

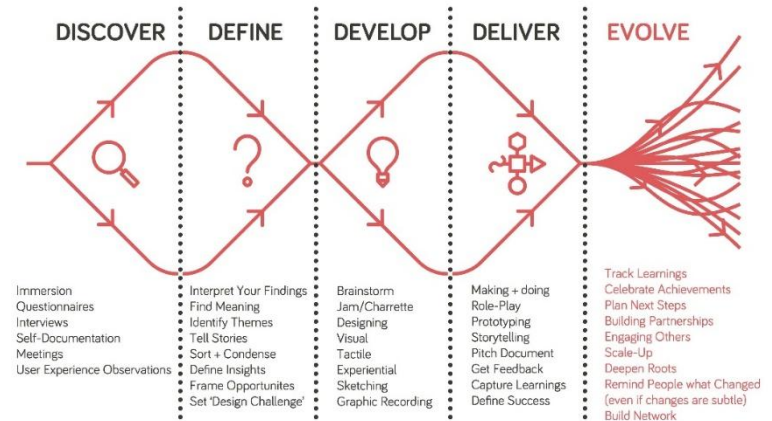
I am a designer

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? <i>2.6 million years ago, early humans developed tool making; humankind has been designing and inventing products ever since.</i> <i>Humans are insatiable designers as they have sought to improve their lives and those of others, following research and developing ideas.</i> <i>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.</i>	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. <i>* The Design Council's Double Diamond Model presented four stages: Discovery, Define, Develop, Deliver</i> 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.



Year 1 Key Knowledge, Vocabulary and Skills

	Structures	Textiles
Discover <i>Immersing and building knowledge:</i>	-Recap 'everyday materials' in science. Think about which materials might be useful for building a structure and why. Use vocabulary: rigid (unable to bend or be forced out of shape; not flexible), stable (not likely to give way or overturn; firmly fixed.) -Look at real structures / pictures of structures and identify materials used and why. • Domestic: tables, chairs, shelves, self-supporting picture frames. • Industrial: bridges, cranes, buildings including towers. -Students make their own structures using a variety of materials: Lego, construction sets, spaghetti and marshmallows, etc. Think about which materials and joining methods work and which do not	Using thread: • Piece holes through card and weave using threads (<i>suggestion: include string, wool, laces</i>). (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. • Fine motor skills: threading beads.
Define <i>Set the design challenge</i>	A product for someone for some purpose – identify a problem / gap What / for who / why e.g., <i>Designing a chair for baby bear to sit on</i> <i>Designing a tower for the three little pigs to live in</i> <i>Designing a bridge from ... to ...</i> Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.	A product for someone for some purpose – identify a problem / gap What / for who / why e.g., <i>We are designing 'dream catcher' for [character / person] to decorate their house</i> <i>We are designing a name card using weaving so my teacher knows where I sit</i> Artists: Julia Bland (weaving), Terri Friedman (weaving) Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.
Develop <i>Experience and record</i>	Develop a skill that you will need to use in the design e.g., strengthening structures – <i>how can we make the chair / bridge stronger?</i> – try different methods and materials and test using weight. Stable structures – <i>how to make a tower stand up on its own</i> – wider base, etc. Joining methods Record ideas and annotate / draw the design.	Develop a skill that you will need to use in the design e.g., <i>tying knots</i> <i>attaching decorations e.g., beads, feathers</i> Use graphic recordings of textiles / fabrics and create a design that meets the expectations of the design challenge.
Deliver <i>Making prototypes</i>	Using the design, make a prototype.	Using the design, make a prototype.
Evolve <i>Present and pitch, evaluate and celebrate</i>	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.
Additional enrichment opportunities		
		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.

Year 2 Key Knowledge, Vocabulary and Skills

	Mechanisms	Textiles
Discover <i>Immersing and building knowledge:</i>	Identify, explore and understand: - mechanisms used to create movement in a product – find different mechanisms in the classroom. Which direction do they move in? e.g., up and down (door handle), round and round (bike), forwards and backwards (drawer) - explore different mechanisms in the world around us: e.g., wheelbarrows, catapult, shoehorn, nutcracker, tweezers, stapler, etc. Introduce levers and sliders: • 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. -Students explore making levers and sliders using paper and card	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 introduce children to stitching – running stitch
Define <i>Set the design challenge</i>	A product for someone for some purpose - identify a problem / gap What / for who / why <i>E.g., Design a moving card for a celebration using a mechanism (lever or slider)</i> <i>Design a moving picture for a book using a mechanism (lever or slider)</i> Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.	A product for someone for some purpose - identify a problem / gap What / for who / why <i>E.g., Design a pattern on small square of fabric that could be up scaled to a blanket, cushion etc.</i> <i>Use individual designs to create one large scale final piece.</i> <i>Design / create a 'basket' to hold specific object using weaving techniques.</i> Artists: Rebecca Mushtare (running stitch) Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.
Develop <i>Experience and record</i>	Explore different types of moving cards. e.g., <i>practise your chosen mechanism (lever or slider)</i> <i>explore using a bridge to keep the lever / slider in place</i> Use graphic recordings of mechanisms and create a design that meets the expectations of the design challenge.	Develop a skill that you will need to use in the design e.g., <i>threading needles</i> <i>more consistent running stitch size</i> Use graphic recordings of textiles / fabrics and create a design that meets the expectations of the design challenge.
Deliver <i>Making prototypes</i>	Using the design, make a prototype.	Using the design, make a prototype.
Evaluate <i>Present and pitch, evaluate and celebrate</i>	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.
Additional enrichment opportunities		
		Using fabric: • 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.

Yea 3 Key Knowledge, Vocabulary and Skills

	Mechanisms	Textiles
Discover <i>Immersing and building knowledge:</i>	Identify, explore and understand: - Recap different mechanisms and where they are used in products / everyday items – levers and sliders from year 2 - A linkage is a mechanism made by connecting together rigid links or levers. - 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. -Children explore making different linkages using card and split pins	Using thread: - Recap threading needles, what a running stitch is - 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’.
Define <i>Set the design challenge</i>	A product for someone for some purpose - identify a problem / gap What / for who / why E.g., <i>Design a moving card for a celebration using a mechanism (linkage)</i> <i>Design a moving picture for a book using a mechanism (linkage)</i> Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.	A product for someone for some purpose - identify a problem / gap What / for who / why E.g., <i>Design a simple holder for coins, card, keys, glasses, etc. for yourself / a friend / family member</i> Artists: Kaffe Fassett (needle work/design), Rebecca Mushtare (running stitch) Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.
Develop <i>Experience and record</i>	Develop a skill that you will need to use in the design e.g., <i>deciding which movement the linkage will make using different fastenings for the pivot</i> Use graphic recordings and create a design that meets the expectations of the design challenge.	Develop a skill that you will need to use in the design e.g., <i>threading needles, starting and finishing stitches over sew technique, joining fabric together</i> Use graphic recordings of textiles / fabrics and create a design that meets the expectations of the design challenge.
Deliver <i>Making prototypes</i>	Using the design, make a prototype.	Using the design, make a prototype.
Evolve <i>Present and pitch, evaluate and celebrate</i>	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.
Additional enrichment opportunities		
	Pulleys: - 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. - Examples of pulleys are window blinds, drapery, moving heavy cargo, sails on boats and elevators - Use these skills to design a system for moving a load	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.

Year 4 Key Knowledge, Vocabulary and Skills

	Structures	Electrical Systems
Discover <i>Immersing and building knowledge:</i>	Identify, explore and understand (recommended: explore either shell structures / nets or strengthening structures) -Recap knowledge of structures from Year 1 – sort materials that would be effective / not for different structures Shell structures / nets: - Shell structures – solid outer face and hollow inner area: packaging (egg boxes, sweet tubes), boats, tunnels, St Peter’s Basilica Dome, helmets, drinks cans. -Understand and use different ways of stiffening and strengthening their shell structures: Folding, shaping, corrugating, ribbing, and laminating -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 Strengthening structures: -Cross brace: diagonal supports intersecting building structures -Rafter: beam forming the internal framework, supporting a second level or roof -Strut: a rod or bar designed to resist compression -Use a range of materials to strengthen an reinforce 3D framework - Investigate how to make structures more stable e.g. widening the base. Children explore creating different structures using a range of materials, focussing on making the structures more stable.	-Recap knowledge from Year 4 science curriculum -Identify circuits used in small scale electrical systems (household appliances, toys) and large scale electrical systems (house alarms, entrance systems) -understand that electrical systems are concealed for safety
Define <i>Set the design challenge</i>	A product for someone for some purpose - identify a problem / gap What / for who / why E.g., <i>Design packaging for a specific product (nets, shell structures)</i> <i>Design a prototype for a new reading shed / calm corner for the playground (strengthening structures)</i> Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.	A product for someone for some purpose - identify a problem / gap What / for who / why E.g., <i>Design toy using electrical components e.g., steady hand game</i> <i>Design a prototype for an alarm for home / school</i> <i>Design a night light for (character / person)</i> Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.
Develop <i>Experience and record</i>	Develop a skill that you will need to use in the design e.g., <i>exploring effective ways to strengthen the internal framework of a structure</i> <i>using different materials to make shell structures</i> <i>creating accurate nets / shell structures for specific food types</i> Use graphic recordings and create a design that meets the expectations of the design challenge.	Develop a skill that you will need to use in the design e.g., <i>discuss aesthetics of designs e.g., toys, household appliances</i> <i>discuss different materials that could be used when considering conductors / insulators</i> Use graphic recordings and create a design that meets the expectations of the design challenge.
Deliver <i>Making prototypes</i>	Using the design, make a prototype.	Using the design, make a prototype.
Evaluate <i>Present and pitch, evaluate and celebrate</i>	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.
Additional enrichment opportunities		

Year 5 Key Knowledge, Vocabulary and Skills

	Mechanisms	Textiles
Discover <i>Immersing and building knowledge:</i>	Identify, explore and understand: - Recap mechanisms explore in Year 2 and Year 3 (levers, sliders, linkages) – identify items in everyday life / classroom that use mechanisms and the type of / direction of movement • A cam is a rotating or sliding piece in a mechanical linkage. ○ An axle and crank are 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/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. • Show examples of cams in use through videos, pictures and pre-constructed resources Students explore making their own cardboard cam and are able to identify and explain the different parts.	Identify, explore and understand: Using thread: • Recap threading needles and running stitches (Year 3) • Discover different sewing stitches: backstitch • Begin to 'draw' with thread.
Define <i>Set the design challenge</i>	A product for someone for some purpose - identify a problem / gap What / for who / why E.g., <i>Design a toy for [someone in particular age range] that uses a moving part</i> <i>Design a moving shop display for a supermarket – give more purpose e.g., to promote healthy eating</i> Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.	A product for someone for some purpose - identify a problem / gap What / for who / why E.g., <i>Design a collaborative quilt for school (drawing using thread)</i> <i>Design a fabric decoration (e.g., for Christmas)</i> Artists: Willemien de Villiers (applique), Rachael Howard (embroidery), Kaffe Fassett (needle work/design), Ben Venom (applique, layering) Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.
Develop <i>Experience and record</i>	Develop a skill that you will need to use in the design e.g., <i>exploring different shapes and sizes of cams: snail shaped, pear shaped, circular with off-centre hole</i> Use graphic recordings and create a design that meets the expectations of the design challenge.	Develop a skill that you will need to use in the design e.g., <i>attach fabrics using secure stitching (running and back-stitching)</i> <i>further develop drawing with thread skills specific to their chosen design</i> <i>attach decoration to fabric work (e.g., buttons, sequins)</i> Use graphic recordings and create a design that meets the expectations of the design challenge.
Deliver <i>Making prototypes</i>	Using the design, make a prototype.	Using the design, make a prototype.
Evaluate <i>Present and pitch, evaluate and celebrate</i>	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.
Additional enrichment opportunities		
	Gears • Gears are pairs of wheels with teeth around their edges that mesh and turn together. • 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. • <i>Design 'a propeller' machine using gears e.g. windmill, aeroplane.</i> <i>Design a moving vehicle with gears e.g. bike.</i>	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.

Year 6 Key Knowledge, Vocabulary and Skills

	Electrical Systems	Textiles
Discover <i>Immersing and building knowledge:</i>	Recap knowledge from Year 6 science and computer science curriculum. -electrical systems and components, including symbols -algorithms and programs – producing on-screen prototypes -identify electrical systems that use computing to program, monitor and control their products: <i>traffic lights, modern cars, heating systems, alarms, automatic doors with sensors</i>	Identify, explore and understand: Using thread: - Recap running stitch, backstitch - Discover different sewing stitches: cross stitch, chain stitch and blanket stitch (recommended: choose one) - Attach fabric together for purpose and detail
Define <i>Set the design challenge</i>	A product for someone for some purpose - identify a problem / gap What / for who / why <i>E.g., Design a home alarm system that uses a sensor</i> <i>Design an automatic night light for [someone]</i> Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.	A product for someone for some purpose - identify a problem / gap What / for who / why <i>E.g., Design a bag using recycled / pre-loved materials (stitching)</i> <i>Design a tool belt (attaching fabric)</i> 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) Show materials that will be used to make the prototype. Discuss which ones might work and which might not to meet the design criteria.
Develop <i>Experience and record</i>	Develop a skill that you will need to use in the design e.g., <i>explore using Crumble microcontrollers</i> <i>identifying when circuits / programs are incorrect and fixing</i> <i>making sensors e.g., using card and foil attached to circuit</i> Use graphic recordings and create a design that meets the expectations of the design challenge.	Develop a skill that you will need to use in the design e.g. <i>attaching fabric (e.g., for bag handles)</i> <i>creating detail through use of different coloured threads and stitches</i> Use graphic recordings and create a design that meets the expectations of the design challenge.
Deliver <i>Making prototypes</i>	Using the design, make a prototype.	Using the design, make a prototype.
Evolve <i>Present and pitch, evaluate and celebrate</i>	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.	Present and pitch ideas to an audience (class/ group) <i>I think this design would be good for [...] because ...</i> Evaluate design process and prototype reflecting on purpose, different strengths, joins. Celebrating achievements and areas for improvement within prototype.
Additional enrichment opportunities		
		Investigate the Batik technique by using flour and water paste

Appendix 1: 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.