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| **Design Technology CURRICULUM** | |
| **Purpose of Study** | Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation. |
| **Aims** | The national curriculum for design and technology aims to ensure that all pupils:   * To develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. * To build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users * To critique, evaluate and test their ideas and products and the work of others. * To understand and apply the principles of nutrition and learn how to cook. |
| **Attainment Targets** | By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. |
| **Curriculum Design** | The Ashdene Design and Technology Curriculum explicitly sets out the substantive and disciplinary knowledge children will learn in each lesson, ensuring there is clear interplay between the types of knowledge. To support schema development, lessons are sequenced to build on prior learning, each lesson having clearly defined knowledge to revisit, which will then be built on during the lesson or in those coming. Knowledge revisits are split into three areas: skills, subject specific and health and safety. Each of these areas needs to be retrieved and practiced to ensure children know what they are and that they remember how to approach or complete such challenges successfully and safely.  The Ashdene Design and Technology Curriculum has been designed to ensure that in every year group children will cover a food, textiles and engineering topic. At Ashdene, we prioritise the STEM subjects and all year groups have a STEM-based topic that is covered for a full term each year. These topics make explicit links between the Design and Technology, Science and Computing curriculums. |
| **Topic Overview** | |

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|  | **HT1** | **HT2** | **HT3** | **HT4** | **HT5** | **HT6** |
| **Reception** | Food - Gingerbread |  | STEM – Things with wings | STEM – Things with wings |  | Textiles – Picnic Blanket |
| **Year 1** |  | Textiles – Finger Puppets | STEM - Fairgrounds | STEM - Fairgrounds |  | Food - Seaside Picnic |
| **Year 2** |  | Food - British Cream Tea | STEM – Pirate Ships | STEM – Pirate Ships |  | Textiles – Rainforest 2D felting scene |
| **Year 3** | Textiles - Stone Age to Iron age |  | STEM – Trains | STEM – Trains | Food – Egyptian bread |  |
| **Year 4** | Textiles - Romans |  | STEM – Motorised vehicles | STEM – Motorised vehicles | Food – Greek dishes |  |
| **Year 5** | Textiles – Anglo Saxons |  | STEM – Hovercrafts | STEM – Hovercrafts | Food - Mexican |  |

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| **Year 6** | Engineering – Mechanical systems Victorian toys |  | Food – Chinese banquet |  | STEM – Microbit guitars | STEM – Microbit guitars |

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| **EYFS** | | | | | |
| **EYFS HT1 and HT2** | | | | | |
| **Food and Nutrition**  Brief: To design, make and evaluate a gingerbread biscuit for a reception child to enjoy as a snack. | | | | | |
| **Revisit of prior knowledge** | **Cutting Skills** | | **Food and Nutirtion Specific** | | **Health & Safety** |
| Observations of cutting: playdough using knives, shape cutters and separating with hands. | | Share images of ingredients and appliances in a kitchen. Can children name them all? Can children say whether they have them in their kitchens? What else might you find in a kitchen?   |  |  |  |  | | --- | --- | --- | --- | | Oven | hob | flour | butter | | kettle | microwave | eggs | sugar | | | Discuss the following. Perhaps remove a word and ask children what’s missing. Share images and ask children what is dangerous in a kitchen.   1. Kitchens can be dangerous. 2. Kettles, hobs and ovens can get very hot. 3. Always work with an adult when you are making things in the kitchen. |
| **Knowledge** | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | **Key Vocabulary** |
|  | **Theoretical** | **Tools and Equipment** | | **Knowledge of methods that chefs/bakers would use** |
| **Design** | Biscuits can be sugary or salty.  Many different types of biscuits can be bought or made including shortbread and chocolate. You can buy different shapes of biscuit but, when making your own, you can cut different shapes using a knife or shape cutters. | Shape cutters | |  | |  |  | | --- | --- | | shape cutter (noun) |  | | oven (noun) |  | | Mix (verb) | To bring things together | | oven gloves (noun) | Special gloves or mitts that are worn to stop you from burning your hands. | | ingredients (noun) | All of the foods that are brought together to make a meal or cake. | | dough (noun) | A thick mixture of flour and liquid. | | temperature (noun) | Measuring how hot or cold something is. | |
| **Make** | We wash our hands and tie our hair back when we are around food – eating and cooking.  Ingredients mixed together can make dough.  An hot oven is used to cook or bake food at different temperatures.  An adult will always place things into the oven using oven gloves. Children must stay away from hot ovens. | Oven  Oven Gloves  Mixing Bowl  Shape cutters | |  |
| **Evaluate** | Biscuits taste different depending on their ingredients. |  | | Talk about what we liked and what we didn’t like about the designing and making processes. |

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| **EYFS HT3 and HT4 – STEM project** | | | | | | |
| **Engineering** Brief: To design, make and evaluate a bird that… | | | | | | |
| **Revisit of prior knowledge** | **Cutting Skills** | | **Engineering Specific** | | **Health and Safety** | |
| Complete EYFS Sheet 1 of the Ashdene ‘Cut It Out’ guide – Bird Beaks | | Children being to consider how structures are joined.  Show three items that cotain joins (glue, tape, sewn)  Ask:  What are the items made of?  How are the parts joined together? | | When using scissors you must be careful because they are sharp.  When putting scissors down – make sure the blades are closed together. | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods engineers would use** | |
| **Design** | Five different types of birds are: penguins, ostriches, hawks, owls and hens.  Similarities are things that something has ‘in common’ with another thing.  Differences are things that are not the same.  Design means to come up with an idea.  Ideas are talked about, drawn and written about. |  | | Designers use pictures and what they know about the world to help them when designing.  Design means to gather ideas through talking, drawing, writing and sharing our experiences.  Designers recognise what is similar and different when looking at different designs.  Designers label their drawings to add extra information (naming parts and the materials).  Materials can be categorised and are used for different things. E.g. Plastic and pottery are used to make cups because they can be washed clean and reused. Paper cups are not really used because paper rips when it is wet. | | |  |  | | --- | --- | | Join (noun form) | To keep things together so that they don’t come apart. | | scissor blades (noun) | The sharp pieces of scissors that cut. | | to design (verb) | To come up with ideas and plan the making of a product. | | similar (adjective form) | When things are alike | | different (adjective form) | When things are not alike. | | success (noun) | If something is right – if it works. | | test (verb form) | To check whether something works or if it is understood. | |
| **Make** | Materials can feel and look different.  A texture is how something feels.  Five different types of material are: card, wood, tissue, plastic and paper.  Scissors are used to cut. They have handles (normally made from plastic) and blades which are sharp (normally metal). The end of a pair of scissors is called the point and where the blades meet is called the join.  It is important to use scissors safely. Hold scissors as follows, with blades together and your hand wrapped around them – pointed downwards. | Scissors | | Name the parts of a pair of scissors – see diagram.  When using scissors you must be careful because the blades can be very sharp. When you finish with scissors make sure that the blades are closed together. When carrying scissors you must make sure the blades pont downwards, with your hands wrapped around them. | |
| **Evaluate** | After making a product you can talk about what you like and dislike about it.  To find out how successful a product is it should be tested. |  | |  | |

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| **EYFS HT5 and HT6** | | | | | | |
| **Textiles:** To design, make and evaluate a picnic blanket for the three bears to use when having a picnic. | | | | | | |
| **Revisit of prior knowledge** | | **Cutting Skills** | | **Textiles Specific** | | **Health and Safety** |
| Complete EYFS Sheet 2 of the Ashdene ‘Cut It Out’ – picnic food | | Share images of different materials: fur of a cuddly toy, cotton from socks, leather from a sofa, plastic from a table cloth.  Ask children whether they have seen them before.  What do they think the materials used for? Share the materials use. | | Share images of clothes labels and ask children what they think they are and where they might find them.  These labels give us information to keep our clothes safe when we wear or wash them. |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | | **Disciplinary Knowledge** | | | **Key Vocabulary** |
|  |  | | **Tools and Equipment** | | **Knowledge of methods textile workers would use** |
| **Design** | Blankets have different uses: to keep us warm and to sit on. A picnic blanket should be big enough to sit on, with friends and to put food onto.  A picnic blanket might be pattered or inspired by the users – the three bears. | |  | | Children must develop their understanding of what a blanket is. Question what is a blanket? When might a blanket be used? What might a picnic blanket need to be like? Size/material/design can be considered. | |  |  | | --- | --- | | blanket (noun) |  | | material (noun) |  | | use (verb) |  | |  |  | |  |  | |  |  | |
| **Make** |  | | Cotton  Fabric crayons | |  |
| **Evaluate** |  | |  | |  |

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| **Year 1** | | | | | | |
| **Year 1 HT1 and HT2** | | | | | | |
| **Textiles**  Brief: To design, make and evaluate a finger puppet for a year 1 child to use when telling a story. | | | | | | |
| **Revisit of prior knowledge** | | **Cutting Skills** | | **Textiles Specific** | | **Health and Safety** |
| Complete Year 1 Sheet 1 of the Ashdene ‘Cut It Out’ – Follow the Path | | **Practical**  Use claw weavers to practise threading laces in and out.  Practise threading a plastic needle with thread. | | Using the following statements, fill in the blanks.  When using scissors you must be very careful because the blades can be (sharp).  The spiked end of a needle is called the (tip). It is very sharp and is used to pierce through (material). |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | | **Disciplinary Knowledge** | | | **Key Vocabulary** |
|  |  | | **Tools and Equipment** | | **Knowledge and methods that textile workers would use** |
| **Design** | Designing is when you write down, draw and talk about your ideas. | | Fabric  Felt | | Children can talk about their design ideas and what they are making/have made.  Children can develop an initial idea after referring back to a design brief.  Children can draw and label what they are designing and making.  Children can discuss ideas their design ideas in groups by drawing on their own and others’ experiences.  Children can draw and talk about their ideas. | |  |  | | --- | --- | | Design brief (noun) | What you are going to make, who it is for and why they need it. | | Felt (noun) | A soft type of material that is easy to use when sewing. | | sew (verb) | To join, fasten or repair. | | Needle (noun) | A sharp-ended tool used to pierce through material, pulling a thread, to join pieces together.  chenille needles | | eye of the needle (noun) | The hole in the needle which you pass the thread through | | Running stitch (noun) | See the source image | |
| **Make** | The ‘Design Brief’ is what you are going to make, who it is for and what its purpose is.  Two pieces of material can be attached together by sewing them.  Running stitch is when the thread runs through the material without stopping – up and down.  Needles are very sharp and you must be careful when using them.  Needles are stored in a pin cushion for safety. | | Needles  Eye of the needle  Pin cushion – store needles and pins (if using)  Thread | | To sew you must thread a needle accurately through the eye of the needle.  Place two pieces of material on top of each other and attach them together using running stitch. |
| **Evaluate** |  | |  | | Identify material used to make existing puppets. Soft fabrics are the best materials to use because they are comfortable when placed on the finger and they are easy to work with.  Children can make simple judgements about their products and ideas. What they like, dislike and found easy and difficult.  Children can say whether they have made something that meets the design criteria (design brief). |  |

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| **Year 1 HT3 and HT4 – STEM project** | | | | | | | |
| **Engineering**  Brief: To design, make and evaluate a fairground ride for a Lego person to use as a toy ride. | | | | | | | |
| **Revisit of prior knowledge** | | **Cutting Skills** | | **Engineering Specific** | | **Health and Safety** | |
| Complete Year 1 Sheet 2 of the Ashdene ‘Cut It Out’ –  Fairground Fun | | Share images of items which can all be used to join materials together. Ask children to name them and consider what links them.  Blue Tac, cellotape, pins, screws, paper clips, glue | | EYFS Knowledge  Label the parts of a pair of scissors: blades, handles, join and points.  Complete sentences with the missing words: When using scissors you must be careful because the (blades) can be very sharp. When you finish with scissors make sure that the (blades) are closed together. When carrying scissors you must make sure the (blades) pont downwards, with your hands wrapped around them. | |
| **Knowledge** | | | | | | | |
| **Substantive knowledge** | | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | | **Tools and Equipment** | | **Knowledge of methods engineers would use** | |
| **Design** | Talking about our ideas and drawing what we want to make helps us to plan.  We can get ideas for our designs based on pictures that we see, videos that we watch and experiences that we talk about or listen to.  The purpose of a fairground ride is for the people who use them to have fun. | |  | | It is very important to know the user of the product being designed (Lego person, teddy bear, plastic animal). | | |  |  | | --- | --- | | glue gun |  | | junior hacksaw |  | | clamp |  | | engineer | A person who designs and makes structures. These people also make sure the structures are safe. | | structure | A building or an object made of different parts. | | join | To connect things together | | secure | To make sure that something does not move or become loose. | | purpose | The reason or the point of something. | |
| **Make** | An adult must always help me when using a glue gun.  There are different ways to join materials together: glue, tape, clips and tac.  There are many different tools that can be used to cut things:   * Scissors cut paper and card. * Saws cut wood * Knives are used when cutting food   When using a junior hacksaw, saw using a towards motion. Then lift the saw and bring towards yourself again.    When making structures, they must be secure so that they are safe and do not topple or fall. | | Blue tac, tape, glue, paper clips  Glue gun  Junior hacksaw  Clamp | | Engineers make small scale models of their designs. | |
| **Evaluate** | There are a variety of different fairground rides and many of them move differently.  To evaluate means to talk about the good and bad parts of objects and structures. | |  | | Designers always ask whether what they made meets the brief.  Think how to move forwards | |

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| **Year 1 HT5 and HT6** | | | | | | |
| **Food and Nutrition**  Brief: To design, make and evaluate a sandwich for a Year 1 child to eat at a picnic. | | | | | | |
| **Revisit of prior knowledge** | **Cutting Skills** | | **Food and Nutrition Specific** | | **Health and Safety** | |
| Complete Year 1 Sheet 3 of the Ashdene ‘Cut It Out’ – Picnic Pastries | | Match the stage with it’s meaning.  Design – To write, draw and talk about my ideas.  Make – To have a go at creating or building your product.  Evaluate – To talk about what you liked and disliked about the making stage. | | Share a scenario and ask children to retrieve knowledge of health and safety when working with food to give advice.  Sam has been playing with his friends a breaktime, touching leaves and moving sticks. He remembers he has a snack to eat. What should Same do before eating his snack? (Wash hands to remove germs before eating).  Lilly gave her long hair a good brush before school. She is going to make biscuits with her teacher. What should she do before touching any ingredients? (Wash hands thoroughly and ensure hair is tied back). | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods chefs would use** | |
| **Design** | Food comes from plants or animals.  Lettuce, tomatoes, sweetcorn and cucumber are all grown from plants.    Wheat is grown from a plant and used to make flour, which is used to make bread.  Ham comes from cows and eggs are laid by chickens.  To make sure you are healthy, you should eat five portions of fruit and/or vegetables each day. |  | |  | | |  |  | | --- | --- | | Butter knife (noun) |  | | Spread (verb form) | To apply a thin, even layer. | | healthy | To be or do good for your body | | grate (verb) | To shred food by rubbing on a bladed surface. | | blade (noun form) | A sharp surface which is used to cut or spread. | | blunt (adjective) | A word to describe the blade of a knife. If it is blunt it is not sharp. | | Soft foods | Food types that can be cut easily using a blunt knife (butter, soft cheese, sliced ham). | |
| **Make** | A butter knife is used to spread.  Soft foods (ham, bread, soft cheese) can be cute using a blunt knife.  You must always ensure that you are careful around sharper knives, which are used to cut and slice harder foods. | Soap, sanitiser  Blunt knives  Chopping boards  Graters | | When preparing food you need to be aware of good hygiene: hair tied back, sleeves rolled up, hands washed and clean work surfaces. | |
| **Evaluate** | Fresh products must be used within the date specified on their packaging. |  | | Tasting ingredients is necessary to evaluate a dish. | |

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| **Year 2** | | | | | | | |
| **Year 2 HT1 and HT2** | | | | | | | |
| **Food and Nutrition**  Brief: To design, make and evaluate a traditional British cream tea for a class of children to enjoy at a tea party. | | | | | | | |
| **Revisit of prior knowledge** | | **Chopping Skills** | | **Food and Nutrition Specific** | | **Health and Safety** | |
| Chopping skills – ask children to explain how you might go about chopping up a banana (or other fruit) to add into cereal.  Evidence children talking through the process. If possible record them completing the task or acting it out. Model this ensuring clean hands, clean surface and a clean knife. Give specific information including size of slices and take suggestions for the chopping of other fruits (considering **soft** and **hard** fruits and the difference – Year 1 vocabulary) | | Match words to their definitions including ingredients, healthy, spread (verb), grate (verb), soft foods. | | Share an images of things we need to do to be safe when working with food: apron, clean hands, hair tied back, wash fruits and vegetables, clear up mess, keep pets away and wash hands again before you eat.  Ask children to consider what they may all refer to and why they are important. | |
| **Knowledge** | | | | | | | |
| **Substantive knowledge** | | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | | **Tools and Equipment** | | **Knowledge and methods that chefs would use** | |
| **Evaluate** | Some food products are bought ready made from shops – others can be made (baked, cooked) at home using ingredients. | |  | | Children can suggest how a product can be improved. | | |  |  | | --- | --- | | dairy (noun) | Products that contain or are made from milk | | stir (verb) | To rotate in a circular motion – this is normally done with a spoon. | | mix (verb) | To combine ingredients with a spoon, electrical appliance or with the hands. | | knead (very) | To mix and stretch out a dough with the hands. | | rest (verb) | To allow something time to relax  Food sometimes needs to rest to cool and dough needs to rest to rise. | | pastry brush (noun) | This is used to brush egg or milk onto something before it is baked. This gives the scones a golden colour. | | serve (verb) | To give something or present it because it is ready. | |
| **Design** | Children know 3 of the 5 sections of the Eatwell plate: Fruit and vegetables, carbohydrates and milk and diary.  The basic ingredients needed to make scones are: flour, butter, sugar, milk, egg, baking powder, jam and cream.  Butter, milk and cream are all dairy products that can come from cows.  Jam is made from fruit and sugar.  Flour and sugar are harvested from crops – grown. | |  | | Jams can be bought or made in different flavours or with combined flavours.  Fruit, chocolate chips or cheese can be added to a scone mixture to change its taste | |
| **Make** | When cooking/baking good hygiene rules must be followed to keep us healthy and safe: hair tied back, hands washed and dried and clean work surfaces.  Dough can be baked in an oven. Ovens are very hot and change the ‘state’ of the dough from a liquid-like consistency to a solid.  Ingredients must be measured out accurately when following a recipe. | | Oven  Wooden spoon  Mixing Bowl  Pastry brush  Knife  Scales | | How to make scones: combine ingredients through mixing, | |

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| **Year 2 HT3 and HT4 – STEM project** | | | | | | |
| **Engineering**  Brief: To design, make and evaluate a pirate ship for a pirate to keep treasure safe.  To design, make and evaluate a pirate ship to transport a treasure chest across a body of water. | | | | | | |
| **Revisit of prior knowledge** | **Cutting Skills** | | | **Engineering Specific** | | **Health and Safety** |
| Complete Year 2 Sheet 1 of the Ashdene ‘Cut It Out’ – Precision Cutting Shapes  Share images and name the odd one out: junior hacksaw, clamp, knife, scissors. Discuss reasons why.  Clamp as this is not used to cut materials, ingredients or items. | | | Year 1 Knowledge - There are many different tools that can be used to cut things: scissors, saws, knives.  Ask and share images of the following  What would you use to cut cheese?  What would you use to cut a piece of card?  What would you use to cut Play’doh?  What would you use to cut wooden dowel? | | EYFS Knowledge - Scissor safety  Always ensure scissor blades are together when they are not being used.  Never run with scissors.  When carrying a pair of scissors hold your hands around the blades.  When passing scissors to somebody, hold the blades and allow them to take them using the handles. |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | | **Disciplinary Knowledge** | | | **Key Vocabulary** |
|  | |  | **Tools and Equipment** | | **Knowledge of methods engineers would use** |
| **Design** | | The brief is a clear focus for a designer.  When designing, you must draw, write or discuss how your product will look and how it will work.  Design sketches are completed with a ruler (where necessary), labelled with materials, equipment needed and tools required.  Designs are changed using what is found out during the evaluation of the mock-up product.  Joining separate 2D parts together can create a 3D structure. | Rulers  Sharp pencil | | A mood board is when we gather pictures and ideas, then put them together.  Before designing a final product, designers make ‘mock-ups’ which are used to test how well ideas work.  Designers refer back to the brief of a project regularly and can state what they are making. They also know and understand the purpose of the project.  Designers re-design their products based on the results of the mock-up models. They may change one thing about their original design including size, materials and decoration. | |  |  | | --- | --- | | properties (noun) | The features of something that makes it unique | | mock-up (noun) | A practice attempt – a first try. | | net (noun) | In design, a net is used which is an outline. | | mood-board (noun) | A collection of examples to help form a design. | | purpose (noun) | The reason for the item you are making. | | waterproof (adjective) | Does not let water through. | | float (verb form) | Something that stays above the water. | |
| **Make** | | Mock-up making is the first part of the make stage. This is when we practice how to make something.  When cutting different materials, different tools or equipment is needed. Scissors cut paper & card. Fabric scissors cut materials. Saws cut wood.  When making, designers are precise using measurements and rulers to be as accurate as possible. | scissors  rulers | | When using tools and equipment, safety precautions must be followed.  The mock-up design stage is important because it allows the maker to practice creating the product. They can then think how easy/challenging a task was and whether the materials are good to work with. Also, this process helps us in managing waste of materials. We do not use the best materials and paints when creating a mock-up.  Products which have been made can be decorated to meet the requirements of the user. Designers always refer back to design briefs when at this stage to ensure that their design meets the purpose. |
| **Evaluate** | | Evaluating the mock-ups, which have been made, help us in finalising the design of our final product.  When evaluating we consider the success of a product. We then ask what made it successful or not. |  | | At the mock-up stage, designers consider how easy/challenging a task was and whether the materials are good to work with. Also, this process helps us in managing waste of materials. We do not use the best materials and paints when creating a mock-up.  The success of a product can be based on lots of things, and lots of things can cause a product to fail.  Designers show resilience and use success and failure to help their future designs. |

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| **Year 2 HT5 and HT6** | | | | | | | |
| **Textiles**  Brief: To design, make and evaluate a rainforest inspired scene for a decorative piece, | | | | | | | |
| **Revisit of prior knowledge** | | **Cutting Skills** | | **Textiles Specific** | | **Health and Safety** | |
| Complete Year 2 - Sheet 2 of the Ashdene ‘Cut It Out’ – Rainforest templates  Children can then use the cut shapes as paper patterns or inspiration for their rainforest designs. | | Practice threading a needle. Give children time to practise discussing tips and tricks for accuracy.  Ask children to define a running stitch – learnt in Year 1 | | Needle work: Safety Briefing  Needles have a very (sharp) point.  When using a needle I must be very (careful).  If I finish with my needle I must make sure that I put it where my teacher tells me. | |
| **Knowledge** | | | | | | | |
| **Substantive knowledge** | | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | | **Tools and Equipment** | | **Knowledge of methods textile workers would use** | |
| **Design** | A 3D (three-dimensional) shape is made when two pieces of 2D (two-dimensional) material are joined together.  Designs need to be sketched, using a ruler (when necessary) and labelled. | | Sharp pencil  Ruler | | Inspiration for designs is drawn from the world around us, discussions with friends, books, the media and the work of artists (Henri Rousseau). | | |  |  | | --- | --- | | design brief (noun) | What you are going to make, who it is for and why they need it. | | felt (noun)  To felt (verb) | A soft type of material that is easy to use when sewing. | | felting (noun) | A textiles crafting technique that can be used to make 2D and 3D pieces. | | felting needle (noun) |  | |
| **Make** | Felting requires felting needle being used to stab and agitate wool fibres so they join/bond together.  Fabric scissors are used to cut materials such as cotton and felt. They must not be used to cut anything else as the blades could be damaged. To keep people safe, you must use the safety catch and the blade cover after use. | | Felting needles  Felt  Felting foam block | | Felting needles are sharp and should be used cautiously, following the teacher’s instructions. | |
| **Evaluate** |  | |  | | To adapt the function of the decorative piece, what could be done?  Could the piece be kept in a frame, added to a greeting card or could it be made into a 3D pin cushion or a small padded wall hanging? | |

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| **Year 3** | | | | | | |
| **Year 3 HT1 and HT2** | | | | | | |
| **Textiles**  Brief: To design, make and evaluate a Stone Age inspired | | | | | | |
| **Revisit of prior knowledge** | **Cutting Skills** | | **Textiles Specific** | | **Health and Safety** | |
| Complete Year 3 Sheet 1 of the Ashdene ‘Cut It Out’ – Stone Age Symbols | | 1. Share tips and tricks to successfully thread a needle 2. Recognise and practise a running stitch. | | Needles will always be handed out and collected in by the teacher. Teachers will count the needles and store them in polystyrene balls. Recap the importance of this – ask who knows why this is the case. | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods that textile workers use** | |
| **Design** | To dye something means to change its colour.  Material can be dyed naturally or artificially. Natural dyes include turmeric (yellow), avocado skin (pale red) and purple basil leaf.  During the Stone Age period, people began to experiment with dyes and embellishments. It is thought that people of the time period wanted their clothes to look good.  There are several different patterns that can be created when tie dying. To achieve them, you can fold, twist and pleat the material. You can also use items to help create different patterns: marbles, string and elastic bands |  | | A successful designer thinks about the needs of the user of the product they are about to make.  Plan out their order of the main stages of making following group discussions.  Pattern pieces reduce waste in that you can place the paper pattern towards the edge of a large sheet of material. They give you a sense of scale and can be adapted if needed before material is cut. | | |  |  | | --- | --- | | Tie-dye (noun form) | Producing patterns in cloth by tying parts of the material to avoid them from absorbing colour. | | Natural | Something that has derived from nature. | | Artificial (adjective/noun) | A man-made product. | | Cotton (noun) | A soft, white fibrous substance which can be turned into cloth. | | Canvas (noun) | A strong, coarse cloth made from hemp, flax or yarn. | |
| **Make** | To create the most effective tie-dye patterns, fold, twists and pleats need to be tight and secured well.  Warm and cold water can be used when dying material.  Salt is sometimes added to the water when dyring materials because some people believe it helps the fibres to absorb colour.  All materials needs time to absorb dye. The longer the material is kept in soak, the deeper the dyed colour tone of the material will be. | Dyes – natural & artificial  Bucket  Washing machine  Water – warm/cold | | Materials should be assembled, joined and combined materials with some accuracy for the most effective results. | |
| **Evaluate** |  |  | | A successful evaluation questions:   * How well was the product designed? * What is the quality of its make? * Does it fulfil its purpose?   Asuccessul product fits the design brief and is of use to its prospective user. | |

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| **Year 3 HT3 and HT4 – STEM project** | | | | | | |
| **Engineering**  Brief: To design, make and evaluate a train, with carriages that are magnetically joined, for a 4 year old child to play with. | | | | | | |
| **Revisit of prior knowledge** | **Cutting Skills** | | **Engineering Specific** | | | **Health and Safety** |
| Apporpriate tools task – ask children what the following materials should but cut using.  Year 2 Knowedge When cutting different materials, different tools or equipment is needed. Scissors cut paper & card. Fabric scissors cut materials. Saws cut wood.   |  |  |  |  | | --- | --- | --- | --- | | felt | wooden dowel | card | balsa wood sheets | |  |  |  |  | | | Define the word join.  Ask: When creating a product, how might the parts of it be joined together? Consider previous DT projects: sewing, felting, fairground rides, pirate boats and treasure chests. Do we join when working with food? | | | Knowledge from Y1: When using a junior hacksaw, you saw using a towards motion. Then lift the saw and bring towards yourself again.  Practise this using cast-off dowel. |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | **Key Vocabulary** | |
|  |  | **Tools and Equipment** | | **Knowledge of methods engineers would use** |
| **Design** | Products are designed for different purposes and to be used in different environments including: indoor and outdoor.  Designs sketches include annotations, detailing how each part of their product could work.  Annotated, two-dimensional sketches allow designs to be shared with others, discussed and developed.  Design sketches can be freehand, but often designers require a ruler to ensure straight lines. |  | | Designers ask the intended users of their products for extra information (preferred colours, sizes and materials) so that their designs are as successful as possible. | |  |  | | --- | --- | | measurement (noun) | Finding out the size or length of something | | finishing techniques (noun) | These are jobs including sanding, painting and waxing. They make sure a product looks its best. | | evaluation strength (noun) | These jobs including sanding, painting and waxing. They make sure a product looks its best. | | development point (noun) | How something can be made better. | | magnetically joined | Connected together with the force of a magnet. | | G-clamp |  | | wooden bench hook |  | | juniour hacksaw | Used to saw wood or metal. Its teeth are relatively blunt so it is not dangerous if used safely. | | freehand | When a sketch is drawn without measurements or the use of a ruler. This is often a designers first drawing of their ideas. | | |
| **Make** | Joining components (parts) should be done with a material that is of appropriate strength. When making these decisions the brief should be referred to.  When using junior hacksaws, clamps must be used for safety. Items being cut should be secured to tables or a double sided wooden bench hook should be clamped to a table to cut dowel or sticks of wood. This is for safety because materials should be secure (as still as possible) when cutting them.  Finishing techniques allow a product to look its best and are generally completed at the end of the make process. |  | | Designers plan out what they will do first, second and so on in their make process. |
| **Evaluate** | Talking about the strengths and development points of a product is how we evaluate. |  | | When evaluating the designer/engineer must always refer back to the brief and ask themselves ‘Is my product successful?’ |

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| **Year 3 HT5 and HT6** | | | | | | |
| **Food and Nutrition**  Brief: To design, make and evaluate a loaf of Egyptian bread, for a family to eat at dinner time. | | | | | | |
| **Revisit of prior knowledge** | **Chopping Skills** | | **Food and Nutrition Specific** | | **Health and Safety** | |
| Practise using a sharp plastic knife to cut a slice of bread. Work in groups and take turns to cut one slice up between groups. | | Share images of use by dates on foods and ask what it is and the importance of them. | | Fill in the blanks:  When cooking/baking good hygiene rules must be followed to keep us healthy and safe: hair tied back, hands washed and dried and clean work surfaces. | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods chefs would use** | |
| **Design** | Bread is a staple food in many cultures and is eaten at different times of the day.  Bread can be presented differently: loaf, bun, bagel, stick.  Food products can be fresh or precooked. Bread can have preservatives added to it to increase its ‘use-by’ date. |  | | Different countries and cultures eat/have different types of bread for different occasions. | | |  |  | | --- | --- | | oven (noun) | A heat source used in cooking. | | wheat (noun) | Wheat is a popular grass (cereal crop) grown mainly for its seed. It is used to make cereal and bread. | | whole wheat flour (noun) | Whole wheat flour is made by grinding or bashing wheat. As a flour it can be used as an ingredient to make other food products. | | knead (verb) | To knead means to work into a dough using the hands. | | yeast (noun) | Yeast is a very useful ingredient in cooking. It is used to make baked goods rise. | | baking powder | Helps to make baked goods light and airy. It can be used when making cakes and breads. | |
| **Make** | Hygiene awareness is very important when cooking to stop the spread of germs.  Hands must be washed, sleeves rolled up and hair tied back. |  | | Warm water reacts with baking powder to make dough rise. | |
| **Evaluate** | We should always consider the healthiness of food that we make and eat. Be awa |  | | Recipes can be adapted and changed to alter the appearabce of the product, the taste, texture and/or aroma. | |

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| **Year 4** | | | | | | |
| **Year 4 HT1 and HT2** | | | | | | |
| **Textiles**  Brief: To design, make and evaluate a decorative Roman inspired coin pouch for a child to store pocket money in. | | | | | | |
| **Revisit of prior knowledge** | **Skills** | | **Textiles Specific** | | **Health and Safety** | |
| Complete Year 4 Sheet 1 of the Ashdene ‘Cut It Out’ – Shapes with Straight Edges | | Share image of a running stitch and cross-stitch. Can children recall their names?  Share tips and tricks for needle threading. Needle challenge – who can thread their needle quicker than the teacher? Reshare tips and challenge again.  Practise using both stitches. | | Needle and fabric scissor safety.  Fill in the blanks…  Fabric scissors are used to cut materials such as cotton and felt. They must not be used to cut anything else as the blades could be damaged. To keep people safe, you must use the safety catch and the blade cover after use. | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods textile workers would use** | |
| **Design** | When two 2D shapes are attached together they create a 3D shape  Leather and fur are materials that were used during the Stone Age as people could skin animals.  Felt is a cloth made by rolling and pressing wool then applying heat or moisture. It is an ancient technique  A paper pattern is used to plan the shape and size of a single piece of material. It can be used as a template to draw around when cutting out fabric.  Paper pattern pieces help to reduce material waste.  Fastenings are used to bring pieces of material together securely. | Paper pattern piece  Fastenings  Press studs | | Annotated two dimensional sketches help to develop and communicate design ideas.  Three dimensional sketches of clothing designs help designers and users to imagine the finished product from different perspectives.  During the design process, the intended user should be thought about. What might they like? What might suit them? | | |  |  | | --- | --- | | leather | A material sourced from the skin of an animal. It is often tanned or dyed to give it its colour. | | fur | The short, fine, soft hair of an animal. | | Faux fur | An artificial animal fur used to make clothing or soft furnishings. | | fastening | Something which is used to secure pieces of material together but it can be altered to release the materials. | | press studs | A small fastening which works by pressing two halves together. | | blanket stitch | A way to securely attach two pieces of material together. This is used around the edge of the material pieces. | |
| **Make** | Thread needs to be cut ‘cleanly’ to make threading a needle simpler.  Blanket stitch can be used to create a neat and secure join between two pieces of material. <https://www.youtube.com/watch?v=S9zegUYdPmg> | Needle  Thread  Pins  Pin cushion | |  | |
| **Evaluate** |  |  | | Is the choice of fastening fit for purpose? Is it secure? Can children use it easily?  Evaluate against:   * How well was the product designed? * What is the quality of its make? * Does it fulfil its purpose?   Evaluate the completed product, referring back to the design brief. | |

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| **Year 4 HT3 and HT4 – STEM project** | | | | | | |
| **Engineering**  Brief: To design, make and evaluate a motorised car for a Year 4 child to use when completing a circuit of a track. | | | | | | |
| **Revisit of prior knowledge** | **Skills – Sketching** | | **Engineering Specific** | | | **Health and Safety** |
| Year 3 Knowledge  Fill in the missing words  Design sketches can be freehand, but often designers require a ruler to ensure straight lines.  What might make steching easier?   * Sharp pencils * Graph or squared paper to help with line precision | | Joining components together  Wooden pieces can be joined together using… hot glue (children may draw upon their own expienece – screws and nails)  Felt pieces can be joined together using… hot glue, stitching (children may draw upon their own experience – felting) | | | Revisit using clamps to secure materials to a surface in order to safely cut – use g-clamps and bench hooks.  Remodel how to use clamps and allow children practice time.  Year 3 knowledge: When using junior hacksaws, clamps must be used for safety. Items being cut should be secured to tables or a double sided wooden bench hook should be clamped to a table to cut dowel or sticks of wood. This is for safety because materials should be secure (as still as possible) when cutting them. |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | **Key Vocabulary** | |
|  |  | **Tools and Equipment** | | **Knowledge of methods engineers would use** |
| **Design** | A design specification is developed after finding out the additional wants and needs of the user – consider what the people who buy cars want them to look and be like.  Annotated 2D and 3D sketches are used to share and communicate the designer’s ideas. A ruler and a sharp pencil must be used when doing this, and squared or graph paper is ofte used to ensure precision.  A jointer (or jig) is used to help form a join that is straight or well connected. It is a structure to help hold things in place, making construction easier for the person making the product.    Structures can be strengthened (reinforced) with another layer or extra support. | Sharp pencil  Ruler | | Designers always consider the brief when designing, making sure their design is functional and appealing.  Designers research successful pre-existing products before coming up with their first ideas.  Squared or graph paper is often used to ensure precision when sketching. | |  |  | | --- | --- | | aerodynamic | Streamlined – its design/structure is considered to make it move through the air with little resistance. | | Clamp | A piece of equipment that is used to keep something in place. | | function | The ability that something has to work | | appeal | Whether something is liked in terms of interest or attractiveness | | ‘Fit for purpose’ | If something works; whether it meets its purpose and if its user is happy with the product. | | modifications | Changes – these may be small or large | | scaled model | A model of the item that is being produced. It has simialrities in terms of its dimensions to the actual product be is often smaller – sometimes larger. | | design specification | Additional information to the original brief, which is specific to the product’s user. | | reinforce | To give something extra strength by adding an additional layer or extra support. | | Jointer (jig) |  | | precision | To be accurate and exact. | | |
| **Make** | Glue guns secure items and join materials securely.They are very hot and can be dangerous – always follow safety precautions. | Glue guns  Junior hacksaws | |  |
| **Evaluate** | Designers take feedback to better their products making them as fit for purpose as possible. |  | | Group feedback is vital in the evaluation of a product. Designers and makers share their products with a range of people and ask for their advice and feedback. |

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| **Year 4 HT5 and HT6** | | | | | | |
| **Food and Nutrition**  Brief: To design, make and evaluate two traditional Greek dips for a family to eat as part of a meal. | | | | | | |
| **Revisit of prior knowledge** | **Knife Skills** | | **Food and Nutrition Specific** | | **Health and Safety** | |
| Discuss: What would be easier to cut: feta cheese or bread sticks? | |  | |  | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods chefs would use** | |
| **Design** | We should always have an awareness of the Eat Well Plate when making and eating food to make sure we are as healthy as possible.  Food products can be fresh, precooked or processed.  Dips and condiments are commonly used to enhance the flavor of a meal. |  | |  | | |  |  | | --- | --- | | traditional | Something which is well-established and known. | | blender (noun) | A machine which mixes up food (blends) so that it changes in consistency. | | hummus (Middle Eastern spelling) /houmous (noun) | A traditional and popular Greek dip made using chickpeas tahini, olive oil, and lemon juice | | tzatziki (noun) | A fresh Greek dip, often served with lamb. This includes yogurt, mint, lomon juice and cucumber. | | grate (verb) | To shred using a sharp series of blades. | | fresh | A product is fresh if it has recently been picked. Always consider the use-by date of a product. | |
| **Make** | Hygiene awareness is very important when cooking to stop the spread of germs.  Hands must be washed, sleeves rolled up and hair tied back.  Adults must always be present when using blenders to ensure the safety of children.  Peeling an chopping are two actions used when preparing food. | blender  knife  chopping board  serving spoons | | Blendrs are useful in ensuring that ingredients are well chopped or mixed. | |
| **Evaluate** | When evaluating a food product you can discuss how it could be improved or how its flavor could be enhances. Consider the seasonality or freshness of the ingredients.  Products are given use-by dates to ensure that they are used or consumed (eaten) when they are fresh or until they start to be considered ‘off’. |  | | Chefs use ingedients which are as fresh as possible to ensure the best possible taste. | |

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| **Year 5** | | | | | | |
| **Year 5 HT1 and HT2** | | | | | | |
| **Textiles**  Brief: To design, make and evaluate a Nordic inspired cross-stitch to send to a family member as a decorative greeting card. | | | | | | |
| **Revisit of prior knowledge** | **Skills - Cutting and Stitching** | | **Textiles Specific** | | **Health & Safety** | |
| Recognise a running stitch and blanket stitch from images  Think back to Year 3, retrieve cross-stitching using large aida to practise skill. | | A quick recap pf the cross stitch.  Children should use aida which is larger to initially practise the cross-stitch. | | Needle safety – expain the importance of your teacher counting out and counting back in needles. Needles are sharp items that could cause damage if not used safely. If the teacher keeps a note of how many needles have been handed out, and collects in after use this should ensure none are left on the floor, with the potential to cause harm  How can we ensure needles are stored safely when not in use? Pin cushions or polystyrene balls. | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods that chefs, engineers and textile workers use** | |
| **Design** | Products can be made for a functional purpose and/or to be aesthetically pleasing.  Cross-stitch is a form of sewing during which the sewer counts the stitches hole in the fabric (aida) to create or follow a pattern.  Cross-stitch patterns can be followed or made. | Aida  Squared paper  Cross-stitches can be designed on <https://www.stitchfiddle.com/en> | | The Nordic Alphabet is made up of many linear symbols.  Ideas can be shared and clarifyied (taking notes and modifying designs through sketching) through paired and group discussions.  Annotated two dimensional sketches help to develop and communicate designs ideas.  When making design decisions, time constraints, space and resources available must be considered.  Graph or squared paper must be used when measuring, marking out, cutting and shaping materials and components accurately. | | |  |  | | --- | --- | | Aida (noun) | Fabric commonly used when cross-stitching | | Embroidery (noun) | A craft when fabric is decorated using a needle to apply thread or yarn. | | Embroidery thread (noun) | A thread which has a texture and a sheen. | | Embroidery Hoop (noun) | A wooden circular frame used to hold a piece of material tightly in place. | | Cross-stitch (noun) | A form of counted embroidery that uses an ‘x’ stitch to creat a pattern. | | Aesthetics (noun) | The visual appreciation of something. | |
| **Make** | Embroidery thread must be tied off after passing through the eye of the needle to ensure it stays in place.  An embroidery hoop is used to stretch out the aida, ensuring a tight and neat pattern can be stitched. | Aida – material used when cross-stitching  Embroidery thread  Embroidery hoop  Card  Glue gun | | Accurately use a range of art and design finishing techniques to make their product aesthetically pleasing, individual to their own style yet still in line with the brief. | |
| **Evaluate** |  |  | | A successful evaluation always refers back to the design brief.  Identifying strengths and development points of your own product and that of a peer are indicative of a successful evaluation. | |

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| **Year 5 HT3 and HT4 – STEM project** | | | | | | |
| **Engineering**  Brief: To design, make and evaluate a hovercraft for Year 5 children to use recreationally. | | | | | | |
| **Revisit of prior knowledge** | **Cutting Skills** | | **Engineering Specific** | | **Health and Safety** | |
| Complete Year 5 Sheet 1 – Symmetry | | Name the following items (share images) and match them to their purpose. | | Safety when using clamps  Revisit how to use a junior hacksaw. | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods engineers would use** | |
| **Design** |  |  | | Designers use annotated 2D and 3D sketches, and cross-sectional and exploded diagrams to develop and communicate their design ideas.  Designers conduct research to develop their designs. They use books, previous designers work, discussions with likeminded designers and they talk to the intended user of the product, developing their understanding of a successful product.  Finding out what the intended user views to be aesthetically pleasing can impact the success of the product. | | |  |  | | --- | --- | | Lever | A bar that balances on a fixed point, like a seesaw. | | pulley | A rope that moves over a wheel. | | bar |  | | Air cushioned vehicle (ACV) |  | | Air cushion (skirt) |  | | G-clamp |  | |  |  | |  |  | |  |  |  |  |  | | --- | --- | | Prototype | A practice attempt at the end product using cheaper materials and often smaller in size to the final product. | | Air cushioned vehicle (ACV) | An amphibious craft capable of travelling over land, water, mud, ice and other surfaces | | Air cushion (skirt) |  | | Cross-sectional diagram | A view into the inside of something made by cutting through it. | | Aesthetics | The way that something looks. | |
| **Make** |  |  | | When sawing and sanding wood, you should always wear goggles and (ideally) a mask. This is to stop dust entering your eyes or airways. | |
| **Evaluate** |  |  | |  | |

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| **Year 5 HT5 and HT6** | | | | | | | |
| **Food and Nutrition**  Brief: To design, make and evaluate a healthy meal inspired by Mexican cuisine, using local ingredients, for a feast. | | | | | | | |
| **Revisit of prior knowledge** | | **Cutting Skills** | | **Food and Nutrition Specific** | | **Health and Safety** | |
| Explain the difference between the following three items which you will find in a kitchen: grater, butter knife, sharp knife. | | Name all sections of the Eat Well Plate | | To ensure we are safe when preparing food you must:   1. Wash hands 2. Tie back hair 3. Wear an apron 4. Rewash hands regularly 5. Ensure work surfaces are clean | |
| **Knowledge** | | | | | | | |
| **Substantive knowledge** | | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | | **Tools and Equipment** | | **Knowledge of methods chefs would use** | |
| **Design** | The process of adapting recipes is crucial to improve a product/meal.  Chefs adapt recipes because of various reasons: dietry requirements, likes and dislikes of the user and the availability of products. | |  | | This happens after something has been made and evaluated for the first time. This process can be repeated multiple times to ensure the product is the best it can be. | | |  |  | | --- | --- | | produce (noun) | Smething that is made or created. Eg dairy produce, farm produce | | adapting recipes  adapt (verb)  recipe (noun) | To change the method through ingredient choices or the order of instructions. | | balance (noun) | To keep things equal. | | variety (noun) | To include a mixture of different/diverse things. | | nutrients (noun) | A susbtabce which provides nourishment | | seasonality (noun) | The state of an item dependent on the season (time of year in a particular part of the planet). | |
| **Make** | Long hair must be tied back, hands and surfaces must be clean, and all equipment and utensils should be checked to ensure they are safe to use.  Vegetables and fruits must be washed thoroughly before consumed or used in cooking.  When chopping or dicing vegetables it is easier to do so if the vegetable has been parboiled because they are not as hard to cut. | | Knives  Pans  Gas hob  Chopping board | |  | |
| **Evaluate** | A successful evaluation of a product will question whether the item is fit for purpose. | |  | | *Does it taste good? Is it insprired by Mexican cuisine?*  A product should be evaluated by its maker, considering the design and make process, but it must also be evaluated by its intended user.  Consider whether the dishes could be mass produced for 60 Year 5 children. | |

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| **Year 6** | | | | | | |
| **Year 6 HT1 and HT2** | | | | | | |
| **Engineering**  Brief: To design, make and evaluate an automata toy for a 6 year old child to play with. | | | | | | |
| **Revisit of prior knowledge** | **Cutting Skills**  **Sawing Skills** | | **Engineering Specific** | | **Health And Safety** | |
| Complete Year 6 Sheet 1 – Symmetrical cuts | | Share an image of a junior hacksaw and ask what it is.  Ask the children to explain when and why it might be used. | |  | |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  | **Theoretical** | **Tools and Equipment** | | **Knowledge of methods that chefs, engineers and textile workers use** | |
| **Evaluate** | Different shaped cams create different types of movement.  Cams turn one form of movement into another in a machine, such as a car engine. | Cams  Followers | | Automata toys work using cams to create movement. Movement differs when different shaped cams are used. | | |  |  | | --- | --- | |  |  | | Cam (noun) | A shaped component used to turn one form of movement into another. | | rotational movement | Spinning around the pivot point. | | pivot point | The point around where rotational movement occurs. | | linear movement | Up and down movement caused by a non-circular cam. | | circular cam | A round cam | | non-circular cam | Any cam which is not round | | follower | The component that is moved up and down or rotated by the cam. | | slide | The housing (case) for the follower that allows it to move. | | G-clamp |  | | Spreader clamp |  | | Exploded diagram | Diagram detailing each part |   [Year 6 Engineering - Key Vocabulary - Match up (wordwall.net)](https://wordwall.net/resource/34003880/year-6-engineering-key-vocabulary) |
| **Design** | When a circular cam is placed at the edge of another circular cam at a 90° angle it will rotate with a continuous movement. This is commonly used in simple spinning toys. | Tape measures – cm/mm | | Non-circular cams are used to create different types of linear movement. The shape of these non-circular cams will influence how smoothly or quickly the follower rises and falls. If the non-circular cam is placed directly underneath the follower, only linear movement will occur. If it is placed towards the edge, then the follower will rotate, as well as going up and down.    Use annotated 2D and 3D sketches and exploded diagrams to develop and communicate design ideas. | |
| **Make** | Safety: Inspect tools for cracks, chips and wear.  Safety: Always tie back long hair and tuck it out of the way.  Tighten and loosen a G and spreader clamp by turning the handle.    G-clamps can come in a range of sizes which are designed for different levels of duty.  For example, a smaller G-clamp should be used for lighter-duty work, such as small repairs, whereas a larger version can be used for heavy-duty work, including sawing and drilling.  Junior hacksaws are used to cut wood into straight lines.  They cut when pulled towards user or backwards (look at the teeth position on the blade).  Sandpaper is used to smooth cut wood and avoid splinters. | G-clamp  Spreader clamp  Tape measures  Junior hacksaw  Sandpaper | | Join a cam to a shaft/follower successfully so it only rotates with the shaft/follower.    Position components within the 3D structure, allowing for alterations if necessary so ensure movements are as required. | |
| **Evaluate** |  |  | | Consider the views of others, including its intended user, to improve work.  Critically evaluate their design, its manufacturing process and whether it is fit for purpose against the original design brief.  Say how they would develop their design based on the strengths and development points identified. | |

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| **Year 6 HT3 and HT4** | | | | | | |
| **Food and Nutrition**  Brief: To design, make and evaluate a healthy lunch menu for children, inspired by Chinese cuisine, to eat as a school meal. | | | | | | |
| **Revisit of prior knowledge** | **Cutting & Chopping Skills** | | **Food and Nutrition Specific** | | **Health and Safety** | |
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| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | | **Key Vocabulary** |
|  |  | **Tools and Equipment** | | **Knowledge of methods textile workers would use** | |
| **Design** | The process of ‘re-designing’ (adapting) is crucial to improve a product.  Chefs re-design or adapt recipes because of various reasons: dietry requirements, likes and dislikes of the user, cost restraints and the availability of products.  When designing, the cost of materials and ingredients, and time scale of production must be considered. |  | | This happens after something has been made and evaluated for the first time. This process can be repeated multiple times to ensure the product is the best it can be. | | |  |  | | --- | --- | | wok | A bowl shaped frying pan, traditionally used in Chinese cooking. | | parboil | A method of partially cooking food in boiling water. | | produce | To make (verb) or things that are grown/reared (noun) | | locally sourced | Items which are found (farmed, grown, reared) close to where they are used in the making process. | | adapt the recipe | To change the process or ingredients when making a dish. | | substitute ingredients | The changing of one food item, which is required in a recipe, for another ingredient. | | variety | A range/mixture of products, items or ingredients. | | balance  mass production | To keep things even  To make a large quantity of identical products. | |
| **Make** | Long hair must be tied back, hands and surfaces must be clean, and all equipment and utensils should be checked to ensure they are safe to use.  Before consumption, most fresh food should be stored in a refrigerator to ensure bacteria does not grow on it.  Vegetables and fruits must be washed thoroughly before consumed or used in cooking.  When chopping or dicing vegetables it is easier to do so if the vegetable has been parboiled because they are not as hard to cut. | Wok  Knives  Chopping board | |  | |
| **Evaluate** | A successful evaluation of a product will question whether the item is fit for purpose.  Evaluations of made products (or dishes) must consider any benefits or challenges in relation to costs and time constraints. |  | | *Does it taste good?*  *Is it insprired by Chinese cuisine?*  *Can the ingredients be sourced locally?*  A product should be evaluated by its maker, considering the design and make process, but it must also be evaluated by its intended user.  Consider whether the dishes could be mass produced for 60 Year 6 children. | |

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| **Year 6 HT5 and HT6 – STEM project** | | | | | | |
| **Engineering**  Brief: To design, make and evaluate an electronic guitar for a reception child to play with. | | | | | | |
| **Revisit of prior knowledge** | **Sawing Skills** | | **Engineering Skills** | | | **Health and Safety** |
| Review  Fixing a clamp in place  Sawing action  Sanding purpose | | Share two types of sketch. Ask: what’s the difference between two types of sketch? One should be 2D and the other 3D. | | | Safety around using saws  Health and safety when cutting wood. - children should use goggles and wear masks if there is a lot of dust. Area should be well ventilated. |
| **Knowledge** | | | | | | |
| **Substantive knowledge** | | **Disciplinary Knowledge** | | | **Key Vocabulary** | |
|  |  | **Tools and Equipment** | | **Knowledge of methods engineers would use** |
| **Design** | A guitar is constructed of: body, neck and headstock. It also has a bridge, nut, sound hole, frets and strings  Designs need to be practical to construct and influenced by existing designs, but also appealing for their porspective user. | Tinker CAD is a design programme used by beginner designers/engineers. | | Scaled designs, including sketches and CAD, are effective in envisaging the final product and an important part of the design process | |  |  | | --- | --- | | CAD | Computer aided Design  When a computer is used to design the product. | | Scaled design | A drawing of an object, whereby the object is drawn smaller or larger than the item itself | | Coping saw |  | | Junior hacksaw |  | | durable | Able to withstand wear, pressure or damage. | | G-Clamp |  | | Spreader clamp |  | | MDF | Medium density fibrewood  A man-made wood which is free from natural defects. | | balsa wood | A light-weight wood | | |
| **Make** | Using different materials to create products give different outcomes. E.g. Plastic is lightweight but not always hard-wearing and has environmental implications whereas wood is a strong and durable material for construction.  Coping saws can be used to cut curved shapes in wood  Sanding and filing help achieve the shape and a smooth finish which also ensure the product is safe for use with no shape edges. | - Coping saw  - Junior hacksaw  - g-clamp  - spreader clamp  - Sandpaper  - Bolsa wood  - MDF | | Decorative products and materials should be used based on their aesthetics but also their safety, practicality and durability. |
| **Evaluate** | To evaluate a product effectively, it should be trialled with/by the intended user (Reception children) and feedback gathered.  Designs are developed based on the strengths and development points identified by the product’s intended user. |  | |  |