Year 4

YEAR 4 — DESIGN TECHNOLOGY CAREERS

Pupils see how specialist skills are applied in creative, technical and food careers.

2D SHAPE TO 3D PRODUCT

WE COULD BE...

Fashion / Textile Designers • Pattern Cutters

Discover how textile professionals select fabrics, create patterns, join materials, prototype and refine products for a particular user.

CAREER ENCOUNTER

Tailor, fashion or textile designer, costume maker.

CIRCUITS & SWITCHES

WE COULD BE...

Electrical Engineers • Product Engineers

Discover how engineers combine circuits, switches and electrical components to create useful, safe and reliable products.

CAREER ENCOUNTER

Electrician, electrical engineer or product engineer.

HEALTHY & VARIED DIET

WE COULD BE...

Food Technologists • Dietitians • Chefs

Explore how professionals investigate ingredients, nutrition and sensory qualities to develop healthy and appealing food products.

CAREER ENCOUNTER

Chef, dietitian, school catering professional or food producer.

Gatsby-informed: BM4 throughout | BM5 employer encounters | BM6 where appropriate

YEAR 4 — DESIGN TECHNOLOGY KNOWLEDGE

Substantive knowledge • Disciplinary knowledge and skills

2D SHAPE TO 3D PRODUCT

SUBSTANTIVE KNOWLEDGE

- 2D pattern pieces join to form functional 3D textile products.
- Seams require seam allowances; fabric choice affects strength, structure and function.
- Fastenings include zips/buttons; fabric can be stiffened.
- Finishes may include appliqué, embroidery, printing and fabric pens/paint.

DISCIPLINARY KNOWLEDGE & SKILLS

- Investigate textile products and compare stitches, joins, fabrics, fastenings and finishes.
- Practise stitching and seam allowances; test fabric suitability, seam strength and stiffening.
- Create a design brief/criteria; communicate ideas with annotated sketches, mock-ups and prototypes.
- Plan stages, construct accurately, test with the intended user and refine from feedback.

SIMPLE CIRCUITS & SWITCHES

SUBSTANTIVE KNOWLEDGE

- A simple series circuit contains a power source, conductors and output components such as bulbs/buzzers.
- Switches control circuits; types include push-to-make, push-to-break and toggle.
- Electrical systems can be described using input and output.
- Faults prevent a circuit working and can be diagnosed systematically.

DISCIPLINARY KNOWLEDGE & SKILLS

- Investigate battery-powered products and how switches are positioned/used.
- Construct and fault-find series circuits; make/test different switches and secure connections.
- Design an electrical product for a user/purpose, showing circuit/component placement.
- Incorporate a working system into a product, test functionality and evaluate against criteria.

HEALTHY & VARIED DIET

SUBSTANTIVE KNOWLEDGE

- Ingredient choices contribute to a healthy and varied diet and have different sensory qualities.
- Provenance and processing influence food choices; ingredients may be fresh, seasonal or processed.
- Different utensils and preparation techniques suit different ingredients/tasks.
- Design criteria should reflect user, purpose, nutrition and sensory appeal.

DISCIPLINARY KNOWLEDGE & SKILLS

- Investigate ingredients/products and deepen sensory evaluation.
- Select utensils and preparation techniques independently; work safely and hygienically.
- Plan with design criteria, sequence the making and select ingredients purposefully.
- Make and evaluate against user/purpose, nutrition and sensory evidence; refine choices.

Year 4 — 2D Shape to 3D Product

Textiles

Prior learning being retrieved

Year 2 textiles: templates, pattern pieces, fabrics, simple stitching, joining and finishing techniques.

New knowledge / skill introduced

Pupils construct a 3D textile product from 2D pieces. They learn seams, seam allowances, fastenings, stiffening, appliqué, embroidery and prototyping.

Why this? Why now?

Pupils now have the control and accuracy to understand how carefully made pattern pieces join to create a functional product.

What does this prepare pupils for?

Prepares for Year 5 CAD textiles, where manual pattern and seam knowledge transfers to digital design and possible CAM.

Design Technology 2D Shape to 3D product

Investigative and Evaluative Activities	**L.O. to** 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.
Focused Tasks	**L.O. to** 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. 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?

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

Design Technology 2D Shape to 3D product

Design	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.
Make	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	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.

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

Year 4 — Simple Circuits and Switches

Electrical Systems

Prior learning being retrieved

DT understanding of user, purpose, function, materials and evaluation, plus science knowledge of simple series circuits.

New knowledge / skill introduced

Pupils investigate battery products, push-to-make, push-to-break and toggle switches. They fault-find series circuits and identify inputs/outputs.

Why this? Why now?

Pupils can now combine science and DT so electricity becomes a functional system within a designed product.

What does this prepare pupils for?

Prepares for Year 6 complex circuits with sensors, multiple outputs, possible parallel circuits and computer control.

Design Technology Simple Circuits and switches

Investigative and Evaluative Activities	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.
Focused Tasks	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. 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. Teach children how to avoid making short circuits.

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

Design Technology Simple Circuits and switches

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

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

Year 4 — Healthy and Varied Diet

Cooking and Nutrition

Prior learning being retrieved

Year 3 nutrition, food groups, provenance, sensory evaluation, hygiene and a wider repertoire of preparation techniques.

New knowledge / skill introduced

Pupils deepen ingredient investigation, sensory evaluation and purposeful selection of utensils/techniques. They plan with design criteria for user and purpose.

Why this? Why now?

This secures core cooking and nutrition before upper KS2 adds culture, seasonality, dietary need and sustainable sourcing.

What does this prepare pupils for?

Prepares for Year 5 and 6 culture and seasonality, when pupils make more independent and ethical food-design choices.

Design Technology Healthy and Varied Diet

Investigative and Evaluative Activities	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 plate 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. Find out how a variety of ingredients used in products are grown and harvested, reared, caught and processed e.g. Where and when are the ingredients grown? Where do different meats/fish/cheese/eggs come from? How and why are they processed?
Focused Tasks	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?

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

Design Technology Healthy and Varied Diet

Design	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.
Make	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	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 considering how the work might be improved.

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