Barrow CEVC Primary School

Inspire, Create, Discover, Together

DESIGN & TECHNOLOGY INTENT

How do we know that our curriculum is having the desired impact?

Teachers	Children	Children's work
• Become more knowledgeable • Higher levels of confidence in delivering all aspects of the curriculum • Detailed understanding of how much children understand and can apply the taught content • Teach consistently well; applying pedagogical practices in all lessons • Plan learning sequences using progression of skills and knowledge • Understand how to identify any gaps in knowledge and skills and be able to address these • Gain advice and support from subject leads • Making learning across the curriculum accessible to all learners • High expectations and outcomes for all pupils across all subjects	• Can talk about what they have learned, using the correct terminology • Are enthused and interested in a wide range of curriculum areas • Can talk about specific characteristics of subjects • Can describe the 'why' behind their work • Demonstrate good learning behaviours in all lessons • Are able to explain how their learning within a subject builds on previous learning • Are able to make thoughtful links between subjects • Can all access, enjoy and make progress across the curriculum – regardless of their starting points or additional needs.	• Demonstrates that our children take pride in the work they produce • Children show the same effort and quality of work in all subjects • Shows their increasing understanding of key concepts • Shows a coherent teaching sequence within each unit of work • Demonstrates our curriculum's emphasis on subject specific terminology and vocabulary. • Children can enthusiastically talk about their work and what they have enjoyed and excelled in • Shows a variety of outcomes and within each of work across all subjects ie. Written work, photographs of practical work etc.

Visitors and Governors	• Give positive feedback about pupil engagement and behaviour in lessons and in pupil perception sessions • Comment on the high quality work they see • Recognise the knowledge and expertise of subject leaders in understanding the strengths and areas for development in their subjects	Parents	• Give positive feedback about their child's attitude to school and their learning • Share examples of when their child has enjoyed their learning • Engagement of parents at parents evenings, open book sessions and conversations for pupils with SEND

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INTENT

Design and Technology- Intent

At Barrow Primary School, we believe that Design and technology should be an inspiring, rigorous and practical subject. 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.

The children at Barrow are taught to acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world.

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

Aims of the Design and Technology Curriculum

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

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Design and Technology- Intent

The CUSP Design and Technology curriculum is organised into blocks with each block covering a particular set of

disciplines, including food and nutrition, mechanisms, structures, systems, electrical systems, understanding materials and textiles. Vertical progression in each discipline has been deliberately woven into the fabric of the curriculum so that pupils revisit key disciplines throughout their Primary journey at increasing degrees of challenge and complexity.

In addition to the core knowledge required to be successful within each discipline, the curriculum outlines key aspects of development in the Working as a Designer section. Each module will focus on promoting different aspects of these competencies. This will support teachers in understanding pupils' progress as designers more broadly, as well as how successfully they are acquiring the taught knowledge and skills.

Working as a Designer			
Design	**Make**	**Evaluate**	**Apply**
The art or process of deciding how something will look or work.	Create something by combining materials or putting parts together.	Form an opinion of the value or quality of something after careful thought.	Use something or make something work in a particular situation.

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Early Years

During the Early Years Foundation Stage, the essential building blocks of children's design and technology capability are established. There are many opportunities for carrying out D&T-related activities in all areas of learning in the EYFS.

By the end of the EYFS, most children should be able to:

- Construct with a purpose in mind, using a variety of resources
- Use simple tools and techniques competently and appropriately
- Build and construct with a wide range of objects, selecting appropriate resources and adapting their work when necessary
- Select the tools and techniques they need to shape, assemble and join materials they are using

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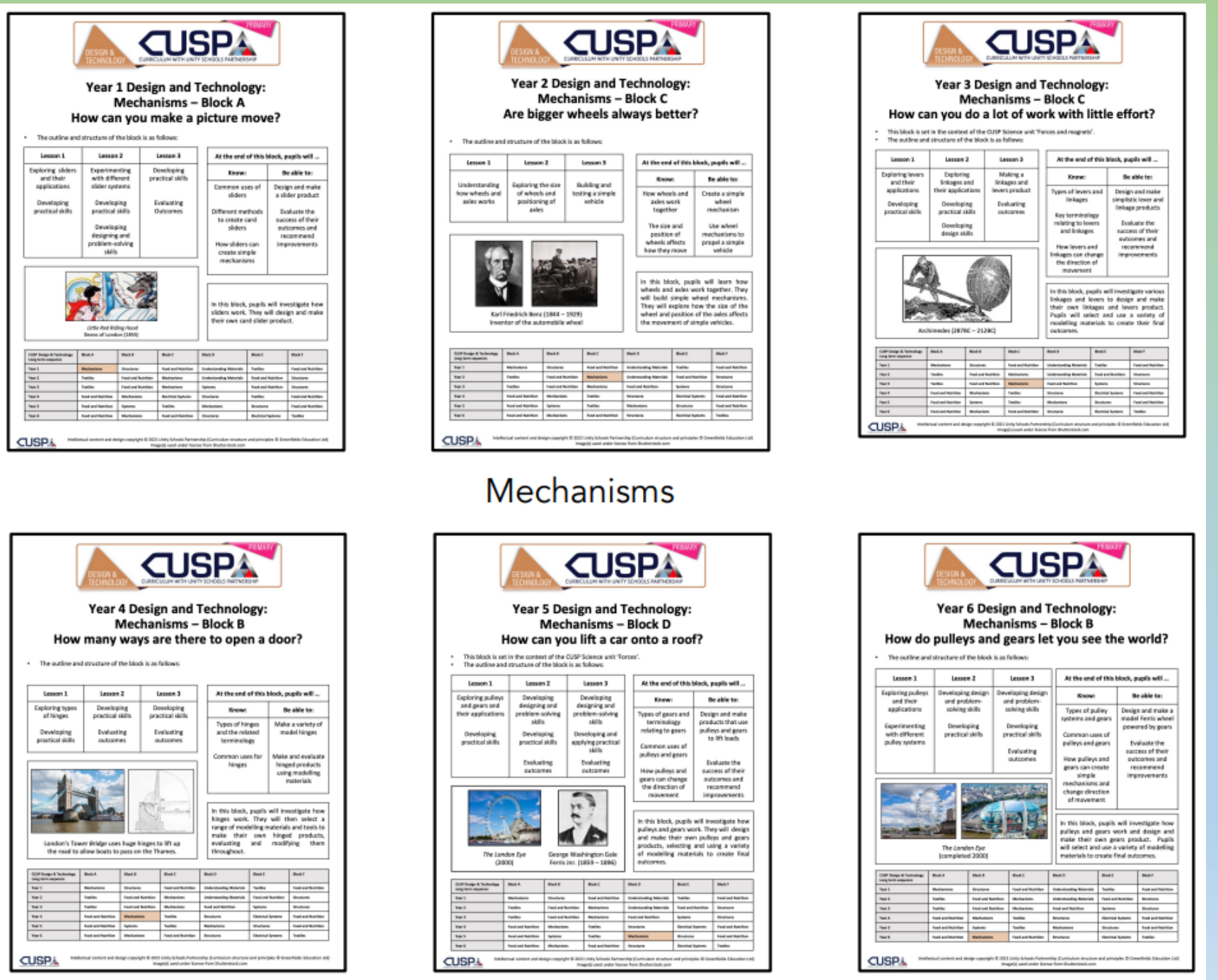
Coverage Overview

Group	1	2	1	2	1	
EYFS	Build models small & large scale using construction equipment (indoor & outdoor)	Different techniques for joining materials, such as how to use adhesive tape and different sorts of glue Make pumpkin soup	Making puppets of story characters Use various construction materials – designing and making a house for the three pigs Make porridge	Junk modelling vehicles, buildings & landmarks	Design and build bug hotels	Making models from recycled materials – link to keeping our sea clean Designing and making a boat Designing and making kites
Year 1	**Core discipline:** Mechanisms **Key concept:** Sliders & levers	**Core discipline:** Structures **Key concept:** Freestanding structures	**Core discipline:** Food & nutrition **Key concept:**	**Core discipline:** Understanding materials **Key concept:** Selecting materials	**Core discipline:** Textiles **Key concept:** Joining techniques	**Core discipline:** Food & nutrition **Key concept:**
Year 2	**Core discipline:** Textiles **Key concept:** Exploring shape using a template	**Core discipline:** Food & nutrition **Key concept:** Keeping healthy	**Core discipline:** Mechanisms **Key concept:** Axles and wheels	**Core discipline:** Understanding materials **Key concept:** Manipulating materials	**Core discipline:** Food & nutrition **Key concept:**	**Core discipline:** Structures **Key concept:** Developing strength in structures
Year 3	**Core discipline:** Textiles **Key concept:** Stiffening & strengthening fabric	**Core discipline:** Food & nutrition **Key concept:** balanced diet	**Core discipline:** Mechanisms **Key concept:** Levers & linkages	**Core discipline:** Food & nutrition **Key concept:**	**Core discipline:** Systems **Key concept:** How are things powered?	**Core discipline:** Structures **Key concept:** Spanning gaps
Year 4	**Core discipline:** Food & nutrition **Key concept:**	**Core discipline:** Mechanisms **Key concept:** Hinges	**Core discipline:** Textiles **Key concept:** Fixings & fastenings	**Core discipline:** Structures **Key concept:** Designing structures using a frame to make them stronger and sturdier	**Core discipline:** Electrical Systems **Key concept:** Switches and circuits	**Core discipline:** Food & nutrition **Key concept:**
Year 5	**Core discipline:** Electrical Systems **Key concept:** Greener power	**Core discipline:** Food & nutrition **Key concept:**	**Core discipline:** Textiles **Key concept:** Durability of fabric	**Core discipline:** Mechanisms **Key concept:** Pulleys & gears	**Core discipline:** Structures **Key concept:** Developing structures that are fit for purpose & design	**Core discipline:** Food & nutrition **Key concept:**
Year 6	**Core discipline:** Food & nutrition **Key concept:**	**Core discipline:** Structures **Key concept:** Designing structures revisited – combining skills and knowledge	**Core discipline:** Food & nutrition **Key concept:**	**Core discipline:** Textiles **Key concept:** Sustainable materials	**Core discipline:** Electrical Systems **Key concept:** Complex switches & circuits	**Core discipline:** Mechanisms **Key concept:** Pulleys & gears

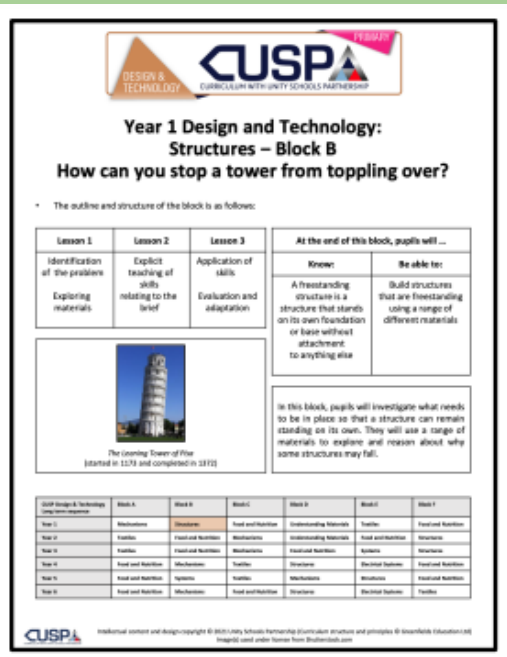
– D&T Curriculum Overview 2023-2024

Content Progression



Content Progression

Structures



Year 1 Design and Technology:
Structures – Block B
How can you stop a tower from toppling over?

- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Identification of the problem Exploring materials	Explicit teaching of skills relating to the brief	Application of skills Evaluation and adaptation

At the end of this block, pupils will ...	
Know:	Be able to:
A freestanding structure is a structure that stands on its own foundation or base without attachment to anything else	Build structures that are freestanding using a range of different materials

The Leaning Tower of Pisa
(started in 1173 and completed in 1372)

In this block, pupils will investigate what needs to be in place so that a structure can remain standing on its own. They will use a range of materials to explore and reason about why some structures may fall.

Year 2 Design and Technology:
Structures – Block F
How strong is a piece of paper?

- The outline and structure of the block is as follows:

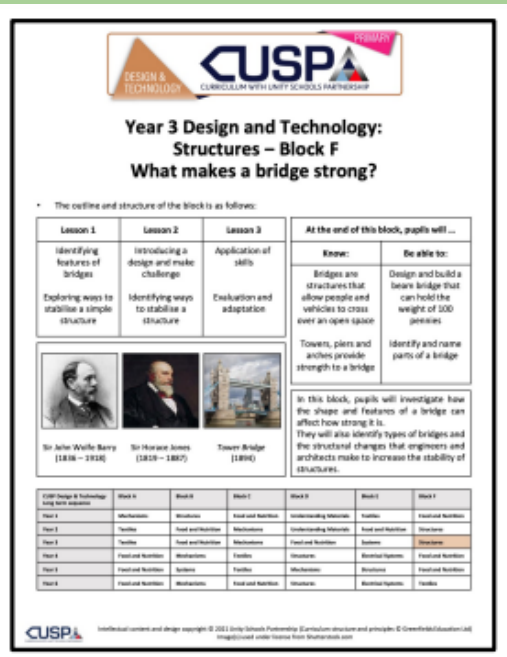
Lesson 1	Lesson 2	Lesson 3
Explicit teaching of skills Exploring materials	Explicit teaching of skills Exploring materials	Application of skills Evaluation and adaptation

At the end of this block, pupils will ...	
Know:	Be able to:
Paper becomes stronger when it is folded A load is the amount of weight a structure must carry	Fold paper to increase strength and stability Test and record how much weight paper can hold

Dame Zaha Mohammad Hadid
(1950 – 2016)

The Riverside Museum, Glasgow
(2011)

In this unit, pupils will discover that they can increase the strength and stability of paper by folding. They will test and record their paper structures and design a paper tower that is at least 90cm tall and can bear a 1kg weight.



Year 3 Design and Technology:
Structures – Block F
What makes a bridge strong?

- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Identifying features of bridges Exploring ways to stabilise a simple structure	Introducing a design and make challenge Identifying ways to stabilise a structure	Application of skills Evaluation and adaptation

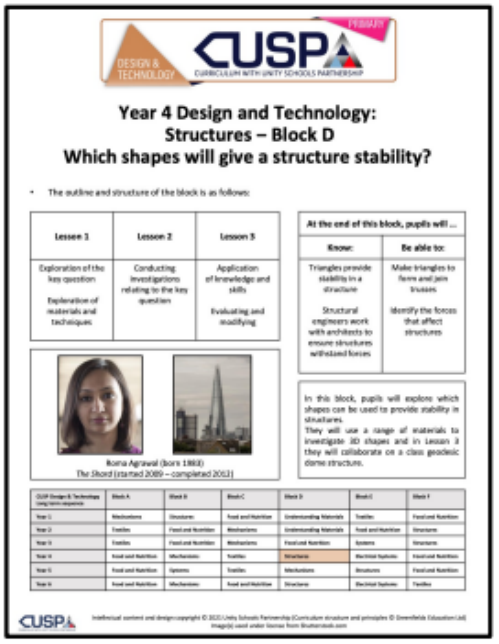
At the end of this block, pupils will ...	
Know:	Be able to:
Bridges are structures that allow people and vehicles to cross over an open space Towers, piers and arches provide strength to a bridge	Design and build a beam bridge that can hold the weight of 100 pennies Identify and name parts of a bridge

Sir John Wolfe Barry
(1836 – 1918)

Sir Horace Jones
(1819 – 1887)

Tower Bridge
(1894)

In this block, pupils will investigate how the shape and features of a bridge can affect how strong it is.
They will also identify types of bridges and the structural changes that engineers and architects make to increase the stability of structures.



Year 4 Design and Technology:
Structures – Block D
Which shapes will give a structure stability?

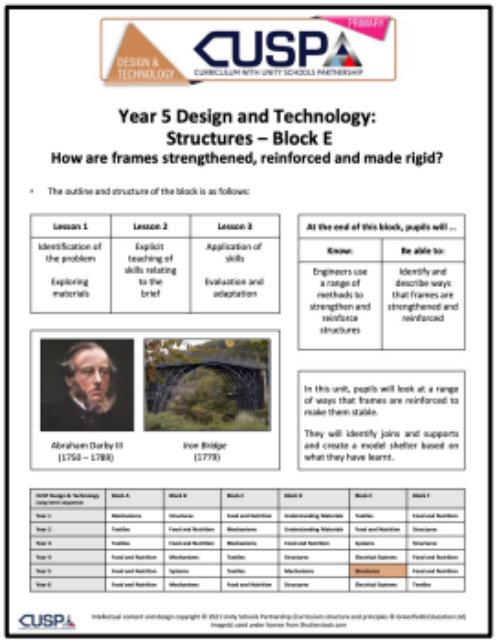
- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Exploration of the key question Exploration of materials and techniques	Conducting investigations relating to the key question	Application of knowledge and skills Evaluating and modifying

At the end of this block, pupils will ...	
Know:	Be able to:
Triangles provide stability in a structure Structural engineers work with architects to ensure structures withstand forces	Make triangles to form and join trusses Identify the forces that affect structures

Roma Agrawal (born 1868)
The Shard (started 2009 – completed 2013)

In this block, pupils will explore which shapes can be used to provide stability in structures.
They will use a range of materials to investigate 3D shapes and in Lesson 3 they will collaborate on a class geodesic dome structure.



Year 5 Design and Technology:
Structures – Block E
How are frames strengthened, reinforced and made rigid?

- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Identification of the problem Exploring materials	Explicit teaching of skills relating to the brief	Application of skills Evaluation and adaptation

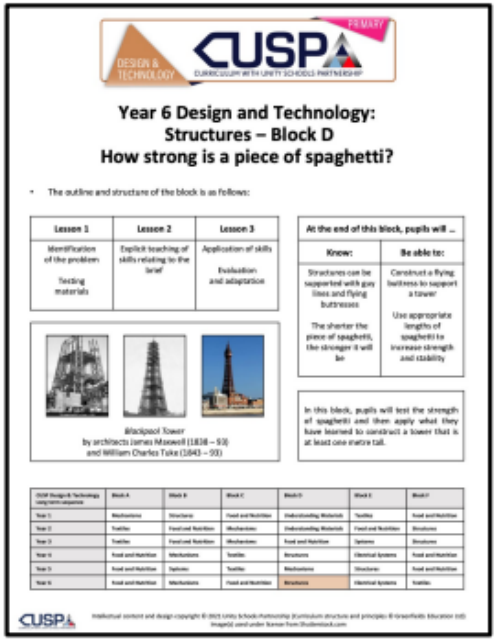
At the end of this block, pupils will ...	
Know:	Be able to:
Engineers use a range of methods to strengthen and reinforce structures	Identify and describe ways that frames are strengthened and reinforced

Abraham Darby III
(1750 – 1789)

Iron Bridge
(1779)

In this unit, pupils will look at a range of ways that frames are reinforced to make them stable.

They will identify joins and supports and create a model shelter based on what they have learnt.



Year 6 Design and Technology:
Structures – Block D
How strong is a piece of spaghetti?

- The outline and structure of the block is as follows:

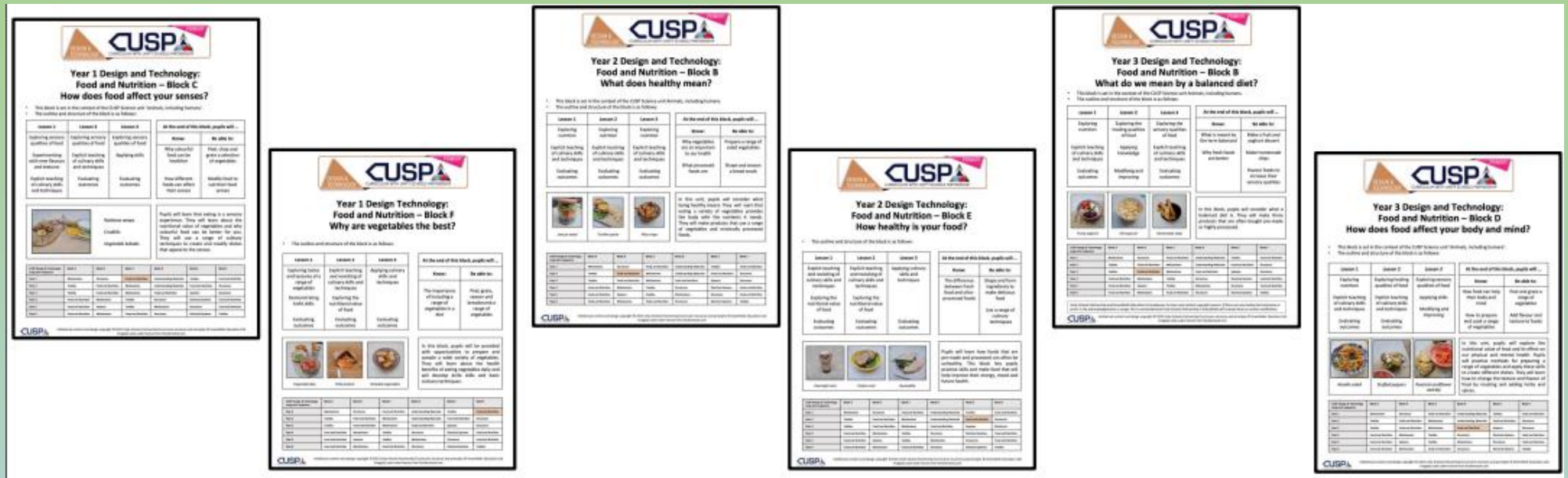
Lesson 1	Lesson 2	Lesson 3
Identification of the problem Testing materials	Explicit teaching of skills relating to the brief	Application of skills Evaluation and adaptation

At the end of this block, pupils will ...	
Know:	Be able to:
Structures can be supported with guy lines and flying buttresses The shorter the piece of spaghetti, the stronger it will be	Construct a flying buttress to support a tower Use appropriate lengths of spaghetti to increase strength and stability

Blackpool Tower
by architects James Maxwell (1838 – 93)
and William Charles Fuke (1843 – 93)

In this block, pupils will test the strength of spaghetti and then apply what they have learned to construct a tower that is at least one metre tall.

Content Progression



Food and Nutrition

Content Progression

Year 1 Design and Technology: Understanding Materials – Block D

Can you build with bread?

- This block is set in the context of the CUSP Science unit 'Materials'.
- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Exploring materials	Explicit teaching of skills relating to the brief	Application of skills Evaluation and adaptation

At the end of this block, pupils will …	
Know:	**Be able to:**
Building materials have different properties which enable them to be used for different purposes	Identify, sort and select materials that can be used in construction Combine materials

Frank Lloyd Wright
(1867 – 1959)

Fallingwater (1935)
Frank Lloyd Wright

In this block, pupils will be able to identify a range of construction materials. They will investigate how materials can be changed by adding heat or water. They will use a combination of materials to create a small model house.

CUSP Design & Technology Long term sequence	Block A	Block B	Block C	Block D	Block E	Block F
Year 1	Mechanisms	Structures	Food and Nutrition	Understanding Materials	Textiles	Food and Nutrition
Year 2	Textiles	Food and Nutrition	Mechanisms	Understanding Materials	Food and Nutrition	Structures
Year 3	Textiles	Food and Nutrition	Mechanisms	Food and Nutrition	Systems	Structures
Year 4	Food and Nutrition	Mechanisms	Textiles	Structures	Electrical Systems	Food and Nutrition
Year 5	Food and Nutrition	Systems	Textiles	Mechanisms	Structures	Food and Nutrition
Year 6	Food and Nutrition	Mechanisms	Food and Nutrition	Structures	Electrical Systems	Textiles

Understanding materials

Year 2 Design and Technology: Understanding Materials – Block D

How can you waterproof a hat?

- This block is set in the context of the CUSP unit 'Uses of everyday materials'.
- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Exploration and testing of materials Reference to other designers	Exploration of materials and properties	Application of knowledge and skills to fulfil a brief Evaluation

At the end of this block, pupils will …	
Know:	**Be able to:**
Materials can be modified to become waterproof Origami comes from the Japanese words: ori – folding and kami – paper	Make paper waterproof Transform flat paper by folding and creasing to form a hat

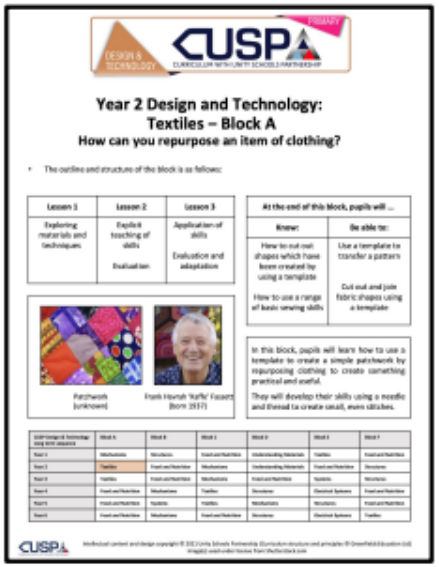
Arthur Wellesley – First Duke of Wellington
(1769 – 1852)

In this block, pupils will investigate materials to discover whether they absorb or resist water. Pupils will also use wax or oil crayons to create a waterproof coating for a paper hat which they have made by creasing and folding a sheet of paper.

CUSP Design & Technology Long term sequence	Block A	Block B	Block C	Block D	Block E	Block F
Year 1	Mechanisms	Structures	Food and Nutrition	Understanding Materials	Textiles	Food and Nutrition
Year 2	Textiles	Food and Nutrition	Mechanisms	Understanding Materials	Food and Nutrition	Structures
Year 3	Textiles	Food and Nutrition	Mechanisms	Food and Nutrition	Systems	Structures
Year 4	Food and Nutrition	Mechanisms	Textiles	Structures	Electrical Systems	Food and Nutrition
Year 5	Food and Nutrition	Systems	Textiles	Mechanisms	Structures	Food and Nutrition
Year 6	Food and Nutrition	Mechanisms	Food and Nutrition	Structures	Electrical Systems	Textiles

Content Progression

Year 1 Design and Technology:
Textiles – Block E
How can two squares of fabric keep you warm?

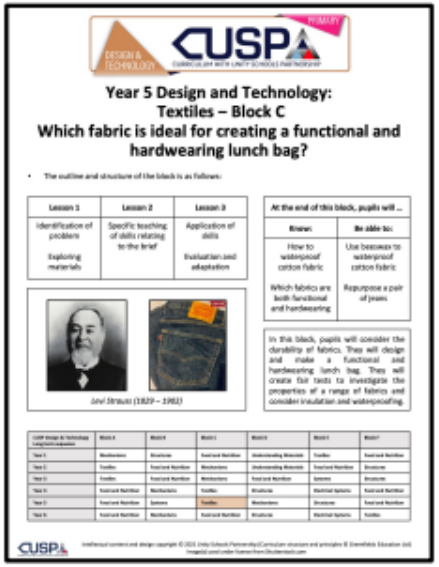


Year 2 Design and Technology:
Textiles – Block A
How can you repurpose an item of clothing?

Year 3 Design and Technology:
Textiles – Block A
How can you make a box out of cloth?

Textiles

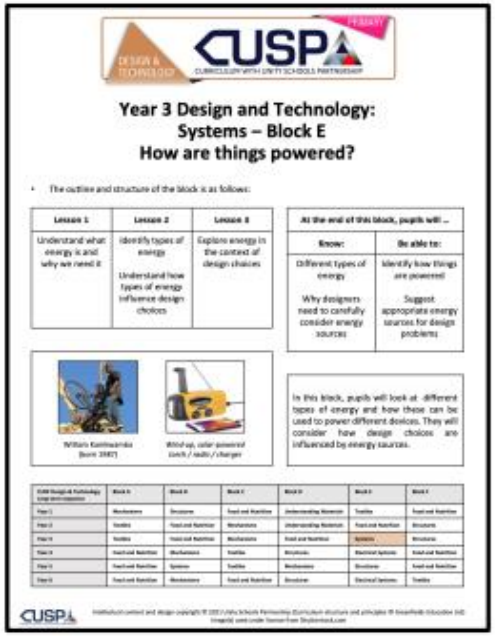
Year 4 Design and Technology:
Textiles – Block C
How do you keep a tea towel from slipping off a hook?



Year 5 Design and Technology:
Textiles – Block C
Which fabric is ideal for creating a functional and hardwearing lunch bag?

Year 6 Design and Technology:
Textiles – Block F
How can we reduce, recycle and repurpose?

Content Progression



Year 3 Design and Technology:
Systems – Block E
How are things powered?

- The outline and structure of the block is as follows:

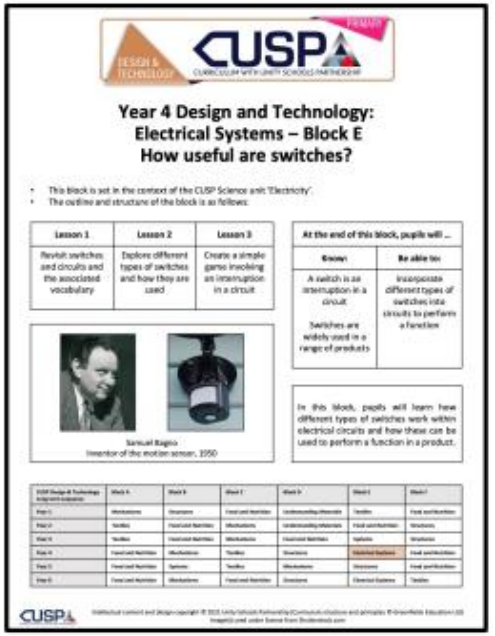
Lesson 1	Lesson 2	Lesson 3
Understand what energy is and why we need it	Identify types of energy Understand how types of energy influence design choices	Explore energy in the context of design choices

At the end of this block, pupils will ...	
Know:	Be able to:
Different types of energy Why designers need to carefully consider energy sources	Identify how things are powered Suggest appropriate energy sources for design problems

William Kamkwamba
(born 1987)

Wind-up, solar-powered torch / radio / charger

In this block, pupils will look at different types of energy and how these can be used to power different devices. They will consider how design choices are influenced by energy sources.



Year 4 Design and Technology:
Electrical Systems – Block E
How useful are switches?

- This block is set in the context of the CUSP Science unit 'Electricity'.
- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Revisit switches and circuits and the associated vocabulary	Explore different types of switches and how they are used	Create a simple game involving an interruption in a circuit

At the end of this block, pupils will ...	
Know:	Be able to:
A switch is an interruption in a circuit Switches are widely used in a range of products	Incorporate different types of switches into circuits to perform a function

Samuel Ragno
Inventor of the motion sensor, 1950

In this block, pupils will learn how different types of switches work within electrical circuits and how these can be used to perform a function in a product.

Systems

Year 5 Design and Technology:
Systems – Block B
How can we keep ourselves safe on the road?

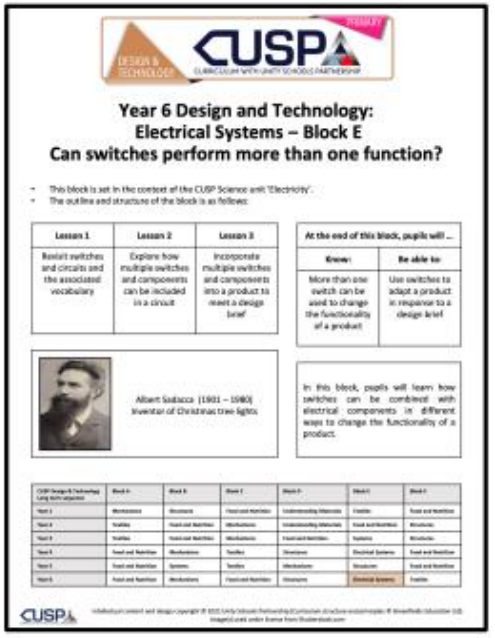
- This block combines pupils' knowledge from Science, Computing and DT knowledge acquired so far in KS2.
- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Understanding and selecting materials	Using fixings and fastenings	Using knowledge of programming to control a product

At the end of this block, pupils will ...	
Know:	Be able to:
Technology can be used to program and control a product	Combine elements of their design knowledge to fulfil a brief

Emily Brooke
Inventor of the *Laserlight* bike light projector

In this block, pupils will draw on the knowledge they have learnt so far to design and make a road safety belt. Pupils will write a simple program for a micro:bit and evaluate their outcome against the design brief.



Year 6 Design and Technology:
Electrical Systems – Block E
Can switches perform more than one function?

- This block is set in the context of the CUSP Science unit 'Electricity'.
- The outline and structure of the block is as follows:

Lesson 1	Lesson 2	Lesson 3
Revisit switches and circuits and the associated vocabulary	Explore how multiple switches and components can be included in a circuit	Incorporate multiple switches and components into a product to meet a design brief

At the end of this block, pupils will ...	
Know:	Be able to:
More than one switch can be used to change the functionality of a product	Use switches to adapt a product in response to a design brief

Albert Sobacco (1901 – 1980)
Inventor of Christmas tree lights

In this block, pupils will learn how switches can be combined with electrical components in different ways to change the functionality of a product.

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Early Years to Key Stage 1

Reception Long Term Plan 2023-2024

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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
General Themes	Marvellous me and my friends & family	Fun, Food and Celebrations!	We love stories!	Are we there yet?	Minibeast madness!	Under the sea!
Expressive Arts and Design *Painting, 3D modelling, messy play, collage, cutting, drama, role play, threading, moving to music, clay sculptures, following music patterns with instruments, singing songs linked to topics, making instruments, percussion.* *Work will be displayed in the classroom* *lots of links to Fine Motor Skills. Children to explain their work to others. Children will have opportunities to learn and perform songs, nursery rhymes and poetry linked to their work / interests and passions.*	The development of children's artistic and cultural awareness supports **their imagination and creativity**. It is important that children have regular opportunities to **engage with the arts**, enabling them to explore and play with a wide range of **media and materials**. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, **self-expression, vocabulary and ability to communicate through the arts**. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe. Give children an insight into new musical worlds. Invite musicians in to play music to children and talk about it. Encourage children to listen attentively to music. Discuss changes and patterns as a piece of music develops.					
	Exploring Sound (Kapow) Exploring how to use our voice and bodies to make sounds, experimenting with tempo and dynamic when playing instruments and identifying sounds in the environment Join in with familiar songs and rhymes. Tapping out of simple rhythms. Performing - introducing the outside stage Handling and Naming percussion instruments Naming colours Begin to mix colours – introducing Painting Bench using poster paint Draw a self-portrait (enclosing lines): draw definite features Paul Klee: produce a piece of artwork using an artists style as a stimulus - shape people Talk about a famous artist. Transient art – faces – children use ipad to capture their creations. Introduce Creation Station – using glue sticks Build models small and large scale using construction equipment. (indoor and outdoor) Making play doh Domestic Role play Dolls house & other small World resources	Celebration Music (Kapow) Learning about the music from a range of cultural and religious celebrations, including Diwali, Hanukkah, Kwanzaa and Christmas Using chalk and pastels – firework creations . Transient Art – firework and poppies Christmas decorations Christmas cards Making a stick man using natural objects Mod-rock Christmas Puddings Draw a self-portrait (enclosing lines): draw definite features Junk modelling, take picture of children's creations and record them explaining what they did. Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue Making bread Performing Christmas Play Role Play The nativity Story	Musical Stories (Kapow) Music and instruments can be used to convey moods or represent characters. Explore how colour can be changed – introduce water colours Making lanterns, Chinese writing, puppet making. Recognise, create and describe pattern Draw a self-portrait (enclosing lines): draw definite features Collage -Henri Rousseau: produce a piece of artwork using an artists style as a stimulus - Tiger Clay Gingerbread people Making puppets of story characters Use various construction materials: designing and making a house for the three pigs. Use story maps, props, puppets & story bags to encourage children to retell, invent and adapt stories	Transport (Kapow) Children explore how they can use their voice and bodies to make sounds and experiment with tempo and dynamic when playing instruments. Make different textures – puffy paint globes Printing - using cars, wheels make patterns using different colours Mother's Day crafts Creating patterns - Easter eggs Draw a self-portrait (enclosing lines): draw definite features Create collaboratively: Easter Gardens Junk modelling vehicles and buildings, & landmarks.	Music and Movement (Kapow) Creating simple actions to songs, learning how to move to a beat and expressing feelings and emotions through movement to music Water colour painting minibeasts. Wool winding minibeasts Creating collaboratively: caterpillars and butterflies Printing patterns - butterflies Using clay to make worms Weaving spider webs Draw a self-portrait (enclosing lines): draw definite features	Big Band (Kapow) Learning about the four different groups of musical instruments, following a beat using an untuned instrument and performing a practised song to a small audience Using chalks & pastels to create whale pictures. Water colour Rock Pool art Draw a self-portrait (enclosing lines): draw definite features Making models from recycled materials: link to keeping our sea clean Designing and making a boat. Designing and making kites

INEINT

Barrow CEVC Primary School
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Early Years to Key Stage 1

Design and Technology – EYFS – KS1

	ELG 16 Creating with Materials	How this is achieved in EYFS	Art and Design KS1
	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • Share their creations, explaining the process they have used.	Children can self-select from a range of tools and materials in the continuous provision. Children learn by experimenting with tools such as scissors, staplers and hole punches. They make use of fixing and joining materials such as sellotape, masking tape, string, pipe cleaners and glue. Through questioning children are encouraged to talk about what they like about their work and other children's designs and how they would improve it. **Activity Examples:** • Designing and making a kite on a windy day, choosing the best materials. • Building a minibeast hotel outside. • Creating vehicles outside with large bricks. • Construction of houses, bridges and boats in the outdoor Builders Yard. • Using junk model boxes to create vehicles inspired by Naughty Bus story. • Using tools to prepare snack – E.g. cutting bananas. • Selecting the best resources for den building outside. • Cookery - Observing the effects of heat when melting chocolate when making Easter nests.	**Design** Design purposeful, functional, appealing products for themselves and other users based on design criteria. Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. **Make** Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]. Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. **Evaluate** Explore and evaluate a range of existing products. Evaluate their ideas and products against design criteria. **Technical knowledge** build structures, exploring how they can be made stronger, stiffer and more stable. Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.