



## Fitzwilliam Primary School Design and Technology Progression Grid 2024-25

### Aims and Intent

“Design and Technology is a phenomenally important subject. Logical, creative and practical, it’s the only opportunity students have to apply what they learn in maths and science - directly preparing them for a career in engineering. Policy-makers must recognise design and technology’s significance for the UK economy and strive not just to preserve it – but to ensure it appeals to the brightest of young minds.”

*James Dyson, Design and Technology Association Patron.*

Design and Technology (DT) is a subject that brings together learning and experiences from three main areas:

- 1. Creative and original thinking:** children are encouraged to use their problem-solving skills and imagination, and to feel confident in taking their own original ideas from conception to reality when designing and making their products.
- 2. Practical skills:** children are taught the skills needed in order to successfully create appealing and functional products. They will develop these skills as they progress through school.
- 3. Scientific and mathematical knowledge:** children are taught that ‘technology’ means using what we know about science to make useful things. They are encouraged to see the links between what they may have learnt in Science or Maths and what they can design and create in DT.

When delivering the DT curriculum, teachers aim to expose children to a variety of real-world contexts, by learning about influential designers of past and present, and exploring case studies which show how key designers and key moments in design have impacted upon the world we live in. Through this, DT is brought to life and placed in a meaningful context which aims to not only help children know, remember and understand more, but also to encourage our young people to begin to imagine and consider further learning or careers in STEM fields.

At Fitzwilliam Primary School, through our teaching of Design and Technology we aim to:

- Develop imaginative and creative thinking in children, and encourage them to have the confidence to bring their ideas to life.
- Teach and develop the practical skills that children will need in order to successfully make appealing and functional products.
- Encourage and guide children in thinking critically about both existing products and their own work, in order to form their own opinions, and evaluations, and to learn from others’ work and their own successes and failures.
- Expose children to key designers and design case studies, in order to understand the role and impact of design and technology on the world in which we live, and to consider the future learning and career opportunities within these fields.
- Encourage children to use what they have learnt in Science and Maths to inform their approach to designing and making in DT, and to understand that this is what real-life designers do.

Children complete three DT projects in each year group. Each project will follow the DT process of:

- Research (including Existing Product Research, Skills Research and Focus Designer/Case Study Research)
- Design
- Make
- Evaluate

The Scheme of Work has been designed by the subject leader in order to ensure an appropriate variety of project types (within the categories of Construction, Textiles and Food Technology) are covered throughout school, and that progression is evidenced within these different strands. Construction is the widest category, and covers the designing and making of different types of structure, mechanisms and electrical systems. Food technology is taught once per year, and Textiles is taught in Years 2, 3 and 5. See the whole school overviews below for further details.

Whole School Summary Overview			
	AUTUMN	SPRING	SUMMER
<b>Nursery</b>	<b>CONSTRUCTION:</b> Structures Brief: To design and make a diya to help someone celebrate Diwali.	<b>CONSTRUCTION:</b> Structures Brief: To design and make an Easter basket to hold a small Easter egg.	<b>FOOD TECHNOLOGY</b> Brief: To design and make a fruit salad to be enjoyed by children in Nursery.
<b>Reception</b>	<b>CONSTRUCTION:</b> Structures Brief: To design and make a Christmas decoration to give to a family member.	<b>CONSTRUCTION:</b> Structures Brief: To design and make a picture frame to display a special picture.	<b>FOOD TECHNOLOGY</b> Brief: To design and make a fruit smoothie to be enjoyed by children in Reception.
<b>Year 1</b>	<b>CONSTRUCTION:</b> Mechanisms Brief: To design and make a moving picture Christmas Card to give to a family member.	<b>FOOD TECHNOLOGY</b> Brief: To design and make a topped pancake to celebrate Pancake Day.	<b>CONSTRUCTION:</b> Structures Brief: To design and make a bridge to help the Three Billy Goats Gruff escape from the Troll.
<b>Year 2</b>	<b>FOOD TECHNOLOGY</b> Brief: To design and make a healthy 'World Kitchen' wrap for the school lunch menu.	<b>CONSTRUCTION:</b> Structures Brief: To design and make a boat to help someone escape from the Great Fire of London.	<b>TEXTILES</b> Brief: To design and make a flag for an explorer.
<b>Year 3</b>	<b>TEXTILES</b> Brief: To design and make a fabric Christmas tree decoration, to be given to a family member as a gift.	<b>CONSTRUCTION:</b> Mechanisms Brief: To design and make a moving monster puppet for a young child.	<b>FOOD TECHNOLOGY</b> Brief: To design and make a Chinese stir-fry noodle dish, for Year 3 pupils to enjoy.
<b>Year 4</b>	<b>CONSTRUCTION:</b> Structures Brief: To design and make the packaging for a new confectionary product, to be sold in supermarkets.	<b>FOOD TECHNOLOGY</b> Brief: To design and make a pizza, using traditional Italian ingredients, for Year 4 pupils to enjoy.	<b>CONSTRUCTION:</b> Electrical Systems Brief: To design and make a decorative light box for a Year 4 child.
<b>Year 5</b>	<b>FOOD TECHNOLOGY</b> Brief: To design and make a Mexican street food dish which could be eaten at a Christmas party.	<b>CONSTRUCTION:</b> Structures Brief: To design and make a mini greenhouse to be used in the school quad.	<b>TEXTILES</b> Brief: To design and make a small bag to store a phone or wallet, for a Year 5 child to use.
<b>Year 6</b>	<b>CONSTRUCTION:</b> Mechanisms Brief: To design and make a marble run to be played with by primary school-aged children.	<b>CONSTRUCTION:</b> Electrical Systems Brief: To design and make a carousel for a funfair company, which can be controlled by a computer program.	<b>FOOD TECHNOLOGY</b> Brief: To design and make a barbequed kebab, for Year 6 children to enjoy at their leavers party.

## Whole School Curriculum Overview

Whole School Curriculum Overview			
Nursery	<b>EYFS Area of Learning – Expressive Arts and Design</b> <b>Babies, toddlers and young children will be learning to:</b> <ul style="list-style-type: none"> <li>• Explore different materials, using all their senses to investigate them.</li> <li>• Manipulate and play with different materials. • Use their imagination as they consider what they can do with different materials.</li> <li>• Make simple models which express their ideas</li> </ul> <b>3 and 4 year olds will be learning to:</b> <ul style="list-style-type: none"> <li>• Explore different materials freely, in order to develop their ideas about how to use them and what to make.</li> <li>• Develop their own ideas and then decide which materials to use to express them.</li> <li>• Join different materials and explore different textures.</li> <li>• Create closed shapes with continuous lines, and begin to use these shapes to represent objects.</li> </ul>		
	Autumn	Spring	Summer
	<b>CONSTRUCTION: Structures</b> Brief: To design and make a diya to help someone celebrate Diwali.  <b>Key Vocab</b> designer materials join  <b>Key Knowledge</b> A design is a drawing of what you are going to make. It's a good idea to create a design so that you can plan what you are going to do. Your work might turn out better if you have made a plan. Materials are the things you will use to make your product, for example paper, string, wood, card, dough. Joining means sticking two things together. We can use things like glue, tape, paper clips and string to join things.  <b>Skills to learn/improve</b> drawing; shaping dough; cutting; joining	<b>CONSTRUCTION: Structures</b> Brief: To design and make an Easter basket to hold a small Easter egg.  <b>Key Vocab</b> design handle join test  <b>Key Knowledge</b> It's a good idea to create a design so that you can plan what you are going to do. Your work might turn out better if you have made a plan. A basket is a container with a handle. It can hold something and help you carry it. There are different ways to can we fasten a handle onto our basket, we need to choose the strongest. [Investigate different ways of joining - glue, tape, elastic bands, paper clips, staples etc.] We can test our basket by placing an egg inside and trying to pick it up! If your handle is strong it won't break!  <b>Skills to learn/improve</b> drawing; cutting; joining	<b>FOOD TECHNOLOGY</b> Brief: To design and make a fruit salad to be enjoyed by children in Nursery.  <b>Key Vocab</b> design healthy chop peel  <b>Key Knowledge</b> Healthy food helps us to grow, feel good and have lots of energy A fruit salad contains lots of different fruits, so it's really healthy. When we cut food we need a knife and a chopping board. We need to work safely, keeping fingers out of the way, working slowly, watching carefully what we are doing.  <b>Skills to learn/improve</b> Cutting fruit
Reception	<b>EYFS Area of Learning - Physical Development</b> <b>ELG: Fine Motor Skills</b> Children at the expected level of development will: <ul style="list-style-type: none"> <li>- Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases;</li> <li>- Use a range of small tools, including scissors, paint brushes and cutlery;</li> <li>- Begin to show accuracy and care when drawing.</li> </ul> <b>EYFS Area of Learning - Expressive Arts and Design</b> <b>ELG: Creating with Materials</b> Children at the expected level of development will: <ul style="list-style-type: none"> <li>- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function;</li> <li>- Share their creations, explaining the process they have used;</li> </ul>		
	Autumn	Spring	Summer
	<b>CONSTRUCTION: Structures</b> Brief: To design and make a Christmas decoration to give to a family member.  <b>Key Vocab</b>	<b>CONSTRUCTION: Structures</b> Brief: To design and make a picture frame to display a special picture.  <b>Key Vocab</b> design designer picture frame saw join	<b>FOOD TECHNOLOGY</b> Brief: To design and make a fruit smoothie to be enjoyed by children in Reception.  <b>Key Vocab</b>

	<p>design designer materials tools join</p> <p><b>Key Knowledge</b> A designer is someone who decides on something that they want to make, then draws a picture of it, then makes it. Designers use their imagination and have to try and solve problems. When we do DT we are all designers! Materials are the things you will use to make your product, such as paper, wood and straws. Tools help you to do something, like scissors help you to cut and a pencil helps you to draw. We can use different joining materials to join things together, like glue, tape, paper clips and string. You need to think about which joining material will work best for your product, to ensure it is strong and won't come apart.</p> <p><b>Skills to learn/improve</b> drawing; cutting; joining</p>	<p><b>Key Knowledge</b> It's a good idea to create a design so that you can plan what you are going to do. Your work might turn out better if you have made a plan. A designer is someone who decides on something that they want to make, then draws a picture of it, then makes it! Designers use their imagination and have to try and solve problems. When we do DT we are all designers! A picture frame is used to hold a picture or photo, so you can display it. It keeps the picture safe and makes it look nice. Some picture frames have decoration on them. To saw wood safely, we need to use a bench hook to hold the wood securely. You need to push the wood into the bench hook with one hand, and saw with the other. You don't need to press too hard with the saw, use a gentle sweeping motion. You must make sure your fingers are nowhere near the saw blade. [Adult will model/supervise]. Wood can be joined neatly and securely using cardboard triangles and PVA glue.</p> <p><b>Skills to learn/improve</b> drawing; cutting; joining; measuring</p>	<p>design healthy ingredients blend</p> <p><b>Key Knowledge</b> Healthy food helps us to grow, feel good and have lots of energy A fruit smoothie contains lots of different fruits and other healthy ingredients, so it's really healthy. Ingredients are the different food items we need to make our finished product. When we cut food we need a knife and a chopping board. We need to work safely, keeping fingers out of the way, working slowly, watching carefully what we are doing. To blend the ingredients we will use a blender, which will make them into a smooth drink.</p> <p><b>Skills to learn/improve</b> Measuring; chopping fruit</p>
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#### National Curriculum – KS1

##### **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**

- explore and use mechanisms [for example, levers, sliders, wheels and axels], in their products

Year 1	Autumn	Spring	Summer
	<p><b>CONSTRUCTION: Mechanisms</b> Brief: To design and make a moving picture Christmas Card to give to a family member.</p> <p><b>Key Vocab</b> designer brief product mechanism lever slider pivot</p> <p><b>Key Knowledge</b> A mechanism is something with moving parts that do something. In a moving picture, some parts of the picture have mechanisms which let them move. This brings the picture to life. A lever is a stick or long piece of card, which is fixed to the background with a split pin. The pin lets it turn around - this turning point is called a pivot. A moving part on a lever mechanism will move in a circular or an arch shape.</p>	<p><b>FOOD TECHNOLOGY</b> Brief: To design and make a topped pancake to celebrate Pancake Day.</p> <p><b>Key Vocab</b> designer brief product recipe crêpe Scotch pancake batter whisk</p> <p><b>Key Knowledge</b> A pancake is a thin, flat cake which is made from batter and fried in a pan. It can be served with sweet or savoury toppings. A crêpe is a very thin pancake but a scotch pancake is thicker and fluffier. Crêpes tend to be larger in size, whereas scotch pancakes are quite small. Batter is a runny mixture of flour, eggs and milk, which is used to make pancakes. Scotch pancake batter has baking powder in it, to</p>	<p><b>CONSTRUCTION: Structures</b> Brief: To design and make a bridge to help the Three Billy Goats Gruff escape from the Troll.</p> <p><b>Focus Designer/Design Case Study</b> Isambard Kingdom Brunel – civil engineer</p> <p><b>Key Vocab</b> designer brief product bridge structure support stable engineer</p> <p><b>Key Knowledge</b> A structure is a building or other object that has been built by people, and it can stand up by itself. A bridge is a structure that is used to help people or vehicles to cross over something like a river or road.</p>

	<p>A slider is a mechanism which can move up and down or from left to right in a straight line. A slit is cut in the background, then a picture on a stick is inserted, which can slide back and forth along the slit.</p> <p><b>Skills to learn/improve</b> Cutting (inc. cutting a slit); drawing; making a hole in paper safely; using a split pin</p> <p><b>STEM Curriculum Links</b> Maths – shape Science – levers and pivots</p>	<p>make the pancakes rise, whereas crêpe batter doesn't, so it makes a flatter pancake. Whisking means mixing ingredients together quickly using an action that lets some air get into it, to make the mixture lighter. A whisk is the best tool to use for this. We need to follow food hygiene and safety rules when preparing food. Food hygiene means working in a safe, clean way that stops germs and bacteria from getting onto food when you are preparing it. Good food hygiene is important so that people don't get ill from eating your food. Safety rules are important so that you don't hurt.</p> <p><b>Skills to learn/improve</b> Weighing; whisking, pouring; chopping</p> <p><b>STEM Curriculum Links</b> Maths – weights and measures Science – states of matter</p>	<p>An engineer is a person who designs and makes engines, machines or structures. Engineers are very creative and they need to know a lot about Science and Maths. Bridges are designed by people called civil engineers. Isambard Kingdom Brunel was a very talented and famous engineer who lived and worked in Britain 200 years ago You will be a civil engineer when you design and make your bridge! To support means to hold something's weight. You will need supports to hold up your bridge and also to hold the weight of the billy goats! Your supports will act like legs for the top part of your bridge. If something is stable it means that it doesn't fall or tip over. You will need to make sure that your bridge is stable so it stays standing up and doesn't fall into the river!</p> <p><b>Skills to learn/improve</b> Drawing; cutting, joining, strengthening</p> <p><b>STEM Curriculum Links</b> Maths - Geometry</p>
<b>Year 2</b>	<p><b>Autumn</b></p> <p><b>FOOD TECHNOLOGY</b> Brief: To design and make a healthy 'World Kitchen' wrap for the school lunch menu.</p> <p><b>Focus Designer/Design Case Study</b> Jamie Oliver (chef)</p> <p><b>Key Vocab</b> brief product user chef ingredients food hygiene healthy balanced</p> <p><b>Key Knowledge</b> Jamie Oliver is a famous British chef who has worked in lots of different restaurants, and even has some restaurants of his own. He has also written lots of cookery books and been on TV shows, helping other people learn how to cook. Jamie Oliver saw that lots of schools were serving unhealthy junk food to children for their school dinners. He worked hard trying to make changes to school dinners for children across the UK, to ensure that the food served was healthy and balanced, so that school children would be healthier and feel happier and more energetic at school. A balanced diet means eating foods from different food groups, such as carbohydrates, proteins, dairy and fruit and vegetables. It is important to eat a variety of foods and not just the same food/food group all the time. To create a balanced meal, choose foods from different food groups. Food hygiene means working in a safe, clean way that stops germs and bacteria from getting onto food when you are preparing it, so that people don't get ill from eating your food. Safety rules are important so that you don't hurt yourself or others when preparing food.</p>	<p><b>Spring</b></p> <p><b>CONSTRUCTION: Structures</b> Brief: To design and make a boat to help someone escape from the Great Fire of London.</p> <p><b>Focus Designer/Design Case Study</b> Isambard Kingdom Brunel - ship designer</p> <p><b>Key Vocab</b> brief product user engineer hull float buoyant water-proof</p> <p><b>Key Knowledge</b> Isambard Kingdom Brunel was a very talented and famous engineer who lived and worked in Britain 200 years ago. An engineer is a person who designs and builds useful things like machines or structures. He designed tunnels, bridges and railways. He also designed huge ships which sailed all over the world. His designs helped people and changed Britain. The hull is the main body of a boat – the bottom/sides/deck. Boats need to float, they need to be stable, some have sails, some have oars, they have places for people/cargo etc. In order to make sure our boats are buoyant and waterproof, we will need to conduct an experiment to test out different materials and find the best ones for the job.</p> <p><b>Skills to learn/improve</b> Drawing; cutting; joining; strengthening</p> <p><b>STEM Curriculum Links</b> Science – materials, buoyancy</p>	<p><b>Summer</b></p> <p><b>TEXTILES</b> Brief: To design and make a flag for an explorer.</p> <p><b>Focus Designer/Design Case Study</b> Orla Kiely (Textile Designer)</p> <p><b>Key Vocab</b> brief product user needle thread running stitch pattern piece applique</p> <p><b>Key Knowledge</b> A textile designer designs things made of fabric. They might design the pattern that is put on the fabric as well. A textile designer may design things like clothes, bags, cushions, tea towels, curtains, blankets – anything you use that is made out of fabric Orla Kiely is a textile designer who comes from Ireland but lives in London, in England. She is 58 years old. She studied Art and Design at university, and now she is a very successful textile designer. She designs things like bags, bedsheets and cushions, and you can buy her products in lots of shops or on the internet. She has a very memorable style, which uses bright colours and simple, repeating shapes. Applique means making a pattern/picture on fabric by sewing on other fabric pieces. A pattern piece is a paper template which is used to then cut out fabric pieces. Running stitch is a simple way of stitching, where the stitches go in a straight line, without overlapping, with a small gap between each stitch.</p> <p><b>Skills to learn/improve</b> Drawing; cutting; threading a needle; tying a knot, sewing</p>

	<b>Skills to learn/improve</b> Chopping; slicing; filling and folding a wrap; food hygiene basics		<b>STEM Curriculum Links</b> Maths - Shape
	<b>STEM Curriculum Links</b> Maths – weights and measures      Science – food hygiene		
<b>National Curriculum – KS2</b> <b>Design</b> <ul style="list-style-type: none"> <li>• 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</li> <li>• generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</li> </ul> <b>Make</b> <ul style="list-style-type: none"> <li>• select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</li> <li>• 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</li> </ul> <b>Evaluate</b> <ul style="list-style-type: none"> <li>• investigate and analyse a range of existing products</li> <li>• evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</li> <li>• understand how key events and individuals in design and technology have helped shape the world</li> </ul> <b>Technical knowledge</b> <ul style="list-style-type: none"> <li>• apply their understanding of how to strengthen, stiffen and reinforce more complex structures</li> <li>• understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]</li> </ul>			
<b>Year 3</b>	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>
	<b>TEXTILES</b> Brief: To design and make a fabric Christmas tree decoration, to be given to a family member as a gift.  <b>Focus Designer/Design Case Study</b> Japanese Kawaii Style  <b>Key Vocab</b> brief product user Kawaii pattern piece whip stitch stuffing component  <b>Key Knowledge</b> Kawaii means ‘cute’ in Japanese. It has become a popular style in Japan and across the world, and Kawaii characters can be found in cartoons, toys, games and on clothing and accessories. Kawaii characters usually have bright colours, simple shapes, large heads, wide-set eyes and button noses/small mouths. A pattern piece is a paper template which is used to then cut out fabric pieces. Textile components are things which can be added onto textile products, e.g. zips, buttons, poppers, ribbon. Some are for decoration and some have a function. Whip stitch is often used for closing up the sides of something. The needle is passed in and out of the fabric creating looped stitches that circle the edges of the fabric pieces being joined.  <b>Skills to learn/improve</b> drawing; cutting; threading a needle; tying a knot; sewing; inserting stuffing  <b>STEM Curriculum Links</b> Maths – length, shape, symmetry	<b>CONSTRUCTION: Mechanisms</b> Brief: To design and make a moving monster puppet for a young child.  <b>Focus Designer/Design Case Study</b> Jim Henson (puppeteer)  <b>Key Vocab</b> brief product user mechanism puppeteer lever fixed pivot loose pivot  <b>Key Knowledge</b> Jim Henson was an American puppeteer who died in 1990 aged 53. He started making puppets while he was at high school. He designed some very famous puppets which were on TV shows and in films – Fraggle Rock, Sesame Street and The Muppets. His puppets were mostly monsters and were brightly coloured and textured. A mechanism is used to create movement in a toy. The moving parts bring life to a toy and make it more interesting for children to play with. A lever is a rigid bar which moves around a pivot point. A fixed pivot secures the lever to the back piece, however a loose pivot is only secured to the lever, therefore it has increased movement.  <b>Skills to learn/improve</b> Drawing; cutting; joining; making a hole  <b>STEM Curriculum Links</b> Science – levers and pivots (forces)	<b>FOOD TECHNOLOGY</b> Brief: To design and make a Chinese stir-fry noodle dish, for Year 3 pupils to enjoy.  <b>Focus Designer/Design Case Study</b> Ken Hom (chef)  <b>Key Vocab</b> brief product user chef wok stir fry noodles slice  <b>Key Knowledge</b> Ken Hom is a Chinese-American chef, who is famous for cooking Chinese cuisine. He is 71 years old and has appeared on television and written many cookery books. Noodles are an essential Chinese staple food. The most common type are made from wheat flour and are called ‘miàn’ or ‘mein’ in English. A wok is a large round-bottomed pan that originated in China. It is often used with long-handled cooking utensils, as high heats are used when cooking in a wok. Stir frying is a method of cooking that involves frying food in oil quickly, over a high heat.  <b>Skills to learn/improve</b> Chopping/slicing food; frying  <b>STEM Curriculum Links</b> Maths – weights and measures
<b>Year 4</b>	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>

Year 5	<p><b>CONSTRUCTION: Structures</b> Brief: To design and make the packaging for a new confectionary product, to be sold in supermarkets.</p> <p><b>Focus Designer/Design Case Study</b> Iconic food packaging</p> <p><b>Key Vocab consumer</b> shelf-appeal graphic design net score computer-aided design (CAD)</p> <p><b>Key Knowledge</b> Package design is the creation of a container or wrapper for a product to be sold in. A package designer needs to think about the material, shape and decoration used on the packaging. Graphic design is the text and pictures found on things such as adverts, labels and packaging. Shelf-appeal means that a product stands out when you see it on the shelf in a shop: it looks appealing so consumers want to buy it, rather than a different product. Designers need to consider shelf appeal when designing the packaging for a product A box net is a flat drawing of the faces of a 3D shape, which can be cut out and folded to make that 3D shape. It will include tabs, which are used to stick it together more easily. Some of the lines of the net will need to be scored. Scoring means scratching a line along the surface of the paper, to allow it to be folded more easily/accurately. Computer-aided design (CAD) is using a computer to help you create a design. For example, you could use software such as Microsoft Paint or Word to help you to draw your design neatly and accurately.</p> <p><b>Skills to learn/improve</b> drawing; cutting with a craft knife and ruler; scoring; measuring; folding; joining</p> <p><b>STEM Curriculum Links</b> Maths: geometry - 3D shapes, box nets; measurement – length Computing: CAD</p>	<p><b>FOOD TECHNOLOGY</b> Brief: To design and make a pizza, using traditional Italian ingredients, for Year 4 pupils to enjoy.</p> <p><b>Focus Designer/Design Case Study</b> Franco Pepe (chef)</p> <p><b>Key Vocab</b> chef recipe pizza dough knead locality pizzaiolo</p> <p><b>Key Knowledge</b> Franco Pepe is a famous Italian chef, from a city called Caiazzo, which is close to Naples in Italy. He owns several restaurants and is said to be one of the best pizza chefs in the world. He learnt how to make pizza from his father who was a baker. Pepe does not use machines to make his pizza dough, believing it should always be done by hand. ‘Locality’ means using ingredients that are produced close to where you are cooking/eating them. Franco Pepe believes in using local produce to make his pizzas – ingredients such as olive oil, mozzarella and pork come from close to his restaurant in Caiazzo. Pizza is made by first creating a dough using wheat flour, oil, salt and water, then shaping this into a flat base. It is then topped with tomato, cheese, and toppings, and baked in a hot oven (traditionally a wood-fired oven). Pizzas have been around in some form for hundreds of years, but pizzas as we eat them today originated in Italy, in the city of Naples, around 250 years ago. A pizzaiolo is a person who makes pizza. Franco Pepe is a pizzaiolo, and so will you be during this project! Kneading means working dough by stretching and squeezing it with your hands. It combines the ingredients together, and makes the dough smooth and elastic.</p> <p><b>Skills to learn/improve</b> Weighing; mixing; kneading; shaping dough; baking</p> <p><b>STEM Curriculum Links</b> Maths – weights and measures</p>	<p><b>CONSTRUCTION: Electrical Systems</b> Brief: To design and make a decorative light box for a Year 4 child.</p> <p><b>Focus Designer/Design Case Study</b> Alessandro Volta (scientist/inventor)</p> <p><b>Key Vocab</b> battery circuit switch current electrical engineer</p> <p><b>Key Knowledge</b> Electrical engineers design and create products that use electricity in helpful ways. Anything that needs electricity to function will have been designed by an electrical engineer. Electrical engineers need an excellent knowledge of Science in order to design successful products. Alessandro Volta was born in Italy in 1745. He was a scientist and inventor, who invented the electrical battery, the first source of continuous electrical current. This invention had a huge impact upon the modern world, as without electric batteries, portable electronic devices would not exist. Link to learning in Science lessons. Electricity is pushed from the positive terminal of a battery, through the wires and back into the negative terminal. If a bulb is connected into the circuit, it will light up as the electricity flows through it. A switch is used to break an electrical circuit, thus stopping the flow of electricity. If a bulb is connected to the circuit, a switch would cause the bulb to go on or off when pressed.</p> <p><b>Skills to learn/improve</b> Drawing; cutting; joining; setting up electrical circuits</p> <p><b>STEM Curriculum Links</b> Science – Electricity</p>
	<p><b>Autumn</b></p> <p><b>FOOD TECHNOLOGY</b> Brief: To design and make a Mexican street food dish which could be eaten at a Christmas party.</p> <p><b>Focus Designer/Design Case Study</b> Thomasina Miers (chef)</p> <p><b>Key Vocab</b> street food tacos spices tortillas cross-contamination</p> <p><b>Key Knowledge</b> Thomasina Miers is a chef and restaurant owner from London. She became famous after winning a TV cookery programme called</p>	<p><b>Spring</b></p> <p><b>CONSTRUCTION: Structures</b> Brief: To design and make a mini greenhouse to be used in the school quad.</p> <p><b>Focus Designer/Design Case Study</b> Nicolas Grimshaw (architect)</p> <p><b>Key Vocab</b> greenhouse architect technology frame structure triangulation reinforce</p> <p><b>Key Knowledge</b></p>	<p><b>Summer</b></p> <p><b>TEXTILES</b> Brief: To design and make a small bag to store a phone or wallet, for a Year 5 child to use.</p> <p><b>Focus Designer/Design Case Study</b> British Fashion designers</p> <p><b>Key Vocab</b> fashion designer pattern piece backstitch turning out component</p> <p><b>Key Knowledge</b> A fashion designer designs and makes clothing and accessories.</p>



	<p>Masterchef in 2005. Despite being British, she has a passion for Mexican food, and she owns a chain of Mexican street food restaurants called Wahaca.</p> <p>Street food is food cooked and sold in the streets, for people to eat immediately, on the go. Mexico is famous for its street food, called 'antojitos' in Spanish, which means 'little cravings'. Typical Mexican street foods include tacos, empanadas, tamales, quesadillas and nachos.</p> <p>Tacos are a popular Mexican street food dish. They are made of a small wheat or corn tortilla with a variety of fillings. The tortilla is known as a taco 'shell' and can be hard or soft. Fillings include meat, fish, cheese and beans. Tacos are topped with sauces and garnish such as salsa, guacamole, sour cream, lettuce and fresh coriander. A spice is a dried, ground part of a plant that adds flavour to food. The spices used most in Mexican cuisine are coriander, cumin, cayenne pepper, chipotle chilli powder, oregano, garlic powder, onion powder.</p> <p>Cross contamination is where bacteria are transferred from one thing to another. Bacteria can be transferred from people to food, from equipment to food, or from raw to cooked food. It is very important to keep raw and cooked foods, especially meats, apart. Contaminated foods can cause food poisoning</p> <p><b>Skills to learn/improve</b> chopping; slicing; dicing; frying; grating; measuring</p> <p><b>STEM Curriculum Links</b> Maths: measurement – weight, volume, temperature, time Science: food hygiene, bacteria</p>	<p>An architect is a person who designs buildings and oversees their construction. Nicolas Grimshaw is a British architect, who is 81 years old. He studied architecture at University, then he had his own architecture company. He has designed many famous buildings and structures in the UK, including the Eden Project. The Eden Project is in Cornwall, in the south of England. It is a visitor attraction consisting of giant domes (called biomes) which contain many different plant species from all over the world. It is like a giant greenhouse, and its purpose is to teach people about plants, conservation and climate. The biomes are made from a steel tube frame, made up of lots of hexagons. They are covered in a thick, clear plastic. The temperature and moisture inside the biomes is controlled, so that plant species from different climates can survive. A greenhouse is a structure made of a frame (usually metal) covered in clear glass (or sometimes plastic) panels. It works by trapping the heat from sunlight, creating a warm environment for plants to live in, all year round. Lots of the food we eat in this country is grown in huge commercial greenhouses. This is an example of how technology impacts our lives.</p> <p>A frame structure is a made from a skeleton of beams/supports that are attached together to provide a rigid frame. The frame is then covered in a material such as glass, fabric or plastic, to create flat sides and a roof.</p> <p>Triangulation is the use of triangles to reinforce a structure and make it stronger/more stable. A triangle is one of the strongest shapes.</p> <p><b>Skills to learn/improve</b> Drawing; cutting; sawing; joining; reinforcing</p> <p><b>STEM Curriculum Links</b> Science – Plants, temperature, energy Maths – geometry - shape</p>	<p>Backstitch is a simple sewing stitch where each stitch is sewn in a backward motion, right up to the one before, thus leaving no gaps. It is a neat and sturdy stitch.</p> <p>A pattern piece is a paper template which is used to then cut out fabric pieces.</p> <p>Turning out means sewing the item inside out, then turning it the right way round when done, so that the stitches cannot be seen.</p> <p><b>Skills to learn/improve</b> Drawing; cutting; threading a needle; tying a knot; sewing</p> <p><b>STEM Curriculum Links</b> Maths - shape</p>
<b>Year 6</b>	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>
	<p><b>CONSTRUCTION: Mechanisms</b> Brief: To design and make a marble run to be played with by primary school-aged children.</p> <p><b>Focus Designer/Design Case Study</b> Mechanical Engineers through history</p> <p><b>Key Vocab</b> mechanical engineer marble run friction gravity gradient</p> <p><b>Key Knowledge</b> A mechanical engineer designs and makes mechanical systems or machines (things with moving parts that create an output that does something useful). They need a good understanding of Science, which is then applied to create useful things. When designing and making your marble run, you will become a mechanical engineer. Innovations in mechanical engineering have impacted hugely on the world we live in and made human tasks and activities easier and</p>	<p><b>CONSTRUCTION: Electrical Systems</b> Brief: To design and make a carousel for a funfair company, which can be controlled by a computer program.</p> <p><b>Focus Designer/Design Case Study</b> Ada Lovelace (Mathematician, first computer programmer)</p> <p><b>Key Vocab</b> computer programming computer programmer controller motor software hardware</p> <p><b>Key Knowledge</b> Ada Lovelace was born in London in 1815. She was a brilliant mathematician and is often considered the world's first computer programmer. She worked with Charles Babbage, who was the inventor of an early calculator. Lovelace compared Babbage's machine to a weaving machine, which followed patterns to make a design. She imagined that a machine could also follow patterns, or</p>	<p><b>FOOD TECHNOLOGY</b> Brief: To design and make a barbequed kebab, for Year 6 children to enjoy at their leavers party.</p> <p><b>Focus Designer/Design Case Study</b> Tom Kerridge (chef)</p> <p><b>Key Vocab</b> kebab barbeque skewer flatbread</p> <p><b>Key Knowledge</b> Tom Kerridge is a famous British chef. He has worked at lots of restaurants and owns some of his own. He has also appeared on lots of cookery TV shows and written cookery books. A kebab is a dish consisting of pieces of meat on a skewer which is roasted on a grill.</p> <p><b>Skills to learn/improve</b> Weighing; chopping; mixing; grilling</p>



	<p>more effective, e.g: Archimedes (Archimedes screw, weapons, pulley systems), Edmund Cartwright (power loom) George Stephenson (railways).</p> <p>A marble run is a course made for a small ball (or marble) and the aim is for it to travel from start to finish without stopping or falling off. Marble runs have lots of different components such as tubes, chutes, funnels and wheels, and need a sturdy base/structure to hold them up.</p> <p>In a marble run, gravity is what makes the marbles roll downwards. The stronger the force of gravity, the quicker the marble will roll. Friction (the force of two surfaces rubbing together) acts against gravity, therefore will slow the marble down or even stop it from rolling. In a marble run, the tracks need to be steep enough so that gravity keeps the marble rolling. Some friction will be helpful, however, to keep the marble on the track and to stop it from rolling too fast. Applying this scientific knowledge will allow you to create a more successful product!</p> <p><b>Skills to learn/improve</b> drawing; cutting (scissors and craft knife); joining; measuring</p> <p><b>STEM Curriculum Area Links</b> Science: forces, friction, gravity      Maths: geometry - angles; measurement - length</p>	<p>codes, to calculate numbers or form letters, and thus went on to write the first computer program. Lovelace correctly predicted that computers would go on to be used for many more things than just calculating numbers.</p> <p>Computer programming is a series of instructions that tell a computer to perform an action. Computer programming can be written in different programming languages, such as Scratch. Hardware is all the components that are connected to the computer, i.e. the controller, motor, wires etc. Software is the programs/instructions that tell the hardware what to do.</p> <p>In this project you will use a Crumble controller. The crumble controller is a small circuit board which receives and processes the instructions passed to it from the computer software in which you will write your code. The controller then sends outputs to the hardware, in this case the motor or lights, so that they follow the coded instructions.</p> <p>The motor is a piece of hardware that changes electrical current into movement - eg. a spinning motion.</p> <p>A carousel is a fairground ride that turns around and has something for riders to sit on.</p> <p><b>Skills to learn/improve</b> drawing; cutting; joining; programming</p> <p><b>STEM Curriculum Links</b> Science – Forces of motion Computing – Programming</p>	<p><b>STEM Curriculum Links</b> Maths – weights and measures.</p>
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