Design and Technology Curriculum

The page numbers refer to the CQ Design and Technology Companion available on sharepoint.

	Term 1	Term 2	Term 3
Year 1	Introduction unit 1.1 What is Design and Technology? (pages 31-34) • Design process: think, make, break, repeat • Think: product design 1.1 Structures (pages 35-41) • Structures introduction: stability 1 • Structures introduction: stability 2 • Structures introduction: strength 1.2 Frame structures (43-58) • Frame structures: finger fluency • Frame structures: design inspiration • Frame structures: guided design-think • Frame structures: guided design-break Frame structures: guided design-re-think	1.3 Slider Mechanisms (pages 79-98) • Sliders 2 • Sliders 3 • Slider mechanisms: finger fluency • Slider mechanisms: design inspiration • Slider mechanisms: guided design-think • Slider mechanisms: guided design-break Slider mechanisms: guided design-re-think Key Vocabulary- horizontal, vertical, diagonal, attach, automatically, fluency, inspiration, purpose, transparent, opaque	1.8 Portable snacks (pages 133-148) • Food preparation 1: finger fluency • Food preparation 2: finger fluency • Portable snacks: guided design-think • Portable snacks: guided design-break • Portable snacks: guided design-re-think Things to remember: (pages 161-166) -sources -seasonal food -safety and hygiene Key Vocabulary – inspiration, purpose, user, automatically, fluency, grown, reared, caught, processed food, seasonal food, harvest, prepared, stored

	Key Vocabulary- beam, column, slab, automatically, fluency, accurate, inspiration, purpose, user		
Milestones	**Threshold Concepts** **Master practical skills.** **Materials** Cut materials safely using tools provided. Measure and mark out to the nearest centimeter. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). **Construction** Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products. **Design, make, evaluate and improve** Design products that have a clear purpose and an intended user. Make products, refining the design as work progresses. Use software to design. **Take inspiration from design throughout history** Explore objects and designs to identify likes and dislikes of the designs. Suggest improvements to existing designs. Explore how products have been created.	**Threshold Concepts** **Master practical skills** **Materials** Cut materials safely using tools provided. Measure and mark out to the nearest centimetre. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). **Mechanics** Create products using levers, wheels and winding mechanisms. **Design, make, evaluate and improve** Design products that have a clear purpose and an intended user. Make products, refining the design as work progresses. Use software to design. **Take inspiration from design throughout history** Explore objects and designs to identify likes and dislikes of the designs. Suggest improvements to existing designs. Explore how products have been created.	**Threshold Concepts** **Master practical skills** **Materials** Cut materials safely using tools provided. Measure and mark out to the nearest centimetre. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). **Textiles** Shape textiles using templates. Join textiles using running stitch. Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing). **Computing** Model designs using software. **Design, make, evaluate and improve** Design products that have a clear purpose and an intended user. Make products, refining the design as work progresses. Use software to design. **Take inspiration from design throughout history** Explore objects and designs to identify likes and dislikes of the designs. Suggest improvements to existing designs. Explore how products have been created.
Year 2	Introduction unit 1.1 What is Design and Technology? (pages 31-34)	1.7 Wheels and axles (pages 115-131) • Wheels and axels: attaching	Textiles Threshold Concepts

	• Design process: think, make, break, repeat • Think: product design Key Vocabulary- purpose, inspiration, materials, intended user, features, techniques, product 1.4 Lever Mechanisms (pages 99-114) • Lever mechanisms: finger fluency • Lever mechanisms: design inspiration • Lever mechanisms: guided design-think • Lever mechanisms: guided design-break • Lever mechanisms: guided design- re-think Key Vocabulary- rigid, pivot, fulcrum, force, input, output, automatically, fluency, inspiration, purpose, user.	• Wheels and axels: finger fluency • Wheels and axels: design inspiration • Wheels and axels: guided design-think • Wheels and axels: guided design-re-think Key Vocabulary- mechanism, rotating, force, attach, chassis, automatically, fluency	Join textiles using running stitch Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing) • Textiles: finger fluency • Textiles: design inspiration • Textiles: guided design-think • Textiles: guided design break • Textiles: guided design-re-think Suggested activities- bunting, fabric faces, small cushion. Key Vocabulary- fabric, cotton, linen, dye, tie dye, attach, pattern, embroidery, thread, applique
Milestone	**Threshold Concepts** **Master practical skills** **Materials** Cut materials safely using tools provided. Measure and mark out to the nearest centimeter. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).	**Threshold Concepts** **Master practical skills** **Materials** Cut materials safely using tools provided. Measure and mark out to the nearest centimeter. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).	**Threshold Concepts** **Master practical skills** **Food and Nutrition** • Cut, peel and grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble and cook ingredients.

	Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). **Construction** Use materials to practice drilling, screwing, gluing and nailing materials to make and strengthen products. **Design, make, evaluate and improve** Design products that have a clear purpose and an intended user. Make products, refining the design as work progresses. Use software to design. **Take inspiration from design throughout history** Explore objects and designs to identify likes and dislikes of the designs. Suggest improvements to existing designs. Explore how products have been created.	**Construction** Use materials to practice drilling, screwing, gluing and nailing materials to make and strengthen products. **Mechanics** Create products using levers, wheels and winding mechanisms. **Design, make, evaluate and improve** Design products that have a clear purpose and an intended user. Make products, refining the design as work progresses. Use software to design. **Take inspiration from design throughout history** Explore objects and designs to identify likes and dislikes of the designs. Suggest improvements to existing designs. Explore how products have been created.	
Year 3	Introduction Unit 2.1 What is design and Technology? (pages 169-172) • Design process: think, make, break, repeat • Think: product design Linked Levers/ Frame structures 2.4 Linked levers (pages 209-224) • Linked levers: finger fluency • Linked levers: design inspiration • Linked levers: guided design-think • Linked levers: guided design-break • Linked levers: guided design-re-think	Textiles Threshold concepts -understand the need for a seam allowance -join textiles with appropriate stitching • Textiles: finger fluency • Textiles: design inspiration • Textiles: guided design-think • Textiles: guided design break • Textiles: guided design-re-think Key Vocabulary- seam, fabric, cotton, linen, dye, tie dye, attach, pattern, embroidery, thread, applique	2.2 App control (pages 173-189) • App control: finger fluency • App control: design inspiration • App control: guided design-think • App control: guided design-break • App control: guided design-re-think Key Vocabulary- device, app-enabled, respond, automatically, fluency, inspiration, purpose, user

	Key Vocabulary- pivot, fulcrum, linear, rotary, reciprocating, oscillating, automatically, fluency, inspiration, purpose, user		
Milestones	**Threshold Concepts** **Master practical skills** **Materials** Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest millimeter. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Select appropriate joining techniques. **Construction** Choose suitable techniques to construct products or to repair items. Strengthen materials using suitable techniques. **Mechanics** Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears). **Design, make, evaluate and improve** Design with purpose by identifying opportunities to design. Make products by working efficiently (such as by carefully selecting materials). Refine work and techniques as work progresses, continually evaluating the product design. Use software to design and represent product designs. **Take inspiration from design throughout history** Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. Improve upon existing designs, giving reasons for choices.	**Threshold Concepts** **Master practical skills** **Materials** Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest millimeter. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Select appropriate joining techniques. **Textiles** Understand the need for a seam allowance. Join textiles with appropriate stitching Select the most appropriate techniques to decorate textiles.	**Threshold Concepts** **Master practical skills** **Electrics and Computing** Create products with series and parallel circuits. Control and monitor models using apps designed for this purpose

	Disassemble products to understand how they work.		
Year 4	Introduction Unit 2.1 What is design and Technology? (pages 169-172) • Design process: think, make, break, repeat • Think: product design Paper circuits or shell structures (see cycle A) 2.7 Shell structures (pages 259-276) • Shell structures: finger fluency • Shell structures: using CAD • Shell structures: design inspiration • Shell structures: guided design-think • Shell structures: guided design-break • Shell structures: guided design-re-think Key Vocabulary- variety, purpose, contain, conjunction, external, automatically, fluency, aspects, component parts, coordinates, assembles, inspiration, purpose, user 2.3 Paper circuits (pages 191-207) • Paper circuits: switches • Paper circuits: finger fluency	2.5 Pneumatics (pages 225-241) • Pneumatics: operation • Pneumatics: finger fluency • Pneumatics: design inspiration • Pneumatics: guided design-think • Pneumatics: guided design-break • Pneumatics: guided design-re-think Key Vocabulary- pneumatic, compressed, pressure, hydraulic, piston, hollow cylinder, reciprocating, automatically, fluency	Textiles Threshold concepts -understand the need for a seam allowance -join textiles with appropriate stitching -select the most appropriate techniques to decorate textiles • Textiles: finger fluency • Textiles: design inspiration • Textiles: guided design-think • Textiles: guided design break • Textiles: guided design-re-think Key Vocabulary- seam, fabric, cotton, linen, dye, tie dye, attach, pattern, embroidery, thread, applique

	• Paper circuits: design inspiration • Paper circuits: guided design-think • Paper circuits: guided design-break • Paper circuits: guided design-re-think Key Vocabulary- LED, conductive, adhesive, exploded diagram, illuminate,		
Milestones	**Threshold Concepts (Shell Structures)** **Master practical skills** **Materials** Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest millimeter. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Select appropriate joining techniques. **Computing** Control and monitor models using software designed for this purpose. **Construction** Choose suitable techniques to construct products or to repair items. Strengthen materials using suitable techniques. **Design, make, evaluate and improve** Design with purpose by identifying opportunities to design. Make products by working efficiently (such as by carefully selecting materials). Refine work and techniques as work progresses, continually evaluating the product design.	**Threshold Concepts** **Mechanisms** Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as linked levers or pneumatics). **Design, make, evaluate and improve** Design with purpose by identifying opportunities to design. Make products by working efficiently (such as by carefully selecting materials). Refine work and techniques as work progresses, continually evaluating the product design. Use software to design and represent product designs.	**Threshold Concepts** **Master practical skills** **Materials** Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest millimeter. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Select appropriate joining techniques. **Textiles** Understand the need for a seam allowance. Join textiles with appropriate stitching Select the most appropriate techniques to decorate textiles

	Use software to design and represent product designs. **Take inspiration from design throughout history** Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. Improve upon existing designs, giving reasons for choices. Disassemble products to understand how they work. **Threshold Concepts (Paper circuits)** **Master practical skills** **Materials** Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest millimeter. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Select appropriate joining techniques. **Electricals and Electronics** Create series and parallel circuits **Design, make, evaluate and improve** Design with purpose by identifying opportunities to design. Make products by working efficiently (such as by carefully selecting materials). Refine work and techniques as work progresses, continually evaluating the product design. Use software to design and represent product designs. **Take inspiration from design throughout history** Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. Improve upon existing designs, giving reasons for choices. Disassemble products to understand how they work.		
Year 5	Introduction unit 3.1 What is design and technology? (pages 313-316)	3.8 Food throughout the year (pages 419-426)	3.2 Artificial Intelligence (pages 317-336) • AI: force sensors

	• Design process: think, make, break, repeat • Think: product design Arch structures or Pulleys 3.4 Arch structure (pages 353-368) • Arch structures: finger fluency • Arch structures: design inspiration • Arch structures: guided design-think • Arch structures: guided design-break • Arch structures: guided design-re-think Key Vocabulary- perfected, ellipse, parabola, automatically, fluency, inspiration, purpose, user, 3.6 Pulleys and gears (pages 385-402) • Gears • Pulleys: finger fluency • Gears: finger fluency • Pulleys: design inspiration • Pulleys: guided design-think • Pulleys: guided design-break • Pulleys: guided design-re-think Key Vocabulary- circumference, mechanical advantage, physicist, gear	• Cultural events: Chinese New Year • Cultural events: Christmas • Cultural events Diwali • Cultural events: Iftar • Cultural events: Hanukkah 3.10 Bolognese (pages 441-452) • Bolognese: guided design-think • Bolognese: guided design-break • Bolognese: guided design-rethink Things to remember (pages 453-456) Ideas- a Kitchen garden Key vocabulary- inspiration, purpose, user, chopping, crushing, sauteing, stirring, perishable, infectious, compost, perennial, annual	• AI: distance sensors • AI: finger fluency • AI: design inspiration • AI: guided design-think • AI: guided design-break • AI: guided design-re-think Key Vocabulary- Artificial Intelligence, sensor, component, detect, automatically, fluency, inspiration, purpose, user

	train, interlock, mitre gear, automatically, fluency, inspiration, purpose, user,		
	Threshold Concepts (Arch structures) **Master practical skills** **Materials** Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper). **Construction** Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). **Design, make, evaluate and improve** Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high quality finish, using art skills where appropriate. Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. **Take inspiration from design throughout history** Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience. **Threshold Concepts (Pulleys)** **Master practical skills**	**Threshold Concepts** **Food and Nutrition** Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. Demonstrate a range of baking and cooking techniques. Create and refine recipes, including ingredients, methods, cooking times and temperatures.	**Threshold Concepts** **Electrics and computing** Create products using electronics kits that employ a number of components (such as LEDs and resistors). Write code to control and monitor models or products. **Design, make, evaluate and improve** Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high quality finish, using art skills where appropriate. Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.

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Year 6	Introduction unit 3.1 What is design and technology? (pages 313-316) • Design process: think, make, break, repeat	Frame structures or cams 3.5 Frame structures (pages 369-384)	3.3 Electronic motors (pages 337-352) • Electronic motors: finger fluency

	• Think: product design 3.8 Food throughout the year (pages 419-426) • Cultural events: Chinese New Year • Cultural events: Christmas • Cultural events Diwali • Cultural events: Iftar • Cultural events: Hanukkah 3.9 Bread (pages 427-440) • Bread: finger fluency • Bread: guided design-think • Bread: guided design-think • Bread: guided design-break • Bread: guided design-re-think Things to remember (pages 453-456) Ideas- a Kitchen garden Key Vocabulary- inspiration, purpose, user, automatically, fluency, accurate, perishable, infectious, compost, perennial, annual	• Frame structures: finger fluency • Frame structures: design inspiration • Frame structures: guided design-think • Frame structures: guided design-break • Frame structures: guided design-re-think Key Vocabulary- assemble, technique, construct, extend, automatically, fluency, inspiration, purpose, user, 3.7 Cams (pages 403-418) • Cams: finger fluency • Cams: design inspiration • Cams: guided design-think • Cams: guided design-break • Cams: guided design-re-think Key Vocabulary- linear reciprocating, vice versa, dwell, eccentric circle, automatically, fluency, automaton, inspiration, purpose, user	• Electronic motors: design inspiration • Electronic motors: guided design-think • Electronic motors: guided design-break • Electronic motors: guided design-re-think Key Vocabulary- rotary, propeller, combined, automatically, fluency, inspiration, purpose, user,
	Threshold Concepts **Food and Nutrition** Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). Measure accurately and calculate ratios of ingredients to scale up or down from a recipe.	**Threshold Concepts (Frame Structures)** **Master practical skills** **Materials** Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting	**Threshold Concepts** **Electrics and computing** Create products using electronics kits that employ a number of components (such as LEDs and resistors). Write code to control and monitor models or products. **Design, make, evaluate and improve**

	Demonstrate a range of baking and cooking techniques. Create and refine recipes, including ingredients, methods, cooking times and temperatures.	or a more precise scissor cut after roughly cutting out a shape). Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper). **Construction** Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). **Design, make, evaluate and improve** Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high-quality finish, using art skills where appropriate. Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. **Take inspiration from design throughout history** Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience. **Threshold Concepts (Cams)** **Master practical skills** **Materials** Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper). **Construction**	Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high-quality finish, using art skills where appropriate. Use prototypes, cross-sectional diagrams and computer aided designs to represent designs

		Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). **Mechanics** Convert rotary motion to linear using cams. Use innovative combinations of electronics (or computing) and mechanics in product designs. **Design, make, evaluate and improve** Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high-quality finish, using art skills where appropriate. Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. **Take inspiration from design throughout history** Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience.	