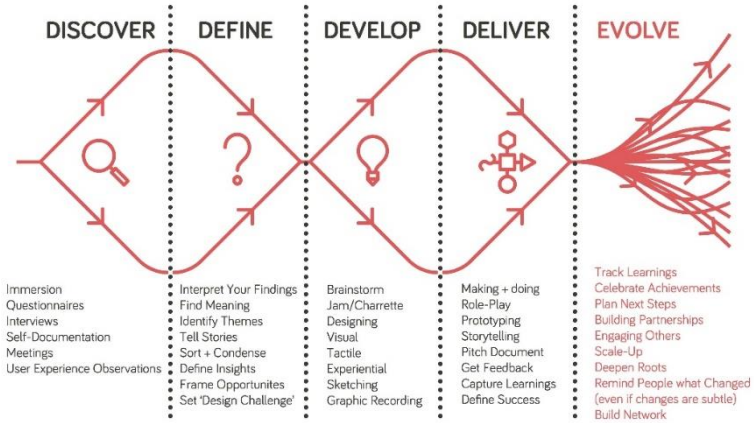
Cabot Learning Federation

I am a designer

I am a designer. I seek to use creativity to innovate. I surround myself in a range of products and inspirational contexts, before I find meaning and tell a story that sets up a new design challenge. I shape my ideas to become practical and attractive products for users. When designing, I use my knowledge and skills towards delivering a specific end and utilise appropriate technologies.

Key Concepts for Designers

	Key Concepts
What is design technology? *2.6 million years ago, early humans developed tool making; humankind has been designing and inventing products ever since.* *Humans are insatiable designers as they have sought to improve their lives and those of others, following research and developing ideas.* *Understanding the story of people, their interactions with their environments, their wants and needs, and how these lead to the design and creation of products, for specific purposes, is design technology.*	**There are five stages to a design process*:** **- Discovery** Immersing and building knowledge: researching and understanding contexts and concepts, users and purposes, needs and the range of products and systems available. - **Define** Finding meaning, telling stories, sorting and condensing ideas and setting the design challenge. **- Develop:** Review and evaluating ideas through graphic recording and tactile experiences leading to a design. - **Deliver:** Making and doing, prototyping, pitching and justifying, receiving feedback and defining success. **- Evolve** Scaling up ideas, pitch and engage an audience, evaluating and celebrating achievements. ** The Design Council's Double Diamond Model presented four stages: Discovery, Define, Develop, Deliver* 
	There are bodies of knowledge and understanding within design technology and these are applied exclusively or collectively: Knowledge of Structures, Mechanisms, Electrical Systems and Textiles.

Key Knowledge, Vocabulary and Skills – Designers: Year 1

	Structures	Textiles
Discover *Immersing and building knowledge:*	Identify, explore and understand: (See Year 1 Science Chemistry 'Everyday materials') • Structures at domestic and industrial scales: • Domestic: tables, chairs, shelves, self-supporting picture frames. • Industrial: bridges, cranes, buildings including towers. • A structure is building or object constructed from several parts. • Rigid means a part of structure is unable to bend or be forced out of shape; not flexible • Stable means of an object or structure) not likely to give way or overturn; firmly fixed. • The strength of a structure depends on the materials properties (twisting/torsion, compression, stretching/tensile, shear strength/resistant to shear force, bending. • Structures are joined together using a variety of methods • Structures are joined together using different materials or techniques: - mechanical (pins, bolts) - adhesive (glue, tape) - chemical changes (heating, reactions between materials)	Identify, explore and understand: **Using thread:** • Piece holes through card and weave using threads *(suggestion: include string, wool, laces).* • (Suggested: use cardboard with pre-pierced with holes approximately 1-2cm apart (adult led hole forming/punching). • Investigate weaving materials and processes e.g. use a cardboard or twig loom. • Model knotting and wrapping techniques and opportunity to explore for example wrapping or knotting onto twigs. **Using fabric:** • Explore and begin to identify different types of textiles: silk, wool, linen, cotton, such synthetic fibres as nylon and polyesters. • Explore by colouring textiles through the use of printing and fabric crayons. • Use appropriate language to describe colours textures and evaluate why some colours and textures may have been used for a specific purpose.
Define *Set the design challenge*	• Consider how knowledge of mechanisms can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.	• Consider how knowledge of textiles and or fabrics can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.
Develop *Experience and record*	• Using tactile experiences explore and make mechanisms. • Use graphic recordings of mechanisms and create a design that meets the expectations of the design challenge.	• Using tactile experiences explore and practise textile and fabric skills. • Reflect on their choice of materials, colours & placement • Use graphic recordings of textiles and or fabrics and create a design that meets the expectations of the design challenge.
Deliver *Making prototypes*	• Using the design, make a prototype or prototypes justifying choices. • Respond to feedback.	• Using the design, make a prototype or prototypes justifying choices. • Respond to feedback.
Evolve *Present and pitch, evaluate and celebrate*	• Present and pitch ideas to an audience • Evaluate design process and prototype reflecting on purpose, different strengths, joins. • Consider possibilities for scaling up including materials to be used, which joining techniques could be used, wider purposes for the prototype. • Celebrating achievements and areas for improvement within prototype.	• Present and pitch ideas to an audience. • Evaluate design process and prototype reflecting upon choices for colours, textures, placement, techniques used e.g. thread. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.
	Suggested Contexts / design challenge	
	• Design a bridge. • Design tower.	• Design an item of clothing for a specific purpose e.g. a woollen jumper for warmth. • Design a 'name card' / specific shape by using weaving technique. • Design a 'dream catcher' using weaving technique Artists: Julia Bland (weaving), Terri Friedman (weaving)

Key Knowledge, Vocabulary and Skills – Designers: Year 2

	Mechanisms	Textiles
Discover *Immersing and building knowledge:*	Identify, explore and understand: - mechanisms used to create movement in a product. - hinges or pivots, that are called fulcrums, within products. • A lever is a rigid bar resting on a hinge or pivot, used to move a load with one end when pressure is applied to the other. • A slider is a rigid bar, which moves backwards and forwards along a straight line. Unlike a lever, a slider does not have a pivot point. Introduce: • There are 3 types (classes) of lever: - Class 1 levers have the fulcrum placed between the effort and load. The movement of the load is in the opposite direction of the movement of the effort e.g. catapult, shoehorn - Class 2 levers have the load between the effort and the fulcrum e.g. wheelbarrow, nutcracker - Class 3 lever have the effort between the load and the fulcrum e.g. tweezers, stapler • A wheel is a circular device that is attached to an axle in its centre. • An axle is a rotating rigid bar on which a wheel, a pair of wheels, or another rotating part is attached. • A wheel or roller by itself can make it easier to move objects by overcoming friction. • A crank is like a wheel and axle. You can push on the handle of a crank, and it will create a twisting force or torque on the axle. This is a variation of the wheel and axle.	Identify, explore and understand: **Using thread:** • Continue to work on knotting and wrapping techniques and explore for example, wrapping or knotting onto twigs. • Continue to gain experience in weaving, both 3D and flat i.e. grass through twigs, carrier bags on a bike wheel. • Model and allow children to gain confidence in stitching – running stitch (thread drawing). **Using fabric:** • Match and sort fabrics (and threads) for colour, texture, length, size and shape. • Investigate the dip dye process e.g. use Brusho (pigment powder) and squares of white cotton fabric (10cm square). • Explore the effect of part dyeing e.g. fold the fabric square in different ways and explore dyeing only parts of the folded squares to see what patterns can be created. • Experiment with dipping only part of the fabric and using different colours and record different effects / outcomes.
Define *Set the design challenge*	• Consider how knowledge of mechanisms can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.	• Consider how knowledge of textiles and or fabrics can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.
Develop *Experience and record*	• Using tactile experiences explore and make mechanisms. • Use graphic recordings of mechanisms and create a design that meets the expectations of the design challenge.	• Using tactile experiences explore and practise textile and fabric skills learnt so far. • Reflect on their choice of materials, colours & placemen.t • Use graphic recordings of textiles and or fabrics and create a design that meets the expectations of the design challenge.
Deliver *Making prototypes*	• Using the design, make a prototype or prototypes justifying choices. • Respond to feedback.	• Using the design, make a prototype or prototypes justifying choices. • Respond to feedback. • Link to Print (Artists curriculum) : Use blocks to explore printing repeated patterns onto fabric.
Evolve *Present and pitch, evaluate and celebrate*	• Evaluate design process and prototype. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.	• Present and pitch ideas to an audience. • Evaluate design process and prototype reflecting upon choices for colours, textures, placement, techniques used e.g. thread. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.
	Suggested Contexts / design challenge	
	• Design a moving picture or interactive text to communicate story or information. • Design a toy. • Design a useful tool.	• Design a pattern on small square of fabric that could be up-scaled to a blanket, cushion etc. • Use individual designs to create one large scale final piece. • Design / create a 'basket' to hold specific object using weaving techniques. Artists: Julia Bland (weaving), Terri Friedman (weaving), Marian Clayden (dip-dye), Rebecca Mushtare (running stitch)

Key Knowledge, Vocabulary and Skills – Designers: Year 3

	Mechanisms	Textiles
Discover *Immersing and building knowledge:*	Identify, explore and understand: • A lever is a rigid bar resting on a hinge or pivot, used to move a load with one end when pressure is applied to the other. • A lever is a force multiplier. They reduce the effort needed to work against a force called the load. • There are 3 types (classes) of lever: - Class 1 levers have the fulcrum placed between the effort and load. The movement of the load is in the opposite direction of the movement of the effort e.g. catapult, shoehorn - Class 2 levers have the load between the effort and the fulcrum e.g. wheelbarrow, nutcracker - Class 3 lever have the effort between the load and the fulcrum e.g. tweezers, stapler • A linkage is a mechanism made by connecting together rigid links or levers. • Levers or links may be connected together using a wide range of fastenings which allow free movement - e.g. screws, split pins, paper fasteners, pop rivets, clevis pins, nuts and bolts, etc. • The linkage can be made to change the magnitude or direction of a force or make two or more things move at the same time - or they can be used to amplify movement. • A ramp is an inclined plane that allows you to move a heavy object to some height with less force than needed to lift the object. • A ramp can also be used to ease an object to a lower height. • A ramp has no moving parts, but is still considered a simple machine. • A wedge is an object that tapers to a thin edge. Pushing the wedge in one direction creates a force in a sideways direction. *Examples of wedges for separating are a shovel or axe. Examples of wedges for holding something in place are a nail or a doorstop.* • The pulley is a simple machine made with a rope, cord, or chain around a wheel to make a heavy load easier to lift. • The more 'ropes' and wheels are used, the less force is needed to lift the load. • Pulleys are used to make it easier to lift things using less force. • Doubling the wheels and ropes halves the force needed to lift a given weight, but the rope must be pulled twice as far. • *Examples of pulleys are window blinds, drapery, moving heavy cargo, sails on boats and elevators*	Identify, explore and understand: **Using thread:** • Discover basic sewing stitches – running stitch with regular equal stitches (talk about why regular stitches would be needed). • Experiment with using a variety of colours to create different patterns. • Stitch two pieces of fabric together, including using basic 'over-sew technique'. **Using fabric:** • Continue to investigate the dip dye process. • Explore dip-dyeing fabric for use as a background. • Experiment by using a contrasting colour and sew onto dip dyed fabric to create a pattern using straight lines. • Begin to apply decoration to fabric work, using needle and thread: buttons, sequins.
Define *Set the design challenge*	• Consider how knowledge of mechanisms can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.	• Consider how knowledge of textiles and or fabrics can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.
Develop *Experience and record*	• Using tactile experiences explore and make mechanisms. • Use graphic recordings of mechanisms and create a design that meets the expectations of the design challenge.	• Using tactile experiences explore and practise textile and fabric skills learnt so far. • Reflect on their choice of materials, colours & placement. • Use graphic recordings of textiles and or fabrics and create a design that meets the expectations of the design challenge.
Deliver *Making prototypes*	• Using the design, make a prototype or prototypes justifying choices. • Respond to feedback.	• Using the design, make a prototype or prototypes justifying choices e.g. choice of template, choice of fabric. • Respond to feedback.
Evolve *Present and pitch, evaluate and celebrate*	• Evaluate design process and prototype. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.	• Present and pitch ideas to an audience. • Evaluate design process and prototype reflecting upon choices for colours, textures, placement, techniques used e.g. thread. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.
	Suggested Contexts / design challenge	
	• Design a system for moving a load.	• Design a simple holder for coins, card, keys, glasses etc. with learnt skills. • Design a back drop for a specific purpose e.g. a back drop on a stage and create a small prototype of this design. Artists: Kaffe Fassett (needle work/design), Rebecca Mushtare (running stitch)

Key Knowledge, Vocabulary and Skills – Designers: Year 4

	Structures	Electrical Systems
Discover *Immersing and building knowledge:*	Identify, explore and understand: • With increasing independence and ability, build innovate, functional, appealing, stable structures that are fit for purpose. • Build structures with increasing independence and accuracy. • A cross-brace and a cross brace system is used to reinforce building structures in which diagonal supports intersect. • A cantilever is long projecting beam or girder fixed only at one end. • A large iron or steel beam use for buildings and the framework of large buildings • A rafter is a beam forming the internal framework and ensuring the strength of the structure, usually supporting a second level or roof. • A strut is a rod or bar forming part of a framework and designed to resist compression. • Demonstrate confidently how to reinforce and strengthen a 3D framework with an understanding of how structures can be made stronger and more stable. - Shell structures – solid outer face and hollow inner area: packaging (egg boxes, sweet tubes), boats, tunnels, St Peter's Basilica Dome, helmets, drinks cans. – A rounded outer surface is particularly strong, because it spreads forces throughout the whole structure, which means that every part of the structure, supports only a small part of the load. • Understand and use different ways of stiffening and strengthening their shell structures: Folding, shaping, corrugating, ribbing, and laminating • Explore how to strengthen and reinforce a 3D framework using a range of materials • Knowledge of nets of cubes, cuboids and more complicated 3D shapes • Create nets and templates accurately using a range of sizes: three dimensional, vertex, scoring • Investigate how to make structures more stable e.g. widening the base. • Measure and record the load of tolerance different structures and find ways of improving structures load-bearing capacity. • Build a range of structures using a wide range of effective materials. • Develop knowledge of how to construct, stiff shell structures.	Identify, explore and understand: As detailed in the Science Curriculum Physics Year 4 Electricity: • Identify common appliances that run on electricity • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • Recognise some common conductors and insulators, and associate metals with being good conductors • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • Compare and give reasons for variations in how components function, including the brightness of bulbs and the on/off position of switches • Use recognised symbols when representing a simple circuit in a diagram. Additional Design knowledge: • Identify circuits used in small scale electrical systems, for example household appliances, toys • Identify circuits used in large scale electrical systems, for example house alarms, entrance systems. • There is consideration to the concealment of electrical equipment within products for safety. • Electrical equipment within products require suitable protective and durability measures to ensure effective repeated functionality. Examples: a casing; a plastic button with a spring within a switch; glue to attach wires to frame. • Aesthetics in product design are concerned with a product's desirable appearance. • Products are designed with consideration to aesthetics, including electrical systems, such as domestic appliances or entertainment systems.
Define *Set the design challenge*	• Consider how knowledge of mechanisms can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.	• Consider how knowledge of electrical systems can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.
Develop *Experience and record*	• Using tactile experiences explore and make structures. • Use graphic recordings of structures and create a design that meets the expectations of the design challenge.	• Using age appropriate and low voltage electrical equipment, experiences explore and make simple circuits. • Present a 3D design as a design sketch, including aesthetics. • Use recognised symbols when representing the electrical circuits in a design.
Deliver *Making prototypes*	• Using the design, make a prototype or prototypes justifying choices. • Respond to feedback.	• Design a simple electrical circuit incorporating switches, bulbs, buzzers or motors based on a design brief. • Using the design, make a prototype or prototypes justifying choices, for example the position of switches, bulbs, buzzers and motors based on product needs and aesthetics. • Respond to feedback.
Evolve *Present and pitch, evaluate and celebrate*	• Evaluate design process and prototype. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.	• Evaluate design process and prototype • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements
	Suggested Contexts / design challenge	
	• Design a self-supporting 3D building.	• Design a toy with electrical components • Design a security device like an alarm • Design a domestic appliance

Key Knowledge, Vocabulary and Skills – Designers: Year 5

	Mechanisms	Textiles
Discover *Immersing and building knowledge:*	Identify, explore and understand: • A cam is a rotating or sliding piece in a mechanical linkage. • An axel and crank is attached to a cam to create circular/rotary motion. • A cam will drive a linked component, known as a follower. • When cams are operated, they convert/transform their circular/rotary motion to drive the follower into up and down/linear motion. • There are 3 types of cams: plate or disk cams, cylindrical or drum cams and linear cams. • Plate or disk cams are the simplest and most common type of cam. • Plate/disk cams can provide a lift (when the follower is moving up), fall (when the follower is moving downwards and dwell (when the follower is not moving). • The shapes of individual cams are designed to produce specific types of motion. • Cams come in a variety of shapes and sizes - the most common types: snail shaped, pear shaped and a circular with an off-centre hole. • Gears are pairs of wheels with teeth around their edges that mesh and turn together. • Gears are machines because they multiply turning force or speed. • If one gear wheel drives another that has more teeth, the wheel with more teeth turns more slowly but with greater force than the other. If a gear wheel drives another with fewer teeth, the wheel with fewer teeth turns with less force but faster. • Different kinds of gears do different roles: • Spur gears multiply speed or force. Examples of spur gears can be found in bikes and washing machines. • Bevel gears change vertical movement into horizontal movement. Examples of spur gears can be found in cars and hand drills. • Worm gears change the direction of horizontal movement. Examples of worm gears can be found in conveyor belts. • Rack and pinion gears change rotation into back-and-forth motion. An example of this is used for a car steering system. • Gears such as these can be used to transmit power to many different parts of a large machine. • The screw is a twisted inclined plane. • It allows movement from a lower position to a higher position but at the same time it moves it in a circle. • By rotating the screw (applying a torque), the force is applied perpendicular to the groove, which translates a rotational force into a linear one. • *Examples of screws are jar lids, taps, bottle caps, a car jack, The Ancient Water Screw.*	Identify, explore and understand: **Using thread:** • Discover different sewing stitches: running stitch, backstitch and cross-stitch. • Begin to 'draw' with thread, using several different colours. • Use a range of coloured threads and stitches to add detail to create a thread drawing or details to patterns. • Attach fabrics using secure stitching (running and back-stitching). **Using fabric:** • Continue to investigate tie-dyeing fabric e.g. use Brusho to dye fabric, tie material with elastic bands. • Experiment learnt tie-dye skills so far using up to two colours. • Create different tie-dye patterns by tying the fabric in a variety of ways e.g. tiger stripes, spiral or marble. • Begin to enhance fabrics using 'applique' technique. • Continue to practise applying decoration to fabric work, using needle and thread: buttons, sequins. • Continue to use a range of coloured threads to sew onto tie-dyed fabric to create an image. • Explore construction and destruction. • Investigate ways of changing fabrics e.g. layering, stitching, sticking, weaving, pleating, plaiting, tying, knotting, cutting, tearing, hole punching, thread removing. • Begin to change and modify threads and fabrics, knotting, fraying, fringing, pulling threads, twisting and plaiting.
Define *Set the design challenge*	• Consider how knowledge of mechanisms can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.	• Consider how knowledge of textiles and or fabrics can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.
Develop *Experience and record*	• Using tactile experiences explore and make mechanisms. • Use graphic recordings of mechanisms and create a design that meets the expectations of the design challenge.	• Using tactile experiences explore and practise textile and fabric skills learnt so far. • Reflect on their choice of materials, placement & techniques. • Use graphic recordings of textiles and or fabrics and create a design that meets the expectations of the design challenge.
Deliver *Making prototypes*	• Using the design, make a prototype or prototypes justifying choices. • Respond to feedback.	• Using the design, make a prototype or prototypes justifying choices e.g. choice of template, choice of fabric. • Respond to feedback.
Evolve *Present and pitch, evaluate and celebrate*	• Evaluate design process and prototype. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.	• Present and pitch ideas to an audience. • Evaluate design process and prototype reflecting upon choices for colours, textures, placement, techniques used e.g. thread. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.
	Suggested Contexts / design challenge	
	• Design a toy using a cam mechanism. • Design 'a propeller' machine using gears e.g. windmill, aeroplane. • Design a moving vehicle with gears e.g. bike.	• Design large scale piece through joining individual pieces together. • Design a quilt and create one square piece of the fabric using this design. Artists: Willemien de Villiers (applique), Rachael Howard (embroidery), Kaffe Fassett (needle work/design), Ben Venom (applique, layering)

Key Knowledge, Vocabulary and Skills – Designers: Year 6

	Electrical Systems	**Textiles**
Discover *Immersing and building knowledge:*	Identify, explore and understand: • Understand electrical systems and components: series circuits incorporating switches, bulbs, buzzers and motors. • An algorithm is a series of instructions that solve a problem. • A program is a series of instructions, written using specific computer language that inform a computer to perform an action. • Monitor means observing and recognising the actions of the program. • Control means to managing the electrical system using components and or programming. Managing the electrical system may involve changing speeds, adjusting components, which identify and or evaluate the effectiveness of the program. • Electrical systems use computing to program, monitor and control their products: *traffic lights, modern cars, heating systems, alarms, automatic doors with sensors,* • Electrical systems can be manually-controlled, *e.g. pedestrian crossing, heating systems* • *Algorithms and programs can produce on-screen porotypes.* • Physical electrical systems can be represented using electrical components as accurate symbols. • Know that simple algorithms work and to detect and correct errors in algorithms and programs Additional Design knowledge: • Aesthetics in product design are concerned with a product's desirable appearance. • Products are designed with consideration to aesthetics and security, including electrical systems, such as public facing security sensors and traffic systems.	Identify, explore and understand: **Using thread:** • Discover different sewing stitches: chain stitch and blanket stitch (button hole stitch) • Continue to practise different sewing stitches: running stitch, backstitch and cross-stitch. • Practise taught stitching techniques by developing own accuracy and speed. • Develop stitching techniques for texture e.g. French-knot, stem stitch, seed stitch. • Apply these stitch techniques to enhance a design. • Use a range of coloured thread and stitches to add detail, including additional material to a garment **Using fabric:** • Continue to investigate ways of changing fabrics e.g. layering, stitching, sticking, weaving, pleating, plaiting, tying, knotting, cutting, tearing, hole punching, thread removing. • Continue to change and modify threads and fabrics, knotting, fraying, fringing, pulling threads, twisting and plaiting. • Investigate the Batik technique by using flour and water paste • Explore original patterns for templates for a planned purpose • Begin to develop confidence in seam allowance. • Begin to understand the skills involved in aspects such as knitting and lace making.
Define *Set the design challenge*	• Consider how knowledge of electrical systems can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.	• Consider how knowledge of textiles and or fabrics can be applied to new contexts. • Identify the design challenge considering the meaning and purpose. • Sort and condense ideas within the context of the design challenge.
Develop *Experience and record*	• Using tactile experiences explore and make electrical systems. • Use graphic recordings of mechanisms and create a design that meets the expectations of the design challenge. • Apply their understanding of computing to program, monitor and control their products.	• Using tactile experiences explore and practise textile and fabric skills learnt so far. • Reflect on their choice of materials, colours, placement & techniques. • Use graphic recordings of textiles and or fabrics and create a design that meets the expectations of the design challenge.
Deliver *Making prototypes*	• Using the design, make a prototype (including on-screen, if appropriate) or prototypes justifying choices. • Respond to feedback.	• Using the design, make a prototype or prototypes justifying choices e.g. choice of fabric, choice of stitch etc. • Respond to feedback.
Evolve *Present and pitch, evaluate and celebrate*	• Evaluate design process and prototype • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements	• Present and pitch ideas to an audience. • Evaluate design process and prototype reflecting upon choices for colours, textures, placement, techniques used. • Consider possibilities for scaling up and engaging an audience. • Celebrating achievements.
	Suggested Contexts / design challenge	
	• Design an electrical system to manage traffic flow • Design an electrical system using a sensor • Design a controller to operate an electrical system e.g. *Makey Makey*	• Create a batik design for a piece of clothing. Artists: Artists: Willemien de Villiers (applique), Rachael Howard (embroidery), Kaffe Fassett (needle work/design), Ben Venom (applique, layering), Wendy Evans (Batik) Hundertwasser (flags and clothing)

Appendix 1: Research/references

National curriculum: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/239041/PRIMARY_national_curriculum_-_Design_and_technology.pdf
https://www.sfsm.co.uk/attachments/download.asp?file=407&type=pdf
https://hillsideprimary.org.uk/wp-content/uploads/2018/12/DT-progression-of-knowledge-skills-and-vocabulary.pdf
http://foxboroughprimary.co.uk/uploads/admin/download/file/292/D_TSkillsProgression.pdf
https://swinemoorprimary.org.uk/design-technology-structures/
http://www.sandgateprimaryschool.co.uk/wp-content/uploads/2013/08/Please-click-here-to-download-the-DT-Progression-of-skills-document-pdf.pdf
https://towngateacademy.co.uk/sitetemplate/towngate/uploads/Curriculum%20skills%20documents/DT%20skills%20progression%20across%20the%20academy.pptx
http://www.folly-hill.surrey.sch.uk/sites/default/files/Dt%20SOL.pdf
https://www.tweseldowninfantschool.co.uk/attachments/download.asp?file=428&type=pdf
Progression in Primary Design and Technology By Christine Bold
Joining of Materials and Structures From Pragmatic Process to Enabling Technology 2004
http://www.cementechnology.ir/Library/Joining.of.Materials.and.Structures.pdf
https://www.npl.co.uk/resources/q-a/mass-weight-force-load-differences
https://me-mechanicalengineering.com/cams-followers-types/
Energy & Movement Britanica Illustrated Science Library https://books.google.co.uk/books?id=iTSdAAAAQBAJ&printsec=frontcover#v=onepage&q&f=false
http://standring.weebly.com/uploads/2/3/3/5/23356120/07.pdf
file://hva-fs-001/staff%20home$/craig.jones/Downloads/D_T_and_Computing_web.pdf DT Association DT & Computing case studies

Appendix 2: Curriculum Rationale

The curriculum provides detail to the statements of technical knowledge (bodies of knowledge) in textiles, structures, electrical systems and mechanisms. There are many links across the subject disciplines, not least in art and science. Discovering and understanding the technical elements and the wide ranging applications in the real world are an important starting point prior to learning to apply and design new products and ideas. The document has been presented and organised to assist educators in teaching through the Design Council's Double Diamond Model presented as four stages: *Discovery, Define, Develop, and Deliver.* The National Curriculum has steered the content of this curriculum and consideration has been given to the traditional amount of time and content expectation in a primary school curriculum.