Year 1 and 2 A

Vocabulary	Question	3 S	Key Concepts	Common Misconceptions	Substantive Knowledge	Disciplinary Knowledge	Oracy	Resources
□ Design □ Make □ Evaluate □ Plan □ Build □ Test □ Improve □ Join □ Cut □ Stick □ Slider □ Mechanism □ Move □ Push □ Pull □ Model □ Weather □ Rain □ Sun □ Wind □ Cloud □ Temperature □ Weather station □ Thermometer □ Wind vane □ Rain gauge	**Can I design, make and evaluate my own weather station using sliders?** Can I identify what makes a good weather station? Can I use my research to design my own weather station? Can I test my design ideas by exploring different materials? Can I describe my final design? Can I use a range of materials when making a weather station? Can I evaluate my weather station and compare it to my final design?	**Something: Weather station** **Someone: Reception children** **Some purpose: to track the weather each day.**	🧠 **Design Thinking** • Understanding the purpose of a weather station (to show or record weather) • Designing for a user (e.g., children who need to know the weather) • Making simple labelled drawings to plan a product 🛠 **Making and Mechanisms** • Exploring how sliders move parts of a model • Creating a simple mechanism (slider) that moves up/down or side to side • Cutting and joining materials safely and accurately • Choosing appropriate tools and materials for construction 🔄 **Evaluation** • Testing how well the slider works (Does it move smoothly? Is it easy to see?) • Talking about what they like	□ **Misconception:** *"Sliders are only for decoration, they don't really do anything."* **Clarification:** Explain that sliders are a type of simple mechanism that make parts move, helping to show changes (like different types of weather). □ **Misconception:** *"Weather stations only measure rain."* **Clarification:** Show examples of different weather tools (thermometer, wind vane, rain gauge) to broaden understanding of weather types. □ **Misconception:** *"Sliders move in any direction."* **Clarification:** Teach that sliders usually move along a straight path (side to side or up and down), and this helps control or show something specific. □ **Misconception:** *"All materials are easy to cut and join."* **Clarification:** Discuss which materials are easier or safer to use for cutting and joining, and why some choices are better for building a model. □ **Misconception:** *"My weather station has to look exactly like a real one."* **Clarification:** Emphasize that models can be simple and creative — the important part is how well it works and shows the weather.	**1. Weather and Weather Symbols** • Understanding different types of weather: sunny, rainy, windy, cloudy, snowy • Recognising weather symbols and what they represent • Knowing that weather changes daily and can be observed and recorded **2. Simple Mechanisms – Sliders** • What a slider mechanism is: a part that moves along a straight path (up/down or side to side) • How sliders can be used to change or show information on a model (e.g., showing different weather symbols) • Materials and techniques used to make sliders work smoothly (slots, tabs, and guides) **3. Design and Planning** • Drawing simple labelled diagrams to plan a weather station model	**1. Design Thinking** • Asking questions about what a weather station needs to show • Generating simple ideas and plans through drawing and talking • Making choices about materials and mechanisms to meet the design goal **2. Technical Skills** • Using tools safely and effectively (cutting slots, joining parts) • Constructing moving parts (sliders) that work smoothly • Applying understanding of simple mechanisms to make functional models **3. Problem Solving** • Testing the slider mechanism and identifying any issues (e.g., sticking or loose parts) • Making adjustments to improve the movement or appearance • Reflecting on how well the weather	**Designing** • I want to design a weather station that can… □ Sliders (potentiometers) • □ Microcontroller (e.g. Arduino, micro:bit, or Raspberry Pi) • □ Breadboard • □ Jumper wires • □ Cardboard or foam board • □ Scissors • □ Glue or tape • □ Pens and markers • □ Ruler • □ Printed dials or labels • □ Display screen or printed scales (optional) • • The sliders will help me to… • I plan to measure… using the sliders. • I think the sliders will allow me to control… • My weather station needs to be able to… **Making** • I am using sliders to… • I connected the sliders to the sensors because…	• Cardboard (cereal boxes, packaging) • Paper (plain, colored, or card stock) • Sliders made from paper strips, split pins, or cardboard tabs • Split pins (paper fasteners) for making moving parts/sliders • Scissors (child-safe) • Glue sticks or PVA glue • Sticky tape • Rulers • Pencils, crayons, felt tips, markers • Lollipop sticks or straws (for moving parts) • Blue tack or Velcro dots (for adjustable parts) • Templates for dials or measuring scales • Clipboards or printed data sheets • Weather symbols (printed or drawn) • Evaluation worksheet or peer feedback form

			about their weather station • Suggesting how they could make it better or different **🔍 Understanding Weather** • Identifying different types of weather (sunny, rainy, cloudy, windy, etc.) • Representing weather using symbols or moving parts • Linking DT with science and seasonal changes **🎨 Creativity and Presentation** • Designing a product that is both useful and attractive • Using colour, labels and decoration to show different types of weather clearly	**❓ Misconception:** *"Evaluating means finding what's wrong only."* **Clarification:** Encourage children to talk about what worked well and what could be improved — evaluation is positive and constructive.	• Choosing materials suitable for making a moving part • Understanding the purpose of the weather station (to show weather conditions clearly) **4. Making Skills** • Cutting slots and shapes carefully to allow slider movement • Joining parts securely so the model is sturdy • Using tools safely and appropriately (scissors, glue, tape) **5. Evaluation and Improvement** • Testing if the slider moves easily and shows the intended weather symbol • Describing what works well and what could be improved • Understanding that design can be changed based on testing	station works and how it could be better **4. Evaluation and Communication** • Using simple language to describe what works and what doesn't • Sharing ideas about improvements or changes • Listening to feedback from others and using it to enhance the design **5. Collaboration** • Working together to share materials and tools • Supporting each other with ideas and practical help during making and testing	• When I adjust the slider, it changes… • I faced a problem when… so I… • The materials I chose for the sliders are… **Evaluating** • To check if my weather station works well, I… • The sliders helped improve the accuracy by… • One thing I noticed when I tested the sliders was… • If I could improve my weather station, I would… • Overall, I think the sliders are useful because…	
• Design • Make • Evaluate • Healthy • Tasty • Smoothie • Fruit • Vegetable • Sweet	**Can I design, make and evaluate smoothies using vegetables?** **Can I say what makes a tasty and healthy smoothie?**	**3 Something: Weather station** **Someone:** **Some purpose:**	**🧠 Design Thinking** • Planning a simple food product with purpose (a smoothie that includes vegetables)	**Misconception:** *"Vegetables don't taste good in smoothies."* **Clarification:** Explain that some vegetables (like carrots, cucumber, or spinach) can add	**1. Vegetables and Their Properties** • Recognising common vegetables used in smoothies (e.g., carrots, spinach,	**1. Design Thinking** • Asking questions about what vegetables to use and why • Planning smoothie recipes by	**☑ Design Stage** Use these stems when planning the smoothie: • *I think we should include… because…*	• A selection of vegetables (e.g. spinach, carrot, cucumber) • Fruits (e.g. banana, apple, berries) • Liquid (e.g. water, juice, or yogurt) • Child-safe knives • Chopping boards • Bowls and spoons • Measuring cups or jugs • Plastic or paper cups (for tasting)

• Sour • Bitter • Soft • Chunky • Blended • Peel • Chop • Mix • Ingredients • Recipe • Flavour • Texture • Colour • Healthy eating • Vitamins • Energy	**Can I identify ingredients to include in my own smoothie?** **Can I research what flavours mixed will taste nice?** **Can I explain why I have chosen the ingredients I have in my final design?** **Can I use kitchen equipment safely to make a smoothie?** **Can I evaluate a smoothie using Healthy Eating guidelines?**		• Choosing ingredients based on taste, colour, and texture • Designing a recipe or sequence of steps **🍴 Food Preparation Skills** • Learning to safely **chop**, **peel**, and **mix** ingredients • Using tools correctly (e.g. blunt knives, peelers, spoons) • Practising basic **food hygiene** (washing hands and vegetables) **🥗 Nutrition and Healthy Eating** • Understanding that vegetables are part of a healthy diet • Exploring different types of vegetables that can go in smoothies (e.g. spinach, cucumber, carrot, beetroot) • Talking about flavours: sweet, earthy, fresh, strong **♻️ Evaluation** • Tasting and describing their smoothie (taste, texture, colour, smell)	a nice flavour and are healthy. Mixing with fruit can make smoothies tasty and colourful. **Misconception:** *"All vegetables need to be cooked before eating or blending."* **Clarification:** Teach that many vegetables can be eaten raw and blended safely in smoothies, helping retain their nutrients. **Misconception:** *"Smoothies are only sweet drinks."* **Clarification:** Discuss how smoothies can have different flavours—some sweet, some more earthy or fresh depending on the vegetables used. **Misconception:** *"I don't have to wash vegetables before using them."* **Clarification:** Stress the importance of washing all fruit and vegetables before use for safety and hygiene. **Misconception:** *"If I don't like the taste, I can't change the recipe."* **Clarification:** Encourage children that recipes can be changed and improved, and tasting helps us decide what works best. **Misconception:** *"Making a smoothie means just throwing everything together quickly."* **Clarification:**	cucumber, beetroot) • Understanding basic vegetable textures (crunchy, soft, leafy) and flavours (earthy, fresh, mild) • Knowing which vegetables are safe and healthy to eat raw **2. Healthy Eating and Nutrition** • Vegetables are important for health because they provide vitamins and minerals • Combining vegetables with fruits can improve taste and nutrition • Understanding that smoothies can be a healthy snack or drink **3. Food Preparation Skills** • Washing vegetables thoroughly before use • Basic skills: peeling, chopping, mixing, blending (with adult help) • Safe use of simple kitchen tools (plastic knives, peelers) **4. Design and Planning** • Planning which vegetables	choosing and combining vegetables (and possibly fruits) • Drawing or talking through the steps needed to make the smoothie **2. Technical Skills** • Washing and preparing vegetables safely (peeling, chopping) • Using simple kitchen tools correctly and safely (plastic knives, peelers, blenders with adult supervision) • Understanding how to mix ingredients to create a smoothie **3. Problem Solving** • Testing the smoothie taste and texture • Thinking about how to adjust the recipe if the smoothie is too bitter, thick, or thin • Making changes to improve flavour or consistency **4. Evaluation and Communication** • Using descriptive words to talk about taste, texture, smell, and appearance	• *One vegetable that might work well is…* • *Have you considered using…?* • *We could balance the flavor by adding…* • *What do you think about using… instead of…?* • *Let's agree on the ingredients by…* **🥣 Make Stage** Use these while making the smoothie: • *I'll be in charge of… because…* • *Can you help me with…?* • *Let's double-check the quantity of…* • *Be careful when…* • *We need to blend this until…* • *How can we make sure it's smooth enough?* **⭐ Evaluate Stage** Use these to reflect and evaluate: • *I liked the taste because…* • *Next time, I would change…* • *The texture was… because…* • *It was/wasn't a good balance of flavors because…*	• Blender (adult-supervised) • Handwashing station or hand sanitiser • Aprons • Antibacterial wipes or cloths • Waste bin or compost container • Smoothie design and evaluation sheets • Pencils and clipboards

			• Saying what they like and what they might change • Comparing different combinations 🎨 **Creativity and Presentation** • Making a smoothie that not only tastes good but looks appealing • Naming their smoothie and designing a label or menu card	Teach that planning, measuring, and preparing ingredients carefully helps make a better smoothie.	(and possibly fruits) to include in a smoothie • Drawing or discussing a simple recipe or steps to make the smoothie • Considering colour, taste, and texture in the design **5. Making and Hygiene** • Following a sequence of steps to prepare and make the smoothie • Practising good hygiene (washing hands and equipment) • Using equipment safely, especially blenders (with adult supervision) **6. Evaluation and Tasting** • Tasting their smoothie and describing flavour, texture, and appearance • Saying what they liked and what they might change next time • Understanding that recipes can be adjusted to improve taste or nutrition	• Saying what they like or don't like about the smoothie • Suggesting ways to improve the recipe next time **5. Hygiene and Safety** • Practising good hygiene by washing hands and ingredients • Handling kitchen tools safely with adult supervision • Understanding the importance of cleaning up after making food	• *The vegetables we used made it…* • *I would/wouldn't recommend this smoothie because…*	
▯ Design ▯ Make ▯ Evaluate	**Can I design, make and evaluate my own holiday cottage?**	**Something:** **a holiday cottage**	**Key Concepts – Holiday Cottage DT Unit (KS1)** 🧠 **Design Thinking**	1. **Misconception:** *"A house only needs walls and*	**1. Understanding Buildings and Structures**	**1. Design Thinking** • Asking questions	**Design Stage** Use these to share and discuss your ideas:	▯ Cardboard (e.g. cereal boxes, shoe boxes) ▯ Paper (plain, coloured, card)

Plan Draw Build Join Cut Stick Materials Structure Strong Stable Walls Roof Door Window Floor Furniture Model Holiday Cottage Home Shape Texture Improve	**Can I research and decide on the features of a holiday cottage?** **Can I use my research to develop my own design of a holiday cottage?** **Can I explore structures and joining techniques needed for my design to be successful?** **Can I adapt my design from my tests to create a final design?** **Can I build a stable and strong structure?** **Can I explain if my finished product would be a good holiday cottage?**	**Someone:** **Some purpose:**	• Understanding what a holiday cottage is and its features • Planning a simple structure with key parts (walls, roof, doors, windows) • Drawing or talking about their design before building **🛠 Making and Construction Skills** • Choosing and joining materials to build a stable model • Using simple tools safely (scissors, glue, tape) • Creating 3D structures (folding, cutting, assembling) **Evaluation** • Testing the strength and stability of their model • Discussing what they like about their cottage and what could be improved • Reflecting on their building process **Creativity and Presentation** • Decorating the cottage with colours, textures, and details (flowers,	*a roof — other parts like doors and windows aren't important."* **Clarification:** Explain that doors and windows are important parts of a house for letting light in, letting people in and out, and for safety. 2. **Misconception:** *"Any materials will make a strong house."* **Clarification:** Teach about different materials (paper, cardboard, fabric, wood) and which ones make stronger or more stable structures. 3. **Misconception:** *"The house has to be exactly like a real cottage."* **Clarification:** Emphasize that their model can be imaginative and creative, not just an exact copy. 4. **Misconception:** *"I don't need to plan before I build."* **Clarification:** Show how planning (drawing or talking through ideas) helps make building easier and the final product better.	• What makes a building stable and strong (walls, roof, base) • Different parts of a house: walls, roof, doors, windows, chimney • Materials used for building (cardboard, paper, wood, fabric) and their properties (strong, flexible, easy to cut) **2. Designing and Planning** • Drawing simple plans and labelled diagrams for a model cottage • Choosing materials based on purpose and properties • Understanding that a holiday cottage is a type of house where people stay for holidays **3. Making Skills** • Cutting, folding, joining materials to create 3D shapes • Using tools safely (scissors, glue, tape) • Assembling parts to create a stable structure **4. Decorating and Personalising**	about what makes a good holiday cottage • Generating ideas and planning through drawing and talking • Choosing materials and features based on their purpose and suitability **2. Technical Skills** • Using tools and materials safely and accurately (cutting, joining, assembling) • Building stable structures by joining parts securely • Adding details like doors and windows to enhance the model **3. Problem Solving** • Testing the stability and strength of the model • Identifying any weaknesses and thinking about how to fix them • Adjusting the design or making improvements based on testing **4. Evaluation and Communication** • Describing what worked well and what could be better	• *My idea for the holiday cottage is to include… because…* • *I was inspired by… when designing this part…* • *What do you think about having… in the cottage?* • *One feature that's important for comfort is…* • *We could make it more eco-friendly by…* • *I'd like to change this because…* **Make (Model) Stage** Use these while creating the model: • *I'm going to start with… because it's the main structure.* • *This part represents…* • *I chose these materials because…* • *How can we make sure it's strong/realistic?* • *Do you think this looks like a real cottage? Why/why not?* • *Can you help me figure out how to build the…?* **Evaluate Stage** Use these to reflect on your work:	Scissors (child-safe) Glue sticks or PVA glue Sticky tape or masking tape Rulers and pencils Felt tips, crayons, or coloured pencils Lollipop sticks, straws, or pipe cleaners (for structure/detail) Cotton wool or fabric scraps (for texture like bedding or curtains) Building templates or planning sheets Clipboards or plain paper for drawing floor plans Evaluation sheet or peer feedback form Small figures or paper people (optional, for scale) Recycled materials (e.g. bottle tops, yoghurt pots, egg cartons)

			curtains, chimney) • Making their model unique and personal **Context and Communication** • Talking about why holiday cottages are special places to stay • Linking design to real-world houses and holiday experiences	5. **Misconception:** *"Evaluation is only about saying what's wrong."* **Clarification:** Encourage children to say what they like and what worked well, as well as what could be improved. 6. **Misconception:** *"Decorations don't matter on a model."* **Clarification:** Point out that decoration helps make the cottage look more realistic and shows attention to detail.	• Adding details like windows, doors, colours, and decorations • Understanding how decoration makes the model look more realistic and appealing **5. Evaluation** • Testing the strength and stability of the cottage model • Talking about what they like and what could be improved • Reflecting on the design and making process	• Explaining choices made during designing and making • Listening to feedback and using it to improve the model **5. Collaboration** • Sharing materials and tools with others • Supporting peers with ideas and practical help • Working together to tidy and manage the workspace	• *I'm proud of… because…* • *If I could do it again, I would change…* • *The best feature of my cottage is… because…* • *I found it challenging to… but I solved it by…* • *My model does/doesn't meet the brief because…* • *I would rate my cottage a… out of 10 because…*	
• Design • Make • Evaluate • Vehicle • Wheel • Axle • Axle holder • Chassis • Body • Join • Cut • Stick • Turn • Move • Push • Pull • Fast • Slow • Strong • Stable • Map • London • Road • Bridge • Route • Landmark	**Can I design, make and evaluate a moving vehicle? (link to London Maps)** **Can I identify the features of moving vehicles?** **Can I design my own moving vehicle with wheels?** **Can I explore how to join and assemble components to make sure the wheels turn?** **Can I use my learning to create my final design?** **Can I assemble, join and decorate components to make a moving vehicle?** **Can I say what I like and what I would**	**Can I design, make and evaluate a moving vehicle? (link to London Maps)**	**Key Concepts – Moving Vehicle Linked to London Maps (KS1 DT)** **Design Thinking** • Understanding the purpose of different vehicles in London (buses, taxis, bikes) • Planning a vehicle that could travel on London roads or landmarks • Drawing simple plans and choosing materials **Making and Mechanisms** • Exploring how wheels and axles work to	**Misconception:** *"Wheels can be put anywhere on a vehicle."* **Clarification:** Explain that wheels need to be placed carefully to help the vehicle move smoothly and stay balanced. **Misconception:** *"The vehicle will move on its own without wheels or axles."* **Clarification:** Teach that wheels and axles work together to help vehicles move easily. **Misconception:** *"All wheels spin freely without any support."* **Clarification:** Show how axles hold wheels in place and allow them to turn correctly. **Misconception:** *"The vehicle has to look exactly like a real London*	**1. Understanding Vehicles and Their Purpose** • Different types of vehicles in London (buses, taxis, bicycles) and their uses • How vehicles move using wheels and axles • Recognising the importance of vehicles in transporting people around a city **2. Simple Mechanisms: Wheels and Axles** • What wheels and axles are and how they work together to help vehicles move	**1. Design Thinking** • Asking questions about what kind of vehicle is needed and where it will travel (using London maps) • Generating ideas and planning designs with sketches and labels • Choosing materials and features to help the vehicle move and fit its purpose **2. Technical Skills** • Using tools safely to cut, join, and assemble parts	**Design Stage** (Thinking about the purpose, function, and how it links to London) • *My vehicle is designed to travel around… (name of London area) because…* • *I chose this type of vehicle because…* • *The design will help it move on London's roads by…* • *Looking at the London map, I think the vehicle should be able to…* • *How can we make sure it works well on busy streets like…?*	Cardboard (e.g. boxes, tubes) Paper (plain or coloured) Straws (for axles) Wooden dowels or skewers (for axles – ends blunted for safety) Bottle tops or cardboard circles (for wheels) Scissors (child-safe) Glue sticks or PVA glue Sticky tape or masking tape Rulers and pencils Felt tips, crayons, or markers Rubber bands or balloons (for propulsion – optional) Planning and evaluation sheets Map of London or London transport map (for context) Small boxes or toys (as "passengers" or "deliveries") Paper or printed backgrounds (e.g. landmarks from London)

	change about my moving vehicle?		make a vehicle move • Constructing a chassis and attaching wheels securely • Using tools and materials safely and appropriately **Evaluation** • Testing how well the vehicle moves on different surfaces (e.g., flat, rough) • Talking about what works well and what could be improved • Considering how their design fits with London's roads or maps **Geography Link** • Exploring London landmarks and transport routes on maps • Thinking about where their vehicle would travel in the city • Using map symbols and simple route planning **Creativity and Presentation** • Decorating their vehicle to represent a London bus, taxi, or another city vehicle • Naming their vehicle and maybe	*bus or taxi."* **Clarification:** Encourage creativity; models can be imaginative and don't have to be exact copies. **Misconception:** *"Vehicles only move on smooth surfaces."* **Clarification:** Test vehicles on different surfaces and discuss how surface type affects movement. **Misconception:** *"Maps are only for looking at, not for designing vehicles."* **Clarification:** Explain how maps help us understand where vehicles travel and plan routes.	• How to attach wheels and axles so they spin freely and support the vehicle • Understanding that the placement of wheels affects balance and movement **3. Design and Planning** • Drawing simple plans of a vehicle and labelling parts • Considering size, shape, and purpose of the vehicle • Linking design to where the vehicle might travel in London (using maps) **4. Making Skills** • Cutting, joining, and assembling materials to create a vehicle chassis • Fixing wheels and axles securely • Using tools safely (scissors, glue, tape) **5. Linking to Geography** • Using London maps to explore routes and places vehicles travel • Understanding basic map symbols and landmarks • Thinking about how their vehicle fits into the	• Constructing functional moving parts like wheels and axles • Ensuring wheels are attached correctly to allow smooth movement **3. Problem Solving** • Testing the vehicle's movement on different surfaces • Identifying problems like wheels not turning or the vehicle tipping over • Making improvements to enhance performance and stability **4. Evaluation and Communication** • Describing what works well and what needs changing • Explaining design choices and the reasons behind them • Listening to others' feedback and using it to improve the vehicle **5. Linking to Geography** • Using London maps to think about routes and where the vehicle might be used • Understanding how vehicle design can be	• *I think the size should be… so it can travel through areas like…* **Make Stage** (While constructing or modeling the vehicle) • *I'm building this part first because…* • *This wheel/axle/chassis is important because…* • *Can we test it on a surface like a London road?* • *We need to make sure it moves smoothly across…* • *How can we improve the balance or speed?* • *Let's try to match it with the map journey we planned.* **Evaluate Stage** (Reflecting on how it performed and its connection to the map) • *My vehicle worked well when…* • *It struggled to… so next time I would…* • *If this were used in real London traffic, it would need to…* • *The journey on the map helped me think about…*	

			creating a simple “route map”		London environment **6. Evaluation** • Testing how well the vehicle moves on different surfaces • Describing what works well and what could be improved • Reflecting on the design and making process	influenced by the environment and roads	• *I would improve it by… because of what I saw on the London map.* • *The best thing about my moving vehicle is… because…*	
• Design • Make • Evaluate • Fruit • Smoothie • Ingredients • Chop • Peel • Cut • Mix • Blend • Healthy • Tasty • Sweet • Sour • Texture • Colour • Smell • Recipe • Plan • Choose • Wash • Safety • Fresh • Flavour	**Can I design, make and evaluate smoothies using fruit?** **Can I research and evaluate fruit smoothies compared to vegetable smoothies?** **Can I use my understanding of seasonality to design my own healthy spring-time smoothie?** **Can I explore flavours, textures and taste to inform my design ideas for a healthy smoothie?** **Can I explain and justify the choice of ingredients in my final design recipe?** **Can I use a range of techniques and kitchen equipment safely to make a healthy smoothie?** **Can I evaluate the success of my fruit smoothie?**	**Something: Smoothie** **Someone: Mrs Davis to test to put on the school menu** **Some purpose: To encourage healthy eating**	**Key Concepts – Fruit Smoothie DT Unit (KS1)** **Design Thinking** • Planning a smoothie by choosing different fruits • Designing a simple recipe and drawing their plan **Food Preparation Skills** • Washing, peeling, and cutting fruit safely • Using tools like knives and blenders (with adult help) • Mixing and blending ingredients **Nutrition and Healthy Eating** • Understanding that fruit is healthy and full of vitamins • Exploring flavours: sweet, sour,	**Misconception:** *“Smoothies are always very sweet.”* **Clarification:** Explain that smoothies can have different levels of sweetness depending on the fruits used and that some fruits are naturally sweeter than others. **Misconception:** *“All fruits need to be peeled before using.”* **Clarification:** Teach that some fruits (like bananas and oranges) need peeling, while others (like berries and grapes) can be used whole after washing. **Misconception:** *“Smoothies are only made from fruit, never vegetables.”* **Clarification:** Introduce the idea that smoothies can also include vegetables to make them healthier and add different flavors. **Misconception:** *“You can just throw all fruits together without planning.”* **Clarification:** Emphasize the importance of planning	**1. Understanding Fruits and Their Properties** • Identifying common fruits used in smoothies (e.g., bananas, strawberries, apples, oranges) • Knowing the textures (soft, crunchy, juicy) and flavours (sweet, tart) of different fruits • Understanding which fruits need peeling or cutting before use **2. Healthy Eating and Nutrition** • Fruits provide vitamins and are good for health • Combining different fruits can make smoothies tasty and nutritious • Understanding the importance of washing fruit before use	**1. Design Thinking** • Asking questions about which fruits to use and why • Planning a simple recipe by selecting fruits for flavour, colour, and texture • Drawing or talking through the steps needed to make the smoothie **2. Technical Skills** • Washing and preparing fruits safely (peeling, chopping) • Using kitchen tools (plastic knives, peelers, blenders) safely with adult supervision • Combining ingredients properly to create a smoothie **3. Problem Solving**	**Design Stage** (Planning your smoothie and choosing fruits) • *I think we should use… because it tastes…* • *A good combination might be… and… because…* • *Let’s include a fruit that is… (e.g., sweet, juicy, tropical)* • *What do you think about adding… for extra flavor?* • *This fruit will help with the texture because…* • *I chose this fruit because it is my favorite and…* **Make Stage** (While preparing and blending the smoothie) • *Can you help me cut/blend/mix the…?*	• A selection of fruits (e.g. banana, apple, berries, mango, pineapple) • Liquid (e.g. water, milk, fruit juice, or yogurt) • Child-safe knives • Chopping boards • Bowls and spoons • Measuring cups or jugs • Plastic or paper cups (for tasting) • Blender (adult-supervised) • Handwashing station or hand sanitiser • Aprons • Antibacterial wipes or cloths • Waste bin or compost container • Smoothie design and evaluation sheets • Pencils and clipboards	

			and different textures **Evaluation** • Tasting and describing their smoothie • Saying what they liked or what they would change • Comparing different fruit combinations **Creativity and Presentation** • Naming their smoothie and designing a label or cup decoration	and choosing fruits that go well together for taste and texture. **Misconception:** *"Smoothies don't need to be washed before making."* **Clarification:** Stress that all fruit must be washed before use for hygiene and safety. **Misconception:** *"If I don't like the smoothie, I can't change the recipe."* **Clarification:** Encourage tasting and adjusting recipes to improve flavor and texture.	**3. Food Preparation Skills** • Washing fruit thoroughly • Basic cutting, peeling, and preparing fruit safely (with adult help) • Using a blender or mixer safely (with adult supervision) **4. Design and Planning** • Planning which fruits to include based on flavour, colour, and texture • Drawing or discussing a simple recipe or step-by-step plan for making the smoothie **5. Making and Hygiene** • Following steps to prepare and blend the smoothie • Practising good hygiene (washing hands, cleaning equipment) • Using kitchen tools and equipment safely **6. Evaluation and Tasting** • Tasting and describing the smoothie's flavour, texture, and appearance • Saying what they liked and what they might change	• Tasting the smoothie and deciding if it needs adjusting (more sweet, less thick, etc.) • Making changes to improve taste or texture based on testing **4. Evaluation and Communication** • Using descriptive words to talk about taste, texture, smell, and appearance • Sharing likes, dislikes, and ideas for improvement • Listening to feedback and thinking about how to change the recipe **5. Hygiene and Safety** • Washing hands and fruit before preparing • Using tools and equipment safely • Cleaning up the workspace after making food	• *Be careful when using the… because…* • *We need to measure the right amount of…* • *Let's check the thickness—is it too runny or too thick?* • *Do we need to add more fruit, juice, or yogurt?* • *It smells like… and looks…* **Evaluate Stage** (Tasting and reflecting on the smoothie) • *I really liked the flavor because…* • *Next time, I would add more/less…* • *The smoothie was too… (sweet/sour/thick/thin) because…* • *My favorite part was… because…* • *It looked/tasted/felt…* • *If I could improve it, I would…*	

Year 1 and 2 A

					• Understanding that recipes can be adjusted to improve taste or nutrition			
• Design • Make • Taste • Evaluate • Pasty • Filling • Pastry • Ingredients • Chop • Slice • Mix • Fold • Crimp • Bake • Oven • Prepare • Recipe • Plan • Smell • Texture • Flavour • Traditional • Healthy • Local food • Safety • Hygiene	**Can I design, make and taste your own version Cornish pasty?** **Can I research and evaluate the range of Cornish Pasties?** **Can I use my research to design my own recipe for a Cornish pasty?** **Can I explore cooking techniques and timing of my ingredients to inform my recipe?** **Can I create my final design justifying my choices?** **Can I use a range of cooking techniques and equipment safely to make a Cornish Pasty?** **Can I evaluate how tasty my Cornish pasty was?**	**Something: Cornish Pasty** **Someone: Their parents** **Some purpose:** **To encourage healthy eating**	**Key Concepts – Cornish Pasty DT Unit (KS1)** **Design Thinking** • Learning about Cornish pasties and their traditional ingredients • Planning their own pasty with chosen fillings • Drawing and labelling their design **Food Preparation Skills** • Chopping and preparing ingredients safely • Making pastry and assembling the pasty • Using baking equipment with adult support **Nutrition and Healthy Eating** • Understanding different food groups in their pasty • Talking about healthy choices and balancing ingredients **Evaluation** • Tasting and describing their pasty • Discussing what they liked and	**Misconception:** *"A pasty is only made with meat."* **Clarification:** Explain that pasties can have different fillings, including vegetarian options like cheese and vegetables. **Misconception:** *"You don't need to wash your hands before handling food."* **Clarification:** Reinforce the importance of food hygiene and washing hands before cooking. **Misconception:** *"The pastry doesn't need to be sealed properly."* **Clarification:** Show how crimping the edges seals the pasty to keep the filling inside while baking. **Misconception:** *"All ingredients can be raw inside the pasty."* **Clarification:** Teach that some fillings need to be cooked or pre-prepared before putting them inside the pastry. **Misconception:** *"My pasty has to look exactly like a traditional Cornish pasty."* **Clarification:** Encourage creativity with fillings, shapes, and decorations. **Misconception:** *"Evaluation is just about saying if I liked it or not."* **Clarification:** Help children use descriptive words about	**1. Understanding Traditional Foods** • What a Cornish pasty is and its traditional ingredients (pastry, meat, vegetables) • Knowing that pasties can have different fillings, including vegetarian options • Learning about the cultural significance of the Cornish pasty **2. Food Preparation and Hygiene** • Washing hands before cooking and keeping the work area clean • Preparing ingredients safely: peeling, chopping, mixing • Understanding the importance of cooking fillings before assembling (where needed) **3. Pastry Making and Assembly** • Understanding how to make or handle pastry	**Design & Technology (Food Tech)** • **Understanding ingredients**: Know how different fillings behave when cooked. • **Nutrition**: Balance your pasty to include protein, carbohydrates, and vegetables. • **Food safety and hygiene**: Learn how to prepare, store, and cook ingredients safely. • **Cooking skills**: Use practical techniques like crimping, baking, and seasoning. **Example disciplinary knowledge:** "I know that pastry needs to be chilled before baking so it stays crisp." **Geography** • **Local ingredients**: Understand what ingredients were traditionally available in Cornwall. • **Food origins**: Learn where your	**Designing (using D&T, geography, and history knowledge)** • I chose these ingredients because… • My pasty design is inspired by… • Traditionally, Cornish pasties included…, but I decided to… • I know that using [ingredient] is important because… • From my research, I learned that… **Making (practical food knowledge & technique)** • While making my pasty, I had to… • I found it challenging to…, but I solved it by… • I used the crimping method because… • I made sure to follow hygiene rules like… • One skill I practised was… **Evaluating and Tasting (critical thinking + reflection)**	• Ready-made shortcrust or puff pastry sheets • Vegetables (e.g. potatoes, swede, onions) • Cooked meat (e.g. beef or chicken) or vegetarian fillings (optional) • Cheese (optional) • Mixing bowls and spoons • Chopping boards • Child-safe knives • Oven or toaster oven (adult-supervised) • Baking trays and parchment paper • Measuring cups and spoons • Pastry brush (for egg wash or milk) • Plates and napkins (for tasting) • Handwashing station or hand sanitiser • Aprons • Evaluation sheets or tasting feedback forms • Pencils and clipboards

			what could be changed • Reflecting on the cooking and design process 🎨 **Creativity and Presentation** • Decorating their pasty with crimping and shaping • Naming their pasty and sharing their creation	taste, texture, smell, and appearance, and suggest improvements.	• Learning how to fill and seal a pasty properly (crimping edges) • Knowing why sealing the pasty is important to keep the filling inside during cooking **4. Cooking and Safety** • Baking the pasty safely with adult help • Understanding cooking times and checking when food is cooked through **5. Evaluation and Tasting** • Tasting the pasty and using descriptive words about taste, texture, and smell • Discussing what they liked and what could be changed for next time • Reflecting on the cooking and design process	vegetables, meats, or spices come from. • **Seasonality**: Choose vegetables that are in season to make your pasty more sustainable. **Example disciplinary knowledge:** "Potatoes and swede are root vegetables that grow well in the Cornish climate." 🏰 **History** • **Cultural tradition**: Know that Cornish pasties were created for miners who needed a portable meal. • **Authentic vs. adapted**: Recognise what makes a pasty "Cornish" and how your version might differ. **Example disciplinary knowledge:** "The original Cornish pasty had a thick crust so miners could hold it with dirty hands and not eat the crust."	• I tasted my pasty and noticed that… • If I made it again, I would improve… • One thing I liked about my pasty was… • The texture/flavour/appearance was… • Feedback from others told me that… 🔄 **Using Disciplinary Knowledge** • In history, I learned that pasties were designed for… • In geography, I found out that ingredients like… are local to Cornwall. • In food technology, I learned that… helps with… • Understanding the origin of the Cornish pasty helped me to…	

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Vocabulary	Question	3 S	Key Concepts	Common Misconceptions	Substantive Knowledge	Disciplinary Knowledge	Oracy	Resources
Design • plan • design • choose • decorate • ingredients **Make** • mix • measure • stir • bake • add **Evaluate** • like • improve • taste • change • texture	**Can I design, make and evaluate a Christmas cake?** Can I research Christmas cakes to create a design criteria? Can I design my own Christmas cake for an intended audience? Can I experiment with flavours to shape my recipe for my Christmas cake design? Can I explain my final ingredient choices? Can I measure and weigh ingredients accurately? Can I evaluate the success of my Christmas cake?	**Something**: A **Christmas cake** **Someone**: For **a family celebrating Christmas** (or **children at a school party**, or **a local charity event** — depending on your target audience) **Some purpose**: To **celebrate Christmas with a festive, tasty, and visually appealing**	**1. Design** • **Understanding the brief**: Who is the cake for? (e.g. family, classmates) • **Exploring ideas**: Sketching or planning cake decoration ideas • **Selecting ingredients**: Choosing appropriate fruits, spices, or decorations • **Considering user needs**: Thinking about allergies, flavours, or presentation preferences **2. Make** • **Measuring ingredients accurately** • **Using tools safely and hygienically** (e.g. mixing bowls, wooden spoons, icing tools) • **Following a sequence of steps** in a recipe • **Working collaboratively** (if done in pairs or groups) • **Applying decorative techniques** (e.g. icing, cutting shapes, adding edible decorations) **3. Evaluate** • **Taste testing and giving feedback** (What went well? What could improve?) • **Appearance and texture**: Is it appealing? Is the texture right? • **Function and purpose**: Did it meet the brief? Was it festive and enjoyable? • **Peer and adult feedback**: Listening and responding to others' opinions **4. Nutrition and Food Knowledge** • **Knowing what goes into a cake** (sugars, fats, dried fruit, flour) • **Understanding the role of each ingredient** • **Discussing healthier options** (optional: e.g. reducing sugar, using natural decorations) **5. Cultural Understanding** • **Learning about the tradition of Christmas cakes** • **Discussing seasonal and cultural significance of food**	☐ **Baking is only about following instructions** • Students might think they just need to follow the recipe exactly without understanding why they use certain ingredients or steps. ☐ **Design means just choosing decorations** • They may believe designing is only about how the cake looks, not about planning the whole cake including flavours, textures, and ingredients. ☐ **All cakes bake the same way** • Some might assume every cake needs the same baking time and temperature, not realizing different recipes vary. ☐ **Evaluating means just saying "I like it" or "I don't like it"** • Students may not understand evaluation involves thinking about what worked well and what could be improved. ☐ **More ingredients make a better cake** • They might think adding more ingredients will always improve the cake, without considering balance or taste. ☐ **The cake has to look perfect** • Children might focus only on appearance and get discouraged if the cake doesn't look like a professional one, ignoring taste and effort.	**Substantive Knowledge** 1. **Ingredients and Their Functions** Understanding common cake ingredients (flour, sugar, eggs, butter) Knowing the role of each ingredient (e.g., eggs bind, baking powder helps rise) Recognising how different ingredients affect flavour and texture 2. **Baking Techniques** Mixing methods (e.g., creaming butter and sugar) How heat changes the batter to cake (chemical reactions during baking) Importance of oven temperature and baking time 3. **Designing a Cake** Planning decoration and flavours suitable for Christmas (e.g., spices, icing) Considering the appearance and texture of the cake Balancing flavours and textures for a pleasant result 4. **Food Safety and Hygiene** Washing hands and cleaning surfaces Safe handling of ingredients and equipment Avoiding contamination 5. **Evaluating Food** Using senses (taste, smell, sight, touch) to judge the cake Thinking about what worked well and what could be improved Describing taste, texture, and appearance	**1. Designing** • Apply prior knowledge of ingredients, taste, and appearance to create a design that meets a purpose (e.g. festive, appealing to parents). • Generate and communicate ideas through annotated sketches or planning sheets. • Make choices about flavours, decorations, and presentation based on audience and theme. **2. Making** • Select and use appropriate tools, equipment, and techniques to prepare ingredients (e.g. measuring, mixing, combining). • Follow a sequence of steps with some independence. • Work safely and hygienically when handling food. **3. Evaluating** • Reflect on the finished product by identifying strengths and areas for improvement. • Use tasting and sensory vocabulary to describe the cake (e.g. texture, flavour, appearance). • Compare the finished product to the original design and evaluate how well it meets the brief (e.g. "Would a parent enjoy this at Christmas?"). **4. Technical Knowledge in Context** • Apply understanding of how ingredients behave when mixed and baked (e.g. heat makes mixtures rise or solidify). • Understand basic food preparation and combining techniques (e.g. creaming butter and sugar, folding flour into mixture). • Use knowledge of nutrition to talk about ingredients (e.g. sugar content, alternatives for a healthier option).	**Designing** • *I chose these ingredients because...* • *My cake design looks festive because...* • *I planned my cake by...* • *I think this decoration will...* **Making** • *First, I... then I...* • *I used this tool to...* • *It was important to be careful when...* • *I followed the recipe by...* **Evaluating** • *The cake tastes... because...* • *I like/don't like the texture because...* • *Next time, I would change...* • *I am proud of my cake because...* • *My cake meets the design because...* **Reflecting and Improving** • *One thing I found tricky was...* • *I solved this problem by...* • *If I did this again, I would...*	**Ingredients:** • Flour, sugar, butter, eggs • Dried fruits and peel • Milk or juice • Spices (optional) • Icing sugar, marzipan/fondant (optional) **Tools:** • Mixing bowls, spoons • Measuring scales/spoons • Cake tins • Oven • Decorating tools (optional) **Safety & Hygiene:** • Aprons, hair ties • Cleaning cloths • Handwashing facilities **Planning & Evaluation:** • Design and evaluation sheets • Pencils and colours
Design • plan • design • label • choose **Make** • build • connect • light • cut • circuit **Evaluate** • test • fix • change • explain	**Can I design, make and evaluate a light up digestive system to show the journey of food?** Can I identify what I makes a good electrical toy? Can I use my research of current products to design my own light up animal? Can I make prototypes to check the quality of my design ideas? Can I adapt my design ideas from my research to create my final design? Can I use electrical components successfully to make a light up animal? Can I evaluate my light up animal compared to my final design?	**Something**: A **light-up model of the digestive system** **Someone**: For **KS2 science students** (or **children learning about human biology**) **Some purpose**: To **teach and visually explain the journey**	☐ **Design** • Planning a model to represent the digestive system • Understanding the main parts: mouth, oesophagus, stomach, intestines • Deciding where to place lights to show the food's journey ☐ **Make** • Building the model using materials (card, paper, wires) • Creating simple electrical circuits with batteries and LED lights • Connecting and placing lights in the right places ☐ **Evaluate**	**Common Misconceptions** 1. **The lights just need to turn on** Students may think it's enough for any light to come on, without linking the lights to the correct parts of the digestive system. 2. **Circuits are too complicated to build** Some might believe they can't make simple circuits themselves and rely on adults too much. 3. **The digestive system is just one big pipe** They might not understand the different parts and their specific functions, thinking the journey of food is simple and straight. 4. **Labels and explanations aren't important** Children might focus only on the model looking cool, not realizing how important clear labels and explanations are to show understanding. 5. **You only need to design the model, not test or improve it** Some may think once it's built, their job is done and not see the value in evaluating and improving their work.	**1. The Digestive System (Linked to Science)** Know the main parts of the digestive system: **mouth**, **oesophagus**, **stomach**, **small intestine**, **large intestine**, **rectum**. Understand the **basic function** of each part and the **order** food travels through the body. **2. Electrical Circuits (Linked to Science and DT)** Know how to build a **simple electrical circuit** using: **Battery** (power source) **Wires** **LED lights** (outputs) Understand how a **complete circuit** is needed for the light to work. Recognise that **switches** can be used to control circuits. **3. Designing a Product** Know how to plan a model with purpose (to **teach others** about digestion). Understand how to **label** parts and position components clearly. Use simple **sketches and diagrams** to plan the layout of the model. **4. Making and Using Materials**	**1. Designing** • Apply scientific knowledge of the **digestive system** to plan a model that clearly shows the correct **sequence of food** through the body. • Use labelled drawings or diagrams to plan the layout and **light placement**. • Make design choices based on **function** (how well it explains digestion) and **audience** (to inform others). **2. Making** • Select and use appropriate tools and materials to build the model (e.g. cardboard, glue, wires, LEDs). • Assemble a **simple electrical circuit**	**Designing** • *I designed my model to show...* • *The lights represent the journey of food through...* • *I chose these materials because...* • *My plan includes where the lights will go to...* **Making** • *First, I built the parts that show...* • *I connected the lights using wires to...* • *I made sure the circuit was complete by...* • *It was important to be careful with the wires because...* **Evaluating**	**Materials:** • Cardboard or foam board (for the digestive system base) • Colored paper or card (for organs) • LED lights or small bulbs • Copper tape or wires • Small batteries (e.g. coin cells) • Switches or clips (optional) • Glue, tape, scissors **Tools:** • Wire strippers (if needed) • Craft knives (with supervision) • Rulers, pencils, markers **Safety & Hygiene:** • Safety scissors and craft knives used carefully • Adult supervision for electrical components **Planning & Evaluation:** • Design sheets

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			• Testing if the lights work correctly to show the journey of food • Thinking about what worked well and what could be improved • Explaining how the model helps people understand digestion **Scientific Understanding** • Knowing the order food travels through the digestive system • Recognising the function of each part of the system **Technical Skills** • Using simple circuits and understanding basic electricity • Handling materials carefully and safely	6. **Lights can be placed anywhere on the model** They might not realize the importance of placing lights accurately to show the food's journey.	Know how to choose suitable **materials** for the model (e.g. card, foil, paper, glue). Understand how to safely use tools and components to build a model and circuit. Recognise the importance of **neatness**, **accuracy**, and **stability**. **5. Evaluating a Product** Know how to **test** if the circuit and model work as intended. Understand how to give and receive feedback. Identify what worked well and what could be **improved**.	correctly using a battery, wires, and LED lights. • Work safely with electrical components and basic tools, following a **step-by-step plan**. **3. Evaluating** • Test whether the lights correctly represent each stage of the digestive system. • Reflect on how well the model communicates scientific learning. • Suggest realistic **improvements** to the design, function, or accuracy of the model. **4. Technical Knowledge in Context** • Understand how to build and complete a **basic circuit** (power source, conductors, output). • Recognise that a **closed circuit** is needed for the light to work. • Apply knowledge of **model-making techniques** to ensure the structure is neat, clear, and durable.	• *The lights worked well because...* • *My model shows the food journey clearly by...* • *One thing I want to improve is...* • *I am happy with... but next time I would...* **Reflecting and Improving** • *I found it tricky to...* • *I solved this by...* • *If I did this again, I would...*	• Evaluation/reflection forms • Pencils and colouring materials
Design • plan • design • choose • shape **Make** • build • attach • fan • motor • test **Evaluate** • check • fix • change • improve	**Can I design, make and evaluate a fan powered boat?** Can I research and evaluate how boats are powered? Can I use my research to design my own fan powered boat? Can I make and test prototypes to inform my design ideas? Can I explain the choices in my final design? Can I incorporate mechanical components successfully to make a fan powered boat? Can I evaluate my fan powered boat and suggest improvements?	**Something**: A **fan-powered boat** **Someone**: For **children learning about forces and motion** (or **young engineers in a STEM club**) **Some purpose**: To **demonstrate how propulsion and buoyancy work in a fun, hands-on way**	• **Design** Planning the shape and size of the boat Choosing materials that will float and are lightweight Deciding where to place the fan for best movement • **Make** Building the boat structure using suitable materials Attaching the fan and motor securely Testing the boat to see how well it moves on water • **Evaluate** Observing how well the boat floats and moves Thinking about what worked and what could be improved Explaining how changes affect speed and stability • **Scientific Understanding** Understanding buoyancy (why things float) Knowing how the fan creates movement (air pushing the boat) • **Technical Skills** Using tools safely to build the boat Connecting and using simple motors or fans	**A bigger fan always makes the boat go faster** • Students might think just using a bigger fan or stronger motor automatically means a better boat. **Any materials will float equally well** • Some may not understand how different materials affect buoyancy and stability. **The shape of the boat doesn't matter** • They might believe the boat will float and move the same no matter what shape it is. **Once the boat moves, the project is finished** • Students might think there's no need to test further, evaluate, or improve their design. **The fan just needs to be attached anywhere** • They may not realize that where and how the fan is placed affects how well the boat moves. **Speed is the only important factor** • Some might overlook stability, control, and safety when focusing only on how fast the boat goes.	**1. Properties of Materials** • Know which materials are **water-resistant**, **lightweight**, and **buoyant** (e.g. plastic, foam, cardboard). • Understand that materials must be **suitable for water use** and able to support weight without sinking. **2. Forces and Movement (Linked to Science)** • Know that a **fan** creates movement by **pushing air**, which moves the boat forward (air resistance and propulsion). • Understand that shape affects how a boat **moves through water** (streamlined vs. bulky). • Recognise that a boat needs to be **balanced** and **stable** to float and move effectively. **3. Simple Electrical Components (Linked to DT/Science)** • Know how to build a **simple circuit** using: ○ **Battery holder** ○ **Wires** ○ **Motor and fan** • Understand how to connect and test the components safely. **4. Designing a Product** • Know how to sketch and label a **clear design** showing the boat shape, fan placement, and materials used. • Understand the purpose of a **design brief** (to solve a real problem or challenge). **5. Making and Assembling** • Know how to use **tools and materials safely** to cut, join, and build. • Understand how to follow a **plan** and make adjustments if needed. • Know how to securely attach electrical parts to a model. **6. Evaluating a Product**	**1. Designing** • Use knowledge of **floating and movement** to design a boat that is stable and moves in water. • Plan how to **position the fan and motor** effectively to create forward motion. • Create **labelled diagrams** and choose appropriate materials based on function (e.g. waterproof, lightweight). **2. Making** • Follow a step-by-step plan to construct a **working model boat** using chosen tools and materials. • Assemble a **simple electrical circuit** (battery, wires, motor, fan) safely and correctly. • Join and build components carefully so the boat floats and moves as intended. **3. Evaluating** • Test the boat to see if it **floats and moves** efficiently. • Reflect on how well the design met the criteria (e.g. speed, stability, direction). • Suggest practical **improvements** to performance or construction (e.g. fan angle, shape of hull). **4. Technical Knowledge in Context** • Understand how a **motor-driven fan** creates movement through air propulsion. • Know how to build and troubleshoot a **basic circuit** for power and motion. • Recognise the importance of **shape, balance, and materials** in model construction.	**Designing** • *I designed my boat to be...* • *I chose these materials because...* • *The fan will help my boat move by...* • *My plan shows how the fan is placed to...* **Making** • *First, I built the boat hull using...* • *I attached the fan carefully so that...* • *I connected the motor and battery by...* • *It was important to make sure the boat floats because...* **Evaluating** • *My boat moved well because...* • *The fan helped the boat by...* • *One thing I want to improve is...* • *Next time, I would change...* **Reflecting and Improving** • *I found it tricky to...* • *I fixed the problem by...* • *If I did this again, I would...*	**Materials:** • Lightweight materials for the boat body (foam, plastic, cardboard) • Small electric fan or motor with fan blade • Battery pack and batteries • Wires and switch • Glue, tape, scissors • Waterproof materials or sealant (optional) **Tools:** • Screwdrivers (if needed) • Wire strippers • Rulers, pencils, markers **Safety & Hygiene:** • Care when handling electrical parts • Adult supervision during assembly **Planning & Evaluation:** • Design templates • Evaluation sheets • Pencils and colouring materials

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					● Understand how to **test the boat** (Does it float? Does it move?) ● Know how to talk about **what worked well** and **what could be improved** (e.g. shape, balance, wiring). ● Be able to explain how changes might make the boat **faster**, **straighter**, or **more stable**.			
Program ● plan ● code ● instructions ● sequence **Monitor** ● watch ● check ● follow ● track **Control** ● move ● start ● stop ● turn	**Can I program, monitor and control a bee-bot to deliver materials to the pyramid building site?** Can I use research to learn about computer programming? Can I explore how to program using Bee-Bots? Can I plan a map of Foxhole for my Bee-Bot to travel on? Can I create my own map for my Bee-Bot to travel on? Can I program a bee-bot around my own map? Can I evaluate how successful I was at computer programming?	☐ **Something**: A **programmed Bee-Bot delivery robot** ☐ **Someone**: For **ancient Egyptian builders** (or **pupils learning about ancient Egypt**) ☐ **Some purpose**: To **simulate the delivery of materials to a pyramid building site, combining coding with history**	**Key Concepts** 1. **Program** Plan the steps for the Bee-Bot to reach the pyramid Create a clear sequence of commands (move forward, turn left/right) Understand how programming controls the Bee-Bot's movement 2. **Monitor** Watch the Bee-Bot follow the commands Check if it reaches the correct destination Notice any mistakes or changes needed 3. **Control** Start and stop the Bee-Bot Change the program to fix errors Guide the Bee-Bot accurately to deliver materials 4. **Skills** Use the Bee-Bot buttons and controls confidently Think logically to solve problems (debugging) 5. **Understanding Direction** Use terms like forward, backward, left, right Understand turns and movement on a grid	☐ **Programming means just pressing buttons randomly** ● Students might think they can press any buttons without planning the correct sequence of moves. ☐ **The Bee-Bot will always go exactly where I want the first time** ● They may expect perfect results without understanding the need to test and adjust their program. ☐ **Monitoring means only watching without thinking** ● Some might believe monitoring is just watching, not actively checking if the Bee-Bot is following instructions. ☐ **Controlling the Bee-Bot means moving it manually** ● Students might confuse programming with manually pushing the Bee-Bot instead of using its commands. ☐ **The Bee-Bot can turn in all directions instantly** ● They may not realize the Bee-Bot turns only in fixed increments (usually 90 degrees), which affects how it moves. ☐ **The route only needs to be programmed once** ● Some might not understand the importance of reviewing and improving the instructions based on trial runs.	**1. Programming Concepts** ● Know what an **algorithm** is: a set of clear, step-by-step instructions. ● Understand how to **input commands** into the Bee-Bot using buttons (e.g. forward, backward, left, right). ● Know that a **sequence** of commands must be in the correct order to work properly. **2. Debugging** ● Understand that sometimes programs don't work the first time. ● Know how to **identify mistakes** (bugs) in the command sequence. ● Know how to **change or fix** the commands to correct the movement (debugging). **3. Monitoring and Control** ● Know how to **monitor** whether the Bee-Bot follows the intended route. ● Understand how to make small adjustments to improve accuracy. ● Recognise how to **control** movement through programming, rather than manual pushing. **4. Spatial Awareness and Direction** ● Know and use directional vocabulary: **forwards**, **backwards**, **turn left**, **turn right**. ● Understand how to **plan routes** on a grid or map (e.g. to reach the pyramid site). ● Know that each turn is a **90-degree** turn, and each step is a set distance. **5. Purpose and Real-World Links** ● Understand that programming can be used to **solve real-world problems** (e.g. delivering materials). ● Know that robots can follow instructions to complete tasks safely and accurately. **6. Evaluation** ● Know how to reflect on what went well in the programming. ● Understand how to suggest and apply **improvements**. ● Use **logical reasoning** to explain how the Bee-Bot followed the sequence.	**1. Programming** ● Use **sequences of commands** (e.g. forward, turn, go) to create a clear algorithm that controls the Bee-Bot. ● Understand that the **order of instructions** affects the outcome. ● Use **trial and error** to improve or adjust the program. **2. Monitoring** ● Watch and record how the Bee-Bot behaves during each run. ● Notice and identify **errors** or unexpected movements (bugs). ● Decide where the program needs to be changed for improved accuracy. **3. Controlling** ● Use programming to **control movement** rather than moving the Bee-Bot by hand. ● Make purposeful decisions about how to direct the Bee-Bot to the correct destination. ● Understand that repeated or incorrect instructions can affect the **success of the delivery task**. **4. Technical Understanding in Context** ● Recognise that Bee-Bots **move in fixed steps** and turn in **90-degree angles**. ● Understand that **precise input** leads to a successful output (reaching the pyramid building site). ● Know how to **debug** by re-entering or adjusting code to correct errors. **5. Real-World Application** ● Understand how programming and robots are used in the real world to **complete tasks and solve problems**. ● Apply logical thinking to break down a real-world scenario (delivery to a pyramid site) into a **solvable sequence**.	**Programming** ● *I programmed the Bee-Bot to move by...* ● *I used these commands in this order because...* ● *I knew the sequence was correct when...* ● *I had to change my program because...* **Monitoring** ● *While watching the Bee-Bot, I noticed...* ● *The Bee-Bot did/didn't follow the instructions because...* ● *I spotted a mistake when...* ● *I recorded the Bee-Bot's movements by...* **Controlling** ● *I controlled the Bee-Bot by...* ● *I made sure it reached the pyramid site by...* ● *I corrected the route by...* ● *Using programming helped me because...* **Reflecting and Improving** ● *One challenge I had was...* ● *I fixed this by...* ● *Next time, I would...* ● *I am proud because...*	**Equipment:** ● Bee-Bots (programmable floor robots) ● Large floor mat or grid with pyramid building site layout ● Cards or tokens representing building materials ● Charging station or batteries for Bee-Bots **Tools:** ● Tablets or computers (optional, for programming apps) ● Markers and tape (for marking start/end points) **Planning & Evaluation:** ● Programming flowcharts or plan sheets ● Observation/monitoring logs ● Reflection or evaluation forms ● Pencils and colouring materials **Safety & Supervision:** ● Safe use of Bee-Bots and related equipment ● Adult supervision
Design Vocabulary ● plan ● choose ● ingredients ● recipe ● flavour ● healthy	**Can I design, make and evaluate a traditional Greek dish for parents to try?** Can I research traditional Italian dishes to inform design ideas? Can I design my own Italian dish explaining its authenticity to Italy?	● **Something**: A **traditional Greek dish** ● **Someone**: For **parents or carers** ● **Some purpose**: To **share Greek culture through food and showcase cooking and presentation skills**	1. **Design** Plan the dish and choose ingredients Think about flavour, texture, and presentation Understand the cultural background of the dish 2. **Make** Prepare and cook the dish safely Follow the recipe steps carefully Use cooking tools and equipment correctly	**Common Misconceptions** 1. **Cooking is just following a recipe without thinking** Students may think they only need to copy the recipe without understanding why ingredients are used or how to adjust flavours. 2. **Designing food is only about how it looks** Some might believe designing means only decorating the dish, not planning	**1. Understanding Ingredients** ● Know examples of **traditional Greek ingredients** (e.g. olives, feta cheese, cucumber, tomatoes, olive oil, yoghurt). ● Understand where food comes from and how	**1. Designing** ● Use knowledge of **traditional Greek ingredients and dishes** to design a recipe. ● Plan a dish considering **taste, texture, appearance, and cultural relevance**.	**Designing** ● *I chose this dish because...* ● *The ingredients I picked are...* ● *My recipe includes...* ● *I designed the dish to taste...*	**Ingredients:** ● Traditional Greek ingredients (e.g., olive oil, feta cheese, tomatoes, herbs) ● Basic cooking ingredients (flour, eggs, vegetables, etc.) ● Spices and seasonings typical of Greek cuisine **Tools & Equipment:** ● Mixing bowls, knives, chopping boards

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Make Vocabulary • prepare • mix • cook • measure • chop • bake • taste **Evaluate Vocabulary** • like • dislike • improve • change • flavour • texture • appearance • favourite	Can I explore cutting and cooking techniques for my Italian dish? Can I refine and adapt my final design? Can I prepare and cook a savoury Italian dish? Can I evaluate my Italian dish compared to the design brief?		3. **Evaluate** Taste the dish and think about what worked well Identify improvements for next time Describe the flavours, textures, and appearance 4. **Healthy Eating** Consider balanced ingredients and nutrition Understand how different ingredients affect health 5. **Cooking Skills** Measuring, mixing, chopping, and cooking safely Hygiene and safety in the kitchen	the flavours, textures, or nutritional balance. 3. **All traditional dishes have to be complicated** They may think traditional dishes must be difficult to make, which can be discouraging. 4. **Evaluation is only saying if you liked it or not** Students might not realize evaluation involves thinking about taste, texture, appearance, and how to improve the dish. 5. **Adding more ingredients always makes the dish better** They may think more ingredients improve the dish, without considering balance and flavour. 6. **The dish must look perfect to be successful** Some children might focus only on appearance and overlook taste or effort.	ingredients link to **culture and geography**. • Recognise the importance of **seasonal and fresh produce**. **2. Food Preparation Skills** • Know how to **safely prepare ingredients**, e.g. washing, chopping, grating, mixing. • Understand how to use simple kitchen equipment (e.g. knives, peelers, graters) with care. • Understand the basics of **food hygiene and safety** (washing hands, clean surfaces, handling food properly). **3. Designing a Dish** • Know how to **plan a dish** by thinking about flavour, texture, and appearance. • Understand that a dish should be **balanced, appealing, and culturally relevant**. • Know how to record ideas using **annotated drawings** or **recipe plans**. **4. Making a Dish** • Know how to follow a simple **recipe** or set of instructions. • Understand how to measure ingredients accurately using **standard units**. • Be able to assemble and present the dish with care and creativity. **5. Evaluating a Dish** • Know how to taste and describe food using sensory vocabulary (e.g. sweet, salty, crunchy, smooth). • Understand how to give and receive **constructive feedback**. • Know how to suggest **improvements** to taste, presentation, or preparation. **6. Nutrition and Healthy Eating** • Know the **Eatwell Guide** and the importance of a **balanced diet**. • Understand how traditional dishes can be **adapted** to be healthier if needed.	• Create clear **annotated sketches or recipe plans** that show ingredients and steps. **2. Making** • Follow a recipe or set of instructions to prepare and cook the dish safely and hygienically. • Use kitchen tools properly (e.g. knives, peelers, graters) and measure ingredients accurately. • Combine ingredients using appropriate techniques (e.g. mixing, chopping, assembling). **3. Evaluating** • Taste the dish and use sensory language to describe flavours, textures, and appearance. • Reflect on how well the dish meets the design brief and audience needs (parents). • Suggest improvements for flavour, presentation, or ease of preparation. **4. Technical Understanding in Context** • Understand how different ingredients behave during preparation and cooking (e.g. chopping, mixing). • Know the importance of **food hygiene and safety** practices. • Recognise how traditional recipes link to culture and history.	**Making** • *First, I prepared the ingredients by...* • *I used this tool to...* • *I followed the recipe step by step...* • *It was important to be careful when...* **Evaluating** • *The dish tastes... because...* • *I like/didn't like the texture because...* • *I think parents will enjoy it because...* • *Next time, I would change...* **Reflecting and Improving** • *One thing I found tricky was...* • *I solved this by...* • *If I made this again, I would...* • *I am proud of my dish because...*	• Cooking utensils (spoons, whisks, peelers) • Oven or stove • Measuring cups and spoons • Plates and serving dishes **Safety & Hygiene:** • Aprons, hair ties • Cleaning supplies • Handwashing facilities **Planning & Evaluation:** • Recipe planning sheets • Tasting and evaluation forms • Pencils and colouring materials
Design • plan • design • sketch • materials • shape **Make** • build • cut • join • stick • model **Evaluate** • test • improve • change • explain • strong	**Can I design, make and evaluate my own Anglo Saxon building to supply to a museum?** Can I research and evaluate other model castles compared to actual castles? Can I use my research to inform the design process for my own model castle? Can I make prototypes and test materials for strength and durability needed for my castle? Can I use my learning to create my final design with clear reasoning? Can I measure and cut with accuracy and join materials to create a model castle structure? Can I evaluate my castle for appearance, strength and durability?	• **Something**: An **Anglo-Saxon building model** • **Someone**: For **a museum** (or **visitors learning about Anglo-Saxon life**) • **Some purpose**: To **help educate people about how Anglo-Saxons lived through a detailed model**	☐ **Design** • Plan the building shape, size, and materials • Research Anglo-Saxon building styles and features • Sketch clear designs with labels ☐ **Make** • Use suitable materials to build a sturdy model • Join parts carefully and accurately • Follow the design plan during construction ☐ **Evaluate** • Test the model's strength and stability • Consider historical accuracy and appearance • Suggest improvements for design or building ☐ **Historical Understanding**	**Common Misconceptions** 1. **Anglo-Saxon buildings all looked the same** Students might think all buildings had the same shape, size, and materials, missing the variety that existed. 2. **Designing means just making it look nice** Some may believe designing is only about appearance, not about structure, strength, or historical accuracy. 3. **Using modern materials is okay** They might think any material is fine, without considering what materials would have been used in Anglo-Saxon times. 4. **Building the model is the final step** Students may not realize the importance of evaluating their model to see if it is strong or accurate. 5. **A model doesn't need to be sturdy** They might not understand the importance of making a durable model, especially if it's to be displayed in a museum. 6. **Evaluation is just saying if you like it or not** They might not understand that evaluation means thinking about how well the building meets the design goals and what could be improved.	**1. Historical Understanding (Cross-curricular with History)** • Know what **Anglo-Saxon buildings** looked like and their typical features (e.g. timber frames, thatched roofs, wattle and daub walls). • Understand why buildings were built in certain ways (e.g. for warmth, protection, materials available). • Recognise the **purpose** of buildings (homes, halls, workshops) in Anglo-Saxon times. **2. Properties of Materials** • Know which materials are best suited for building strong, stable models (e.g. card, paper straws, wood, glue). • Understand how to choose materials that represent **Anglo-Saxon construction** while being practical for a model. **3. Designing a Model**	**1. Designing** • Use knowledge of **Anglo-Saxon architecture and materials** to create a detailed design. • Plan a model building considering **structure, stability, and historical accuracy**. • Produce clear drawings or plans with labels showing materials and construction techniques. **2. Making** • Select and use appropriate materials (e.g. wood, card, glue) to build a strong, stable model. • Use tools safely and effectively to cut, join, and assemble the building. • Follow the design plan and adapt as needed during construction. **3. Evaluating**	**Designing** • *I designed my building to look like...* • *I chose these materials because...* • *My plan shows how the building will be...* • *I included these features because...* **Making** • *First, I built the base using...* • *I joined the parts carefully by...* • *I made sure the building was strong by...* • *I used these tools safely when...* **Evaluating** • *My building is strong because...* • *It looks like an Anglo-Saxon building because...* • *One thing I want to improve is...*	**Materials:** • Cardboard, foam board, or wood (for building structure) • Craft sticks, straws, or twigs (for timber frames) • Wattle and daub substitutes (clay, papier-mâché, or modelling clay) • Glue, tape, scissors • Paints and brushes (for decoration) **Tools:** • Scissors, craft knives (with supervision) • Rulers, pencils, markers • Hot glue gun (optional, with adult supervision) **Safety & Hygiene:** • Care with sharp tools • Adult supervision required **Planning & Evaluation:** • Design sheets • Evaluation/reflection forms • Pencils and colouring materials

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			• Learn about Anglo-Saxon homes and construction methods • Understand the purpose of different building parts **Technical Skills** • Cutting, joining, and assembling materials safely • Working carefully to create detailed models		• Know how to plan a model using **drawings**, **labels**, and **lists of materials**. • Understand how to design a structure that is **realistic**, **stable**, and **visually accurate**. • Use knowledge of structure and shape to plan a model that reflects the Anglo-Saxon style. **4. Making and Assembling** • Know how to **cut**, **join**, and **assemble** materials safely and accurately. • Understand how to follow a plan and make changes when needed. • Know how to build a model that is **sturdy** and **well-finished** for display. **5. Evaluating the Product** • Understand how to **test** the model for stability and historical accuracy. • Be able to explain what went well and what could be improved. • Know how to present the model clearly with appropriate **labelling** and **explanation** for a museum audience.	• Test the model for **stability and durability**. • Assess how well the building represents Anglo-Saxon design features. • Suggest improvements to design, materials, or construction methods. **4. Technical Understanding in Context** • Understand the purpose of different building materials used by Anglo-Saxons (e.g. wattle and daub, timber frames). • Recognise basic structural principles like **balance and support**. • Know how to make a model that is both **historically accurate and practical** for display.	• *Next time, I would change...* **Reflecting and Improving** • *I found it tricky to...* • *I solved this problem by...* • *If I did this again, I would...* • *I am proud of my building because...*	

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Vocabulary	Question	Trips/ Experiments	Key Concepts	Common Misconceptions	Substantive Knowledge	Disciplinary Knowledge	Oracy	Resources
• Pulley • System • Load • Effort • Fixed pulley • Movable pulley • Mechanical advantage • Force • Tension • Wheel and axle • Rope or cord • Transport • Structure • Stability • Design brief • Prototype • Evaluate • Mechanism • Moving parts • Assembly • Safety • Materials (wood, plastic, metal, string)	**Can I design and make a pully system within a product to transport the Benin bronzes?** Can I investigate pully systems to inform a design criteria? Can I use my design criteria to inform designs for an intended purpose? Can I investigate and test materials and components needed for my pully system? Can I shape my final design and design criteria, explaining adaptations made? Can I assemble, join and combine components accurately to make a pully system? Can I evaluate the strengths and improvements needed in my pully system?		• **Mechanisms:** Understanding how pulleys work to make moving heavy objects easier. • **Mechanical Advantage:** How pulleys reduce the effort needed to lift or move loads. • **Design:** Planning and creating a product that includes a pulley system to transport objects safely. • **Materials:** Choosing strong and suitable materials to support the structure and pulley system. • **Functionality:** Ensuring the pulley system works smoothly and safely to carry the load. • **Structure and Stability:** Designing a stable base to support the pulley and the load. • **Evaluation:** Testing the product, identifying strengths and weaknesses, and suggesting improvements. • **Safety:** Considering safety during design, making, and using the product. • **Historical Context:** Understanding the significance of the Benin Bronzes and why careful transport is important.	• **Pulleys make things weightless:** Thinking pulleys remove the weight of objects rather than just making them easier to lift. • **More pulleys always mean less effort:** Believing adding more pulleys always reduces effort, without understanding fixed vs. movable pulleys. • **Pulleys work without a rope or cord:** Not realizing the pulley system requires a rope or belt to transfer force. • **Pulleys work alone:** Forgetting pulleys are part of a system and need a structure to support them. • **You can pull in any direction:** Misunderstanding that the direction you pull the rope affects how the load moves. • **All materials work the same:** Not considering that weak materials may break or fail under load. • **Pulleys don't need maintenance:** Overlooking the need for smooth movement and checking for wear. • **Speed vs. effort confusion:** Thinking pulleys always make lifting faster rather than easier.	□ **Pulley Systems:** Understanding how pulleys work as simple machines to change the direction of force and reduce effort needed to lift or move heavy objects. □ **Types of Pulleys:** Knowing the difference between fixed, movable, and compound pulleys and their uses. □ **Mechanical Advantage:** Learning how using multiple pulleys can make lifting easier by distributing the weight. □ **Force and Effort:** Recognizing the relationship between force applied, load weight, and movement efficiency. □ **Materials and Construction:** Choosing strong, durable materials to build a pulley system that can safely support and transport valuable objects like the Benin Bronzes. □ **Design and Engineering:** Planning a product that integrates a pulley mechanism to meet functional and safety needs. □ **Cultural Context:** Understanding the importance and fragility of the Benin Bronzes, emphasizing careful handling. □ **Evaluation:** Testing the pulley system for effectiveness, safety, and durability, and reflecting on improvements. □ **Safety Considerations:** Knowing how to ensure safe use of the pulley system during operation and construction.	□ **Applying Mechanical Principles:** Using knowledge of pulleys as simple machines to create mechanical advantage in a product. □ **Problem Solving:** Designing a pulley system to meet specific criteria such as weight, safety, and ease of use. □ **Technical Skills:** Developing skills in assembling, connecting, and testing pulley components accurately. □ **Precision and Accuracy:** Ensuring measurements and alignments are precise to make the pulley work effectively. □ **Iterative Design:** Evaluating prototypes, identifying flaws, and refining the design through multiple attempts. □ **Materials Understanding:** Choosing appropriate materials that can withstand the load and movement. □ **Safety Considerations:** Applying safety knowledge when designing and building moving parts. □ **Communication:** Explaining design choices clearly and using technical vocabulary. □ **Reflective Evaluation:** Critically assessing the effectiveness and efficiency of the pulley system and suggesting improvements.	**Design Discussion** • "I chose this material because…" • "My design solves the problem by…" • "One challenge I had was…, and I solved it by…" **Group Work** • "I agree with you because…" • "Have you thought about trying…?" • "Can you explain why you chose that idea?" **Ethical/History Link** • "I think the Benin Bronzes are important because…" • "They should/shouldn't be returned because…" **Evaluation** • "If I were to do this again, I would improve…" • "The pulley made the task easier because…"	□ String or strong thread □ Pulleys (plastic, metal, or made from spools/bottle caps) □ Hooks or paperclips □ Small tray, bucket, or box (to carry the "bronze") □ Cardboard (corrugated), wooden dowels, or cardboard tubes □ Lollipop sticks or straws □ Tape (masking or clear) □ Glue □ Scissors □ Hole punch □ Ruler □ Design templates / planning sheets □ Evaluation sheets □ Photos or videos of the Benin Bronzes (for context) □ Markers, gold foil, or paint (for decoration) □ Tissue paper or cloth (to wrap the bronze) □ Oracy sentence stems sheet
• Rocket • Launch • Thrust • Aerodynamics • Propulsion • Nose cone • Fins • Fuel • Engine • Stability • Trajectory • Payload • Design brief • Prototype • Evaluate • Materials • Structure • Assembly • Safety • Mechanism • Testing	**Can I design, make and evaluate my own rocket for Nasa?** Can I explore how pneumatics are used in products? Can I use my understanding of pneumatics to inform initial designs? Can I test the success of a pneumatic device and make improvements to meet the design specification? Can I create a detailed final design with explanation for choices? Can I independently measure to the nearest mm when making a pneumatic rocket? Can I critically evaluate my pneumatic rocket?		□ **Aerodynamics:** Understanding how air flows around the rocket to reduce drag and improve flight. □ **Thrust and Propulsion:** How rockets move using force generated by engines or propulsion systems. □ **Stability:** Designing fins and structure to keep the rocket balanced during flight. □ **Materials:** Choosing lightweight but strong materials for building the rocket. □ **Design Process:** Planning, creating prototypes, and refining the rocket design. □ **Functionality:** Ensuring the rocket can launch and fly safely. □ **Testing and Evaluation:** Checking how well the rocket flies and making improvements. □ **Safety:** Considering safety in design, construction, and testing. □ **Scientific Understanding:** Basic physics of motion, gravity, and forces involved in rocket flight.	• **Rockets float in space:** Thinking rockets float because they are light, rather than understanding they move due to thrust and Newton's Third Law. • **More fuel means better flight:** Believing that simply adding more fuel always improves rocket performance, ignoring weight and fuel efficiency. • **Rockets go straight up only:** Not realizing rockets need to follow a trajectory and can move in different directions. • **Fins are just for decoration:** Thinking fins don't affect stability or flight control. • **Rocket engines burn oxygen from the air:** Not understanding rockets carry their own oxidizer since there is no air in space. • **Size equals power:** Assuming bigger rockets are always more powerful without considering design and engineering. • **Once launched, you can't control a rocket:** Overlooking modern rockets' ability to be guided and controlled. • **Testing isn't necessary:** Underestimating the importance of prototypes and tests before the final launch.	□ **Rocket Design:** Understanding key parts of a rocket, such as the body, nose cone, fins, and engine. □ **Aerodynamics:** Knowing how shape affects air resistance and flight stability. □ **Thrust and Propulsion:** Learning how rockets move using thrust generated by engines or propulsion systems. □ **Materials:** Selecting lightweight and strong materials suitable for building rockets. □ **Stability and Balance:** Designing fins and weight distribution to keep the rocket stable during flight. □ **The Design Process:** Planning, sketching, making prototypes, and refining the rocket design. □ **Testing and Evaluation:** Assessing how well the rocket flies and making improvements based on results. □ **Safety:** Understanding safety precautions during building and launching. □ **Scientific Principles:** Applying Newton's Third Law (for every action, there is an equal and opposite reaction) to explain rocket movement.	□ **Design Thinking:** Creating a purposeful design based on research, function, and user needs (e.g. NASA's requirements). □ **Testing & Evaluation:** Planning fair tests (e.g. distance flown, stability), observing outcomes, and using evidence to improve the design. □ **Prototyping:** Making and adapting models through trial and error, learning from mistakes. □ **Materials Selection:** Choosing and justifying materials based on weight, strength, and suitability for flight. □ **Technical Accuracy:** Measuring, cutting, and assembling components precisely to ensure effective performance. □ **Aerodynamic Principles:** Applying scientific understanding (e.g. drag, lift, thrust) to influence shape and structure.	**Design Thinking** • "I chose this shape because it reduces air resistance…" • "I designed the fins like this to help with balance…" **Science & Evaluation** • "My rocket flew further because…" • "The force that helped my rocket launch was…" • "To improve it, I would change…" **Persuasive/NASA Pitch** • "This rocket is ideal for space travel because…" • "Our design is both efficient and safe, and here's why…"	□ Cardboard tubes (e.g., from kitchen rolls) □ Plastic bottles or film canisters (for rocket body) □ Paper or card (for fins and nose cones) □ Tape (masking or duct tape) □ Glue (PVA or hot glue) □ Scissors and craft knives (with supervision) □ Straws (for launch guides) □ Elastic bands or balloons (for air-powered propulsion) □ Stomp launcher kit or simple launch platform (optional) □ Weights (small washers or coins for balancing) □ Rulers and measuring tape □ Stopwatch or timer (to measure flight time) □ Graph paper or recording sheets (to log flight data) □ Design templates and planning sheets □ Evaluation sheets □ Safety goggles (for launch safety) □ Photos or videos of real rockets (NASA missions for inspiration)

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						Iterative Improvement: Modifying and refining rockets based on evaluations and test results. **Recording & Communicating Ideas:** Using annotated sketches, diagrams, or digital tools to plan and present the design process.		Oracy sentence stems and presentation prompts
Rationing Recipe Ingredients Substitute Portion Nutrients Balanced diet Preserving Seasonal Simple Traditional Cooking method Flavour Texture Preparation Evaluate Presentation Portion size Healthy Budget Tasting session	**Can I design, make and evaluate a WW2 rationing recipe for a tasting session with parents?** Can I research and evaluate other WW2 recipes, explaining why recipes were adapted during this period? Can I use my research to develop my own credible WW2 recipe? Can I explore different cooking techniques to inform my WW2 recipe? Can I show my understanding of seasonality and availability to inform my final recipe design? Can I prepare and cook a savoury WW2 recipe safely and hygienically? Can I adapt and refine recipes by adding or substituting one or more ingredients to change the appearance, taste, texture and aroma within my WW2 recipe?		**Rationing:** Understanding how food was limited during WW2 and why. **Substitution:** Finding alternative ingredients due to shortages. **Nutritional Balance:** Ensuring recipes meet dietary needs despite limited ingredients. **Budgeting:** Using limited resources wisely. **Cooking Techniques:** Simple methods suitable for rationed ingredients. **Taste and Presentation:** Making food appealing and enjoyable. **Evaluation:** Reflecting on the success and areas for improvement of the recipe. **Historical Context:** Learning about life during WW2 and how it affected cooking and eating. **Safety and Hygiene:** Following safe food preparation practices.	• **Rationing means no food:** Thinking people had no food at all, rather than limited quantities and substitutions. • **All food tasted bad:** Believing all wartime food was unpleasant, ignoring creative and tasty recipes made from rationed ingredients. • **Recipes were very simple:** Assuming recipes had to be extremely basic, when some were quite inventive. • **You can use any ingredients:** Not understanding that some ingredients were scarce or unavailable. • **More food is better:** Thinking having more food was possible during rationing, rather than making do with less. • **No cooking skills were needed:** Underestimating the effort and skill needed to cook with rationed ingredients. • **Modern food and wartime food are the same:** Overlooking differences in availability and nutrition. • **Health wasn't important:** Assuming nutrition was not considered during rationing.	• **Rationing History:** Understanding what food rationing was during WW2 and why it was necessary. • **Available Ingredients:** Knowing which ingredients were commonly rationed or scarce and what substitutes were used. • **Nutrition:** Recognizing the importance of balanced nutrition despite limited resources. • **Recipe Design:** Planning recipes that use rationed ingredients creatively and efficiently. • **Cooking Skills:** Applying basic cooking techniques suitable for rationed recipes. • **Taste and Presentation:** Considering how to make rationed recipes tasty and visually appealing for a tasting event. • **Evaluation:** Testing the recipe, gathering feedback, and reflecting on taste, appearance, and ease of preparation. • **Cultural Understanding:** Appreciating the resilience and creativity of people during wartime through food.	**Design Process:** Planning a recipe with a clear purpose and audience in mind (e.g. creating something tasty with limited ingredients). **Historical Constraints:** Designing under restrictions inspired by WW2 rationing (limited availability, substitutes). **Food Preparation Skills:** Applying safe and accurate techniques such as weighing, mixing, peeling, and combining ingredients. **Hygiene and Safety:** Following food hygiene rules when preparing and handling ingredients. **Adaptation and Problem Solving:** Modifying recipes or techniques when faced with limited resources or outcomes that don't work. **Sensory Evaluation:** Using taste, texture, and appearance to assess and improve the final dish. **Audience Feedback:** Gathering and interpreting feedback from parents or peers to evaluate success. **Presentation and Communication:** Presenting food attractively and explaining design choices based on context and constraints.	**Design Thinking** • "My recipe uses ingredients people had in WW2 because…" • "I wanted to make something nutritious by adding…" **Cooking & Evaluation** • "The texture/taste/smell of my dish is…" • "Next time, I would change… to improve the flavour." • "This dish is suitable for rationing because it uses…" **Presentation to Parents** • "Welcome to our WW2 Tasting Table. I'd like to share…" • "This recipe helped people stay healthy during wartime by…" • "Please try my dish — it includes ingredients such as…"	WW2 rationing ingredient list (e.g., flour, carrots, potatoes, oats, powdered eggs) Basic cooking equipment (mixing bowls, spoons, measuring cups/spoons) Oven or stove (adult supervision required) Recipe cards or templates for planning Ingredients according to recipe (within ration limits) Scales or measuring tools Cooking utensils (knives, graters, baking trays, pans) Hygiene supplies (aprons, hand sanitizer) Tasting cups/plates and utensils for parents Feedback forms or tasting evaluation sheets Photos or wartime rationing posters for context Oracy sentence stems for presenting and evaluating Historical info sheets or short videos about rationing
Decoration Design brief Prototype Circuit Switch	**Can I design, make and evaluate a light up Christmas decoration with a switch to sell at the Christmas Fair?**		• **Electrical Circuits:** Understanding how circuits work,	• **Electricity is dangerous, so I can't touch it:** Fear of handling circuits without	**Electrical Circuits:** Understanding simple circuits, including batteries, wires, bulbs/LEDs, and switches.	• **Electrical Systems Application:** Designing and building a working electrical circuit that	**Design Discussion** • "I chose this design because I think it will	LED lights or small bulbs Coin cell batteries or battery holders Switches (slide, push, or toggle) Copper tape or insulated wire

□ LED light □ Battery □ Conductors □ Insulators □ Wiring □ Electrical components □ Assembly □ Safety □ Evaluate □ Materials □ Stability □ Functionality □ Creativity □ Product □ Market □ Fair	Can I research and evaluate the range of Christmas light decorations on the current market? Can I design my own Christmas light for the intended purpose and audience? Can I test the electrical components and circuit needed for my Christmas light? Can I create my final design and write a full design rationale? Can I assemble different components to make a working Christmas light decoration? Can I evaluate how successful my Christmas light is against the design brief?		including switches, batteries, and LEDs. • **Design Process:** Planning, prototyping, and refining the decoration. • **Materials:** Choosing suitable materials for durability and appearance. • **Functionality:** Ensuring the decoration lights up and the switch works reliably. • **Aesthetics:** Creating an attractive, festive design. • **Safety:** Considering electrical safety and safe use of materials. • **Evaluation:** Testing the product and reflecting on what worked well and what could improve. • **Market Awareness:** Thinking about the target audience and how to make the product appealing to buyers.	understanding safe practices. • **Circuits only work one way:** Thinking electricity flows in any direction, not understanding polarity and correct wiring. • **Bigger batteries mean brighter lights:** Assuming battery size always affects light brightness without considering voltage and current. • **Switches aren't necessary:** Believing a light can just be turned on/off without a switch. • **All materials conduct electricity:** Not distinguishing between conductors and insulators. • **Wires don't need to be connected properly:** Overlooking the need for secure, complete connections in circuits. • **LEDs work like regular bulbs:** Not understanding LEDs need correct polarity and lower power. • **Aesthetics don't matter:** Ignoring the importance of design and appearance for selling the decoration.	□ **Switch Mechanisms:** Knowing how switches control the flow of electricity to turn lights on and off. □ **Materials Selection:** Choosing materials that are safe, durable, and suitable for decoration and circuitry. □ **Design Process:** Planning the decoration's appearance and electrical components before building. □ **Safety:** Recognizing safe handling of electrical components and materials. □ **Aesthetic Design:** Combining functionality with attractive design to appeal to buyers. □ **Testing and Troubleshooting:** Checking the circuit works reliably and fixing any faults. □ **Evaluation:** Reflecting on design effectiveness, ease of use, durability, and appearance.	includes a switch to control a light. • **Problem Solving:** Identifying and fixing issues with circuits (e.g. poor connections, faulty components). • **Product Purpose:** Designing with a clear user and function in mind (appeal for buyers at a fair). • **Aesthetic Design:** Combining creative and decorative elements with functional components to make an attractive product. • **Precision and Construction:** Accurately measuring, cutting, and assembling components to create a reliable and well-finished product. • **Prototyping and Iteration:** Testing ideas, refining designs, and improving the decoration through hands-on trials. • **Evaluation Skills:** Reflecting on performance (e.g. does the light work? is the product appealing?), and using feedback to suggest improvements. • **Safe Working:** Following safety rules when using tools, materials, and electrical components.	attract customers who like…" • "My decoration is different because it includes…" **Explaining Circuits** • "The circuit works when…" • "I added a switch so that…" **Evaluation** • "One problem I had was… I solved it by…" • "If I made this again, I would improve…" **Sales Pitch** • "This decoration is perfect for your tree because…" • "It's safe, reusable, and it lights up when you…" • "Buy this for someone special this Christmas!"	□ Cardboard, felt, or craft foam (for decoration base) □ Scissors and craft knives (with supervision) □ Tape and glue (PVA, hot glue) □ Markers, paint, glitter, and other decorating materials □ Rulers and pencils for measuring and marking □ Design templates or sketching sheets □ Evaluation sheets □ Safety goggles (for working with electrical components) □ Photos or examples of Christmas decorations for inspiration □ Oracy sentence stems for explaining design and sales pitch □ Price tags and simple budgeting sheets (for selling at fair)
□ Structure □ Strength □ Stability	**Can I design, make and evaluate a strong structure for Henry v111**		□ **Structural Strength:** Understanding how to build a structure that can hold heavy weight.	• **Bigger structures are always stronger:** Thinking that simply making something	• **Structural Strength:** Understanding how shapes like triangles and arches provide	□ **Structural Engineering:** Applying knowledge of strong shapes (e.g. triangles, arches) and frameworks to build stability. □ **Load Testing and Analysis:** Designing with weight-bearing in mind and testing how well the structure holds mass.	**Design Justification** • "I used triangles in my design because…"	• Cardboard, corrugated card, or foam board (for structure)

□ Load-bearing □ Support □ Balance □ Foundation □ Materials □ Prototype □ Design brief □ Evaluate □ Force □ Weight □ Reinforce □ Joint □ Frame □ Tension □ Compression □ Durability □ Assembly □ Safety	**that will withstand his weight?** Can I research and evaluate other chairs? Can I use my research to select appropriate materials suited to the period? Can I make prototypes and test materials needed for my seat to be strong? Can I create my final design explaining my choices for materials and components? Can I combine components to make a suitable throne? Can I critically evaluate my throne?		□ **Stability and Balance:** Designing to prevent tipping or collapsing. □ **Load-Bearing:** How forces like weight affect structures. □ **Materials:** Selecting strong and appropriate materials for building. □ **Reinforcement:** Techniques to make structures stronger (e.g., bracing, supports). □ **Design Process:** Planning, prototyping, and refining the structure. □ **Testing and Evaluation:** Checking if the structure can hold weight safely and making improvements. □ **Safety:** Ensuring the structure is safe to use and build.	bigger makes it stronger, without considering design. • **Any material can hold heavy weight:** Not realizing some materials are too weak or flexible to support heavy loads. • **More weight is better for stability:** Assuming adding weight improves stability rather than possibly causing collapse. • **Structures don't need a strong base:** Overlooking the importance of a solid foundation for strength. • **All joints hold equally:** Not understanding some types of joints or connections are stronger than others. • **Stronger means heavier:** Confusing strength with heaviness rather than smart design. • **Reinforcement isn't necessary:** Ignoring the need to add supports or braces to increase strength. • **Testing once is enough:** Thinking one test proves the structure is perfect, without making improvements.	strength and stability. • **Materials:** Knowing properties of different materials (wood, metal, plastic) and how they affect strength and durability. • **Load and Weight:** Recognizing how weight distribution and support affect a structure's ability to hold heavy loads. • **Joints and Fixings:** Learning about different ways to join materials securely (nails, screws, glue, brackets). • **Design Principles:** Applying ideas of balance, symmetry, and reinforcement to improve strength. • **Testing and Evaluation:** Assessing the structure's performance and identifying improvements. • **Historical Context:** Appreciating how structures were designed in Henry VIII's time and their purposes. • **Safety:** Understanding the importance of safe design and construction practices.	□ **Design Criteria:** Creating with a user (Henry VIII) and purpose in mind—strength, scale, and appearance. □ **Prototyping and Refinement:** Testing structural ideas, making changes, and improving designs through hands-on iteration. □ **Material Choice and Properties:** Selecting suitable materials based on strength, durability, and joinability. □ **Joining Techniques:** Using and refining appropriate methods (e.g. tabs, glue, supports, reinforcements) to increase strength. □ **Measurement and Accuracy:** Cutting and assembling parts precisely to ensure alignment and strength. □ **Critical Evaluation:** Reviewing success against strength, design intent, and user need—suggesting improvements. □ **Teamwork and Planning:** Collaborating effectively to complete a shared structural build.	• "My structure is inspired by Tudor architecture, especially…" **Making & Testing** • "When I added more weight, I noticed that…" • "One part of my structure collapsed because…" **Evaluation & Improvement** • "My structure was successful because it held…" • "To improve it, I would strengthen the…" • "Next time, I would choose a different material because…" **Creative Extension** • "If Henry VIII were here, he would like this because…" • "I think this design reflects his personality by…"	• Wooden sticks, lollipop sticks, or craft straws (for support and framework) • Tape (masking or duct tape) and glue (PVA or hot glue) • Scissors and craft knives (with supervision) • Ruler and measuring tape • Weights (books, small bags of sand, or water bottles for testing) • Design and planning templates • Evaluation sheets • Photos or illustrations of Tudor architecture and furniture • Oracy sentence stems for explaining design choices and evaluation • Markers or pens for decorating or labelling
• Animation • Program • Code • Sequence • Loop • Sprite • Background • Algorithm • Command • Debug • Motion • Event • Habitat • Interactive • Timing • Frame • Script • Variable • Repeat • Condition	**Can I program an animation (animal moving in their habitat) for younger children?** Can I research and evaluate other moving animations? (Wallce and Gromit) Can I use digital equipment to explore creating animations? Can I design a short animation sequence? Can I use digital equipment and software to make my animation? Can I view and edit my animation from feedback given? Can I evaluate my animation linked back to the design brief?		• **Animation:** Creating moving images or sequences. • **Programming:** Writing code to control the animation. • **Sequence:** Ordering commands so actions happen correctly. • **Looping:** Repeating parts of the animation smoothly. • **Sprites:** Characters or objects in the animation. • **Backgrounds:** Setting the	• **Animations happen automatically:** Thinking animations just appear without needing code or commands. • **One command moves the whole animation:** Believing a single instruction can make the entire animal move smoothly. • **Looping is confusing or unnecessary:** Not understanding loops help repeat movements efficiently. • **Backgrounds don't affect animation:** Overlooking that backgrounds set the scene and affect how the animation feels. • **Sprites can't interact:** Thinking characters (sprites) can't respond to each other or to events.	• **Animation Basics:** Understanding frames, sprites, and how movement is created on screen. • **Programming Concepts:** Using sequencing, loops, and events to control animation. • **Sprites and Backgrounds:** Knowing how to add and control characters (sprites) and set scenes (backgrounds). • **Movement Commands:** Learning how to move sprites smoothly and change directions. • **Timing and Speed:** Controlling how fast or slow animations play using delays or timers.	**Design & Technology (DT):** • Designing purposeful, functional digital content. • Understanding and using computing to support design processes. • Planning and evaluating a product (the animation). **Computing:** • Programming sequences (e.g. loops, events). • Using block-based languages like Scratch or Python (with support). • Debugging and refining code. **Science:** • Knowledge of animal	**Explaining the Design** • "I chose this animal because it lives in…" • "My background shows its habitat, which includes…" **Explaining the Code** • "When the green flag is clicked, my animal…" • "I used a loop to make it keep moving because…" **Evaluating the Animation** • "Younger children will enjoy this because…" • "If I made it again, I would improve the…" • "It teaches younger children about the habitat by showing…" **Feedback and Reflection** • "Something that worked really well in my animation was…" • "One challenge I had was…, but I solved it by…" **Presenting to an Audience** • "Welcome to my animation — today you'll meet a…" • "Watch closely as the animal moves	□ Computers or tablets with Scratch or another block-based coding software □ Scratch account or offline editor installed □ Headphones (optional, for audio) □ Storyboard templates for planning animation □ Images or sprites of animals and habitats (can be drawn or sourced online) □ Background templates (forests, oceans, deserts, etc.) □ Scratch tutorials or guides for motion and animation blocks □ Design and coding planning sheets □ Evaluation sheets □ Oracy sentence stems for explaining design and code □ Projector or screen for sharing final animations with younger children

			scene or habitat. • **Events:** Actions that trigger changes (e.g., starting animation). • **Variables:** Storing data to control aspects like speed or position. • **Debugging:** Finding and fixing errors in the code. • **User Interaction:** Making animations interactive for younger children.	• **Debugging means failure:** Seeing errors as something bad instead of a chance to fix and improve code. • **Animations are only visuals:** Not realizing programming can include sounds or interactivity. • **You can't control timing:** Assuming animation speed can't be changed or controlled precisely.	• **Interactivity:** Programming responses to user inputs or environmental changes. • **Debugging:** Identifying and fixing errors in code to ensure smooth animations. • **Audience Awareness:** Designing animations that are engaging and understandable for younger children.	habitats, adaptation, life cycles. **Art/Design:** • Creating simple visuals or backgrounds for the habitat.	through its habitat and…"	