Design Technology at St. Andrew's Junior School

Contents

Design Technology at St Andrews

1. Timetable:

The Design Technology curriculum at St Andrews is made up of practical, theoretical and disciplinary tasks divided into three topics, one per half term. Design Technology is taught for three half terms across the school year. For Years 3, 4 & 5 it is taught for a full week (DT week) and it is taught weekly in Year 6. It is evident that a DT week allows for a more consistent approach and has proved to achieve more in-depth learning. (During the remaining three half terms, we teach Art & Design.)

2. Content of Design Technology lessons:

Design Technology at St Andrews is divided into three topics, one per half term. Textiles, Cooking and Healthy Eating, and in the final term a topic linked with Science (pneumatics, electronics, cams and levers, an electric motor).

The work completed is recorded in DT books in order to show a progression of skills. Students complete a process of Design, Make and Evaluate using pro-forma design sheets in order to show consistency across the school. Most topics start with students looking at products that are already available in order to create a design criteria that will be used to evaluate against. They are encouraged to write a set of instructions and to develop their design through annotated design drawings. During the learning journey, we focus on teaching a key skill and then give an opportunity to develop that skill. Often there is a chance for more able students to develop their own ideas and pursue the skill in their own way. Finished work will be photographed as a record.

Students are introduced to the work of makers, engineers, designers and chefs in order to give inspiration and show examples of careers and products in the real world.

Marking:

Verbal feedback should be given throughout the lesson. Children are to be given advice on how to improve so that they can act upon it immediately. Wherever possible, examples will be shown to give students ideas and inspiration.

Students will be expected to self-evaluate and peer assess throughout the topics.

Teachers will make a comment in the DT books at the end of the topic.

Assessment:

Each child will be assessed using the progression of skills document for the relevant year group. This sheet will be glued into the front of each sketchbook. Learning intentions should be taken from this document. We have high expectations for all and strive for children to achieve a deeper understanding through questioning and the skills to experiment.

Assessment data will be added to Target Tracker termly.

Suggested websites:

The Design Technology Association https://www.data.org.uk/for-education/primary/

STEM Learning https://www.stem.org.uk/resources/curated-collections/primary-0

BBC Bitesize https://www.bbc.co.uk/bitesize/subjects/zyr9wmn

Twinkl https://www.twinkl.co.uk/resources/keystage2-ks2/ks2-subjects/ks2-design-and-technology

Cracking Ideas https://crackingideas.com/teachingresources_hub

Crafts Council https://www.craftscouncil.org.uk/articles/

Cooking and Healthy Eating

School Food Matters https://www.schoolfoodmatters.org/why-school-food-matters/why-cooking-schools

Warburtons https://www.warburtons.co.uk/#

The Soil Association https://www.soilassociation.org/

Jamie Oliver https://www.jamieoliver.com/

NHS - The Eatwell Guide https://www.nhs.uk/live-well/eat-well/the-eatwell-guide/

BHF - The Eatwell Guide https://www.bhf.org.uk/informationsupport/support/healthy-living/healthy-eating/healthy-eating-toolkit/eatwell-plate

Quality of Education

Design and Technology is an inspiring, rigorous and practical subject. It encourages children to learn to think and intervene creatively and to solve problems both as individuals and as members of a team. At St Andrews, we encourage our children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values.

Through a spiral curriculum that focuses on three main areas: Textiles, Cooking and Nutrition, STEAM (Science, Technology, Engineering, Art and Maths) activities, children learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. STEAM activities align with the way we work and problem solve in our daily lives. Making it an exceptional way of instructing and learning. We teach skills in the way that they are used in the real world. Rarely does a job require only one skill set.

The teaching and implementation of Design Technology at St Andrews is a skills based curriculum designed to equip pupils with the knowledge and skills to experiment, invent and create their own products. It is a structured whole school approach to this creative subject derived from the National Curriculum and some topics which have been developed from the old QCA scheme of work. Lessons are planned following a structure of 'Design, Make and Evaluate'. Pro-forma worksheets are used across the school to ensure consistency of approach.

Our whole school curriculum provides pupils with opportunities to develop their skills in Design Technology using a variety of tools and materials. Specific skills are built upon each year and tracked through our progression of skills document. All pupils have the opportunity to explore and evaluate different creative ideas developing skills in topics such as, textiles, cooking and nutrition, growing vegetables and STEAM activities. Work is completed in DT books to show both a progression of skills and a learning journey.

In addition, we introduce all children to a wide range of designers, makers, chefs, architects and textile artists from different periods and cultures. Our children are introduced to classic and contemporary designers in order to understand and appreciate how their designs impact on daily life and the wider world. We ask children to consider how high-quality Design and Technology makes an essential contribution to the creativity, culture, wealth and well-being of the nation. It also gives them an insight into a variety of careers and jobs that could be available to them in the future.

Design Technology is taught as a discreet subject in an opposite term to Art & Design. The terms when it is covered can differ throughout the year groups. Design Technology is taught for three half terms and Art & Design for three half terms. Design and Technology lessons are taught as a block so that children's learning is focused throughout each unit of work. Progression grids are used in order to ensure knowledge, skills and vocabulary build year on year. This ensures that by the end of year 6, pupils have a wealth of skills to prepare them for secondary school.

Our Design Technology Curriculum is planned to demonstrate progression and to stimulate creativity. Children are clear about what the intended outcomes are and have a means to measure their own work against this, as a means of expression or to explore the styles of other artists that inspire our own work.

In Design Technology, children are reflective and evaluate their own and each other's work, thinking about how they can make changes to keep improving. This is meaningful and continuous throughout the process, with evidence of age-related verbal and written reflection.

The Design Technology lead checks the long term plans to ensure coverage of the National Curriculum content and the skills set out in our progression of skills document. Lessons are planned to allow all children to access the Design Technology curriculum. The document 'What Greater Depth Looks Like at St Andrew's' allows teachers to plan lessons that will challenge the most able. SEND pupils are supported through differentiated learning activities. This may include differentiating through outcome, support or through simplifying the learning objective. However, the main objective is for children to investigate, experiment and overall have fun with their creativity. The outcomes of pupils are monitored by the class teacher, subject lead and SLT through assessment and marking, tracking, book scrutiny and pupil interviews.

The impact of our Design Technology Curriculum is that it equips our children to be risk takers, evaluators and reflective and engaged learners with the ability to make the right choices that will have a positive life-long impact.

Cultural Capital

Cultural capital is the knowledge, skills, and experiences that provide advantages and help children get ahead in education and in life. It is about valuing the different culture, experiences, beliefs, interests, and language of each child in the classroom, understanding how all these different things link together, and providing a rich, varied curriculum that builds on existing experiences.

We intend to widen children's experiences and enable them to encounter places and cultures that they may not otherwise experience. This is especially true of disadvantaged pupils.

Design and technology gives young people the skills and abilities to engage positively with the designed and made world and to harness the benefits of technology.

In DT children learn life skills, sewing, cooking, engineering and electronics through a range of practical activities. The opportunity to cut, sew, dye, mould, join materials is something that many children are unable to access at home. All of our children can learn these practical life skills to enable them to become well-rounded members of society in preparation for later life.

Children are introduced to contemporary designers, makers, architects, jewellers and chefs and learn about their products. We feel it is important that children are aware of a variety of different careers that are available to them.

St Andrew's Policy for Design and Technology

Rationale

The National Curriculum for Design and Technology (2014) aims to ensure that all pupils:

- 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

Aims

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in a process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. When designing and making, pupils should be taught to:

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 programme, monitor and control their products

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

- 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

Approaches to the teaching of Design Technology

Design and Technology will be taught over three specific weeks throughout the year (DT Weeks) in Years 3, 4 and 5. Year 6 will be taught weekly. Children will be taught the relevant skills, how to design, make and evaluate through an activity. Children will be encouraged to research their activity using a wide range of media and technology, such as chrome books and the library. Ideas and designs will be shared through a collaborative process before children start to make. Each activity will be thoroughly evaluated and the children will be asked how they could improve their design. Teachers will allow for collaborative learning through peer support in mixed ability groups and matched to the needs of the children.

Cooking lessons will cover the basic foods, such as: bread, rice, pasta and potatoes. Children will be taught about healthy choices and a well-balanced plate, in addition to food hygiene, possible risks and health and safety. As part of the cooking lessons, we will teach the children where food comes from. In the future, this will be supported through the school garden. The children will be able to choose the foods that they grow, tend to the crop, pick and finally cook. Some classes will have the opportunity to visit a local supermarket in order to become familiar with the logistics of food supply and others may visit a community bakery.

Assessment and Evaluation

We will keep examples of children's work as a portfolio to show a progression in skills and the range of techniques taught.

The progression of skills document (whole school and individual year groups) will ensure progression and coverage of skills across the whole school. This will be reviewed each year.

An assessment sheet will be put in each child's DT book and work will be assessed to the objectives.

ART & DT - Long Term Overview

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
	ART	**DT**	**ART**	**DT**	**ART**	**DT**
Y3	Drawing Skills Pencils Artist: Vincent Van Gogh Revisit: Van Gogh from Y1	Textiles Make a Puppet Maker: Michael Curry Revisit: Textile techniques from Y2	Colour Theory & Painting Skills Artist: Jackson Pollock Revisit: Primary colours from KS1	Cooking & Healthy Living Chef: Jack Monroe (food on a budget) Revisit: What is a healthy meal? Fruit and Vegetables Making bread and biscuits Y1	Mark Making with Pastels & Charcoal Artist: Edvard Munch	Moving Toy with Pneumatics Designer: Ole Kirk Christiansen Revisit: Using construction kits from Y1
Y4	Drawing Skills Pens & Pencils Artist: Bridget Riley Revisit: Pencil grades from y3	Textiles Weaving Maker: Anni Albers	Colour Theory & Painting Skills Artist: J M W Turner Revisit: Primary and secondary colours from KS1 & Y3	Cooking & Healthy Living Chef: Tom Kerridge Revisit: The eat well plate	Digital & Computer Based Art Artist: Georges Seurat	Electronic Games Designer: John Spinello Revisit: Construction techniques from Y1 & Y3
Y5	Drawing Skills Pencils & Charcoal Artist: Alexander Cozens and Vincent Van Gogh Revisit:	Textiles Make Slippers Makers: Lynsey Walters & Ruth Waller Revisit: using felt in Y3	Colour Theory & Painting Skills Artist: Picasso Revisit: Primary, secondary and tertiary	Cooking & Healthy Living Chef: Jamie Oliver Revisit: How much sugar is in foods?	Print Making Artist: Jo Gorner	Moving Toy Cams & Levers Illustrators: W Heath Robinson, Roland Emett, Maker: Martin Smith Revisit:

	Vincent Van Gogh from Y3 Pencil grades from Y3 & Y4 Charcoal from Y3	The textile industry and the industrial revolution in Y4	colours from KS1, Y3 & Y4	Nutrients in foods		Construction techniques, fixing, joining and strengthening from Y2
Y6	Drawing Skills Pens, Pen & Ink and Carbon Paper Artist: Op Art Revisit: Bridget Riley from Y4 Pencil grades from Y3, Y4 & Y5 Types of pens from Y4	Textiles Soft Circuits Maker: Kathleen McDermott Revisit: Electrical circuits from Y4 Using felt in Y3 & Y5 Link with Electricity Y6 Science	Colour Theory & Painting Skills Artist: Paul Klee Revisit: Primary, secondary, tertiary colours and tones from KS1, Y3, Y4 & Y5	Cooking & Healthy Living Chef: Hugh Fearnley Whittingstall (River Cottage) Revisit: Where food comes from? Food miles.	Street Art & Graffiti Artist: Basquiat, Banksy	F1 Car To incorporate a motor Engineers: The top ten F1 engineers in history Revisit: Electrical circuits from y4 Moving Toys, cams and levers from Y5

<u>What does Greater Depth look like at St Andrews?</u>

In this document, there is a selection of criteria presented that staff need to aim to provide for children during Design Technology lessons. This will assist pupils in getting to greater depth or show that they are performing at greater depth.

D&T gives children the opportunity to develop skills, knowledge and understanding of designing and making functional products. We feel it is vital to nurture creativity and innovation through design, and by exploring the designed and made world in which we all live and work.

D&T Association 2020

Creating the opportunity for greater depth in Design Technology involves allowing pupils the independence to apply their learning at a deeper level. They are the pupils who take an idea or a new skill and adapt it or develop it further independently.

This means that pupils working at Greater Depth will be able to:

- GD pupils will work independently
- GD pupils will demonstrate a creative response to the problem
- GD pupils will stick tightly to the brief and consider the end user's needs and preferences throughout the process
- GD pupils will think critically about and comment on other products and their own product
- GD pupils will likely amend their product to improve its outcome
- GD pupils will display high quality presentation and precision throughout the process of design and make

Inspectors found that pupils made very good progress when the challenge in designing and making became increasingly sophisticated, requiring them to think as designers, to apply their technological knowledge, understanding of complex principles and construction techniques.

Ofsted's subject professional development materials: Design and Technology.
A training resource for teachers of Design and Technology in primary schools, 2012

Good achievement and challenge are evident when pupils:

- demonstrate a secure understanding of who they are designing and making for, the purpose of the product and how it would work, and the specific criteria their product must meet to be successful
- communicate their innovative ideas and plans clearly and modify their designs and prototypes in light of their testing and evaluation
- develop technical competence, applying measurement and using tools and components with increasing accuracy to safely make well-finished products
- draw effectively upon their scientific understanding and their knowledge of mechanisms to create and explain how their products work
- use an increasingly technical vocabulary when talking or writing about what they might change as their work develops.

The UK is struggling with an annual shortfall of 59,000 engineers. So we need more young people to choose a future in engineering. We believe the solution is to engage young people at an early age with exciting, industry relevant Design and Technology lessons.

The James Dyson Foundation, 2020

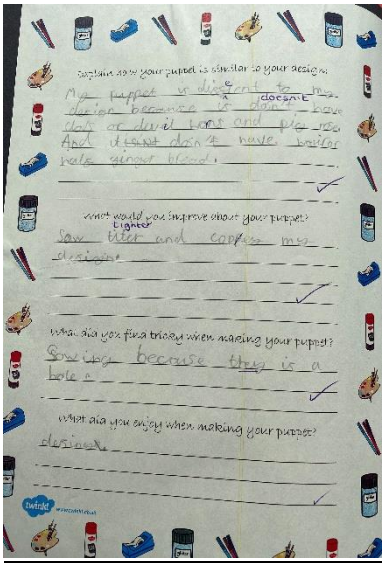
This is the DT display that shows the progression of skills across the school.

DT Display

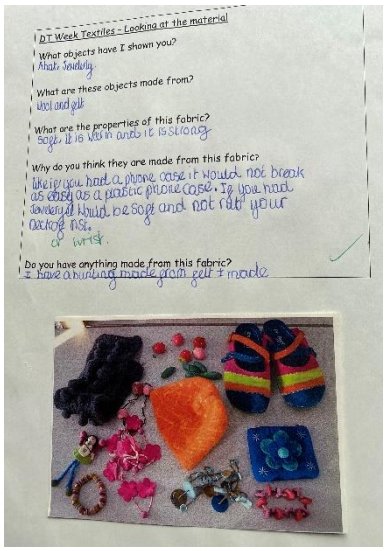
The display shows the progression of skills across the school in Textiles. The children were asked to evaluate their work by writing a comment in a speech bubble.

A selection of examples of work taken from the books of children at St Andrew's, which staff have declared as 'Greater Depth'.

Year 3



Year 5


DT Week Textiles - Looking at the material

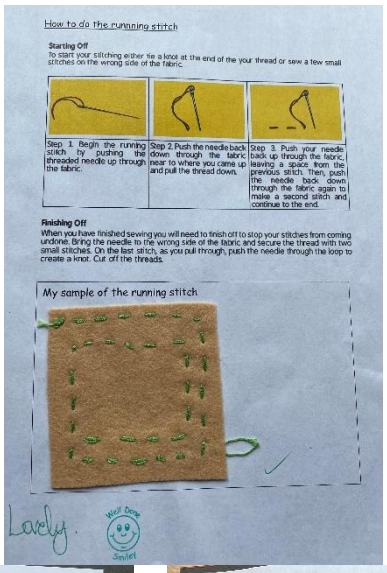
What objects have I shown you?
Khali Soulely.

What are these objects made from?
Wool and felt

What are the properties of this fabric?
Soft. It is thin and it is strong

Why do you think they are made from this fabric?
like if you had a phone case it would not break as easy as a plastic phone case. If you had severely it would be soft and not rub your actual ear.

Do you have anything made from this fabric?
I have a bunting made from felt I made


How to do the running stitch

Starting Off
To start your stitching either tie a knot at the end of the your thread or sew a few small stitches on the wrong side of the fabric.

Step 1. Begin the running stitch by pushing the threaded needle up through the fabric.
Step 2. Push the needle back down through the fabric near to where you came up and pull the thread down.
Step 3. Push your needle back up through the fabric, leaving a space from the previous stitch. Then, push the needle back down through the fabric again to make a second stitch and continue to the end.

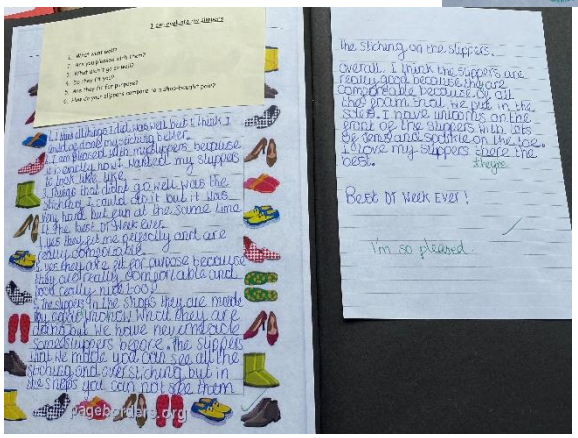
Finishing Off
When you have finished sewing you will need to finish off to stop your stitches from coming undone. Bring the needle to the wrong side of the fabric and secure the thread with two small stitches. On the last stitch, as you pull through, push the needle through the loop to create a knot. Cut off the threads.

My sample of the running stitch

Lovely.

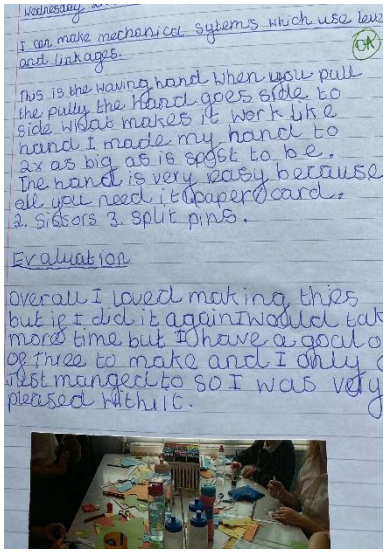
Textiles – make a pair of slippers to fit your own feet

These Year 5 children have shown that they have looked at other products, learnt how to do the running stitch and they have evaluated their product based on the design criteria.


the Stitching on the slippers.
Overall I think the slippers are really good because they are comfortable because of all the foam that we put in the slips. I have unicorns on the front of the slippers with bits of lace and sparkle on the toe. I love my slippers there the best.

Best DT week EVER!

I'm so pleased


Wednesday
I can make mechanical systems which use lever and linkages.

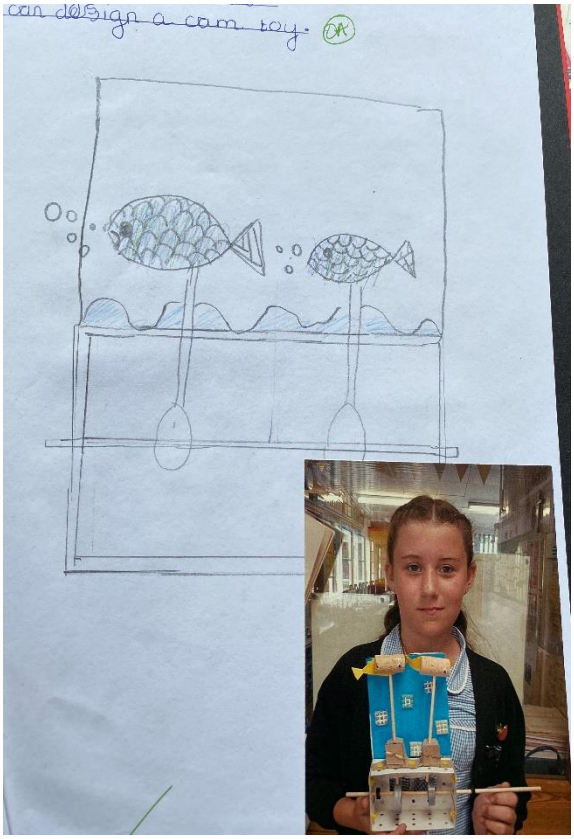
This is the waving hand when you pull the pully the hand goes side to side what makes it work like a hand I made my hand to 2x as big as is spost to be. The hand is very easy because all you need is paper/card. 2. Sissors 3. split pins.

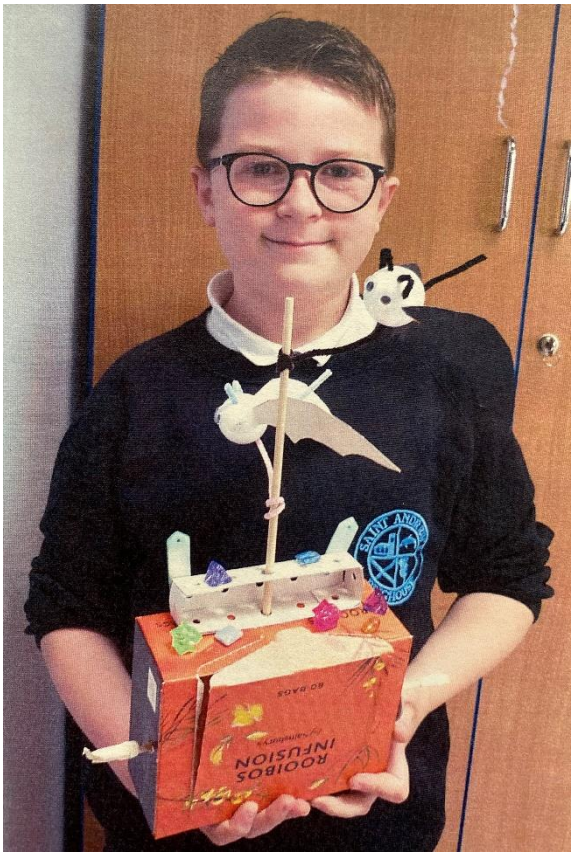
Evaluation

Overall I loved making this but if I did it again I would take more time but I have a goal of three to make and I only just manged to so I was very pleased with it.

Make a Moving Toy – focus on cams and levers (STEM)

This child has persevered with the mechanism to make the hand wave. They followed the instructions but soon realised that they needed to change the length of the lever in order to make the hand move.





What does good teaching in Design Technology look like?

Good teaching in D&T features teachers who:

- use existing products to inspire pupils and to support their investigations, testing and analysis
- use focused tasks and demonstrations effectively to show pupils different methods of manufacture
- use their own work to model ideas, and to explain the methods they used to identify the problem or to tackle a task
- use resources effectively and adapt them well to overcome barriers to participation in practical work for pupils who are disabled or have special educational needs
- use questioning to encourage classes to contribute to the development of success criteria for design briefs, to prompt pupils to think through the problems they might encounter and to share strategies to solve them
- model and use technical language and subject-specific terms accurately
- structure learning effectively to encourage the pooling of ideas and findings to support pupils critically evaluating and extending or improving the ideas
- ensure D&T is relevant by linking activity to pupils' interests, establishing real contexts for their work, and building upon their knowledge and skills in other subjects
- manage discussions effectively to include all pupils' views and challenge pupils' thinking, particularly about the function of products and the needs of users
- ensure that learning intentions are clear in plans, make good use of available time, offer suitable challenge to all groups of pupils – including the more able – and develop their learning.

STICKY KNOWLEDGE – DESIGN TECHNOLOGY - Whole school overview

By the end of:	Y3	Y4	Y5	Y6
Textiles	• Pupils will know how to use a simple straight stitch • Pupils will be able to write step by step instructions for what they have made using instructional language • Pupils will be aware of how to do an over-locking stitch • Pupils will know how to explain what they like and dislike about their finished product	• Pupils will understand the principle of weaving (under and over) • Pupils will be aware of the link between hand weaving and machine weaving on an industrial scale • Pupils will be aware of how to develop and experiment with weaving, through changing materials or adding embellishment	• Pupils will be confident with straight and over-locking stitches • Pupils will know how to take measurements to make their product fit • Pupils will know how to decorate and add embellishment • Pupils will evaluate their product against the design criteria and shop-bought products	• Pupils will know how to create a soft electrical circuit • Pupils will accurately measure their materials and cut pieces accordingly • Pupils will write instructions using instructional language • Pupils will evaluate their product against the design criteria
Cooking and Healthy Eating	• Pupils will cook a savoury dish • Pupils will be aware of healthy food choices	• Pupils will cook a savoury dish • Pupils will be aware of how to make healthy food choices • Pupils will begin to understand why we should eat healthily	• Pupils will cook a savoury dish • Pupils will know how to make healthy meal choices • Pupils will be aware of the seasonality of fruit and vegetables • Pupils will know how to adapt a	• Pupils will cook a savoury dish • Pupils will know how and why they should eat healthily • Pupils will know how we can reduce food waste

			recipe for portion size	
Link with Science Topics Y3 - pneumatics Y4 – electrical circuits Y5 – cams and levers Y6 – electric motors	• Pupils will know about different products that are powered by air (pneumatics) • Pupils will design and make a toy that is powered by air • Pupils will be able to write step by step instructions of how to make their toy	• Pupils will work in groups to build a game using an electronic circuit • Pupils will be able to measure, mark and cut out materials • Pupils will write step by step instructions of how to make their game • Pupils will evaluate their game	• Pupils will know how a lever and a cam works • Pupils will create toys using a cam and a lever • Pupils will know how to develop a moving toy that will be powered by their mechanism • Pupils will evaluate their toy to the design criteria	• Pupils will understand aerodynamics (how formula 1 cars are designed) • Pupils will know how to construct a simple circuit using an electric motor • Pupils will create an annotated labelled design for their car • Pupils will evaluate their car to the design criteria

LKS2 D.T: TEXTILES KNOWLEDGE ORGANISER

Overview

Sewing Techniques

Textiles are flexible materials woven from fibres

-Textiles are used to make clothing, sheets, towels, linen, carpets, rugs and a wide variety of other products.

-Sewing involves the joining of different textile fabrics using a needle and thread.

-Sewers can use a range of different sewing styles to produce strong joins.

-Some stitches also create an attractive-looking seam (a line of stitching joining fabrics together). Thinking about the way a product looks is called 'aesthetics', and is highly important in textiles.

Example Textiles

Phone Cases

Can be made with cotton/ floss thread/ leather

Decorated using running back stitch

-Phone Cases are designed to protect the phone inside them – phones are often very expensive! Therefore they need to be soft and durable.
-Rubber and leather are good materials for phone cases, because they are tough. However, cotton/ woolen fabrics are sometimes used as they offer a soft cushion for the phone.
-The pictured product has used a backstitch for joining fabrics together. This is a particularly strong stitch, that will keep fabrics together securely.

Purses and Wallets

Made with many different materials

Joined with Blanket Stitch technique and decorated using cross-stitching

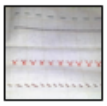
-Wallets and purses can be made using a wide variety of materials. They are designed to be durable, to keep contents safe, and yet also to be aesthetically-pleasing.
-This purse has been joined using the blanket stitch technique. Whilst this can be quite time-consuming, it creates an attractive seam and a secure join.
-The creator has then created elaborate embroidery patterns to decorate the purse.

Designing

Designers of textile products need to think about the purpose (what does it do?) and the user (who will use it?)

Fabrics -Different fabrics have different properties (characteristics) which make them good for different purposes. For example, some are soft and provide a cushion (e.g. felt) whilst others can be thin and lightweight (e.g. silk, cotton). This can make them easier to join/ decorate with.

Joining – There are lots of different stitches that you could use to join the fabrics together (see below). Some are easier and quicker, (e.g. running stitch) some are more secure and do not show the seam as obviously (e.g. backstitch), some help to improve certain fabrics (e.g. overstitch) and some are more aesthetically pleasing (e.g. blanket stitch).



As a part of the design process, you should be able to sketch and annotate different ideas. You should also be able to plan the main stages of making, using either a checklist, a storyboard, or a flowchart.

Key Vocabulary

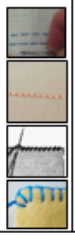
- Textiles
- Sew/ Stitch
- Thread
- Needle
- Appliqué
- Seam
- Aesthetics
- Running Stitch
- Back Stitch
- Over Sew Stitch
- Blanket Stitch

Making & Evaluating

Making

-Here is a guide to the different stitches that you may use to join fabrics together:

Running Stitch – This is the simplest stitch. It creates a dotted line effect. Remember to leave a space from the previous stitch.
Back Stitch – Similar to the running stitch, except that the thread doubles back so that there is no visible spacing between stitches. It is a very strong and secure stitch.
Over Sew Stitch – The over sew stitch is a good way to neaten the raw edge of fabrics. It involves sewing over the edge of the fabrics.
Blanket Stitch – Another way to reinforce the edges of thick materials. This stitch is popular as it is thought to be aesthetically-pleasing.



Evaluating

-How does your textile look? Would your user like it? Why or why not? How could you improve the way it looks?

-Are your attached fabrics secure? How did you achieve this? Which type of stitch did you use? How could fabrics be joined more securely?

-Which materials did you choose? Why? Does your product perform its purpose well? Why or why not?

What do you like about your product? How could you improve your product?

Health and Safety

-Remove any jewellery and tie back long hair.
-Walk safely and calmly around the classroom/ workshop.
-When using a needle, keep your fingers well clear. Use a thimble where available.
-When you are not using your needle, keep it in the same safe place.
Follow the teacher's cutting instructions carefully.
Make sure that you are wearing the correct equipment for tasks.
If you need to move around with scissor, hold around the closed blades, facing down.
Report any accidents & clean up properly after yourself.

UKS2 D.T: TEXTILES KNOWLEDGE ORGANISER

Overview

Combining Different Fabric Shapes

Textiles are flexible materials woven from fibres

-In your prior learning, you should have learnt that textiles are used to make clothing, sheets, towels, linen, carpets, rugs and a wide variety of other products. There are a wide range of textile fabrics.

-You should already know how to join fabrics in a number of ways, including using a range of sewing techniques.

-Textiles designers and makers can use stitches and other techniques (e.g. embroidery, tie dye) to add to the aesthetic appeal of their product.

-They can also add a number of features to improve the product's functionality, for example by adding a range of fasteners (e.g. clasps, ties, buttons, zips, studs, toggles and Velcro).

Example Textiles

Clothes

Can be made with cotton/ polyester

Embroidered using a number of different stitching techniques.

-A wide range of clothes, including those found in high-end fashion designs contain embroidery patterns, pictures and design. Floral patterns (patterns including flowers) are particularly popular.

-Many clothes, for example the dress on the left, are made of polyester. It is very resilient and can stand a good deal of wear and tear. It also holds colour well.

-A number of advanced stitching techniques are often used, including stem stitches for outlines (particularly effective for the individual leaves and stems) and satin stitches for filling in shapes (e.g. the flowers).

Bags/ Satchels

Made from synthetic fabrics, with leather strap

Decorated using tie dye

Zip fastener

-Bags and satchels can be made from a variety of materials. It is important that the materials are strong enough to bear the weight of the bag's contents. Leather, cotton and polyester are all often used.

-The tie-dye technique has been used to create the vivid colours on this bag, whilst a zip has been joined to the top of the bag as a fastener. This helps to keep the contents safe and secure in the bag, but allows the user easy access when needed.

Designing

Designers of textile products need to think about the purpose (what does it do?) and the user (who will use it?)
This project will draw on/ build on the textiles skills you have learnt in prior years.

Fabrics -Different fabrics have different properties (characteristics) which make them good for different purposes. For example, some materials are good insulators (keep things warm/cool, e.g. wool/fleece), others are waterproof/resistant (e.g. laminated fabrics, PUL, TPU, leather), whilst others are eco-friendly (e.g. organic cotton, linen). Consider will help you to meet the purpose and audience of your product.

Joining – In addition to the stitches that you have previously learnt, you should plan to use a range of further stitches (see below) can be used to sew and shape curved edges, and to decorate your product.

Fasteners – There are a range of fasteners that can be used to open & close different compartments on the product (see right). Each offers different strengths (e.g. aesthetics, strength & durability, size/ practicality and style).

As a part of the design process, you should be able to sketch and annotate different ideas. You should also be able to plan the main stages of making, using either a checklist, a storyboard, or a flowchart.

Key Vocabulary

- Textiles
- Sew/ Stitch
- Aesthetics
- Functionality
- Appliqué
- Stitch
- Tie Dye
- Fasteners
- Embroidery
- Cross Stitch
- Stem Stitch
- Chain Stitch
- Satin Stitch

Making & Evaluating

Making

-You should use a wider range of stitches and decorations.

Cross Stitch – A popular form of embroidery stitching in which two diagonal lines are stitched to create an 'X' shape. This form of stitching can be continued to create patterns and pictures.
Stem Stitch – The stem stitch creates a thin outline which can be curved. It uses diagonal stitches running closely beside the prior stitch.
Chain Stitch – Chain stitches create a thick, textured line. It uses looped stitches to form a chain-like pattern.
Satin Stitch – Satin stitches are often used to fill in shapes. Shapes can be outlined with other stitches before the satin stitch is used to fill the shape.
Tie Dye – Tie dye is a method of colouring fabrics, by tying it in a tight bundle (with rubber bands/ string) and dyeing it with different colours.

Evaluating

-How does your textile look? Would your user like it? Why or why not? How could you improve the way it looks?

-Are your attached fabrics secure? How did you achieve this? Which type of stitch did you use? How could fabrics be joined more securely?

-Which materials did you choose? What fasteners did you use? Why? Does your product perform its purpose well? Why or why not?

What do you like about your product? How could you improve your product?

Health and Safety

-Remove any jewellery and tie back long hair.
-Walk safely and calmly around the classroom/ workshop.
-When using a needle, keep your fingers well clear. Use a thimble where available.
-When you are not using your needle, keep it in the same safe place.
If using a sewing machine, follow staff instructions carefully.
Make sure that you are wearing the correct equipment for tasks.
If you need to move around with scissors, hold around the closed blades, facing down.
Report any accidents & clean up properly after yourself.

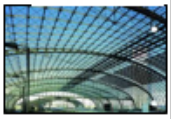
LKS2 D.T: STRUCTURES KNOWLEDGE ORGANISER

Overview

Shell Structures

You should already know that structures are things that are built for a purpose, for example to support something or hold something.

-Shell Structures are structures with a solid outer surface (which may be curved or flat) and a hollow inner area.



-Shell structures can serve many different purposes. Often, they are used to protecting, containing and/or presenting (e.g. packaging).

-Some examples of shell structures are food packaging, tunnels, helmets, drinks cans, and boats.

-A rounded outer surface is particularly strong, because it spreads forces throughout the whole structure, which means every part of the structure supports only a small part of the load.

Example Structures

	Name: St. Peter's Basilica Dome Location: Rome, Italy Height: 136m Built in: 1590 Purpose: Protecting	-The dome on St. Peter's Basilica is one of the most famous sites in the world. -There are many other dome-like shell structures on religious buildings all across the world. -As the surface is curved, there is no need for joints. Often the material is quite light and streamlined. -This dome is made with a lightened concrete/ rock mix (it was made a long time ago). -As with other shell structures, the dome does not carry a load (a triangular structure beneath supports the spire). -Rather, it is a roof, that protects the interior.
	Name: Sweets Tubes Purpose: Protecting, Containing, Presenting Materials: Cardboard tube, plastic lid.	-Sweet tubes are another example of strong curved shell structures. -They are normally made of a thin, lightweight material such as card or cardboard. These materials are normally cheap, durable, easy to work with and recyclable. Despite being thin, card/cardboard are still strong enough: the curved surface spreads the load of the sweets inside equally around the tube.

Designing – How does a shell structure contain, protect, present?

Shell structures may be used to contain things.

-The structures need to be able to take the weight of their contents.

-Consider the 3-D shapes that are most appropriate for this purpose: cubes, cuboids, prisms, are all possibilities.

-Remember, curved shell structures are effective at spreading weight evenly.

Shell structures may be used to protect things.

-The materials used are important for protecting interior contents. Some shell structures can be shaped to fit their contents, protecting them from movement and damage (e.g. egg cartons).

-Shell structures can be stiffened through folding, layering, corrugating, ribbing or lamination.

Shell Structures may be used to present things.

-Shell structures are designed to be visually appropriate for their purpose and attractive to their audience.

-Whilst the shape needs to be strong & durable, it also needs to be appealing to the users. Designers should think about these stylistic choices.

-For this reason, the choice of colour, the look, and the feel are all important.

-The use of logos and fonts (styles of lettering) should be considered.

Key Vocabulary

Structures
Shell Structures
Packaging
Purpose
Forces
Style
Font
Durable
3D Nets
Tabs
Folding/Layering
Corrugating/ Ribbing
CAD

Making & Evaluating

Making

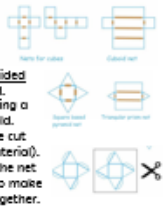
-Nets can be used to make 3D products.

-Nets can then be assembled using either CAD (computer aided design) systems or by hand.

-Scoring is the process of marking a sheet to make it easier to fold.

-Outer edges of the net can be cut out (apparatus depends on material).

-Tabs are additional strips on the net that can be scored and folded to make a surface for sticking vertices together.



Evaluating

-How well does your structure work? Does it meet its purpose?

-How did you make your shell structure strong and durable? How could you make it more stable?

-Which materials did you use? Why did you make these choices? How does you product protect and contain? How could it do this more effectively?

-How does your product look? How could it look more appealing?

Health and Safety

-Remove any jewellery, and tie back long hair. Keep belongings clear.

-Wear an apron where necessary and roll up your sleeves.

-Walk safely and calmly around the classroom/ workshop.

Keep your work area and floor area clear – regularly tidy up to avoid accidents.

Follow the teacher's cutting/ machinery instructions carefully.

Make sure that you are wearing the correct equipment for tasks, including safety goggles.

Should you need to move around with sharp objects, hold them appropriately.

Report and clean all spillages & other potential hazards.

UKS2 D.T: STRUCTURES KNOWLEDGE ORGANISER

Overview

Frame Structures

You should already know that structures are things that are built for a purpose, for example to support something or hold something.

-Frame Structures are rigid support structures that use beams, columns and slabs to hold large forces of gravity and weight.

-Frame structures give shape, and are useful for support & weight bearing.

-Unlike shell structures, frame structures have joints, which are formed according to the design requirements and materials being used.

-Some examples of man-made objects that use frame structures are houses, skyscrapers, bridges, scaffolding, tables, and roller coasters!

-The system of beams and columns in a frame structure can be further strengthened through the use of other features, e.g. foundations, bracing.

Designing – How do I design a strong, stable, secure frame structure?

-Remember your prior learning. a wider base can help a structure to be more secure.

-Frames should be able to stand on their own, providing a 'skeleton structure.'

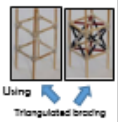
-You may wish to consider a foundation/ anchoring system, where appropriate.

You should be able to consider the most appropriate materials for your frame structure, considering a number of properties (e.g. weight, toughness, malleability, strength and presentation) depending upon the nature of your project.

-You should also be able to consider restraints, for example time and cost.

Triangulation can help to make structures stronger. This is important to consider when creating stable joints (see the making section below for this).

-Triangulation is also important when bracing. When force is applied to one point on the triangle, the pressure is shared amongst the other two points, which provide a secure wide base. Using bracing, you can create triangular shapes, can therefore make your structure more rigid from different angles.



Triangulated bracing adds to rigidity.

Design stage should include: step-by-step plan, annotated sketches, listing tools & materials.

Key Vocabulary

Structures
Frame Structure
Rigid
Beam
Column
Slab
Joints
Foundations
Triangulation
Bracing
Malleable
Horizontal
Diagonal
Vertical

Example Structures

	Name: The Eiffel Tower Location: Paris, France Height: 324m Built in: 1889 Purpose: Observation/ Broadcasting Tower Materials: Wrought Iron	-The Eiffel Tower is one of the most famous structures in the world. The main architect who designed the Eiffel Tower was Stephen Sauvestre, whilst Gustave Eiffel was the chief engineer. -The wrought-iron structure is based of four huge arched legs, set on masonry piers that curve inward. - The material used to make this tower is wrought iron which has is tough, malleable (can be pressed into shape without cracking) & corrosion-resistant. -Sauvestre and Eiffel wanted to prove that the metal could be as strong as stone, whilst lighter. -It uses a diagonal bracing structure throughout, to prevent side-to-side movement in the wind.
	Name: Cazebos/ Tents Purpose: Shelter/ Temporary Habiting Space Materials: Wood, iron or aluminum & canvas.	-Tents and gazebos are shelters made up of sheets of fabric/material, draped over a frame structure. -The frames are often made of iron or aluminium poles (lightweight, which makes them easy to transport/ erect/ deconstruct) or wood. They can range in size, from simple 'bivouac' structures for one person, to huge circus tents for thousands of people. -Rather than foundations, hooks or pegs are ordinarily used to anchor tents to the ground.

Making & Evaluating

Making

Using Straw/Rolled Paper

-When using straw, rolled paper, a number of adhesives can be used – e.g. sellotape, different types of glue.

-However, these structures are not as strong/ stable as wooden structures.

-Creating a rigid frame requires the creation of secure joints.

-These can be made using the methods shown on the right.

Using Wood

-When using wood, PVA glue is most appropriate. Joints should be securely clamped together to allow for drying time.

-Card strips can be used to create secure joints.

-Card triangles can be used to create secure corner joints.

-One suitable alternative is elastic bands, which can be securely fastened around beams and columns, in order to create secure joints.

Evaluating

-How well does your structure work? Does it meet its purpose?

-How did you make your frame structure strong and rigid?

-How could you make it more strong and rigid?

-Which materials did you use? Why did you make these choices?

What restraints did you have? How would you have changed your product without these restraints?

-How did you cover your frame? Was this the best material? Why or why not?

-How does your product look? How could it look more appealing?

Health and Safety

-Remove any jewellery, and tie back long hair. Keep belongings clear.

-Wear an apron where necessary and roll up your sleeves.

-Walk safely and calmly around the classroom/ workshop.

Keep your work area and floor area clear – regularly tidy up to avoid accidents.

Follow the teacher's cutting/ machinery instructions carefully.

Make sure that you are wearing the correct equipment for tasks, including safety goggles.

Should you need to move around with sharp objects, hold them appropriately.

Report and clean all spillages & other potential hazards.

KS2 D.T: ELECTRICAL SYSTEMS KNOWLEDGE ORGANISER

Overview

More Complex Switches and Circuits

Electricity is a type of energy. It is used to power lots of things

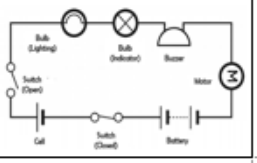
-Electricity can flow through circuits. A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow. The symbols for different objects in electrical circuits are shown on the right.

-The electricity flowing through a circuit is known as the current. It can be used to power an output device.

-Switches can be positioned so that electrical currents can flow through them (closed switch) or cannot flow through them (open switch). This alters the way that output devices function.

-In a series circuit, two output devices are controlled by one switch. In a parallel circuit, two output devices can be controlled separately by switches.

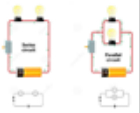
Switches can be used alongside control boxes, to set up timed systems (e.g. traffic lights) and monitoring systems (e.g. alarms).



Designing

-You need to think about who your product is for – what is its purpose and who is going to use it?

-Consider which type of circuits you will need to use.
-In a series circuit, there is only one path which the electricity follows. The electricity flows from the input source, around one path (on which the components are positioned) and returns to complete a closed circuit.
-In a parallel circuit, the components are positioned on different branches of the wire. If one component breaks or becomes disconnected, the other components can still work.



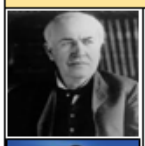
-Consider which type of circuits you will need to use.
-Micro-switch: a small switch that is extremely sensitive to motion, used in automatic monitoring systems. -Reed Switch: a switch that it operated by a magnet. -Light Dependent Resistor: operates when light is shined on it. As the light increases, the resistance of the device decreases. -Push-to-Make Switch: on when switch is pressed – Push-to-Break Switch: off when the switch is pressed. – Tilt Switch: A switch that works when held at angle. – Toggle Switch: works when a lever is pressed.

In designing you should be able to sketch and annotate different ideas, and should also be able to create either a making checklist, a storyboard, or a flowchart.

Key Vocabulary

- Series Circuit
- Parallel Circuit
- Input/ Output Devices
- Control Boxes
- Timed Systems
- Monitoring Systems
- Micro-switch
- Light Dependent Resistor (LDR)
- Push-to-break/make Switches
- Reed Switch
- Tilt Switch

Research and Examples



Thomas Edison

-Thomas Edison was a famous American inventor, who is best known for inventing the domestic lightbulb and the electrical power system that enables them to work. He investigated new materials for filament that allowed immediate and long-lasting lighting. He also invented safety fuses and on/ off switches for light sockets.

Traffic Lights

-The most basic types of traffic lights work on a timer system (e.g. giving a minute of green light in each direction) to ensure that there is a consistent flow of traffic in all directions. This works best in places where there is a consistently busy flow of traffic. In some quieter areas, smart-based traffic signals use monitoring to detect when there are vehicles. Sometimes this is done with 'inductive loop' systems (a coil in the ground that detects the weight of a car), or sometimes with LDR or video camera systems.

Burglar Alarm

-Burglar alarms are another example of a monitoring system. They generally work using micro-switch, LDR, laser, or video camera systems, and can be controlled to act in certain ways (e.g. sounding a buzzer) via a control box.

Making

Making

-In addition to the making skill that you used throughout your electrical systems DT topic in lower KS2, you also need to learn how to write a sequence of instructions using a control program.

-This 'control language' or flowchart enables the system to act in a particular way e.g. when a switch is pressed.

-You will develop an understanding of using standalone/ interface control boxes.

Evaluating

-How well does your electrical system work? Does it work as planned?
-Does it meet its purpose?
-What would your audience think about your product? What would they like about it? What would they not like?
-What type of switch did you choose to use? Why? What are the pros and cons of this type of switch?
-What instructions did you input into your control box? How did this work? What could you still improve about your product? How would you do things differently next time?

Health and Safety

-Remove any jewellery, and tie back long hair. Wear an apron.
-Do not put fingers or objects in outlets.
-Never use anything with a plug, wire or cord around water.
Keep metal objects away from electrical heat sources – e.g. knife away from toaster.
Never pull a plug out by its cord.
Follow electrical signs and guidance carefully.
Return all equipment to the correct zoned areas of the classroom/ workshop.
Remember that electricity can cause burn, shocks, serious injury & even death.

KS2 D.T: ELECTRICAL SYSTEMS KNOWLEDGE ORGANISER

Overview

Simple Circuits

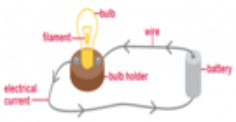
Electricity is a type of energy. It is used to power lots of things

-Electricity can flow through wires and cables. It can also be stored in batteries or cells.

-Electricity can flow through circuits. A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow.

The electricity flowing through a circuit is known as the current. The current can be deliberately allowed to flow or broken using a switch.

-Some materials conduct electricity (conductors), whilst others do not (insulators).



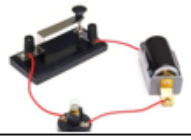
Designing

-You need to think about who your product is for – what is its purpose and who is going to use it?

-Consider the materials that you will use – what type of input device (e.g. battery/cell), conductor (e.g. wire) and output device (e.g. bulb) are best for your purpose and audience?

-Consider whether to create a homemade switch or use a bought switch. Different switches work in different ways (see below) – think about which will be the most accessible/ appealing to your user.

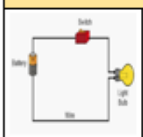
As a part of the design process, you should be able to sketch and annotate different ideas. You should also be able to plan the main stages of making, using either a checklist, a storyboard, or a flowchart.



Key Vocabulary

- Simple Circuit
- Switch
- Current
- Short Circuit
- Battery/ Cell
- Switch
- Input/ Output Device
- Conductor
- Insulator

Example of Battery-Powered Products



Simple Circuit

-A simple circuit is a closed loop of a conductor material, e.g. wire, in which electricity can travel in a current. In order for it to be a closed circuit, a power source e.g. battery/cell is needed (input device), and something that is powered by the electricity, e.g. light bulb (output device). A switch can be used to break the circuit (turning the output device off).

Torch

-A torch is one of the simplest forms of a battery-powered product. Torches are useful when the source of light needs to be portable, or when it needs to be operated by children. When the switch is pressed, a conductor material is positioned into a circuit, making it a closed circuit, thus powering the light bulb.

Handheld Fan

-Handheld fans are another example of a simple battery-powered electrical system in action. Once again, it is the perfect option for someone who needs to keep cool where there is no safe/ practical mains option available. Rather than powering a bulb, the closed circuit powers the propeller, which blows air.

Making & Evaluating

Making Electrical Systems

-In order to ensure that your circuit is closed, it is hugely important that your connections are secure.
-Connecting blocks and bulb holders are useful pieces of equipment for ensuring this.
-Twisting strands of wire and taping wire are also useful strategies for creating a secure connection.

Switches

-Homemade switches can be made using this equipment:

-A range of bought switches can also be used. Reed switches operate by magnets, whereas toggle switches use a lever. Push-to-break switches are turned off by pressing them. Push-to-make switches are turned on by pressing them.

Evaluating

-How well does your electrical system work? Does it work as planned?
-Does it meet its purpose?

-What would your audience think about your product? What would they like about it? What would they not like?

-What type of switch did you choose to use? Why? What are the pros and cons of this type of switch?

What problems did you encounter? How did you fix them?

What could you still improve about your product? How would you do things differently next time?

Health and Safety

-Remove any jewellery, and tie back long hair. Wear an apron.
-Do not put fingers or objects in outlets.
-Never use anything with a plug, wire or cord around water.
Keep metal objects away from electrical heat sources – e.g. knife away from toaster.
Never pull a plug out by its cord.
Follow electrical signs and guidance carefully.
Return all equipment to the correct zoned areas of the classroom/ workshop.
Remember that electricity can cause burn, shocks, serious injury & even death.

KS2 D.T: MECHANISMS KNOWLEDGE ORGANISER

Overview

Gears and Pulleys

Mechanisms are the parts that make something work.

-Mechanisms are all around us. A set of related mechanisms used to create movement is called a mechanical system.

-Gears are toothed wheels (cogs) that lock together and turn one another. When one gear is turned the other turns as well.

The wheels are usually different sizes, so that one gear speeds up to slow down the next gear. They therefore increase the power of a turning force.

-Pulleys are like gears, but the wheels do not lock together. The wheels are instead joined together by a drive belt. Pulleys can be used to affect the speed, direction or force of a movement.

Designing

Below are some of the main considerations of a design process for a toy vehicle.

Chassis, Axle, Wheels

-You will need to draw on your prior knowledge of chassis, axle and wheel systems. The chassis is the frame or base on which the vehicle is built. The chassis should include axle holders. Your axle needs to be strong enough to hold the wheels, and fit freely in the axle holder. Consider the materials of your wheels.

Gears and Pulleys

-The vehicle can run using either a gear or pulley mechanical system.

-In either case, you need to understand the ratio (how often lower wheels turn in relation to smaller pulleys). With gears, this can be done by counting the number of teeth (see right).

No.Teeth	Ratio (spins)
8 and 16	2:1
8 and 24	3:1
24 and 24	1:1
8 and 40	5:1

As a part of the design process, you should be able to sketch and annotate different ideas. You should also be able to plan the main stages of making, using either a checklist, a storyboard, or a flowchart.

Key Vocabulary

- Mechanism
- Mechanical System
- Gear
- Pulley
- Lever
- Cogs
- Force
- Drive Belt
- Driver
- Follower
- Motor Spindle

Example Mechanisms

Flag/Flagpole

-A flag being raised/ lowered on a flagpole is a prime example of a pulley mechanism in action. The rope or belt pulled by the user fits into a groove in wheels at the top and bottom of the flagpole. This switches the direction of the force needed to lift/ lower the flag up and down the post.

Can Opener

-A can opener is an example of a gear mechanism in action. When you turn the handle, it turns a small, round, metal traction gear. The notches in the gear allow it to grip onto the lip of the can. As the wheel moves around the rim of the can, the cutting wheel on the other side of the lip opens the can.

Bicycle Gears

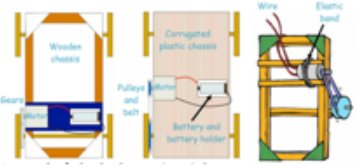
-Bicycle gears are an example of a multiple gear and pulley mechanism in action. The size of the gears (and number of teeth) determines how many times the rear wheel turns for every pedal stroke. A lower, easier gear (small chain ring, big cog) helps the user to accelerate faster, whilst a higher, harder gear (big chain ring, small cog)

Making & Evaluating

Making - Mechanical System

-In order for the vehicle to move, it is essential that the mechanical system is planned effectively, and include an input, a process, and an output.

-e.g. Batteries hold stored power, accessed by using a switch (input) to enable a motor to set in motion the motor spindle. Motor spindles can attach the motor to the gears/ pulley system (process)., which in turn propels the axles and/or wheels to move the vehicle forwards/ backwards (output).



Evaluating

-How well does your mechanical system work? Does it move smoothly?

-Does it meet its purpose?

-What would your audience think about your product? What would they like about it? What would they not like?

-What problems did you face in constructing your mechanical system? What changes did you need to make?

What could you still improve about your product? How would you do things differently next time?

Health and Safety

-Remove any jewellery, and tie back long hair. Wear an apron.

-Follow guidelines for working with electrical equipment.

-Walk safely and calmly around the classroom/ workshop.

Keep your work area and floor area clear – keep your belongings well clear.

Follow the teacher's instructions for using equipment carefully.

Make sure that you are wearing the correct equipment for tasks.

Return all equipment to the correct zoned areas of the classroom/ workshop.

Report all spillages & clean up properly after yourself.

UKS2 D.T: FOOD AND NUTRITION KNOWLEDGE ORGANISER

Preparing and Cooking Processes

Preparing Processes

Preparing processes are the different ways that we get food ready to be eaten.

-**Slicing:** cutting food using a knife.

-**Mixing:** to blend ingredients together, using a spoon, blender, or whisk.

-**Weighing/measuring:** to get the right amount of an ingredient, using scales, tablet/teaspoons

-**Grating:** to peel a layer off something (like carrots or cheese) using a peeler or grater.

-**Serving:** making food look nice on the plate.

-**Adding/ substituting:** changing the taste of food by adding or replacing ingredients.

Cooking Processes

Cooking processes are the different ways that we heat food before it is eaten.

-**Baking:** to cook food in a heated oven.

-**Boiling:** to cook food in boiling (100°C) water.

-**Frying:** to cook food in a pan of heated oil.

-**Grilling:** to cook food by putting it under a hot grill (like a radiator in a cooker).

-**Griddling:** to cook on a flat iron plate called a griddle.

-**Steaming:** to cook using steam, normally from boiled water.

-**Poaching:** to cook by simmering in a small amount of liquid.

Where Food Comes From

Grown, Raised, Caught

It is important to know that foods are grown, raised and caught more easily during certain seasons. This is called seasonality.

Some food is grown

- In order for us to get cucumbers, we need to grow a cucumber plant. Cucumbers grow on the vines of cucumber plants. In the UK, the cucumber season is between March and June, when they grow most naturally in the seasonal conditions.

Some food is raised

- In order for us to be able to eat chicken, we need to raise chickens. Eggs are laid by female chickens. In order to be sustainable, we need to know that most chicks are born in the spring/ summer season.

Some food is caught

- In order for us to get tuna, we need to catch the tuna-fish. There are also seasonal changes for caught food, as animals can migrate. E.g. a lot of tuna is caught between November-May in the Pacific off San Francisco.

Eating Sustainably

-With modern technology, it is possible to grow and rear food out of season.

-However, growing and rearing foods out of season consumes a lot of energy, because the process takes place in artificial conditions, and needs a lot of resources, for example heat, light, water and nutrients.

-Eating sustainably is about finding the right balance between your food needs and your food choices. It helps to reduce our carbon footprint.

Key Vocabulary

- Healthy & Varied Diet
- Food/Meal Plan
- Calories
- Saturated Fat
- Adding/ Substituting
- Griddling
- Steaming
- Poaching
- Seasonal Produce
- Seasonality
- Sustainability
- Health & Safety

A Healthy and Varied Diet

Food Groups

You should now know how much to eat of each food group:

-**Fruit and vegetables** – Eat lots! About 5 portions per day.
Good for vitamins, minerals and fibre. Fresh, tinned and juices all count.

-**Carbohydrates** – Eat lots! Include in every meal.
Good for energy (carbohydrates), vitamins, minerals and fibre.

-**Proteins** – You should eat about 2-3 portions per day.
Good for muscle-building (protein), vitamins and minerals.

-**Dairy** – You should eat about 2-3 portions per day.
Good for muscle-building protein, vitamins and minerals.

-**Fats and Sugars** – Only eat occasionally and in small amounts.
Good for energy and fat reserves in small amounts. Cut down on saturated fats.

A Varied Diet

-In order to stay healthy, it is important that we eat a balanced diet of foods from each of the five food groups. Too much of any one food group is not healthy for us.

-You should be able to create a weekly food plan, incorporating a healthy and varied diet of foods across each day and the week.
-Your plan should apply your understanding of which foods within groups have advantages and disadvantages (e.g. fish has less fat than red meat' and 'use a low-fat butter alternative).
-You may even be able to understand calories and how they work, and count these in your food plan!

Food from Around the World

Seasonal Foods around the World

-It is important to remember that the seasons are different in different places over a year.

-In the northern hemisphere, spring takes place between March and May. In the southern hemisphere, spring is September to November.

Therefore, foods are in season in different places at different times of the year. Cucumbers can be naturally grown in the northern hemisphere March-June, and in the southern hemisphere October-December.

UK Seasonal Foods

Winter: Apples, Beetroot, Sprouts, Cabbage, Leeks, Mushrooms, Onions, Parsnips, Pears, Turnips.

Spring: Artichokes, Asparagus, Aubergines, New Potatoes, Rhubarb, Rocket, Spinach, Spring Greens, Spring Onions.

Summer: Blackcurrants, Broad Beans, Cherries, Chillies, Courgettes, Gooseberries, Garlic, Strawberries, Water Cress.

Autumn: Butternut Squash, Cauliflowers, Chicory, Elderberries, Marrow, Pumpkin, Wild Mushrooms, Squash.

Health and Safety

-Remove any jewellery and tie back long hair. Ideally, wear a hair net.

-Wear an apron and roll up your sleeves. Tie your apron securely.

-Wash your hands with hot water and antibacterial soap, for at least 20 seconds.

Washing your hands should be done before, during and after preparing food.

Use different chopping boards and knives for raw meat & other foods. This stops bacteria spreading.

Use a food thermometer to check that food is cooked through.

Check the dates on food, and check for allergies & diet e.g. vegetarian, vegan.

Make sure that you clean up properly after yourself.

Electricity is a type of energy. It is used to power lots of things

Electricity can flow through wires and cables. It can also be stored in batteries or cells.

Electricity can flow through circuits. A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow.

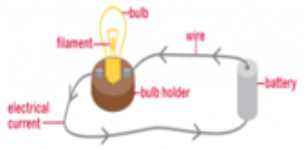
The electricity flowing through a circuit is known as the current. The current can be deliberately allowed to flow or broken using a switch.

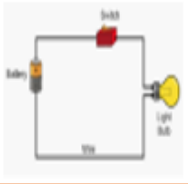
Some materials conduct electricity (conductors), whilst others do not (insulators).

Key Vocabulary

Simple Circuit, Switch, Current, Short Circuit, Battery/ Cell, Switch, Conductor, Insulator, Input/ Output Device,

SOFT CIRCUITS





A simple circuit is a closed loop of a conductor material, e.g. wire, in which electricity can travel in a current.

In order for it to be a closed circuit, a power source e.g. battery/cell is needed (input device), and something that is powered by the electricity, e.g. light bulb (output device). A switch can be used to break the circuit (turning the output device off).

Make something wearable: Incorporate LEDs into your clothes or make accessories like light-up neckties, brooches, headbands, hats, and more. Conductive thread can substitute wires to extend your explorations into wearable circuits.

switches

Working with Conductive Thread

Keep your stitches as close together as possible. Conductive thread tends to fray, so if a circuit is not functioning, check for spots where the thread has frayed. Knots that are tied with conductive thread may not stay in place permanently on their own. Secure each of your knots by dabbing them with hot glue. This will also help insulate any loose thread ends. The soft circuits created are washable! Just remove the battery and hand-wash with gentle detergent.