Nether Green Junior School

Design and Technology curriculum intent

At Nether Green Junior school, we believe that every child should feel valued and experience the feeling of success in a wide range of curriculum areas, therefore we provide a curriculum that is inspiring, engaging and relevant for the children whilst promoting opportunities for independent learning. We offer a coherently planned sequence of lessons to ensure we have progressively covered the knowledge, understanding and skills required in the National Curriculum. We aim to inspire children through a broad range of practical experiences to create innovative designs which solve real and relevant problems within a variety of different contexts. The iterative design process is fundamental and runs throughout KS2. This iterative process encourages children to identify real and relevant problems, critically evaluate existing products and then take risks and innovate when designing and creating solutions to the problems. As part of the iterative process, time is built in to reflect, evaluate and improve on prototypes using design criteria throughout to support this process. Opportunities are provided for children to evaluate key events and individuals who have helped shape the world, showing the real impact of design and technology on the wider environment and helping to inspire children to become the next generation of innovators.

Children will become confident and proficient in a variety of areas within Design and Technology including textiles, food and nutrition, materials, mechanics and electronics. Children will also develop their knowledge of famous designers. Children will be given the opportunity to develop their interest and curiosity about Design and Technology through a series of lessons offering skills progression, knowledge progression and offering children the opportunity to ask questions and demonstrate their skills in a variety of ways.

The sequence of lessons for each year group will follow the same structure:

Lesson 1	Research
Lesson 2/3/4/5	Research/acquire new skills Design Make
Lesson 6	Evaluate

	Y3	Y4	Y5	Y6
Autumn	Textiles Winter decoration	Food and Nutrition Greek Salad	Textiles Keyring purse	Mechanics/Electricity Moving Vehicles
Spring	Food and Nutrition Make Egyptian bread	Electricity Battery Operated light	Food and Nutrition Mezze platter	Food and Nutrition Healthy baked snack
Summer	Mechanics Water Wheel	Materials Eco friendly bird feeder	Mechanics Catapult	Materials/Electricity Electrical games

Design and Technology long term plan

Year group	Prior Knowledge	New Knowledge	Disciplinary Knowledge	Vocabulary
Y3 Autumn How did life change between the Stone Age and the Iron Age? What is the UK and how do I fit in it?	KS1 Curriculum: Textiles • Use basic running stitch and over stitch • Cut with scissors with reasonable accuracy • Consider design criteria	**Design brief: To design and make a winter decoration using textiles** • To research designers and textiles • To develop knowledge of textile materials and stitches • To understand the need for seam allowance	• To use knowledge of materials to choose the most suitable materials for the product • To use their knowledge of simple stitches to choose the most suitable stitch to join textiles • To select the most appropriate techniques to decorate textiles • To use the design criteria to evaluate their final product	Textiles Fabric Stitch Embroidery Needle Eye Thread Template Seam Print
Y3 Spring How does light behave? What was life like for the Ancient Egyptians?	KS1 Curriculum: Food and nutrition • Know about healthy food and what makes up a balanced diet • Have an awareness of food hygiene • Know that food is seasonal	**Design brief: To design and make bread using knowledge of food and nutrition** • To research a famous bread baker e.g. Paul Hollywood and explore a recipe • To understand the ingredients needed to make bread and the different types • To taste and evaluate different types of bread • To learn about how different foods are seasonal • To measure ingredients accurately	• To research and evaluate different products • To draw and annotate the design • To prepare ingredients to the nearest gram accurately • To follow a recipe • To cook ingredients using the necessary temperature • To use the design criteria to evaluate their final product	Design Savoury Healthy Varied Seasonal Balanced Product Hygiene Utensils Measure Scale Gram Recipe
Y3 Summer How do plants to grow?	KS1 Curriculum: Mechanisms and mechanics	**Design brief: To design and make a water wheel using mechanics** • To develop knowledge of forces and mechanisms such as levers, winding mechanisms, pulleys and gears	• To research and evaluate different products • To draw and annotate the design • To apply knowledge of forces to choose appropriate mechanisms	Material Product Strengthen Stiffen Reinforce

Why are Sheffield's rivers important?	• Understand levers, pivots, wheels and axis. • Be able to attach mechanisms to simple components. • Be able to cut a slot • Be able to join materials	• To explore and evaluate different mechanisms in other designs such as a water bottle lid or a bath toy • To learn about the purpose and functions of a real water wheel (Shepherd's Wheel in Bingham park)	such as levers, winding mechanisms, pulleys and gears • To make a water wheel using appropriate materials with mechanisms • To test water wheel and to evaluate the final product using the design brief	Fold Functional Lever Wheel Pulley water wheel blades axis model material plan design features river construct
Y4 Autumn Greece then and now…what's the difference? How do we make poo?	KS1 Curriculum: Food and nutrition • Know about healthy food and what makes up a balanced diet • Have an awareness of food hygiene • Know that food is seasonal Food and nutrition in Y3 (making bread)	**Design brief: To design and make a Greek salad using knowledge of food and nutrition** • To explore and evaluate Greek cuisine and diet • To discuss seasonal foods and traditional foods • To understand hygiene and safety when preparing food • To taste and evaluate different ingredients to develop food vocabulary such as salty, light, rich, strong	• To research and evaluate different products • To use knowledge of the digestive system and nutrition to create a recipe with necessary ingredients • To draw and annotate the design • To use the design criteria to evaluate their final product	Design Cut Chop Slice Knife Savoury Healthy Varied Seasonal Balanced Product Hygiene
Y4 Spring What did the Romans do for me?	KS1 Curriculum: • Be able to attach mechanisms to simple components.	**Design brief: To design and make a battery-operated light using electronics** • To learn about designers and makers who have created electronic battery-operated portable lights	• To research and evaluate different products • To draw and annotate the design • To use knowledge of circuits to create a light that works	Design Diagram Material Product Annotate Battery

What are sounds made of?	• Be able to cut a slot • Be able to join materials Y3 Science – Light Y4 Science – Electricity	• To understand the safety around electrical equipment and consider this when designing their product • To create series and parallel circuits with resources • To understand how switches are made	• To apply knowledge of switches to design and model their product • To use the tools and equipment safely and with expertise • To use the design criteria to evaluate their final product • To decorate the overall product to ensure that it is functional and high quality	Circuit Series Device Electricity Program
Y4 Summer Why do people live where they live? How does an ecosystem work?	KS1 Curriculum: • Be able to attach mechanisms to simple components. • Be able to cut a slot • Be able to join materials Y4 Science: Ecosystems	**Design brief: To design and make an animal feeder using eco-friendly materials** • To explore animal feeders' purpose and function. • To learn about what makes materials eco friendly	• To research and evaluate different products • To draw and annotate the design • To use knowledge of environmentally friendly materials to choose appropriate materials • To measure, cut and shape materials accurately and safely • To select appropriate joining techniques • To use the design criteria to evaluate their final product	Design Cut Chop Materials Connect Join Hinge Hook Environmentally friendly
Y5 Autumn Invaders or Settlers: How should we remember the Vikings? What is the solar system and how does it affect night and day around the world?	KS1 Curriculum: Textiles • Use basic running stitch and over stitch • Cut with scissors with reasonable accuracy • Consider design criteria	**Design brief: To design and make a keyring purse using textiles** • To explore and analyse purse designs and materials • To develop knowledge of stitching techniques (such as back stitch for seams and running stitch to attach a decoration).	• To combine elements of design from a range of designers. • To draw and annotate the innovative designs with the user in mind that improve upon existing products • To make products through stages of prototypes, making continual refinements	Textiles Template Running stitch Cross stitch Back stitch Fabric Seam Decorate Embroidery Needle

	Textiles: Making winter decorations in Y3		• To ensure products have a high-quality finish, using art skills where appropriate • To use the design criteria to evaluate their final product	Eye Thread
Y5 Spring What was the Golden Age of Islam? What are mountains and where are they?	KS1 Curriculum: Food and nutrition • Know about healthy food and what makes up a balanced diet • Have an awareness of food hygiene • Know that food is seasonal Food and nutrition in Y3 (making bread) Food and nutrition in Y4 (Greek Salad)	**Design brief: To design and make a mezze platter using knowledge of food and nutrition** • To research and evaluate mezze ingredients including taste testing and describing foods • To explore recipes for different mezze ingredients such as hummus	• To research and evaluate different products • To draw and annotate the design • To create and refine recipes including ingredients and methods • To demonstrate a range of cooking techniques • To use the design criteria to evaluate their final product	Design Cut Chop Slice Knife Savoury Healthy Varied Seasonal Balanced Product Hygiene
Y5 Summer Where in the world is most extreme? What was the Great Plague?	KS1 Curriculum: Mechanisms and mechanics • Understand levers, pivots, wheels and axis. • Be able to attach mechanisms to simple components. • Be able to cut a slot • Be able to join materials	**Design brief: To design and make a catapult using mechanics** • To research catapult designs and designers • To look at the features and criteria of a catapult • To explore different mechanisms • To research and evaluate different products • To draw and annotate the design • To make products through stages of prototypes, making continual refinements	• To research and evaluate different products • To draw and annotate the design • To make products through stages of prototypes, making continual refinements • To use knowledge of mechanics to cut, join and strengthen the product • To use the design criteria to evaluate their final product	Catapult Forces Elastic Energy Missile Triangulation Launch Design Cross-section Diagram Material Product

	Mechanics in Y3 (Water Wheel)	• To use knowledge of mechanics to cut, join and strengthen the product • To use the design criteria to evaluate their final product		Strengthen Stiffen Reinforce Fold Functional Lever Structure Architect
Y6 Autumn How should we power our world? What impact did the Victorians have on Sheffield?	KS1 Curriculum: Mechanisms and mechanics • Understand levers, pivots, wheels and axis. • Be able to attach mechanisms to simple components. • Be able to cut a slot • Be able to join materials Mechanics in Y3 (Water Wheel) Electricity in Y4 (Battery operated light) Mechanics in Y5 (Catapult)	**Design brief: To design and make a moving vehicle using mechanics and electronics** • To research moving vehicle designs and designers • To look at the features and criteria of a moving vehicle • To explore different mechanisms and electronics that could be used in the final design	• To research and evaluate different products • To draw and annotate the design • To use the design criteria to evaluate their final product	Design Cross-section Diagram Material Product Strengthen Stiffen Reinforce Fold Functional Gears Pulley Cam Lever Structure Architect Design Annotate Prototype CAD Circuit Series Electricity Program

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Y6 Spring Why do we need rainforests? How did World War II affect Sheffield?	KS1 Curriculum: Food and nutrition • Know about healthy food and what makes up a balanced diet • Have an awareness of food hygiene • Know that food is seasonal Food and nutrition in Y3 (making bread) Food and nutrition in Y4 (Greek Salad) Food and nutrition in Y5 (Mezze)	**Design brief: To design and make a healthy baked snack using knowledge of food and nutrition for Y6 during SATS** • To research healthy baked snacks and the ingredients/packaging that are used • To taste test different products and ingredients and evaluate them. • To conduct market research to find out what ingredients/flavours the user would like • To explore the nutritional value of different ingredients	• To research and evaluate different products • To used the evidence from market research to draw and annotate the design • To write a recipe using the required ingredients and method • To consider the target audience and how to design the packaging for the product • To use knowledge of food and nutrition to bake a healthy snack with the required ingredients • To use the design criteria to evaluate their final product	Design Cross-section Product Savoury Healthy Varied Cut Chop Slice Knife Savoury Healthy Varied Seasonal Balanced Product Hygiene
Y6 Summer How Do Our Bodies Work and Grow? Where do we come from? Where are we going to?	KS1 Curriculum: • Be able to attach mechanisms to simple components. • Be able to cut a slot • Be able to join materials Materials in Y4 (Animal feeder) Electricity in Y4 (Battery operated light) Electricity in Y6 (Moving Vehicles)	**Design brief: To design and make an electrical game using materials and electronics for the Summer Fayre** • To research different electronic games and evaluate them • To conduct market research for what other children want from the product • To explore how a circuit can be connected and what extra components can be added and used in the game e.g. buzzer	• To research and evaluate different products • To use the market research to draw and annotate their design • To use knowledge of electronics and materials to construct their design using the necessary materials • To use the design criteria to evaluate their final product	Design Cross-section Diagram Material Product Architect Design Annotate Prototype CAD Circuit Series Electricity Program