Long Term Plan: Design and Technology

Through a variety of creative and practical activities, our pupils will be taught the knowledge, understanding and skills needed to engage in the process of designing, making and evaluating. Where possible, cross curricular links will be made, giving a purpose and relevance to the products the children will make. Currently available products will be investigated first, to give children a base from which to start. As production develops, the children will learn how to take risks and will become resourceful, innovative, enterprising and capable citizens. This is particularly important in our ever-changing world and our children will be encouraged to think about sustainability, environmentally friendly materials and opportunities for reusing and recycling.

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.

Annfield Plain Junior School each year group will aim to complete 3 Design and Technology units, one of which will be food technology. *Note: Year 6 will only complete an Autumn and Summer unit due to SATs.

		Autumn	Spring	Summer
YEAR 3	Topic/ No of lessons	Textiles & Digital World (Packaging)	Food Technology (Making a Smoothie)	Mechanical Systems (Moving Vehicles)
	Key vocabulary	purpose, function, user, client, product, material, packaging, tools, material, research, design, make, prototype, evaluate, measure, net, template, join, tabs, fold, logo	design specification, innovation, research, evaluate, cut, chop, slice, blend, fruit vocabulary, taste, sweet, sour	axle, input, linkage, output, pivot, wheel, design, make, prototype, evaluate, join, material
	Key knowledge and skills	Children should: • Generate realistic ideas through discussion and design criteria for an appealing functional product fit for purpose and specific user/s. • Research existing products. • Produce annotated sketches, prototypes, final product sketches and pattern pieces. •Plan the main stages in making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. • Select fabrics, materials and fastening according to their functional characteristics e.g. strength, and aesthetic qualities. • Investigate a range of 3D products relevant to the project. • Test their product against the original design criteria with the intended user. • Consider other's views. • Understand how a key event/individual has influenced the development of the chosen product and/or fabric. • Know how to strengthen, stiffen and reinforce existing fabrics/materials. • Understand how to securely join two pieces of fabric/material together.	Children should: • Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. • Use annotated sketches and appropriate ICT, such as web- based recipes, to develop and communicate ideas. • Research and taste a range of smoothies to help generate ideas. • Develop basic kitchen skills. • Develop an awareness for food health, hygiene and safety.	Children should: • 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. • 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 • Explore and evaluate a range of existing products. • Evaluate their ideas and products against design criteria. • Explore and use mechanisms.

		• To know technical vocabular relevant to the project. • To understand the impact of the digital revolution in the world of (D&T) product design. • To design a display badge and/or logo using CAD (computeraided design) software for a new product.		
	Working as a Design Developer/ Technician/Food Technologist	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail. • complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning. • communication (written and verbal). • empathy for users. • teamwork.	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail. • complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning. • communication (written and verbal). • empathy for users. • Teamwork.	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail. • complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning. • communication (written and verbal). • empathy for users. • teamwork.
	Pre and post assessment	Pre-assessment APJS Skills chart Q. Which skills will we use? Q. What do we already know that might help us in this unit?	Pre-assessment APJS Skills chart Q. Which skills will we use? Q. What do we already know that might help us in this unit?	Pre-assessment APJS Skills chart Q. Which skills will we use? Q. What do we already know that might help us in this unit?

		Post-assessment Photograph of final design/product Evaluation feedback (self and peer)	**Post-assessment** Photograph of final design/product Evaluation feedback (self and peer)	**Post-assessment** Photograph of final design/product Evaluation feedback (self and peer)
	Links with other subjects	Maths -3D nets Art – drawing, sketching, logos, word art P4C- Always, Sometimes, Never -The plastic bag is a great invention. ICT – logo design	Literacy – writing instructions Science- Healthy Eating	Science – Forces Art/P4C – Design a car of the future
	Possible resources/ websites	Kid's Product Packaging Ideas - 223+ Best Kid's Packaging Designs In 2023 | 99designs Plastic carrier bags: Why they were meant to save the planet - BBC News	Smoothie bike	The history of vehicles to modern electric cars History of the automobile Facts for Kids (kiddle.co) YouTube videos

		Autumn	Spring	Summer
YEAR 4	Topic/ No of lessons	Textiles (Christmas Decoration/Cushions)	Food Technology (Making Pizza)	Structures (School of the Future)
	Key vocabulary	design specification, innovation, research, evaluate, decorate, fabric, join, stich	Ingredients, dough, yeast, flour, toppings, carbohydrate, protein, vitamins, nutrients, healthy, varied, knead, prove, design specification, innovation, research, evaluate	Structure, design criteria, equipment, building, landscape features, eco-friendly, energy saving, solar panels, reduce, re use, recycle, design specification, innovation, research, evaluate
	Key knowledge and skills	**Pupils should be taught to:** • 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	**Pupils should be taught to:** •Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. •Explore initial ideas, and make design decisions to develop a final product linked to user and purpose.	**Pupils should be taught to:** •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

		diagrams, prototypes, pattern pieces and computer- aided design. • 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. • 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.	•Use words, annotated sketches and ICT as an appropriate method to communicate ideas. •Write a step-by-step recipe, including a list of ingredients, equipment, utensils. •Select and use appropriate utensils and equipment accurately to measure and combine ingredients. •Make, decorate and present the food product appropriately for the intended user and purpose. •Carry out sensory evaluations of a range of relevant products and ingredients. Record and evaluate using tables/charts/graphs etc. •Evaluate the final product with reference back to the design brief and design specification, considering the views of others when identifying improvements. •Understand the history behind the product and how this has changed over time. •Know how to use utensils and equipment (including heat sources) to prepare and cook food. •Have an awareness of food hygiene, health and safety.	exploded diagrams, prototypes, pattern pieces and computer- aided design. • 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. • 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. • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
	Working as a Design Developer/ Technician/Food Technologist	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail.	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail.	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail.

		• complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning. • communication (written and verbal). • empathy for users. • teamwork.	• complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning. • communication (written and verbal). • empathy for users. • teamwork.	• complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning. • communication (written and verbal). • empathy for users. • Teamwork.
	Pre and post assessment	**Pre-assessment** APJS Skills chart Q. Which skills will we use? Q. What do we already know that might help us in this unit? **Post-assessment** Photograph of final design/product Evaluation feedback (self and peer)	**Pre-assessment** APJS Skills chart Q. Which skills will we use? Q. What do we already know that might help us in this unit? **Post-assessment** Photograph of final design/product Evaluation feedback (self and peer)	**Pre-assessment** APJS Skills chart Q. Which skills will we use? Q. What do we already know that might help us in this unit? **Post-assessment** Photograph of final design/product Evaluation feedback (self and peer)
	Links with other subjects	History – Ancient Egypt Art – clay/sculpture	Literacy and Geography – Study of Sicily in Italy P4C – Q. Does Pineapple belong on pizza?	Science – biodiversity
	Possible resources/ websites	History KS2: The afterlife in Ancient Egypt - BBC Teach https://www.twinkl.co.uk/	Sicily - Kids | Britannica Kids | Homework Help History of pizza Facts for Kids (kiddle.co) 20 Fun facts about Pizza - Interesting facts about Pizza - Life in Italy	

		Autumn	Spring	Summer
YEAR 5	Topic/ No of lessons	Mechanical Systems (Pop Up Book/Toy)	Food Technology (Alternative Packed Lunch)	Structures (Playgrounds)
	Key vocabulary	Input, motion, mechanism, reinforce, model, design specification, innovation, research, evaluate, cam, leaver, join, move, turn	Eatwell plate model, names of food groups, balanced diet, names of different breads (wraps, bagels, rolls etc), alternatives to crisps, low sugar cakes, names of different protein fillings and fruit or vegetables that can be added, names of tools used in preparation, vocabulary related to health, hygiene and safety	structure, design criteria, equipment, joins, corners, triangular, design specification, innovation, research, evaluate
	Key knowledge and skills	Pupils should be taught to: • 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. • 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 • Select from and use a wider range of tools and equipment to perform practical tasks [for	Pupils should be taught to: •Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. •Explore initial ideas, and make design decisions to develop a final product linked to user and purpose. •Use words, annotated sketches and ICT as an appropriate method to communicate ideas. •Write a step-by-step recipe, including a list of ingredients, equipment, utensils. •Select and use appropriate utensils and equipment accurately to measure and combine ingredients.	Pupils should be taught to: •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. • 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

		example, cutting, shaping, joining and finishing], accurately. • 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 and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].	•Make, decorate and present the food product appropriately for the intended user and purpose. •Carry out sensory evaluations of a range of relevant products and ingredients. Record and evaluate using tables/charts/graphs etc. •Evaluate the final product with reference back to the design brief and design specification, considering the views of others when identifying improvements. •Understand the history behind the product and how this has changed over time. •Know how to use utensils and equipment (including heat sources) to prepare and cook food. •Have an awareness of food hygiene, health and safety.	ingredients, according to their functional properties and aesthetic qualities. • 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. • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
	Working as a Design Developer/ Technician/Food Technologist	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail. • complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning. • communication (written and verbal).	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail. • complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning.	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology. • the ability to come up with new ways of doing things. • to be thorough and pay attention to detail. • complex problem-solving skills. • persistence and determination. • maths skills. • the ability to think clearly using logic and reasoning. • communication (written and verbal).

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	Links with other subjects	Science – Forces History - Victorians	Science Healthy Eating Life Skills- Health and Fitness Week	Science – Electricity
	Possible resources/ websites			

		Autumn	Spring	Summer
YEAR 6	Topic/ No of lessons	**Food Technology – Christmas Cakes**		**Structures – Bridges**
	Key vocabulary	Ingredients, bake, mix, combine, decorate, preserve, design specification, innovation, research, evaluate		structure, design criteria, equipment, joins, corners, triangular, design specification, innovation, research, evaluate
	Key knowledge and skills	**Pupils should be taught to:** •Generate innovative ideas through research and discussion with peers and adults to develop		**Pupils should be taught to:** •Use research and develop design criteria to inform the design of innovative, functional,

		a design brief and criteria for a design specification. •Explore initial ideas, and make design decisions to develop a final product linked to user and purpose. •Use words, annotated sketches and ICT as an appropriate method to communicate ideas. •Write a step-by-step recipe, including a list of ingredients, equipment, utensils. •Select and use appropriate utensils and equipment accurately to measure and combine ingredients. •Make, decorate and present the food product appropriately for the intended user and purpose. •Carry out sensory evaluations of a range of relevant products and ingredients. Record and evaluate using tables/charts/graphs etc. •Evaluate the final product with reference back to the design brief and design specification, considering the views of others when identifying improvements. •Understand the history behind the product and how this has changed over time. •Know how to use utensils and equipment (including heat sources) to prepare and cook food. •Have an awareness of food hygiene, health and safety.		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. • 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. • 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. • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
	Working as a Design Developer/ Technician/Food Technologist	Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology.		Children will need/develop: • design skills and knowledge. • knowledge of engineering science and technology.

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	Links with other subjects	History – World War rationing Victorian P4C – It is important to keep old traditions important.		
	Possible resources/ websites	Christmas cake Facts for Kids (kiddle.co)		Bridges around the World Picture PowerPoint (teacher made) (twinkl.co.uk) Bridge Facts for Kids (kiddle.co)