


Design & Technology



Intent

Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values

Implementation

Through opportunities to design, evaluate and make a range of ideas and products drawing on different disciplines such as mathematics, geography, science and art.

Impact

For our pupils to learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens.
Pupils develop a critical understanding of the impact of technology on daily life and the wider world.
They can understand and apply the principles of nutrition and learn how to cook.

'High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.'
National Curriculum

Chellaston Fields
SPENCER ACADEMY

Design & Technology Curriculum

Each child has the opportunity to experience each of the strands of Design Technology: Design, Make, Evaluate, Technical Knowledge and Food Technology every year. To ensure a high standard the curriculum is designed around the following principles:

Purpose: children should know what the products they make are for.

Functionality: children should design and make products that function in some way to be successful

Design decisions: when designing and making, children need opportunities to make informed decisions such as selecting materials, components and techniques and deciding what form the products will take, how they will work, what task they will perform and who they are for.

Innovation: when designing and making, children need some scope to be original with their thinking.

Authenticity: children should design and make products that are believable, real and meaningful to themselves

User: children should have a clear idea of who they are designing and making

Children have the opportunity to use a variety of materials starting in EYFS with a range of construction materials (blocks, bricks, paper, fabric and card) and joining techniques such as glue and tape. Progressing in KS1 to exploring freestanding structures, using simple mechanisms and different textiles and sewing techniques to join. In KS2 pupils explore a range of structures and mechanisms and use of computer aided design.

Each unit is supported by a Knowledge Organiser which details the key facts, vocabulary and skills for each unit. This is sent home in advance of the unit, allowing children to make a head start on their learning.

Links are built with other subjects, predominantly but not exclusively with science, history, art and geography.

D&T Knowledge Progression

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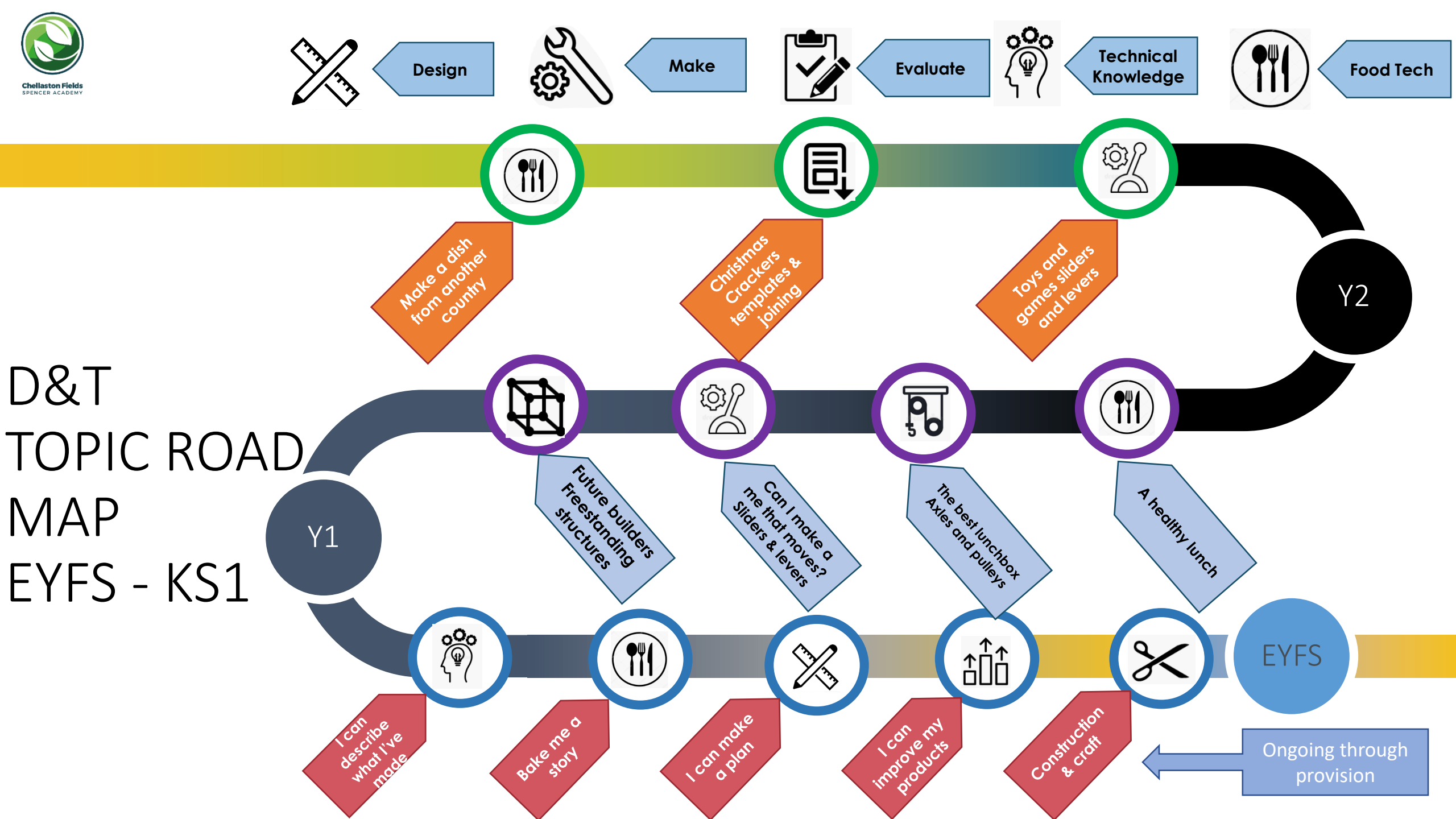
	EYFS	YEAR 1	YEAR 2	YEAR3	YEAR 4	YEAR 5	YEAR 6
Design	Use own ideas to design something and describe how their own idea work	Design a product that moves. Explain to someone else how they want to make their product and make a simple plan before making	Explain why they have chosen specific textiles. Think of an idea & plan what to do next – use ICT to design and mock up template or design game	Prove that a design meets a set criteria. Design a product and make sure that it looks attractive. Choose a material for both its suitability and its appearance	Persevere and adapt work when original ideas do not work. Communicate ideas in a range of ways, including by sketches and drawings which are annotated	Come up with a range of ideas after collecting information from different sources • produce a detailed, step-by-step plan • design a product that requires pulleys or gears	Use market research to develop & inform ideas. Communicate ideas through discussion, annotated sketches, cross sectional, pattern pieces and computer aided design
Make	Use a range of materials and tools to make their own products: construction blocks, loose parts, paper/card, glue and tape. Develop pencil grip and hold scissors safely.	Select from and use a range of tools and equipment to perform practical tasks e.g. cutting, shaping, joining and finishing	Join materials and components in different ways to make a soft toy.	Work accurately to measure, make cuts and make holes. Select from a wider range of tools and equipment to perform practical tasks: cutting, shaping, joining & finishing	Know which tools to use for a particular task and show knowledge of handling the tool • know which material is likely to give the best outcome • measure accurately	Use a range of tools and equipment competently • make a prototype before making a final version • make a product that relies on pulleys or gear	Select from & use a wider range of materials & components, including construction, textiles & ingredients, according to their functional & aesthetic qualities
Evaluate	Can describe what they have made and what they used to make it.	Explore and evaluate a range of existing products.	Evaluate their ideas and products against design criteria.	Explain how to improve a finished product. Know why a product has, or has not, been successful	Evaluate and suggest improvements for design • • explain how the original design has been improved • present a product in an interesting way	Suggest alternative plans; outlining the positive features and drawbacks • evaluate appearance and function against original criteria	Understand how key events & individuals in design technology have helped shape the world.
Technical Knowledge	Use language to describe properties of models: stronger, longer, shorter, stiff, bendy, soft, hard etc.	Build structures, exploring how they can be made stronger, stiffer and more stable	Explore and use textiles and different ways of joining them – glue, simple stiches	Know how to strengthen a product by stiffening a given part or reinforce a part of the structure	Links scientific knowledge by using lights, switches or buzzers • use electrical systems to enhance the quality of the product	Links scientific knowledge to design by using pulleys or gears	Apply their understanding of computing to program, monitor and control their products.
Food Tech	Make and try different foods. Know that some food has to be cooked. Use vocabulary such as stir, roll, knead, roll, bake, weigh, mix, bake, grate, sift	Know different groups of food – fruit, vegetables, meat and dairy. Cut food safely	Weigh ingredients to use in a recipe. Describe the ingredients used when making a dish or cake.	Understand and apply the principles of a healthy diet Know which food is healthy and which is not.	Know how to be both hygienic and safe when using food. Bring a creative element to the food product being designed in creation of savoury dishes.	Be both hygienic and safe in the kitchen • know how to prepare a meal using wider range of ingredients • know which season various foods are available for harvesting	Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.

D&T TOPIC ROAD MAP EYFS - KS1



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Design | Make | Evaluate | Technical Knowledge | Food Tech

GEOGRAPHY TOPIC ROAD MAP KS2

Y6

- Electrical systems More complex circuits & switches
- Textiles of different shapes Using CAD
- Celebrate culture & seasonality

Y5

- All the fun of the fair. Pulleys & gears
- Frame structures
- Celebrate culture & seasonality

Y4

- A savoury feast, celebrate culture & seasonality
- Electric Avenue circuits & switches
- Shell structures

Y3

- 2D shape to 3D product – bag/case
- Structures. Investigate bridges
- Are our diets healthier now? Healthy diets

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Autumn

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Mechanisms Flaps, sliders & levers.	**Mechanisms** Wheels & axles	**Food** Healthy and varied diet	**Electrical systems** Simple circuits and switches (including programming and control)	**Food** Celebrating culture & seasonality	**Food** Celebrating culture & seasonality

Spring

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures Freestanding structures	**Textiles** Templates & joining techniques	**Structures** Investigating bridges	**Food** Healthy and varied diet	**Structure** Frame structures	**Textiles** Combining different fabric shapes (including computer aided design)

Summer

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Food Preparing fruit and vegetables **Mechanisms** Pulleys & axles	**Food** Preparing healthy food, fruit & vegetables	**Textiles** 2D shape to 3D product	**Structures** Shell structure (including computer aided design)	**Mechanical systems** Pulleys, gears or cams	**Electrical systems** Using more complex switches and circuits (including programming control and monitoring)

Reception Knowledge

- Design – a plan about what you are going to make
- Measurement – longer, shorter, wider, thinner, stronger, rigid, bendy/flexible, weigh
- Cooking - stir, roll, knead, roll, bake, weigh, mix, bake, grate, sift

Reception Statements

Can join materials using appropriate method

Glue, sellotape, split pins

Create a design plan and describe what they are going to make

Identify materials needed

Talk about properties and purpose of their product

Identify what could be improved or changed

Year 1 Knowledge

- Freestanding structure – a structure that stands on its own without foundation, base or attachment to something else
- Structures can be made more stable by making base wider
- A mechanism is a device used to create movement
- Sliders move from side to side and up and down
- Levers can be used with or without a slot
- Simple mechanisms move in a straight line, in a curve and round and round
- A pulley is a wheel attached to a drive belt

Year 1 Statements

Make: Use own ideas to make something and choose appropriate resources and tools

Make a product which moves using a slider or a lever

Using design

Explain to someone else how they want to make their product and make a simple plan before making

Evaluate what they have made

Explain what works well and not so well in the model they have

Demonstrate technical knowledge

Make their own model more stable by increasing size of base or changing brick pattern

Prepare food

Cut food safely

Technical knowledge

Identifies and operates a pulley

Year 2 Knowledge

- A wheel needs to be attached to an axle to move
- Fixed and free axles
- A wheel is always round
- Chassis – the frame or base on which the vehicle is built
- Body – the external part of the vehicle
- Cab – where passengers sit
- Sew – to join fabric with stitches
- Template – a shape drawn to help with cutting out of shapes
- Applique – to attach a decorative fabric to another piece of fabric by sewing or gluing

Year 2 Statements

Design

Explain why they have chosen specific textiles for the product they are making

Make

Measure materials to use in a model or structure

Evaluate

Explain what went well with their work

Technical knowledge

Use wheels and axles, when appropriate to do so

Food technology

Weigh ingredients to use in a recipe. Describe the ingredients used when making a dish or cake

Year 3 Knowledge

- **Structures** - wall, tower, framework, base, joint, metal, wood, plastic, brick, triangle, square, rectangle, cuboid, cube.
- **Bridges** – suspension, viaduct, arch, cable
- **Appliqué** – means 'applied' - describes method of stitching/gluing patches onto fabric (originally to mend holes in worn clothes) to provide decoration.
- **Pattern/Template** – a shape drawn to exact shape and size and used to assist cutting out.
- **Seam** – a line of stitching that joins pieces of fabrics together.
- **Seam Allowance** – extra fabric allowed for joining together - usually 1.5cm.
- **Prototype** – a model that is made to test whether a design will work.
- **Aesthetics** – the way in which the product looks with the nature and expression of beauty.
- **Fastenings** – buttons, Velcro, gluing, stitching
- **Healthy diet** – fruit, vegetables, dairy, meat, vitamins, carbohydrate

Year 3 Statements

Investigate and explore structures

Can label with technical vocabulary in relation to structure, materials and shape

Investigate and explore structures - build

Identify how they have been made stable and strong enough, what is their purpose?

Considers questions to inform purpose and aesthetics of design

Who is it for? What will it hold? e.g. phone, money, plastic cards, pencils. What shape will the holder be? How will it fasten? What fabric should I use? How can I make it appealing? What fabrics should I use?

Know which tools to use for a particular task and show knowledge of handling the tool

Select appropriate needle and thread.

Identify and use effective joining techniques

Back stitch, running stitch, glue, velcro

Work accurately to measure, make cuts and make holes

Use a template and step by step guide/plan

Year 4 Knowledge

- Food hygiene – wash hands, remove jewellery, hair is tied up, sleeves rolled up
- Healthy diet – good balance of food groups: fruit, vegetables, dairy, meat, carbohydrate
- Circuit – a path through which electricity travels
- Conductor – a material which allows an electric current to pass through it.
- Insulator – a material which does not easily allow electric current to pass through it.
- Push-to-break switch – a switch turned off by pressing it.
- Push-to-make switch – a switch turned on by pressing it.
- Toggle switch – a switch operated when a lever is pressed.
- Output devices – components that produce an outcome e.g. bulbs and buzzers.
- Input devices – components that are used to control an electrical circuit e.g. switches.

Year 4 Statements

Evaluate

Persevere and adapt work when original ideas do not work

Design

Communicate ideas in a range of ways, including by sketches and drawings which are annotated

Make

Can select the appropriate materials to make a simple circuit and use it to improve a product

Technical knowledge

Links scientific knowledge by using lights, switches or buzzers in a circuit

Food technology

Knows how to be hygienic and safe when preparing food

Food technology

Can bring a creative element to food they are preparing by ingredient selection of presentation.

Year 5 Knowledge

- Mechanism – the parts that make something work
- Gears – toothed wheels that lock together and turn one another. Can increase the power of a turning force.
- Pulleys – wheels joined together by a drive belt. Can affect the speed, direction or force of movement
- Example mechanisms – flag pole, can opener, bicycle gears
- Chassis – the frame on which the vehicle is built and includes axle holders.
- Cam – a mechanism that changes one sort of movement to another.
- Design specification and design brief
- Annotated drawings, exploded diagrams
- Frame structure – a structure made from thin components e.g. tent frame
- Diagonal – a straight line that goes from one corner to another inside a shape.
- Horizontal – a line that is parallel to the ground.
- Vertical – a line that is at right angles to the ground

Year 5 Statements

Food

Can follow a recipe to create a savoury dish by collecting the ingredients first.

Design

Explain how a product appeals to a certain audience

Make

Make a prototype before making a final version

Evaluate

Evaluate appearance and function against original criteria

Design

Design a product that requires pulleys, gears or cams

Technical Knowledge

Links scientific knowledge to design by using pulleys, gears or cams

Year 6 Knowledge

- Specification – describes what a product has to do.
- Tacking – large running stitches to hold pieces of fabric together temporarily.
- Working drawing – detailed drawing contains all information needed to make a product but is updated as changes are made.
- Modelling – to realise and manipulate ideas in a tangible form.
- Open switch – when a switch is positioned such that electricity cannot flow through it.
- Closed switch – when a switch is positioned such that electricity can flow through it.
- Normally open – the term used to describe when a switch is in the off position, i.e. the switch is open and no electricity can flow when the button on not pressed.
- Normally closed – the term used to describe when a switch is in the on position i.e. the switch is closed and electricity can flow when the button is not pressed
- Computer control input – when a switch, such as a micro switch, sends a signal to a computer control box to activate a sequence of events such as a buzzer or light being used to attract attention or alert people.

Year 6 Statements

Food

Explain how food ingredients should be stored and give reasons

Food

Work within a budget to create a meal

Design

Use market research to inform plans and idea

Make

Explain why a specific tool is best for a specific action

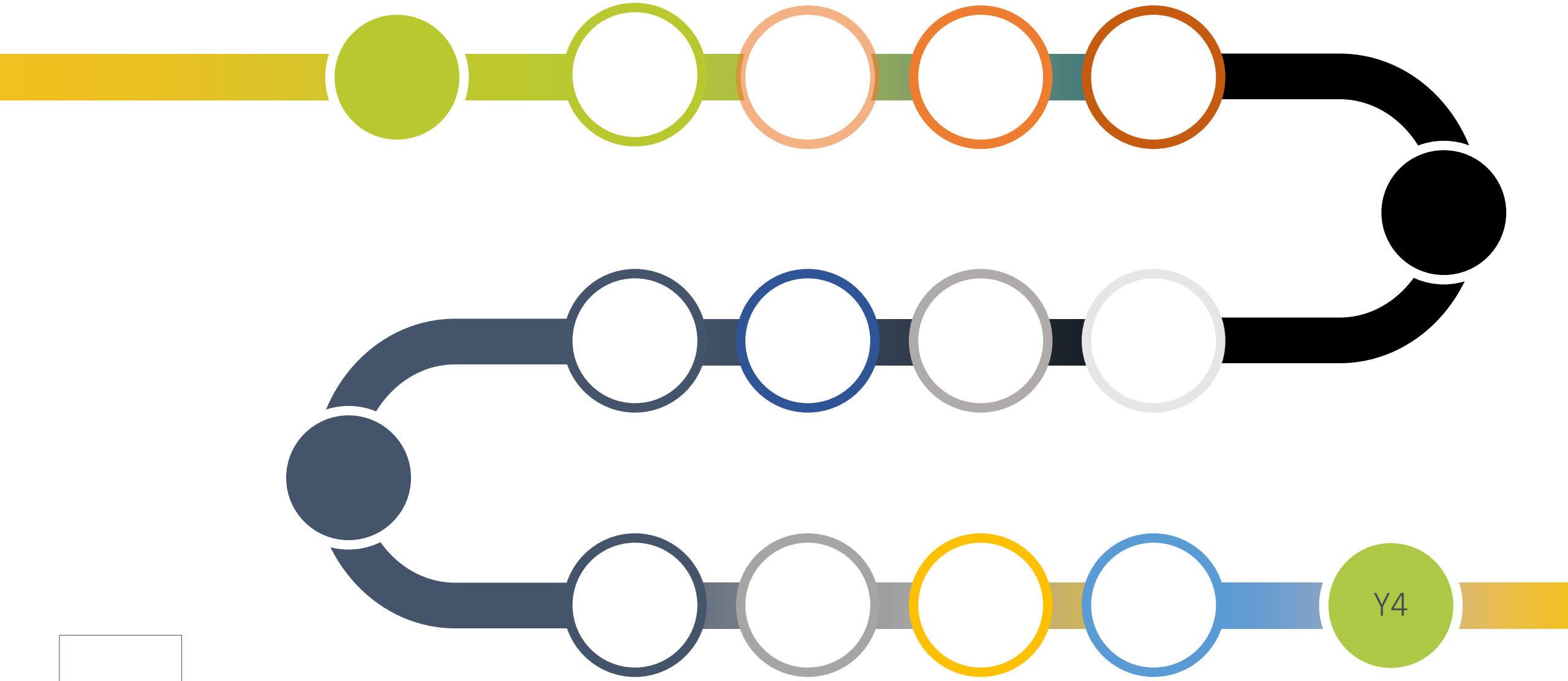
Technical knowledge

Use electrical systems correctly and accurately to enhance a given product

Evaluate

Describe the impact a famous designer has had

Knowledge organisers


Y4