Highcliffe St Mark Primary School

Design and Technology Curriculum Overview

Through our teaching of Design and Technology, we want to inspire children to use their imagination and subject knowledge to solve real life, practical problems with the ultimate belief that they can contribute to (and change) the world in which we live. We want to prepare our children for a healthy lifestyle with an understanding of where their food comes from and what their body needs.

Topic Knowledge

EYFS curriculum

To know how to safely use and transport scissors. To understand how to use glue and tape to join pieces of paper and card together. To understand that bricks can be joined together.

KS1 National Curriculum—Programme of Study

Year 1: To know that 'joining technique' means connecting two pieces of material together. To understand that different techniques for joining materials can be used for different purposes. To know that a wheel needs an axle in order to move. To understand that cylinders are a strong type of structure. To know that design criteria is a list of points to ensure the product meets the clients needs and wants. To learn the growing processes of fruit and vegetables.

Year 2: To know that sewing is a method of joining fabric and the importance of tying a knot after the final stitch. To know that mechanisms are a collection of moving parts that work together. 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 understand what makes a balanced diet and the five main food groups.

KS2 National Curriculum—Programme of Study

Year 3: To know the terms 'applique' and 'seam'. To know that pneumatic systems can be used as part of a mechanism. To understand that wide and flat based objects are more stable. To know that climate affects food growth. To understand the terms 'imported' and 'exported'. To understand the nutritional benefits of fruit and vegetables.

Year 4: 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 air resistance is the level of drag on an object as it is forced through the air. To know that aesthetics are how a product looks. **To know the** terminology 'vitamins, minerals and fibre.'

Year 5: To know that blanket stitch is useful to reinforce the edges of a fabric or join to pieces of fabric. To know that mechanisms control movement. To understand some different ways to reinforce structures. To understand where meat comes from.

Year 6: To understand that it is important to design clothing with the target customer in mind. To understand that the mechanism in an automata uses a system of cams, axles and followers. To know that structures can be strengthened by manipulating materials and shapes. To know that many countries have national dishes.

Skills Progression

EYFS

To explore the tools and materials in the junk modelling area. To talk about their model. To name any materials. To identify problems and suggest how to solve them.

Develop Scissor skills. Make snips/cuts in paper. Cut different materials.

Select materials to make a model. Plan and create a junk model. To identify problems and suggest how to solve them. To share a finished model with a group/adult and talk about the processes in its creation.

Explore ways to temporarily join materials together. Identify some familiar ways to join materials and use these as part of child led play.

KS1

Year 1: Cut fabric neatly with scissors. Use joining methods (textiles). Adapt mechanisms. Create moving models using levers and sliders. Test and evaluate a finished product (mechanisms). Make stable structures from card, tape and glue. Learn how to turn 2D nets into 3D structures (structures). Chopping fruit and vegetables safely to make a smoothie (cooking and nutrition).

Year 2: Thread a needle and sewing a running stitch (textiles). Make linkages using card for levers and split pins for pivots. Follow a design brief. Test and adapt a design (mechanisms). Create joints and structures from paper, card and tape. Evaluate the strength and stability of their own structure (structures). To grate food to make a wrap (cooking and nutrition).

KS2

Year 3: Thread needles with greater independence and use cross stitch to sew. (textiles).Create a pneumatic system to create a desired motion. Develop design criteria from a design brief. Use the views of others to improve designs (mechanisms). Constructing a range of 3D geometric shapes using nets. Evaluate their work based on the aesthetic of the finished product and in comparison to the original design (structures). To learn about seasonal foods and create a seasonal food tart (cooking and nutrition).

Year 4: Select a stitch style to join fabric and incorporate fastening to a design (textiles).Design a shape that reduces air resistance. Making a model based on their chosen design (mechanisms).Create a range of different shaped frame structures, reinforcing corners to strengthen the structure. Evaluate structures made by the class—describing what characteristics make it the most effective (structures) . To adapt a recipe for a target audience.

Year 5: Using applique to attach pieces of fabric decoration.To apply blanket stich so the spaces are even and regular (textiles). To make a mechanism using sliders, pivots and folds to produce movement (mechanisms). Make a range of different shaped beam bridges.(structures) To adapt a recipe to improve nutritional content.

Year 6: To use a template when pinning panels onto fabric.To decorate a waistcoat using applique and securing it with a fastening. Make small neat stitches. (textiles). To experiment with a range of cams, creating a design for an automata toy based on a choic of cam to create a desired movement. (mechanisms).Build a range of play apparatus drawing upon new and prior knowledge of structures (structures). To develop their own recipes and menus.

The Curriculum Sequence

EYFS

Make choices about form and function when creating and talk about it.

Use and choose from a range of media: Sculpture

Notice when ideas don't work and adapt the process.

Plan, do & review approach to creating.
Use and choose from a range of tools:

KS1

Year 1: Structures - To understand that cylinders are a strong type of structure. Mechanisms/ mechanical systems - To know that wheels must be attached to a rotating axle. Cooking/ nutrition - To understand the difference between fruits and vegetables. Textiles - To know that 'joining technique' means connecting two pieces of material together.

Year 2: Structures,- To know that structures with wide, flat bases are the most stable. Mechanisms/ mechanical systems - To know that mechanisms are a collection of moving parts. Cooking/nutrition - To know what makes a balanced diet. Textiles - To know that sewing is a method of joining fabric.

KS2

Year 3: Structures - To understand the importance of strength and stiffness in structures. Mechanisms/ mechanical systems - To understand how pneumatic systems work. Cooking/nutrition - To know that climate affects food growth. Textiles - To know that when two edges of fabric have been joined together it is called a seam.

Year 4: Structures - To know what a frame structure is. Mechanisms/mechanical systems - To understand that all moving things have kinetic energy. Cooking/nutrition - To know that the amount of an ingredient in a recipe is known as the 'quantity'. Textiles– To know that a fastening is something that holds two pieces of material together. Electrical systems - To understand that electrical conductors are materials which electricity can pass through.

Year 5: Structures - To understand different ways to reinforce structures. Mechanisms/mechanical systems - To understand that mechanisms can be used to change one kind of motion into another. Cooking/nutrition - To know that I can adapt a recipe to make it healthier by substituting ingredients. Textiles -To understand that it is easier to finish simpler designs to a high standard.

Year 6: Structures - To know that structures can be strengthened by manipulating materials and shapes. Mechanisms/ mechanical systems - To understand that different shaped cams produce different outputs. Cooking/nutrition - To make their own menus and recipes. Textiles - To understand that it is important to design clothing with the client in mind. Electrical systems - To understand that 'fit for purpose' means that a product works how it should and is easy to use.

Central Substantive Concepts

Design: Children will be seen drawing templates of puppets and making prototypes, having the confidence to make changes if they need to.

Making: Children will use construction materials to make buildings. They will manipulate and combine textiles. They will select their materials according to their characteristics.

Evaluating: Children will set criteria for what a successful design and build should achieve and will evaluate existing products against these criteria. They will apply the same methodology to their own designs and builds. They will see this self-reflection as part of the design and manufacture process and will have the resilience to be critical of their work, whilst being a critical friend to others.

Technical Knowledge: Technical knowledge will be built on year after year.

Children will also be seen in our school kitchen donning aprons, getting messy and preparing healthy dishes with an understanding of where their food comes from.

Assessment

Lessons are formatively assessed by the teacher through observation, questioning and analysis of learning. There is a large emphasis on peer, self-assessment or whole class evaluation as this is part of the Design and Technology learning process. These observations will inform future lessons and successes will be celebrated. Assessments are also added to O Track.

SEND

Learning is differentiated by scaffolding and a flexible approach. Concepts can be pre-taught and fine motor skills practised. Success and failure are discussed and celebrated as part of the learning process. Each Kapow lesson has a section about how the lesson can be adapted for a child with SEND.

Links Across the Curriculum

History– look at designers in the past. Also to understand that products change over time.

Art– to use sketches and drawing to communicate design ideas.

Maths– to use shapes to reinforce structures. Also to budget for a recipe.

Subject Leader: Hayley Mitchell

Highcliffe St Mark Primary School

Experiencing Design and Technology

Subject Enhancements

How do children experience D and T in different contexts e.g. real life, trips, visits, their immediate environment

EYFS

The children have opportunities to take part in external D and T competitions. Children have access to Playdoh and junk modelling materials. These can be used on a daily basis. Children have access to Lego and building equipment at playtimes in the quiet area.

KS1

The children have opportunities to take part in external D and T competitions. In their immediate environment are displays celebrating their learning. Children have access to Lego and building equipment at playtimes in the quiet area.

KS2

The children have opportunities to take part in external D and T competitions. In their immediate environment are displays celebrating their learning. Children have access to Lego and building equipment during 'our time' and wet playtimes.

Resources and Texts

What are the key resources that the children will encounter and explore throughout their time in our school?

EYFS

Lego, Duplo, marble run, Magnetic Polydron, Octons, wooden 3D blocks, Interstellar rings, Mobilo, tyres, bricks, planks, crates, Knex.

KS1

Holed MDF wheels, wood dowel, sewing needles, fabric, blender, split pins.

Wallace and Gromit inventions. Real world application.

KS2

Holed MDF wheels, wood dowel, sewing needles, fabric, crocodile wires, lamps, LEDs, buzzers, wood square rod, IPad.

Wood file, Tenon saw, Coping saw, Coping saw blades, Try square, Bench Hook, Sandpaper, cutting mat, wire cutter, pliers, hand drill, compact drill, drill bits 3 and 4 mm.

Book "Until I Met Dudley" How Everyday Things Really Work."

Key Vocabulary

EYFS

Join, stick, cut, bend, slot, smooth, bendy, bumpy, measure, bigger, shorter, longer, taller, thinner, lift, fix, temporary, permanent, push, pull, break, separate.

KS1—Design, make and evaluate

Healthy, claw grip, diet, nutrients, carbohydrates, protein, dairy, blender, template, joining technique, slider, thimble, mechanism, axle, chassis, output, input, lever, turbine, structure, strong, stiff, natural, man-made, joints, running stitch.

KS2—Design, make and evaluate

Recipe, imported, exported, nutrition, vitamins, minerals, fibre, hygiene, quantity, sieving, creaming, cross-contamination, flavour, processed food, insecticides, nets,recycled, aesthetic, reinforce, frame structure, pavilions, cladding, function, target audience, architect. Beam bridges, truss bridges, arch bridges, properties, material, effective, ineffective, footprint plan, prototype, pneumatic system, thumbnail sketch, exploded diagrams, motion, aesthetic, cutting, creasing, folding, weaving, compressing air, air resistance, kinetic energy, template, birds eye view, graphics, sliders, pivots, cam, axle, cross sectional, dowel, set square, bench hook, saw, cross stitch, applique, seam, fastening, blanket stitch, taut, running stitch, client, Micro:bit, computer aided design (CAD), thermometer, sustainability, annotated sketch, multifunctional, electric poster, component, electrical system, battery holder, crocodile wire, electrical conductors, electrical insulators, switch, mood board, copper, symbols, cell, mass production, bespoke, 'fit for purpose', acid, buzzer, form.