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|  | **Textiles:** Fastenings (Y4)  | **Digital world:** Monitoring Devices (Y5)  |
| **Design** | * Writing design criteria for a product, articulating decisions made.
* Designing a personalised book sleeve.
 | * Researching (books, internet) for a particular (user’s) animal’s needs.
* Developing design criteria based on research.
* Generating multiple housing ideas using building bricks.
* Understanding what a virtual model is and the pros and cons of traditional and CAD modelling.
* Placing and manoeuvring 3D objects, using CAD.
* Changing the properties of, or combining one or more 3D objects, using CAD.
 |
| **Make** | * Making and testing a paper template with accuracy and in keeping with the design criteria.
* Measuring, marking and cutting fabric using a paper template.
* Selecting a stitch style to join fabric.
* Working neatly by sewing small, straight stitches.
* Incorporating a fastening to a design.
 | * Understanding the functional and aesthetic properties of plastics.
* Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a speciﬁed range.
 |
| **Evaluate** | * Testing and evaluating an end product against the original design criteria.
* Deciding how many of the criteria should be met for the product to be considered successful.
* Suggesting modiﬁcations for improvement.
* Articulating the advantages and disadvantages of different fastening types.
 | * Stating an event or fact from the last 100 years of plastic history.
* Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices.
* Explaining key functions in my program (audible alert, visuals).
* Explaining how my product would be useful for an animal carer including programmed features.
 |
| **Technical** | * To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro.
* To know that different fastening types are useful for different purposes.
* To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions.
 | * To know that a ‘device’ means equipment created for a certain purpose or job and that monitoring devices observe and record.
* To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose.
* To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met.
 |
| **Additional** |  | * To understand key developments in thermometer history.
* To know events or facts that took place over the last 100 years in the history of plastic, and how this is changing our outlook on the future.
* To know the 6Rs of sustainability.
* To understand what a virtual model is and the pros and cons of traditional vs CAD modelling.
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|  | **Electrical systems:** Doodlers (Y5)  | **Food:** What Could be healthier (Y5)  |
| **Design** | * Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.
* Developing design criteria based on ﬁndings from investigating existing products.
* Developing design criteria that clariﬁes the target user.
 | * Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.
* Writing an amended method for a recipe to incorporate the relevant changes to ingredients.
* Designing appealing packaging to reﬂect a recipe.
 |
| **Make** | * Altering a product’s form and function by tinkering with its conﬁguration.
* Making a functional series circuit, incorporating a motor.
* Constructing a product with consideration for the design criteria.
* Breaking down the construction process into steps so that others can make the product.
 | * Cutting and preparing vegetables safely.
* Using equipment safely, including knives, hot pans and hobs.
* Knowing how to avoid cross-contamination.
* Following a step by step method carefully to make a recipe.
 |
| **Evaluate** | * Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.
* Determining which parts of a product affect its function and which parts affect its form.
* Analysing whether changes in conﬁguration positively or negatively affect an existing product.
* Peer evaluating a set of instructions to build a product.
 | * Identifying the nutritional differences between different products and recipes.
* Identifying and describing healthy beneﬁts of food groups.
 |
| **Technical** | * To know that series circuits only have one direction for the electricity to ﬂow.
* To know when there is a break in a series circuit, all components turn off.
* To know that an electric motor converts electrical energy into rotational movement, causing the motor’s axle to spin.
* To know a motorised product is one which uses a motor to function.
 | * To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.
* To know that I can adapt a recipe to make it healthier by substituting ingredients.
* To know that I can use a nutritional calculator to see how healthy a food option is.
* To understand that ‘cross-contamination’ means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.
 |
| **Additional** | * To know that product analysis is critiquing the strengths and weaknesses of a product.
* To know that ‘conﬁguration’ means how the parts of a product are arranged.
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|  | **Structures:** Bridges (Y5)  | **Mechanical Systems:** Making a Pop-up Book (Y5)  |
| **Design** | * Designing a stable structure that is able to support weight.
* Creating a frame structure with a focus on triangulation.
 | * Designing a pop-up book which uses a mixture of structures and mechanisms.
* Naming each mechanism, input and output accurately.
* Storyboarding ideas for a book.
 |
| **Make** | * Making a range of different shaped beam bridges.
* Using triangles to create truss bridges that span a given distance and support a load.
* Building a wooden bridge structure.
* Independently measuring and marking wood accurately.
* Selecting appropriate tools and equipment for particular tasks.
* Using the correct techniques to saws safely.
* Identifying where a structure needs reinforcement and using card corners for support.
* Explaining why selecting appropriating materials is an important part of the design process.
* Understanding basic wood functional properties.
 | * Following a design brief to make a pop up book, neatly and with focus on accuracy.
* Making mechanisms and/or structures using sliders, pivots and folds to produce movement.
* Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.
 |
| **Evaluate** | * Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary.
* Suggesting points for improvements for own bridges and those designed by others.
 | * Evaluating the work of others and receiving feedback on own work.
* Suggesting points for improvement.
 |
| **Technical** | * To understand some different ways to reinforce structures.
* To understand how triangles can be used to reinforce bridges.
* To know that properties are words that describe the form and function of materials.
* To understand why material selection is important based on properties.
* To understand the material (functional and aesthetic) properties of wood.
 | * To know that mechanisms control movement.
* To understand that mechanisms can be used to change one kind of motion into another.
* To understand how to use sliders, pivots and folds to create paper-based mechanisms.
 |
| **Additional** | * To understand the difference between arch, beam, truss and suspension bridges.
* To understand how to carry and use a saw safely.
 | * To know that a design brief is a description of what I am going to design and make.
* To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.
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