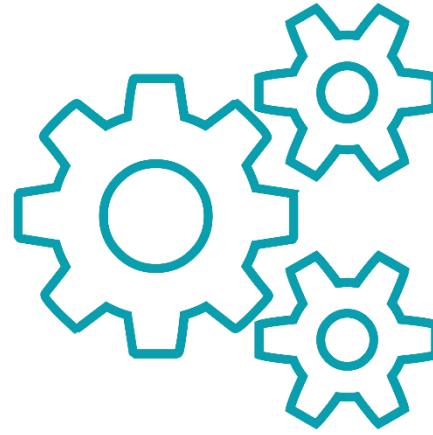


Design

Make

Evaluation

Technical
knowledge



Design and technology

Progression of skills

Design	2-4
Make	5-8
Evaluation	9-11
Technical knowledge	12-17

Design

Make

Evaluation

Technical knowledge

Structures

Mechanisms/
Mechanical systems

- Learning the importance of a clear design criteria
- Including individual preferences and requirements in a design

- Generating and communicating ideas using sketching and modelling
- Learning about different types of structures, found in the natural world and in everyday objects

- Designing a castle with key features to appeal to a specific person/purpose
- Drawing and labelling a castle design using 2D shapes, labelling:
 - the 3D shapes that will create the features - materials need and colours
- Designing and/or decorating a castle tower on CAD software

- Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect
- Building frame structures designed to support weight

- Designing a stable structure that is able to support weight
- Creating frame structure with focus on triangulation

- Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs

- Explaining how to adapt mechanisms, using bridges or guides to control the movement
- Designing a moving story book for a given audience
- Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move
- Creating clearly labelled drawings which illustrate movement

- Creating a class design criteria for a moving monster
- Designing a moving monster for a specific audience in accordance with a design criteria
- Selecting a suitable linkage system to produce the desired motions
- Designing a wheel
 - Selecting appropriate materials based on their properties

- Designing a toy which uses a pneumatic system
- Developing design criteria from a design brief
- Generating ideas using thumbnail sketches and exploded diagrams
- Learning that different types of drawings are used in design to explain ideas clearly

- Designing a shape that reduces air resistance
- Drawing a net to create a structure from
- Choosing shapes that increase or decrease speed as a result of air resistance
- Personalising a design

- Designing a pop-up book which uses a mixture of structures and mechanisms
- Naming each mechanism, input and output accurately
- Storyboarding ideas for a book

- Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement
- Understanding how linkages change the direction of a force
- Making things move at the same time
- Understanding and drawing cross-sectional diagrams to show the inner-workings of the automata

Design

Make

Evaluation

Technical knowledge

Electrical systems
(KS2 only)

N/A

N/A

- Designing a game that works using static electricity, including the instructions for playing the game
- Identifying a design criteria and a target audience

- Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas

- Designing an electronic greetings card with a copper track circuit and components
- Creating a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery
- Writing design criteria for an electronic greeting card
- Compiling a moodboard relevant to my chosen theme, purpose and recipient

- Designing a steady hand game - identifying and naming the components required
- Drawing a design from three different perspectives
- Generating ideas through sketching and discussion
- Modelling ideas through prototypes
- Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'

- Designing smoothie carton packaging by-hand or on ICT software

- Designing a healthy wrap based on a food combination which work well together

- Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish

- Designing a biscuit within a given budget, drawing upon previous taste testing

- Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients
- Writing an amended method for a recipe to incorporate the relevant changes to ingredients
- Designing appealing packaging to reflect a recipe

- Writing a recipe, explaining the key steps, method and ingredients
- Including facts and drawings from research undertaken

Cooking and nutrition

Design

Make

Evaluation

Technical knowledge

Textiles

Digital world
(KS2 only)

- Using a template to create a design for a puppet

- Designing apouch

- Designing and making a template from an existing cushion and applying individual design criteria

- Writing design criteria for a product, articulating decisions made
- Designing a personalised Book sleeve

- Designing a stuffed toy considering the main component shapes required and creating an appropriate template
- Considering the proportions of individual components

- Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme
- Annotating designs

N/A

N/A

- Problem solving by suggesting potential features on a Micro:bit and justifying my ideas
- Developing design ideas for a technology pouch
- Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge

- Writing design criteria for a programmed timer (Micro:bit)
- Exploring different mindfulness strategies
- Applying the results of my research to further inform my design criteria
- Developing a prototype case for my mindful moment timer
- Using and manipulating shapes and clipart, using computer-aided design (CAD), to produce a logo
- Following a list of design requirements

- Researching (books, internet) for a particular (user's) animal's needs
- Developing design criteria based on research
- Generating multiple housing ideas using building bricks
- Understanding what a virtual model is and the pros and cons of traditional and CAD modelling
- Placing and manoeuvring 3D objects, using CAD
- Changing the properties of, or combine one or more 3D objects, using CAD

- Writing a design brief from information submitted by a client
- Developing design criteria to fulfil the client's request
- Considering and suggesting additional functions for my navigation tool
- Developing a product idea through annotated sketches
- Placing and manoeuvring 3D objects, using CAD
- Changing the properties of, or combine one or more 3D objects, using CAD

Design

Make

Evaluation

Technical knowledge

Structures

- Making stable structures from card, tape and glue

- Following instructions to cut and assemble the supporting structure of a windmill

- Making functioning turbines and axles which are assembled into a main supporting structure

- Making a structure according to design criteria

- Creating joints and structures from paper/card and tape

- Constructing a range of 3D geometric shapes using nets

- Creating special features for individual designs

- Making facades from a range of recycled materials

- Creating a range of different shaped frame structures

- Making a variety of free standing frame structures of different shapes and sizes

- Selecting appropriate materials to build a strong structure and for the cladding

- Reinforcing corners to strengthen a structure

- Creating a design in accordance with a plan

- Learning to create different textural effects with materials

- Making a range of different shaped beam bridges

- Using triangles to create truss bridges that span a given distance and supports a load

- Building a wooden bridge structure independently measuring and marking wood accurately

- Selecting appropriate tools and equipment for particular tasks

- Using the correct techniques to saw safely

- Identifying where a structure needs reinforcement and using card corners for support

- Explaining why selecting appropriate materials is an important part of the design process

- Understanding basic wood functional properties

- Building a range of play apparatus structures drawing upon new and prior knowledge of structures

- Measuring, marking and cutting wood to create a range of structures

- Using a range of materials to reinforce and add decoration to structures

Design

Make

Evaluation

Technical knowledge

Mechanisms/
Mechanical systems

- Following a design to create moving models that use levers and sliders

- Adapting mechanisms

- Making linkages using card for levers and split pins for pivots

- Experimenting with linkages adjusting the widths, lengths and thicknesses of card used

- Cutting and assembling components neatly

- Selecting materials according to their characteristics

- Following a design brief

- Creating a pneumatic system to create a desired motion

- Building secure housing for a pneumatic system

- Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy

- Selecting materials due to their functional and aesthetic characteristics

- Manipulating materials to create different effects by cutting, creasing, folding, weaving

- Measuring, marking, cutting and assembling with increasing accuracy

- Making a model based on a chosen design

- Following a design brief to make a pop up book, neatly and with focus on accuracy

- Making mechanisms and/or structures using sliders, pivots and folds to produce movement

- Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result

- Measuring, marking and checking the accuracy of the jelutong and dowel pieces required

- Measuring, marking and cutting components accurately using a ruler and scissors

- Assembling components accurately to make a stable frame

- Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles

- Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set

Strands:

Key stage 1	
Year 1	Year 2

Key stage 2			
Year 3	Year 4	Year 5	Year 6

Design
Make
Evaluation
Technical knowledge

<p>Electrical systems (KS2 <i>only</i>)</p>	N/A	N/A	<ul style="list-style-type: none"> • Making an electrostatic game, referring to the design criteria • Using a wider range of materials and equipment safely • Using electrostatic energy to move objects in isolation as well as in part of a system 	<ul style="list-style-type: none"> • Making a torch with a working electrical circuit and switch • Using appropriate equipment to cut and attach materials • Assembling a torch according to the design and success criteria 	<ul style="list-style-type: none"> • Making a functional series circuit • Creating an electronics greeting card, referring to a design criteria • Mapping out where different components of the circuit will go 	<ul style="list-style-type: none"> • Constructing a stable base for a game • Accurately cutting, folding and assembling a net • Decorating the base of the game to a high quality finish • Making and testing a circuit Incorporating a circuit into a base
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<p>Cooking and nutrition</p>	<ul style="list-style-type: none"> • Chopping fruit and vegetables safely to make a smoothie • Identifying if a food is a fruit or a vegetable • Learning where and how fruits and vegetables grow 	<ul style="list-style-type: none"> • Slicing food safely using the bridge or claw grip • Constructing a wrap that meets a design brief 	<ul style="list-style-type: none"> • Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination • Following the instructions within a recipe 	<ul style="list-style-type: none"> • Following a baking recipe • Cooking safely, following basic hygiene rules • Adapting a recipe 	<ul style="list-style-type: none"> • Cutting and preparing vegetables safely • Using equipment safely, including knives, hot pans and hobs • Knowing how to avoid cross-contamination • Following a step by step method carefully to make a recipe 	<ul style="list-style-type: none"> • Following a recipe, including using the correct quantities of each ingredient • Adapting a recipe based on research • Working to a given timescale • Working safely and hygienically with independence
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Strands:

Key stage 1

Key stage 2

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6

Design

Make

Evaluation

Technical knowledge

Textiles

- Cutting fabric neatly with scissors
- Using joining methods to decorate a puppet
- Sequencing steps for construction

- Selecting and cutting fabrics for sewing
- Decorating a pouch using fabric glue or running stitch

- Following design criteria to create a cushion
- Selecting and cutting fabrics with ease using fabric scissors
- Sewing cross stitch to join fabric
- Decorating fabric using appliqué
- Completing design ideas with stuffing and sewing the edges

- Making and testing a paper template with accuracy and in keeping with the design criteria
- Measuring, marking and cutting fabric using a paper template
- Selecting a stitch style to join fabric, working neatly sewing small neat stitches
- Incorporating fastening to a design

- Creating a 3D stuffed toy from a 2D design
- Measuring, marking and cutting fabric accurately and independently
- Creating strong and secure blanket stitches when joining fabric
- Using applique to attach pieces of fabric decoration

- Using a template when pinning panels onto fabric
- Marking and cutting fabric accurately, in accordance with a design
- Sewing a strong running stitch, making small, neat stitches and following the edge
- Tying strong knots
- Decorating a waistcoat - attaching objects using thread and adding a secure fastening

N/A

N/A

- Using a template when cutting and assembling the pouch
- Following a list of design requirements
- Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch
- Applying functional features such as using foam to create soft buttons

- Developing a prototype case for my mindful moment timer
- Creating a 3D structure using a net

- Understanding the functional and aesthetic properties of plastics

- Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo)
- Explaining material choices and why they were chosen as part of a product concept

Digital world
(KS2 only)

Strands:

Key stage 1

Key stage 2

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6

Design

Make

Evaluation

Technical knowledge

Structures

- Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't
- Suggest points for improvements

- Exploring the features of structures
- Comparing the stability of different shapes
- Testing the strength of own structures
- Identifying the weakest part of a structure
- Evaluating the strength, stiffness and stability of own structure

- Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design
- Suggesting points for modification of the individual designs

- Evaluating structures made by the class
- Describing what characteristics of a design and construction made it the most effective
- Considering effective and ineffective designs

- Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary
- Suggesting points for improvements for own bridges and those designed by others

- Improving a design plan based on peer evaluation
- Testing and adapting a design to improve it as it is developed
- Identifying what makes a successful structure

Cooking and nutrition

- Tasting and evaluating different food combinations
- Describing appearance, smell and taste
- Suggesting information to be included on packaging

- Describing the taste, texture and smell of fruit and vegetables
- Taste testing food combinations and final products
- Describing the information that should be included on a label
- Evaluating which grip was most effective

- Establishing and using design criteria to help test and review dishes
- Describing the benefits of seasonal fruits and vegetables and the impact on the environment
- Suggesting points for improvement when making a seasonal tart

- Evaluating a recipe, considering: taste, smell, texture and appearance
- Describing the impact of the budget on the selection of ingredients
- Evaluating and comparing a range of products
- Suggesting modifications

- Identifying the nutritional differences between different products and recipes
- Identifying and describing healthy benefits of food groups

- Evaluating a recipe, considering: taste, smell, texture and origin of the food group

- Taste testing and scoring final products

- Suggesting and writing up points of improvements in productions

- Evaluating health and safety in production to minimise cross contamination

Strands:

Key stage 1

Key stage 2

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6

Design

Make

Evaluation

Technical knowledge

Mechanisms/
Mechanical systems

Electrical systems
(KS2 only)

- Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed

- Reviewing the success of a product by testing it with its intended audience

- Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move

N/A

- Evaluating own designs against design criteria

- Using peer feedback to modify a final design

- Evaluating different designs

- Testing and adapting a design

N/A

- Using the views of others to improve designs

- Testing and modifying the outcome, suggesting improvements

- Understanding the purpose of exploded-diagrams through the eyes of a designer and their client

- Learning to give constructive criticism on own work and the work of others

- Testing the success of a product against the original design criteria and justifying opinions

- Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance

- Evaluating electrical products

- Testing and evaluating the success of a final product and taking inspiration from the work of peers

- Evaluating the work of others and receiving feedback on own work

- Suggesting points for improvement

- Evaluating a peer's product against design criteria and suggesting modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component

- Stating what Sir Rowland Hill invented and why it was important for greeting cards

- Analysing and evaluating a range of existing greeting cards.

- Evaluating the work of others and receiving feedback on own work

- Applying points of improvements

- Describing changes they would make/do if they were to do the project again

- Testing own and others finished games, identifying what went well and making suggestions for improvement

- Gathering images and information about existing children's toys

- Analysing a selection of existing children's toys

Design

Make

Evaluation

Technical knowledge

Textiles

Digital world
(KS2 only)

- Reflecting on a finished product, explaining likes and dislikes

- Troubleshooting scenarios posed by teacher
- Evaluating the quality of the stitching on others' work
- Discussing as a class, the success of their stitching against the success criteria
- Identifying aspects of their peers' work that they particularly like and why

- Evaluating an end product and thinking of other ways in which to create similar items

- Testing and evaluating an end product against the original design criteria
- Deciding how many of the criteria should be met for the product to be considered successful
- Suggesting modifications for improvement

- Testing and evaluating an end product and giving point for further improvements

- Evaluating work continually as it is created

N/A

N/A

- Analysing and evaluating an existing product
- Identifying the key features of a pouch

- Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages
- Evaluating my micro:bit program against points on my design criteria and amending them to include any changes I made
- Documenting and evaluating my project
- Understanding what a logo is and why they are important in the world of design and business

- Stating an event or fact from the last 100 years of plastic history
- Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices

- Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool
- Developing an awareness of sustainable design
- Identifying key industries that utilise 3D CAD modelling and explain why
- Describing how the product concept fits the client's request and how it will benefit the customers

Design

Make

Evaluation

Technical knowledge

Cooking and nutrition

- Understanding the difference between fruits and vegetables

- Describing and grouping fruits by texture and taste

- Understanding what makes a balanced diet

- Knowing where to find the nutritional information on packaging

- Knowing the five food groups

- Learning that climate affects food growth

- Working with cooking equipment safely and hygienically

- Learning that imported foods travel from far away and this can negatively impact the environment

- Learning that vegetables and fruit grow in certain seasons

- Learning that each fruit and vegetable gives us nutritional benefits

- Learning to use, store and clean a knife safely

- Understanding the impact of the cost and importance of budgeting while planning ingredients for biscuits

- Understanding the environmental impact on future product and cost of production

- Understanding where food comes from - learning that beef is from cattle and how beef is reared and processed

- Understanding what constitutes a balanced diet

- Learning to adapt a recipe to make it healthier

- Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option

- Learning how to research a recipe by ingredient

- Recording the relevant ingredients and equipment needed for a recipe

- Understanding the combinations of food that will complement one another

- Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient

Design

Make

Evaluation

Technical knowledge

Mechanisms/ Mechanical systems

- Learning that levers and sliders are mechanisms and can make things move

- Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make

- Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement

- Identifying what mechanism makes a toy or vehicle roll forwards

- Learning that for a wheel to move it must be attached to an axle

- Learning that mechanisms are a collection of moving parts that work together in a machine

- Learning that there is an input and output in a mechanism

- Identifying mechanisms in everyday objects

- Learning that a lever is something that turns on a pivot

- Learning that a linkage is a system of levers that are connected by pivots

- Exploring wheel mechanisms

- Learning how axels help wheels to move a vehicle

- Understanding how pneumatic systems work

- Learning that mechanisms are a system of parts that work together to create motion

- Understanding that pneumatic systems can be used as part of a mechanism

- Learning that pneumatic systems force air over a distance to create movement

- Learning that products change and evolve overtime

- Learning that all moving things have kinetic energy

- Understanding that kinetic energy is the energy that something (object person) has by being in motion

- Knowing that an input is the motion used to start a mechanism

- Knowing that output is the motion that happens as a result of starting the input

- Knowing that mechanisms control movement

- Describing mechanisms that can be used to change one kind of motion into another

- Using a bench hook to saw safely and effectively

- Exploring cams, learning that different shaped cams produce different follower movements

- Exploring types of motions and direction of a motion

Design

Make

Evaluation

Technical knowledge

Structures

- Describing the purpose of structures, including windmills

- Learning how to turn 2D nets into 3D structures

- Learning that the shape of materials can be changed to improve the strength and stiffness of structures

- Understanding that cylinders are a strong type of structure that are often used for windmills and lighthouses

- Understanding that windmill turbines use wind to turn and make the machines inside work

- Understanding that axles are used in structures and mechanisms to make parts turn in a circle

- Developing awareness of different structures for different purposes

- Identifying natural and man-made structures

- Identifying when a structure is more or less stable than another

- Knowing that shapes and structures with wide, flat bases or legs are the most stable

- Understanding that the shape of a structure affects its strength

- Using the vocabulary: strength, stiffness and stability

- Knowing that materials can be manipulated to improve strength and stiffness

- Building a strong and stiff structure by folding paper

- Identifying features of a castle

- Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension

- Extending the knowledge of wide and flat based objects are more stable

- Understanding the terminology of strut, tie, span, beam

- Understanding the difference between frame and shell structure

- Learning what pavilions are and their purpose

- Building on prior knowledge of net structures and broadening knowledge of frame structures

- Learning that architects consider light, shadow and patterns when designing

- Implementing frame and shell structure knowledge

- Considering effective and ineffective designs

- Exploring how to create a strong beam Identifying arch and beam bridges and understanding the terms: compression and tension

- Identifying stronger and weaker structures

- Finding different ways to reinforce structures

- Understanding how triangles can be used to reinforce bridges

- Articulating the difference between beam, arch, truss and suspension bridges

- Knowing that structures can be strengthened by manipulating materials and shapes

- Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans)

- Understanding man made and natural structures

Design

Make

Evaluation

Technical knowledge

Textiles

- Learning different ways in which to join fabrics together: pinning, stapling, gluing

- Joining items using fabric glue or stitching
Identifying benefits of these techniques

- Threading a needle

- Sewing running stitch, with evenly spaced, neat, even stitches to join fabric

- Neatly pinning and cutting fabric using a template

- Threading needles with greater independence

- Tying knots with greater independence

- Sewing cross stitch and appliqué

- Understanding the need to count the thread on a piece of evenweave fabric in each direction to create uniform size and appearance

- Understanding that fabrics can be layered for affect

- Understanding that there are different types of fastenings and what they are

- Articulating the benefits and disadvantages of different fastening types

- Learning to sew blanket stitch to join fabric

- Applying blanket stitch so the space between the stitches are even and regular

- Threading needles independently

- Learning different decorative stitches

- Application and outcome of the individual technique

- Sewing accurately with even regularity of stitches

Design

Make

Evaluation

N/A

N/A

- Understanding what static electricity is and how it moves objects through attraction or repulsion

- Generating static electricity independently

- Using static electricity to make objects move in a desired way

- Learning how electrical items work
- Identifying electrical products

- Learning what electrical conductors and insulators are

- Understanding that a battery contains stored electricity and can be used to power products

- Identifying the features of a torch

- Understanding how a torch works

- Articulating the positives and negatives about different torches

- Learning the key components used to create a functioning circuit

- Learning that copper is a conductor and can be used as part of a circuit

- Understanding that breaks in a circuit will stop it from working

- Explaining how a series circuit will work in mycard

- Identifying the negative and positive leg of an LED

- Drawing a series circuit diagram and symbols

- Learning that batteries contain acid, which can be dangerous if they leak

- Identifying and naming the circuit components in a steady hand game

Technical knowledge

Electrical systems
(KS2 *only*)

Design

Make

Evaluation

N/A

N/A

- Identifying key product developments that occurred as a result of the digital revolution

- Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm

- Understanding what a loop is in programming

- Explaining the basic functionality of my eCharm program

- Understanding what is meant by 'point of sale display'

- Writing design criteria for a programmed timer (Micro:bit)

- Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press

- Testing my program for bugs (errors in the code)

- Finding and fixing the bugs (debug) in my code

- Describing key developments in thermometer history

- Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range

- Explaining key functions in my program (audible alert, visuals)

- Explaining how my product would be useful for an animal carer including programmed features

- Programming an N,E, S,W cardinal compass

- Explaining the key functions in my program, including any additions

- Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool

- Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch

- Demonstrating a functional program as part of a product concept

Technical knowledge

Digital world
(KS2 *only*)

