DESIGH AND TECHNOLOGY

"Have no fear of perfection – you will never reach it", ***Salvador Dali***

"Design creates culture. Culture shapes values. Values determine the future", ***Robert L Peters***

At Blewbury Church of England Primary School, children receive a Design and Technology curriculum which allows them to exercise their creativity through designing and making. The children are taught to combine their designing and making skills with knowledge and understanding in order to design and make a product. Skills are taught progressively to ensure that all children are able to learn and practice in order to develop as they move through the school. Evaluation is an integral part of the design process and allows children to adapt and improve their product; this is a key skill which they need throughout their life. Design and Technology allows children to apply the knowledge and skills learned in other subjects, particularly Maths, Science and Art; children's interests are captured through theme learning, ensuring that links are made in a cross curricular way, giving children motivation and meaning for their learning.

Our whole curriculum is shaped by our school vision which aims to enable all children, regardless of background, ability, additional needs, to flourish and become the very best version of themselves that they can possibly be. We teach the National Curriculum, supported by a clear skills and knowledge progression; this ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children. All teaching of Design and Technology should follow the Design, Make and Evaluate cycle; each stage should be rooted in technical knowledge and the design process should be rooted in real life, relevant contexts to give meaning to learning.
While *making*, children should be given choice and a range of tools to choose freely from. To *evaluate*, children should be able to evaluate their own products against a design criterion; each of these steps should be rooted in technical knowledge and vocabulary. Design and Technology should be taught to a high standard, where each of the stages should be given equal weight.

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 – National Curriculum

The National Curriculum for Design and Technology aims to ensure that all children:

- ✓ 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

Early Learning Goal

Children are given opportunities to:

- ✓ 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;
- ✓ Make use of props and materials when role playing characters in narratives and stories.

Key Stage One – National Curriculum

Through a variety of creative and practical activities, children should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment]. When designing and making, pupils should be taught to:

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.

Key Stage Two – National Curriculum

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. When designing and making, pupils 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 [for example, 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 [for example, gears, pulleys, cams, levers and linkages]
- ✓ understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- ✓ apply their understanding of computing to program, monitor and control their products.

Cooking and Nutrition – National Curriculum

As part of their work with food, children should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Children should be taught to:

Key Stage One – National Curriculum

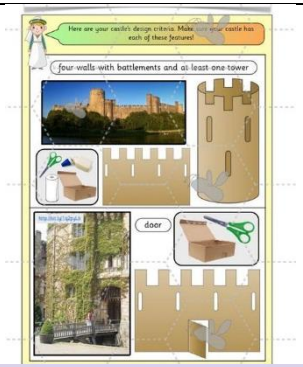
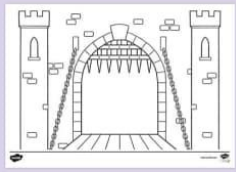
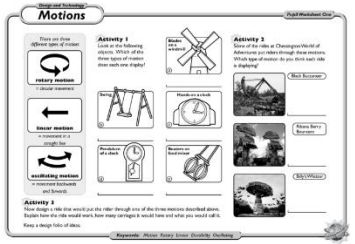
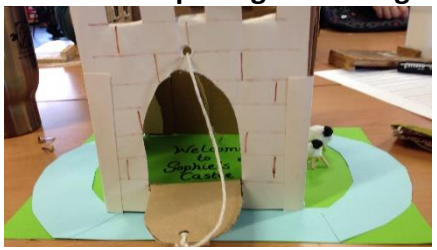
- ✓ use the basic principles of a healthy and varied diet to prepare dishes
- ✓ understand where food comes from

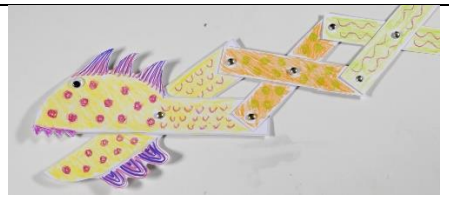
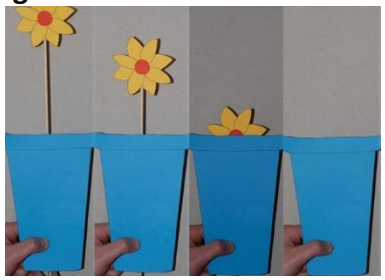
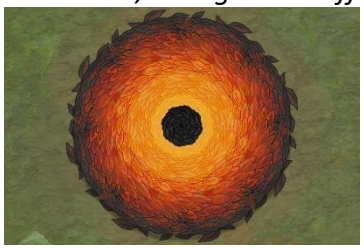
Key Stage Two – National Curriculum

- ✓ 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.

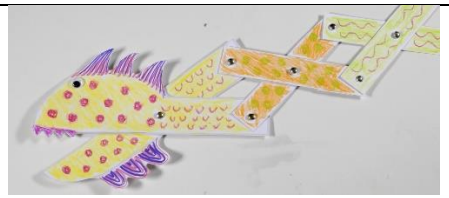
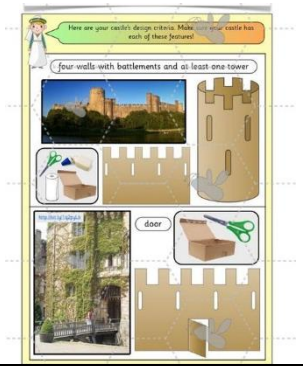
YEAR GROUPS	KNOWLEDGE	SKILLS	SUGGESTED ACTIVITIES	POSSIBLE RESOURCES	VOCABULARY
		STRUCTURES			
		STRUCTURES/MECHANISMS AND LEVERS – EYFS /YEAR 1 ***Possible Artists:*** *Georgia O'Keeffe – class artist, Andy Goldsworthy, Pablo Picasso, Gustav Klimt, Banksy,*  ***Local Enrichment:***			
EYFS/ Year 1	▪ know how to make freestanding structures stronger, stiffer and more stable	▪ can design appealing products for a particular user based on a simple design criteria	www.teaching ideas.co.uk/subjects	*Metal* *Wood* *Plastic* *Cardboard*	*Cut* *Fold* *Join* *Fix*

	▪ know and use technical vocabulary relevant to the project;	▪ can generate initial ideas and design criteria through own experiences ▪ can develop and communicate their ideas through talk and drawings and mock-ups where relevant ▪ can select and use simple utensils, tools and equipment to perform a task, eg. cutting, joining, etc ▪ can select from a range of materials according to their characteristics to create a chosen product ▪ can explore and evaluate a range of products to determine the intended user's preferences for the product ▪ can evaluate their ideas throughout and finished products against design criteria, including intended user and purpose	 https://www.kapowprimary.com/subjects/design-technology/key-stage1k/ **Constructing a windmill** Completing turbines, cutting and folding, attaching to the structure and testing strength and stability **Advent calendars**  **Building a Castle** Looking at different nets	*Paper* *Glue* *Lego* *Playmobil*	*Structure* *Wall* *Tower* *Framework* *Weak* *Strong* *Base* *Top* *Underneath* *Side* *Edge* *Surface* *Thinner* *Thicker* *Corner* *Point* *Straight* *Curved* *Circle* *Triangle* *Square* *Rectangle* *Cuboid* *Cylinder* *Evaluate* *Purpose* *Product*

			   **A castle with an opening drawbridge**  **Moving Monsters**		

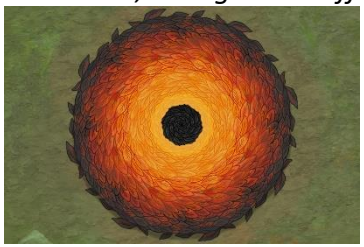
			 **Working with levers** 		
STRUCTURES/MECHANISMS AND LEVERS – YEAR 2 ***Possible Artists:*** *Andy Goldsworthy – class artist, Georgia O'Keeffe, Pablo Picasso, Gustav Klimt, Banksy,*  ***Local Enrichment:***					
Year 2	▪ know how to make freestanding structures stronger, stiffer and more stable	▪ can generate ideas based on simple design criteria and their own experiences, explain what they could make ▪ develop, model and communicate their ideas,	www.teaching ideas.co.uk/subjects 	*Metal* *Wood* *Plastic* *Cardboard* *Paper* *Glue*	*Cut* *Fold* *Join* *Fix* *Structure* *Wall*

	▪ know and use technical vocabulary relevant to the project;	through talk, mock-ups and drawings ▪ can plan by suggesting what to do next ▪ can selects tools and equipment, skills and techniques to perform practical tasks, explain their choices ▪ can select materials, components, reclaimed materials and construction kits to build and create their products ▪ can use simple finishing techniques suitable for the products they are creating ▪ can explore a range of existing products related to their design criteria ▪ can evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria	https://www.kapowprimary.com/subjects/design-technology/key-stage1k/ **Constructing a windmill** Completing turbines, cutting and folding, attaching to the structure and testing strength and stability **Advent calendars**  **Using levers for different transports**  **Moving Monsters**		*Tower* *Framework* *Weak* *Strong* *Base* *Top* *Underneath* *Side* *Edge* *Surface* *Thinner* *Thicker* *Corner* *Point* *Straight* *Curved* *Circle* *Triangle* *Square* *Rectangle* *Cuboid* *Cylinder* *Investigate* *Evaluate* *Purpose* *Product* *Function*

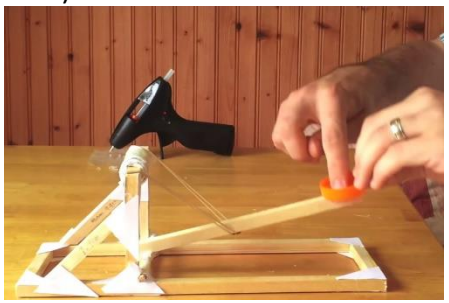
			 **Building a Castle** Looking at different nets 		

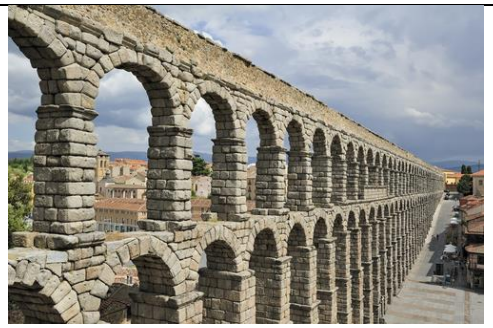
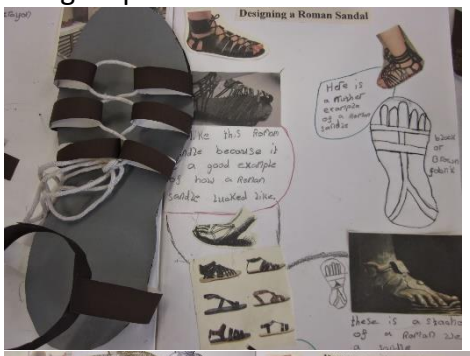
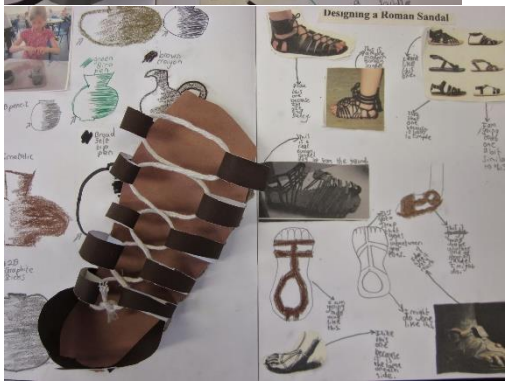
STRUCTURES – YEAR 3

Possible Artists: *Andy Goldsworthy – class artist, Georgia O'Keeffe, Pablo Picasso, Gustav Klimt, Banksy,*



Local Enrichment:

Year 3	▪ know and use technical vocabulary relevant to the project ▪ know how to develop and use knowledge of how to construct strong and stiff shell structures ▪ know how to develop and use knowledge of nets of cubes and cuboids and where appropriate, more complex 3D shapes	▪ can generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s ▪ can use annotated sketches, prototypes, final product sketches and pattern pieces; communication technology, to develop and communicate ideas ▪ can plan the main stages of making ▪ can select from and use a range of appropriate utensils, tools and equipment with some accuracy related to their product ▪ can select from and use finishing techniques suitable for the product they are creating ▪ can investigate a range of 3D textile products and linkage products relevant to their project ▪ can test their product against the original design criteria and with the intended user ▪ can evaluate the ongoing work and the final product with	www.teaching ideas.co.uk/subjects Making a Roman Catapult  www.instructables.com (See details on Teaching Ideas sheet attached)  Design and build a Roman aqueduct model that carried carries water	*Cardboard* *Paper* *Glue* *Metal* *Wood* *Plastic*	*Shell* *Structure* *3D* *Shape* *Net* *Cube* *Cuboid* *Prism* *Vertex* *Edge* *Face* *Length* *Width* *Breadth* *Capacity* *Marking out* *Scoring* *Shaping* *Adhesives* *Joining* *Assembly* *Accuracy* *Material* *Stiff* *Strong* *Reduce* *Reuse* *Recycle* *Corrugating* *Ribbing*

		reference to the design criteria and the views of others	 Design a pair of sandals that fits feet   Design and build an exploding volcano		*Laminating* *Font* *Lettering*

STRUCTURES – YEAR 4

Possible Artists: *Picasso – class artist, Andy Goldsworthy, Georgia O'Keeffe, Gustav Klimt, Banksy,*

Local Enrichment:

Year 4	▪ know and use technical vocabulary relevant to the project ▪ know how to develop and use knowledge of how to construct strong and stiff shell structures ▪ know how to develop and use knowledge of nets of cubes and cuboids and where appropriate, more complex 3D shapes	▪ can generate and clarify ideas through discussion with peers to develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups ▪ can use annotated sketches and appropriate information and communication technology, to develop and communicate ideas ▪ can generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams ▪ can order the main stages of making ▪ can select and use appropriate tools to measure, mark out, cut, score, shape and combine with some accuracy related to their products ▪ can explain their choice of materials according to functional properties and aesthetic qualities	www.teaching ideas.co.uk/subjects **Spaghetti Towers** Spaghetti Towers is a fun challenge requiring children to build a tower made of spaghetti. This would be an excellent activity to do at the start or the end of teaching 'Properties and Changes of Materials'. This activity could be extended by asking children to suggest other foodstuffs which could be used to create structures. This could be set in the context of an end-of-topic party for which all the dishes need to resemble structures. www.stem.org.uk On Twinkl, there are excellent PowerPoints to start the project off: *Brilliant Bridges, Making Materials Stronger, Struts and Frames Structures, STEM: Attachments Techniques Display* **Creating Bridges** **Initially:** Get children working in small groups to create structures from a single sheet of A4 paper. Following on from this they are challenged to create the tallest free-standing tower and the longest possible	*Metal* *Wood* *Plastic* *Cardboard* *Paper* *Glue*	*Shell* *Structure* *3D* *Shape* *Net* *Cube* *Cuboid* *Prism* *Vertex* *Edge* *Face* *Length* *Width* *Breadth* *Capacity* *Marking out* *Scoring* *Shaping* *Tabs* *Adhesives* *Joining* *Assembly* *Accuracy* *Material* *Stiff* *Strong* *Reduce* *Reuse* *Recycle* *Corrugating*

		▪ can select from and use materials and construction components according to their function and properties ▪ can investigate and evaluate a range of products and materials, components and techniques that are used ▪ can test and evaluate their own products against design criteria and the intended user and purpose ▪ can evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work	span between two end supports. Ask children to test their bridges for strength and say which designs work and why. They can use blu-tak, scissors, paper and string. **Design:** Children work in small groups, to design their bridge. Show PowerPoints on different bridge designs. Children to choose materials: cardboard, masking tape, string, paper, etc		*Ribbing* *Laminating* *Font* *Lettering* *Text* *Graphics* *Decision* *Design brief* *Innovative* *Prototype* *Purpose* *Sensory*

STRUCTURES – YEAR 5

Possible Artists: *Gustav Klimt – class artist, Picasso, Andy Goldsworthy, Georgia O'Keeffe Banksy,*

Local Enrichment:

Year 5	▪ will understand how to strengthen, stiffen and reinforce 3-D frameworks ▪ know and use technical vocabulary relevant to the project;	▪ can generate innovative ideas through research including surveys, interviews and questionnaires and discussion with peers to develop a design brief and criteria for a design specification ▪ can design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification ▪ can develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views, and, where appropriate, computer-aided design ▪ can produce detailed lists of equipment and fabrics relevant to their tasks ▪ can write a step-by-step plan, including a list of resources required ▪ can select from and use, a range of appropriate utensils, tools, materials and resources	www.teaching ideas.co.uk/subjects  **Creating Bridges** Get children working in small groups to create structures from a single sheet of A4 paper. Following on from this they are challenged to create the tallest free-standing tower and the longest possible span between two end supports. Ask children to test their bridges for strength and say which designs work and why www.stem.org.uk **Investigating Parachutes** A great way for children to learn about air resistance. The inclusion of a video clip in with this resource is particularly helpful as children need to see that a 'good' parachute should fall slowly rather than it being about who make the fastest parachute! This activity could also form	*Metal* *Wood* *Plastic* *Cardboard* *Paper* *Glue*	*Frame* *Structure* *Stiffen,* *Strengthen* *Reinforce* *Triangulation* *Stability* *Shape* *Join* *Temporary* *Permanent* *Design* *Decisions* *Functionality* *Authentic* *User* *Purpose* *Specification* *Design brief* *Innovative* *Research* *Evaluate* *Design criteria* *Annotate* *Mock-up* *Prototype*

		▪ can investigate and analyse products linked to their final product ▪ can compare the final product to the original design specification and record the evaluations ▪ can test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose ▪ can consider the views of others to improve their work	the basis for a cross curricular DT unit with children being asked to design and make a parachute that would safely land an egg for example. www.stem.org.uk		

STRUCTURES – YEAR 6

Possible Artists: *Banksy – class artist, Gustav Klimt, Picasso, Andy Goldsworthy, Georgia O'Keeffe,*

Local Enrichment:

Year 6	▪ understand how to strengthen, stiffen and reinforce 3-D frameworks ▪ know and use technical vocabulary relevant to the project	▪ can use research using surveys, interviews, questionnaires and web-based resources to develop a design specification for a range of functional products ▪ can develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost ▪ can generate and develop innovative ideas and share and clarify these through discussion ▪ can communicate ideas through annotated sketches ▪ can formulate a step-by-step plan to guide making, listing tools, equipment, materials and components ▪ can competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, to produce reliable, functional products ▪ can use finishing and decorative techniques suitable for the	www.teaching ideas.co.uk/subjects **Creating Bridges** Get children working in small groups to create structures from a single sheet of A4 paper. Following on from this they are challenged to create the tallest free-standing tower and the longest possible span between two end supports. Ask children to test their bridges for strength and say which designs work and why www.stem.org.uk **Investigating Parachutes** A great way for children to learn about air resistance. The inclusion of a video clip in with this resource is particularly helpful as children need to see that a 'good' parachute should fall slowly rather than it being about who make the fastest parachute! This activity could also form the basis for a cross curricular DT unit with children being asked to design and make a parachute that would safely land an egg for example. www.stem.org.uk	*Metal* *Wood* *Plastic* *Cardboard* *Paper* *Glue*	*Frame* *Structure* *Stiffen,* *Strengthen* *Reinforce* *Triangulation* *Stability* *Shape* *Join* *Temporary* *Permanent* *Function* *Innovative* *Design* *Specification* *Design brief* *User* *Purpose* *Design brief* *Specification* *Research* *Functional*

		product they are designing and making			

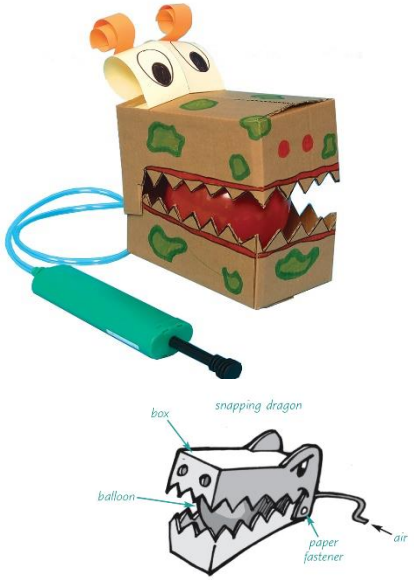
MECHANISMS AND LEVERS

MECHANISMS AND LEVERS – EYFS/YEAR 1

Possible Artists: *Georgia O'Keeffe – class artist, Gustav Klimt, Pablo Picasso, Andy Goldsworthy, Banksy,*

<table>
<tr><td colspan="6"> 
Local enrichment:</td></tr>
<tr><td>EYFS/ Year 1</td><td>▪ explore and use sliders and levers
▪ will understand that different mechanisms produce different types of movement
▪ know and use technical vocabulary relevant to the project</td><td>▪ can design appealing products for a particular user based on a simple design criteria
▪ can generate initial ideas and design criteria through own experiences
▪ can develop and communicate their ideas through talk and drawings and mock-ups where relevant
▪ can select and use simple utensils, tools and equipment to perform a task, eg. cutting, joining, etc.
▪ can select from a range of materials according to their characteristics to create a chosen product
▪ can explore and evaluate a range of products to determine the intended user’s preferences for the product</td><td>Children can explore and evaluate a collection of books and everyday products that have moving parts, including those with levers and sliders
Questions:
What is it?
What is it for?
Who is it for?
Use questions do develop children’s understanding:
What do you think will move?
What part of the product moved and how did it move?
How do you think the mechanism works?
What else could move in the product?
How well does it work?
How does the slider move?
How does the lever move?
Which part of the mechanism is the pivot?
What does the movement of the slider and the lever remind you of?</td><td>Card
Masking tape
Paper
Paper fasteners
Glue
PVA glue
Scissors
Cutting mats
Blu Tack</td><td>Slider
Lever
Pivot
Slot
Bridge/guide
Join
Pull
Push
Up
Down
Straight
Curve,
Forwards
Backwards
Guide
Bridge</td></tr>
</table>

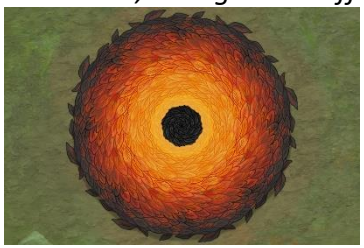
		▪ can evaluate their ideas throughout and finished products against design criteria, including intended user and purpose	Experience of simple cutting, shaping and joining skills with glue, paper fasteners and masking tape Make simple flaps and hinges – greeting cards with pop-ups Greeting cards with sliders Designing and making a kite www.teaching ideas.co.uk/subjects https://www.kapowprimary.com/subjects/design-technology/key-stage-1/year-1/mechanisms-making-a-moving-story-book/ Designing slider greeting cards and moving books https://www.kapowprimary.com/subjects/design-technology/key-stage1k/ Investigating how wheels move on a variety of different objects – children will create a simple version of a wheel mechanism, including an axle, wheel and axle holder. They will learn the different components of a vehicle with moving wheels www.stem.org.uk Students design and make a moving picture that tells a nursery rhyme or a simple story, using paper, card, found		

			pictures, found materials and paper fasteners www.stem.org.uk children design and make a simple push-along toy (a *Roly Poly*) using a mixture of found materials, paper and card **Designing a Moving Monster** 		
MECHANISMS AND LEVERS – YEAR 2 ***Possible Artists:*** *Andy Goldsworthy – class artist, Georgia O'Keeffe, Pablo Picasso, Gustav Klimt, Banksy,*					

			 ***Local enrichment:***		
Year 2	▪ will explore and use wheels, axles and axle holders ▪ know how to distinguish between fixed and freely moving axles ▪ know and use technical vocabulary relevant to the project	▪ can generate ideas based on simple design criteria and their own experiences, explain what they could make ▪ develop, model and communicate their ideas, through talk, mock-ups and drawings ▪ can plan by suggesting what to do next ▪ can selects tools and equipment, skills and techniques to perform practical tasks, explain their choices ▪ can select materials, components, reclaimed materials and construction kits to build and create their products ▪ can use simple finishing techniques suitable for the products they are creating	Children can explore and evaluate a collection of books and everyday products that have moving parts, including those with levers and sliders **Questions:** *What is it?* *What is it for?* *Who is it for?* Use questions do develop children's understanding: *What do you think will move?* *What part of the product moved and how did it move?* *How do you think the mechanism works?* *What else could move in the product?* *How well does it work?* *How does the slider move?* *How does the lever move?* *Which part of the mechanism is the pivot?* *What does the movement of the slider and the lever remind you of?*		*Vehicle* *Wheel* *Axle* *Axle holder* *Chassis* *Body* *Cab* *Assembling* *Cutting* *Joining* *Shaping,* *Finishing* *Fixed* *Free* *Moving* *Mechanism*

		▪ can explore a range of existing products related to their design criteria ▪ can evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria	Experience of simple cutting, shaping and joining skills with glue, paper fasteners and masking tape Make simple flaps and hinges – greeting cards with pop-ups Greeting cards with sliders Designing and making a kite www.teaching ideas.co.uk/subjects https://www.kapowprimary.com/subjects/design-technology/key-stage1k/ Investigating how wheels move on a variety of different objects – children will create a simple version of a wheel mechanism, including an axle, wheel and axle holder. They will learn the different components of a vehicle with moving wheels www.stem.org.uk Students design and make a moving picture that tells a nursery rhyme or a simple story, using paper, card, found pictures, found materials and paper fasteners **Making a Moving Monster**		

			 **Moving Toys**  		
MECHANISMS AND LEVERS – YEAR 3					

Possible Artists: *Andy Goldsworthy – class artist, Georgia O'Keeffe, Pablo Picasso, Gustav Klimt, Banksy,*  ***Local Enrichment:***					
Year 3	▪ will understand and use lever and linkage mechanisms ▪ will distinguish between fixed and loose pivots ▪ know and use technical vocabulary relevant to the project	▪ can generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s ▪ can use annotated sketches, prototypes, final product sketches and pattern pieces; communication technology, to develop and communicate ideas ▪ can plan the main stages of making ▪ can select from and use a range of appropriate utensils, tools and equipment with some accuracy related to their product ▪ can select from and use finishing techniques suitable for the product they are creating	www.teaching ideas.co.uk/subjects **Making a fidget spinner**  (Details on Teaching ideas sheet) **Moving Viking Longboat**		*Mechanism* *Lever* *Linkage* *Pivot* *Slot* *Bridge* *Guide system* *Input* *Process* *Output* *Linear* *Rotary* *Oscillating* *Reciprocating*

		▪ can investigate a range of 3D textile products and lever and linkage products relevant to their project ▪ can test their product against the original design criteria and with the intended user ▪ can evaluate the ongoing work and the final product with reference to the design criteria and the views of others	  		

			 **Making a Merry-go-Round**  		

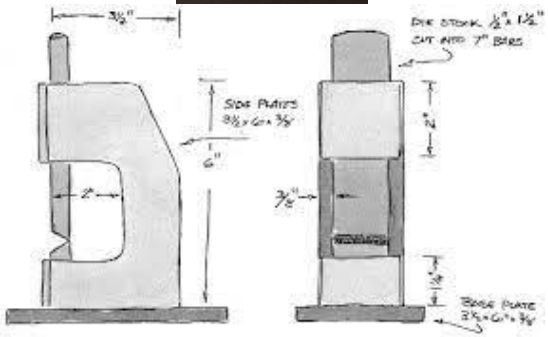
MECHANISMS AND LEVERS – YEAR 4

Possible Artists: *Picasso – class artist, Andy Goldsworthy, Georgia O'Keeffe, Gustav Klimt, Banksy,*

Local Enrichment:

Year 4	▪ will understand and use lever and linkage mechanisms ▪ will distinguish between fixed and loose pivots ▪ know and use technical vocabulary relevant to the project	▪ can generate and clarify ideas through discussion with peers to develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups ▪ can use annotated sketches and appropriate information and communication technology, to develop and communicate ideas ▪ can generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-section ▪ can order the main stages of making	www.teaching ideas.co.uk/subjects **Making a fidget spinner**  (Details on Teaching ideas sheet)		*Mechanism* *Lever* *Linkage* *Pivot* *Slot* *Bridge* *Guide system* *Input* *Process* *Output* *Linear* *Rotary* *Oscillating* *Reciprocating*

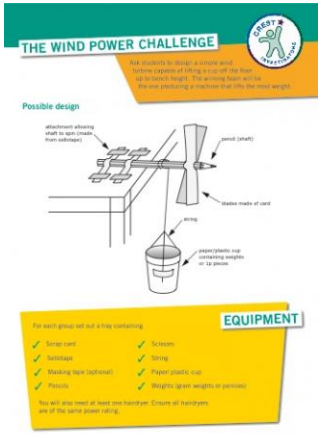
		▪ can select and use appropriate tools to measure, mark out, cut, score, shape and combine with some accuracy related to their products ▪ can explain their choice of materials according to functional properties and aesthetic qualities ▪ can select from and use materials and components, according to their function and properties ▪ can investigate and evaluate a range of products including the materials, components and techniques that are used ▪ can test and evaluate their own products against design criteria and the intended user and purpose ▪ can evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work	**Moving Viking Longboat**   		

			Making a guillotine  		

MECHANISMS AND LEVERS – YEAR 5

Possible Artists: *Gustav Klimt – class artist, Picasso, Andy Goldsworthy, Georgia O'Keeffe, Banksy,*

Local Enrichment:

Year 5	▪ will understand that mechanical and electrical systems have an input, process and an output ▪ will understand how gears and pulleys can be used to speed up, slow down or change the direction of movement ▪ know and use technical vocabulary relevant to the project;	▪ can generate innovative ideas through research including surveys, interviews and questionnaires and discussion with peers to develop a design brief and criteria for a design specification ▪ can design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification ▪ can develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views, and, where appropriate, computer-aided design	www.teaching ideas.co.uk/subjects 		*Pulley* *Drive belt* *Gear* *Rotation* *Spindle* *Driver* *Follower* *Ratio* *Transmit* *Axle* *Motor* *Circuit* *Switch* *Circuit Diagram* *Annotated Drawings* *Exploded Diagrams* *Mechanical System*

		▪ can produce detailed lists of equipment relevant to their tasks ▪ can write a step-by-step plan, including a list of resources required ▪ can select from and use, a range of appropriate utensils, tools and equipment accurately to combine materials and resources ▪ can investigate and analyse products linked to their final product ▪ can compare the final product to the original design specification and record the evaluations ▪ can test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose ▪ can consider the views of others to improve their work	**Making a fidget spinner**  (Details on Teaching ideas sheet) **Moving Viking Longboat**  		*Electrical* *System* *Input* *Process* *Output*

MECHANISMS AND LEVERS – YEAR 6

Possible Artists: *Banksy – class artist, Gustav Klimt, Picasso, Andy Goldsworthy, Georgia O'Keeffe*

Local enrichment:

Year 6	▪ will understand that mechanical and electrical systems have an input, process and an output ▪ will understand how gears and pulleys can be used to speed up, slow down or change the direction of movement ▪ know and use technical vocabulary relevant to the project	▪ can use research using surveys, interviews, questionnaires and web-based resources to develop a design specification for a range of functional products ▪ can develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost ▪ can generate and develop innovative ideas and share and clarify these through discussion ▪ can communicate ideas through annotated sketches and pictorial representations	www.teaching ideas.co.uk/subjects **Moving Viking Longboat** 		*Pulley* *Drive belt* *Gear* *Rotation* *Spindle* *Driver* *Follower* *Ratio* *Transmit* *Axle* *Motor* *Circuit* *Switch* *Circuit Diagram* *Annotated Drawings* *Exploded Diagrams* *Mechanical System*

			 **Making a fidget spinner** 		*Electrical* *System* *Input* *Process* *Output*

FOOD AND NUTRITION

FOOD AND NUTRITION – EYFS/YEAR 1

Possible Artists: *Georgia O'Keeffe – class artist, Andy Goldsworthy, Pablo Picasso, Gustav Klimt, Banksy,*

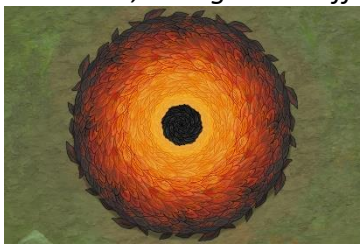
Local enrichment:

EYFS/ Year 1	▪ understand where a range of fruit and vegetables come from, e.g. farmed or grown at home ▪ understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of *The Eatwell Plate* ▪ know and use technical and sensory vocabulary relevant to the project	▪ can design appealing products for a particular user based on a simple design criteria ▪ can generate initial ideas and design criteria through own experiences ▪ can select and use simple utensils, tools and equipment to perform a task, eg. cutting, peeling, slicing, squeezing, grating, chopping, etc ▪ can select from a range of ingredients according to their characteristics to create a chosen product ▪ can taste, explore and evaluate a range of products to	**Making seasonal ice lollies**  **Making simple pizzas** 	*Selection of fruit and vegetables*	*Fruit and vegetable names* *Soft* *Juicy* *Crunchy* *Sweet* *Sticky* *Smooth* *Sharp* *Crisp* *Sour* *Hard* *Flesh* *Skin* *Seed* *Pip* *Core*

		determine the intended user's preferences for the product	**Is it a Fruit or a Vegetable?** https://www.kapowprimary.com/subjects/design-technology/key-stage-1/ Learning to distinguish between fruits and vegetables Where do fruits and vegetables grow?  **Making a smoothie**  www.stem.org.uk Children design and make a bowl of fruit salad to share with other children in the class. Children need to consider the look, feel and taste of the fruit salad so that it matches the requirements of the group, as revealed by their own research and recorded in their specification		*Slicing* *Peeling* *Cutting* *Squeezing* *Healthy diet*

FOOD AND NUTRITION – YEAR 2

Possible Artists: *Andy Goldsworthy – class artist, Georgia O'Keeffe, Pablo Picasso, Gustav Klimt, Banksy,*



Local Enrichment:

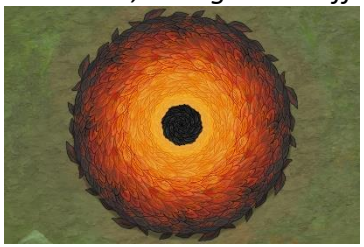
Year 2	▪ understand where a range of fruit and vegetables come from, e.g. farmed or grown at home; ▪ understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of *The Eatwell Plate*; ▪ know and use technical and sensory vocabulary relevant to the project;	▪ can generate ideas based on simple design criteria and their own experiences, explain what they could make; ▪ can plan by suggesting what to do next; ▪ can select and use simple utensils, tools and equipment to perform a task, eg. cutting, peeling, slicing, squeezing, grating, chopping, etc ▪ can select tools and equipment, skills and techniques to perform practical tasks, explain their choices; ▪ can use simple finishing techniques suitable for the products they are creating; ▪ can explore a range of existing products related to their design criteria;	www.stem.org.uk Children design and make a bowl of fruit salad to share with other children in the class. Children need to consider the look, feel and taste of the fruit salad so that it matches the requirements of the group, as revealed by their own research and recorded in their specification. **Seasonal Ice Lollies** 	*Selection of fruit and vegetables*	*Fruit and vegetable names* *Soft* *Juicy* *Crunchy* *Sweet* *Sticky* *Smooth* *Sharp* *Crisp* *Sour* *Hard* *Flesh* *Skin* *Seed* *Pip* *Core* *Slicing* *Peeling*

		▪ can evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria;	**Is it a Fruit or a Vegetable?** https://www.kapowprimary.com/subjects/design-technology/key-stage-1/ Learning to distinguish between fruits and vegetables Where do fruits and vegetables grow?  Using the school garden to grow own vegetables and then use them in cooking **Making Pizzas**  		*Cutting* *Squeezing* *Healthy diet* *Sensory*

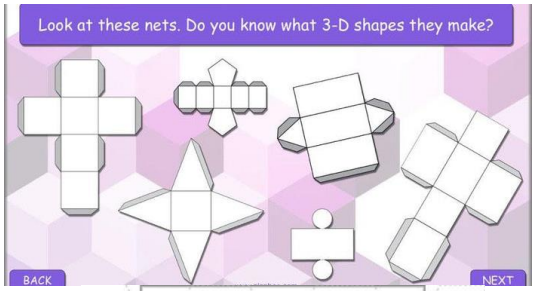
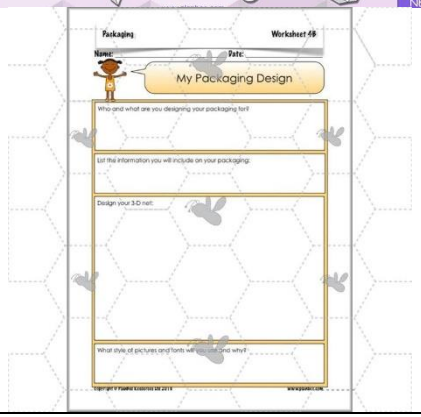
			Learning about food from Africa  **https://kids.kiddle.co/African_cuisine** Simple foods such as couscous could be cooked with fresh vegetables 		

FOOD AND NUTRITION – YEAR 3

Possible Artists: *Andy Goldsworthy – class artist, Georgia O'Keeffe, Pablo Picasso, Gustav Klimt, Banksy,*



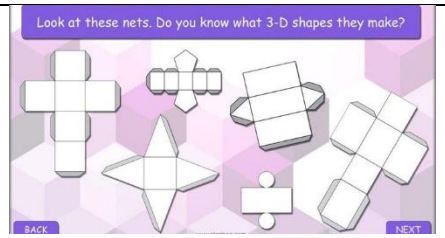
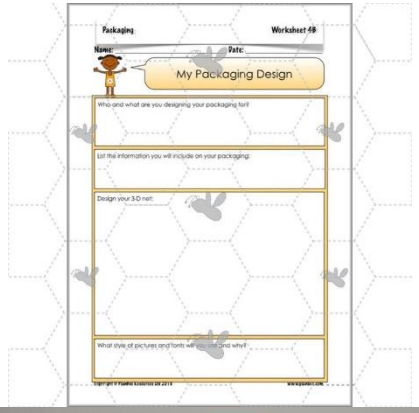
Local Enrichment:

Year 3	▪ know how to use appropriate equipment and utensils to prepare and combine food; ▪ know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught; ▪ know and use relevant technical and sensory vocabulary appropriately;	▪ can generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s; ▪ can use communication technology, such as web-based recipes, to develop and communicate ideas; ▪ can plan the main stages of making; ▪ can select from and use a range of appropriate utensils, tools and equipment with some accuracy related to their product; ▪ can select from and use finishing techniques suitable for the product they are creating;	**Healthy Eating:** Researching, designing and making a healthy sandwich and its packaging Examine different nets  		*Texture* *Taste* *Sweet* *Sour* *Hot* *Spicy* *Appearance* *Smell* *Preference* *Greasy* *Moist* *Cook* *Fresh* *Savoury* *Hygienic* *Edible* *Grown* *Reared* *Caught* *Frozen* *Tinned*

		▪ can investigate a range of ingredients relevant to their project; ▪ can test their product against the original design criteria and with the intended user; ▪ can evaluate the ongoing work and the final product with reference to the design criteria and the views of others; ▪	  Can we design the packaging without cellophane? **Researching foods from South America**  Making South American inspired bread: adding different ingredients to the dough to see what difference they make. Making a South American salad		*Processed* *Seasonal* *Harvested* *Healthy/varied diet*

			 Twinkl has hundreds of ideas Using plants grown in school to cook with  For example, baked marrow 		

			 		
FOOD AND NUTRITION – YEAR 4 ***Possible Artists:*** *Pablo Picasso – class artist, Georgia O'Keeffe, Andy Goldsworthy, Gustav Klimt, Banksy,*  ***Local enrichment:***					
Year 4	▪ know how to use appropriate equipment and utensils to prepare and combine food; ▪ know about a range of fresh and processed	▪ can generate and clarify ideas through discussion with peers to develop design criteria to inform the design of products that are fit for purpose, aimed	**Healthy Eating:** Researching, designing and making a healthy sandwich and its packaging Examine different nets		*Texture* *Taste* *Sweet* *Sour* *Hot*

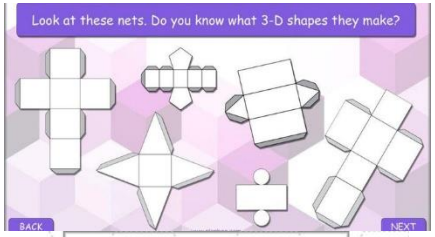
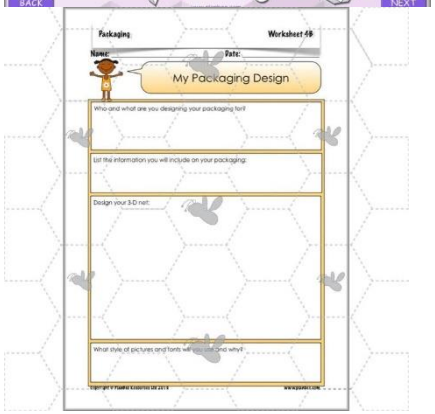
	ingredients appropriate for their product, and whether they are grown, reared or caught; ▪ know and use relevant technical and sensory vocabulary appropriately;	at particular individuals or groups; ▪ can use communication technology, such as web-based recipes, to develop and communicate ideas; ▪ can generate, develop, model and communicate realistic ideas through discussion ▪ can order the main stages of making; ▪ can select and use appropriate tools to measure, mark out, cut, score, shape and combine with some accuracy related to their products; ▪ can explain their choice of materials according to functional properties and aesthetic qualities; ▪ can select from and use materials and components, including ingredients, construction and electrical components according to their function and properties; ▪ can investigate and evaluate a range of products including the ingredients, materials,	   		*Spicy* *Appearance* *Smell* *Preference* *Greasy* *Moist* *Cook* *Fresh* *Savoury,* *Hygienic* *Edible* *Grown* *Reared* *Caught* *Frozen* *Tinned* *Processed* *Seasonal* *Harvested* *Healthy/varied diet*

		components and techniques that are used; ▪ can test and evaluate their own products against design criteria and the intended user and purpose; ▪ can evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work;	Can we design the packaging without cellophane? **Researching foods from South America**  Making South American inspired bread: adding different ingredients to the dough to see what difference they make. Making a South American salad There are loads of ideas on Twinkl 		

FOOD AND NUTRITION – YEAR 5

Possible Artists: *Gustav Klimt– class artist, Georgia O'Keeffe, Andy Goldsworthy, Pablo Picasso, Banksy,*

Local enrichment:

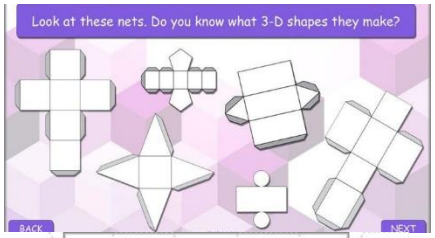
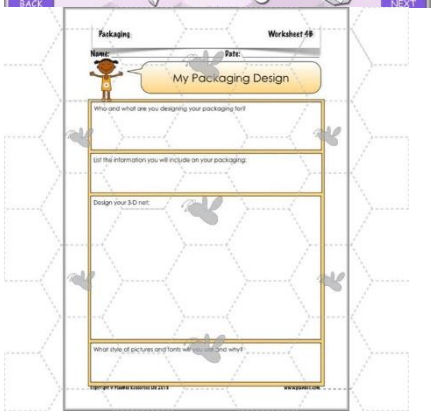
Year 5	▪ know how to use utensils and equipment including heat sources to prepare and cook food; ▪ understand about seasonality in relation to food products and the source of different food products; ▪ know and use relevant technical and sensory vocabulary;	▪ can generate innovative ideas through research including surveys, interviews and questionnaires and discussion with peers to develop a design brief and criteria for a design specification; ▪ can design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification; ▪ can develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views, and, where appropriate, computer-aided design; ▪ can produce detailed lists of equipment and fabrics relevant to their tasks;	**Healthy Eating:** Researching, designing and making a healthy sandwich and its packaging Examine different nets  	*Yeast* *Dough* *Bran* *Flour* *Wholemeal* *Unleavened* *Baking soda* *Spice* *Herbs* *Fat* *Sugar* *Flour* *Yeast*	*Carbohydrate* *Protein* *Vitamins* *Nutrients* *Nutrition* *Healthy* *Varied* *Gluten* *Dairy* *Allergy* *Intolerance* *Savoury* *Source* *Seasonality* *Utensils* *Combine* *Fold* *Knead* *Stir* *Pour* *Mix*

		▪ can write a step-by-step plan, including a list of resources required; ▪ can select from and use, a range of appropriate utensils, tools and equipment accurately to measure and combine appropriate ingredients, materials and resources; ▪ can investigate and analyse products linked to their final product; ▪ can compare the final product to the original design specification and record the evaluations; ▪ can test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose; ▪ can consider the views of others to improve their work; ▪	  Can we design the packaging without cellophane? **Researching foods from South America**  Making South American inspired bread: adding different ingredients to the dough to see what difference they make. Making a South American salad There are loads of ideas on Twinkl		*Rubbing in* *Whisk* *Beat* *Roll out* *Shape* *Sprinkle* *Crumble* *Yeast* *Dough* *Bran* *Flour* *Wholemeal* *Unleavened* *Baking soda* *Spice* *Herbs* *Fat* *Sugar*

FOOD AND NUTRITION – YEAR 6

Possible Artists: *Banksy – class artist, Georgia O'Keeffe, Andy Goldsworthy, Pablo Picasso, Gustav Klimt,*

Local enrichment:

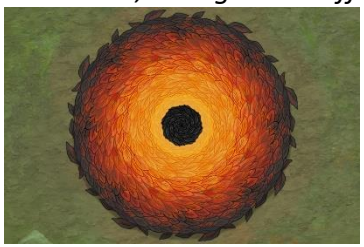
Year 6	▪ know how to use utensils and equipment including heat sources to prepare and cook food; ▪ understand about seasonality in relation to food products and the source of different food products; ▪ know and use relevant technical and sensory vocabulary;	▪ can draw an object from ▪ can use research using surveys, interviews, questionnaires and web-based resources. to develop a design specification for a range of functional products; ▪ can develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost; ▪ can generate and develop innovative ideas and share and clarify these through discussion; ▪ can communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams;	**Healthy Eating:** Researching, designing and making a healthy sandwich and its packaging Examine different nets  	*Yeast* *Dough* *Bran* *Flour* *Wholemeal* *Unleavened* *Baking soda* *Spice* *Herbs* *Fat* *Sugar* *Flour* *Yeast*	*Carbohydrate* *Protein* *Vitamins* *Nutrients* *Nutrition* *Healthy* *Varied* *Gluten* *Dairy* *Allergy* *Intolerance* *Savoury* *Source* *Seasonality* *Utensils* *Combine* *Fold* *Knead* *Stir* *Pour* *Mix*

			  Can we design the packaging without cellophane? **Researching foods from South America**  Making South American inspired bread: adding different ingredients to the dough to see what difference they make. Making a South American salad There are loads of ideas on Twinkl		*Rubbing in* *Whisk* *Beat* *Roll out* *Shape* *Sprinkle* *Crumble* *Yeast* *Dough* *Bran* *Flour* *Wholemeal* *Unleavened* *Baking soda* *Spice* *Herbs* *Fat* *Sugar*

ELECTRICAL SYSTEMS

ELECTRICAL SYSTEMS – YEAR 3

Possible Artists: *Andy Goldsworthy – class artist, Georgia O'Keeffe, Pablo Picasso, Gustav Klimt, Banksy,*



Local Enrichment:

Year 3	▪ will understand and use electrical systems in their products linked to science coverage; ▪ will apply their understanding of computing to program and control their products; ▪ know and use technical vocabulary relevant to the project;	▪ can generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s; ▪ can use annotated sketches, prototypes, final product sketches and pattern pieces; communication technology, such as web-based recipes, to develop and communicate ideas; ▪ can plan the main stages of making; ▪ can select from and use a range of appropriate utensils, tools and equipment with some accuracy related to their product;			*Series* *Circuit* *Fault* *Connection* *Toggle* *Switch* *Push-to-make switch* *Push-to-break switch* *Battery* *Battery holder,* *Bulb* *Bulb holder* *Wire* *Insulator* *Conductor* *Crocodile clip* *Control*

		▪ can select from and use finishing techniques suitable for the product they are creating; ▪ can investigate a range of 3-D textile products, ingredients and lever and linkage products relevant to their project; ▪ can test their product against the original design criteria and with the intended user;			*Program* *System* *Input* *Device* *Output* *Device*
ELECTRICAL SYSTEMS – YEAR 4 ***Possible Artists:*** *Picasso – class artist, Andy Goldsworthy, Georgia O'Keeffe, Gustav Klimt, Banksy,*  ***Local enrichment:***					
Year 4	▪ will understand and use electrical systems in their products linked to science coverage; ▪ will apply their understanding of computing to program and control their products;	▪ can generate and clarify ideas through discussion with peers to develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups; ▪ can use annotated sketches and appropriate information and			*Series* *Circuit* *Fault* *Connection* *Toggle* *Switch* *Push-to-make switch* *Push-to-break*

	▪ know and use technical vocabulary relevant to the project;	communication technology, to develop and communicate ideas; ▪ can generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-section; ▪ can order the main stages of making; ▪ can select and use appropriate tools to measure, mark out, cut, score, shape and combine with some accuracy related to their products; ▪ can explain their choice of materials according to functional properties and aesthetic qualities; ▪ can select from and use materials and components, including ingredients, construction and electrical components according to their function and properties; ▪ can investigate and evaluate a range of products including the ingredients, materials, components and techniques that are used;			*switch* *Battery* *Battery holder,* *Bulb* *Bulb holder* *Wire* *Insulator* *Conductor* *Crocodile clip* *Control* *Program* *System* *Input* *Device* *Output* *Device*

		▪ can test and evaluate their own products against design criteria and the intended user and purpose; ▪ can evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work; ▪			
ELECTRICAL SYSTEMS – YEAR 5 ***Possible Artists:*** *Gustav Klimt – class artist, Picasso, Andy Goldsworthy, Georgia O'Keeffe, Banksy,*  ***Local enrichment:***					
Year 5	▪ will understand and use electrical systems in their products linked to science coverage; ▪ will apply their understanding of computing to program, monitor and control their products; ▪ know and use technical vocabulary relevant to the project;	▪ can generate innovative ideas through research including surveys, interviews and questionnaires and discussion with peers to develop a design brief and criteria for a design specification; ▪ can design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification;			*Reed switch* *Toggle switch* *Push-to-make switch* *Push-to-break switch* *Light dependent resistor (LDR),* *Tilt switch* *Light emitting diode (LED)*

		▪ can develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views, and, where appropriate, computer-aided design; ▪ can produce detailed lists of equipment and fabrics relevant to their tasks; ▪ can write a step-by-step plan, including a list of resources required; ▪ can select from and use, a range of appropriate utensils, tools and equipment accurately to measure and combine appropriate ingredients, materials and resources; ▪ can investigate and analyse products linked to their final product; ▪ can compare the final product to the original design specification and record the evaluations; ▪ can test products with intended user and critically evaluate the quality of the design,			*Bulb* *Bulb holder,* *Battery* *Battery holder* *USB cable* *Wire* *Insulator* *Conductor* *Crocodile clip* *Control* *Program* *System* *Input device* *Output* *Device* *Series circuit* *Parallel circuit*

		manufacture, functionality and fitness for purpose; ▪ can consider the views of others to improve their work; ▪			
ELECTRICAL SYSTEMS – YEAR 6 ***Possible Artists:*** *Gustav Klimt – class artist, Picasso, Andy Goldsworthy, Georgia O'Keeffe, Banksy,*  ***Local enrichment:***					
Year 6	▪ will understand and use electrical systems in their products linked to science coverage; ▪ will apply their understanding of computing to program, monitor and control their products;	▪ can draw an object from ▪ can use research using surveys, interviews, questionnaires and web-based resources. to develop a design specification for a range of functional products; ▪ can develop a simple design specification to guide the development of their ideas and			*Reed switch* *Toggle switch* *Push-to-make switch* *Push-to-break switch* *Light dependent resistor (LDR),* *Tilt switch*

	▪ know and use technical vocabulary relevant to the project;	products, taking account of constraints including time, resources and cost; ▪ can generate and develop innovative ideas and share and clarify these through discussion; ▪ can communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams;			*Light emitting diode (LED)* *Bulb* *Bulb holder,* *Battery* *Battery holder* *USB cable* *Wire* *Insulator* *Conductor* *Crocodile clip* *Control* *Program* *System* *Input device* *Output* *Device* *Series circuit* *Parallel circuit*
	▪	▪	Use programming software to design an obstacle course for a Roman gladiator Make a stop-motion animation of the story of Boudica or Romulus and Remus Create and edit a video of own version of one of many Roman story books available ▪		

Primary Planning Links September 2016

Projects on a Page

An innovative scheme of work for Primary developed by the D&T Association's Primary Working Group comprising 21 project planners covering Mechanisms, Structures, Food, Textiles and Electrical Systems.

Are you really teaching D&T? and D&T Principles guidance

To help you decide whether the projects you are teaching are really D&T and help you evaluate your planning in relation to each of the 'D&T principles': User, Purpose, Functionality, Design Decisions, Innovation and Authenticity.

Annotated Programme of Study – Key messages, advice and explanatory notes for schools

The Association's detailed advice and support to help members implement the new NC requirements.

Designer's Toolkit for Children

A guide to applying designing tools and prompting pupils to ask the right questions during the creative process of designing.

Example Long-Term Plan An editable version of an example D&T long-term plan. It suggests both the aspect to be taught and the age-related focus for pupils' learning.

Minimum requirements for effective practice in KS1 and KS2 A set of twelve minimum requirements for KS1 and KS2 which schools may wish t o consider when they are reviewing and developing their provision in D&T.

Formative Assessment – Initial Guidance

Includes commentary from DfE and some guiding principles to inform the development of schools' individual approaches to assessment.

Primary Subject Leaders File 2016 A comprehensive set of materials addressing all the major aspects which subject leaders are expected to address in their work.

Primary D&T Food Guidance Produced in association with the British Nutrition Foundation to help primary schools implement the requirements for food within the National Curriculum.

Are you Teaching Food in Primary D&T?

Two presentations that explain the skills and teaching tips for those working with children aged 7-11 years and how to teach a selection of food skills.

Primary D&T National Curriculum 2014 – Myths and Facts

A useful set of FAQs to dispel any myths and misunderstandings that teachers may have about the NC's content and implementation.

A to Z of D&T

A pictorial dictionary of D&T terminology presented as PowerPoint presentations which may also be printed as classroom display cards.
Working with Materials
A guide to a wide range of tools and materials in use in primary schools.
Butterflies in My Tummy Helps children develop the skills and attitudes needed for risk taking and innovation.
Applying Computing in D&T at KS2 and KS3
Explains how computing and design and technology are related and focuses on programming and control of physical systems in KS2 and KS3.