| **Design & Technology**    **Curriculum Coverage**  **EYFS – Cycle B** | | | | |
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| **Unit of work** | **Autumn**  Fantastic Fruit | **Spring**  Chairs for 3 bears | **Summer**  Let’s look at hats |
| **Prior Learning** | What fruits do you like to eat at home?  What are your favourite fruits?  When do you eat them? | Story of Goldilocks and the Three Bears.  What happened to the chairs?  Why did this happen to the chairs? | Do you wear a hat, why?  What occasions do we were hats? |
| **Core Learning** | Set the challenge of preparing a layered fruit dish for a friend which contains a least two 5-A-DAY portions. It could be:  • a breakfast, e.g. layered fruit, cereal and yogurt;  • a fruit salad snack, e.g. layers of different fruit;  • a dessert, e.g. layers of fruit with yogurt and drizzled with honey.  Help them plan by asking what time of day it will be eaten, what ingredients will be used, how it will be made, what container it will go into and how they can make it look good so the friend will want to eat it.  Display the available ingredients and talk through these to remind the children what they are and how they are prepared.  Provide a planning sheet to help design the dish, and get the children to work in pairs.  Remind them how to use equipment and how to work hygienically. Encourage them to follow their plans during making.  Help them evaluate their work through questioning:  • Do you like the way it looks? Why?  • How does it taste?  • Do you think your friend would like it?  • What food skills did you use to make it?  • Would you change anything if you could? | 1. Finding out about making joints that are fixed  This work can be started through teacher directed activities; follow up can be through child-initiated activity. The teacher can show the children how the component/joiner works and then offer a teacher directed context in which the children see how the component/joiner works for themselves.  Through a series of activities, children can be introduced to components that will help make a fixed joint e.g. staple, glue. They can be shown how to join a thin surface to a flat one i.e. splay out the end of the thin surface to make it wider.  2. Finishing techniques  The children will need to know about some finishing techniques for their chairs. They could create a ‘mood board’ as designers do with different finishes that they might use e.g. fabric, adding foam and then covering it, using patterned paper from e.g. wall paper, printed from a computer, sticky paper, foil, wood (lolly sticks).  3. Finding out about structures  What makes something stable? The children can look at any everyday object e.g. cup, tin, eggcup, photo frame, clock. What makes the object stand up? Why doesn’t it wobble or fall down. Get the children to think about the wide base. They could model a cup out of Plasticine which has a much narrower base than the top. Is it as firm when it is standing up?  4. Finding out about structures  Arrange three card cylinders (kitchen paper rolls) in different ways and try a card seat on top.  • Which way/s are the most stable?  • Where is it best to have the cylinders?  • Why do you think so?  Try the same activity with four cylinders.  5. Finding out about structures  Show the children pictures of animals. Talk about their pets.  • How do they stand up?  • Where are their legs on their bodies?  Ask the children to model with e.g. Plasticine an animal. Try putting the legs in different places.  • What happens?  • What happens when the animal only has three legs?  • Can they make the animal stable when standing?  Suggested context - a new chair for baby bear  The children will have investigated a range of chairs.  They will have undertaken a variety of activities to develop their practical skills and their knowledge and understanding of structures.  Talk to the children about the chairs. Have a baby bear to use for judging size.  • What chair do they think would be suitable for baby bear and why?  • What material will they use?  • How will they join it?  • What finish will they use?  • Will their chair be the right size for baby bear?  • How will they check it?  • Will it be stable?  • How will they know?  Make sure that the children have access to a variety of materials during discussion time so they can start to model with /manipulate them. Put out different joiners including different glues so the children can make their own decisions.  As they design and make their chair, encourage the children to think about the size of their chair, its stability and a quality finish e.g. careful use of fabric.  When the chairs are finished, ensure that the children check to see if baby bear can sit in it.  • Is it the right size?  • Does the chair wobble?  • Do they think the chair will be comfortable?  • Why?  • Do they think it needs any changes? | Show children the woolly hat and ask them if they know what the item is? Allow children to pass the hat around and explore it further. Do they know what type of hat it is? What material is the hat made from? Explore the texture of the material; use this as a focus as you pass the hat around. Then ask children why they think that material has been used. What interesting features does the hat have (side flaps for covering ears, tassels for decorations, logo, colourful)? Focus on ear flaps- let a child try the hat on and emphasise where the flaps are located- do they know what they are for? Who do they think the hat is designed for? When would the hat be used? Where would the hat be used? Can they draw the hat and label the parts.  Show children a collection of hats. Allow children to pass the hats around and explore them further. Listen to the comments and questions they ask. Teacher to act as an observer here, noting down their initial thoughts and ideas concerning the hats they are exploring, do they draw on any of the language introduced in session 1? Choose a hat and ask the group whether they know what type of hat it is? What material is the hat made from? Who might use this hat? What would they use it for? Does the hat have any interesting features? Use these questions as a focus as you pass the hats around. Encourage children to try the hats on and question them about what it feels like on their head? Who do they think the hat is designed for? When would the hat be used? Where would the hat be used? Can they draw their favourite hat and label some of the different parts.  Using play dough to create hats- thinking about the structure of a hat. Support children in developing skills to create a bowl shape. Creating a ball like shape first and then pushing our thumbs half way through the centre and then pinching the sides out (clearly model this techniques first). Once children have got to this stage they can then use tools to join parts to the base shape of their hat, add features such as earflaps or a peak and decorate their hat. Remember to model how to use the different play dough tools you are providing.  Encouraging children to focus on the language introduced in the previous session (exploring hats) to describe some of the fabrics provided. Introduce new language and vocabulary that relates to the different fabrics they may find on the table. As children explore the materials draw their focus back to the questions highlighted in the introduction. Children can use an Alice band to hold the different fabric squares on their heads to investigate how they feel on their head in the sun. Support children in their discussion concerning which material will be most suitable for their sun hat, children can stick smiley face stickers on the fabric they feel would be suitable and sad face stickers on those fabrics they feel will not be suitable.  Children to explore the different tools and techniques, joining the materials in different ways and exploring, which are the strongest, fastest, easiest to use and which create a neat join. Support children in discussing and testing the different techniques and continuously model how to use the tools appropriately.  Show children the collection of sun hats. Allow children to pass the hats around and explore them further. Listen to the comments and questions they ask. What material is the hat made from? Explore the texture of the fabric; use this as a focus as you pass the hats around. Then ask children why they think that material has been used. What interesting features do the hats have? Encourage children to try the hat on and question them about what it feels like on their head?  Using play dough to design a sun hat- thinking about the structure of a hat, the features they will include e.g. peak. Support in developing skills to create a bowl shape using our thumbs as before, providing more support for less able children. Children can use play dough tools provided to join parts such as a peak to their sun hat and decorate their sun hat. Model to recap previous learning.  Support children in creating their sun hat, support children in checking the hat fits, adding features such as a peak, measuring out pieces and marking shapes on the fabric. Remind children about the fixing and joining techniques we have previously tested and which ones we have found most suitable. Support children in testing and adapting their sun hat during the session, encouraging them to really think through their ideas and continuously evaluate the creations.  Children will then choose the resources and techniques they wish to use to decorate their sun hat. Support children where necessary e.g. creating patterns with the fabric pens and 3D fabric gel and supporting children in fixing the feathers and sequins to their hat. Ask children ‘why are we decorating our hats?’ ‘What difference does it make if they are not decorated?’ Discuss why we are decorating our hats e.g. to make it bright and attractive so that other children will like it, to make it individual/different from the other hats.  Children to wear their sun hats whilst playing outside in the Nursery outdoor area. Towards the end of the session gather children together and discuss how well their hats have worked? What did they like about their hats? Were they comfortable? Did they protect their heads from the sun well? What didn’t they like about their hat? What might they change about their hat? |
| **Key knowledge/ Skills** | * Name at least 5 fruits. * Make a decision about which 3 fruits to use in their desert. * Use a planning sheet effectively. * Work hygienically. * Describe what worked and what could be better. | * Describe the job of a ‘joiner’ when looking at different types of chair. * Talk about where the best placement of 3 cylinders under a card seat would be. * Show how to make something stable. * Choose the right type of joiner (including glue) for the job. * Name 2 finishing techniques that could be used for a chair seat. | * Draw and label parts of a hat. * Suggest which materials would be suitable for different situations. * Suggest suitable decorations for a hat. * Measure and mark out pieces. * Suggest suitable joining techniques. |
| **Vocabulary** | soft  hard  smooth  spiky  bumpy  hairy  long  round  colourful  furry  squashy  crunchy  squeaky  fruity  sweet  juicy  bitty  sour | Stable  stability  wide base  wobbly  strong  strength  collapse  heavy  light  user  purpose  plan  model  label  joiner  stapler | Soft, rough, knitted, tassels, ear flaps, wool, woolly, warm, thick, stripy, logo,  Circular, cylinder, sphere, rounded.  Mould, fix, join, push, squeeze, and pinch.  Soft, rough, itchy, smooth, knitted, strong, heavy, light, comfortable, suitable, unsuitable, furry,  Light, soft, bright, comfortable, peak, rim.  Circular, cylinder, sphere, rounded.  Mould, fix, join, push, squeeze.  Join, fix, cut, add, attach, stapler, staples, glue, glue spreader,  Join, fix, cut, add, attach, stapler, staples, glue, glue spreader, feathers, felt shapes, pompoms, sequins, 3D fabric gel pens, fabric pens  Explore Investigate Test Try  Soft, rough, itchy, strong, heavy, light, comfortable, suitable, unsuitable, furry |
| **Personal Development** | Why is it important to have a healthy diet?  Why is it important to wash our hands before we prepare food? |  | How does your hat make you feel?  How are you looking after yourself by wearing your hat? |
| **Quick Quiz** | Can you name some healthy fruits?  What do we mean by ingredients?  How can we make our food look good to eat? | Why did the chairs in the story break?  What did you have to do to ensure your chair was stable? | What material did you make your hat out of? Why?  How did you attach your decoration? |

| **Design & Technology**    **Curriculum Coverage**  **Year 1/2 – Cycle B** | | | | | |
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| **Unit of work** | **Autumn**  **Mechanisms**  Wheels and axles | | **Spring**  **Structures**  Free standing structures | **Summer**  **Food**  Preparing fruit & vegetables |
| **Prior Learning** | **EYFS Year A: Let’s look at vehicles**  • Assembled vehicles with moving wheels using construction kits.  • Explored moving vehicles through play.  • Gained some experience of designing, making and evaluating products for a specified user and purpose.  • Developed some cutting, joining and finishing skills with card. | | **EYFS Year B: Chairs for three Bears**  Experience of using construction kits to build walls, towers and frameworks.  • Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card.  • Experience of different methods of joining card and paper. | **EYFS Year B: Fantastic Fruit**  • Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell.  • Experience of cutting soft fruit and vegetables using appropriate utensils. |
| **Core Learning** | **Investigative and Evaluative Activities (IEAs)**  • Explore and evaluate a range of wheeled products such as toys and everyday objects. Through questioning, direct children’s observations e.g. the number, size, position and methods of fixing wheels and axles. How do you think the wheels move? How do you think the wheels are fixed on? Why do you think the product has this number of wheels? Why do you think the wheels are round?  • Draw an example of a wheeled product, stating the user and purpose, and labelling the main parts e.g. body, chassis, wheels, axles and axle holders.  • Walk around the school building and grounds, recording how wheels and axles are used in daily life.  • Read a story or non-fiction book that includes a wheeled product. Use this to introduce relevant vocabulary and to emphasise user and purpose.  **Focused Tasks (FTs)**  • Using construction kits with wheels and axles, ask children to make a product that moves.  • Demonstrate to children how wheels and axles may be assembled as either fixed axles or free axles.  • Show different ways of making axle holders and stress the importance of making sure the axles run freely within the holders.  • Ensure that children are taught how to mark out, hold, cut and join materials and components correctly.  • Using samples of materials and components they will use when designing and making, ask the children to assemble some examples of wheel, axle, axle holder combinations. Display the work completed as a reference for their DMEA.  **Design, Make and Evaluate Assignment (DMEA)**  • Discuss with the children what they will be designing, making and evaluating within an authentic context.  • With the children identify a user and purpose for the product and generate simple criteria.  • Ask children to generate, develop and communicate their ideas as appropriate e.g. through talk and drawing. Talk about, evaluate and share ideas with other children/adults.  • Make their wheel and axle product using their design ideas and criteria as an ongoing guide.  • Discuss how the children might add finishing techniques to their product with reference to their design ideas and criteria. Direct the children to information and communication technology opportunities such as clip art, word processing, paint or simple drawing programs.  • Ask children to evaluate their finished product, communicating how it works and how it matches their design criteria, including any changes they made. | | **Investigative and Evaluative Activities (IEAs)**  • Go on a walk and/or look at photographs of the local area to explore structures such as playground equipment, street furniture, walls, towers and bridges e.g. What are the structures called and what is their purpose? Who might use them? What materials have been used? Why have these been chosen? How have the parts been joined together? How have the structures been made strong enough? How have they been made stable?  • Where possible, ask the children to draw or photograph the structures they have been exploring and label with the correct technical vocabulary in relation to the structure, materials used and shapes e.g. wall, tower, framework, base, joint, metal, wood, plastic, brick, triangle, square, rectangle, cuboid, cube.  **Focused Tasks (FTs)**  • Demonstrate measuring, marking out, cutting, shaping, joining and finishing techniques with a range of tools and new and reclaimed materials that children are likely to use to make their structures. Discuss the suitability of materials for their products according to their characteristics.  • Ask the children to build and explore a variety of freestanding structures using construction kits, such as wooden blocks, interconnecting plastic bricks and those that make frameworks e.g. How can you stop your structures from falling over? How they can be made stronger and stiffer in order to carry a load? Children could make models of the structures they have seen in school and the local area.  • Ask children to fold paper or card in different ways to make freestanding structures, using masking tape where necessary to make joins. Encourage them to think about how folding materials can make them stronger, stiffer, stand up and be more stable e.g. Can they support an object on top of their structures without it falling over or breaking?  **Design, Make and Evaluate Assignment (DMEA**)  • Discuss with the children what structure they will be designing, making and evaluating e.g. Who will your product be for? What will be its purpose? What materials will you use? How will you make it strong and stable?  • Generate some simple design criteria with the children e.g. the structure should stand up on its own, it should be strong enough to carry Teddy.  • Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with construction kits and other materials.  • As a whole class, plan the order in which the structures will be made. Children could make their final products from construction kits, new and reclaimed materials or any combination of these, according to their characteristics.  • Ask children to evaluate their developing ideas and final products against original design criteria. | **Investigative and Evaluative Activities (IEAs**)  • Children examine a range of fruit/vegetables. Use questions to develop children’s understanding e.g. What is this called? Who has eaten this fruit/vegetable before? Where is it grown? When can it be harvested? What are its taste, smell, texture and appearance? What will it look like if we peel it or cut it in half? What are the different parts called?  • Provide opportunities for children to handle, smell and taste fruit and vegetables in order to describe them through talking and drawing. e.g. What words can we use to describe the shape, colour, feel, taste?  • Evaluate existing products to determine what the children like best; provide opportunities for the children to investigate preferences of their intended users/suitability for intended purposes e.g. What do you prefer and why? What might we want to include in our product to meet our user’s preferences? Which fruit/vegetables might be the best for our product to match the occasion/purpose?  **Focused Tasks (FTs)**  • Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. What should we do before we work with food? Why is following instructions important?  • Demonstrate how to use simple utensils and provide opportunities for the children to practise food-processing skills such as washing, grating, peeling, slicing, squeezing e.g. Do we eat the whole fruit? Why or why not? Which parts do we eat? What might we have to do before eating this? Why do we cut, grate, peel and slice in this way? Discuss different effects achieved by different processes.  • Discuss healthy eating advice, including eating more fruit and vegetables; using The Eatwell Guide model talk about the importance of fruit and vegetables in our balanced diet e.g. Why is it good to eat fruit and vegetables? How many pieces of fruit/vegetables do you eat per day? Why is it important to wash fruit/vegetables before we eat them?  **Design, Make and Evaluate Assignment (DMEA)**  • Set a context for designing and making which is authentic and meaningful.  • Discuss with the children the possible products that they might want to design, make and evaluate and who the products will be for. Agree on design criteria that can be used to guide the development and evaluation of children’s products e.g. Who/what is the product for? What will make our product unique/different? How will we know that we designed and made a successful product?  • Use talk and drawings when planning for a product; ask the children to develop, model and communicate their ideas e.g. What will you need? What fruit/vegetable will you need? How much will you need? How will you present the product?  • Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs.  • Evaluate as the children work through the project and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed |
| **Key knowledge/ Skills** | * To name main parts of a vehicle - chassis, wheels, axles and axle holders. * To describe the job of an axle. * To demonstrate 2 ways to make an axle holder. * To produce a wheeled vehicle. * To describe 1 change they made / would make to improve the vehicle. | | * Name at least 5 materials which could be used to create structures. * Describe how card can be manipulated to form a strong, free-standing structure. * Talk about how a structure could stand up unaided. * Demonstrate the use of a construction kit alongside reclaimed materials. * Show how structures can be strengthened to carry a load. | * Design appealing products for a particular user based on simple design criteria. * Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. * Taste and evaluate a range of fruit and vegetables to determine the intended user’s preferences. * Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. * Know and use technical and sensory vocabulary relevant to the project. |
| **Vocabulary** | vehicle, wheel, axle, axle holder, chassis, body, cab  assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism  names of tools, equipment and materials used  design, make, evaluate, purpose, user, criteria, functional | | structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved  metal, wood, plastic  circle, triangle, square, rectangle, cuboid, cube, cylinder  design, make, evaluate, user, purpose, ideas, design criteria, product, function | fruit and vegetable names, names of equipment and utensils  sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard  flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria |
| **Personal Development** | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. |
| **Quick Quiz** | Can you name the tools that you used?  Explain what is:  An axle  Axle holder  Chassis  Friction  Dowel  What is the difference between a fixed and rotating axle? | | What is a   * Freestanding structure * Frame structure * Shell structure   What do these words mean   * Stability * Buttress * Brick bonding * Mock-up | Can you stay how we can be hygienic?   * Jewellery removed * Hair tied back * Apron is on * Sleeves are rolled up * Hands washed * Cuts covered with blue waterproof dressing |
| **Design & Technology**    **Curriculum Coverage**  **Year 3/4– Cycle B** | | | | | |
| **Unit of work** | **Autumn**  **Mechanical systems**  Levers & linkages | **Spring**  **Food**  Healthy & varied diet | | **Summer**  **Electrical systems**  Simple circuits & switches |
| **Prior Learning** | Year 1/2 Year A:  **Mechanisms** Sliders and levers  Year B:  **Mechanisms** Wheels and axles  • Explored and used mechanisms such as flaps, sliders and levers.  • Gained experience of basic cutting, joining and finishing techniques with paper and card. | EYFS Year B: **Fantastic Fruit**  Year 1/2 Year A & B  **Food** Preparing fruit & vegetables  • Know some ways to prepare ingredients safely and hygienically.  • Have some basic knowledge and understanding about healthy eating and The Eatwell Guide.  • Have used some equipment and utensils and prepared and combined ingredients to make a product. | | • Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers.  • Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue. |
| **Core Learning** | **Investigative and Evaluative Activities (IEAs)**  • Children investigate, analyse and evaluate books and, where available, other products which have a range of lever and linkage mechanisms.  • Use questions to develop children’s understanding e.g. Who might it be for? What is its purpose? What do you think will move? How will you make it move? What part moved and how did it move? How do you think the mechanism works? What materials have been used? How effective do you think it is and why? What else could move?  **Focused Tasks (FTs)**  • Demonstrate a range of lever and linkage mechanisms to the children using prepared teaching aids.  • Use questions to develop children’s understanding e.g. Which card strip is the lever? Which card strip is acting as the linkage? Which part of the system is the input and which part the output? What does the type of movement remind you of? Which are the fixed pivots and which are the loose pivots?  • Demonstrate the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques.  • Children should develop their knowledge and skills by replicating one or more of the teaching aids.  **Design, Make and Evaluate Assignment (DMEA**)  • Develop a design brief with the children within a context which is authentic and meaningful.  • Discuss with children the purpose of the products they will be designing and making and who the products will be for. Ask the children to generate a range of ideas, encouraging creative responses. Agree on design criteria that can be used to guide the development and evaluation of the children’s products.  • Using annotated sketches and prototypes, ask the children to develop, model and communicate their ideas.  • Ask the children to consider the main stages in making before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs.  • Evaluate the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed. | **Investigative and Evaluative Activities (IEAs)**  • Children investigate a range of food products e.g. the content of their lunchboxes over a week, a selection of foods provided for them, food from a visit to a local shop. Link to the principles of a varied and healthy diet using The Eatwell Guide e.g. What ingredients have been used? Which food groups do they belong to? What substances are used in the products e.g. nutrients, water and fibre?  • Carry out sensory evaluations on the contents of the food from e.g. a variety of bought food products such as a range of wraps or sandwiches. Record results, for example using a table. Use appropriate words to describe the taste/smell/texture/appearance e.g. How do the sensory characteristics affect your liking for the food?  • Gather information about existing products available relating to your product. Visit a local supermarket and/or use the internet.  • Find out how a variety of ingredients used in products are grown and harvested, reared, caught and processed e.g. Where and when are the ingredients grown? Where do different meats/fish/cheese/eggs come from? How and why are they processed?  **Focused Tasks (FTs)**  • Learn to select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically including the bridge and claw technique, grating, peeling, chopping, slicing, mixing, spreading, kneading and baking.  • Food preparation and cooking techniques could be practised by making a food product using an existing recipe.  • Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. What should we do before we work with food? Why is following instructions important?  **Design, Make and Evaluate Assignment (DMEA)**  • Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for.  • Develop and agree on design criteria with the children within a context that is authentic and meaningful. This can include criteria relating to healthy eating and a varied diet e.g. What do you need to consider to make it part of a balanced diet? How do we select the ingredients? How could we make it appealing to eat?  • Ask children to generate a range of ideas encouraging realistic responses.  • Using discussion, annotated sketches and information and communication technology if appropriate, ask the children to develop and communicate their ideas.  • Ask children to consider the main stages in making the food product, before preparing/cooking the product including the ingredients and utensils they will need.  • Evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria previously agreed. Consider what others think of the product when considering how the work might be improved. | | **Investigative and Evaluative Activities (IEAs)**  • Discuss, investigate and, where practical, disassemble different examples of relevant battery-powered products, including those which are commercially available e.g. Where and why they are used? How does the product work? What are its key features and components? How does the switch work? Is the product manually controlled or controlled by a computer? What materials have been used and why? How is it suited to its intended user and purpose?  • Ask children to investigate examples of switches, including those which are commercially available, which work in different ways e.g. push-to-make, push-to-break, toggle switch. Let the children use them in simple circuits e.g. How might different types of switches be useful in different types of products?  • Remind children about the dangers of mains electricity.  **Focused Tasks (FTs)**  • Recap with the children how to make manually controlled, simple series circuits with batteries and different types of switches, bulbs and buzzers. Discuss which of the components in the circuit are input devices e.g. switches, and which are output devices e.g. bulbs and buzzers.  • Demonstrate how to find a fault in a simple circuit and correct it, giving pupils opportunities to practise.  • Use a simple computer control program with an interface box or standalone control box to physically control output devices e.g. bulbs and buzzers.  • Ask the children to make a variety of switches by using simple classroom materials e.g. card, corrugated plastic, aluminium foil, paper fasteners and paper clips. Encourage children to make switches that operate in different ways e.g. when you press them, when you turn them, when you push them from side to side. Ask the children to test their switches in a simple series circuit.  • Teach children how to avoid making short circuits.  **Design, Make and Evaluate Assignment (DMEA)**  • Develop a design brief with the children within a context which is authentic and meaningful.  • Discuss with children the purpose of the battery-powered products that they will be designing and making and who they will be for. Ask the children to generate a range of ideas, encouraging realistic responses. Agree on design criteria that can be used to guide the development and evaluation of the children’s products, including safety features.  • Using annotated sketches, cross-sectional and exploded diagrams, as appropriate, ask the children to develop, model and communicate their ideas.  • Ask the children to consider the main stages in making and testing before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs.  • Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed. |
| **Key knowledge/ Skills** | * Know and use key vocabulary - Mechanism, lever, linkage and Pivot. Say what each means. * To know that lever and linkage mechanisms usually produce oscillating or reciprocating movements. * To make a simple oscillating and rotary lever * Make annotated sketches to plan work. * To make a pop up mechanism using either an oscillating or rotary lever. | * Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk. * Use appropriate words to describe the taste/smell/texture/appearance of foods when tasting. * Select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically. * Describe how a variety of ingredients used in products are grown and harvested, reared, caught and processed. * Follow a simple commercial recipe. | | * Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams. * Select from and use tools and equipment to cut, shape, join and finish with some accuracy. * Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities. * Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. * Know and use technical vocabulary relevant to the project. |
| **Vocabulary** | mechanism, lever, linkage, pivot, slot, bridge, guide  system, input, process, output  linear, rotary, oscillating, reciprocating  user, purpose, function  prototype, design criteria, innovative, appealing, design brief  • Mechanism – a device used to create movement in a product.  • Lever – a rigid bar which moves around a pivot. Levers are used in many everyday products. In this project children will use card strips for levers and paper fasteners for pivots.  • Linkage – the card strips joining one or more levers to produce the type of movement required. The term ‘linkage’ is also used to describe the lever and linkage mechanism as a whole.  • Slot – the hole through which a lever is placed to enable part of a picture to move.  • Guide or bridge – a short card strip used to keep lever and linkage mechanisms in place and control movement.  • Loose pivot – a paper fastener that joins card strips together.  • Fixed pivot – a paper fastener that joins card strips to the backing card. • System – a set of related parts or components used to create an outcome. Systems have an input, process and an output. In a lever and linkage mechanism, the ‘input movement’ is where the user pushes or pulls a card strip. The ‘output movement’ is where one or more parts of the picture move. | name of products, names of equipment, utensils, techniques and ingredients  texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury  hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet  planning, design criteria, purpose, user, annotated sketch, sensory evaluations | | series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip  control, program, system, input device, output device  user, purpose, function, prototype, design criteria, innovative, appealing, design brief |
| **Personal Development** | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. |
| **Quick Quiz** | Why do we need fixed and loose pivots?  How do the lever and linkage mechanisms move?   * Linear – straight line * Reciprocating * Rotary * Oscillating | How can you analyse existing products?   * Appearance * Smell * Taste * Texture   How do you safely   * Grate cheese * Spread butter * Cut using the bridge technique * Cut using the claw technique | | How do you make secure connections?   * Connecting block * Bulb holder – bent wire around the screw in direction of turning when tightened * Twist strands of wire together * Wrap ends around * Tape over insulating tape   How do you make a handmade switch?  Name some commercial switches? |
| **Design & Technology**    **Curriculum Coverage**  **Year 5/6 – Cycle B** | | | | | |
| **Unit of work** | **Autumn**  **Mechanical systems**  Pulleys or gears | **Spring**  **Textiles**  Combining different fabric shapes | | **Summer**  **Food**  Celebrating culture & seasonality |
| **Prior Learning** | Year 1/2 Year A:  **Mechanisms** Sliders and levers  Year B:  **Mechanisms** Wheels and axles  Year 3/4 Year B  **Mechanical systems** Levers & linkages  • Experience of axles, axle holders and wheels that are fixed or free moving.  • Basic understanding of electrical circuits, simple switches and components.  • Experience of cutting and joining techniques with a range of materials including card, plastic and wood.  • An understanding of how to strengthen and stiffen structures. | Year 1/2 Year A  **Textiles** Templates & joining techniques  Year 3/4 Year A:  **Textiles** 2D shape to 3D product  • Experience of basic stitching, joining textiles and finishing techniques.  • Experience of making and using simple pattern pieces. | | EYFS Year B: Fantastic Fruit  Year 1/2 Year A & B  **Food** Preparing fruit & vegetables  Year 3/4 Year A & B:  **Food** Healthy & varied diet  • Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet.  • Be able to use appropriate equipment and utensils, and apply a range of techniques for measuring out, preparing and combining ingredients. |
| **Core Learning** | **Investigative and Evaluative Activities (IEAs)**  • Investigate, analyse and evaluate existing everyday products and existing or pre-made toys that incorporate gear or pulley systems. Use videos and photographs of products that cannot be explored through first-hand experience.  • Use observational drawings and questions to develop understanding of each product in the collection e.g. How innovative is the product? What design decisions have been made? What type of movement can be seen? What types of mechanical components are used and where are they positioned? What are the input, process and output of the system? How well does the product work? Why have the materials and components been chosen? How well has it been designed? How well has it been made?  • Children could research and, if possible, visit engineering and manufacturing companies that are relevant to the product they are designing and making e.g. Jaguar Land Rover, JCB, local companies  **Focused Tasks (FTs)**  • Using a construction kit, investigate combinations of two different sized pulleys to learn about direction and speed of rotation e.g. How many times does the smaller pulley turn each time the larger pulley turns once? Do the pulleys move in the same direction? How can you reverse the direction of rotation?  AND/OR  • Using a construction kit, explore combinations of two different size gears meshed together. Investigate the direction and speed of rotation focusing on how the size of the driver gear affects the speed of the follower gear. Ask the children to use the number of teeth on each gear to decide upon the gear ratios e.g. 10 tooth driver gear meshed with a 20 tooth follower gear produces a ratio of 2:1  • Build a working circuit that incorporates a battery, a motor and a handmade switch, such as a reversing switch. Demonstrate the accurate use of tools and equipment including cutting and stripping wire, and making secure electrical connections. Remind children about the dangers of mains electricity. Draw a pictorial representation of the circuit or draw a circuit diagram using correct symbols.  • Develop measuring, marking, cutting, shaping and joining skills using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames, as appropriate. Demonstrate the accurate use of tools and equipment.  **Design, Make and Evaluate Assignment (DMEA**)  • Develop an authentic and meaningful design brief with the children.  • Children generate innovative ideas by carrying out research including surveys, interviews and questionnaires and develop a design specification for their product, carefully considering the purpose and intended user for their product.  • Communicate ideas through detailed, annotated drawings from different views and/or exploded diagrams. The drawings should indicate the design decisions made, including the location of the mechanical and electrical components, how they work as a system with an input, process and output, and the appearance and finishing techniques for the product.  • Produce detailed step-by-step plans and lists of tools, equipment and materials needed. If appropriate, allocate tasks within a team.  • Make high quality products, applying knowledge, understanding and skills from IEAs and FTs. Children should use a range of decorative finishing techniques to ensure a well finished final product that matches the intended user and purpose.  • Evaluate throughout and the final product in use, comparing it to the original design specification. Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for the intended user and purpose. | **Investigative and Evaluative Activities (IEAs)**  • Children investigate, analyse and evaluate a range of existing products which have been produced by combining fabric shapes. Investigate work by designers and their impact on fabrics and products. Use questions to develop children’s understanding e.g. Is the product functional or decorative? Who would use this product? What is its purpose? What design decisions have been made? Do the textiles used match the intended purpose? What components have been used to enhance the appearance? To what extent is the design innovative?  • Children investigate and analyse how existing products have been constructed. Children disassemble a product and evaluate what the fabric shapes look like, how the parts have been joined, how the product has been strengthen and stiffened, what fastenings have been used and why.  • Children investigate properties of textiles through investigation e.g. exploring insulating properties, water resistance, wear and strength of textiles.  .**Focused Tasks (FTs)**  • Develop skills of threading needles and joining textiles using a range of stitches. This activity must build upon children’s earlier experiences of stitches e.g. improving appearance and consistency of stitches and introducing new stitches. If available, demonstrate and allow children to use sewing machines to join fabric with close adult supervision.  • Develop skills of sewing textiles by joining right side together and making seams. Children should investigate how to sew and shape curved edges by snipping seams, how to tack or attach wadding or stiffening and learn how to start and finish off a row of stitches.  • Develop skills of 2-D paper pattern making using grid or tracing paper to create a 3-D dipryl mock-up of a chosen product. Remind/teach how to pin a pattern on to fabric ensuring limited wastage, how to leave a seam allowance and different cutting techniques.  • Develop skills of computer-aided design (CAD) by using on-line pattern making software to generate pattern pieces. Investigate using art packages on the computer to design prints that can be applied to textiles using iron transfer paper.  **Design, Make and Evaluate Assignment (DMEA)**  • Set an authentic and meaningful design brief. Children generate ideas by carrying out research using e.g. surveys, interviews, questionnaires and the web. Children develop a simple design specification for their product.  • Communicate ideas through detailed, annotated drawings from different perspectives and/or computer- aided design. Drawings should indicate design decisions made, the methods of strengthening, the type of fabrics to be used and the types of stitching that will be incorporated.  • Produce step-by-step plans, lists of tools equipment, fabrics and components needed. Allocate tasks within a team if appropriate.  • Make high quality products applying knowledge, understanding and skills from IEAs and FTs. Incorporate simple computer-aided manufacture (CAM) if appropriate e.g. printing on fabric. Children use a range of decorating techniques to ensure a well-finished final product that matches the intended user and purpose.  • Evaluate both as the children proceed with their work and the final product in use, comparing the final product to the original design specification. Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for intended user and purpose, considering others’ opinions. Communicate the evaluation in various forms e.g. writing for a particular purpose, giving a well-structured oral evaluation, speaking clearly and fluently. | | **Investigative and Evaluative Activities (IEAs)**  Children use first hand and secondary sources to carry out relevant research into existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a local bakery, farm, farm shop or supermarket e.g. What ingredients are sourced locally/in the UK/from overseas? What are the key ingredients needed to make a particular product? How have ingredients been processed? What is the nutritional value of a product?  Children carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. The ingredients could include those that could be added to a basic recipe such as herbs, spices, vegetables or cheese. These could be locally sourced, seasonal, Fair Trade or organic. Present results in e.g. tables/graphs/charts and by using evaluative writing.  Use a range of questions to support children’s ability to evaluate food ingredients and products e.g. What ingredients help to make the product spicy/crisp/crunchy etc? What is the impact of added ingredients/finishes/shapes on the finished product?  • Research key chefs and how they have promoted seasonality, local produce and healthy eating.  **Focused Tasks (FTs)**  • Demonstrate how to measure out, cut, shape and combine e.g. knead, beat, rub and mix ingredients.  • Demonstrate how to use appropriate utensils and equipment that the children may use safely and hygienically.  • Techniques could be practised following a basic recipe to prepare and cook a savoury food product.  • Ask questions about which ingredients could be changed or added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance and smell.  • When using a basic dough recipe, explore making different shapes to change the appearance of the food product e.g. Which shape is most appealing and why?  **Design, Make and Evaluate Assignment (DMEA)**  • Develop a design brief and simple design specification with the children within a context that is authentic and meaningful. This can include design criteria relating to nutrition and healthy eating.  • Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for.  • Ask children to generate a range of ideas encouraging innovative responses. Agree on design criteria that can be used to guide the development and evaluation of the children’s product.  • Using annotated sketches, discussion and information and communication technology if appropriate, ask children to develop and communicate their ideas.  • Ask children to record the steps, equipment, utensils and ingredients for making the food product drawing on the knowledge, understanding and skills learnt through IEAs and FTs.  • Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed. |
| **Key knowledge/ Skills** | * Generate innovative ideas by carrying out research including surveys, interviews and questionnaires and develop a design specification for the product. * Communicate ideas through detailed, annotated drawings? * Produce detailed step-by-step plans and lists of tools, equipment and materials needed. * Use a construction kit, explore combinations of two different size gears meshed together. * Build a working circuit that incorporates a battery, a motor and a handmade switch, such as a reversing switch. | * Give examples of 4 types of fastener and where each could be used. * Demonstrate 2 types of stitch - 1 used for decoration and 1 for fastening. * Create a 2D paper pattern with a seam allowance. * Produce step-by-step plans, lists of tools, equipment, fabrics and components needed. * Know what each of these terms means; mock up, pattern or template, seam allowance, specification, tacking, working drawing,detailed drawing. | | * Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. * Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas. * Write a step-by-step recipe, including a list of ingredients, equipment and utensils. * Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. * Understand how key chefs have influenced eating habits to promote varied and healthy diets. |
| **Vocabulary** | pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor  circuit, switch,  circuit diagram  annotated drawings, exploded diagrams  mechanical system, electrical system, input, | seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces  name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper  design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype | | ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs  fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality  utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble  design specification, innovative, research, evaluate, design brief |
| **Personal Development** | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. | | Developing values of  creativity  perseverance  What could I do better? Learning from my experiences. |
| **Quick Quiz** | What is a pulley? Gear?  Explain how these work in your product. | Discuss different fasteners:  Zip, Velcro, clasp, toggle, ties, press stud, buttons  Stitches: stem, satin, chain, lazy daisy. | | Name and explain some of the techniques you could use  • Mixing  • Rubbing  • kneading |