St Mark's Primary School

Design and Technology - Knowledge, vocabulary EYFS - Y6

Aims for the Design and Technology curriculum:

See EYFS Expressive Arts and Design Progression Map

EYFS Expressive Arts and Design Progression Map 2022.docx - Google Docs

Key Stage 1

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 2

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]

How do we teach about famous artists, designers and architects? The vast majority of units contain a focus craftsperson / artist/designer/architect and an example stimulus piece with which to begin the unit of work. This has been chosen, not because it must be replicated in the finished outcome, but because the chosen pieces (and often artists) demonstrate the skills that are going to be taught in that unit of work.

1)That design and technology is about the creation of a product to fulfil a need.
That design is about making choices.
That evaluation is about understanding the effectiveness of these choices.

2) That design and technology is about the creation of a product to fulfil a need.

That design is about making choices.

That evaluation is about understanding the effectiveness of these choices.

3) That technical knowledge and skills are required in the manufacture of a product.

Contexts: Textiles, resistant materials, cooking and nutrition.

DESIGN and TECHNOLOGY Long Term Plan

DESIGN

National Curriculum Objectives	**See EYFS Expressive Arts and Design Progression Map**	Pupils should be taught: • 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		Pupils should be taught: • 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, prototypes, pattern pieces and computer-aided design			
Focus Area:		**Y1 Audience is themselves.** Focus: That a brief is designing something to meet it.	**Y2 They identify an audience for their design.** Focus on design criteria and linking scientific knowledge of materials and their properties to choosing materials in design.	**Y3 Brief specifies a user / audience.** Focus: Function and appearance. Annotated plans and establishing success criteria.	**Y4 Brief specifies user / audience.** Focus: Taking into account resources available and time. Multiple design ideas and justification of choices.	**Y5 Brief specifies specific user / audience.** Focus: Appeal of a product including cost, appearance, functionality and sustainability. Including longevity in design (e.g. techniques to reinforce).	**Y6 Focus: Introduce prototypes and market research**. Cross sectional diagrams. Use of computer aided design Y5 or Y6
Knowledge and Skills:	-That we can get ideas about how to design and make something by looking at examples -That a picture plan helps us to think about how we are going to make something and what we might need **-Use the plan, do, review model** **-Explain what they are going to make** -Use the language of designing and making (join, build, shape) -Say what they want to make - Know that there is a reason behind why they need to design and make something e.g., to make something already existing better, more attractive, stronger. -To draw a plan what they want to make e.g. pictorial -Choose and use appropriate tools and techniques needed to shape, assemble and join materials **Specific to cooking and nutrition** -That a balanced diet, with lots of fruits and vegetables is important to be healthy. (Half a plate of vegetables, 5 a day)	**-That there is a reason behind why they need to design and make something e.g. to make something already existing better, more attractive, stronger.** This is called a brief. -That a design can be like an original product, with a small adjustment to improve it. e.g. change of material. -Make a list of the materials that they need for their design. **-Draw a plan, (which could be an adjustment to an existing design or from an example shown).** **Specific to cooking and nutrition** -That food looks different in its raw to its cooked state or prepared/unprepared state (e.g. kiwi pineapple)	**-That a brief identifies a need** and can be broken down into design criteria, which identifies the need it should meet. -That a brief /design criterion can be solved / met in different ways. -That the design and planning process can be enhanced by generating more than one idea and adding labels to plans. **-That we can get ideas about how to design and make something by looking at examples.** - That there are existing products in the wider world that can be used as a source of inspiration for new designs. **-Identify a target group and the need for the design.** **-Justify their choices of materials using scientific knowledge of their properties and suitability (can be verbal) fulfil a brief.** **-Use sketches, models and pictures with words to describe designs.** **Specific to cooking and nutrition:** -Know where food consumed comes from (source of food, how it is grown e.g. trees field or underground, and country of origin link to food miles and sustainability.)	**-That a brief identifies a need** for a user or audience **and can be broken down into design criteria, which identifies the need the design should meet.** **-**That this user / audience should be identified in the design criteria. **-That different materials have different scientific properties which makes some more suitable than others to fulfil a brief.** - That materials should be evaluated against others and chosen based on their ability to meet the brief. **-That the design and planning process can be enhanced by generating more than one idea.** **-That we can get ideas about how to design and make something by looking at examples.** **-That there are existing products in the wider world that can be used as a source of inspiration for new designs.** -That a product's ability to meet a brief is based on a balance between function and appearance **-Establish success criteria for what will make a successful product, which includes both function and appearance.** **-Annotate and label their plan with materials chosen and their properties including why they have made the choices they have.** **Specific to cooking and nutrition** –That a dish/meal should be evaluated for how healthy it will be at the time of planning. -That food is classified into different groups, that there should be a	**-That a brief identifies a need for an audience or user and can be broken down into design criteria, which identifies the needs the design should meet.** -That the use / user of a product will affect design choices e.g. a smaller cushion for children. -That designs should be evaluated against the design criteria. **-That a product's ability to meet a brief is based on a balance between function and appearance.** **-That different materials have different scientific properties which make some more suitable than others to fulfil a brief** including electrical systems -That more than one idea should be evaluated to decide which would meet the brief best before moving into manufacture. -That function and appearance, availability of resources, time available and skill level should be considered when choosing the final design and manufacturing process. **-That we can get ideas about how to design and make something by looking at examples.** **- That there are existing products in the wider world that can be used as a source of inspiration for new designs.** **-Develop multiple design ideas and make a final choice on a design.** **-Annotate and label their plan with materials chosen and their properties including justifying why they have made the choices they have.**	-That a product should be designed with the specific audience/user in mind. **-That a product's ability to meet a brief is based on a balance between function and appearance.** **-That more than one idea should be evaluated to decide which would meet the brief best before moving into manufacture.** **-That function and appeal, availability of resources, time available,** cost, footprint and sustainability **should be considered when choosing the final design** (in cooking seasonality and cost to health). **-There are lots of designs in the wider world that can be used as a source of inspiration for new designs.** -That the longevity of some materials/mechanisms can be increased through reinforcing, stiffening and strengthening techniques. **-Interpret a brief into a detailed design criterion, understanding that some parts of the criteria are higher priority than others and may work against each other e.g. cost Vs availability/sustainability.** **Specific to cooking and nutrition** **-To know where food they are consuming comes from.** -That some ingredients in products that have a higher carbon footprint or lower sustainability and health benefits e.g. palm oil, high sugar. -That there are some common allergies e.g. nuts, egg, wheat, gluten that sometimes need to be factored into a design process.	**-That market research can be conducted to gain a better understanding of the factors that influence the needs of the specific user, this should be incorporated into a design.** -That a product should be designed with the specific audience/user in mind. **-That prototypes can be used to give an indication of how successful the design will be at the manufacturing stage.** **-That designs should be evaluated against the design criteria** and the success of prototypes made. **-That the appeal of a product is based on ability of a product to fulfil a specified need, appearance and cost.** **-Annotate and label their plan with materials chosen and their properties including labelling specific mechanisms or working parts using cross sectional and exploded diagrams to show specific parts of the design.** **Specific to cooking and nutrition** **-That different foods are grown, caught, reared and processed in different ways e.g. organic, farmed, wild, reared caged/uncaged, organic, processed / unprocessed.** -That seasons and climate affect food growth, but that some products are grown out of natural climates to increase yield. -Know the appropriate portion sizes for children and adults (link to geography and waste and overconsumption of resources).

				balance of the different food groups in any diet. -Know that a recipe can be adapted to change the taste, appearance and smell.	**<u>Specific to cooking and nutrition</u>** -Plan a sequence of actions to make a product (cooking) write a recipe. -That locally produced food has a lower carbon footprint and that meat farming produces carbon dioxide. -That different foods are grown, caught, reared and processed in different ways e.g. organic, farmed, wild, reared caged/uncaged, organic, processed / unprocessed. **-That different foods are grown at different times of the year, this means they are more readily available: seasonality.**		**-Be able to discuss their own lifestyle choices and the impact this has on their health.**
Famous designer/ mechanic/ architect/ engineer/inventors:		Inspiration from Nancy Johnson (Ice cream maker. Inspiration from designer Will Kurtz - life-sized moving parts animal paper mache sculptures).	Inspiration from designer Robert Sabuda (3D books with moving pictures). Inspiration fromg Maria Beasley - life raft inventor. Inspiration from John Montague (Earl of sandwich) –inventor of the Sandwich.	Inspiration from Carl Benz – car axles. Inspiration from John Boyd Dunlop- invented the first pneumatic tyre. Inspiration from Paul Hollywood – Bread Baker.	Inspiration from Henry Ford- mass car production. Inspiration from Jamie Oliver – his plight to make school dinners healthier and Marcus Rashford who campaigned to end child food poverty. Inspiration from Dame Vivienne Westwood DBE RDI English fashion designer.	Inspiration from Homan Walsh who used the kite to help build the Niagara Falls Bridge. Inspiration from the Wright brothers – inventors of the aeroplane. Inspiration from Mary Berry - Chef.	Inspiration from Tom Karen, OBE: the man that designed the Chopper bike and Marble Run. Inspiration from Thomas Edison - Phonograph, motion picture, lightbulb (also Lewis Lattimer).
Vocabulary:		uses, materials, design, join, tools, split pin, paperclip, staple purpose, function, brief, templates, mock up, raw, cooked, Vocab linked to skills taught e.g. V-fold, spring	uses, materials, design, tools, purpose, function, criteria, brief, templates, mock up, target audience, appealing, properties, criteria, vocab linked to skills taught e.g Pulley, twine, mechanism	uses, materials, design, tools, purpose, function, criteria, brief, templates, mock up, target audience, appealing, properties, suitability, annotate, design drawing, user, wider world,	**uses, materials, design, tools, purpose, function, criteria, brief, templates, mock up, target audience, appealing, properties, suitability, annotate,** reinforcing, stiffening and strengthening techniques, sustainability, footprint, allergy, organic, fair trade, farmed, wild, reared caged/uncaged, organic, processed / unprocessed,	**uses, materials, design, tools, purpose, function, criteria, brief, templates, mock up, target audience, appealing, properties, suitability, annotate,** reinforcing, stiffening and strengthening techniques, sustainability, footprint, allergy, organic, fair trade, farmed, wild, reared caged/uncaged, organic, processed / unprocessed, Beam bridge, Arch bridge, Strength, Technique, Corrugation, Lamination, Stiff, Rigid	**target audience, properties, suitability, annotate, reinforcing, stiffening and strengthening techniques,** cross section, exploded diagram **sustainability, footprint, allergy, organic, farmed, wild, reared caged/uncaged, organic, processed / unprocessed,** market research, seasonal, consumption, resources, portion,

DESIGN and TECHNOLOGY Long Term Plan

EVALUATION

National Curriculum Objectives	**See EYFS Expressive Arts and Design Progression Map**	Pupils should be taught: • Explore and evaluate a range of existing products. Evaluate their ideas and products against design criteria		Pupils should be taught: • -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			
Focus Area:		Y1 Focus: Evaluate products against a brief.	Y2 Focus: Evaluate products against the design criteria.	Y3 Focus: Evaluate strengths and weaknesses in their design.	Y4 Focus: Evaluate strengths and weaknesses in their design and manufacture.	Y5 Focus: Mid project reviews. Evaluate their product for overall appeal (e.g. functionality, appearance, cost, sustainability) as well as ability to meet design criteria.	Y6 Focus: Evaluation against cost, sustainability of materials, longevity, appearance, and whether it addresses previously identified design flaws in existing products.
Knowledge and skills:	-Know that ideas don't always work **-Use the plan, do, review model** **-Take part in a class (verbal) evaluation of a product identifying what they like about it and one thing to improve (taste, appearance)** -Identify what I like about my creation -That idea of improvement, eg by showing 2 models, noticing that one is better than the other and beginning to articulate why -Talk about their creation and how they made it -Talk about something that could be improved	**-Ideas don't always work.** -Plans can be adjusted during manufacture (if part of it doesn't work). **-Evaluate existing products and identify what is good and what features could be improved (before).** **-Evaluate if their product met the brief (after).** **<u>Specific to cooking and nutrition</u>** **-Food can be evaluated for taste.**	-That how effective a product is depends on how well it meets the brief. Evaluate existing products for how well they work in relation to their intended purpose. Identify successes and what they have learnt. Identify successes and what they have learnt. **-Explain how their product works and identify if they have met the design criteria.** Discuss reasons for any changes to initial design, including why they were needed. **<u>Specific to cooking and nutrition</u>** **-Food can be evaluated for taste and smell.**	**Evaluate how well their product meets the overall design criteria, using this to identify strengths and improvements.** Independently **change part of the design (technical skill or material) to a problem (in manufacture).** -Discuss reasons for any changes to initial design, including why they were needed. **<u>Specific to cooking & nutrition:</u>** **Food can be evaluated for, taste and appearance.**	**-Evaluate how well their product meets each part of the design criteria, using this to identify strengths and improvements in both the manufacture and the design stage.** **-That how effective a product is depends on how well it meets the brief.** **Discuss reasons for any changes to initial design, why they were needed and how they made the product better.** -That existing products all have good and bad points (flaws) and meet some parts of the design criteria better than others. **<u>Specific to cooking & nutrition:</u>** **Food can be evaluated for, appearance, texture, taste and nutritional value.**	**-Evaluate their products for overall appeal: functionality, appearance, cost, footprint and sustainability (in cooking seasonality and cost to health).** **-Evaluate the extent to which existing products meet their intended purpose.** -Independently **change part of the design (technical skill or material) to solve a problem in manufacturing.** -Identify the work of relevant designers / inventors in the creation of the original product and use this to influence their work. **<u>Explicit to cooking & nutrition:</u> For food to be appealing it needs to balance the senses: food can be evaluated for appearance, smell, taste, nutritional value and balance (sweet, sour, salty, bitter, spicy).**	**-Evaluate their product in terms of its overall appeal, factoring in: cost and sustainability of materials, longevity, appearance, and whether it addresses previously identified design flaws in existing products. (cooking: taste and balance, cost, availability sustainability, health and nutrition).** -Engage in constant review against design criteria during the manufacture of the product. -To know how technology has developed over time and how this has changed people's way of life. **<u>Specific to cooking & nutrition:</u> For food to be appealing it needs to balance the senses: food can be evaluated for appearance, smell, taste, and value for money.**
Vocabulary:	**Change, idea**	**Change, idea, improve.** See vocab for Design.	**Change, idea, improve.** See vocab for Design.	**Designer**, **flaws.** See vocab for Design.	**Designer**, **flaws,** Investigate, manufacture, extent. See vocab for Design.	**Designer**, **flaws investigate, manufacture, extent,** planned review. See vocab for Design.	**Designer**, **flaws investigate, manufacture, extent, planned review.** See vocab for Design.

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Technical manufacture of product

National Curriculum Objectives	See EYFS Expressive Arts and Design Progression Map	Pupils should be taught: • 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.	Pupils should be taught: • 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.
Focus Area:	***Textiles, resistant materials, cooking and nutrition***		

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge and skills:	-Handle equipment and tools safely and effectively - How to hold and cut with a pair of scissors -How to cut string/wool (pull tight with a friend) **To know how to carry scissors safely.** **To know how to hold scissors with thumb at the top.** **To know how to munch along the outline, turning the paper to cut round.** **To know how to trim off excess when cutting loosely.** -Use simple tools and techniques to cut, assemble and join materials -Know that materials can be joined together in different ways and that some ways are better than others **-Join materials e.g. using glue, staple, cellotape, masking tape, paperclip, split pin** **-To know how to use PVA glue.** - How to use a glue stick (pull and twist) -How to use a cellotape dispenser -Have experience of different types of materials -Select appropriate resources and say what they are going to make -Select appropriate tools and techniques needed to shape, assemble and join materials **Specific to cooking and nutrition** -That hands can carry germs and should be washed before handling food **-Wash their hands before cooking** -To cut spread and mix (food) -To identify healthy and unhealthy food **-To know some techniques and steps involved in food preparation.** **-To use utensils to chop fruit.** **-To name different fruits and vegetables.** **- To talk about the taste and texture of fruits; sweet, sour, crunchy, juicy, chewy, sticky.**	**-Handle tools safely.** -That tools (e.g. **scissors,** knives, peelers, needles) need to be handled safely. That there are safety rules associated with using each tool. -That there are some techniques that can reinforce materials (how to make materials stronger, stiffer and more stable) e.g. layering. -Know how different mechanisms work and why/when they should be used (e.g. levers, pivots). **-Make simple moving mechanisms e.g. levers.** **-Reinforce and stiffen materials e.g. using folding and layering.** **Specific to cooking and nutrition** **-That there are basic hygiene rules that should be followed when preparing food** (e.g. hands washed, hair up, apron on, sleeves rolled up). -That food can be handled in a variety of ways: stir, cut, pour, peel. -	-Know how different mechanisms work and why/when they should be used (e.g. sliders, wheels). **-Make simple moving mechanisms e.g. sliders, wheels.** -Mark in order to cut out . **-That materials can be joined together in different ways** that some methods create a more permanent joins than others (e.g. temporary: paperclips, tape, permanent: glue, staples, running stitch) -That there are some techniques that can reinforce materials (how to make materials stronger, stiffer and more stable) e.g. folding **-Assemble, join and combine materials and components** **Specific to cooking and nutrition** **-That there are basic hygiene rules that should be followed when preparing food** (e.g. hands washed, hair up, apron on, sleeves rolled up). -That food can be handled and measured in a variety of ways: spreading, grating (cheese) and using non-standard measurements. -That tools (e.g. knives and peelers) need to be handled safely. That there are safety rules associated with using each tool.	**-Tools need to be handled safely. There are safety rules associated with using each tool** (cookers, knife, grating). -Know how different mechanisms work and why/when they should be used (**e.g. axles**, pneumatics). **-Measure and mark in cm using a ruler.** **-That materials can be joined together in different ways e.g. glue, staple, pin** (sewing and allowing for tabs to assist with joins e.g. for the net of a 3D shape). **Specific to cooking and nutrition** **-That there are basic hygiene rules that should be followed when preparing food (e.g. hands washed, hair up, apron on, sleeves rolled up).** -That food can be cooked in a variety of ways, but a heat source is always required (baking linked to predominantly **savoury dishes).** -That a basic recipe can be altered, kneaded (bread), baked and measured using standard measures to weigh.	**-Tools need to be handled safely. There are safety rules associated with using each tool** (needles, pins and scissors suitable for different materials). -Know how different mechanisms work and why/when they should be used (**e.g.** pivots, linkages and hinges). **-Use one type of stitch to join two pieces of material.** -That there are different types of stitches each technique has advantages and disadvantages that should be considered when choosing which to use, which affects when they should be used (e.g. overstitch, running stitch, blanket stitch). **Specific to cooking and nutrition** **-That there are basic hygiene rules that should be followed when preparing food (e.g. hands washed, hair up, apron on, sleeves rolled up).** -That food can be cooked in a variety of ways, but a heat source is always required (baking linked to predominantly **savoury dishes).** -That food can be made into breadcrumbs by rubbing through fingers, slicing.	**-Tools need to be handled safely. There are safety rules associated with using each tool: needles, cookers,** e.g. junior hack saws, wood glue, fabric glue. -That there are some techniques that can reinforce materials (how to make materials stronger, stiffer and more stable) **such as layering and folding** using reinforcing strips and triangles. **-Add reinforcements to joins in order to create a stronger structure.** **-**That for some materials, certain adhesives are more effective than others. **Specific to cooking and nutrition** **-That there are basic hygiene rules that should be followed when preparing food including the handling of raw foods.** -That some foods can be substituted with alternative ingredients. e.g. sugar/honey. -Understand the need for correct storage of different types of food.	**-Tools need to be handled safely. There are safety rules associated with using each tool: needles, cookers,** e.g. strong adhesives, craft knives / craft scissors, pliers and wire cutters to cut and mould wire. **-Make something move using cams, axles and / or electric circuits.** -Know how different mechanisms work and why/when they should be used (e.g. **levers, sliders, wheels, axles, pivots, pneumatics, linkages and hinges** gears, pulleys, cams). -Understand and use electrical systems in their products. **Specific to cooking and nutrition** **-Measure ingredients accurately.** **-That there are basic hygiene rules that should be followed when preparing food including the handling of raw foods.** -That food can be cooked in a variety of ways: boil, sauté, fry, steam, and there are safety precautions that need to be taken. -Understand the need for correct storage of different types of food. -That garnishes can make food more attractive. -That raw food sometimes has additional hygiene rules linked to food preparation (e.g. raw meat) **NB: raw meat does now have to be included in recipes to teach this.**
Vocabulary:	join, tools, split pin, paperclip, staple, materials, blu-tac, scissors, stir, cut, pour, shape, spread	**Mix, stir, cut, pour, shape, spread** sieve, slice, squeeze grate and peel.		**Mix, stir, cut, pour, shape, spread sieve, slice, squeeze grate and peel,** rolling, measure, weigh, overstitch, running stitch, blanket stitch.		**Mix, stir, pour, shape, spread sieve, slice, squeeze grate and peel, rolling, measure, weigh, overstitch, running stitch, blanket stitch,** glue gun, craft knife, adhesive, dice, boiling, sauté, fry, steam.	