

Design and Technology SUBSTANTIVE knowledge progression overview

Substantive knowledge is the collection of established facts within a subject. It's the content that students need to know and provides the foundational knowledge needed to understand the world. At Hollybrook we have arranged our DT knowledge under main topics; structures, mechanisms, food, textiles and electrical systems.

At Hollybrook our children will know the following:

DT Topics	EYFS	KS1	Lower KS2 (Y3 and 4)	Upper KS2 (Y5 and 6)
Structures	• To begin to know that the size and weight of something can help a structure be stable	**Year 1 -** Windmills • The shape of materials can be changed to improve the strength and stiffness of structures. • Cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses) • Windmills have 3 main parts; the turbine, axle and structure. • Axles are used in structures and mechanisms to make parts turn in a circle. • Different structures are used for different purposes. • A structure is something that has been made and put together. • Windmill turbines use wind to turn and make the machines inside work. • A windmill is a structure with sails that are moved by the wind.	**Year 3** - Castles • To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To know that a façade is the front of a structure. • To understand that a castle needed to be strong and stable to withstand enemy attack. • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled.	**Year 5** – Bridges • Understand basic wood functional properties. • To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges • To understand the material (functional and aesthetic) properties of wood. • To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely. • How to measure, mark and check the accuracy of the jelutong and dowel pieces required. • To understand how to use a bench hook and saw safely. • To know that a set square can be used to help mark 90° angles.
Mechanisms /Mechanical systems		**Year 1 – Moving Pictures** • A mechanism is the parts of an object that move together. • A slider mechanism moves an object from side to side. • A slider mechanism has a slider, slots , guides and an object. • Bridges and guides are bits of card that purposefully restrict the movement of the slider.	**Year 4 – Circus Transport** • Air resistance is the level of drag on an object as it is forced through the air. • The shape of a moving object will affect how it moves due to air resistance. • The aesthetics means how an object or product looks in design and technology.	**Year 6 – Automata Toys** • Drawing cross-sectional diagrams will show the inner-workings of my design. • Linkages change the direction of a force. • There are ways things move at the same time using different linkages. • To understand that the mechanism in an automata uses a system of cams, axles and followers. • To understand that different shaped cams produce different outputs.

		Year 2 – Moving Monsters • Mechanisms are a collection of moving parts that work together as a machine to produce movement. • There is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers.		• To know that an automata is a hand powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product.
Food	• Fruit and vegetables are good for you • To begin to know where food comes from • To know the names of different fruit and vegetables that they eat	**Year 1 - Smoothies** • A fruit has seeds. • Fruits grow on trees or vines. • Vegetables can grow either above or below ground. **Year 2 – Healthy Wraps** • A balanced diet includes the five main food groups. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that 'ingredients' means the items in a mixture or recipe	**Year 3 – Pitta Pizzas** • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country. • To know that eating seasonal foods can have a positive impact on the environment. **Year 4 - Biscuits** • To know that the appearance of food is as important as taste. • To know that safety and hygiene are important when cooking. • To know the following cooking techniques: sieving, measuring, stirring, cutting out and shaping. • To understand the importance of budgeting while planning ingredients for biscuits.	**Year 5 - Bread** • Understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. • 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. • To know that coloured chopping boards can prevent cross-contamination. • To know that nutritional information is found on food packaging. **Year 6 - Crumble** • They have to work to a given timescale. • To know that 'flavour' is how a food or drink tastes. • To know that many countries have 'national dishes' which are recipes associated with that country. • To know that 'processed food' means food that has been put through multiple changes in a factory. • To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. • To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).

Textiles	• To know that materials are used to make clothing • To name parts that fasten – poppers, buttons and zips	**Year 2 -** Puppets • To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples. glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.	**Year 3** – Cushions • Applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. • When two edges of fabric have been joined together it is called a seam. • To know that it is important to leave space on the fabric for the seam. • Some products are turned inside out after sewing so the stitching is hidden.	**Year 5** - Fastenings • That a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. • The advantages and disadvantages of different fastening types. • That different fastening types are useful for different purposes. •
Electrical Systems			**Year 4** – Lights • An electrical circuit must be complete for electricity to flow. • A switch can be used to complete and break an electrical circuit. • There are key features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • Sir Joseph Swan and Thomas Edison were scientists involved in the invention of the electric light bulb(s)	**Year 6** – Steady Hand Game • To know that batteries contain acid, which can be dangerous if they leak. • To know the names of the components in a basic series circuit, including a buzzer. • You can incorporate a circuit into a base.