DESIGN AND TECHNOLOGY

In Design and Technology (DT) we learn about the design and development of products.

Design and Technology at Defford
Our Vision
Our Intent

Faith	Friendship	Fun	Learn	Grow
• Appreciate the skills and work behind objects in the man-made world • Develop confidence in your ability to design products and create products that meet a brief	• To critically evaluate products of others to help them to improve • To collaborate on design and technology projects	• To develop a passion for creating objects that successfully meet the needs of a brief • To enjoy the process of designing and constructing	• Design skills • Technical design and making skills • Which tools and materials are best suited to different tasks	• Develop skills to improve the quality of products • Develop evaluative skills to aid self-improvement of designing and making

Design and Technology Curriculum Threads

Design	Make	Evaluate	Tools and equipment
Pupils will learn to research and design purposeful, functional and appealing products based on a set criteria. Share ideas through talking, drawing, annotated sketches, templates, mock-ups and the use of computers.	Select from a range of materials and use tools to create a product. Ensure the make follows the brief provided and any design/instructions that are available.	Investigate and analyse a range of existing products Consider existing products both made by the individual and by others and their success against design criteria.	Select and use a range of tools and equipment to perform practical tasks(such as cutting, shaping, joining and finishing) accurately Learn how to safely use tools and equipment. Learn how to create and use simple mechanical systems.

AREA OF LEARNING – YEAR A – BIRCH CLASS – AUTUMN TERM – HEROES/ FIRE FIRE

KNOWLEDGE

How a wheel turns, turning an axle that it is attached to.

Name the components of a wheel

Name the parts of the focus vehicle eg car/ skateboard

Skye Brown is a teenage skateboarder who became famous in the 2021 Olympics.

Tudor houses – designed and decorating box to fit the design adding key features of a Tudor house

(LL) Sewing – reindeer faces. How to use needle and thread to sew an image. Using different colored thread in different positions to create a picture.

VOCABULARY

Wheel – a circle that moves on an axle, normally below a vehicle to allow it to move easily over the ground.

Axle – a rod or spindle passing through the centre of a wheel or group of wheels.

Chassis – the base frame of a car, carriage or other wheeled vehicle.

Design – draw a picture to show what you intend to create. This may include additional details about materials, how it is fixed together etc.

Needle

Thread

Eye – of a needle

UNDERSTANDING

That in Design and Technology we work through a series of steps to create a product.

PLAN

DESIGN

(LL) MAKE

ADAPT

EVALUATE

That a design is an intention, the finished product is likely to be different but that the process matters.

Evaluation can often be helped by thinking, if I did this again, what would I do differently?

SKILLS

Measuring accurately to the nearest cm.

(LL) Cutting accurately having used measurements.

Follow their designs – refer to designs whilst producing a product.

Adapt their designs as it is needed

Overcome problems – understand the nature of a problem, how can I now try to get passed this?

AREA OF LEARNING – YEAR A – BIRCH CLASS – SUMMER TERM – AWESOME ANIMALS / I DO LIKE TO BE BESIDE THE SEASIDE

KNOWLEDGE

Sewing (LL) puppets -Animals

What is a puppet?

Different materials are suitable for different jobs.

There are different ways to join materials.

How to sew with a needle and thread.

Cooking and nutrition. Seaside picnic

Identify healthy/ unhealthy food.

How to design a healthy sandwich/ picnic options.

VOCABULARY

Puppet

Materials

Needle

Thread

Design/ pattern

Prototype

Decorate

Healthy / unhealthy

UNDERSTANDING

Identify how puppets work, what their purpose is and how they have been made.

Select suitable materials for the purpose.

Select the most effective way to join the materials

Select from a range of ingredients to create a balanced lunch.

How to select and use a range of tools to do simple cutting of food products.

Different people like different foods.

SKILLS

Examine a range of puppets and identify common features.

Investigate ways of joining different materials

Measure out a pattern accurately.

Join two pieces of materials by sewing a simple stitch

Cutting accurately having used measurements.

Follow their designs – refer to designs whilst producing a product.

Adapt their designs as it is needed

Overcome problems – understand the nature of a problem, how to fix it.

Evaluate the product and compare to specifications

Using cutting implements

Group work

Through faith, friendship and fun we learn and grow.

AREA OF LEARNING – YEAR B – BIRCH CLASS – AUTUMN TERM – OUT OF THIS WORLD/ TIME TRAVELLERS

KNOWLEDGE

Textiles- Xmas dec

Explore a range of products- Christmas decorations

Recognise properties of materials and choose suitable materials

A 3-D textiles product can be assembled from two identical fabric shapes

Think about the purpose of the product

VOCABULARY

Scissors, shears, felt, cotton, template, pattern pieces, mark out, join, decorate, finish, features, suitable, quality mock-up, design brief, design criteria, make, evaluate, user, purpose, function, identical, front, back

UNDERSTANDING

Use design criteria to help develop ideas.

Model ideas by making mock ups

Use correct vocab during the project

SKILLS

- Thread a needle
- measure, mark out, cut and shape materials and components
- Join materials together using different techniques.
- Generate ideas
- use finishing techniques, including those from art and design
- Evaluate their finished product

AREA OF LEARNING – YEAR B – BIRCH CLASS – SPRING TERM – TOPICS/THEME

KNOWLEDGE

(LL) **Sliders and levers**

Use paper and card to make simple flaps and hinges.

Use knowledge of existing products to help come up with ideas

How to create a slider.

How to create a lever

Say how they will make their products suitable for their uses

VOCABULARY

Slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards, backwards , design, make, evaluate, user, purpose, ideas, design criteria, product, function

UNDERSTANDING

- Explain what they like and dislike about a product
- Explore and evaluate products
- Select materials according to their characteristics
- Select tools and equipments ex plaining their choices
- Suggest how their products could be improved
- Compare product to the design criteria

SKILLS

- measure, mark out, cut and shape materials and components
- assemble, join and combine materials and components about the movement of simple mechanis ms such as levers, sliders, wheels and axles
- Experience of simp le cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape

AREA OF LEARNING – YEAR B – BIRCH CLASS – SUMMER TERM – EARTH CARETAKERS/ A LONG WAY FROM HOME

KNOWLEDGE

Cooking and nutrition.

Identify healthy/ unhealthy food.

How to design a healthy snack for a journey.

Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell.

All foods come from plants and animals.

Food is either grown, farmed or caught.

Everyone should eat at least five portions of fruit and vegetables every day

VOCABULARY

Healthy

Unhealthy

Different fruit and vegetable names

Fruit and vegetable names, names of equipment and utensils, sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard, flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria

UNDERSTANDING

Select from a range of ingredients to create a balanced snack.

How to select and use a range of tools to do simple cutting of food products.

Different people like different foods.

Good to try new things

Food ingredients should be combined according to their sensory characteristics

Follow health and hygiene procedures

SKILLS

Experience of cutting soft fruit and vegetables using appropriate utensils.

How to prepare simple dishes safely and hygienically, without using a heat source how to use techniques such as cutting, peeling and grating

Through faith, friendship and fun we learn and grow.

AREA OF LEARNING – YEAR A – OAK CLASS – AUTUMN TERM – MEET THE ROMANS & ANGRY EARTH

KNOWLEDGE

Structures: Shell Structures



Develop and use knowledge of how to construct strong, stiff shell structures.

Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.

Know and use technical vocabulary relevant to the project.

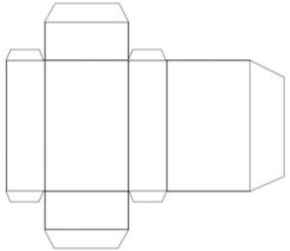
VOCABULARY

shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity

marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating

font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype

Consumer – a customer/user of a product



UNDERSTANDING

To understand
that shell structures are usually made from thin, sheet material.

That they are often made from 'nets'.

The reasons why materials have been chosen.
Science

The need for products to be evaluated in terms of how well they work and meet user needs and wants.

SKILLS

problem-solving

teamwork negotiation

consumer awareness

organisation of tools and equipment

motivation

persuasion

leadership

perseverance

Measuring accurately to the nearest cm.

Accurate cutting

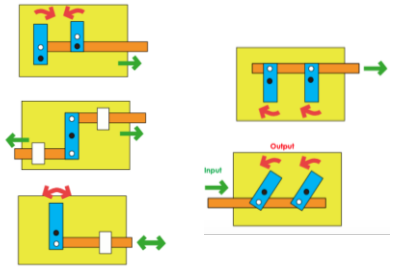
Through faith, friendship and fun we learn and grow.

AREA OF LEARNING – YEAR A – OAK CLASS – SPRING TERM – WHO WERE THE ANGLO SAXONS? AND WILD

KNOWLEDGE

Mechanisms: Levers and Linkages

- Distinguish between fixed and loose pivots.
- Know and use technical vocabulary relevant to the project.



VOCABULARY

mechanism, lever, linkage, pivot, slot, bridge, guide

system, input, process, output

linear, rotary, oscillating, reciprocating

user, purpose, function

prototype, design criteria, innovative, appealing, design brief

UNDERSTANDING

Children gain an understanding of linkage-type mechanisms through investigating a range of products *eg books or greetings cards*. Through focused practical tasks, children develop further skills and understanding relating to the construction and assembly of a range of simple mechanisms that can be incorporated into a book with moving parts.

Be able to use ideas gained from investigating a variety of products and will have increased their repertoire of skills and techniques; have suggested a way of working and produced a page of a book incorporating one type of movement

Have produced step-by-step plans for the production of their chosen designs; have combined several types of mechanisms within their book pages; have evaluated their ideas systematically and made on-going modifications; have created a product that functions well and is visually effective

SKILLS

Use tools safely to design and incorporate levers and linkages, for a product finished to a high standard.

Develop skills in making a range of simple mechanisms;

Develop their ability to work in groups as they make decisions about the book and share out tasks.

Can evaluate, in use, both their own and others' products and made on-going modifications.

Through faith, friendship and fun we learn and grow.

AREA OF LEARNING – YEAR A – OAK CLASS – SUMMER TERM – VIKING RAIDERS & OUR UNITED KINGDOM

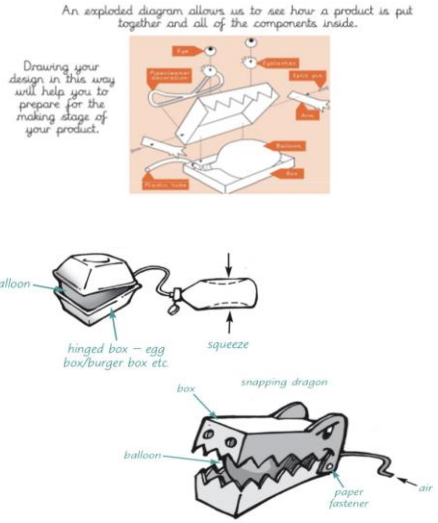
KNOWLEDGE

Mechanisms: Pneumatics

Know and use technical vocabulary relevant to the project.

A pneumatic system is a mechanism that runs on air.

An exploded diagram allows us to see how a product is put together and all of the components inside.



VOCABULARY

components, fixing, attaching, tubing, syringe, plunger, split pin, paper fastener

pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight

linear, rotary, oscillating, reciprocating

user, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate

UNDERSTANDING

Understand and use pneumatic mechanisms.

- That designs need to be realistic and appropriate and generate their own design criteria through discussion, focusing on the needs of the user.
- The importance of annotated sketches and prototypes to develop, model and communicate ideas.
- Understand that air is used to help some mechanisms move.
- To understand how a pneumatic system works to make something move.

SKILLS

To follow a design to make a moving monster using pneumatic system.

To successfully assemble a pneumatic system.

Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.

Select from and use finishing techniques suitable for the product they are creating.

Evaluate the product and their ideas against criteria and user needs, during the design and make process.

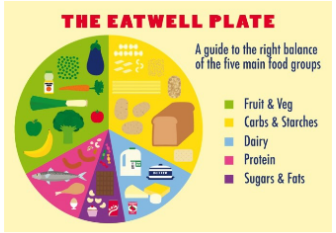
Through faith, friendship and fun we learn and grow.

AREA OF LEARNING – YEAR B – OAK CLASS – AUTUMN TERM – STEP BACK IN TIME

KNOWLEDGE

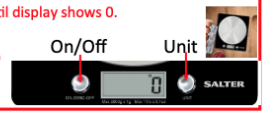
To choose ingredients from all 5 food groups (Eatwell plate) to design a healthy pizza:

Fruit and vegetables
Carbohydrates
Protein
Dairy
Fats (including oils and sugar)



How to measure accurately using an electronic scale: Put empty bowl on scales, turn on and ensure they are on zero, if not press on/off button again. Wait until display shows 0.

To switch between **units** tap **unit** to scroll through.



How to make pizza dough: **Combine ingredients**, **knead** dough **'heel, flip, turn'** method, **roll** dough to shape using **rolling pin**.

How to roll dough: Using a floured work surface, apply pressure with rolling pin to the dough mixture and roll away from you, rotate dough and repeat until you have reached desired shape/thickness.

How to **bake** using an **oven**—plug in, switch plug on, preheat the oven by selecting correct temperature by turning the dial and the time required - ***timer must be on for oven to heat up***.

How to use an **oven safely** with **high temperature**—use **oven gloves** to open oven and stand back to allow any steam to escape, use oven gloves with both hands when handling hot tray and use **cooling rack** next to the oven (on the same work surface) to cool tray - leave for at least 10 minutes. Turn oven off by turning timer dial to 0 and switch the plug off at the mains.

VOCABULARY

Word	Definition
Rolling pin	A hard, smooth cylinder of wood or marble with handles at each end. It is used to roll out dough.
Oven gloves	A padded glove or mitten used to handle cooking utensils and dishes when they are too hot to touch with bare hands; oven mitt.
Bridge hold	Cutting technique whereby one hand is used to make a bridge over the vegetable or fruit with fingers on one side and thumb on the other.
Dough	A thick mixture of flour and a liquid such as water or milk that is prepared for baking into bread or cake.
Knead	To work and press dough with the palms of the hands or mechanically, to develop the gluten in the flour.
Roll	Applying pressure to dough using a rolling pin to flatten dough and make it even in thickness.
Cooling rack	A kitchen tool used to allow various cooked items such as breads, cakes, meats etc. to be placed and cooled or rested immediately after the cooking process.
Bake	To cook by dry heat, usually in the oven.
Pinch	A pinch is the trifling amount you can hold between your thumb and forefinger.
Combine	To bring or join together into a whole.
tsp	Teaspoon.
tbsp.	Tablespoon.

UNDERSTANDING

To understand that some foods are healthier than others.

To understand that choosing ingredients from all 5 food groups will produce a healthy meal.

To understand that food packaging can be misleading – some snack foods claim to be healthy which can be misleading.

To understand that some foods are allergic to some people.

Healthy pizza design:

Pizzas baking in the oven:

SKILLS

To **chop, peel and grate** vegetables safely using the most appropriate techniques to attain my cookery skills **grade one certificate**.

Bridge hold

To **chop** using the **'bridge hold'**— Using one hand, make a **bridge** over the vegetable or fruit with fingers on one side and thumb on the other, cut down under the 'bridge'.

'Knife goes under the bridge, through the tunnel, then chops down'.

Claw—tucking in thumb

To **chop** safely— using the claw - tucking in thumb or fork hold techniques.

Fork hold

Grate

To **grate** safely using a grater— grate away from self, grater positioned downwards against chopping board.

Peel

To **peel** safely using a peeler— peel away from self, peel middle of vegetable, rotate vegetable.

To **measure** accurately using both: **Measuring jug** (ml) - fill liquid until it reaches required amount looking at the line carefully, pour some away if there is too much. And **electronic scale** (g).

Knead

To **knead** dough— using the **'heel, flip, turn'** method.

Roll

To **roll** dough— using a rolling pin and regularly applying flour to avoid dough sticking to surface and rolling pin.

Oven

Bake using a hot oven and handle a **hot baking tray** safely wearing **oven gloves**.

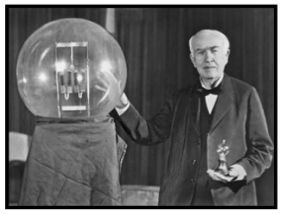
Oven gloves

Through faith, friendship and fun we learn and grow.

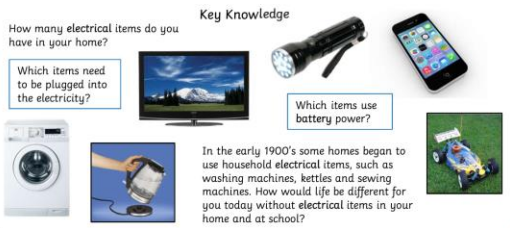
AREA OF LEARNING – YEAR B – OAK CLASS – SPRING TERM 2 – IRON GIANTS (Electrical Systems)

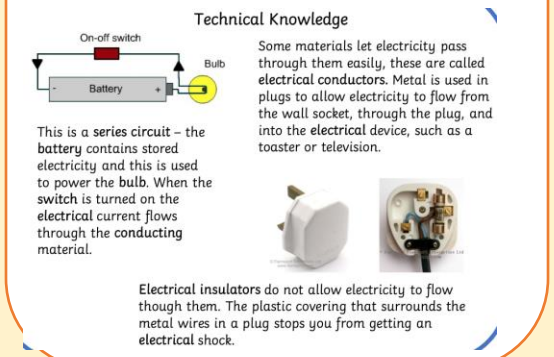
KNOWLEDGE

Thomas Edison



Thomas Edison was an American inventor who transformed the world with inventions including the lightbulb. In January 1869 Edison resigned from his job, intending to devote himself full time to inventing things. In 1879, after considerable experimentation and based on 70 years work of several other inventors, Edison invented a carbon filament that would burn for 40 hours—the first practical lightbulb.





VOCABULARY

Electricity - A type of energy, that is usually invisible, that can be made or stored and used to make objects work (for example to move things or heat them up)

Electrical – an item that uses electricity to work.

Conductor – a material that allows electricity to flow through it, e.g. metal

Insulator – a material that does not allow electricity to flow through it. e.g.plastic.

Battery / Cell – a cell that provides electrical energy to power a circuit.

Bulb – part of the circuit, made from plastic or glass, that gives out light when electricity passes through it.

Switch – part of the circuit that can be opened or closed to allow electricity flow.

Series circuit – a circuit where the electricity flows along one path.

Test - to find out whether something works as it should.

Torch - A battery-powered electric lamp.

Wire – A thin piece of copper thread which conducts electricity to connect circuit components together.

UNDERSTANDING

Children should be able to discuss the intended user for the product and its purpose and appeal.

To understand the dangers of mains electricity.

Understand and use electrical systems in their products such as series circuits incorporating switches, bulbs and buzzers

Apply their understanding of computing to program and control their products.

Understand the need to develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups.

SKILLS

Discuss ideas, modeling possible electrical circuits.

Draw annotated sketches, cross-sectional and exploded diagrams, generating design criteria.

Discuss, explore and trial materials.

Negotiating, developing and agreeing a plan of action.

Appraise, reflect, refine and evaluate the product with the intended user and against design criteria.

Through faith, friendship and fun we learn and grow.

AREA OF LEARNING – YEAR B – OAK CLASS – SUMMER TERM 1 – HAPPY ENDINGS 2D Shape to 3D Product

KNOWLEDGE

Know how to work safely using tools, equipment, materials, components and techniques appropriate to the task.

Select fabrics and fastenings according to their functional characteristics e.g. strength and aesthetic qualities e.g. pattern.

VOCABULARY

Fabric

Names of fabrics

Fastening

Compartment

Zip

Button

Structure

Finishing technique

Strength

Weakness

Stiffening

Templates

Stitch

Seam

Seam allowance

UNDERSTANDING

Children should be able to discuss the intended user for the product and its purpose and appeal.

Understand the need for a plan which shows the main stages of making e.g. a flowchart or storyboard.

Understand the need for patterns and seam allowances.

Understand how to securely join two pieces of fabric together.

Children should understand the need for a quality finish of their product.

Children should be able to evaluate the final product in relation to the design brief and criteria.

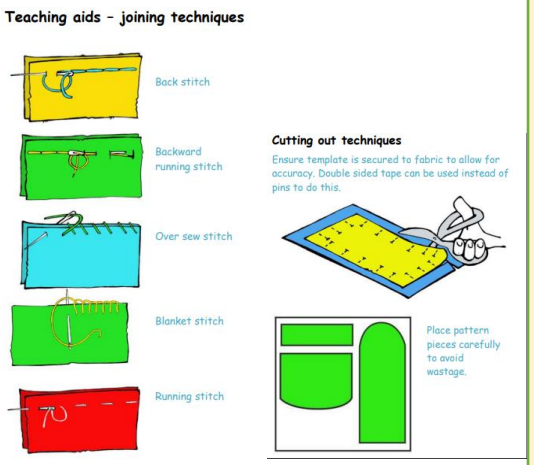
SKILLS

Work safely using tools, equipment, materials, components and techniques appropriate to the task.

Sketch and annotate their ideas, thinking creatively.

Strengthening, stiffening and joining techniques.

Assemble their product – securely join two pieces of fabric together.



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