Khalsa VA Primary School

Design and Technology Curriculum KS1 & KS2

About this document

This progression of skills demonstrates how we meet the requirements of the National Curriculum across our school. It shows how we cover all of the statutory requirements within our own curriculum and how it is tailored and specific to the needs and interests of our children.

In this document, enrichment activities such as trips, visits, local walks and engaging practical activities are highlighted in yellow. Key skills and learning objectives are in **bold.** Finally, key vertical (across year groups), horizontal (across subjects within a year group) and diagonal (across year groups and subjects) links are highlighted in green.

Key Aims of the National Curriculum

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

KS1 Key Skills:

Pupils should be taught

Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

Technical knowledge

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Cooking and Nutrition

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

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Topic	Y1 Learning Journey
Old fashioned toys	Design: Children will explore a range of different toys from the past in their history lessons, considering how they work and what they do. They will **design a purposeful and appealing toy** from the past, with a moving part included e.g. cup and ball. Make: Children will select from a range of different materials and discuss the best materials to use for their project. Children will use their **cutting, joining and finishing skills** to create a toy from the past. Evaluate: Children will be able to **evaluate their finished project** against a design criterion.
Fruit kebabs	Design: Reflecting on their work on healthy eating in PSHE, children will **look at a range of healthy snacks and discuss** what about them makes them healthy and what the common features are e.g. low sugar. Children will taste and rate a range of fruit and **design a fruit kebab**. Make: Following hygiene and food safety procedures, children will **cut and prepare fruit** for their kebab. Then using a skewer and following their design, they will assemble their kebab. Evaluate: Finally, children **will compare their finished product** to their design and eat them, discussing what they liked and what they might change next time.
Boats for Penguin	Design: After reading lost and found in English lessons the children will discuss modes of transport for Penguin. They will investigate objects that sink and float, **choosing materials** that would make a good boat. Children will then **design a boat** which can carry a toy penguin across a water tray successfully. Make: Using their chosen materials and their design, children will experiment with **assembling a boat using a selection of materials e.g.** tape, glue or elastic bands. They will make their boat, **testing and redesigning** it if necessary and considering how it will be propelled (e.g. with a sail). Evaluate: Children will **test their boats** to see if they can take the penguin across the water and draw conclusions about which materials work best. They will reflect on their own design and **suggest improvements**.
Topic	**Year 2 Learning Journey**
Tudor Houses	Design: Following on from their work on the Great Fire of London and houses in Stuart London, children will look at a range of Tudor/Stuart houses around the UK. They will walk to Southall Manor House and the Plough to see real buildings from that era, sketching and **comparing them, observing common features**. Back in school, children will then **design their own, 2-storey house** in a Tudor style. Make: Children will use their technical knowledge of cutting, fixing and reinforcing where necessary to **create a strong and stable structure.** They will select from a rage of materials to create the building and its roof and use materials to fix it all together. Finally, they will consider the aesthetic of their house, **decorating the exterior** as they see fit. Evaluate: Children will **compare their finished product** to their design, test its stability and judge its looks. The houses will then be assembled and burnt down like in the Fire!
Spring Rolls	Design: Based on children's knowledge of China from English and Geography, children will **research different festive foods** during Chinese celebrations as well as **tasting them**. They will then **create a list of ingredients** which

	they will be using to prepare and make their own spring rolls. Make: Starting by **observing food safety procedures**, children will follow instructions to create their spring roll. They will **cut and prepare** the vegetables using the necessary tools and assemble their rolls which will be cooked by an adult. Evaluate: Children will **taste and evaluate** their rolls; discussing what they like and what could be improved in the future.
Bunting	Design: Children will look at, touch and feel a range of fabrics and materials. They will discuss what they think they are **made of and what they might be used for**, using their knowledge of materials in science. They will **explore the history** of fabrics, the production process for natural and man-made fabrics and some important artists and designers who work with fabrics. Children will be given the task of designing a range of flags for a class string of bunting. They will **design their flags with labelled diagrams**, considering base textiles, additional fabrics, shapes and colours. Make: Over the course of the week, children will **experiment with different joining techniques**; stabling, gluing and sewing (running and back stitch). They will **select from a range of materials** and tools to cut, shape and fix materials to realise their designs. Evaluate: Joining all of their flags together to make bunting for the classroom, children will **evaluate the effectiveness** of their products as decorations, suggesting changes if necessary.

KS2 Key Skills:
Pupils should be taught

Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

Cooking and Nutrition

- understand and apply the principles of a healthy and varied diet
- prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
- understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

Topic	Year 3 Learning Journey
Magnet Games	Design: Children will **look at and experience a variety of games** that involve magnets (fishing, football racing), discussing what they like and how they think they work. Children will design a game that involves magnets for one or more players, **creating annotated sketches** that explain the game and target audience. Make: **Selecting from a range of materials**, children will assemble their game. They will constantly test and redesign if necessary e.g. if the material is too thick for the magnets. They will **consider too the durability and stability** of the game as well as the aesthetics. Evaluate: Children will present and explain their game to their target audience e.g. younger pupils, judging whether they have been successful in creating an effective game. They will **evaluate their product** and make suggestions to

	improve it.
Making Paper	Design: Using their knowledge of papyrus and ancient technology, children **will investigate the history of paper and the materials used**. They will research how paper is made and recycled currently. Children will be given the task of creating their own paper using a range of materials (e.g. recycling old paper) for different purposes. They will choose **what they would like their paper to be for** and therefore what properties it should have. Make: Selecting from a range of materials and using specific tools, children will **follow instructions for how to make paper.** Once they have tried to make paper following instructions, they will be allowed to **experiment with different materials, colours and decorations** e.g. flowers. Evaluate: Children will review the paper they have made, asking and commenting on **whether it is fit for purpose** and how it could be improved.
Stories with Moving Parts	Design: The class will look at a range or pop up books or cards with push/pull tabs for moving images, considering how they might work, the control mechanism and the effect that it has. Children will **investigate the mechanics** and vocabulary of levers, slides and pivots, considering which of these are in use in various moving pictures. Children will then design and plan, **using a labelled diagram**, a moving picture of their own. Make: Experimenting with a range of systems at first, children will **investigate** how a slider, for example, works in action, revisiting their design if necessary. Children will then **select from tools to create** a card and paper moving image, ensuring that the mechanism works well and that the end result look good. Evaluate: Children will demonstrate their moving pictures and allow others to test them. They will **evaluate their final product** and suggest improvements where necessary.
Topic	**Year 4 Learning Journey**
Bread	Design: Children will taste and discuss a range of different breads from around the world, discussing the ingredients, process for making (from seed to table) and their preferences. Considering their work on healthy eating, they will discuss the **benefits and potential** negatives of eating bread and look into the **history of bread** and its importance in cultures worldwide. Make: Throughout the week, children will **prepare, make and taste a range of breads** e.g. roti, bread rolls and savoury breads. Evaluate: Children will **taste and evaluate the breads**, discussing their likes and ways they could be improved.
Iron Man Shadow Puppets	Design: Children will begin by **investigating a variety of shadow puppet shows** from various cultures (e.g. Vietnamese shadow puppets) and linking their understanding of how they work to their work on light in science. They will use some real life examples of puppets, observing closely the mechanisms (e.g. levers). They will work in small groups to **design, using a labelled diagram,** a group of shadow puppets featuring characters and/or objects from The Iron Man featuring one or more moving parts. Make: Children will experiment with their moving parts, **redrafting and redesigning** their puppets if necessary. They will select from a **range of tools and materials to construct** their puppets, considering moving parts and controls.

	Evaluate: In their groups children will perform a scene from the Iron Man, using their puppets and a light stage. The audience will judge how effective their puppets are in representing the characters and how well the moving parts work as shadow puppets. Children will **evaluate their puppets** and suggest improvements.
Decorations	Design: Children will look at a range of fabric Christmas decorations, discussing the shape, materials and extra additions involved in an **effective decoration**. They will **design and produce** a labelled diagram for a Christmas decoration of their own, including the materials and tools they will need. Make: Recapping their work on stitching in Y2, children will **practice a running and back stitch, trying cross-stitching** if they feel confident. They will **select from a range of materials** and tools to cut shapes for their decorations, join, fill and decorate. Evaluate: Children will hang their decorations on a class tree and **evaluate their finished product**, comparing it with their design and suggesting improvements if necessary.
Topic	**Year 5 Learning Journey**
Viking Long ships	Design: Linked to their work on Vikings and their previous work on floating in Year 1, children will be given the task of creating a watertight and buoyant long ship to hold a crew of Lego men. The class will **research the design** of long ships and other kinds of boats, recognising the name and function of key features e.g. keel, sail, and prow. Children will design a boat using a **labelled and annotated diagram,** Make: **Choosing from a range of materials and tools,** including wood, saws and glue guns children will create a boat that meets the design criteria, including a sail. Children will revise and redesign their design where necessary. Children will also decorate and consider the aesthetic of a Viking ship e.g. with a dragon prow. Evaluate: Children will place their boats in a water tray **to test their designs** against the criteria. They will **evaluate** and suggest improvements as necessary.
Moving bridges	Design: Children will **investigate the life and work** of Victorian engineers like Brunel and will visit Three Bridges and Hanwell Lock to see some real life examples. Given the task of creating a moving bridge, children will **research moving bridges** around the world and the mechanisms involved in them (Tower Bridge, Horn Bridge, Gateshead Millennium Bridge, Falkirk Wheel for example). The class will **experiment with pulleys and gears**, investigating how they can be used to move much larger objects. Finally they will work in small groups to design a model of a bridge with a functional moving part, creating an **exploded diagram.** Make: Children will select from a range of tools and materials to **cut and join the parts** for their bridge. They will ensure that the bridge is stable, **strengthening and stiffening where necessary**. They will make sure they have included a moving part which includes a pulley or gear system and that it works as intended. Evaluate: The groups will demonstrate their bridge and the moving part, explaining what problem it might solve e.g. a toad and rail intersection. They will **evaluate their final product** and suggest improvements where necessary.
Pizza	Design: Children will **research and discuss the origins,** history and variety of pizza, discussing what they like and dislike and relating that to what they know about healthy eating. They will investigate the ingredients in pizza and

	discuss why takeaway pizza is not as healthy. Make: Following instructions, children will **assemble, weigh, mix and prepare** the ingredients for dough, following food safety rules. They will discuss the scientific processes which enact change upon the dough and cause it to rise. Once the dough is risen, they will shape and top the pizza, **cooking it** under adult supervision. Evaluate: Children will taste their pizza and **evaluate their final product** against their original design, suggesting changes where necessary.
Topic	**Year 6 Learning Journey**
Biscuits and packaging	Design: Using a range of products, children will **conduct their own market research** to find out what consumers like and why, formulating ideas for what their biscuit will be. In groups, children will decide on which style and flavour of biscuit they prefer and will **investigate the history** of some of the leading brands e.g. McVities. They will **produce a design and marketing pitch** for a biscuit and packaging with a unique selling point e.g. sugar free, shape etc. Make: Using a range of tools, children will **experiment with preparing and shaping their** biscuits and creating a card package to hold their biscuits, **using folding, cutting and fixing** where necessary. Once happy with their testing, children will create a final product – some biscuits and packaging. Evaluate: Tasting and comparing their biscuits with some of the biscuits that they originally investigated, children will say **what has worked well and what could be improved.**
Automaton	Design: Beginning by looking at range of automatons, both real and on video, children will discuss what they like and how they think they work. They will **investigate the role of cams and axles** in automata, investigating how axle placement and shape of cap affect the movement of an automation. Children will then **design, using an exploded diagram**, an automaton with one or move moving parts and using one or more. Make: Selecting from a range of tools, children will **create a prototype** automaton from cardboard and wood. When they are satisfied with their design, they will **cut, shape and join** a wooden housing for their automaton and dill holes safely in pre-cut cams to assemble a final design. Evaluate: As part of a class exhibition, children will demonstrate their automaton and allow others to try them. They will **evaluate their product**, suggesting improvements if necessary.
Burglar Alarms	Design: Revisiting their knowledge of electrical circuits, children will be given a design brief for an alarm system to stop burglars. They will investigate real systems for homes and businesses and the kinds of triggers and alarms that can be raised. Children will **create a cross sectional sketch**, with circuits diagrams, for a system or part of a system (e.g. a window alarm) that they will create a model for. Make: In groups, children will **create functioning electrical circuits** with visual or audio alarms and a clear method of triggering the alarms. They will then select from a range of tools and materials to **create a working model** of their system e.g. a window frame or door way. Evaluate: Children will **demonstrate the effectiveness of their design and evaluate it**, suggesting improvements where necessary.