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Design and technology

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Anne Vernon
Jo Warner

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Scope of the Design and technology curriculum

National Curriculum Purpose of Study

- Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values.
- They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens.
- Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

National Curriculum Aims

The national curriculum for design and technology 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.

Key Stage 1, 2 and 3

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making.

They should work in a range of contexts, for example:

- the home and school, gardens and playgrounds, the local community, industry and the wider environment - KS1
- the home, school, leisure, culture, enterprise, industry and the wider environment – KS2
- the home, health, leisure and culture, and industrial contexts for example, engineering, manufacturing, construction, food, energy, agriculture (including horticulture) and fashion – KS3

Key Stage 1

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

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Key Stage 1

Pupils should be taught:

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.

Key Stage 2

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

Key Stage 2

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

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Key Stage 2

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

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Key Stage 2

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.

Key Stage 3

When designing and making, pupils should be taught to:

Design

- use research and exploration, such as the study of different cultures, to identify and understand user needs
- identify and solve their own design problems and understand how to reformulate problems given to them
- develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations
- use a variety of approaches [for example, biomimicry and user-centred design],to generate creative ideas and avoid stereotypical responses
- develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools

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Key Stage 3

When designing and making, pupils should be taught to:

Make

- select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture
- select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties

Key Stage 3

Evaluate

- analyse the work of past and present professionals and others to develop and broaden their understanding
- investigate new and emerging technologies
- test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
- understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists

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Key Stage 3

Technical knowledge

- understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
- understand how more advanced mechanical systems used in their products enable changes in movement and force
- understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]
- apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].

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Cooking and Nutrition Curriculum

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.

Key stage 1

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

Key stage 2

- **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**

Cooking and Nutrition Curriculum

Key stage 3

- understand and apply the principles of nutrition and health
- cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet
- become competent in a range of cooking techniques [for example, selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes]
- understand the source, seasonality and characteristics of a broad range of ingredients.

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The work of others...

FRANK GEHRY

Frank Owen Gehry was born in February 1929 and is a Canadian-born architect and designer.

A lot of people consider Gehry to be one of the most innovative architects working today.

His most famous buildings are the **Guggenheim Museum in Bilbao**, Spain, which is covered in a metal called Titanium, and the Walt Disney Concert Hall in Los Angeles.

JAMIE OLIVER

Jamie Oliver born in 1975 is a **British chef**, restaurant owner, and cookbook author with lots of TV shows.

In 2005 Jamie started a mission called 'Feed me Better' where he wanted **all school children to eat healthier foods for their school dinners.**

"Imagine a world where children were fed tasty and nutritious, real food at school from the age of 4 to 18. A world where every child was educated about how amazing food is, where it comes from, how it affects the body and how it can save their lives." – Jamie Oliver

Jamie opened a restaurant called **Fifteen in London**. It taught young adults who had difficult lives on how to get jobs in the restaurant business.

MORAG MYERSCOUGH

Morag was born in Holloway, London and was raised by her mother who was a textiles designer and her father who was a classical musician.

Morag believes *happy those w near and those are far will con*

Morag **transfor public spaces** hospitals, parks centres into acti fun places for everyone.

HARRY BECK

Beck was drawing an **electrical circuits map** for work and he came up with the idea of a map for the underground that looks like a electrical circuit map where all the **stations were equally spaced out.**

Beck realised that because the railway was underground, the passengers did not need to know the actual locations of the stops but instead it was more important that they understood how the railway lines connected to each other and how to get to the different stops.

The first **schematic map** of the Underground network was designed by Harry Beck in 1931.

Beck worked for the **London Underground** and drew the map in his spare time.

FRANK LLOYD WRIGHT

Frank Lloyd Wright (Born June 8, 1867 – April 9, 1959) was an American architect, interior designer, writer and educator.

He designed buildings that fitted in to the natural world. He called it **'organic architecture'.**

He is considered to be one of the **greatest American architects of all time.**

Wright designed some of the most well known buildings in North America including the **Guggenheim** which is an art gallery in **New York.**

Frank Lloyd Wright design more than **1000 structures** in his life.

TINKER HATFIELD

Tinker Hatfield is an American designer of **Nike shoes** including the **Air Jordan and the Nike Air Trainer.**

He is famous for his innovative designs and numerous shoes over more than 30 years of work. People think of him as a **legend of shoe design.**

Tinker Hatfield born 1952, went to university to learn how to become an architect. When he was there, he also took part in the high jump which is where his PE teacher got him thinking about sports shoe design.

Tinker designed the **Nike AirMAG** for the film Back to the Future II and in 2015 he gave a pair to Michael J Fox that actually worked. The laces can tighten themselves!

JAMES DYSON

The Dyson Company was said to be worth approximately 21 Billion Pounds in 2022!!

'The key to success is failure... Success is made of 99 percent failure.' James Dyson

With the **Dyson vacuum cleaner**, people actually REALLY 'wanted' a vacuum cleaner rather than just 'needing' one. Dyson has since **invented bladeless fans, hairdryers, hair straighteners and a wheelbarrow** that uses a ball instead of a wheel.

Sir James Dyson (born 2 May 1947) is a British industrial designer and founder of the Dyson Company. He was born in Norfolk.

His revolutionary invention was the **dual cyclone bag-less vacuum cleaner.**

ANTONI GAUDI

Spanish Catalan architect Antoni Gaudí's most famous building is the **Sagrada Familia in Barcelona.**

The Sagrada Familia has been being built since 1882 and is will not be finished until 2027 – hopefully. That's over 100 years!!

Gaudi was inspired by **nature**. Many of his buildings feature **biomimicry**, a design style that mimics shapes and patterns found in the natural world.

Gaudi designed **bright, multi-colour buildings** using tiles and stained glass.

He also mixed together materials that wouldn't normally be put together in buildings.

Gaudi designed lots of buildings in Barcelona like; **Park Güell, Casa Milà, and Casa Batlló.** As well as architecture is also designed the inside of buildings, doors, and furniture.

COCO CHANEL

Coco Chanel was **a fashion designer** who wanted to make clothes more comfortable for women. Women used to wear clothes that were structured, very tight fitting and not very comfortable or easy to move in. Chanel wanted to design clothes that were **relaxed but still sophisticated.**

Gabrielle Bonheur Chanel was born in France in 1883 and was the founder of the Chanel brand.

Chanel was raised by nuns who taught her how to sew.

Coco Chanel designed clothes such as **suits for women,** little black dresses and even made her own perfume in the 1920s.

ZAHA HADID

Zaha Hadid was born in Iraq and was the **first woman to win the Pritzker Architecture Prize in 2004.**

Dame Zaha Hadid was born in 1950 and died in 2016. She was an architect, artist and designer.

I AM SURE THAT AS A WOMAN I CAN DO A VERY GOOD SKYSCRAPER

She was described by The Guardian newspaper as the **"Queen of the curve"**

Hadid was, and still is, a very well known **architect** and became famous for her buildings. She has even designed a 3-wheeled automobile and footwear with the clothing brand

NADIYA HUSSAIN

Nadiya was born in 1984 and is a British television chef, author and presenter.

Nadiya won the 6th series of BBC's **Great British Bake Off** in 2015.

"I'm never gonna put boundaries on myself ever again. I'm never gonna say I can't do it. I'm never gonna say "maybe". I'm never gonna say "I don't think I can". I can and I will." – Nadiya Hussain

Nadiya made a four-tier 21st birthday cake for the National Television Awards. The cake used 34 eggs, two kilos of sugar, three kilos of butter, two and a half kilos of flour, two kilos of icing sugar and four kilos of fondant icing to make it.

She also baked the **Queen's 90th birthday cake.**

PHILIPPE STARCK

'When I design, I don't consider the technical or commercial parameters so much as the desire for a dream that humans have attempted to project onto an object.' – Philippe Stark

Starck opened his own design company and worked with some very big design brands such as **Alessi and Vitra.**

Starck has designed all sorts of different products from furniture, household items, staplers, toothbrushes and lemon squeezers, tableware, even clothing, food, and architecture.

This is the **'Juicy Salif'.** It is a lemon juicer designed by Starck for a company called Alessi. It is even displayed at an art gallery called the MOMA in New York.

Philippe Patrick **Starck** is a French product designer and interior designer.

His products are **not too expensive** but still thought of as **'high quality design'.**

He was born 1949 in Paris.

HENRY FORD

Henry worked as an engineer at the Edison Illumination Company where he met Thomas Edison.

His first try at an automobile company was working with Thomas Edison and was called the **Detroit Automobile Company.**

Henry Ford was born in 1863. He started the **Ford Motor Group** and developed of the assembly line technique of **mass production.**

When Ford was 12, he spent a lot of his time in a small machine shop where he learnt a lot about machines and engineering.

He built a steam engine when he was just 15!

Ford made cars that more people could **afford** and made them **practical** and useful ways to travel to places.

Failure is simply the opportunity to begin again, this time more intelligently.

HENRY FORD

VIVIENNE WESTWOOD

Vivienne Westwood would use her clothing designs to carry **political messages** and make people aware of **environmental and human rights issues.**

Westwood was used to be a **primary school teacher** and she made and sold her own jewellery on a stall in a market in her spare time.

Dame Vivienne Westwood English **fashion designe**

Her designs were des **'modern punk'** and were and different to anything sold at

Buy less. Choose well. Make it last.

Westwood died in 2022 but her clothing brand will carry on making new designs.

HESTON BLUMENTHAL

Heston Marc Blumenthal is a British celebrity chef, TV star and food writer. He owns **'The Fat Duck' restaurant** in England which has 3 Michelin stars and it is one of the best restaurants in the world.

To me, food is as much about the moment, the occasion, the location and the company as it is about the taste. Heston Blumenthal

Heston likes to use **science in his cooking** and he made a television programme and a book called 'Kitchen Chemistry with Heston Blumenthal'.

JONATHAN IVE

British born Sir Jonathan Paul "Jony" Ive was Chief Design Officer at **Apple.**

Ive led the design for the following products:
MacBook Pro, iMac, MacBook Air, iPod, iPod Touch, iPhone, iPad, iPad Mini and iOS 7.

It's very easy to be different, but very difficult to be better. — Jonathan Ive

He is responsible for the look, style and function of Apple products.

Ive says he was inspired by a Design Movement called **Bauhaus** and also a designer called **Dieter Rams.**

VIRGIL ABLOH

Virgil Abloh was an American fashion designer and the Artistic Director for **Louis Vuitton** menswear collection from 2018.

He was also the Creative Director of **Donda** and founder of the company **Off-White.**

Abloh graduated from university in 2002 with a degree in **civil engineering**. He then studied **Architecture** at another university in 2006.

Virgil Abloh was born in Illinois (USA) in 1980 and died in 2021. His mother was a seamstress which is where he learnt to sew.

When he was studying **architecture**, he also designed and made T-shirts where he met musician **Kanye West.**

The work of others…

Pupils should learn about a range of inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Consider what they are famous for designing and making and what characteristics enabled them to become successful

The range of people and products should cover the range of aspects of D&T

- mechanical systems
- electrical systems
- structures
- textiles
- food

Children may study the development of a product over time (e.g. electric torch); the product or products invented by a single person (e.g. Edison) or consider products that relate to a single aspect of D&T (e.g. textiles – Ve**lcro)**

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The work of others…

Key Stage 1

- explore and evaluate a range of existing products

Key Stage 2

- investigate and analyse a range of existing products
- understand how key events and individuals in design and technology have helped shape the world

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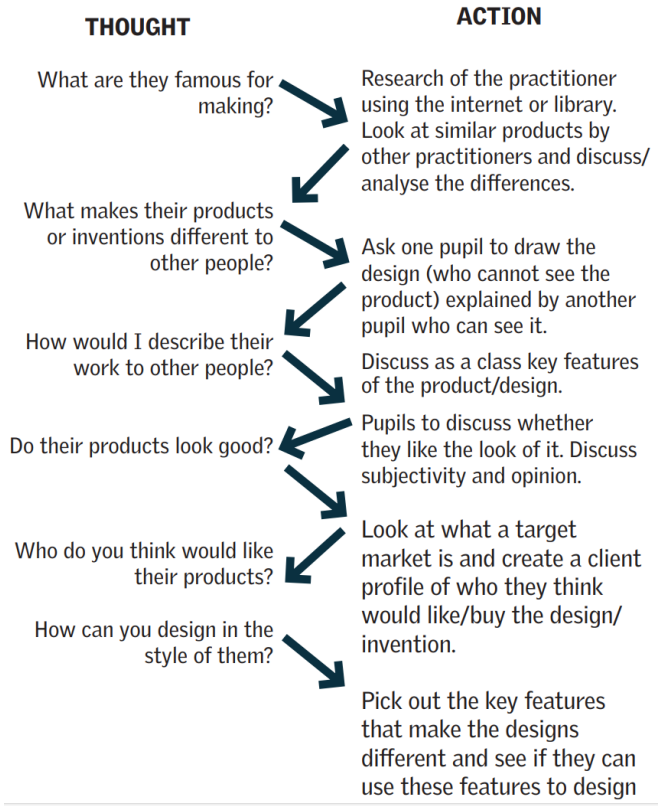
The work of others…

Key Stage 3

- analyse the work of past and present professionals and others to develop and broaden their understanding
- investigate new and emerging technologies
- understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists

The work of others…

Tasks to enable to pupils to consider their chosen practitioner and develop their understanding so as to be able to express their own thoughts and opinions of the practitioner's work.



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Early Years Foundation Stage

Communication and Language – vocabulary / discussions / articulate their ideas / books

Personal, Social and Emotional Development – select and use resources / resilience and perseverance / mange their own needs

Physical Development – fine motor skills / use one handed tools / choose the right resources

Literacy – drawing / writing / literature

Mathematics – 2D and 3D shapes / patterns / length / weight

Understanding the World – explore how things work / forces / senses / explore the natural world

Expressive Arts and Design – small world / blocks / construction kits / join materials / create collaboratively

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EYFS

Preparing for DT in Key Stage 1

- Provide opportunities to work together to develop and realise creative ideas.
- Provide children with a range of materials for children to construct with.
- Encourage them to think about and discuss what they want to make.
- Discuss problems and how they might be solved as they arise. Reflect with children on how they have achieved their aims.
- Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue.
- Provide a range of materials and tools and teach children to use them with care and precision. Promote independence, taking care not to introduce too many new things at once.

EYFS

- How effectively does the EYFS curriculum prepare children for their learning in key stage 1 and into key stage 2?
- How is the knowledge that children have learnt in the early years built on as they move through KS1 and KS2?
- How have you adapted the EYFS curriculum and teaching in the early years, to reflect your school's context and address any gaps that have been identified in key stage 1 and 2?
- How do you help children to sustain periods of concentration when making?
- How do you help them to handle tools and materials effectively?

The EYFS curriculum: what we want children to learn

- The curriculum is a top-level plan of everything the early years setting wants the children to learn.
- Planning to help every child to develop their language is vital.
- The curriculum needs to be ambitious. Careful sequencing will help children to build their learning over time.
- Young children's learning is often driven by their interests. Plans need to be flexible.
- **Depth in early learning is much more important than covering lots of things in a superficial way.**

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Pedagogy: helping children to learn

- Children are powerful learners. Every child can make progress in their learning, with the right help.
- Effective pedagogy is a mix of different approaches. Children learn through play, by adults modelling, by observing each other, and through guided learning and direct teaching.
- Practitioners carefully organise enabling environments for high-quality play. Sometimes, they make time and **space available for children to invent their own play. Sometimes, they join in to sensitively support and extend children's learning.**
- Children in the early years also learn through group work, when practitioners guide their learning.
- Older children need more of this guided learning.
- A well-planned learning environment, indoors and outside, is an important aspect of pedagogy.

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The characteristics of effective teaching and learning

In planning and guiding what children learn, practitioners must reflect on the different rates at which children are developing and adjust their practice appropriately. Three characteristics of effective teaching and learning are:

- playing and exploring - children **investigate and experience things, and 'have a go'**

- active learning - children **concentrate and keep on trying if they encounter difficulties, and enjoy achievements**

- creating and thinking critically - children have and **develop their own ideas, make links between ideas, and develop strategies for doing things**

Expressive Arts and Design

This is the area of learning where DT – related aspects can really be explored. The area focuses on children's creative development and mentions the need for a wide-range of materials, tools and other resources. This provides opportunities for children's learning in DT to draw on the 'arts' when they are designing and making. It is equally important to be aware of the distinctive nature of DT so that children receive a genuine design and technological experience. For DT, the children and adult would be discussing different users, the purpose of their product and how it works. Children should be using a variety of materials and engage in imaginative role-play where they create and use indoor and outdoor environments based on the designed and made world.

How does your EYFS curriculum prepare children for DT in Key Stage 1?

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Disciplinary knowledge

‘Something for somebody for some purpose’

What is design technology?

Which of the following is a D&T activity?

Design and make…

- a model of a Viking longboat
- a portrait of Queen Elizabeth the first
- a coat to protect Teddy from the rain
- a moving vehicle to carry an egg safely across uneven ground
- a safe home for a pet animal of your choice
- an Egyptian pyramid
- a shelter for your playground to protect younger children from the sun
- refreshing drinks for your class picnic
- a volcano
- 'Incy Wincy spider'

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Disciplinary Knowledge

User – children should have a clear idea of who they are designing and making products for, considering their needs, wants, interests or preferences. The user could be themselves, an imaginary character, another person, client, consumer or a specific target audience.

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Disciplinary Knowledge

Purpose – children should know what the products they design and make are for. Each product should perform a clearly defined task that can be evaluated in use.

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Disciplinary Knowledge

Functionality – children should design and make products that function in some way to be successful. Products often combine aesthetic qualities with functional characteristics. In D&T, it is insufficient for children to design and make products which are purely aesthetic.

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Disciplinary Knowledge

Design Decisions – when designing and making, children need opportunities to make informed decisions such as selecting materials, components and techniques and deciding what form the products will take, how they will work, what task they will perform and who they are for.

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Disciplinary Knowledge

Innovation – when designing and making, children need some scope to be original with their thinking. Projects that encourage innovation lead to a range of design ideas and products being developed, characterised by engaging, open-ended starting points for children's learning.

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Disciplinary Knowledge

Authenticity – children should design and make products that are believable, real and meaningful to themselves i.e. not replicas or reproductions or models which do not provide opportunities for children to make design decisions.

Curriculum

- **There is no prescribed content - teachers select the content**
- Teachers must make **strategic decisions about what knowledge and skills are most important**
- Knowledge needs to be broken down into tangible components

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Organisation and sequence

The programmes of study state what should be taught in KS1, 2 and 3, but do not provide detail on how it should be taught.

Building on current good practice, projects should can be based on three types of activity:

Investigative and Evaluative Activities where pupils learn from a range of existing products and find out about DT in the wider world;

Focused Tasks where they are taught specific technical knowledge, designing skills and making skills;

Design, Make and Evaluate Assignment where pupils create functional products with users and purposes in mind.

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Organisation and sequence

Components are organised and sequenced to help pupils acquire knowledge and make meaning.

Broken down and isolates components to help pupils practice before adding further components (novice to expert).

Sequenced to activate **prior knowledge** and is **re-encountered** across the curriculum in different contexts.

Organised so pupils can make connections (meaning making).

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Focus on Cooking and Nutrition

Nutrition and healthy eating

Seasonality

Love of cooking

Great expressions of human creativity

Crucial life skill

Feed themselves and others affordably and well

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Need to consider:

- prior learning – including in other subjects e.g. healthy eating in PSHE
- key vocabulary
- cross curricular links

10. Investigative and Evaluative Activities (IEAs)

- Children use first hand and secondary sources to carry out relevant research into existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a local bakery, farm, farm shop or supermarket e.g. *What ingredients are sourced locally/in the UK/from overseas? What are the key ingredients needed to make a particular product? How have ingredients been processed? What is the nutritional value of a product?*
- Children carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. The ingredients could include those that could be added to a basic recipe such as herbs, spices, vegetables or cheese. These could be locally sourced, seasonal, Fair Trade or organic. Present results in e.g. tables/graphs/charts and by using evaluative writing.
- Use a range of questions to support children's ability to evaluate food ingredients and products e.g. What ingredients help to make the product spicy/crisp/crunchy etc? *What is the impact of added ingredients/finishes/ shapes on the finished product?*
- Research key chefs and how they have promoted seasonality, local produce and healthy eating.

12. Focused Tasks (FTs)

- Demonstrate how to measure out, cut, shape and combine e.g. knead, beat, rub and mix ingredients.
- Demonstrate how to use appropriate utensils and equipment that the children may use safely and hygienically.
- Techniques could be practised following a basic recipe to prepare and cook a savoury food product.
- Ask questions about which ingredients could be changed or added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance and smell.
- When using a basic dough recipe, explore making different shapes to change the appearance of the food product e.g. *Which shape is most appealing and why?*

14. Design, Make and Evaluate Assignment (DMEA)

- Develop a design brief and simple design specification with the children within a context that is authentic and meaningful. This can include design criteria relating to nutrition and healthy eating.
- Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for.
- Ask children to generate a range of ideas encouraging innovative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's product.
- Using annotated sketches, discussion and information and communication technology if appropriate, ask children to develop and communicate their ideas.
- Ask children to record the steps, equipment, utensils and ingredients for making the food product drawing on the knowledge, understanding and skills learnt through IEAs and FTs.
- Evaluate the work as it progresses and the final product against the intended purpose and user reflecting on the design specification previously agreed.

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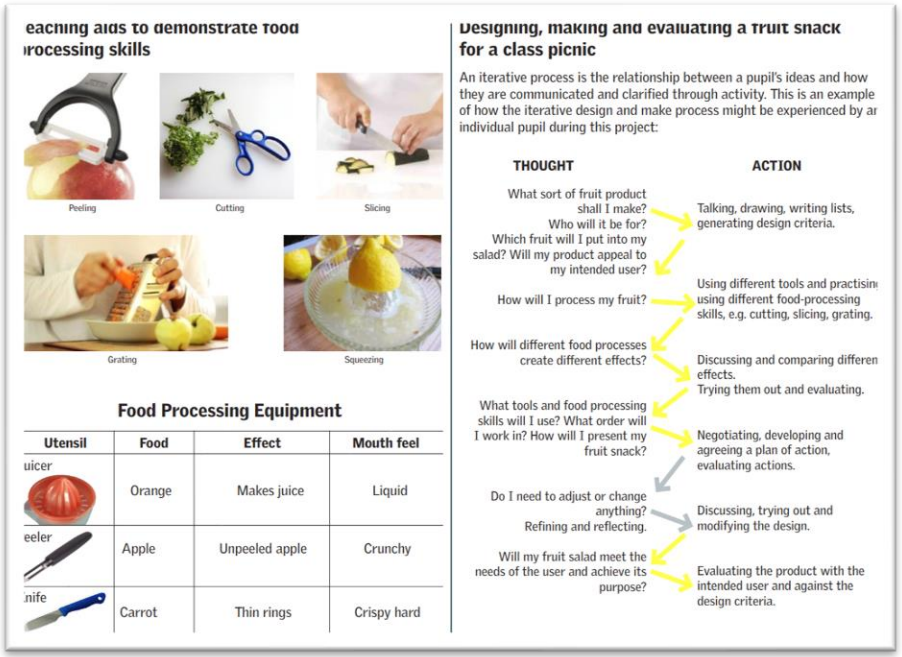


eaching aids to demonstrate food
rocessing skills

Peeling

Cutting

Slicing

Grating

Squeezing

Food Processing Equipment

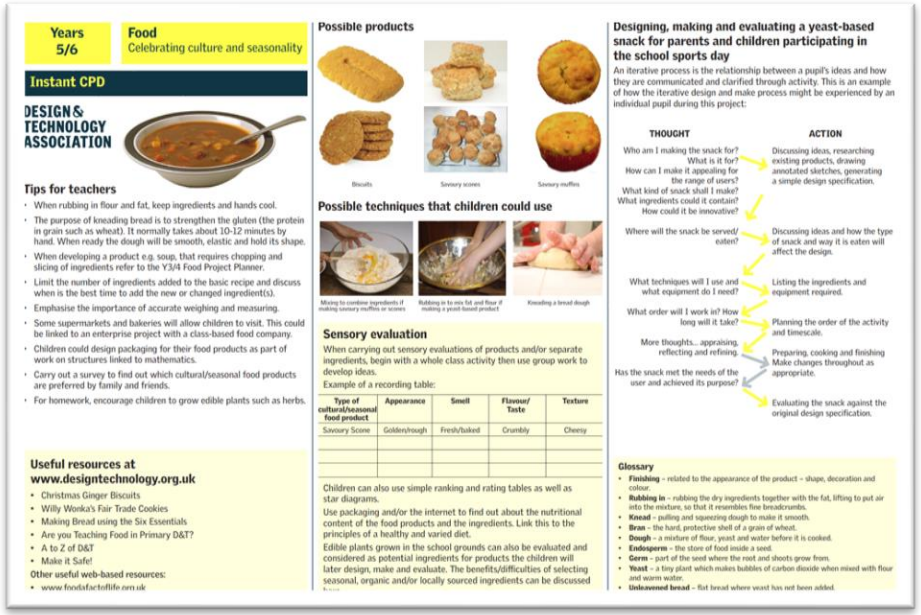
Utensil	Food	Effect	Mouth feel
uicer	Orange	Makes juice	Liquid
eeler	Apple	Unpeeled apple	Crunchy
nife	Carrot	Thin rings	Crispy hard

Designing, making and evaluating a fruit snack for a class picnic

An iterative process is the relationship between a pupil's ideas and how they are communicated and clarified through activity. This is an example of how the iterative design and make process might be experienced by ar individual pupil during this project:

THOUGHT	ACTION
What sort of fruit product shall I make? Who will it be for? Which fruit will I put into my salad? Will my product appeal to my intended user?	Talking, drawing, writing lists, generating design criteria.
How will I process my fruit?	Using different tools and practisin using different food-processing skills, e.g. cutting, slicing, grating.
How will different food processes create different effects?	Discussing and comparing differen effects. Trying them out and evaluating.
What tools and food processing skills will I use? What order will I work in? How will I present my fruit snack?	Negotiating, developing and agreeing a plan of action, evaluating actions.
Do I need to adjust or change anything? Refining and reflecting.	Discussing, trying out and modifying the design.
Will my fruit salad meet the needs of the user and achieve its purpose?	Evaluating the product with the intended user and against the design criteria.

Key Stage 1



Years 5/6

Food
Celebrating culture and seasonality

Instant CPD

DESIGN & TECHNOLOGY ASSOCIATION

Tips for teachers

- When rubbing in flour and fat, keep ingredients and hands cool.
- The purpose of kneading bread is to strengthen the gluten (the protein in grain such as wheat). It normally takes about 10-12 minutes by hand. When ready the dough will be smooth, elastic and hold its shape.
- When developing a product e.g. soup, that requires chopping and slicing of ingredients refer to the Y3/4 Food Project Planner.
- Limit the number of ingredients added to the basic recipe and discuss when is the best time to add the new or changed ingredient(s).
- Emphasise the importance of accurate weighing and measuring.
- Some supermarkets and bakeries will allow children to visit. This could be linked to an enterprise project with a class-based food company.
- Children could design packaging for their food products as part of work on structures linked to mathematics.
- Carry out a survey to find out which cultural/seasonal food products are preferred by family and friends.
- For homework, encourage children to grow edible plants such as herbs.

Useful resources at www.designtechnology.org.uk

- Christmas Ginger Biscuits
- Willy Wonka's Fair Trade Cookies
- Making Bread using the Six Essentials
- Are you Teaching Food in Primary D&T?
- A to Z of D&T
- Make it Safe!

Other useful web-based resources:

- www.foodafactoflife.org.uk

Possible products

Biscuits | Savoury scones | Savoury muffins

Possible techniques that children could use

Mixing to combine ingredients if making savoury muffins or scones | Rubbing in to mix fat and flour if making a yeast-based product | Kneading a bread dough

Sensory evaluation

When carrying out sensory evaluations of products and/or separate ingredients, begin with a whole class activity then use group work to develop ideas.

Example of a recording table:

Type of cultural/seasonal food product	Appearance	Smell	Flavour/ Taste	Texture
Savoury Scone	Golden/rough	Fresh/baked	Crumbly	Cheesy

Children can also use simple ranking and rating tables as well as star diagrams.

Use packaging and/or the internet to find out about the nutritional content of the food products and the ingredients. Link this to the principles of a healthy and varied diet.

Edible plants grown in the school grounds can also be evaluated and considered as potential ingredients for products the children will later design, make and evaluate. The benefits/difficulties of selecting seasonal, organic and/or locally sourced ingredients can be discussed

Designing, making and evaluating a yeast-based snack for parents and children participating in the school sports day

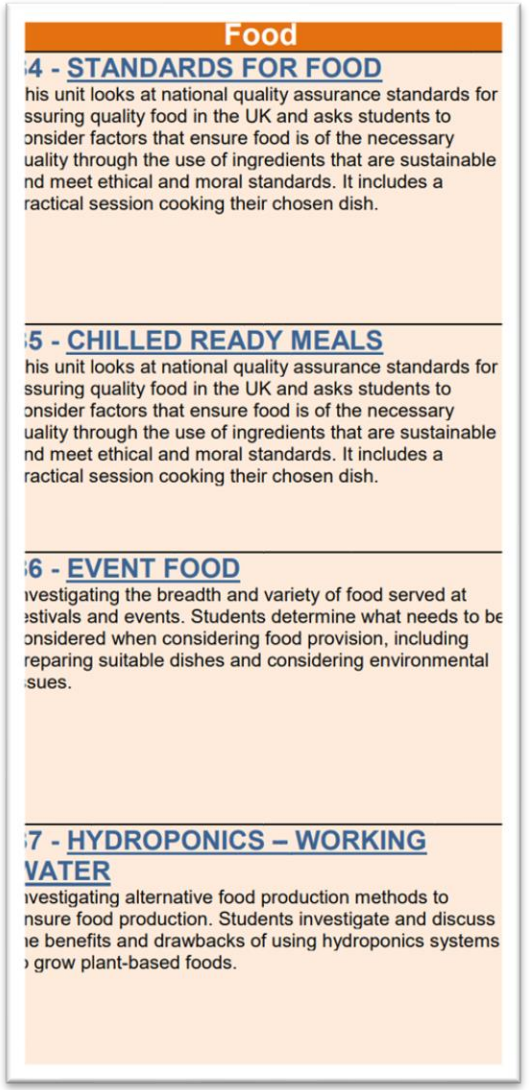
An iterative process is the relationship between a pupil's ideas and how they are communicated and clarified through activity. This is an example of how the iterative design and make process might be experienced by an individual pupil during this project:

THOUGHT	ACTION
Who am I making the snack for? What is it for? How can I make it appealing for the range of users? What kind of snack shall I make? What ingredients could it contain? How could it be innovative?	Discussing ideas, researching existing products, drawing annotated sketches, generating a simple design specification.
Where will the snack be served/ eaten?	Discussing ideas and how the type of snack and way it is eaten will affect the design.
What techniques will I use and what equipment do I need?	Listing the ingredients and equipment required.
What order will I work in? How long will it take?	Planning the order of the activity and timescale.
More thoughts... appraising, reflecting and refining.	Preparing, cooking and finishing Make changes throughout as appropriate.
Has the snack met the needs of the user and achieved its purpose?	Evaluating the snack against the original design specification.

Glossary

- **Finishing** – related to the appearance of the product – shape, decoration and colour.
- **Rubbing in** – rubbing the dry ingredients together with the fat, lifting to put air into the mixture, so that it resembles fine breadcrumbs.
- **Knead** – pulling and squeezing dough to make it smooth.
- **Bran** – the hard, protective shell of a grain of wheat.
- **Dough** – a mixture of flour, yeast and water before it is cooked.
- **Endosperm** – the store of food inside a seed.
- **Germ** – part of the seed where the root and shoots grow from.
- **Yeast** – a tiny plant which makes bubbles of carbon dioxide when mixed with flour and warm water.
- **Unleavened bread** – flat bread where yeast has not been added.

Key Stage 2



Food

4 - STANDARDS FOR FOOD

his unit looks at national quality assurance standards for ssuring quality food in the UK and asks students to onsider factors that ensure food is of the necessary uality through the use of ingredients that are sustainable nd meet ethical and moral standards. It includes a ractical session cooking their chosen dish.

5 - CHILLED READY MEALS

his unit looks at national quality assurance standards for ssuring quality food in the UK and asks students to onsider factors that ensure food is of the necessary uality through the use of ingredients that are sustainable nd meet ethical and moral standards. It includes a ractical session cooking their chosen dish.

6 - EVENT FOOD

nvestigating the breadth and variety of food served at estivals and events. Students determine what needs to be onsidered when considering food provision, including reparing suitable dishes and considering environmental ssues.

7 - HYDROPONICS – WORKING VATER

nvestigating alternative food production methods to nsure food production. Students investigate and discuss ne benefits and drawbacks of using hydroponics systems grow plant-based foods.

Key Stage 3

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SEND

- Identification of the prior knowledge needed to understand new content – ensuring readiness to learn new knowledge
- Carefully break down and chunk content – utilise scaffolds and aids to help pupils achieve complex tasks
- Focus pupils' attention on the content they need to master
- Minimilise additional distractions or considerations
- Potentially give structured or direct prompts

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SEND

Important points for planning inclusive design and technology lessons include:

- providing opportunities for learners to use all their senses
- using a wide range of activities/materials
- helping pupils to manage their behaviour by setting out clear expectations and engaging them in practical work which ensures success
- nurturing a sense of achievement
- acknowledging and celebrating even tiny steps of progress.

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Assessment

- Assessment should check that the curriculum content is remembered long term.
- It should build an understanding of pupils' prior knowledge and help to draw out common misconceptions or gaps which can be addressed in future curriculum plans.
- Timely, focused and precise feedback via questioning or examining pupils' outcomes

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Assessment

Where issues arise they are about:

- Not focusing on the subject content in a meaningful way, consider the curriular goal or content that was taught and should have been learnt e.g. focusing on effort
- Not fit for purpose: does not identify what pupils know or gaps or misconceptions

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Progression

Pupils need to learn the intended curriculum

To ensure they:

- have a secure knowledge
- are fluent
- are able to experiment
- can communicate authentic ideas

All pupils should be able to engage in process of invention, creation and experimentation

Health, safety and hygiene

The National Curriculum programmes of study **do not** include references to safety and hygiene.

- Schools should ensure that practice in the subject is healthy, safe and hygienic.
- Children should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task.
- Risk assessments should be carried out prior to undertaking D&T projects. In food technology identify whether there are any children who are not permitted to taste or handle any food ingredients or products.

‘Make it Safe! - Health and Safety guidance for the teaching of Design and Technology in primary schools’ D&T Association

BS 4163:2021 Health and safety for design and technology in educational and similar establishments - code of practice (+A1:2022) British Standards Institution

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Culture

- How is the subject enriched?
- How do you make design and technology relevant to pupils?
- Do you make links to the world of work and careers?
- How do teachers demonstrate their love for the subject
- Do you have high expectations?
- How is design and technology viewed in school?

Monitoring and evaluating

Things to think about:

- Work scrutiny evidences the impact of the curriculum on pupils' learning
- Lesson visits – focus on implementation
- It indicates whether pupils are learning and remembering long term what intend pupils to learn and remember
- Long term memory change is what is being looked for in impact
- Discussion with pupils evidences impact on knowledge retention

Knowing more and remembering more

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Things to consider…

- How knowledgeable and confident are your staff?
- How do you plan CPD to meet their needs?
- Is your subject well-resourced?
- How do you utilise local industries, designers and makers?

Things to think about…

- How does your school ensure the design and technology curriculum is coherent, sequenced and builds on prior knowledge and skills?
- How does your school ensure the curriculum is inclusive and accessible to all children, including those with special educational needs and disabilities (SEND) and disadvantaged pupils?
- How does your school assess children's knowledge, skills and understanding of design and technology?
- How do teachers use assessment information to plan and adapt their teaching?
- How does your school ensure that the assessment of design and technology is accurate and reliable?
- How does your school ensure that teaching is of a high quality and meets the needs of all children?

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Things to think about…

- What are the gaps in your design and technology curriculum?
- How do teachers address misconceptions?
- Can you show evidence in children's books of how the concept of design is taught over time?
- How is key design and technology vocabulary taught across the school?
- How is your design and technology curriculum organised?
- How is your design and technology curriculum assessed?
- How do you monitor the quality of design and technology across the curriculum?
- What would you like to improve in the design and technology curriculum?

Resources

Design & Technology Association
https://www.designtechnology.org.uk/

DESIGN & TECHNOLOGY ASSOCIATION

The Design and Technology Association

Established in 1989
www.data.org.uk

01789 470007
info@data.org.uk
@DTassoc
@DandTAssociation

About us

Design & technology is the future. Simple as that. That's why it needs to be prized, promoted and protected. Put right at the top of the education agenda, attracting the brightest young minds.

As the wellspring of innovation, the health of the UK economy depends on design & technology. So, it's time for teachers, policymakers, and influencers to recognise how much design & technology matters. And to act on it.

The Design & Technology Association is here to make sure this happens. To focus minds, challenge perceptions and raise the bar. To get future generations fired up about design, engineering and technology. To provide advice, support and training for teachers, helping them make the subject as exciting, appealing and accessible as possible to young people from all backgrounds and walks of life.

Because understanding how things are made and work is fundamental to new ideas and creative thinking. And these are the keys to improving the world around us.

Who do we support?

We support head teachers, D&T subject leaders and teachers at all levels and phases of education from primary through to A Level and beyond.

Looking after you!

- Effectively engage schools with industry via our Blueprint 1000 initiative. Take part in inspiring industry-based projects
- Glossy magazines for primary and secondary teachers
- Classroom posters to encourage option choices and career paths
- Classroom teaching resources, advice & guidance for teachers
- Videos to promote and help deliver the subject effectively
- Online community for networking
- Advocacy and lobbying for the subject at senior level.

How much does it cost?*

Recommended Best value

- Primary school + Projects on a Page - **£139**
- Secondary Departmental Partnership - **reduced to £195**

However, two-Year school, Individual, ECT, and basic for primary and secondary schools is available should they suit your needs better

*prices and packages are subject to change

Membership includes*

- Curriculum Toolkit for all new members
- Glossy magazines for primary and secondary teachers - including 'Designing' magazine celebrating excellence in design - hard copies and online versions
- Digital D&T Practice launching in 2022 alongside the current pdf's and hard copies
- Advice and support from D&T curriculum and education experts
- D&T Self-Review framework
- Design and Technology Mark of Excellence
- Free and discounted CPD session and teaching resources for members
- Monthly E-newsletter
- Access to member only video content on D&TTV.

Prices and packages are subject to change from 2022

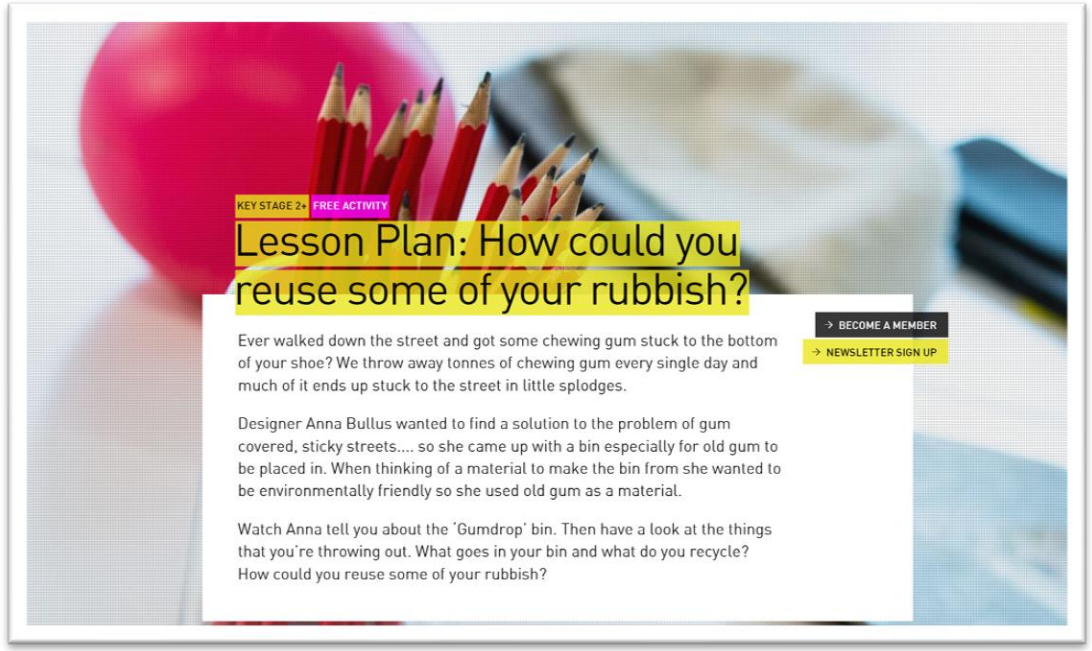
Want to know more?
Click here to visit the website

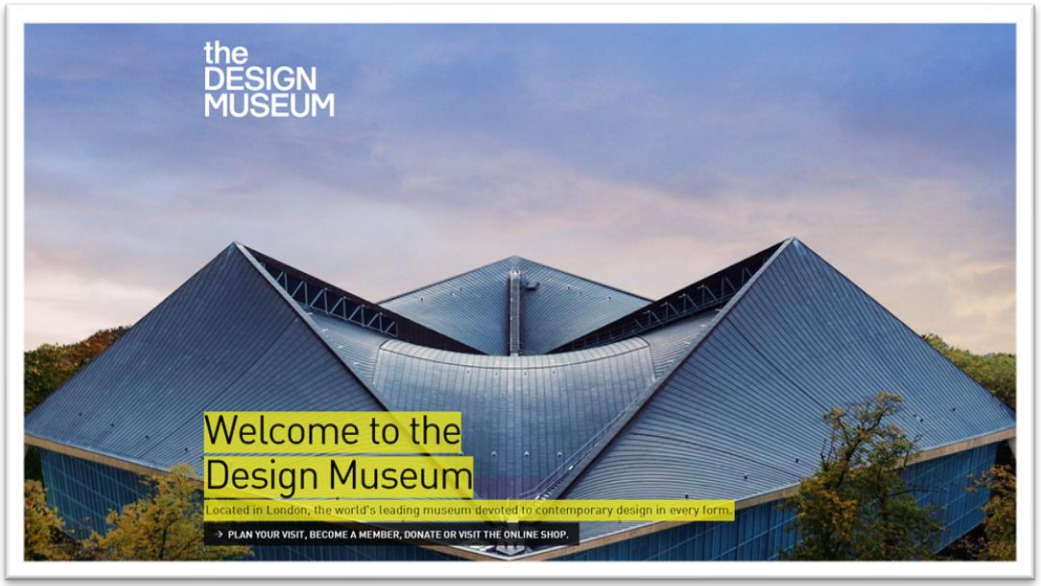
subjectassociations.org.uk

Design & Technology

13

Resources





The Design Museum

https://designmuseum.org/the-design-museum-campus/schools-and-colleges

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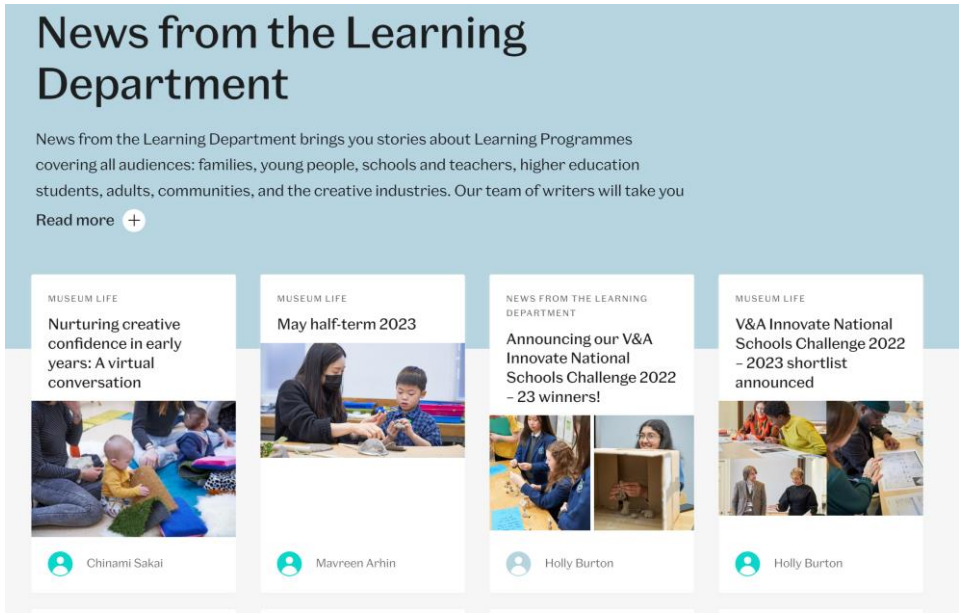
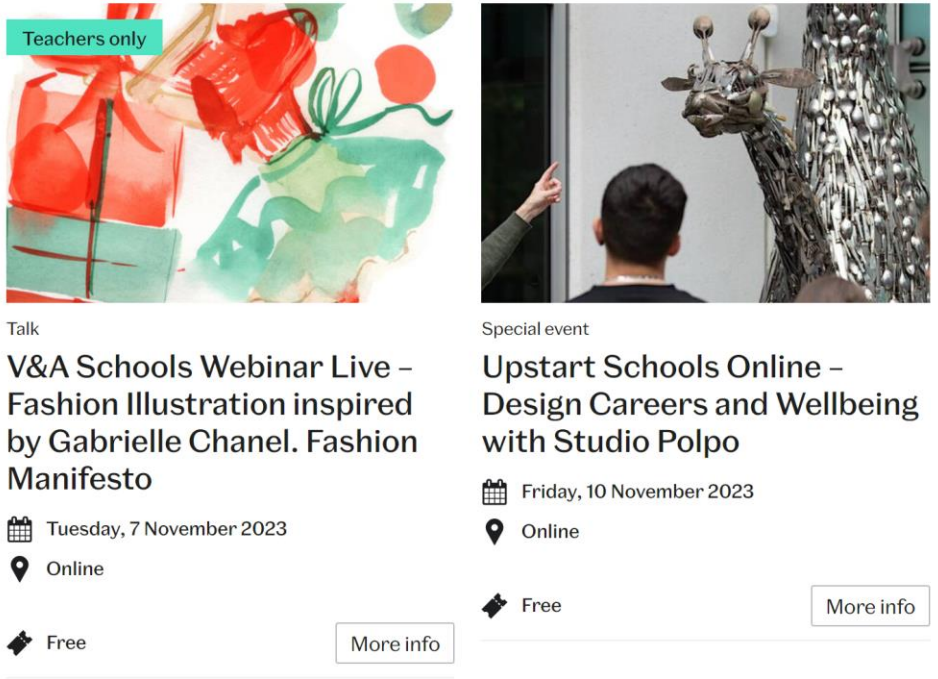
Resources





V&A

[Schools · V&A (vam.ac.uk)]

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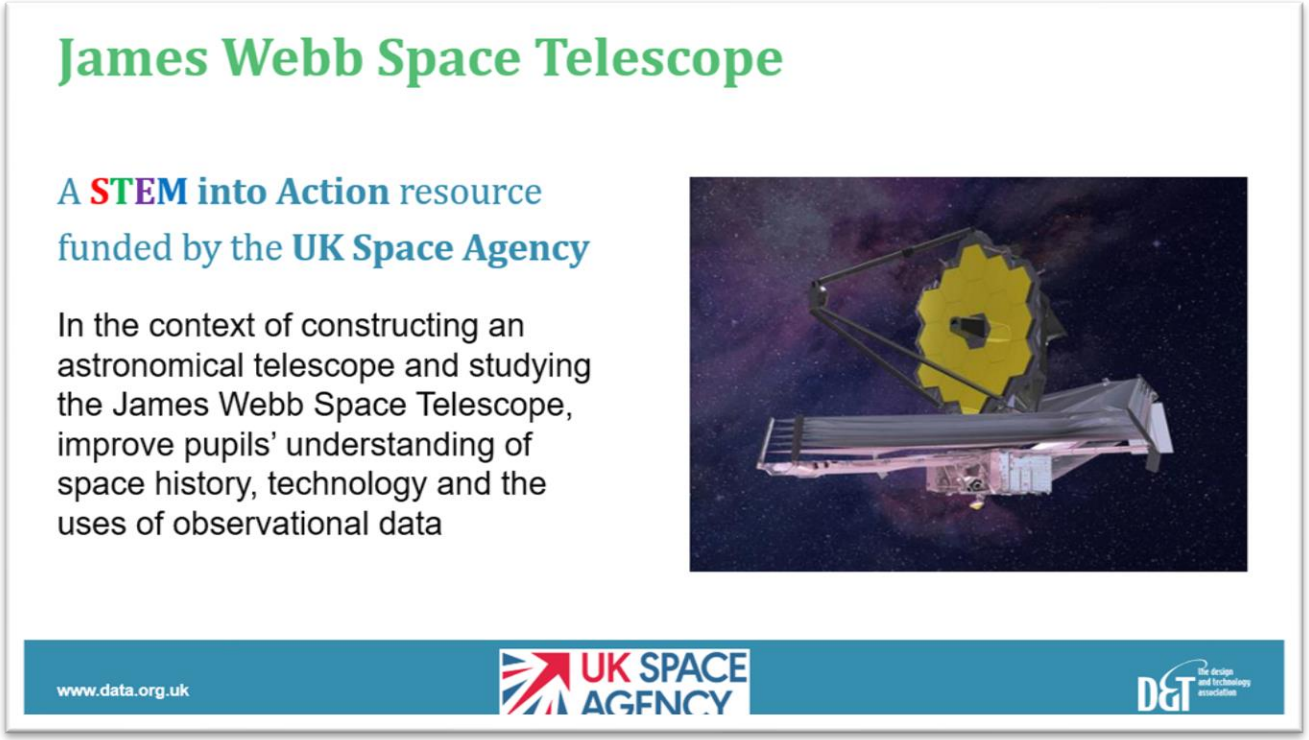
Resources



https://www.stem.org.uk/

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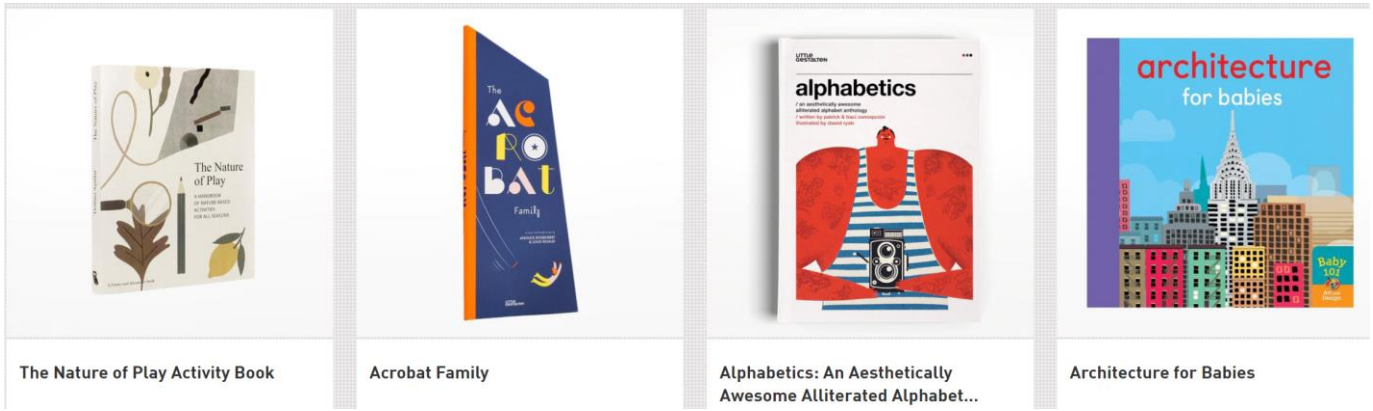
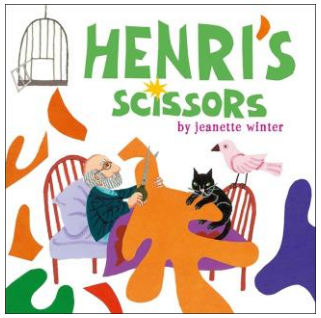
Resources

Books





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What is it like on a day to day basis for pupils in your school?