DT Summer 1 Overview

DT	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit	Boats	Smoothies	Mechanisms: Fairground wheel	Structures: Constructing a castle	Electrical systems: Torches	Developing a recipe	Digital world: Navigating the world
Outline	In this unit, children explore what is meant by 'waterproof,' 'floating,' and 'sinking,' then experiment and make predictions with various materials to carry out a series of tests. They learn about the different features of EYFS boats and ships before investigating their shape and structures to build their own.	Preparing foods by cutting and juicing and selecting fruits and vegetables to create a smoothie to meet a design brief.	Designing and creating a functional fairground wheel so that the wheel rotates and the structure stands freely.	Design a castle with key features which satisfy a given purpose.	Evaluating a range of existing torches and designing a functional torch for a target audience.	Learning a simple bolognese recipe and adapting it to improve nutritional content.	Complete a product pitch plan that includes key information. Developing skills to combine 3D objects to form a complete product in CAD 3D modelling software and learning about its application in industries such as film and animation.
Learning objectives	To understand what waterproof means and to test whether materials are waterproof. To test and make predictions for which materials float or sink. To compare the uses of boats. To investigate how the shape and structure of boats affects the way they move. To design a boat. To create a boat based upon their design.	To identify fruits. To describe where fruits and vegetables grow. To practice food preparation skills. To select ingredients for a recipe. To apply food preparation skills to a recipe. To evaluate against the design brief.	To explore wheel mechanisms and design a fairground wheel. To select materials with appropriate properties. To build and test a moving wheel. To conduct a simple survey to gather opinions. To finish and evaluate a simple structure with a rotating wheel.	To recognise how multiple shapes (2D and 3D) are combined to form a strong and stable structure. To design a castle. To construct 3D nets. To construct and evaluate my final product.	To learn about electrical items and how they work. To analyse and evaluate electrical products. To design a product to fit a set of specific user needs. To make and evaluate a torch.	To understand how ingredients are reared and processed. To make adaptions to design a recipe. To evaluate nutrional content. To practice food preparation skills. To design a product label. To follow and make an adapted recipe.	To write a design brief and criteria based on a client request. To write a program to include multiple functions as part of a navigation device. To develop a sustainable product concept. To develop 3D CAD skills to produce a virtual model.

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							To present a pitch to 'sell' the product to a specified client.
Key Skills	Communication and language • Articulate their ideas and thoughts in well-formed sentences. • Connect one idea or action to another using a range of connectives. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • ELG: Speaking: Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary • ELG: Speaking: Offer	• Designing smoothie carton packaging by hand. • Chopping fruit and vegetables safely to make a smoothie. • Juicing fruits to make a smoothie. • Identifying if a food is a fruit. • Learning where and how fruits and vegetables grow. • Tasting and evaluating different foods. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. • **To know:** • That a blender is a machine which mixes	**Design** Conducting simple surveys or discussions to gather opinions on what others need or like in a design. Knowing that a survey is used to find out what people like. Using a simple design brief that outlines the intended use, target user, and key features of the product, to create simple design criteria. Knowing that a design brief helps to decide what to make. Knowing that design criteria are the steps for making a product successful.	Designing a castle with key features to appeal to a specific person/purpose. Drawing and labelling a castle design using 2D shapes. Designing and/or decorating a castle tower on CAD software. Constructing a range of 3D geometric shapes using nets. Creating special features for individual designs. Making facades from a range of recycled materials. Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. Suggesting points for modification of the individual designs.	Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. Making a torch with a working electrical circuit and switch. Using appropriate equipment to cut and attach materials. Assembling a torch according to the design and success criteria. Evaluating electrical products. Testing and evaluating the success of a final product.	Explaining the farm-to-fork process. Researching existing recipes. Suggesting alternative ingredients. Analysing nutritional content. Writing an alternative recipe. Understanding cross-contamination. Using preparation skills. Designing a jar label. Making a developed recipe.	Writing a design brief from information submitted by a client. Developing design criteria to fulfil the client's request. Developing a product idea through annotated sketches. Placing and manoeuvring 3D objects, using CAD. Changing the properties of, or combine one or more 3D objects, using CAD. Considering materials and their functional properties, especially those that are sustainable and recyclable (for

	explanations for why things might happen. • Understanding the world • • Explore the natural world around them. • ELG: The Natural World: Explore the natural world around them, making observations and drawing pictures of animals and plants • Characteristics of effective learning • Playing and exploring • Active learning • Creating and thinking critically	ingredients together into a smooth liquid. • That a fruit has seeds and a vegetable does not. • That fruits grow on trees or vines. • That vegetables can grow either above or below ground. • That vegetables are any edible part of a plant. •	Creating ideas with design criteria in mind. Referring to specific parts of existing products when generating ideas. Knowing that the design criteria help when thinking of ideas. Using labels to explain parts of a design, label materials, etc. Integrating moving parts when creating mock-ups. Knowing that drawings can help explain how something works. Knowing that a label explains part of a drawing. **Make** Choosing materials, ingredients or components from a wider range of materials, ingredients or components.				example, cork and bamboo). Explaining material choices and why they were chosen as part of a product concept. Programming an N,E, S,W cardinal compass. Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. Developing an awareness of sustainable design. Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch. Demonstrating a functional program as part of a product concept.

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			Explaining their choices based on the properties of materials and components. Knowing some properties of materials like hard, soft, flexible, waterproof, strong etc. Following and recalling simple safety instructions. Knowing that some tools are sharp like scissors and knives. Choosing known geometric shapes when making. Beginning to shape objects to improve how they work. Knowing the names of some geometric shapes: triangle, pyramid, square, cube, circle, sphere. Considering balance in their finishing, like evenly spaced decoration. **Evaluate**				

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			Discussing a range of existing products and saying what they like and dislike about them. Evaluating existing products against design criteria. Evaluating their ideas and creations against simple design criteria. Knowing that design criteria help to decide if their product is a success. Suggesting improvements to their peers' designs and products. Knowing that improve means to make something better. Knowing that their suggestions can improve someone else's work.				
Key Vocab	waterproof material absorb leak wet dry	blend blender chopping board compare cut design	design brief design criteria evaluate frame model opinion	2D 3D castle design key features net	battery bulb buzzer circuit diagram component conductor	abattoir adaptation balanced beef brand cook	application (apps) biodegradable boolean cardinal compass client corrode

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	prediction variable fair test experiment Investigation sail anchor hull mast rudder helm poop deck deck crow's nest boat ship watercraft junk reeds float sink types of boats and ships e.g. fishing boat, canoe, cruise ship	evaluate flavour fork fruit healthy ingredients juice juicer leaf plant recipe root seed select smoothie stem table knife taste tree vegetable vine	rotate survey	scoring shape stable stiff strong structure tab	electrical item electricity electronic item insulator series circuit switch target audience test torch wire	cross-contamination cut design enhance equipment evaluate farm grate hygiene ingredients label measure nutrient nutrition nutritional value preference press process recipe safety theme	design brief design criteria duplicate environmentally friendly equipment function GPS tracker if statement lightweight loop moudable navigation pedometer product lifecycle product lifespan program recyclable replica smart smartphone sustainable design value variable
Key Questions	"I wonder how we could test that?" "What do you think might happen if we…?" "Could you make a prediction about whether this material will be waterproof or not?" "Is it waterproof? How can you tell?" "Which is the best waterproof material?" "I wonder how you will join those parts together?"	Where have you seen fruits or vegetables growing? How are the apples different to the carrots and potatoes? (They are not covered in soil.) Why do you think the carrots and potatoes have soil on them? (They grow underground.)	Is there anything you want to change about your design? Why? Which parts of your design do you like the most? Why? What is our local area known for? How could this be shown in the fairground wheel design? What colour should the wheel be? (Light, dark, pastel, bright,	Which of these castles looks the strongest or weakest? Stable or unstable? Why? (For example, some are bouncy, soft, strong, big, small and have a variety of purposes.) What makes these castles different or the same? (Many of them still include various key castle features – towers,	What is electricity? What is a conductor? What is an insulator? (Do the electrical items we have discussed always stay on? Can you think of a way to create a switch in your circuit? What is the purpose of a torch?	Where are cattle raised? How long does the farmer raise them for? How do we know the animals are properly cared for? Why are the cattle tagged? How does the farmer look after the cows? Where do the cattle go to be turned into meat?	What do you think about the unsustainable product lifespan? What do we mean by 'non-recyclable', 'finite' and 'unsustainable'? How could you change your habits to help the planet? Does your product concept meet all

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	"How could you make sure your boat floats?" "Can you tell me about your design?"	What are you using to cut the food? (Table knife.) What should you cut the food on? (The chopping board.) What are you using to hold the food in place? (A fork.) Did you discover any interesting flavour combinations?	multi-coloured or named colours.) How should the wheel be decorated? (Plain, patterned, with pictures or suggestions from the local area.) What materials should the wheel be made from? (Natural, such as wood or clay or human-made, such as steel/metal or bricks.)	turrets, battlements.) Who would use, make or live in this castle? Why? (Children, Lords, people on holiday at the beach.) Are these man-made or natural structures? (Man-made, they were built by people.) What is a net? What is a tab? What is scoring? What will make a good quality castle? Does your castle include all the features in your original design? Are there any other features you would like to include?	How does a torch work? What features do torches have? What key features will that person need to be included in the design?	Is the meat turned straight into beef products? Which foods can be added without needing to worry about quantity? Which foods should be limited in quantity? Why is it important to understand nutritional information?	of the design criteria? What could be improved about your product concept? Which materials did you choose and why? What is a product pitch and its purpose? What key information should be included in a product pitch?