Models	Developers
1. Nondirective teaching	Carl Rogers
2. Enhancing Self Esteem	Abraham Maslow

THE BEHAVIOURAL SYSTEM FAMILY: structured lessons with predetermined activities, objectives and outcomes that can be readily predicted.

Maths, Literacy and default position

Modification of behavior is the main focus of this family. The stance taken is that human beings are self-correcting communication systems that modify behavior in response to the information about how successfully tasks are navigated. The role of predetermined objectives, observable behavior, clearly defined task and methods, feedback and reinforcement are the foundations of models in behavior family.

Models	Developers
1. Mastery Learning	Benjamin Bloom, James Block
2. Direct Instruction	Tom Good, Jere Brophy, Carl Bereiter, Ziggy Engleman, Wes Becker
3. Simulation	Carl smith, Mary Smith
4. Social Learning	Albert Bandura, Carl Thoresen, Wes Becker
5. Programmed Schedule (Task Performance Reinforcement)	B.F. Skinner

Models of Teaching: Categorising and teaching models

At The Valley School we know our pupils respond to direct instruction (typical 4-5 part lesson) it is default point that teachers can return to and it is tried and tested, but this is only one model of teaching and may not always be suitable. If we adapt our teaching sequences, incorporate different models into our structural model or make the model more best suit the subject “Instructional Teaching and Enquiry Focused learning are enhanced

Design Technology model 6-8 week

Recall and harvest –this can include home study and personal research	Big Picture and ideas Generate questions	Investigation Make and produce	New information Review and reflect	Investigation Revise and improve	Gathering what we know now - can do apply understand	Present Learning Formally link learning
“Informational processing”	“Enquiry focused system” investigation interspersed with behavioural system –direct teaching-Group investigation, paired and individual				“Social family” possible group presentation of findings	
	Investigation opportunities interspersed with factual learning				Application of knowledge and presentation of learning Combine concepts	
Webb’s Depth of knowledge 1-2			Webb’s Depth of knowledge 3-4		Webb’s Depth of knowledge 3-4 Create/Test/Refine	

Appendix 1:

THE VALLEY COMMUNITY SCHOOL
DT SCHEME OF WORK

Design and technology programmes of study: key stages 1 and 2

National curriculum in England

Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims

The national curriculum for design and technology aims to ensure that all pupils:

- ☐ develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- ☐ build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- ☐ critique, evaluate and test their ideas and products and the work of others
- ☐ understand and apply the principles of nutrition and learn how to cook.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Schools are not required by law to teach the example content in [square brackets].

Design and technology – key stages 1 and 2

Subject content

Key stage 1

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

When designing and making, pupils should be taught to:

Design

□ design purposeful, functional, appealing products for themselves and other users based on design criteria

□ generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

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

Evaluate

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

Technical knowledge

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

Design and technology – key stages 1 and 2

Key stage 2

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

When designing and making, pupils should be taught to:

Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated

sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- ☐ select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- ☐ select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

- ☐ investigate and analyse a range of existing products
- ☐ evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- ☐ understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- ☐ apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- ☐ understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- ☐ understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- ☐ apply their understanding of computing to program, monitor and control their products.

Design and technology – key stages 1 and 2

Cooking and nutrition

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

Pupils should be taught to:

Key stage 1

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

Key stage 2

- ☐ understand and apply the principles of a healthy and varied diet
- ☐ prepare and cook a variety of predominantly savoury dishes using a range of cooking

techniques

- ☐ understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

YEAR 1

Scheme of Work Outline Autumn
Design, make and evaluate a puppet for children to perform a puppet show.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigate a variety of toys (wooden toys/Mamod steam engines) online and in person. Looking at a variety of different real puppets. Design: Labelled design drawing of puppet with push/pull head (forces), and lever arms (lever/hinge) and tubular body-strength. Make: making session(s). First/second iterations (prototype) or modifications. Evaluate: Evaluate for design criteria: Is it fit for purpose? Is it robust enough for the puppet show? How did it use pushes/pulls? How did it use levers and hinges? How did we improve their appearance for the puppet show? (aesthetics)
	L1: Task 1	Investigate Investigate toys both online and in person. Think about what makes them fun/appealing/child friendly. Explore a range of puppets and discuss what makes them user friendly.
	L2: Task 2	Design Using a planning sheet, design a puppet which fits the user/purpose. Include original ideas and labels on the diagram.
	L3: Task 3	Make Create their puppet using chosen materials and evaluating the process as they make. Ensure that safety precautions are taken when using materials.
	L4: Task 4	Evaluate Evaluate the puppet checking if it was fit for the user and purpose. Discuss what went well and what they would change if they were to make the puppet again.

YEAR 1

Scheme of Work Outline Spring

Design, make and evaluate a vehicle for children to transport an object from A to B.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigate: Looking at a variety of different real vehicles (Cars, trucks, bikes etc) Use real wheel and axle available in DT store-allow children to fix the real wheel to the axle. Allow children to play with the real wheel bearings supplied. Record investigative activity photographically. Use Lego to try out ideas. Design: Labelled design drawing of vehicle with labels for chassis, axle and wheel. Some simple CAD of a vehicle (Purple Mash software). Control-"Beebots" – computer control link. Make: Having completed the focussed practical task (basic model) the children make modifications with Techcard strips and brass split pins. Add modifications so as to enable the vehicle to carry an object from A to B. Evaluate: Evaluate for design criteria: Is it fit for purpose, against the design criteria? i.e. can it carry an object from A to B? Did the children make modifications to reduce friction (i.e. enlarge hole for axle to run freely?)
	L1: Task 1	Investigate Children to use prior knowledge of vehicles to discuss what they already know. Explore how a wheel and axle works to enable vehicles to move.
	L2: Task 2	Design Design a vehicle, which can transport goods, think about size and measurement. Use the Beebots to explore direction and movement.
	L3: Task 3	Make Create the model using materials and following safety advice. Children should make adjustments and modifications as they go to ensure that the car can carry goods.
	L4: Task 4	Evaluate Written evaluation of car using sentence starters as scaffolds. Children to orally rehearse sentence before writing it down.

YEAR 1

Scheme of Work Outline Summer

Design, make and evaluate a woven box for the children/teachers to use within the classroom for storage.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Look at a variety of products that have been woven in some way. Design: Design the colour design of their weaving-board (show them available materials first.) Make: Complete their weaving on weave-boards (30 available). Combine their weave-boards to make a storage box for the classroom.) Connect sides together to create a storage box. Evaluate: Evaluate for design criteria: Is it fit for purpose, against the design criteria? I.e. is their product attractive? Will it store something? Could it be left outside?
	L1: Task 1	Investigate Process of wool including start and end point (sheep). Explore different materials and think about how they have been woven together. What processes have been used?
	L2: Task 2	Design Design a pattern for a woven box using available materials. Think about measurement and size.
	L3: Task 3	Make Use the weaving boards to learn the technique and create the side/lid for their box. Connect them together to make the complete box.
	L4: Task 4	Evaluate Use sentence starters to scaffold ideas and outcomes. What went well? Why? What would they change to improve for next time?

YEAR 2

Scheme of Work Outline Autumn

Design, make and evaluate a model of their classroom for the headteacher to suggest design improvements.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigation of the different materials used within their own classroom. Design: Design of product via model making and annotated drawings Make: Make model classroom from a variety of materials. Evaluate: Evaluate for design criteria: Is it fit for purpose? Do the materials chosen suit their use? e.g. tubular materials used in chair and table legs, or plastic sheet materials for wipe-able table etc.
	L1: Task 1	Investigate Go on an environment walk and play 'material bingo', seeing how many different materials they can spot within their own classroom and school environment. (Builds upon prior learning from Y1)
	L2: Task 2	Design Use a planning frame to create a design for a classroom. Use labels to annotate. Children should be able to talk about placement and chosen furniture.
	L3: Task 3	Make Create the classroom as a 3D model thinking about design elements and what will be visually appealing for the user. Use safety precautions
	L4: Task 4	Evaluate Use a writing frame and sentence starters to write and evaluation including their own opinions on what went well and what could be improved next time.

YEAR 2

Scheme of Work Outline Summer

Design, make and evaluate a money wallet for a family member to receive as a gift.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigation of different purses/wallets by function and by material. Design: Design of product via labelled diagram. Make: Using stiff binca and coloured cottons, make wallet with sewing designs joining two pieces of material together. Evaluate: Evaluate for design criteria: Is it fit for purpose? Do the materials chosen suit their use? Is it suitable for the chosen recipient? Is it appealing?
	L1: Task 1	Investigate Look at a range of purses and wallets, discuss who the user would be a how specific designs suit different users.
	L2: Task 2	Design Design a purse/wallet with a design for a specific user (user needs to be decided before the design process e.g. mum/dad/grandma etc.)
	L3: Task 3	Make Use running stitch, backstitch, cross-stitch. Focus firstly on the pattern and then sew the wallet together.
	L4: Task 4	Evaluate After the wallet has been given to the intended user, ask them to complete a feedback slip. The children can then use these to complete their evaluation and record what design elements were successful and what could be improved.

YEAR 2

Scheme of Work Outline Spring

Design, make and evaluate a healthy salad for themselves to eat as part of a healthy and balanced diet.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigate a healthy and balanced diet. Eat well plate, food groups and science link. Design: Design recipe for a healthy salad to promote a balanced diet. Make: Prepare and make a healthy salad. Evaluate: Evaluate for design criteria: Is it fit for purpose? Edible? Which do they prefer and why? Which is healthiest? What could be improved (taste/health)
	L1: Task 1	Investigate Investigate the eat well plate and discuss what makes a balanced and healthy meal. Explore sandwiches and discuss texture, flavour and nutritional value. Explore an 'unhealthy' meal.
	L2: Task 2	Design Using a design sheet and choosing from a shortlist of ingredients, children to design their own salad considering nutritional value and taste. Label design.
	L3: Task 3	Make Children to create their own salad including chopping vegetables and mixing ingredients if needed. Dress salad with chosen dressing and mix.
	L4: Task 4	Evaluate Children to taste and then evaluate their own sandwich using sentence starters to scaffold responses.

YEAR 3

Scheme of Work Outline Autumn

Design, make and evaluate a vegetable burger for themselves to eat as part of a healthy and balanced diet.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigate different meals in terms of their nutrition and how healthy they are. Eat well plate, food groups and science link. Design: Design recipe for a healthy vegetable burger to promote a balanced diet. Make: Prepare and make a healthy vegetable burger. Evaluate: Evaluate for design criteria Is it fit for purpose? Is it edible? What makes it healthy? What could be improved (taste/health)?
	L1: Task 1	Investigate Explore the eatwell plate and the 7 food groups pyramid. Consider a range of meals and their nutrition.
	L2: Task 2	Design Design a healthy vegetable burger with the ingredients provided, consider the user and purpose.
	L3: Task 3	Make Create the burger using skills such as chopping, mixing and using utensils.
	L4: Task 4	Evaluate Eat the burger and think about the 5 senses. Written evaluation to record their findings and opinions focussing on what went well and what be improved.

YEAR 3

Scheme of Work Outline Spring

Design, make and evaluate an educational, electrical game for Year 2 children to help them to learn their times tables.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigate the commercial electrical game 'Emergency Room/Operation.' and the 'Simon' game. Leads onto the concept of using electrical motors in their own electrical game design (see game). Science link. Design: Design of product (electrical game) using diagram and labels explaining functions. Make: Make a functioning, educational, electrical game. Evaluate: Evaluate for design criteria Purpose: does it work? Is it educational? Is it attractive? Have you improved using first/second iterations or modifications?
	L1: Task 1	Investigate Look at the electrical games and watch videos of circuits inside the games. Consider how and why they work.
	L2: Task 2	Design Collect ideas for their electrical game considering how it can appeal to the user. Focus on the electrical circuit inside.
	L3: Task 3	Make Use skills such as measuring, sawing and cutting to create the game, including an electrical circuit and a switch.
	L4: Task 4	Evaluate Take the games to Year 2 (the users) and observe them playing. Ask the children questions about their game and for constructive feedback. Consider what went well and what could be improved next time.

YEAR 3

Scheme of Work Outline Summer

Design, make and evaluate a stable structure for people in earthquake zones to test for earthquake resistant buildings.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Research and watch videos on earthquake zones and earthquake resistant buildings. Discuss factors e.g. they are flexible, symmetrical, lower to ground/centre of gravity, strong joints, stability, have a large base. Design: Design a stable structure using “jelly beans and cocktail sticks”. Make: Make a stable structure using “jelly beans and cocktail sticks”. Evaluate: Evaluate for design criteria and stability) on computer controlled “shaker table” Like to to fair testing in science. Is it fit for purpose? Stable? Flexible? Symmetrical Strong?
	L1: Task 1	Investigate Explore a range of buildings, discussing architecture, and how they make them earthquake-proof. Focus on Super Seven architect Zaha Hadid.
	L2: Task 2	Design Use planning sheet to design their structure concentrating on the base. Focus on drawing their design in a 3D style.
	L3: Task 3	Make Assemble the stable structure using the materials provided. Think about the base and amount of materials which will be needed.
	L4: Task 4	Evaluate Test all structures using the Computer Controlled wobble board. Consider what went well and what can be better next time.

YEAR 4

Scheme of Work Outline Summer

Design, make and evaluate a greeting card for the elderly care home residents to receive as a gift.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Children investigate, analyse and evaluate cards, books and, where available, other products which have a range of lever and linkage mechanisms Maths link to measure accurately. Design: Design of a moveable card using levers and linkages to give to a resident of the home. Make: First/second iterations (prototype) or modifications. Evaluate: Evaluate for design criteria. Is it fit for purpose? Purpose: does it work? Is it professional looking? Is it attractive? How could it be improved?
	L1: Task 1	Investigate Look at a range of cards and books which have a 'pop up' mechanism. What is the appeal? Why are these designs popular? Create a prototype lever to explore how they are made.
	L2: Task 2	Design Design a card based on a classic children's story (The Owl and the Pussycat) which will bring joy to the elderly resident. Include design elements, instructions as to how to create the lever/linkage and labels.
	L3: Task 3	Make Create the cards using materials provided. Focus on ensuring the card is moveable and appealing.
	L4: Task 4	Evaluate Written evaluation based on feedback from the user. Would you be able to sell your card to make a profit? Does it look professional? Is it appealing?

YEAR 4

Scheme of Work Outline Autumn

Design, make and evaluate a rainforest fruit drink for themselves to drink as part of a healthy and balanced diet.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigation of different rainforest products through taste testing. Design: Design of the product using proportions and choices of fruit. Make: Blending juices in correct amounts to create a smoothie. Evaluate: Evaluate for design criteria. Is it fit for purpose? How does it taste? Is it attractive? How could it be improved? How could it be marketed and packaged?
	L1: Task 1	Investigate Investigate rainforest fruits and wildlife. What are the most common and accessible rainforest fruits? What animals rely on these fruits? Are they sustainable? Taste test the fruits.
	L2: Task 2	Design Think about the 5 senses and textures/combined flavours. What flavours would work well together? Complete market research looking at what products are currently sold including rainforest fruit flavours. Create a recipe for your smoothie.
	L3: Task 3	Make Create their own rainforest smoothie. Chop/dice/cut fruits themselves and use a blender to achieve the desired texture. Use measurement such as weighing scales and measuring jugs to ensure recipe is correct and accurate.
	L4: Task 4	Evaluate Think about packaging and marketing of your smoothie. Does it have a USP or is it similar to others on the market? Was it successful? Is it nutritious? Complete written evaluation.

YEAR 4

Scheme of Work Outline Spring

Design, make and evaluate packaging for their gifts for their dad's/relatives for Father's Day.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Disassemble packaging to look at nets. Evaluate and explore packaging of similar types of products. Design: Design of a net using CAD. Make: Create a net using CAD. Assembling the net, lining the net and adding a window. Evaluate: Evaluate for design criteria. Is it fit for purpose? Is window placed in best position to advertise cake? Is it greaseproof? Is it similar to your CAD design. Is it attractive? How could it be improved? How could it be marketed? (refer to English persuasive writing)
	L1: Task 1	Investigate Disassemble packaging of cakes and deserts. Think about what commonalities they all share (acetate window, attractive design, luxurious font etc.) Explore what impact this has on a customer and why it would be appealing.
	L2: Task 2	Design Design a net to create your packaging. Create a prototype net using CAD. Print it off and assemble it as a first iteration.
	L3: Task 3	Make Create the net and design to be used for your gift. Remember to keep it professional looking and think about the intended user, what would appeal to them? Use acetate to create a window.
	L4: Task 4	Evaluate Written evaluation of product thinking about the design and intent. Does it match? What feedback did you receive?

YEAR 5

Scheme of Work Outline Spring

Design, make and evaluate Mars Rover models for NASA to test functional ideas for future Mars missions.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigate present Mars Rovers via Nasa. Design: Design of Mars Rover 1. Create a diagram with labels explaining functions of levers e.g. pointing satellite dish or soil sampler. Link with clear exploratory design criteria. Make: Make a prototype of a Rover. Children use Techcard and other components to create a model of a proposed Mars Rover. COMPUTER CONTROL: While constructing their models, subsets of children make and program three Mars Rovers using Lego Mindstorms and Bluetooth transmission. These will use sensors to navigate e.g. light sensors. Evaluate: Evaluate for design criteria. Does their model suggest any credible ideas for constructing on a real Mars Rover? How does the computer controlled model suggest further ideas?
	L1: Task 1	Investigate Use the NASA website and videos to explore Mars Rovers and understand their purpose and value.
	L2: Task 2	Design Create and exploded diagram to plan a Mars Rover. Use annotations and labels. Include instructions to create Rover.
	L3: Task 3	Make Create the Mars Rover Prototype using the materials. Ensure the Rover has axles, wheels, a crane and is moveable. Explore the Lego Mindstorm equipment and program the Rover to move and flash.
	L4: Task 4	Evaluate Written evaluation explaining how and why the Rover was successful/unsuccessful. Think about credibility, would this help a real NASA engineer?

YEAR 5

Scheme of Work Outline Summer

Design, make and evaluate a fun feedback tool for children to use to tell their teachers how confident they are about their learning.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Look at the standing collection of Victorian cam and lever mechanisms (sewing machine cam treadle, 2 Mamod steam engines, Victorian vacuum pump, Victorian water pump and Victorian paper brick maker.) Design: Design of "Learning to Learn" device. Create a diagram with labels explaining the functions. In pairs, the children will design a mechanism to give feedback to their teacher about their understanding in lessons. Make: Use a lever or cam mechanism to raise up positive/negative feedback. Evaluate: Evaluate for design criteria. Does their mechanism give constructive feedback to their teacher?
	L1: Task 1	Investigate Explore Victorian CAM and levers. Why were these used? Are they still used today? If so, in what objects and for what purpose? Think about mechanisms used.
	L2: Task 2	Design Design a learning to learn device thinking about their chosen audience and users. Create design using an exploded diagram clearly showing the mechanism inside the tool.
	L3: Task 3	Make Make the device in their coaching partners using skills such as measuring and teamwork to construct. Ensure design is followed as the device needs to look professional and be functional.
	L4: Task 4	Evaluate Evaluate using feedback received from the users. Was it functional? Did it look professional? What points for improvement are there?

YEAR 5

Scheme of Work Outline Autumn

Design, make and evaluate a shelter for historians to explore how the Romans lived.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: 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. Research Roman buildings and structures. Children research key events and individuals related to their study of frame structures (Marcus Vitruvius Pollio) Design: Children to design a Roman building drawing inspiration from research. (Corinthian, Doric and Ionic.) Make: Create a stable structure that will withstand various weather, battles and natural disasters. Evaluate: How well does the frame structure meet users' needs and purposes? 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?
	L1: Task 1	Investigate Children to look at Roman and Greek structures focusing on similarities and differences. Why did the Romans adjust their buildings from the Ancient Greeks?
	L2: Task 2	Design Design the structure using research and investigate process. What will make their building successful? (Link to Year 3 stable structures). Understand that the base is the most important element. Think about how to strengthen the pillars and columns.
	L3: Task 3	Make Create the structure using materials which are accurately measured and neat looking. Follow design plan and knowledge gained on robust and strengthened buildings.
	L4: Task 4	Evaluate Test the building using the 'wobble board' and other creative means. Does it act as a prototype for historians?

YEAR 6

Scheme of Work Outline Spring

Design, make and evaluate Heritage Food (soup and bread) for themselves to learn about the ingredients available to ancient civilisations.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Research Mayan diets and whether foods available to them are still available to us today. Research whether the foods are healthy. Maths link through measuring. Science like through a healthy and balanced diet. Design: Design in the form of a recipe, which attempts to replicate a Mayan meal. Design the food packaging aimed at marketing for a company called "Heritage Foods". Make: Blending and cooking of the Mayan meal/Roman bread. Evaluate: Evaluate for design criteria. Did it fit the design criteria by replicating a Mayan meal? Does this food technology provide evidence for Mayans eating a healthy balance diet? Could this meal be marketed to people as a Historical Meals" line?
	L1: Task 1	Investigate Think about Mayan diets and their sources of food. Think back to the eat well plate and nutritional pyramid, where do the foods fall? Did Mayans eat a balanced and healthy diet? What packaging would appeal to a Mayan?
	L2: Task 2	Design Design their soup and create a recipe to replicate a Mayan meal. Design the packaging for the food using attractive and professional looking designs.
	L3: Task 3	Make Create their soup and bread ensuring that they are preparing all ingredients and following all hygiene rules. Make the packaging with the user in mind.
	L4: Task 4	Evaluate Think about how this meal would be marketed? Is it still relevant today? Would a modern consumer buy this? Was it successful for a modern person?

YEAR 6

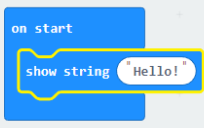
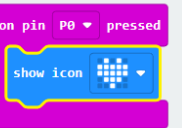
Scheme of Work Outline Summer

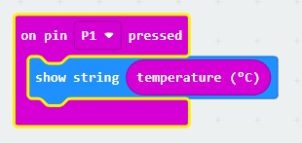
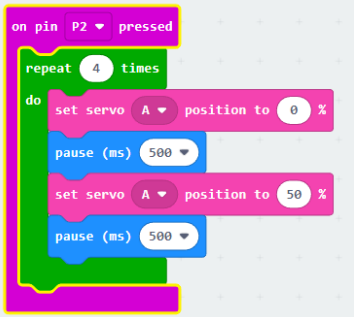
Design, make and evaluate a functional bag using recycled fabrics for a family member to use to carry their belongings.

Term	Lessons	Activities and outcomes
Number of activities or time allocation		Investigate: Investigate a variety of bags and their function. Research upcycling and explore accessories that are made from recycled materials. Design: Design their product in paper. Make: construct their bag from paper (1st iteration). Then make the final product from fabric. Evaluate: Evaluate for design criteria. Did it fit the design criteria? Is it robust enough to be used daily? How could it be improved?
	L1: Task 1	Investigate Look at the function of different bags e.g. handbag (fashion accessory), backpack (every day and functional), suitcase (long journey), think about their purpose. Research 'fast fashion' and identify the issues with it. Look at fashion brands/influencers who are using recyclable materials/second hand fashion as a way to protect the environment.
	L2: Task 2	Design Design a bag using recycled materials and think about stitches needed to assemble the bag. Practice using stitches to create patterns or assemble pieces of material. Create a prototype out of paper.
	L3: Task 3	Make Create their bag using accurate measuring and joining techniques. Ensure that it is functional and they have altered as needed from their prototype.
	L4: Task 4	Evaluate Gather feedback and evaluate the bag for its purpose and design. Could you make a profit from it? Does it look fashionable? Who would it appeal to?

Year 6 Autumn SICT Workshop Project

Design, make and evaluate a robot which has been programmed, for ourselves to develop our coding skills.

<u>Year Group: 6</u>		<u>Subject: Design Technology</u>		<u>Unit: Build a Robot</u>
<u>At the end of this unit, children at age related expectation will be able to:</u> •				<u>Vocabulary</u> Microbit, Blockly, program, code
	<u>Learning Objective</u>	<u>National Curriculum Link</u>	<u>Planned Learning Experience</u>	<u>Assessment Outcome</u>
<u>1</u>	I know how to use a construction kit to make a catapult and a ‘friendbot’	Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, leisure]. When designing and making, pupils should be taught to: <i>Design</i>	<u>Unplugged activity</u> Use a Steam Starter Construction Kit (Strawbees) to construct a catapult, test, evaluate and improve. Use the kit to create a robot (friendbot). Design a face for your robot.	Working catapult Robot created
<u>2</u>	I can program a microbit to make a robot show a welcome message		Log on to BBC program for programming Microbits (https://microbit.org) Go to ‘Let’s Code’ area of the website and create a project. Using ‘Blockly’ programming language, create a simulation for a message that the robot will display using the ‘show string’ (basic) block and adding a message. Program message to appear ‘on start’. Test in simulation. Using a USB (standard and micro) connector, download the algorithm onto the laptop and then upload onto the microbit. 	Welcome message appears on simulation and microbit.
<u>3</u>	I can program a microbit to make a robot show an emoji or an animation.	develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups	Using ‘Blockly’ programming language, create a simulation for an emoji that the robot will display using the ‘show icon’ block and adding an emoji (still) (basic- show icon) or an animation (moving). Program message to appear when ‘P0’ on the simulation / on the microbit is pressed. Test in simulation.  Using a USB (standard and micro) connector, download the algorithm onto the laptop and then upload onto the microbit.	Animation appears on simulation and microbit.

4	I can program a microbit to make a robot show the temperature.	generate, develop, model and communicate their ideas through discussion and prototypes, <i>Make</i> select from and use a wider range of materials and components, including construction materials, according to their functional properties	Using 'Blockly' programming language, create a simulation so that the robot will display the temperature using the 'temperature' block. Program message to appear when 'P0' on the simulation / on the microbit is pressed.. Test in simulation. Using a USB (standard and micro) connector, download the algorithm onto the laptop and then upload onto the microbit. 	Temperature appears on simulation and microbit when GND and 0 pressed.
5	I can program a microbit to make a robot play music.	<i>Evaluate</i> evaluate their ideas and products against their own design criteria and consider the views of others to improve their work <i>Technical knowledge</i>	Using 'Blockly' programming language, create a simulation so that the robot will play music using the 'play melody' (music) block. Program message to appear when 'P1' on the simulation / on the microbit is pressed.. Test in simulation. Using a USB (standard and micro) connector, download the algorithm onto the laptop and then upload onto the microbit. 	Music plays on simulation and microbit when GND and P1 pressed.
6	I can program a microbit to make a robot wave.	apply their understanding of how to strengthen, stiffen and reinforce more complex structures apply their understanding of computing to program, monitor and control their products.	Using 'Blockly' programming language, create a simulation so that the robot will wave its hand using the Strawbees commands (Extensions/Strawbees), 'set Servo (A) position' block. Program so, , when 'P2' on the simulation / on the microbit is pressed, the hand moves from position 0 to position 50 , pausing for 500mS between each move. Repeat 4 times. Test in simulation. Using a USB (standard and micro) connector, download the algorithm onto the laptop and then upload onto the microbit. 	Robot waves on simulation and microbit when GND and P2 pressed.
7	I can use simulations to choose collaboratively		Choose which programs will be used in the final robot and test them using the microbit. Attach the microbit to the robot and test that the programs work as they should. Adapt and refine.	Robot performs actions as it should

	which program to use in my prototype			
<u>8</u>	I can consider a range of ideas and design a control panel for my robot		Using a planning sheet, test out ideas for the design of the control panel. Decide which designs to use and what information to include.	Ideas have been tested / evaluated and final decision made
<u>9</u>	I can test and evaluate my final design for my control panel		Complete the final control panel design then add tinfoil to the corners and attach crocodile clips to the control panel and the microbit. Test out, evaluate, adapt.	Final control panel competed and working correctly
<u>10</u>	I can present my completed robot and evaluate the work of others		One child from each pair move round the classroom evaluating others' work. One child presents their design to the rest of the class.	Clear presentation. Feedback constructive.

Appendix 2: The Design and Technology Association Projects on a Page

1. Year Groups

Years

F2

GLASSES

(FOR

EYES)

2. Aspect of D&T

F2

Explore

Focus

Users and Purpose

4. What could children evaluate?

Glasses, goggles, sun glasses

Adult glasses, child glasses

Safety glasses

7. Links to topics/themes

People Who Help Us, Helping Others, Our Local Community, All about me and my family Traditional Stories, Nursery Rhymes, Toys/small world

5. Intended users

Younger children themselves
 parents grandparents friends

8. Possible contexts

home summer winter
 sport leisure work

6. Purpose of products

Improving sight sun protection

Swimming/skiing, gardening protection

Safety at work experiments

9. Project title

Explore and evaluate the use of eyewear

To be completed by the teacher. Use the project title to set the scene for children’s learning prior to activities in 10, 12 and 14.

13. Possible resources

Books / photographs

Variety of eyewear

different sizes, designs and purpose

14. Key vocabulary

Plastic, glass

safety

user

Purpose

materials

Function

Design

Hinge

lens

3. Key learning in design and technology

Prior learning

- Early experiences of exploring treasure baskets and different materials as well as their own use of eyewear at home
- Experience of using different eyewear

Evaluating

- Explore a range of existing eyewear
- Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.

Technical knowledge and understanding

- Explore and use eyewear
- Understand that different materials, shapes and sizes of eyewear will appeal to different people.
- Know and use technical vocabulary relevant to the project.

10. Investigative and Evaluative Activities (IEAs)

- Children explore and evaluate (using questions below) a collection of images and resources related to and including eyewear
- Use questions to develop children’s understanding e.g. *What do you think this is? Who do you think will use them? Where could you get them? Why are they different? Would you use it? What could make them better? How much would you pay? What are they made of?*

11. Focused Tasks (FTs)

- Introduce and develop vocabulary see 17, support and scaffold children’s ideas about the product

12. Related learning in other subjects

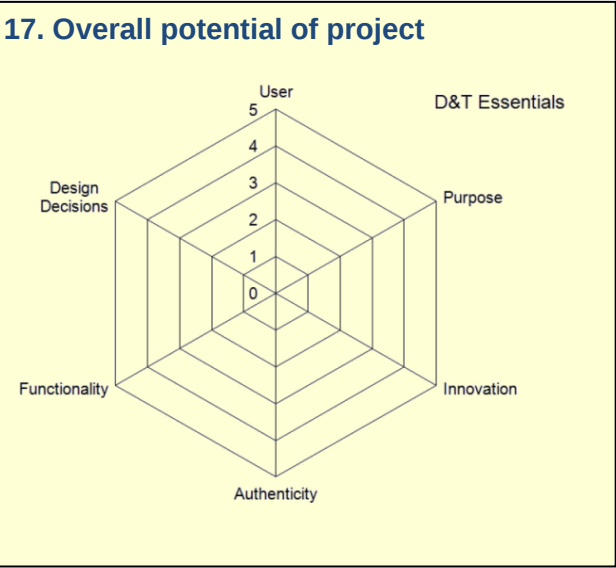
- **Spoken language** – participate in discussion about slippers, taking turns and listening to what others say. Ask relevant questions to extend their knowledge and understanding. Build technical and user vocabulary.

15. Key competencies

- Enquiry
- Consumer awareness

16. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task.



1. Year Groups

Years
F0
CUPS

2. Aspect of D&T

F0

Explore

Focus

Users and
Purpose

4. What could children evaluate?

Baby bottles, feeder cups,
glass/beaker, mugs, plastic cup

5. Intended users

Younger children themselves
parents grandparents friends

6. Purpose of products

Drinking feeding
hot drinks cold drinks

7. Links to topics/themes

People Who Help Us, Helping Others, Our
Local Community, All about me and my
family Traditional Stories, Nursery Rhymes,
Toys/small world

8. Possible contexts

home gifts shops winter
night time comfy time

9. Project title

Explore and evaluate the use of cups
To be completed by the teacher. Use the
project title to set the scene for children's
learning prior to activities in 10, 12 and 14.

13. Possible
resources

Books / photographs

Variety of cups,
different sizes,
designs etc.

14. Key vocabulary

Plastic, glass

Spill, safe

heavy light
hot cold

user
Purpose
materials

Function
design

3. Key learning in design and
technology

Prior learning

- Early experiences of exploring treasure baskets and different materials as well as their own use of cups at home
- Experience of using different cups

Evaluating

- Explore a range of existing cups
- Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.

Technical knowledge and
understanding

- Explore and use cups
- Understand that different materials, shapes and sizes of cups will appeal to different people.
- Know and use technical vocabulary relevant to the project.

10. Investigative and Evaluative Activities (IEAs)

- Children explore and evaluate (using questions below) a collection of images and resources related to and including cups.
- Use questions to develop children's understanding e.g. *What do you think this is? Who do you think will use them? Where could you get them? Why are they different? Would you use it? What could make them better? How much would you pay? What are they made of?*

11. Focused Tasks (FTs)

- Introduce and develop vocabulary see 17, support and scaffold children's ideas about the product

12. Related learning in other subjects

- **Spoken language** – participate in discussion about slippers, taking turns and listening to what others say. Ask relevant questions to extend their knowledge and understanding. Build technical and user vocabulary.

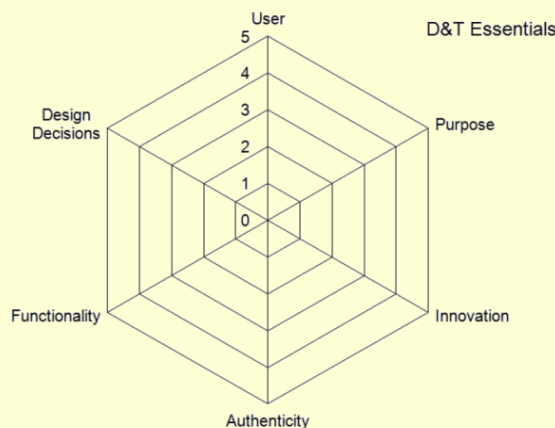
15. Key competencies

- Enquiry
- Consumer awareness

16. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task.

17. Overall potential of project



1. Year Groups

Years
F1
Slippers!

2. Aspect of D&T

F1

Explore

Focus

Users and
Purpose

4. What could children evaluate?

Slippers (possible misconception
children may think flip flops/sliders are
slippers)

5. Intended users

Younger children themselves
parents grandparents friends

6. Purpose of products

Indoor shoe (clean) comfort/leisure
for wearing with pyjamas wearing
when ill alternative comfy footwear

13. Possible
resources

Books / photographs

Joining materials e.g.
glue, cellotape...

Soft fabrics and
bases of slippers

Variety of slippers,
different sizes,
designs etc.

14. Key vocabulary

Heavy light user
Purpose comfort
fabric materials
pair slipper/s

Function

3. Key learning in design and
technology

Prior learning

- Early experiences of exploring treasure baskets and different materials as well as their own use of slippers at home
- Experience of wearing slippers, feeling different fabrics and exploring comfy items of clothes

Evaluating

- Explore a range of existing slippers.
- Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.

Technical knowledge and
understanding

- Explore and use slippers.
- Understand that different materials, shapes and sizes of slippers will appeal to different people.
- Know and use technical vocabulary relevant to the project.

10. Investigative and Evaluative Activities (IEAs)

- Children explore and evaluate (using questions below) a collection of images and recourses related to and including slippers.
- Use questions to develop children's understanding e.g. *What do you think this is? Who do you think will wear/use them? Who makes them? Where could you get them? Why are they different? Would you wear them? What could make them better? How much would you pay? What are they made of?*

11. Focused Tasks (FTs)

- Introduce and develop vocabulary see 17, support and scaffold children's ideas about the product

12. Related learning in other subjects

- **Spoken language** – participate in discussion about slippers, taking turns and listening to what others say. Ask relevant questions to extend their knowledge and understanding. Build technical and user vocabulary.

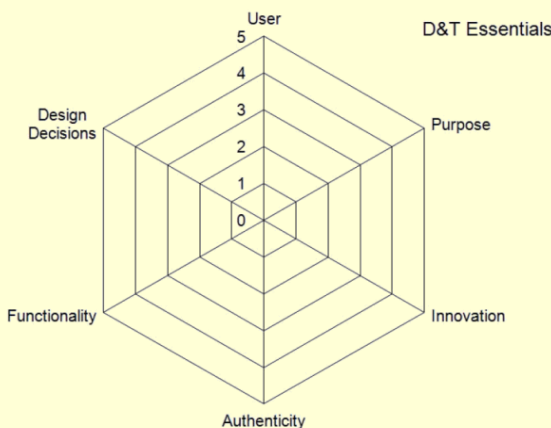
15. Key competencies

- Enquiry
- Consumer awareness

16. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task.

17. Overall potential of project



1. Year Groups

Years F0-F2 Fantastic Food

2. Aspect of D&T

F0 Explore

F1 Explore &
design

F2 Design, make
& evaluate

Focus

Preparing fruit
and/or vegetables

4. What could children design, make and evaluate?

fruit salads fruit yogurt fruit drinks
fruit jelly fruit smoothies veg salads
fruit and vegetable kebabs other – specify
healthy sandwich, porridge, sandwiches

7. Links to topics and themes

Healthy Eating Festivals and Celebrations
Teddy Bear Picnic Food and Farming
Ourselves Senses Growing
other – specify

5. Intended users

themselves parents siblings
grandparents friends peers at school
younger/older children visitors
other – specify

8. Possible contexts

home school gardens playgrounds
local community culture industry
other – specify

6. Purpose of products

picnic celebration party school event
sports day pleasure café corner
other – specify – tasting home grown produce

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose)
To be completed by the teacher. Use the project
title to set the scene for children's learning prior
to activities in 10, 12 and 14.

16. Possible resources

range of fresh fruit and vegetables &
project foods

chopping boards, knives, peelers,
graters, skewers, juicers, spoons,
jugs, plates, bowls, aprons,
plastic table covers, hand washing
and washing-up facilities

bread, spread, eggs, cress

‘Firsts’

Touch, feel, taste, juice,
mix, stir, pour, wash

Measure, chop, cut,
spread with knife

Grate, skewer, peeling
tool,

17. Key vocabulary

fruit and vegetable
names, names of
equipment and utensils
(knife, fork, spoon, bowl,
plate)

taste, smell, sweet, sour,
pull, peel, mix, stir, soft,
smooth, hard

measure, cut out, cut
tear, bitter, sweet, scoop,
touch, feel, seed, juicy,
crunchy, senses
skin, seed, pip, core

(British Nutrition
Foundation)

3. Key learning in design and technology

Prior learning

- Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell.
- Experience of cutting soft fruit and vegetables using appropriate utensils.

Designing

- Design appealing products for a particular user based on simple design criteria.
- Generate initial ideas and design criteria through investigating a variety of fruit/vegetables.
- Communicate these ideas through talk and drawings.

Making

- Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely.
- Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.

Evaluating

- Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences.
- Evaluate ideas and finished products against design criteria, including intended user and purpose.

Technical knowledge and understanding

- Understand where a range of fruit and vegetables come from e.g. farmed or grown at home.
- Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of *The Eatwell Guide*.

Know and use technical and sensory vocabulary relevant to the project.

10. Investigative and Evaluative Activities (IEAs)

- 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?*

12. Focused Tasks (FTs)

- 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?*
- 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.
- Discuss healthy eating advice, including eating more fruit and vegetables; using *The Eatwell Guide* 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?*

14. Design, Make and Evaluate Assignment (DMEA)

- 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?*
- Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs.
- 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.

11. Related learning in other subjects

- **Science** – understand that plants have leaves, stems, roots, flowers and fruits; understand the importance of growing plants and how seasons affect growth.
- **Spoken language** – children develop and use a sensory vocabulary.
- **Writing** – develop descriptive writing based on first-hand experience of tasting fruit and vegetables.
- **Mathematics** – measuring quantities

13. Related learning in other subjects

- **Spoken language** – ask questions to check understanding; use the correct terminology for equipment and food processes.
- **Writing** – instructions on how to use one of the utensils; how to prepare e.g. a fruit for eating.
- **Science** – talk about a balanced diet, different types of food and hygiene.

15. Related learning in other subjects

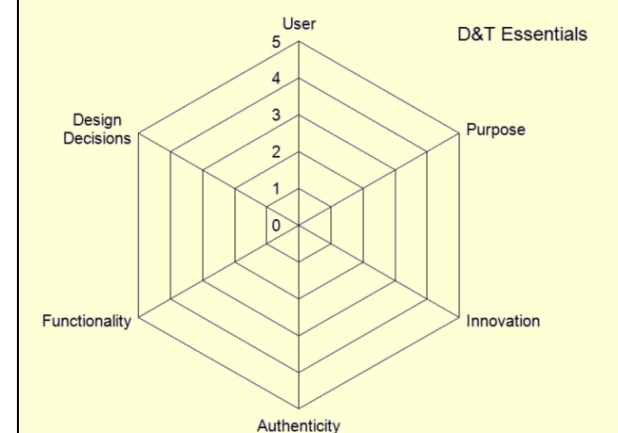
- **Spoken language** – ask questions to develop and check understanding, develop technical and sensory vocabulary and build knowledge.
- **Art and design** – use and develop drawing skills.
- **Writing** – children write instructions to make their food product.
- **Computing** – use digital photographs to help order the main stages of making and support children's writing.

18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify – risk assessment

19. Health and safety Pupils should be taught to work safely and hygienically, using tools, equipment, techniques and ingredients appropriate to the task. Prior to undertaking this project risk assessments should be carried out, including identifying whether there are children who are not permitted to taste or handle any food ingredients or products.

20. Overall potential of project



1. Year Groups

Years
F0-F2
Chairs for
Three
Bears

2. Aspect of D&T

F0 Explore

F1 Explore and
design

F2 Design, make
and evaluate

Focus

Users and
Purpose

4. What could children design, make
and evaluate?

class/group storybook poster display
greetings card class/group information book
storyboard other – specify **chairs/seating**

7. Links to topics and themes

Festivals and Celebrations **Traditional Tales**

Nursery Rhymes history-based topic
geography-based topic science-based topic
other – specify

5. Intended users

themselves younger children parents
grandparents friends visitor to school
other – specify – **toy bears**

8. Possible contexts

imaginary **story-based** **toys** games
people who help us home school
garden playground local community
environment other – specify

6. Purpose of products

Celebration event information
pleasure interests hobbies
educational other – specify - **play**

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose).

To be completed by the teacher. Use the project
title to set the scene for children's learning prior
to activities in 10. 12 and 14.

16. Possible
resources

Books, construction
kitsbuilding materials
loose parts
variety of chairs
(classroom, camping,
wheeled, sofa)
photographs

‘Firsts’

Hammer and nail (golf
tees into polystyrene)

Screwdrivers & screws

Hacksaw and bolsa wood

17. Key vocabulary

Heavy light

Wobbly

Strong, Purpose, user

Stable

Wide base, Collapse

Plan

Model

stapler

3. Key learning in design and
technology

Prior learning

- Early experiences of exploring treasure baskets and different materials
- Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.

Designing

- Generate ideas based on simple design criteria and their own experiences, explaining what they could make.
- Develop, model and communicate their ideas through drawings and mock-ups with card and paper.

Making

- Plan by suggesting what to do next.
- Select and use tools, explaining their choices, to build, stack, combine parts
- Use simple finishing techniques suitable for the product they are creating.

Evaluating

- Explore a range of existing books and everyday products that use simple sliders and levers.
- Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.

Technical knowledge and understanding

- Explore and use sliders and levers.
- Understand that different building resources combine to make different outcomes
- Know and use technical vocabulary relevant to the project.

10. Investigative and Evaluative Activities (IEAs)

- Children explore and evaluate a collection of books and everyday CHAIR products . 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

12. Focused Tasks (FTs)

- Demonstrate experimenting with loose parts to create a seat to the children using prepared teaching aids. It is helpful if these are also used in context.
- Use questions to develop children's understanding e.g. *how will we position the legs?*
- Following teacher demonstration of the correct use of tools and materials, children should develop their knowledge and skills by constructing a seat/or chair suitable for the class bear or WALT mascot.

14. Design, Make and Evaluate Assignment (DMEA)

- 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?*
- Generate simple design criteria with the children e.g. the chair should be light or comfortable
- Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas
- Discuss the finishing techniques the children might use e.g. textiles, cushions or decoration
- Talk about the order in which the product will be made
- Ask children to evaluate their developing ideas and final products

11. Related learning in other subjects

- **Spoken language** – participate in discussion about books and chair/seating products, taking turns and listening to what others say. Ask relevant questions to extend their knowledge and understanding. Build technical and user vocabulary.

13. Related learning in other subjects

- **Spoken language** – children listen and respond appropriately to adults. Ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary.
- **Mathematics** – describe position, direction and movement. Use appropriate standard and non-standard measures.

15. Related learning in other subjects

- **Spoken language** – ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary. Use spoken language to develop understanding through imagining and exploring ideas.
- **Art and design** – use colour, pattern, line, shape.

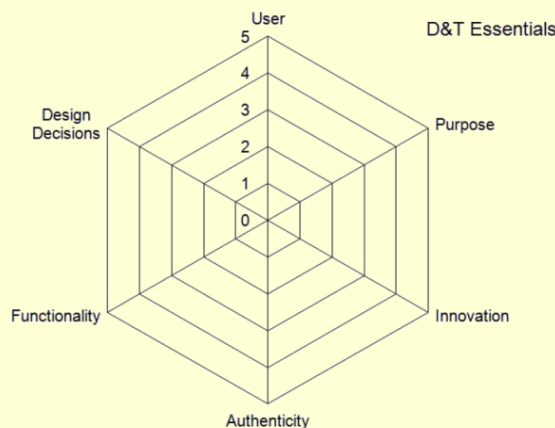
18. Key competencies

problem-solving teamwork negotiation
consumer (user) awareness organisation motivation
persuasion leadership **perseverance**
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Year F0-F2

TOYS

2. Aspect of D&T Mechanisms

F0 Explore

F1 Explore & design

F2 Explore, design & Make

Focus

Joints and mechanisms

3. Key learning in design and technology

Prior learning

• Gained some experience of designing, making and evaluating products for a specified user and purpose.

• Developed some cutting, joining and finishing skills with card.

Designing

• Generate initial ideas and simple design criteria through talking and using own experiences.

• Develop and communicate ideas through drawings and mock-ups.

Making

• Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing.

• Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.

Evaluating

• Explore and evaluate a range of products with wheels and axles.

• Evaluate their ideas throughout and their products against original criteria.

Technical knowledge and understanding

• Explore and use wheels, axles and axle holders.

4. What could children design, make and evaluate?

Moveable toys teddies dolls

5. Intended users

themselves people who help us friends

story character peers in classroom area

other – specify

6. Purpose of products

Comfort

Leisure fun play

7. Links to topics/themes

People Who Help Us Helping Others

Our Local Community Food and Farming

Traditional Stories Fairy Tales Transport

Nursery Rhymes Toys other – specify

8. Possible contexts

imaginary story-based home school

leisure culture local community

other – specify

9. Project title

Design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)

To be completed by the teacher. Use the project title to set the scene for children’s learning prior to activities in 10, 12 and 14.

10. Investigative and Evaluative Activities (IEAs)

• Explore and evaluate a range of locked and hinged products such as toys and everyday objects. Through questioning, direct children’s observations e.g. the number, size, position and methods of hinging/locking.

How do you think the door opens?

How do you think the hinges are fixed on? Why do you think the product has this number of hinges?

11. Related learning in other subjects

• Science – working scientifically: ask simple questions and observe closely. Explore use of everyday materials.

• Mathematics – number of wheels, more than, less than, equal.

• Spoken Language – use of technical vocabulary. Ask relevant questions to extend understanding and build vocabulary and knowledge.

12. Focused Tasks (FTs)

• 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.

13. Related learning in other subjects

• Spoken language – give well-structured descriptions and explanations. Develop speaking and listening skills. Learn relevant technical vocabulary.

• Mathematics – measuring length using non-standard and standard units.

14. Design, Make and Evaluate Assignment (DMEA)

• 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 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.

• Ask children to evaluate their finished product, communicating how it works and how it matches their design criteria, including any changes they made.

15. Related learning in other subjects

• Spoken language – use spoken language to develop understanding through imagining and exploring ideas.

• Art and Design – use a range of media and materials creatively to design and make products.

• Computing – use technology purposefully to create and manipulate digital content.

• Mathematics – measurement using non-standard and standard units.

16. Possible resources

selection of toy vehicles with differently fixed axles

card boxes, cotton reels, plastic tubing, dowel, clothes pegs, single hole punch, card drill, cutting mat, masking tape, PVA glue, paint, thin/thick paint brushes, felt tip pens, decorative paper, double sided sticky fixers, junior hacksaw, vice, left/right handed scissors

‘Firsts’

Deconstruct

slider

Split pins, paper fastener

17. Key vocabulary

Up, down, bend

Forwards/backwards

Hinge, joint, join, cut, fold, connect

Hole punch, catch

design, make, evaluate, purpose, user

18. Key competencies

problem-solving teamwork negotiation

consumer awareness organisation motivation

persuasion leadership perseverance other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project

The diagram is a hexagonal radar chart titled "D&T Essentials". It has six axes extending from a central point, each labeled with a number from 0 to 5. The axes are: "User" (top), "Purpose" (top-right), "Innovation" (bottom-right), "Authenticity" (bottom), "Functionality" (bottom-left), and "Design Decisions" (top-left). The chart is currently empty, with no data lines plotted.

D&T primary

1. Year Groups

**Years
F0-F2
Bear's
picnic
rug**

2. Aspect of D&T

Textiles

F0 Explore

**F1 Explore &
design**

**F2 Explore,
design & Make**

Focus

**Templates and
joining**

4. What could children design, make and evaluate?

glove puppet finger puppet simple bag
(purse) clothes for teddy/soft toy/class doll
fabric placemat other – specify – **picnic rug**

7. Links to topics and themes

Toys Festivals **Stories** **Nursery Rhymes**
Celebrations Homes other – specify

5. Intended users

themselves **friends** younger children
parents **grandparents** teddy story character
class doll soft toy other – specify

8. Possible contexts

entertainment **leisure** **home** **school**
recycling/reusing other – specify – **parent**
picnic events

6. Purpose of products

clothes for toys carrying and storing items
protecting surfaces imaginary role-play
other – specify - **sitting on ground at picnic**

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose)
To be completed by the teacher. Use the project
title to set the scene for children's learning prior to
activities in 10, 12 and 14.

16. Possible resources

Products linked
to chosen
project

variety of textiles e.g. felt,
reclaimed fabric

'Firsts'

Blunt scissors, threading,
glue stick, tearing to cut

PVA glue, plastic
scissors, metal scissors
with close supervision

staplers, staples, fabric

17. Key vocabulary

Stick, glue, join

fabric, materials, re-use

cotton, man-made,
pattern, staple
evaluate, user, purpose

3. Key learning in design and technology

Prior learning

- Explored and used different fabrics.
- Thought about the user and purpose of products.

Designing

- Design a functional and appealing product for a chosen user and purpose based on simple design criteria.
- Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates.

Making

- Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing.
- Select from and use textiles according to their characteristics.

Evaluating

- Explore and evaluate a range of existing textile products relevant to the project being undertaken.
- Evaluate their ideas throughout and their final products against original design criteria.

Technical knowledge and understanding

- Understand how simple 3-D textile products are made, using a template to create two identical shapes.
- Understand how to join fabrics using different techniques e.g. running stitch, **glue**, over stitch, **stapling**.
- Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.
- Know and use technical vocabulary relevant to the project.

10. Investigative and Evaluative Activities (IEAs)

- 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.

12. Focused Tasks (FTs)

- Investigate fabrics to determine which is best for the purpose of the product they are creating.
- 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.
- 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.

14. Design, Make and Evaluate Assignment (DMEA)

- 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.
- 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 ongoing work and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

11. Related learning in other subjects

- **Spoken language** – ask relevant questions to build understanding and their vocabulary.
- **Art and design** – quick drawings or detailed observational drawings of one product to develop and share ideas.

13. Related learning in other subjects

- **Science** – everyday materials. Investigate physical properties of fabric types against suitability for the product to be made.
- **Spoken language** – ask questions throughout the process to check understanding, develop vocabulary and build knowledge. Listen and respond to adults.
- **Art and design** – use colour, pattern, texture, and shape as appropriate.

15. Related learning in other subjects

- **Science** – use knowledge of properties of everyday materials to select appropriate ones for their products.
- **Spoken language** – ask questions throughout the process to check understanding, develop vocabulary and build knowledge. Explain and articulate their ideas orally.
- **Art and design** – use and develop drawing skills.
- **Mathematics** – measurement using non-standard and standard units.
- **Computing** – use technology purposefully to create and manipulate digital content.

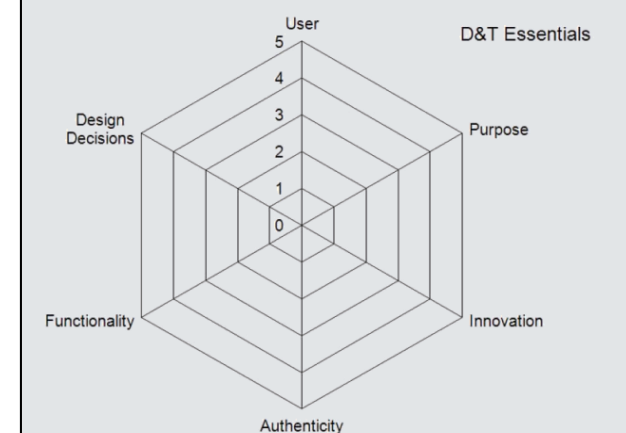
18. Key competencies

problem-solving **teamwork** **negotiation**
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Year
1/2
A to B

2. Aspect of D&T
Mechanisms

Focus

Wheels and
axles

4. What could children design, make
and evaluate?

push/pull toys e.g. emergency service vehicle
carnival float farm vehicle clown's car
vehicle for imaginary/story character
shopping trolley other – specify

7. Links to topics/themes

People Who Help Us Helping Others
Our Local Community Food and Farming
Traditional Stories Fairy Tales Transport
Nursery Rhymes Toys other – specify

5. Intended users

themselves people who help us friends
story character farmers/farm animals
teddy class doll other – specify

8. Possible contexts

imaginary story-based home school
leisure culture local community
other – specify

6. Purpose of products

making work or everyday life easier
moving objects toy vehicle to play with
solving a problem for a story character
other – specify

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose)
To be completed by the teacher. Use the project
title to set the scene for children's learning prior
to activities in 10, 12 and 14.

16. Possible
resources

selection of toy vehicles
with differently fixed axles

card boxes, card, cotton
reels, plastic tubing,
dowel, clothes pegs,
paper sticks/dowel,
paper/plastic straws, card
discs, MDF wheels,
wooden wheels

single hole punch, card
drill, cutting mat, masking
tape, PVA glue, paint,
thin/thick paint brushes,
felt tip pens, decorative
paper, double sided
sticky fixers, junior
hacksaw, vice, left/right

17. Key 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

3. Key learning in design and
technology

Prior learning

- Assembled vehicles with moving wheels using construction kits.
- Explored moving vehicles through play.
- Gained some experience of designing, making and evaluating products for a specified user and purpose.
- Developed some cutting, joining and finishing skills with card.

Designing

- Generate initial ideas and simple design criteria through talking and using own experiences.
- Develop and communicate ideas through drawings and mock-ups.

Making

- Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing.
- Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.

Evaluating

- Explore and evaluate a range of products with wheels and axles.
- Evaluate their ideas throughout and their products against original criteria.

10. Investigative and Evaluative Activities (IEAs)

- 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.

12. Focused Tasks (FTs)

14. Design, Make and Evaluate Assignment (DMEA)

- Using construction kits with wheels and axles, ask children to make a product that moves.
- Discuss with the children what they will be designing, making and evaluating within an authentic context.
- 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.
- 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.
- Children/adults are taught how to mark out, fold, 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 challenge to their peers.
- 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.
- Ask children to evaluate their finished product, communicating how it works and how it matches their design criteria, including any changes they made.

11. Related learning in other subjects

- Science** – working scientifically: ask simple questions and observe closely. Explore use of everyday materials.
- Mathematics** – number of wheels, more than, less than, equal.
- Spoken Language** – use of technical vocabulary. Ask relevant questions to extend understanding and build vocabulary and knowledge.

13. Related learning in other subjects

- Spoken language** – give well-structured descriptions and explanations. Develop speaking and listening skills. Learn relevant technical vocabulary.
- Mathematics** – measuring length using non-standard and standard units.

15. Related learning in other subjects

- Spoken language** – use spoken language to develop understanding through imagining and exploring ideas.
- Art and Design** – use a range of media and materials creatively to design and make products.
- Computing** – use technology purposefully to create and manipulate digital content.
- Mathematics** – measurement using non-standard and standard units.

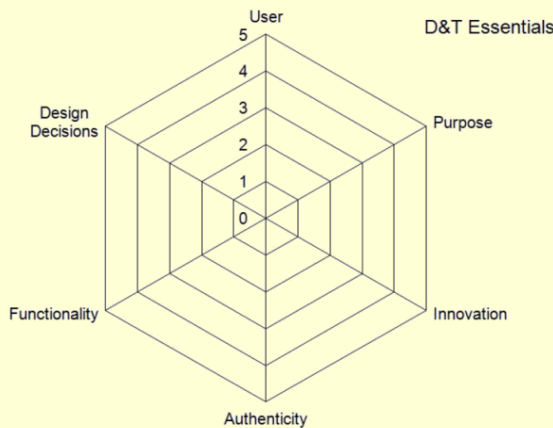
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Years
1/2

Magic
Toymaker

2. Aspect of D&T
Mechanisms

Focus

Sliders and
Levers

4. What could children design, make
and evaluate?

class/group storybook poster display
greetings card class/group information book
storyboard other – specify puppet

5. Intended users

themselves younger children parents
grandparents friends visitor to school
other – specify

6. Purpose of products

celebration event information pleasure
interests hobbies educational
other – specify

16. Possible
resources

books and everyday
products with levers and
slider mechanisms

slider and lever teaching
aids

card strips, card
rectangles, paper,
masking tape, paper
fasteners, paper binders,
stick glue, PVA glue,
finishing materials and
media

left/right handed scissors

17. Key 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

3. Key learning in design and
technology

Prior learning

- Early experiences of working with paper and card to make simple flaps and hinges.
- Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.

Designing

- Generate ideas based on simple design criteria and their own experiences, explaining what they could make.
- Develop, model and communicate their ideas through drawings and mock-ups with card and paper.

Making

- Plan by suggesting what to do next.
- Select and use tools, explaining their choices, to cut, shape and join paper and card.
- Use simple finishing techniques suitable for the product they are creating.

Evaluating

- Explore a range of existing books and everyday products that use simple sliders and levers.
- Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.

Technical knowledge and understanding

- Explore and use sliders and levers.

10. Investigative and Evaluative Activities (IEAs)

- Children 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.

12. Focused Tasks (FTs)

- 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 (Focused practical task using instant CPD) and lever teaching aids. Encourage children to add pictures to their mechanisms.

14. Design, Make and Evaluate Assignment (DMEA)

- 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.
- Discuss the finishing techniques the children might use e.g. using digital text and graphics, paint, felt tipped pens or collage.
- As a whole class, talk about the order in which the mechanisms will be made.
- Ask children to evaluate their developing ideas and final products against the original design criteria.

11. Related learning in other subjects

- **Spoken language** – participate in discussion about books and other products with moving parts, taking turns and listening to what others say. Ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary.

13. Related learning in other subjects

- **Spoken language** – children listen and respond appropriately to adults. Ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary.
- **Mathematics** – describe position, direction and movement. Use appropriate standard and non-standard measures.

15. Related learning in other subjects

- **Spoken language** – ask relevant questions to extend their knowledge and understanding. Build technical and directional vocabulary. Use spoken language to develop understanding through imagining and exploring ideas.
- **Art and design** – use colour, pattern, line, shape.
- **Computing** – digital graphics and text could be incorporated into final products as the background or moving parts.

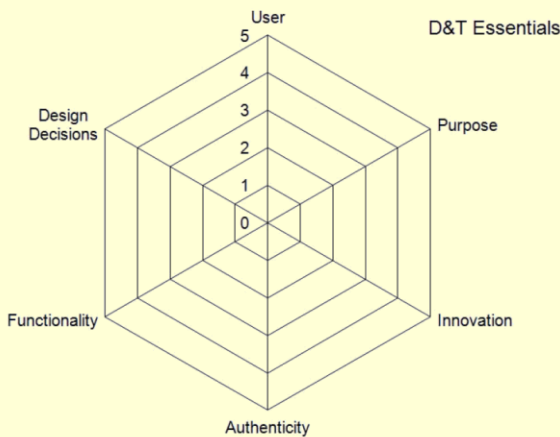
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups Years 1/2 Celebrations	2. Aspect of D&T Textiles Focus Templates and joining techniques	4. What could children design, make and evaluate? glove puppet finger puppet simple bag (purse) clothes for teddy/soft toy/class doll fabric placemat other – specify	5. Intended users themselves friends younger children parents grandparents teddy story character class doll soft toy other – specify	6. Purpose of products plays with puppets clothes for toys carrying and storing items protecting surfaces imaginary role-play other – specify	16. Possible resources existing products linked to chosen project project variety of textiles e.g. dipryl, felt, reclaimed fabric thread, pins, needles, magnet, staplers, staples, fabric glue left/right handed scissors items for finishing e.g. buttons, wool, fabric paints, sequins drawing and colouring	17. Key vocabulary 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
3. Key learning in design and technology Prior learning • Explored and used different fabrics. • Cut and joined fabrics with simple techniques. • Thought about the user and purpose of products. Designing • Design a functional and appealing product for a chosen user and purpose based on simple design criteria. • Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology. Making • Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. • Select from and use textiles according to their characteristics. Evaluating • Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout and their final products against original design criteria. Technical knowledge and understanding • Understand how simple 3-D textile products are made, using a template to create two identical		10. Investigative and Evaluative Activities (IEAs) • 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. <i>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?</i> • Make drawings of existing products, stating the user and purpose. Identify and label, if appropriate, the fabrics, fastenings and techniques used.		11. Related learning in other subjects • Spoken language – ask relevant questions to build understanding and their vocabulary. • Art and design – quick drawings or detailed observational drawings of one product to develop and share ideas.		
		12. Focused Tasks (FTs) • Investigate fabrics to determine which is best for the purpose of the product they are creating. • 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. • 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.		13. Related learning in other subjects • Science – everyday materials. Investigate physical properties of fabric types against suitability for the product to be made. • Spoken language – ask questions throughout the process to check understanding, develop vocabulary and build knowledge. Listen and respond to adults. • Art and design – use colour, pattern, texture, and shape as appropriate.	18. Key competencies problem-solving teamwork negotiation consumer awareness organisation motivation persuasion leadership perseverance other – specify	
		14. Design, Make and Evaluate Assignment (DMEA) • 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. <i>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?</i> • 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. • 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 ongoing work and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.		15. Related learning in other subjects • Science – use knowledge of properties of everyday materials to select appropriate ones for their products. • Spoken language – ask questions throughout the process to check understanding, develop vocabulary and build knowledge. Explain and articulate their ideas orally. • Art and design – use and develop drawing skills. • Mathematics – measurement using non-standard and standard units. • Computing – use technology purposefully to create and manipulate digital content.	19. Health and safety Pupils should be taught to work safely, using tools equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.	
		20. Overall potential of project				

1. Year Groups

Years
1/2 How
are
you?

2. Aspect of D&T

Food

Focus

Preparing
fruit and
vegetables

4. What could children design, make and evaluate?

fruit salads fruit yogurt fruit drinks
fruit jelly fruit smoothies
vegetable salads fruit and vegetable kebabs
other – specify healthy sandwich

7. Links to topics and themes

Healthy Eating Festivals and Celebrations
Teddy Bear Picnic Food and Farming
Ourselves Senses Growing
other – specify

5. Intended users

themselves parents siblings
grandparents friends peers at school
younger/older children visitors
other – specify

8. Possible contexts

home school gardens playgrounds
local community culture industry
other – specify

6. Purpose of products

picnic celebration party school event
sports day pleasure café corner
other – specify

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose)
To be completed by the teacher. Use the project
title to set the scene for children's learning prior
to activities in 10, 12 and 14.

16. Possible
resources

range of fresh fruit and
vegetables

chopping boards, knives,
peelers, graters, skewers,
juicers, spoons, jugs,
plates, bowls, aprons,
plastic table covers,
hand washing and
washing-up facilities

yogurt making machine or
blender, if appropriate

17. Key vocabulary

fruit and 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

3. Key learning in design and
technology

Prior learning

- Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell.
- Experience of cutting soft fruit and vegetables using appropriate utensils.

Designing

- Design appealing products for a particular user based on simple design criteria.
- Generate initial ideas and design criteria through investigating a variety of fruit and vegetables.
- Communicate these ideas through talk and drawings.

Making

- Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely.
- Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.

Evaluating

- Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences.
- Evaluate ideas and finished products against design criteria, including intended user and purpose.

Technical knowledge and understanding

10. Investigative and Evaluative Activities (IEAs)

- 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?*

12. Focused Tasks (FTs)

- 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?*
- 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.
- Discuss healthy eating advice, including eating more fruit and vegetables; using *The Eatwell Guide* 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?*

14. Design, Make and Evaluate Assignment (DMEA)

- 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?*
- Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs.
- 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.

11. Related learning in other subjects

- **Science** – understand that plants have leaves, stems, roots, flowers and fruits; understand the importance of growing plants and how seasons affect growth.
- **Spoken language** – children develop and use a sensory vocabulary.
- **Writing** – develop descriptive writing based on first-hand experience of tasting fruit and vegetables.
- **Mathematics** – carry out a simple survey to

13. Related learning in other subjects

- **Spoken language** – ask questions to check understanding; use the correct terminology for equipment and food processes.
- **Writing** – instructions on how to use one of the utensils; how to prepare e.g. a fruit for eating.
- **Science** – talk about a balanced diet, different types of food and hygiene.

15. Related learning in other subjects

- **Spoken language** – ask questions to develop and check understanding, develop technical and sensory vocabulary and build knowledge.
- **Art and design** – use and develop drawing skills.
- **Writing** – children write a simple account about how they made their food product.
- **Computing** – use digital photographs to help order the main stages of making and support children's writing.

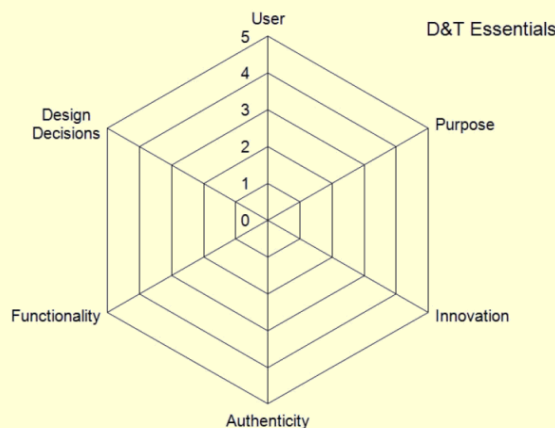
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely and hygienically, using tools, equipment, techniques and ingredients appropriate to the task. Prior to undertaking this project risk assessments should be carried out, including identifying whether there are children who are not permitted to taste or handle any food ingredients or

20. Overall potential of project



1. Year Groups

Years 1/2 What's it made of?

2. Aspect of D&T Structures

Focus

Freestanding structures

4. What could children design, make and evaluate?

enclosures for farm or zoo animals school room
playground/park/garden furniture
bridge for Billy Goats Gruff playground equipment
furniture for the Three Bears other – specify

7. Links to topics and themes

Traditional Tales Nursery Rhymes
Buildings Healthy living Farming Our
School Myself Animals

Parks and Playgrounds other - specify

5. Intended users

themselves school community friends
children of different ages general public
older people story characters teddy animal
other – specify

8. Possible contexts

imaginary story-based classroom school
grounds gardens local community leisure
health environment other - specify

6. Purpose of products

imaginary role-play pleasure
rest recreation health leisure
other – specify design suggestion

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose).

To be completed by the teacher. Use the project
title to set the scene for children's learning prior
to activities in 10, 12 and 14.

16. Possible resources

photographs of various
structures

construction kits that can
be used to construct
freestanding structures
e.g. walls, towers,
frameworks

paper, card, plastic sheet,
paper and plastic straws,
pipe cleaners

reclaimed materials
including small
containers, card boxes,
cotton reels

string, masking tape

PVA glue, Plasticine,
left/right handed scissors,
hole punch, stapler

finishing media and
materials

17. Key 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

3. Key learning in design and technology

Prior learning

- Experience of using construction kits to build walls, towers and frameworks.
- Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card.
- Experience of different methods of joining card and paper.

Designing

- Generate ideas based on simple design criteria and their own experiences, explaining what they could make.
- Develop, model and communicate their ideas through talking, mock-ups and drawings.

Making

- Plan by suggesting what to do next.
- Select and use tools, skills and techniques, explaining their choices.
- Select new and reclaimed materials and construction kits to build their structures.
- Use simple finishing techniques suitable for the structure they are creating.

Evaluating

- Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings.
- Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria

10. Investigative and Evaluative Activities (IEAs)

- 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.

12. Focused Tasks (FTs)

- 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.
- 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?*

14. Design, Make and Evaluate Assignment (DMEA)

- 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. Children could make their final products from construction kits, new and reclaimed materials or any combination of these, according to their characteristics.
- Ask children to evaluate their developing ideas and final products against original design criteria.

11. Related learning in other subjects

- **Geography** – use simple fieldwork and observational skills to study the geography of their school and its grounds and the key physical features of its surrounding environment.
- **Spoken language** – participate in discussion about various structures, taking turns and listening to what others say. Ask relevant questions to extend their knowledge and understanding.

13. Related learning in other subjects

- **Mathematics** – use appropriate standard and non-standard measures. Recognise and name common 2-D and 3-D shapes.
- **Science** – think about the properties of materials that make them suitable or unsuitable for particular purposes.
- **Spoken language** – ask relevant questions to extend their knowledge and understanding. Build technical vocabulary.

15. Related learning in other subjects

- **Spoken language** – ask relevant questions to extend their knowledge and understanding. Build technical vocabulary. Use spoken language to develop understanding through imagining and exploring ideas.
- **Art and design** – use colour, pattern, line, shape. Use and develop drawing skills.
- **Science** – think about the properties of materials that make them suitable or unsuitable for particular purposes.

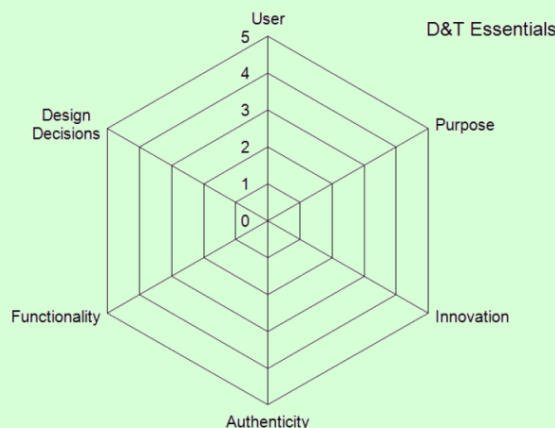
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Years
3/4

Active
Planet

2. Aspect of D&T

Textiles

Focus

2-D shape to
3-D product

4. What could children design, make and evaluate?

purse/wallet soft toy/mascot apron
beach bag shoe bag pencil case story sack clothing for a volcanologist

5. Intended users

themselves friends family teachers
children parents other adults
other – specify

6. Purpose of products

entertainment hobbies protection
celebration pleasure carrying things
other – specify experiment

16. Possible resources

collection of textile products linked to the chosen product to be made

selection of fabrics and fastenings

left/right handed scissors, needles, thread, tape, fabric glue, pins, measuring tape

items to use for finishing e.g. fabric paints, threads, appliqué pieces, paints for printing, thin paint

17. Key vocabulary

fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance

user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces

3. Key learning in design and technology

Prior learning

- Have joined fabric in simple ways by gluing and stitching.
- Have used simple patterns and templates for marking out.
- Have evaluated a range of textile products.

Designing

- Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.
- Produce annotated sketches, prototypes, final product sketches and pattern pieces.

Making

- Plan the main stages of making.
- Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.
- Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.

Evaluating

- Investigate a range of 3-D textile products relevant to the project.
- Test their product against the original design criteria and with the intended user.
- Take into account others' views.
- Understand how a key event/individual has influenced the development of the chosen product

10. Investigative and Evaluative Activities (IEAs)

- 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.
- Give children the opportunity to disassemble appropriate textiles products to gain an understanding of 3-D shape, patterns and seam allowances.
- Use questioning to develop understanding e.g. *What is its purpose? Which one is most suited to its purpose? What properties/characteristics does the fabric have? Why has this fabric been chosen? How has the fabric been joined together? How effective are its fastenings? How has it been decorated?*

12. Focused Tasks (FTs)

- 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.
- Allow children to use a textile product they have taken apart to create a paper pattern using 2-D shapes.
- 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?*

14. Design, Make and Evaluate Assignment (DMEA)

- 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.
- 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 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.

11. Related learning in other subjects

- **Science** – physical properties of fabrics.
- **Spoken language** – asking and answering questions to develop understanding. Through discussion, participate actively initiating and responding to comments.
- **Mathematics** – nets of shapes and accurate measurements mm/cm.
- **History** – investigating textiles and textile

13. Related learning in other subjects

- **Computing** – opportunity to create pattern pieces using a computer program.
- **Mathematics** – nets of shapes and accurate measurement mm/cm.
- **Science** - identify and compare the suitability of a variety of fabrics for particular uses.
- **Art and design** – investigating visual and tactile qualities of fabrics and using colour and pattern appropriately.
- **Spoken language** – develop technical vocabulary. Give well-structured descriptions

15. Related learning in other subjects

- **Art and design** – using a range of tools and decorative techniques. Develop sketching techniques.
- **Computing** – using software to produce pattern pieces and possible use for decorative techniques.
- **Mathematics** – accurate measurements mm/cm.
- **Spoken language** – consideration and evaluation of others' viewpoint.
- **Writing** – written evaluation of their product, organising it under e.g. headings, subheadings.

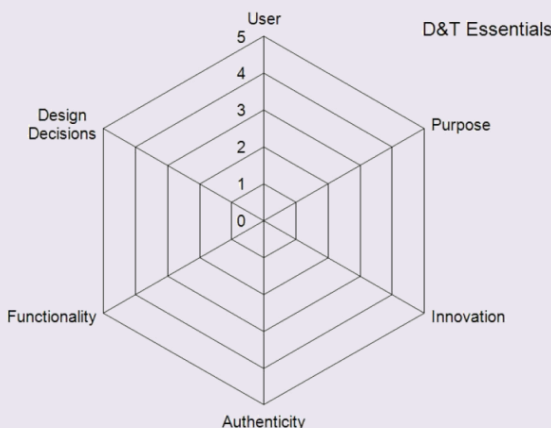
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Year 3/4

Bright Sparks

2. Aspect of D&T

Electrical systems

Focus

Simple circuits and switches

3. Key learning in design and technology

Prior learning

Designing

Making

Evaluating

4. What could children design, make and evaluate?

5. Intended users

6. Purpose of products

7. Links to topics and themes

8. Possible contexts

9. Project title

11. Related learning in other subjects

13. Related learning in other subjects

15. Related learning in other subjects

16. Possible resources

17. Key vocabulary

18. Key competencies

19. Health and safety

20. Overall potential of project

16. Possible resources

handling collection of battery-powered electrical products

switches including toggle, push-to-make and push-to-break

aluminium foil, paper fasteners, paper clips, card, corrugated plastic, reclaimed materials, finishing materials and media

buzzers, bulbs, bulb holders, zinc carbon or zinc chloride batteries, battery holders, wire, automatic wire strippers

suitable control program with interface box or standalone control box

right/left handed scissors, PVA glue, cutting mats

17. Key vocabulary

series circuit, fault, connection, toggle switch, push-to-make 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

18. Key competencies

problem-solving teamwork negotiation

consumer awareness organisation motivation

persuasion leadership perseverance

other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project

User

Purpose

Innovation

Authenticity

Functionality

Design Decisions

5

4

3

2

1

0

4. What could children design, make and evaluate?

siren for a toy vehicle reading light noise-making toy nightlight illuminated sign torches table lamp lighting for display toy for younger children buzzer for school office other – specify

5. Intended users

themselves younger children older children teenagers parents grandparents friends school general public other – specify

6. Purpose of products

safety and security hobbies and interests utility pleasure advertising gift energy saving for sale other – specify

7. Links to topics and themes

Homes Travel and Holidays Cities Emergency Vehicles School Business Enterprise Light and Dark other – specify

8. Possible contexts

home school leisure culture enterprise environment sustainability local community other – specify

9. Project title

Design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)

To be completed by the teacher. Use the project title to set the scene for children’s learning prior to activities in 10, 12 and 14.

11. Related learning in other subjects

• Science – know how to construct simple series circuits and have a basic understanding of conductors, insulators and open and closed switches.

• Spoken language – participate in discussion and evaluation of battery-powered products. Ask relevant questions to extend knowledge and understanding. Build their technical vocabulary.

13. Related learning in other subjects

• Science – know how to construct simple series circuits and have a basic understanding of conductors, insulators and open and closed switches.

• Computing – design, write and debug programs that accomplish specific goals, including controlling physical systems.

• Spoken language – asking questions to check understanding, develop technical vocabulary and build knowledge.

15. Related learning in other subjects

• Spoken language – maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments. Develop understanding through speculating, hypothesising, imagining and exploring ideas.

• Science – know how to construct simple series circuits and have a basic understanding of conductors, insulators and open and closed switches.

• Computing – design, write and debug programs that accomplish specific goals, including controlling physical systems.

• Art and design – using and developing drawing skills.

12. Focused Tasks (FTs)

• 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.

• Use a simple computer control program with an interface box or standalone control box to physically control output devices e.g. bulbs and buzzers.

• 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.

10. Investigative and Evaluative Activities (IEAs)

• 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.

14. Design, Make and Evaluate Assignment (DMEA)

• 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.

• 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 throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

D&T Essentials

User

Purpose

Innovation

Authenticity

Functionality

Design Decisions

5

4

3

2

1

0

D&T primary

1. Year Groups

Years
3/4

How
Humans
Work

2. Aspect of D&T

Food

Focus

Healthy and
varied diet

4. What could children design, make and evaluate?

sandwiches wraps rolls pitta pockets
blinis rice cakes toasties salad snacks
other – specify vegetarian burger

7. Links to topics and themes

Stories Picnics Healthy Eating School Fair
Religious Festival Eco-Fair/Green Days
Cultural Focus day

other – specify

5. Intended users

themselves older children
younger children parents grandparents
friends family visitors

other – specify

8. Possible contexts

home school off-site educational visits
leisure culture enterprise industry
wider environment health

other – specify

6. Purpose of products

celebration picnic lunch boxes
sports day religious festival off-site visits
healthy living other – specify

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose).

To be completed by the teacher. Use the project
title to set the scene for children's learning prior

16. Possible
resources

information about foods
from around the world,
basic recipes

range of relevant
example foods to taste
and evaluate

suitable equipment and
utensils such as: knives,
chopping board,
weighing scales,
measuring jugs,
bowls, baking trays
spoons – various sizes,
parchment paper, plastic
film

17. Key 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

3. Key learning in design and
technology

Prior learning

- Know some ways to prepare ingredients safely and hygienically.
- Have some basic knowledge and understanding about healthy eating and *The Eatwell Guide*.
- Have used some equipment and utensils and prepared and combined ingredients to make a product.

Designing

- Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.
- Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.

Making

- 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.

Evaluating

- Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.
- Evaluate the ongoing work and the final product with reference to the design criteria and the views

10. Investigative and Evaluative Activities (IEAs)

- 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 Guide* 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.

12. Focused Tasks (FTs)

- 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?*

14. Design, Make and Evaluate Assignment (DMEA)

- 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.
- 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 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

11. Related learning in other subjects

- **Mathematics and computing** – making use of mathematical and computing skills to present results of sensory evaluations graphically.
- **Spoken language** – developing relevant vocabulary e.g. sensory descriptors. Ask relevant questions to extend their knowledge.
- **Science** – using and developing skills of observing and questioning. Humans get nutrition from what they eat. Discuss changes of state if heat is used.

13. Related learning in other subjects

- **Mathematics** – mass kg/g.
- **Spoken language** – developing relevant technical vocabulary e.g. names of utensils and techniques. Ask relevant questions to extend their knowledge.

15. Related learning in other subjects

- **Mathematics** – mass kg/g.
- **Art and Design** – using and developing drawing skills.
- **Writing** – new vocabulary. Use non-fiction texts such as description, explanation and instructions e.g. recipes. Organise their work using e.g. headings, subheadings.
- **Spoken language** – consider and evaluate different viewpoints. Use discussion to develop understanding through exploring ideas.

18. Key competencies

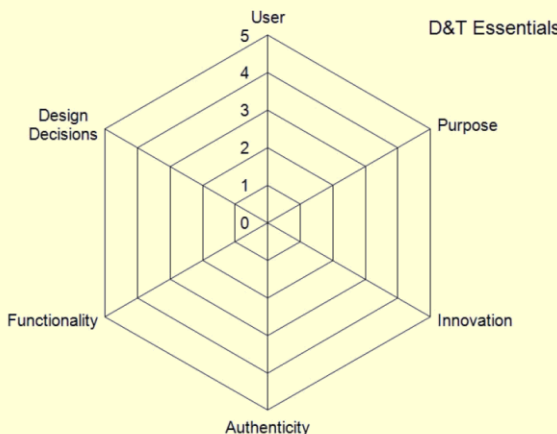
problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance

other – specify

19. Health and safety

Pupils should be taught to work safely and hygienically, using tools, equipment, techniques and ingredients appropriate to the task. Prior to undertaking this project risk assessments should be carried out, including identifying whether there are children who are not permitted to taste or handle any food ingredients or products

20. Overall potential of project



1. Year Groups

Years
3/4

2. Aspect of D&T

Mechanical
systems

Focus

Levers and
linkages

4. What could children design, make and evaluate?

story book poster class display
greetings card information book
storyboard other – specify

5. Intended users

themselves younger children older children
teenagers parents grandparents
visitor to school friends other – specify

6. Purpose of products

celebration event information
pleasure interests hobbies campaign
educational other – specify

16. Possible resources

books and other products
with lever and linkage
mechanisms

lever and linkage
teaching aids

card strips, card
rectangles, paper,
masking tape, paper
fasteners, paper binders,
stick glue

left/right handed scissors,
cutting mats, card drill,
finishing media and
materials

17. Key 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

3. Key learning in design and technology

Prior learning

- Explored and used mechanisms such as flaps, sliders and levers.
- Gained experience of basic cutting, joining and finishing techniques with paper and card.

Designing

- Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user.
- Use annotated sketches and prototypes to develop, model and communicate ideas.

Making

- Order the main stages of making.
- Select from and use appropriate tools with some accuracy to cut, shape and join paper and card.
- Select from and use finishing techniques suitable for the product they are creating.

Evaluating

- Investigate and analyse books and, where available, other products with lever and linkage mechanisms.
- Evaluate their own products and ideas against criteria and user needs, as they design and make.

Technical knowledge and understanding

- Understand and use lever and linkage mechanisms

10. Investigative and Evaluative Activities (IEAs)

- 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?*



11. Related learning in other subjects

- **Spoken language** – participate in discussion and evaluation of books and, where available, other products with moving pictures. Ask relevant questions to extend knowledge and understanding. Build technical vocabulary.



12. Focused Tasks (FTs)

- 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.

13. Related learning in other subjects

- **Mathematics** – use the vocabulary of position, direction and movement. Use a ruler to measure to the nearest cm, half cm or mm.
- **Spoken language** – ask relevant questions to extend knowledge and understanding. Build their technical vocabulary.
- **Art and design** – use colour, pattern, line, shape.



14. Design, Make and Evaluate Assignment (DMEA)

- 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.
- 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 the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

15. Related learning in other subjects

- **Spoken language** – ask relevant questions to extend knowledge and understanding. Build technical vocabulary. Consider and evaluate different viewpoints.
- **Computing** – digital graphics and text could be incorporated into final products as the background or moving parts.
- **Art and design** – use and develop drawing techniques. Use colour, pattern, line, shape.

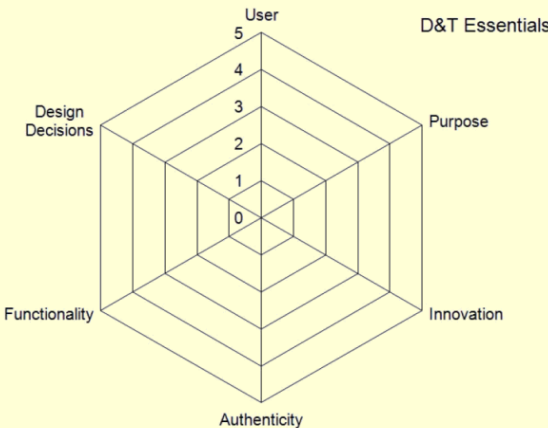
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Years 3/4

Save the World

2. Aspect of D&T

Food

Focus

Healthy and varied diet

3. Key learning in design and technology

Prior learning

• Know some ways to prepare ingredients safely and hygienically.

• Have some basic knowledge and understanding about healthy eating and *The Eatwell Guide*.

• Have used some equipment and utensils and prepared and combined ingredients to make a product.

Designing

• Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.

• Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.

Making

• 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.

Evaluating

• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.

• Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.

4. What could children design, make and evaluate?

sandwiches wraps rolls pitta pockets blinis rice cakes toasties snack bar salad snacks smoothie other – specify

5. Intended users

themselves older children younger children parents grandparents friends family visitors other – specify wider market

7. Links to topics and themes

Stories Picnics Healthy Eating School Fair Religious Festival Eco-Fair/Green Days Cultural Focus other – specify

10. Investigative and Evaluative Activities (IEAs)

• 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 Guide* 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.

12. Focused Tasks (FTs)

• 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?*

14. Design, Make and Evaluate Assignment (DMEA)

• 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.

• 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 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 they try it.

6. Purpose of products

celebration picnic lunch boxes sports day religious festival off-site visits healthy living other – specify to sell

9. Project title

Design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose).

To be completed by the teacher. Use the project title to set the scene for children's learning prior to the project.

11. Related learning in other subjects

• **Mathematics and computing** – making use of mathematical and computing skills to present results of sensory evaluations graphically.

• **Spoken language** – developing relevant vocabulary e.g. sensory descriptors. Ask relevant questions to extend their knowledge.

• **Science** – using and developing skills of observing and questioning. Humans get nutrition from what they eat. Discuss changes of state if heat is used.

13. Related learning in other subjects

• **Mathematics** – mass kg/g.

• **Spoken language** – developing relevant technical vocabulary e.g. names of utensils and techniques. Ask relevant questions to extend their knowledge.

15. Related learning in other subjects

• **Mathematics** – mass kg/g.

• **Art and Design** – using and developing drawing skills.

• **Writing** – new vocabulary. Use non-fiction texts such as description, explanation and instructions e.g. recipes. Organise their work using e.g. headings, subheadings.

• **Spoken language** – consider and evaluate different viewpoints. Use discussion to develop understanding through exploring ideas.

16. Possible resources

information about foods from around the world, basic recipes

range of relevant example foods to taste and evaluate

suitable equipment and utensils such as: knives, chopping board, weighing scales, measuring jugs, bowls, baking trays, spoons – various sizes, parchment paper, plastic film

17. Key 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

18. Key competencies

problem-solving teamwork negotiation consumer awareness organisation motivation persuasion leadership perseverance

other – specify

19. Health and safety

Pupils should be taught to work safely and hygienically, using tools, equipment, techniques and ingredients appropriate to the task. Prior to undertaking this project risk assessments should be carried out, including identifying whether there are children who are not permitted to taste or handle any food ingredients or products.

20. Overall potential of project

**Years
3/4
Shake
it**

Focus

Shell structures using computer-aided design (CAD)

- Investigate and evaluate a range of shell structures including the materials, components

gift boxes desk tidy lunchboxes packaging
cool boxes party boxes mystery boxes
toy car body shell moneyboxes
other – specify

Shape and Space	Shopping	Going Green
Festivals	Celebrations	Healthy Eating
Our School	Toys and Games	
other – specify		

themselves	siblings	parents	relatives
friends	younger/older children		party guests
shop customers		community group	
neighbours	other – specify		

home	school	shopping	culture
enterprise	local community	wider	
environment	other – specify		

packaging	storage	protection
marketing	presentation	display
celebration	postage	other – specify

Design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose). To be completed by the teacher. Use the project title to set the scene for children's learning prior to activities in 10, 12 and 14.

- collection of shell structures for different purposes and users

card, squared paper,
coloured paper,
adhesive tape,
masking tape, PVA glue,
glue spreaders,
acetate sheet, pencils,
felt-tip pens,
rulers, right/left handed
scissors

computer with computer-aided design (CAD) software such as Techsoft 2D Primary or Microsoft Word, printer

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

- 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*

- Practise making nets out of card, joining flat faces with masking tape to create 3-D shapes. Experiment with assembling pre-drawn nets in numerous ways using scoring, cutting and assembling techniques.

- Ask children to identify the main stages of making and the appropriate tools and skills they learnt through focused tasks. Encourage the children to work with accuracy, using their computer-aided

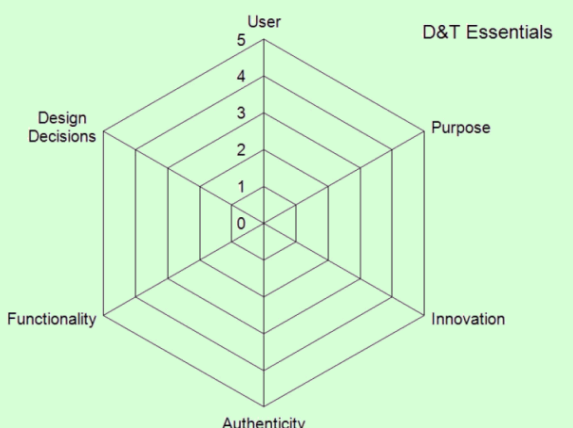
- **Spoken language** – ask relevant questions to extend knowledge and understanding. Build their technical vocabulary.

- **Computing** – design and create digital content on screen, creating nets for their products and combining text with graphics.

- **Computing** – design and create digital content on screen using computer-aided design (CAD) software, creating nets for their products and combining graphics with text.

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

1. Year Groups Years 5/6 The Great, The Bold, The Brave	2. Aspect of D&T Structures Focus Frame structures	4. What could children design, make and evaluate? playground shelter market stall bus shelter tent play house gazebo bird hide parasol park furniture adventure playground equipment kite other – specify	5. Intended users themselves parents younger/older children local community walkers market trader gardeners mountaineers bird watchers other – specify	6. Purpose of products safety weather protection play pleasure meeting place business recreation other – specify	16. Possible resources products, photographs, web-based resources of existing frame structures card, paper straws, newspaper, square sectioned wood, masking tape, PVA glue pencils, rulers, right/left handed scissors, bench hooks, G-clamp, junior hacksaws, glass paper finishing media and materials	17. Key vocabulary frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional
3. Key learning in design and technology Prior learning • Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. • Basic understanding of what structures are and how they can be made stronger, stiffer and more stable. Designing • Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches. Making • Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making. Evaluating • Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development,		10. Investigative and Evaluative Activities (IEAs) • 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. <i>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?</i> • 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.	11. Related learning in other subjects • Science – compare and group together everyday materials on the basis of their properties. • Mathematics – identify 3-D shapes, including cubes and other cuboids, from 2-D representations. • Spoken language – ask relevant questions, formulate and express opinions, give well-structured descriptions and explanations. Use relevant strategies to build their vocabulary. • Computing – use technologies for research	18. Key competencies problem-solving teamwork negotiation consumer awareness organisation motivation persuasion leadership perseverance other – specify		
12. Focused Tasks (FTs) • 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. <i>How could each of the frameworks be reinforced and strengthened?</i> • 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		13. Related learning in other subjects • Mathematics – recognise, describe and build simple 3-D shapes. Apply understanding and skill to carry out accurate measuring using standard units i.e. cm/mm. • Spoken language – ask relevant questions, formulate and express opinions, give well-structured descriptions and explanations. Use strategies to build their vocabulary.	19. Health and safety Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.			
14. Design, Make and Evaluate Assignment (DMEA) • Discuss the brief of designing and making a small-scale frame structure e.g. <i>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?</i> 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. <i>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?</i> • 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		15. Related learning in other subjects • Spoken language – ask relevant questions, formulate and express opinions, give well-structured descriptions and explanations. Use strategies to build their vocabulary. • Art and design – use and develop drawing skills. • Mathematics – apply understanding and skill to carry out accurate measuring using standard units i.e. cm/mm.	20. Overall potential of project 			

1. Year Groups

Years
5/6
Space
explorers

2. Aspect of D&T

Electrical
systems

Focus

More
complex
switches and
circuits

4. What could children design, make and evaluate?

vehicle alarm security lighting system
alarm for valuable artefact automatic
nightlight electrical board game prototype
Mars rover other – specify

7. Links to topics/themes

Our School Toys and Games
Keep Safe Ourselves
Culture and Leisure Travel Homes
Buildings other – specify Space

5. Intended users

vehicle owner themselves
school community school administrator
younger children siblings parents
museum curator other – specify

8. Possible contexts

home school community culture leisure
enterprise business other – specify
investigation

6. Purpose of products

safety protection security detection
warning comfort illumination entertainment

other – specify

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose).

To be completed by the teacher. Use the project title to set the scene for children's learning prior to activities in 10. 12 and 14.

16. Possible resources

zinc carbon or zinc
chloride batteries,
crocodile leads, bulbs,
bulb holders, buzzers,
light emitting diodes
(LEDs), micro switches,
reed switches and
magnets, light dependent
resistors (LDRs), wire,
automatic wire strippers,
masking tape,
construction materials
and tools as required

computer control software
connecting leads

Lego mindstorm
computer controlled

17. Key vocabulary

series circuit, parallel
circuit, names of switches
and components, input
device, output device,
system, monitor, control,
program, flowchart

function, innovative,
design specification,
design brief, user,
purpose

3. Key learning in design and technology

Prior learning

- Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product.
- Initial experience of using computer control software and an interface box or a standalone box, e.g. writing and modifying a program to make a light flash on and off.

Designing

- Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost.
- Generate and develop innovative ideas and share and clarify these through discussion.
- Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.

Making

- Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.
- Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.
- Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.

Evaluating

- Continually evaluate and modify the working features of the product to match the initial design

10. Investigative and Evaluative Activities (IEAs)

- 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.

12. Focused Tasks (FTs)

- 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.

14. Design, Make and Evaluate Assignment (DMEA)

- 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 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.
- 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.

11. Related learning in other subjects

- **Spoken Language** – ask relevant questions, give well-structured descriptions and explanations. Build technical vocabulary.
- **Computing** – use technologies for research purposes and be discerning when evaluating digital content.
- **Science** – apply knowledge and understanding of circuits, switches, conductors and insulators.

13. Related learning in other subjects

- **Mathematics** – apply understanding and skill to carry out accurate measuring using standard units i.e. cm/mm.
- **Science** – apply knowledge and understanding of circuits, switches, conductors and insulators.
- **Computing** – design, write and debug programs that accomplish specific goals, including controlling physical systems. Use sequence, selection, and repetition in programs. Work with variables and various forms of input and output.

15. Related learning in other subjects

- **Mathematics** – apply understanding and skill to carry out accurate measuring using standard units i.e. cm/mm.
- **Science** – apply knowledge and understanding of circuits, switches, conductors and insulators.
- **Computing** – design, write and debug programs that accomplish specific goals, including controlling physical systems. Use sequence, selection, and repetition in programs. Work with variables and various forms of input and output.

18. Key competencies

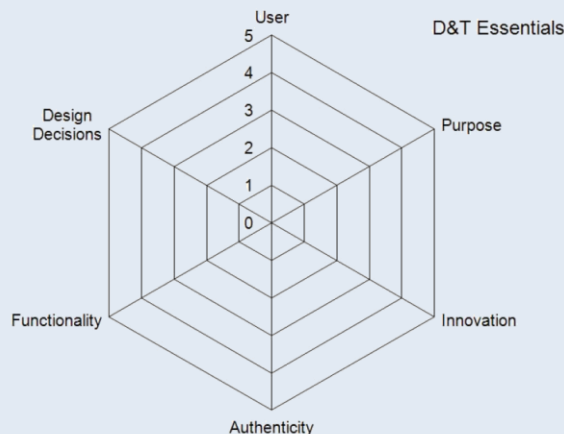
problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance

other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Years

5/6

What Price Progress?

2. Aspect of D&T

Mechanical systems

Focus

Cams

4. What could children design, make and evaluate?
- a shop display with moving parts e.g. lifting or rotating images of items for sale
- a vehicle incorporating cam-driven components
a toy with oscillating, rotating or reciprocating
7. Links to topics and themes
- | | |
|-------------------|-----------------|
| Toys and Games | Our Community |
| Forces and Motion | Mini-enterprise |
| Festivals | Celebrations |
- other – specify

5. Intended users
- peers siblings younger children
- older children shoppers
- specific individuals target groups
- company other – specify
8. Possible contexts
- shops home school local community
- leisure enterprise wider environment
- engineering manufacturing other – specify

6. Purpose of products
- business entertainment pleasure play
- educational interests and hobbies
- other – specify
9. Project title
- Design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose).
- To be completed by the teacher. Use the project title to set the scene for children's learning prior to activities in 10, 12 and 14.

16. Possible resources
- videos and photographs of cams, models or toys with different cam mechanisms
- MDF, card or wooden wheels, plastic or wooden cams, dowel, card boxes, PVA glue, masking tape, double-sided tape, square section wood, card, corrugated plastic, finishing media
- junior hacksaws, glass paper, G-clamps, bench hooks, hand drill
17. Key vocabulary
- cam, snail cam, off-centre cam, peg cam, pear shaped cam
- follower, axle, shaft, crank, handle, housing, framework
- rotation, rotary motion, oscillating motion, reciprocating motion
- annotated sketches, exploded diagrams
- mechanical system, input movement, process, output movement
- design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

3. Key learning in design and technology
- Prior learning
- Experience of axles, axle holders and wheels that are fixed or free moving.
 - Basic understanding of different types of movement.
 - Experience of cutting and joining techniques with a range of materials including card, plastic and wood.
 - An understanding of how to strengthen and stiffen structures.

- Designing
- Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.
 - Develop a simple design specification to guide their thinking.
 - Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.

- Making
- Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team.
 - Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.

- Evaluating
- Compare the final product to the original design specification.

10. Investigative and Evaluative Activities (IEAs)
- 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?*

14. Design, Make and Evaluate Assignment (DMEA)
- 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 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 throughout and the final product in use, comparing it to the original design specification.

12. Focused Tasks (FTs)
- 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?*
 - Develop measuring, marking, cutting, shaping and joining skills using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to make cam mechanisms and construct wooden frames or card housings, as appropriate. Demonstrate the accurate and safe use of tools and equipment.

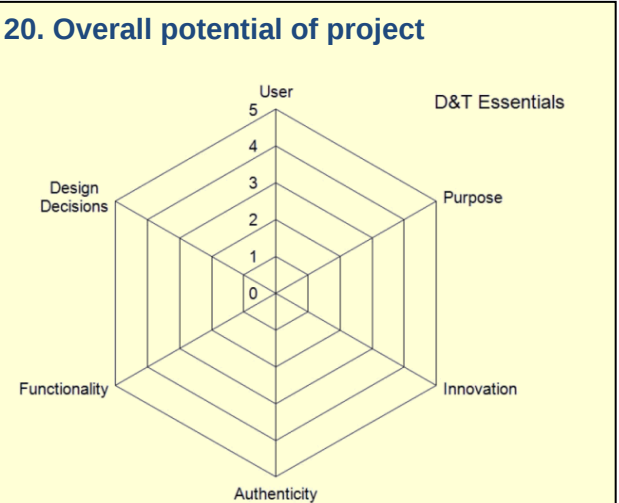
11. Related learning in other subjects
- **Spoken language** – ask relevant questions, formulate and express opinions, give well-structured descriptions and explanations. Listen and respond appropriately, articulate and justify answers, arguments and opinions. Consider and evaluate different viewpoints.
 - **Computing** – use search technologies for research purposes and be discerning when evaluating digital content.
 - **Science** – forces and movement: explore the effects of simple machines on movement.

13. Related learning in other subjects
- **Spoken language** – listen and respond appropriately. Use relevant strategies to build their vocabulary.
 - **Science** – identify and compare the suitability of a variety of everyday materials for particular uses.
 - **Mathematics** – use mathematical vocabulary to describe position, direction and movement.

15. Related learning in other subjects
- **Art and design** – use and apply drawing skills. Use techniques with colour, pattern, texture, line and shape.
 - **Science** – explore the effects of simple machines on movement.
 - **Mathematics** – choose and use appropriate standard units (i.e. cm/mm) to estimate and accurately measure length/height.

18. Key competencies
- problem-solving teamwork negotiation
- consumer awareness organisation motivation
- persuasion leadership perseverance
- other – specify

19. Health and safety
- Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.



1. Year Groups

Years
5/6
Full
Power

2. Aspect of D&T

Electrical
systems

Focus

Monitoring and
control

4. What could children design, make and evaluate?

cycle or vehicle alarm security lighting system
alarm for valuable artefact garden light
automatic nightlight electronic toy
alarm for school shed other – specify

7. Links to topics/themes

Our School Toys and Games
Keep Safe Ourselves
Culture and Leisure Travel Homes
Buildings other – specify

5. Intended users

vehicle or cycle owner school community
school administrator themselves siblings
parents security staff other – specify

8. Possible contexts

home school community culture leisure
enterprise business other – specify

6. Purpose of products

safety protection security detection
warning comfort illumination entertainment
other – specify

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose).

To be completed by the teacher. Use the project title to set the scene for children's learning prior to activities in 10. 12 and 14.

16. Possible resources

microcontroller or
standalone control box or
interface box

collection of battery-
powered, manually-
controlled and
programmable products

batteries, battery holders,
crocodile leads

different output devices
including bulbs with bulb
holders, buzzers, light
emitting diodes (LEDs),
motors

different input devices
including micro switches,
reed switches and
magnets, light dependent
resistors (LDRs)

wire, automatic wire
strippers, masking tape,
construction materials
and tools as required

17. Key vocabulary

reed switch, toggle
switch, push-to-make
switch, push-to-break
switch, light dependent
resistor (LDR), tilt switch

light emitting diode (LED),
bulb, bulb holder,
battery, battery holder,
USB cable, wire,
insulator, conductor,
crocodile clip

control, program, system,
input device, output
device, series circuit,
parallel circuit

function, innovative,
design specification,
design brief, user,
purpose
crumble boards

3. Key learning in design and technology

Prior learning

- Initial experience of using computer control software and an interface box, a standalone box or microcontroller, e.g. Crumble.
- Some experience of writing and modifying a program to make a light turn on or flash on and off.
- Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product.

Designing

- Develop a design specification for a functional product that responds automatically to changes in the environment.
- Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams.

Making

- Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.
- Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.
- Create and modify a computer control program to enable their electrical product to respond to changes in the environment.

Evaluating

- Continually evaluate and modify the working features of the product to match the initial design specification

10. Investigative and Evaluative Activities (IEAs)

- Discuss a range of relevant products (such as nightlights, garden lights, alarm systems, security lighting, electronic moneyboxes) that respond to changes in the environment using a computer control program e.g. *Why is a computer control program used to operate the products? What are the advantages of using computer control? What input devices, e.g. switches, and output devices, e.g. bulbs and buzzers, have been used? Who have the products been designed for and for what purpose?*
- Investigate sensors such as light dependent resistors (LDRs) and a range of switches such as push-to-make, push-to-break, toggle, micro 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.

12. Focused Tasks (FTs)

- 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.
- Using a model circuit, demonstrate and enable children to practise using different input and output devices. Allow them to practise methods for making secure electrical connections e.g. using wire strippers, twist and tape connections, screw connections, crocodile clips and connecting blocks.
- Remind children how to avoid making short circuits.
- 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 and modify computer control

14. Design, Make and Evaluate Assignment (DMEA)

- Develop an authentic and meaningful design brief with the children.
- Ask the children to 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, including the microcontroller, interface box or standalone box to be used. 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. Reference should be made to the control program used and how it will operate to control the inputs and outputs.
- Produce detailed step-by-step plans and lists of tools, equipment and materials needed. If appropriate, allocate tasks within a team.
- 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.

11. Related learning in other subjects

- **Spoken Language** – ask relevant questions, give well-structured descriptions and explanations. Build technical vocabulary.
- **Computing** – use technologies for research purposes and be discerning when evaluating digital content.
- **Science** – apply knowledge and understanding of circuits, switches, conductors and insulators.

13. Related learning in other subjects

- **Science** – apply knowledge and understanding of circuits, switches, conductors and insulators.
- **Computing** – design, write and debug programs that accomplish specific goals, including controlling physical systems. Use sequence, selection, and repetition in programs. Work with variables and various forms of input and output.
- **Mathematics** – apply understanding and skill to carry out accurate measuring using standard units i.e. cm/mm.
- **Spoken language** – asking questions to check understanding, develop technical vocabulary

15. Related learning in other subjects

- **Mathematics** – apply understanding and skill to carry out accurate measuring using standard units i.e. cm/mm.
- **Science** – apply knowledge and understanding of circuits, switches, conductors and insulators.
- **Computing** – design, write and debug programs that accomplish specific goals, including controlling physical systems. Use sequence, selection, and repetition in programs. Work with variables and various forms of input and output.
- **Spoken language** – maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments. Develop

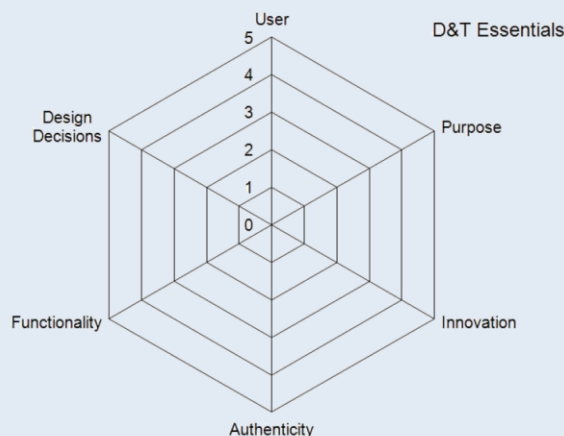
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Years
5/6
Going
Global

2. Aspect of D&T

Textiles

Focus

Combining
different
fabric shapes

4. What could children design, make and evaluate?

tablet case mobile phone carrier
shopping bag insulating bag hat/cap
garden tool belt slippers sandals
fabric advent calendar fabric door stop
other – specify

7. Links to topics and themes

Clothing Hot and Cold Communication
Festivals Celebrations Weather
Sustainability Our School Environment
other – specify

5. Intended users

themselves younger children
older children teenagers parents school
grandparents teachers gardeners
other – specify

8. Possible contexts

home school leisure culture enterprise
environment local community
other – specify

6. Purpose of products

celebration educational interests hobbies
environmental lifestyle religious
protection other – specify

9. Project title

Design, make and evaluate a _____ (product)
for _____ (user) for _____ (purpose).

To be completed by the teacher. Use the project title to set the scene for children's learning prior

16. Possible resources

existing textile products
for investigation and
deconstruction linked to
their product

wide selection of textiles
including reclaimed and
reusable fabrics, dipryl

pins, needles, thread,
measuring tape,
left/right handed fabric
scissors, pinking shears
iron, iron transfer paper,
sewing machine

range of fastenings,
materials for insulating or
strengthening e.g. bubble
wrap, wadding,
interfacing

17. Key vocabulary

seam, seam allowance,
wadding, reinforce, right
side, wrong side,
hem, template, pattern
pieces

name of textiles and
fastenings used, pins,
needles, thread,
pinking shears,
fastenings, iron transfer
paper

design criteria, annotate,
design decisions,
functionality, innovation,
authentic, user, purpose,
evaluate, mock-up,
prototype

3. Key learning in design and technology

Prior learning

- Experience of basic stitching, joining textiles and finishing techniques.
- Experience of making and using simple pattern pieces.

Designing

- Generate innovative ideas by carrying out research including surveys, interviews and questionnaires.
- Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer-aided design.
- Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.

Making

- Produce detailed lists of equipment and fabrics relevant to their tasks.
- Formulate step-by-step plans and, if appropriate, allocate tasks within a team.
- Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.

Evaluating

- Investigate and analyse textile products linked to their final product.
- Compare the final product to the original design specification.

10. Investigative and Evaluative Activities (IEAs)

- Children investigate, analyse and evaluate a range of existing products which have been produced by combining fabric shapes. Investigate work by designers and their impact on fabrics and products. Use questions to develop children's 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? What components have been used to enhance the appearance? To what extent is the design innovative?*
- Children investigate and analyse how existing products have been constructed. Children disassemble a product and evaluate what the fabric shapes look like, how the parts have been joined, how the product has been strengthen and stiffened, what fastenings have been used and why.

12. Focused Tasks (FTs)

- Develop skills of threading needles and joining textiles using a range of stitches. This activity must build 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.
- Develop skills of 2-D paper pattern making using grid or tracing paper to create a 3-D 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 different cutting techniques.
- Develop skills of computer-aided design (CAD) by using on-line pattern making software to generate pattern pieces. Investigate using art packages on the computer to design prints that can be applied to

14. Design, Make and Evaluate Assignment (DMEA)

- Set an authentic and meaningful design brief. Children generate ideas by carrying out research using e.g. surveys, interviews, questionnaires and the web. Children develop a simple design specification for their product.
- Communicate ideas through detailed, annotated drawings from different perspectives and/or computer-aided design. Drawings should indicate design decisions made, the 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.
- 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. Children use a range of decorating techniques to ensure a well-finished final product that matches the intended user and purpose.
- 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

11. Related learning in other subjects

- **Spoken language** – ask questions, formulate, articulate and justify answers, arguments and opinions. Consider and evaluate different viewpoints.
- **Science** – work scientifically investigating properties of fabrics. Children plan different types of scientific enquiries to answer questions.
- **History** – significant person/people in their

13. Related learning in other subjects

- **Mathematics** – apply knowledge of how 2-D nets can be formed into 3-D shapes; apply skills of accurate measuring using standard units i.e. cm/mm.
- **Art and design** – investigate methods of adding colour, pattern and texture on to textiles and how to make their own textiles through weaving or felt making.
- **Computing** – children express themselves and develop ideas using a range of information and communication technology resources.

15. Related learning in other subjects

- **Art and design** – use and apply drawing skills.
- **Writing and computing** – write and record a radio advert, making use of persuasive writing features, sound effects and music to promote the final product or event it is advertising.
- **Computing** – children express themselves and develop ideas using a range of information and communication technology resources.
- **Spoken language** – consider and evaluate others' viewpoints. Give a well-structured oral evaluation to include relevant technical vocabulary.

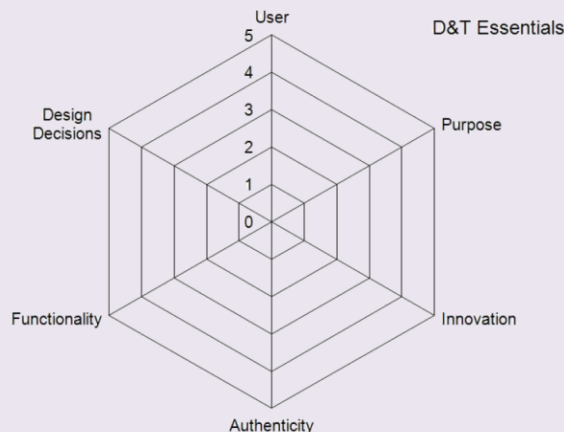
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



1. Year Groups

Years 5/6 Mayans

2. Aspect of D&T

Food

Focus

Celebrating culture and seasonality

4. What could children design, make and evaluate?

bread pizza savoury biscuits

savoury scones savoury muffin

cereal snack soup other – specify

5. Intended users

themselves younger children parents

older people grandparents visitors

people with special dietary needs

consumers from a variety of cultures

other – specify

6. Purpose of products

festival celebration special event for sale

food for travel picnic visit other – specify

16. Possible resources

information about food from around the world

video clips of foods in the context of where they come from, used and eaten

17. Key vocabulary

ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs

7. Links to topics and themes

Festivals Cultures/Celebrating Diversity

Celebrations Special Events Seasons

Sustainability Food Our Local Community

other – specify

8. Possible contexts

home school leisure culture

traditions enterprise healthy eating

local environment/community sustainability

wider environment global citizenship

other – specify

9. Project title

Design, make and evaluate a_____ (product) for _____ (user) for _____ (purpose)

To be completed by the teacher. Use the project title to set the scene for children's learning prior

range of relevant examples of foods to taste and evaluate

basic recipes

suitable equipment and utensils to make and cook recipes such as: weighing scales, measuring jugs, bowls, spoons – various sizes, baking trays, parchment paper, plastic film

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,

3. Key learning in design and technology

Prior learning

- Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet.
- Be able to use appropriate equipment and utensils, and apply a range of techniques for measuring out, preparing and combining ingredients.

Designing

- Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.
- Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose.
- Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas.

Making

- Write a step-by-step recipe, including a list of ingredients, equipment and utensils
- Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.
- Make, decorate and present the food product appropriately for the intended user and purpose.

Evaluating

- Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams.
- Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying

10. Investigative and Evaluative Activities (IEAs)

- 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?*



12. Focused Tasks (FTs)

- 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



11. Related learning in other subjects

- **Mathematics and computing** – making use of mathematical and computing skills to present results of sensory evaluations graphically, handling and interpreting data.
- **Spoken language** – developing relevant vocabulary including sensory descriptors. Give well-structured explanations.
- **Science** – using and developing skills of observing, questioning, changing state of ingredients.
- **Geography** – distribution of natural resources i.e. food.

13. Related learning in other subjects

- **Science** – properties of materials and changes of state.
- **Mathematics** – measuring mass kg/g. Understand and use approximate equivalences between metric and imperial units.
- **Spoken language** – new technical vocabulary.

14. Design, Make and Evaluate Assignment (DMEA)

- 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.
- Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed.



15. Related learning in other subjects

- **Mathematics** – measurement of mass kg/g; understand and use approximate equivalence of metric and imperial units.
- **Art and design** – using and developing drawing skills.
- **Spoken language** – articulate and justify answers and opinions. Listen and respond to adults and peers.
- **Writing** – purpose of writing e.g. for planning and evaluation.
- **Mathematics** – measurement of mass kg/g.
- **Science** – recognise the impact of diet on the

18. Key competencies

problem-solving teamwork negotiation

consumer awareness organisation motivation

persuasion leadership perseverance

other, specify:

19. Health and safety

Pupils should be taught to work safely and hygienically, using tools, equipment, techniques and ingredients appropriate to the task. Prior to undertaking this project risk assessments should be carried out, including identifying whether there are children who are not permitted to taste or handle any food ingredients or products

