

Osmotherley CP Primary School Design and Technology Curriculum

“High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.” DFE National Curriculum 2014

Intent

At Osmotherley Primary School, we strive to provide a high-quality design and technology education, which engages, inspires and challenges pupils, equipping them with the knowledge and skills to design, make and evaluate their own products. Pupils use a wide range of materials and learn the skills to use the tools required to perform practical tasks accurately. They develop the technical knowledge required to understand how to stiffen, strengthen and reinforce more complex structures and apply the skills learned across a range of subjects. Design and technology is taught in progressive steps in each area, which build on prior learning.

Implementation

Design and technology at Osmotherley will be taught by delivering the [statutory requirements for design and technology within the National Curriculum in Key Stage 1 and 2](#). Reception children will follow the [Early Years Statutory Framework \(Sept 2021\)](#). The national curriculum and statutory framework provides the ‘end points’ to children’s learning in each key stage, we have broken these end points down into small steps of progression throughout Reception, Key Stage One, Lower Key Stage Two and Upper Key Stage Two for each strand of D&T.

Within the design and technology curriculum at Osmotherley Primary School, pupils are encouraged to show a curiosity and fascination of the world around them. Pupils research the impact that design and technology has had on the world around us and find out how particular designs have been significant in engineering history. They will research, design and make their own models, learning a range of skills and processes as they do so. They will learn to evaluate existing products and their own ideas and products, considering the views of others to improve their work.

In Key Stage 1 art and design is taught over a 2-year rolling programme and delivered in blocks of 2 or 3 weeks. In Key Stage 2 art and design is also taught over a 2 year rolling programme and is taught in a session once every 2 weeks. Within both Key Stages, prior learning tasks are set at the beginning of each unit of learning, to establish what has been remembered from previous learning. The unit is taught in small

sequenced steps to ensure that the children's working memory is not overloaded and opportunities for deliberate practise are planned to ensure that essential knowledge is committed to their long term memories.

There is an emphasis on the processes of designing and making a product. A similar process will be followed every time the pupils complete a design and technology activity, so that the skills and procedures required to carry out a successful project are embedded. Activities are taught through specific design criteria, but teaching will ensure coverage of the knowledge and skills required to secure successful outcomes in all areas. Pupils are introduced to a range of materials and taught how to use equipment safely. As they reach the end of Year 6, we will ensure that the knowledge and skills they have learnt will prepare them for their future learning in Year 7 by reviewing the Year 7 curriculum within the local secondary schools.

Impact

Pre-learning tasks will be set at the beginning of each task and will be revisited at the end of the project, then re-visited at regular intervals to ensure the key knowledge is committed to the long-term memory. Recalls at 2, 6 and 12 weeks are used to ensure that knowledge is embedded in the children's long-term memory, so that they know more, remember more and can do more. Monitoring of design and technology is conducted by the subject leader, the headteacher and the governors through lesson visits, book scrutiny, pupil voice interviews and analysis of essential knowledge gaps.

Essential Knowledge:

Children will leave Reception able to:

- Plan a creation before starting.
- Safely use a variety of materials, tools and techniques to cut and join.
- Share their creations, explaining the process they have used.
- Talk about healthy food choices.

They will leave Key Stage 1 able to:

- design, make and evaluate a product.
- use levers, sliders, wheels and axles.
- understand where food comes from.
- identify a range of tools and equipment and explain their use.

They will leave Key Stage 2 able to:

- Research, design, make and evaluate a product.
- Produce detailed plans of what they are going to make and how.
- Use tools safely and accurately and choose the correct tools and materials for a particular purpose.
- Apply their technical knowledge to their design work.
- Evaluate and improve their work.

DESIGN AND TECHNOLOGY CURRICULUM: PROGRESSION THROUGH THE COMPONENTS OF THE NATIONAL CURRICULUM

Early Years Reception Expected	Key Stage 1 Years 1 and 2 Expected	Lower Key Stage 2 Years 3 and 4 Expected	Upper Key Stage 2 Years 5 and 6 Expected
Design			
Pupils will: - draw a picture of a model before building or creating it.	Pupils will: - share ideas through talking, drawing and information and communication technology (using google slides) to create a product for a purpose. - make a simple plan including a list of materials needed.	Pupils will: - share ideas through written words and labelled sketches (both on paper and using google drawings), keeping in mind fitness of purpose and the end user. - make realistic step by step plans identifying equipment and materials needed.	Pupils will: -share ideas through written words and labelled sketches including cross-sectional, exploded diagrams and CAD using google sketch up. - work from their own detailed plans, modifying where appropriate.
Make			
Pupils will: - Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	Pupils will: - select from and use a range of tools and equipment to cut, shape, join and finish a product. (hole punch, scissors, saw.) - select from and use a wide range of materials and	Pupils will: - select appropriate tools and use them safely with close supervision. (saw, hand drill, hot glue gun.) - plan to use and select appropriate materials for a task showing an understanding of their characteristics.	Pupils will: - select and name appropriate tools and use them safely and accurately. (saw, hand drill, hot glue gun, sand paper.) - plan to use and select appropriate materials for a task showing an

<ul style="list-style-type: none"> - use glue and tape to join materials. 	<p>components, including construction materials, textiles and ingredients, according to their characteristics.</p> <ul style="list-style-type: none"> - use split pins, ties, folds, sticking and sewing to join materials. 	<ul style="list-style-type: none"> - use flange, tabs and slot joins to join materials. 	<p>understanding of their characteristics and joining them with precision.</p> <p>Make the following joints: - 'L' joint, 'T' joint, '+' joint</p>
Evaluate			
<p>Pupils will:</p> <ul style="list-style-type: none"> - identify what materials are used to make existing products. - Share their creations, explaining the process they have used: 'cut, join, change.' 	<p>Pupils will:</p> <ul style="list-style-type: none"> - discuss and evaluate a range of existing products. - evaluate their ideas and products against a simple design criteria. 	<p>Pupils will:</p> <ul style="list-style-type: none"> - investigate and analyse a range of existing products. - identify what has worked well and what can be improved in their product, using s design criteria. - explore how key events and individuals in design and technology have helped shape the world. 	<p>Pupils will:</p> <ul style="list-style-type: none"> - investigate and analyse a range of existing products in the context or culture in which they were made. - evaluate their product against the design specification identifying modifications that were made as a result of ongoing evaluation. - explore in greater depth, how key events and individuals in design and technology have helped shape the world.
Technical Knowledge			
<p>Pupils will:</p> <p>build structures with a range of materials (crates, planks, waffle bricks, wooden blocks.)</p>	<p>Pupils will:</p> <ul style="list-style-type: none"> - build structures, exploring how they can be made stronger, stiffer and more stable. (Lego, wooden meccano.) - explore and use mechanisms in their products. Year A - levers and sliders. Year B - winches (winding) and wheels with axles 	<p>Pupils will:</p> <ul style="list-style-type: none"> - create a shell or frame structure using diagonal struts to strengthen. - create and use simple wheels, axels, cams, winches, levers and linkages. Year A - Winches and electrical switches 	<p>Pupils will:</p> <ul style="list-style-type: none"> - build a framework, choosing from a range of different materials and explaining their choices. - create and use simple gears and pulleys selecting the most appropriate one to use in their products.

		<p>Year B - Wheels, axles, cams and linkages</p> <ul style="list-style-type: none"> - build models incorporating simple circuits with bulbs and switches. - apply their understanding of computing to program, monitor and control their products (Crumbles) 	<ul style="list-style-type: none"> - build models incorporating circuits with motors, buzzers or bulbs and switches. - apply their understanding of computing to program, monitor and control their products using multi step programs (Crumbles)
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Cooking and Nutrition

<p>Pupils will:</p> <ul style="list-style-type: none"> - know to wash their hands before eating <p>-talk about healthy food choices using the words 'healthy' and 'unhealthy'.</p> <p>- know some edible foods that can be grown in Osmotherley.</p>	<p>Pupils will:</p> <ul style="list-style-type: none"> - know to wash their hands and surfaces before preparing food. <p>- use the basic principles of a healthy and varied diet.</p> <p>-prepare cold dishes using appropriate tools to cut soft foods (fruit kebabs, guacamole).</p> <p>- name where food comes from (milk, bacon, beef, chicken, carrots.)</p>	<p>Pupils will:</p> <ul style="list-style-type: none"> -know to wash fruit and vegetables before preparing them. -choose the best method to keep or package their food for later. - know the principles of a healthy and varied diet (and apply them). -prepare and cook a variety of dishes using a range of techniques. -know which food comes from the UK and which comes from the rest of the world. -explain how foods are preserved. 	<p>Pupils will:</p> <ul style="list-style-type: none"> - know about food safety and sell by / eat by dates. -know how to serve food to others - plan healthy and balanced meals. -how to combine ingredients appropriately and use appropriate tools and equipment. -where and how a variety of ingredients are grown, reared, caught and processed and understand seasonality.
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Vocabulary

<p>Cut Mix Join Colour Rough</p>	<p>Sketch Label Equipment Prepare Ingredients</p>	<p>Fitness of purpose End user Practical Characteristics Gears</p>	<p>Incorporate Multi-step program product Balanced meals Processed</p>
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Smooth Recipe	Lever Slider Wheel Axel Healthy Unhealthy	pulleys cams levers linkages Shell Frame Structure Diagonal Strut Circuit Buzzer bulb Program Monitor Control preserve	seasonality
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IN KEY STAGE ONE, ALL ASPECTS OF THE CURRICULUM WILL BE COVERED OVER 2 YEARS

IN KEY STAGE TWO, MOST ASPECTS ARE ONGOING BUT SPECIFIC ASPECTS WILL BE REVISITED IN A TWO-YEAR CYCLE SO COVERED BY ALL PUPILS IN LOWER AND UPPER KEY STAGE 2.

Osmotherley Primary School: Design & Technology - Two Year Rolling Programme Overview.

EYFS	Autumn	Spring	Summer
	Food Healthy food choices (sorting into healthy / unhealthy foods) Basic Hygiene (wash hands before eating)	Structures Use glue and tape to join. Building with waffle blocks and crates outside. Structures Use a fold to join. Building with small wooden blocks inside.	Structures Use a single hole punch and string to join. Mechanisms Use a split pin to join a moving part. Building vehicles with mobilo.

KS1	Autumn	Spring	Summer
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Year A	Food Hygiene (Self and surfaces) Healthy Eating (Traffic Lights) Food Groups (Simple) Where food comes from e.g. beef from a cow	Structures Building 2D structures Joining Materials Mechanisms Sliders	Structures Building 3D structures Joining Materials Mechanisms Levers
Year B	Mechanisms Spinners Structures Joining materials	Food Hygiene (Self and surfaces) Healthy Eating (Traffic Lights) Food Groups Where food comes from e.g. meat/veg	Structures Building 3D structures Joining materials Mechanisms Wheels and axels

LKS2	Autumn	Spring	Summer
Year A	Food Food Groups and Eat Well Plate Healthy Eating (healthy plate) Where food comes from e.g. UK or abroad How to preserve food. Food preparation and making Hygiene - Food washing and preparation.	Structures Strengthening structures 3D card models Box making Mechanisms Axels simple winding mechanism (winch)	Structures Strengthening structures 3D straw models Mechanisms Electrical Simple switches
Year B	Structures Strengthening and reinforcing structures Holes, spacers and ends Mechanisms Wheels/axels/Cams	Food Healthy Eating (healthy meal) Where food comes from e.g. UK or abroad Food preparation and making Hygiene - Food covering or packaging	Structures Recycling boxes and making hinges Mechanisms Pneumatics

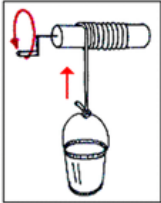
UKS2	Autumn	Spring	Summer
Year A	Food Where food comes from – food miles and seasonality	Structures Joining structures 3D wooden frames Mechanisms Pulleys	Structures Strengthening structures 3D wooden frames Mechanisms Electrical motors and rotating parts.

	Food preparation and making (seasonal soups)		
Year B	Structures Strengthening 3D structures Mechanisms Combination gears which change direction of movement	Food Healthy diets and Food Triangle Reared/grown/caught Food preparation and making Food safety and serving food	Structures Stiffen and reinforce 3D structures Mechanisms Computer controlled models.

Structures Mechanisms Food

Year A (2021-22)			
	Autumn Term	Spring Term	Summer Term
Enquiry Cycle 1	IDENTITY AND DIVERSITY Who do you think you are?	HUMAN RIGHTS AND SOCIAL JUSTICE Can one person make a difference?	SUSTAINABLE DEVELOPMENT What on Earth is going on?
Reception small steps	<ol style="list-style-type: none"> 1. Wash hands before eating food. 2. Try a range of foods. 3. Does it taste sweet? 4. Sort foods into healthy and unhealthy. 5. How can we look after our teeth? 	<ol style="list-style-type: none"> 1. Cut out shapes. 2. Stick paper together with glue. 3. Create a collage picture with paper shapes. 4. Design a 3D clay model for Easter. 5. Create a clay model 6. Add detail to clay using tools. 	<ol style="list-style-type: none"> 1. Use a hole punch and treasury tag to join paper or card. 2. Use scissors to cut out pieces of a moving picture. 3. Use a hole punch and a split pin to make a moving picture.
Key stage 1 Small steps	<ol style="list-style-type: none"> 1. What does healthy and unhealthy mean? 2. Sorting unhealthy / healthy foods.(Traffic light system) 3. Where does food come from? (Sources) 4. What are the four main food groups? 5. Plan a healthy, balanced meal. 6. Wash hands and surfaces before preparing food. 7. Make a healthy, balanced meal. 	<ol style="list-style-type: none"> 1. Identify a range of tools and their uses. 2. What is a design criteria? 3. Look at examples of chinese lanterns and different materials. 4. Design a chinese lantern. 5. Create a chinese lantern choosing appropriate materials and tools. 6. Evaluate chinese lantern against design criteria. 7. Revisited small steps to design & build a chair for Baby Bear. 	<ol style="list-style-type: none"> 1. Look at how 3D building toys are joined together to make a 3D structure e.g knex. 2. Look at how 3D building material can be used to make rotating parts. <ol style="list-style-type: none"> 1. Explain what a lever mechanism is. 2. Explain what a pivot is. 3. Decide how long the lever needs to be. 4. Decide where to put the pivot.

		<ol style="list-style-type: none"> 1. Explain what a slider mechanism is. 2. Use a slider to make a picture move. 3. Measure and cut accurately to make a scene for my picture. 4. Fix a slider to the character that is going to move. 5. Assemble the scene and slider. 6. Design own product with slider (Easter card). 7. Create own product with slider. 8. Evaluate against design criteria. 	<ol style="list-style-type: none"> 5. Make a moving picture with a lever and pivot using split pins. 6. Evaluate against a design criteria.
Key stage 1 essential knowledge	<p>What are the 4 main food groups?</p> <p>Where does your favourite food come from?</p>	<p>What tool would you use to cut wood / paper?</p> <p>What tool would you use to make a hole in wood or metal?</p> <p>What is a slider mechanism?</p> <p>What product could you make including a slider mechanism?</p>	<p>What is 3D?</p> <p>What is a pivot point?</p> <p>What is a lever?</p> <p>What 'real life' object uses a lever?</p>
Lower key stage two Small steps	<ol style="list-style-type: none"> 1. Food from UK and food from abroad. Sorting exercise. 2. Which country is food from – identify on map 3. How can we preserve food? 4. Eat Well plate - what does it mean. 5. Hygiene - washing food (fruit and veg) 6. Follow recipe and make food. 	<p>Structures – Boxes</p> <ol style="list-style-type: none"> 1. What are boxes? (faces, edges, vertices – link to maths 3D shapes) 2. Deconstruct boxes – how are they fastened together? – nets and tabs 3. Which nets of a box will work? (Investigate and test). 4. Where would you put the tabs on a box net? (Investigate and test). 5. Design 6. Make 7. Evaluate your own box. <p>Mechanisms - Pulley (Winch)</p> <ol style="list-style-type: none"> 1. What is a pulley? 	<p>Structures – Straw/stick/plastic corrugated card structures (Lighthouses)</p> <ol style="list-style-type: none"> 1. Joining straws together: Straight joints Angled joints Movable joints 2. Cutting plastic corrugated card to make 3 D shapes. 3. Plastic corrugated card and sticks/straws joining methods. 4. Research – Naming parts of a lighthouse. (cupola, light, tower, base) 5. Research – Example of pre-made lighthouse using above methods and including electric light circuit. <p>Mechanisms – Electrical circuits</p>

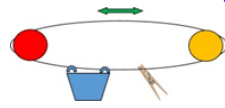
		<p>2. Identify parts of a winding pulley (pulley, axel, rope/string, handle)</p> <p>3. Make a simple winding pulley (e.g. Forest Schools fishing rod).</p> <p>4. Research – winding pulleys (model crane / model lift / model well).</p> <p>5. Design</p> <p>6. Make</p> <p>7. Evaluate</p>	<p>(Lighthouses)</p> <p>1. Make electric light circuit.</p> <p>2. Research – examples of home made switches.</p> <p>3. Make simple switch.</p> <p>4. Design model lighthouse including electrical light circuit.</p> <p>5. Make model.</p> <p>6. Evaluate.</p>
<p>Lower key stage 2</p> <p>Essential knowledge</p>	<p>Identify foods from the UK</p> <p>Name a way food can be preserved</p> <p>Identify healthy food choices</p> <p>Why do we need a varied diet?</p>	<p>Name a fastening method used in boxes.</p> <p>Name a fastening method used to tie sticks together. (Forest Schools)</p> <p>How can you strengthen a box?</p> <p>What do these words mean in dt – research, design, make, evaluate ?</p> <p>What is this called? (pulley)</p>  <p>Label its parts</p> <p>Axel, handle, rope, bucket (container)</p> <p>What do these words mean in dt – research, design, make, evaluate ?</p>	<p>How can you join 2 straws together?</p> <p>How can you cut corrugated plastic card to make a 3D shape?</p> <p>Name the parts of lighthouse (light, tower, base)</p> <p>What would you check for if an electric circuit doesn't work?</p> <p>How would you make a simple switch?</p> <p>What do these words mean in dt?</p> <p>Research</p> <p>Design</p> <p>Make</p> <p>Evaluate</p>
<p>Upper key stage two</p>	<p>1. Research on global map where given fruit is from.</p>	<p>Structures – Wooden Meccano</p>	<p>Structures – Wooden Frames</p> <p>1. How to use a bench hook to hold wood</p>

<p>Small steps</p>	<p>2. Investigate food miles. 3. What is seasonality? 4. Try different seasonal soups. 5. Create a recipe for soup and cook it.</p>	<ol style="list-style-type: none"> 1. Identify horizontal, vertical and diagonal beams on pictures of steel/wooden framed structures. 2. Deconstruct wooden meccano model – numbers of horizontal, vertical and diagonal beams. 3. What fastening methods were used in meccano structures? 4. Design and make a meccano model to 30cm height. 5. Evaluate <p>Mechanisms – Horizontal pulley (Ski Lift)</p> <ol style="list-style-type: none"> 1. What is a pulley? 2. Make a simple pulley (Forest Schools - Flag Pole / Message carrier) and name its parts – axel, pulley, rope. 3. Research – Ski-lifts (Horizontal pulleys) and label parts – axel, pulley, rope/cable, chair/carrier. 4. What is an exploded diagram? 5. Label exploded diagram of ski lift pulley. 6. Design a model ski lift including an exploded diagram of the pulley system, using wood meccano as the structure. 7. Make 8. Evaluate 	<p>securely. 2. How to use a saw to saw wood safely. 3. Tool etiquette. (Safety/storage). 4. How to measure and mark wood for cutting. 5. Measure and mark and cut wood to specific length. 6. What is a joint? 7. How to strengthen wooden joints using card triangles. 8. Follow diagrams to make the following joints: - 'L' joint - 'T' joint - '+' joint</p> <p>Mechanisms – Electrical rotating parts (Windmill)</p> <ol style="list-style-type: none"> 1. Demonstrate electrical circuit using motor. 2. Make electrical circuit using a motor. 3. Follow video instructions to make a simple windmill using a ruler, motor circuit, cork, card sails, paperclips and elastic band. 4. Research and label parts of windmill – tower, blades, motor. 5. Design a windmill using a wooden frame structure with blades rotated by an electric motor. Use exploded diagram of how motor is fixed to frame in design. 6. Make. 7. Evaluate.
<p>Upper key stage two</p> <p>Essential knowledge</p>	<p>Where are these foods grown? avocados/oranges/bananas/ What are food miles? What is seasonality?</p>	<p>Structures - Wooden Meccano Name a fastening method used in meccano. Name a fastening method used to tie sticks together. How can you strengthen a meccano model? What do these words mean in dt – research, design, make, evaluate?</p>	<p>Structures Name a method for strengthening wooden joints. Name these joints.</p> <p>Mechanisms Name the parts of this windmill. What is an exploded diagram? What do these words mean in dt – research, design, make, Evaluate?</p>

Mechanisms

What is an exploded diagram?

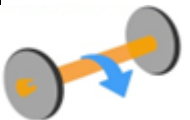
What is this called? (pulley) Label its parts.

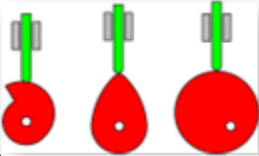




(Axels/pulleys/rope/ string/basket/ container)

Year B (2022-23)

	Autumn Term	Spring Term	Summer Term
Enquiry Cycle 2			
Reception small steps	<p>Food</p> <ol style="list-style-type: none"> 1. Wash hands before eating food. 2. How can we look after our teeth? <p>Structures</p> <ol style="list-style-type: none"> 1. Use a glue stick to join two pieces of paper or card together. 2. Use PVA glue to join two pieces of paper or card together. 		
Key stage 1 Small steps	<p>Mechanisms - spinners</p> <ol style="list-style-type: none"> 1. Explore and identify spinners in every day uses. 2. Know that a mechanism is something which moves. 3. Design and create a spinner using a split pin to join. 4. Evaluate against a simple design criteria. <p>Structures - joining materials</p> <ol style="list-style-type: none"> 1. Explore and create different ways to join materials (tape, glue, fold, tie.) 2. Make a plan for a structure using the joining methods practised. 3. Evaluate against a simple design criteria. 		

Key stage 1 essential knowledge	<p>What is a mechanism? What can you make using a spinning mechanism?</p>		
<p>Lower key stage two</p> <p>Small steps</p>	<p>Mechanisms - Cams</p> <ol style="list-style-type: none"> 1. Wheels and axels – make 2 wheel and axel (centre). 2. Change position of axel on wheel (off centre) and describe what happens. 3. What is a cam? 4. Label cam/follower/guide/ axel. 5. (Research) How does cam shape affect the way the follower moves? 6. Make 2D (flat) working cam and identify cam/axel/ follower/ guide. 7. (Research) Examine model of 3D cam toy, how it moves and name parts. 8. Design and make cam for cam toy. <p>Structures – pre-cut boxes</p> <ol style="list-style-type: none"> 1. How to construct pre-cut box. Identify back and tabs. 2. Make pre-cut box. 3. Examine cam toy and identify insert guide card and its purpose. 4. Children to Insert guide card on their boxes. 5. Deconstruct and re-construct cam toy (teacher) and write equipment list and step-by-step instructions. 6. Children design and write equipment and step by step instruction for making their own cam toy. 7. Make cam toy. 8. Evaluate cam toy 		
<p>Lower key stage 2</p> <p>Essential</p>	<p>Mechanisms –Cams 1. Label the parts</p> 		

<p>knowledge</p>	<p>(Wheel and axel)</p>  <p>Cam / guide / follower</p> <p>Structures – pre-cut boxes</p> <p>1. What is important about holes for axels? (This must be exactly opposite each other)</p> <p>2. Order these words in the DT design process. (Research, design, make, evaluate)</p> <p>3. What do they mean?</p>		
<p>Upper key stage two</p> <p>Small steps</p>	<p>Mechanisms</p> <ol style="list-style-type: none"> 1. Examine gears. 2. Make own gears using wheels and card and discover rules or rotation and speed. 3. Examine 3D gear model and label parts – horizontal/vertical gears and axels. 4. Make own gears system which changes direction of rotation from vertical to horizontal or vice versa using lego or gears toys. <p>Structures</p> <ol style="list-style-type: none"> 1. How to construct pre-cut box. Identify back and tabs. 2. Make pre-cut box. 3. Examine gears toy and identify parts and structure. 4. (Research) Examples of gears toys. 5. What is an exploded diagram? 6. Design gears for their gear toy, design plan -exploded diagram. 		

	<p>7. Design plan - equipment and step by step instruction for making their own gears toy.</p> <p>8. Make gears toy.</p> <p>9. Evaluate gears toy.</p>		
<p>Upper key stage two</p> <p>Essential knowledge</p>	<p>Mechanisms</p>  <p>What is this called?</p> <p>Gear A spins clockwise. Which way will gear B spin?</p>  <p>A B</p> <p>Which gear will spin the fastest?</p> <p>Structures</p> <p>What is an exploded diagram?</p> <p>What do these words mean? Research, design. make, evaluate?</p>		