Design and Technology Overview

Year	Term	Key Concept	Intent	Nat. curriculum objective	Milestones Skills [ ] Knowledge [ ]	Essential Characteristics	Vocabulary	Prior Learning
One	Autumn	Constructing a Windmill – **Structures** Mechanisms	Pupils will include individual preferences and requirements in their designs. Pupils will make a stable structure. Pupils will assemble the components of their structures. Pupils will evaluate their project and adapt their designs.	• Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock- ups and, where appropriate, information and communication technology • Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics • Explore and evaluate a range of existing products • Evaluate their ideas and products against design criteria • Build structures, exploring how they can be made stronger, stiffer and more stable • Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	• Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design. • Making stable structures from card, tape and glue. • Learning how to turn 2D nets into 3D structures. • Following instructions to cut and assemble the supporting structure of a windmill. • Making functioning turbines and axles which are assembled into a main supporting structure. • Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design. • Making stable structures from card, tape and glue. • Learning how to turn 2D nets into 3D structures. • Following instructions to cut and assemble the supporting structure of a windmill. • Making functioning turbines and axles which are assembled into a main supporting structure. •	Identify some features that would appeal to the client and create a suitable design. Explain how their design appeals to the client. Make stable structures, which will eventually support the turbine, out of card, tape and glue. Make functioning turbines and axles that are assembled into the main supporting structure. Say what is good about their windmill and what they could do better.	axle bridge design design criteria model net packaging structure template unstable stable strong weak	Pupils will have learnt how to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Pupils will have learnt how to use a range of small tools including scissors, paintbrushes and cutlery.
	Spring	Puppets – **Textiles**	Pupils will join fabrics together using different methods. Pupils will use a template to create their own design. Pupils will join two fabrics together accurately. Pupils will embellish their design using joining methods.	• Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock- ups and, where appropriate, information and communication technology • Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics • Evaluate their ideas and products against design criteria	• Using a template to create a design for a puppet. • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction. • Reflecting on a finished product, explaining likes and dislikes. • To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples, glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing a design idea is useful to see how an idea will look.	Join fabrics together using pins, staples or glue. Design a puppet and use a template. Join their two puppets' faces together as one. Decorate a puppet to match their design.	decorate design fabric glue model hand puppet safety pin staple stencil template	Pupils will have learnt how to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Pupils will have learnt how to use a range of small tools including scissors, paintbrushes and cutlery.

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	Summer	Wheels and Axles – **Mechanisms**	Pupils will understand how wheels move. Pupils will identify what stops wheels from turning. Pupils will design a moving vehicle. Pupils will build a moving vehicle.	• Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock- ups and, where appropriate, information and communication technology • Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics • Explore and evaluate a range of existing products • Evaluate their ideas and products against design criteria • Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	• Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move. • Creating clearly labelled drawings that illustrate movement. • Adapting mechanisms. • Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move. • Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design. • Making stable structures from card, tape and glue. • Learning how to turn 2D nets into 3D structures. • Following instructions to cut and assemble the supporting structure of a windmill. • Making functioning turbines and axles which are assembled into a main supporting structure.	Explain that wheels move because they are attached to an axle. Recognise that wheels and axles are used in everyday life, not just in cars. Identify and explain vehicle design flaws using the correct vocabulary. Design a vehicle that includes functioning wheels, axles and axle holders. Make a moving vehicle with working wheels and axles. Explain what must be changed if there are any operational issues.	axle axle holder chassis diagram dowel equipment mechanism wheel	No prior learning for mechanisms.
	Summer	Fruit and vegetables – **Cooking and Nutrition**	Pupils will identify if a food is a fruit or a vegetable. Pupils will identify where plants grow and which parts we eat. Pupils will taste and compare fruit and vegetables. Pupils will make a fruit and vegetable smoothie.	• Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics • Explore and evaluate a range of existing products • Use basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from	• Designing smoothie carton packaging by-hand or on ICT software. • Chopping fruit and vegetables safely to make a smoothie. • Identifying if a food is a fruit or a vegetable. • Learning where and how fruits and vegetables grow. • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. • To understand the difference between fruits and vegetables. • To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). • To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds and a vegetable does not. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables can come from different parts of the plant.	Describe fruits and vegetables and explain why they are a fruit or a vegetable. Name a range of places that fruits and vegetables grow. Describe basic characteristics of fruit and vegetables. Prepare fruits and vegetables to make a smoothie.	fruit vegetable seed leaf root stem smoothie healthy carton design flavour peel slice	Pupils will have learnt how to manage their own basic hygiene and personal needs, including… understanding the importance of healthy food choices.

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Year 2	Autumn	Fairground Wheel – **Mechanisms** Structures	Pupils will explore wheel mechanisms and design a wheel. Pupils will select appropriate materials. Pupils will build and test a moving wheel. Pupils will make and evaluate a structure with a rotating wheel.	• Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock- ups and, where appropriate, information and communication technology • Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics • Evaluate their ideas and products against design criteria • Build structures, exploring how they can be made stronger, stiffer and more stable • Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	• Selecting a suitable linkage system to produce the desired motions. • Designing a wheel. • Selecting appropriate materials based on their properties. • Selecting materials according to their characteristics. • Following a design brief. • Evaluating different designs. • Testing and adapting a design. • To know that different materials have different properties and are therefore suitable for different uses. • To know the features of a Ferris wheel include the wheel, frame, pods, a base, an axle and an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur.	Design and label a wheel. Consider the designs of others and make comments about their practicality or appeal. Consider the materials, shape, construction and mechanisms of their wheel. Label their designs. Build a stable structure with a rotating wheel. Test and adapt their designs as necessary. Follow a design plan to make a completed model of the wheel.	design design criteria wheel Ferris wheel pods axle axle holder frame mechanism	Pupils will have learnt about wheels and axles, and what these are and how to use them.
	Spring	Pouches – **Textiles**	Pupils will sew a running stitch. Pupils will use s template. Pupils will join fabrics using a running stitch. Pupils will decorate a pouch using fabric glue or stitching.	• Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock- ups and, where appropriate, information and communication technology • Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics • Evaluate their ideas and products against design criteria	• Designing a pouch. • Selecting and cutting fabrics for sewing. • Decorating a pouch using fabric glue or running stitch. • Threading a needle. • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. Neatly pinning and cutting fabric using a template. • Troubleshooting scenarios posed by teacher. • Evaluating the quality of the stitching on others' work. • Discussing as a class, the success of their stitching against the success criteria. • Identifying aspects of their peers' work that they particularly like and why. • To know that sewing is a method of joining fabric. • To know that different stitches can be used when sewing. • To understand the importance of tying a knot after sewing the final stitch. • To know that a thimble can be used to protect my fingers when sewing.	Sew a running stitch with regular-sized stitches and understand that both ends must be knotted. Prepare and cut fabric to make a pouch from a template. Use a running stitch to join the two pieces of fabric together. Decorate their pouch using the materials provided.	decorate fabric fabric glue knot needle needle threader running stitch sew template thread	Pupils will have learnt how to join two pieces of fabric together.

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	Summer	Baby Bear's Chair – **Structures**	Pupils will explore the concepts and features of structures and the stability of different shapes. Pupils will understand that the shape of a structure affects its strength. Pupils will make a structure according to design criteria. Pupils will produce a finished structure and evaluate its strength, stiffness and stability.	• Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and communicate their ideas through talking, drawing, templates, mock- ups and, where appropriate, information and communication technology • Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics • Evaluate their ideas and products against design criteria • Build structures, exploring how they can be made stronger, stiffer and more stable	• Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects. • Making a structure according to design criteria. • Creating joints and structures from paper/card and tape. # • Building a strong and stiff structure by folding paper. • Exploring the features of structures. Comparing the stability of different shapes. • Testing the strength of their own structures. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of their own structure. • To know that shapes and structures with wide, flat bases or legs are the most stable. • To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily.	Identify man-made and natural structures. Identify stable and unstable structural shapes. Contribute to discussions. Identify features that make a chair stable. Work independently to make a stable structure, following a demonstration. Explain how their ideas would be suitable for Baby Bear. Produce a model that supports a teddy, using the appropriate materials and construction techniques. Explain how they made their model strong, stiff and stable.	design criteria man-made natural properties structure stable shape model test	Pupils will have learnt how to build a structure and how to make one stronger, stiffer and more stable.
	Summer	A Balanced Diet – **Cooking and Nutrition**	Pupils will learn what makes a balanced diet. Pupils will taste test food combinations. Pupils will design a healthy wrap. Pupils will make a healthy wrap.	• Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics • Explore and evaluate a range of existing products • Use basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from	• Designing a healthy wrap based on a food combination which works well together. • Slicing food safely using the bridge or claw grip. • Constructing a wrap that meets a design brief. • Describing the taste, texture and smell of fruit and vegetables. • Taste testing food combinations and final products. • Describing the information that should be included on a label. • Evaluating which grip was most effective. • To know that 'diet' means the food and drink that a person or animal usually eats. • To understand what makes a balanced diet.	Name the main food groups and identify foods that belong to each group. Describe the taste, texture and smell of a given food. Think of four different wrap ideas, considering flavour combinations. Construct a wrap that meets the design brief and their plan.	balanced diet balance carbohydrate dairy fruit ingredients oils sugar protein vegetable design criteria	Pupils will have learnt where food comes from.

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					• To know where to find the nutritional information on packaging. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that nutrients are substances in food that all living things need to make energy, grow and develop. • To know that 'ingredients' means the items in a mixture or recipe. • To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy. • To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.			