THE BOWLAND FEDERATION OF SCHOOLS

DESIGN TECHNOLOGY CURRICULUM NARRATIVE

THE NATIONAL CURRICULUM

Purpose of study

Design and technology is 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. They 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

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.

When designing and making, pupils in Key Stage 2 should be taught to:

Design

♣ use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups

♣ generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

♣ select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately

♣ select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

♣ investigate and analyse a range of existing products

♣ evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

♣ understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

♣ apply their understanding of how to strengthen, stiffen and reinforce more complex structures

♣ understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages

♣ understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors

♣ apply their understanding of computing to programme, monitor and control their products.

Cooking and Nutrition

♣understand and apply the principles of a healthy and varied diet

♣ prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

♣ understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

Working as a Designer			
Design	**Make**	**Evaluate**	**Apply**
The art or process of dividing 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.

LOWER KEYSTAGE 2 TOPICS			
TITLE	**TEXTILES**	**FOOD AND NUTRITION**	**MECHANISMS**
CONCEPT	Explore ways to stiffen and strengthen fabric	Learn what a balanced diet is.	Investigate levers and linkages
	Learn the different functions for fastenings. Sew a button on fabric.	Explore the nutritional benefits of homemade food.	Investigate how hinges work. Make and evaluate hinged products.
BIG IDEAS/KEY QUESTIONS/LEARNING FOCUS	How can you make a box out of cloth? **Designer - Gisela Stromeyer** A New York-based artist and architect who also trained as a dancer and teacher. Her installations start life as sketches which are then developed into finished plans and scale models. She then cuts and sews the fabric herself to create fluid forms. Know fabric can be stiffened Know stiffened fabric can hold a form Be able to select and apply solutions to stiffen fabric Be able to make a box using stiffened fabric	What do we mean by a balanced diet? **Designer – Nadiya Hussain (born 1984)** A British chef, television host and the winner of the Great British Bake Off 2015. Know what is meant by the term balanced Know why fresh foods are better Be able to make a fruit and yoghurt dessert Be able to make homemade chips Be able to flavour foods to increase their sensory qualities – popcorn	How can you do a lot of work with a little effort? **Designer – Archimedes** The Greek mathematician Archimedes lived for 75 years, between 287BC – 212BC. He is considered one of the greatest mathematicians of all time and carried out extensive studies into the power of levers. Know types of levers and linkages Know key terminology related to levers and linkages Know how levers and linkages can change the direction of movement Be able to design and make simplistic lever and linkage products Be able to evaluate the success of outcomes and recommend improvements

	How do you keep a tea towel from slipping off a hook? **Designer - George de Mestral (1907 – 1990)** George de Mestral was a Swiss electrical engineer, best known for his invention of Velcro©. Fastenings have different functions A shank provides a small amount of space between the button and fabric – learn to make one. Select appropriate fastenings and attach them to fabric		What's really in your food? Processed foods have many added ingredients Make, roll and shape bread dough Make a soup		How many ways are there to open a door? **Design - London's Tower Bridge** London's Tower Bridge uses huge hinges to lift up the road to allow boats to pass on the Thames. Types of hinges and the related terminology Common uses for hinges Make a variety of model hinges Make and evaluate hinged products using modelling materials	
VOCABULARY	**High Frequency VOCABULARY** Starch PVA glue Gelatin	**Subject Specific VOCABULARY** Stiffen Interfacing Cloth	**High Frequency VOCABULARY** Seasonal Balance Preserve	**Subject Specific VOCABULARY** Stew Pressure Seasoning	**High Frequency VOCABULARY** Lever Linkage Mechanism	**Subject VOCABULARY** Force Load Effort
	Shank Burr Hook and Loop	Buckle (noun) Fastener Raw edges	Ingredients Processed Bread	Gluten Knead (verb) Ferment (verb)	Hinge Knuckle Leaf Pin Barrel	Butt hinge Concealed hinge Net
TITLE	**FOOD AND NUTRITION**		**SYSTEMS**		**STRUCTURES**	
CONCEPT	Learn how to change the flavour and texture of food by roasting and adding herbs and spices – explore the nutritional value and the effect on physical and mental health.		Look at different types of energy and how these can be used to power different devices.		Investigate how the shape and features of a bridge can affect how strong it is.	
	Learn how to make healthy food from low cost ingredients.		Learn how switches work within an electrical circuit.		Explore which shapes can be used to create stability in structures.	

<table>
<tr><td rowspan="2">BIG IDEAS/KEY QUESTIONS/LEARNING FOCUS</td><td colspan="2">How does food affect your body and mind?

Designer – Heston Blumenthal
Known for his scientific approach to cooking. He pairs unusual flavours together like egg and bacon ice-cream.

Know food can help body and mind
Know how to prepare and cook a range of vegetables – stuffed peppers
Be able to peel and grate a range of vegetables – noodle salad
Be able to add flavour and texture to foods – roasted cauliflower and dip</td><td colspan="2">How are things powered?

Designer - William Kamkwamba (born 1987) William Kamkwamba is a Malawian inventor, engineer and author. He gained fame in his country in 2001, at the age of 14, when he built a wind turbine to power multiple electrical appliances in his family's house and then his entire village in Malawi.

Know different types of energy
Know why designers need to carefully consider energy sources
Be able to identify how things are powered
Be able to suggest appropriate energy sources for design problems</td><td colspan="2">What makes a bridge strong?

Designer - Sir Horace Jones (1819 – 1887) Sir John Wolfe Barry (1836 – 1918)
Tower Bridge is a Grade I listed bascule and suspension bridge that crosses the River Thames in London. It was designed by English architect Sir Horace Jones and built between 1186 and 1894. The structure was engineered by Sir John Wolfe Barry.

Know bridges are structures that allow people and vehicles to cross over an open space
Know towers, piers and arches provide strength to a bridge
Be able to design and build a beam bridge that can hold the weight of 100 pennies
Be able to identify and name parts of a bridge</td></tr>
<tr><td colspan="2">Is cheap food always worse for you?

That cheap processed food often contains additives, salt and sugar, which makes it less healthy than unprocessed food.
Peel, grate and chop vegetables to make economical, tasty and healthy food.</td><td colspan="2">How useful are switches?

Designer - Samuel Bagno (1906 – 1967)
The first motion sensor that acted as a burglar alarm was invented in the 1950s by Samuel Bagno.

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</td><td colspan="2">Which shapes will give a structure stability?

Designer - Roma Agrawal (born 1983)
Roma Agrawal is an Indian-British-American structural engineer. She is also an author and a diversity campaigner, championing women in engineering.

Triangles provide stability in a structure
Structural engineers work with architects to ensure structures withstand forces
Make triangles to form and join trusses</td></tr>
<tr><td rowspan="2">VOCABULARY</td><td>High Frequency VOCABULARY
Nutrition
Fibre
Minerals</td><td>Subject Specific VOCABULARY
Seasoning
Claw
Bridge</td><td>High Frequency VOCABULARY
Energy
Energy source
Potential energy
Kinetic energy</td><td>Subject Specific VOCABULARY
Turbine
Source
Intermittent
Renewable</td><td>High Frequency VOCABULARY
Gap
Deck
Pier</td><td>Subject Specific VOCABULARY
Suspension
Arch
Bascule</td></tr>
<tr><td>Cheap
Fusion
Texture</td><td>Shallow-fry
Shortening
Fragrant</td><td>Switch
Circuit
Component
Current</td><td>Interruption
Unbroken
Multi-purpose
Conductor</td><td>Structural engineer
Geodesic
Gravity</td><td>Truss
Compression
Tension</td></tr>
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