

Design & Technology

At Norton Community Primary School

Through our D&T curriculum, children are inspired and motivated to create a range of structures and products with a real-life purpose. The process of research, design, make, evaluate is embedded throughout all D&T lessons. We encourage children to use their creativity and imagination whilst taking inspiration from existing products, in order to design and make products that are purposeful and appealing. Evaluation is an integral part of the design process and allows them to adapt and improve their product. This encourages them to be self-critical and improves their ability to problem-solve. In our on-site community kitchen, pupils gain an understanding of the importance of a healthy and varied diet. Through practical cookery lessons, we instil a love of cooking in pupils which is a crucial life skill for life.

Contents

EYFS	2
YEAR ONE	2
Y1 – SANDWICH MAKING	4
Y1 – PAPER TOYS	4
Y1 – MOVING PICTURES	5
YEAR TWO	6
Y2 – RAINBOW COUS COUS SALAD	6
Y2 – MOVING VEHICLES	6
Y2 – SEWING ANIMAL DECORATION	7
YEAR THREE	8
Y3 – APPLE CRUMBLE	8
Y3 – GREETINGS CARD (CHRISTMAS OR OTHER CELEBRATION)	8
Y3 – PICTURE FRAME	9
YEAR FOUR	10
Y4 – HEALTHY BACON BREAD LOAF	10
Y4 – CHRISTMAS DECORATION	10
Y4 – LIGHT UP SIGNS	11
YEAR FIVE	12
Y5 – VEGETABLE PIZZA	12
Y5 – CUSHION COVER	12
Y5 – CAM MECHANISM	13
YEAR SIX	14
Y6 – BURGER AND BREAD BUNS	14
Y6 – WIRE BUZZER TOY	14
Y6 – BIRD HOUSE	15

Curriculum link

PSED

Physical Development – Fine Motor Skills

Understanding the World

Communication and Language

Key Essential Skills and Knowledge

FS1

- Explore different materials freely, in order to develop their ideas about how to use them and what to make.
- Develop their own ideas and then decide which materials to use to express them.
- Join different materials and explore different textures.

FS2

- Return to and build on their previous learning, refining ideas and developing their ability to represent them.
- Create collaboratively, sharing ideas, resources and skills.

ELG

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
- Share their creations, explaining the process they have used.
- Make use of props and materials when role playing characters in narratives and stories.

Key Vocabulary

Materials, Explore, Make, Design, Join, Texture, Build, Create, Collaborate, Tools, Experiment, Function, Form, Share.

Year One

Y1 – Sandwich making

Content/ideas

Children will learn to make a sandwich safely and hygienically. They will learn to cut, grate and peel ingredients.

Key skills and knowledge

Design a sandwich with themselves in mind.

Children are able to cut, peel and grate ingredients as appropriate.

Use a knife safely.

Use basic hygiene (wash hands before, keep hands away from their mouth and have long hair tied back).

Key vocabulary

Cut, peel, grate, safe, hygiene.

Teaching Activities

– see Warburtons sandwich making folder with downloads and video.

1. Discuss different sandwiches (fillings and breads).
2. Taste different ones and discuss their likes and dislikes.
3. Design their own sandwich, choosing bread type and fillings.
4. Make their own sandwich safely and hygienically. Cut, peel and grate ingredients.
5. Review their sandwich.

Books/resources

- <https://www.warburtons.co.uk/our-company/sustainability/teaching-resources/sandwich-making-project/>
- <https://www.foodafactoflife.org.uk/>

Sticky Knowledge

Know that ingredients can be cut, grated and peeled.

Y1 – Paper toys

Content/ideas

Children will explore and practise their cutting and shaping skills and techniques. They will also learn about Ole Kirk Christiansen in this unit.

Key vocabulary

Tear, cut, fold, curl.

Key skills and knowledge

Design their product with a clear purpose

Children can tear, cut, fold, curl paper.

They can use scissors to cut and shape paper.

They can use scissors safely (including carrying safely).

Teaching Activities

1. Learn about Ole Kirk Christiansen. Play with Lego and think about the properties of plastic that make it such a good design.
2. Develop cutting skills and scissor safety. Explore different cutting patterns (straight lines, wavy, zig zag) on the scissor cutting skills sheets. Use these skills to cut out a range of shapes to create a picture.
3. Develop paper folding skills.
4. Children look at a selection of different paper toys and discuss both how they work and how they can be made.
5. Design their own paper toy, taking inspiration from the ones they explored.

6. Make the toy using the cutting and folding skills they developed.
7. Review.

Sticky Knowledge

Ole Kirk Christiansen invented Lego in 1932. It was made out of plastic.

Y1 – Moving pictures

Content/ideas

Children will learn to create a sliding mechanism. They will cut carefully and attach the pieces of the mechanism firmly.

Key vocabulary

Cut, slider, lever, join, strengthen.

Key skills and knowledge

Children can cut carefully using scissors and explain why this is important.

Children understand that there are different ways to strengthen their products.

They understand there are a range of joining strategies.

Identify features that can be improved.

Teaching Activities

1. Explore a range of books with levers and sliders in them.
2. Learn how to cut a slit through card for the picture to move. Join a picture onto a lever.
3. Children to make mock-ups using templates to help them.
4. Design product, thinking about the intended audience.
5. Make the moving picture.
6. Review.

Books/resources

- Explore a range of books with levers and sliders.
- Izzy Gizmo and the Invention Convention

Sticky Knowledge

Sliders and levels can be used to create moving pictures.

Year Two

Y2 – Rainbow cous cous salad

Content/ideas

Children will learn to make a cous cous safely and hygienically, developing their knowledge of where the food comes from. They will select their own ingredients and learn to cut, grate and peel them.

Key skills and knowledge

Children can suggest ingredients which can be cut, peeled and grated.

Understand safety involved with boiling water.

Use basic hygiene (wash hands before, keep hands away from their mouth and have long hair tied back).

Key vocabulary

Cut, peel, grate, safe, hygiene.

Teaching Activities

1. Discuss healthy eating and the importance of a varied diet (science link).
2. Sample ingredients, discuss where they come from and their likes and dislikes.
3. Design their own cous cous salad with their choice of vegetables.
4. Make their cous cous safely and hygienically. Cut, peel and grate ingredients.
5. Review their cous cous.

Books/resources

- <https://www.foodafactoflife.org.uk/> go on 5 – 7 years, then where food comes from.

Y2 – Moving vehicles

Content/ideas

Children will learn about Alec Issigonis (1906 – 1988) who was a British - Greek automotive designer. They will learn about wheels and axles to create their own moving vehicle.

Key vocabulary

Wheel, axle, shape, join, finish, strengthen, software.

Key skills and knowledge

Children have a knowledge of how wheels and axles work.

They can shape, join, finish, and strengthen their product.

Children understand that in workplaces ICT is used for product design.

Identify features that need refining.

Teaching Activities

1. Learn about Alec Issigonis (1906 – 1988).
2. Play with toy cars. Children to observe how they move and how they have been created.
3. Research vehicles. How does their design make them fit for purpose? E.g. ambulance has a big area in the back to treat casualties, pick up has an open back for carrying goods etc.
4. Design a vehicle (ice-cream van, ambulance, fire engine etc). Use simple software e.g. Purple Mash. Consider the best materials to use to create a strong product. Evaluate their ideas and proposed product against success criteria (e.g. needs to be able to move on all wheels, needs to stand upright on its own).
5. Make the moving vehicle with axles and wheels (sawing wood to make it).
6. Evaluate against the success criteria (see point 4) including testing out to see if it works.

Books/resources

Provide pupils with the opportunity to design their product using ICT for this project.

<https://www.purplemash.com/#app/tools/2dam>

An Engineer Like Me by Dr Shini Shomara

Sticky Knowledge

Alec Issigonis (1906 – 1988) was one of the most famous car designers of the modern era.

Y2 – Sewing animal decoration

Content/ideas

Children will learn how to do a running stitch and attach decorations using glue or staples. They will use different attachment skills to decorate their decoration.

Key vocabulary

Needle, thread, running stitch, template, attach, decoration, print.

Key skills and knowledge

Children understand how a needle is threaded.

They can sew using running stitch.

Children can draw around a template accurately.

They can understand that the word **attach** means to join.

Children will use different attachments to decorate their decoration.

Teaching Activities

1. Look at animal sewing decorations. What makes them appealing? What do they like and dislike? Suggest improvements to the designs.
2. Learn to use a running stitch on a sample piece of felt.
3. Design their animal decoration thinking about who it will be appropriate for, what they want to decorate it with and how they will attach it.
4. Make their decoration, including drawing around a template. Running stitch around the outside and use glue /staple on other decorations.
5. Evaluate.

Sticky Knowledge

A running stitch can be used to add decoration or to attach things.

Year Three

Study Henry Ford who designed the first four wheeled vehicle.

Y3 – Apple Crumble

Content/ideas

Children will learn about the seasonality of foods. They will learn to follow a recipe, using accurate measurements.

Key vocabulary

Measure, recipe, seasonality, temperature.

Key skills and knowledge

Children are able to read and use scales with support.

Follow a recipe.

Children will understand that foods are available at different times of the year or are imported from different countries.

Teaching Activities

1. Learn about seasonality. Read the book 'Up in the Garden and Down in the Dirt'.
2. Write a product specification- What do they want their crumble to look and taste like?
3. Prepare and cook the apple for the crumble.
4. Make the crumble topping by rubbing the fat into the flour and adding the sugar.
5. Cook following the temperature and time on the recipe.
6. Evaluate.

Books/resources

- Up in the Garden and Down in the Dirt by Kate Messner
- <https://www.foodafactoflife.org.uk/>

Y3 – Greetings Card (Christmas or other celebration)

Content/ideas

Children will design and make a greetings card with levers and linkages. They will learn about Mary Anderson – inventor of the windscreen wiper who used her technical knowledge of levers to solve a practical problem.

Key vocabulary

Lever, linkage, pivot.

Key skills and knowledge

Children will learn how levers and linkages are used in real life.

They know different levers and linkages and suggest which is most appropriate for this product.

Children understand that if their design does not work, they can adapt it and make improvements.

Teaching Activities

1. Learn about Mary Anderson, the inventor of the windscreen wiper. Identify elements of her design.
2. Explore levers and linkages.
3. Make sample levers and linkages, applying cutting and shaping techniques.
4. Design greetings card with lever and linkages.
5. Make the product by working efficiently (such as by carefully selecting materials). Refine work and techniques as they go.
6. Make changes and improve design.
7. Evaluate.

Sticky Knowledge

Mary Anderson invented the windscreen wiper.

Y3 – Picture Frame

Content/ideas

Children will learn how to use a hinge to make a product stand up. Then they will make an attractive photo frame using wood which has a removeable back, allowing the user to replace the photo.

Key vocabulary

Hinge, join, angle, precise measurement, dimension.

Key skills and knowledge

Children can use a ruler accurately and understand the importance of precise measurements.

Children understand the appropriateness of the materials for the product.

They understand and can state the suitability of different materials for the parts of the design.

Teaching Activities

1. Look at existing picture frames. Take them apart to explore them. Explore the use of hinges.
2. Rough design of what their own photo frame will look like. What parts are needed?
3. Make a mock-up using card.
4. Lollipop stick mock-up.
5. Use software to design the photo frame again with more than one angle or dimension. Improve on their existing design. Give more than one reason for their improvement. Children to think about the materials they will use and the accurate measurements needed.
6. Make the photo frame using wood and a hinge.
7. Evaluate. Does it do the job required? Does it look appealing?

Sticky Knowledge

A hinge can be used to make products stand up.

Year Four

Study James Dyson who invented the wheelbarrow with a ball, then set up Dyson vacuums.

Y4 – Bacon bread roll

Content/ideas

Children will learn to follow a recipe with some adult support, choosing and using the appropriate utensils.

Key vocabulary

Recipe, ingredients, measurement, utensils, hygiene.

Key skills and knowledge

Children understand the importance of food hygiene involving uncooked meats.

Children can measure ingredients accurately independently.

Follow a recipe, using a range of utensils.

To understand how to manage dough (flour dusting on workbench, proofing).

Teaching Activities

1. Learn about cooking hygiene, including handling raw meat.
2. Taste different breads, discussing their likes and dislikes.
3. Draw and write their bacon bread roll specification.
4. Make the bread rolls.
5. Review.

Books/resources

- <https://www.foodafactoflife.org.uk/>

Sticky Knowledge

Y4 – Christmas decoration

Content/ideas

Children will sew their own mini stocking Christmas decoration to hang. Use running stitch and at least one additional type of stitch e.g. cross stitch, blanket stitch. Attach appliques.

Key vocabulary

Running stitch, cross stitch, blanket stitch, applique, seam allowance.

Key skills and knowledge

Children are able to thread a needle independently.

They can sew using running stitch and cross stitch or blanket stitch.

They can attach appliques using stitching techniques.

Children understand the need for a seam allowance.

Teaching Activities

1. Look at Christmas decorations.
2. Revise how to do a running stitch (taught in Y2) as well learn to cross stitch or blanket stitch. Introduce the terminology 'seam allowance'.
3. Plan their design. Improve upon existing designs, giving an explanation for their reasoning.
4. Make over a series of lessons. Pupils to select the most appropriate techniques to decorate.
5. Review.

Y4 – Light up box

Content/ideas

Children will make a light up box for a purpose.

Key vocabulary

Electrical circuit, measure, control, monitor, code.

Key skills and knowledge

Children apply their science knowledge about circuits to a product.

They use software to measure, control, monitor and code their product.

Children can explain why some products light up, but others don't.

They can choose suitable techniques to construct products.

Teaching Activities

1. Look at light up boxes and the different purposes they are used for e.g. give information/ give directions/ advertise/ attract attention.
2. Pupils to design their own light up box for a purpose.
3. Make the product, working efficiently knowing which order would be more successful. Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest mm. Select appropriate joining techniques.
4. Refine their work and technique as the work progresses.
5. Evaluate as they go along, suggesting other ideas to solve product faults.
6. Add the electrical circuit to the light up box. Use Crumble software to program to flash/turn on and off on its own.
7. Review the product.

Sticky Knowledge

Thomas Edison invented the light bulb.

Electrical circuits are used inside light up products.

Year Five

Study Jamie Oliver and his work on healthy school dinners.

Y5 – Vegetable Pizza

Content/ideas

Children will learn to consider cooking times and temperatures. They will learn about the seasonality of different foods to cook a vegetable pizza. They will choose appropriate cooking utensils.

Key vocabulary

Seasonality, cooking time, temperature.

Key skills and knowledge

Children are able to read temperature scales on an oven.

Children know how to use an oven safely and are able to set timers.

They will learn about the cost of ingredients changing depending on the seasonality.

Select utensils which are the most appropriate for the purpose (rolling pin, grater, knife).

Teaching Activities

1. Learn about the seasonality of foods, including vegetables.
2. Taste test different pizza toppings, deciding which they like and dislike and which complement each other.
3. Research recipes for a vegetable pizza.
4. Plan own recipe with toppings.
5. Make.
6. Evaluate.

Books/resources

- <https://www.foodafactoflife.org.uk/> go on 7 – 11 years, where food comes from.

Y5 – Cushion Cover

Content/ideas

Children will make a cushion using a range of sewing techniques using visible and hidden stitches. They will learn that Thomas Saint invented the sewing machine in 1790.

Key vocabulary

Running stitch, cross stitch, attach, textiles.

Key skills and knowledge

They can sew using visible and hidden stitches and understand the reason why this is done.

Children can talk about the visual appeal of a product.

They can attach a suitable fastening.

Know that sharper scissors are suitable for cutting fabric.

Teaching Activities

1. Look at cushions. Consider what they are made from and why. Consider who different cushions may appeal to. Evaluate the design and suggest improvements to the user experience.
2. Learn about Thomas Saint (inventor of the sewing machine).
3. Re-cap how to do running stitch (covered in Y2 and Y4) and cross stitch on a sample piece of fabric.
4. Design cushion with consideration to fastening and the intended user. Make sure that they improve upon existing products (the cushions they looked at).
5. Select from a range of materials. Sew cushion (inside out) and then choose fastening (*e.g. zip/paper clips/buttons/poppers/laced up thread*).
6. Sew decorations on the outside of the cushion to make it appealing to the intended user.

7. Review.

Sticky Knowledge

Different stitches can be used for different purposes.

Y5 – Cam Mechanism

Content/ideas

Children will use their scientific knowledge of transference of forces to create a cam mechanism toy. They will design with a specific user in mind and are introduced to woodwork skills in cutting, drilling and screwing, nailing, gluing, filing and sanding.

Key vocabulary

Cam, mechanism, winding, slider, follower, force, handle, axle, linear movement, rotary movement.

Key skills and knowledge

Children understand what cam means.

They understand how to change the movement of a product using cams.

Children develop their woodwork skills in cutting, drilling and screwing, nailing, gluing, filing and sanding.

Children design their character and background with a particular user in mind.

Teaching Activities

1. Explore and research existing cams products.
2. Explore with different shapes and the motions they create.
3. Design cam toy with specific measurements and a particular user in mind.
4. Make using wood. Select from a range of components. Apply appropriate cutting and shaping techniques that accurate measuring, sawing and sanding.
5. Refine their product using appropriate tools to give a high-quality finish.
6. Review.

Sticky Knowledge

- A cam mechanism is made up of three components: a cam, slider and follower.
- Cams come in different shapes which create different motions.
- Cam mechanisms create linear and rotary movements.

Year Six

Study Steve Jobs who invented the iPod, iPhone and iPad. Study how not all countries have products as advanced as these.

Y6 – Burger and Bread Buns

Content/ideas

Children will learn to understand how a variety of ingredients are grown, reared, caught and processed. They will understand the importance of correct storage and handling of ingredients.

Key vocabulary

Grown, reared, caught, processed, raw meat.

Key skills and knowledge

Children understand where their food comes from (Fairtrade, organic etc).

They can explain why it is important to store food correctly and the consequences if it is not.

Teaching Activities

1. Teach children about the importance of correct storage and handling of ingredients, including raw meat.
2. Discuss burger restaurants (McDonalds, Burger King, Five Guys). Which do they like/dislike and why?
3. Research bread rolls and burger fillings. Which would you choose and why?
4. Plan burger recipe, burger fillings and bread roll type.
5. Make burger and bread roll.
6. Review.

Books/resources

- <https://www.foodafactoflife.org.uk/>

Sticky Knowledge

Correct storage and handling of ingredients need to be followed when cooking with raw meat.

Y6 – Wire Buzzer Toy

Content/ideas

Children will create a wire buzzer toy which uses an electrical circuit with a buzzer or light bulb.

Key vocabulary

Wire, series circuit, switch, buzzer.

Key skills and knowledge

Children know how the shape and size of the wire loop changes the challenge.

They use precise measurements in their plans.

They consider the functional properties and aesthetic qualities of materials and components.

Children will consistently apply cutting and shaping techniques that include cuts within the perimeter of the material (e.g. slots or cut outs).

Teaching Activities

1. Explore buzzer toys. Look at the shapes the wire has been bent into and whether they are easy or difficult.
2. Plan - Create an innovative design that improves upon existing products with a specific area given to enhance. Include precise measurements and consider slots or cut-outs.
3. Make the buzzer toy over a series of lessons. Option to include a switch using a paperclip. Select and use a range of materials according to their functional properties and aesthetic qualities.
4. Refine the product to make it purposeful and appealing to the intended user.

5. Test out games.
6. Review, suggesting how it could be improved.

Y6 – Bird House

Content/ideas

Children will make a bird house using wood. Pupils to choose which type of bird they would like to make the bird house for as some designs are better for certain birds. They decide when to use the woodwork skills of cutting, drilling and screwing, nailing and gluing. They use filing and sanding to refine and improve their final product.

Key vocabulary

Drilling, screwing, nailing, sanding, refine.

Key skills and knowledge

Children decide on measurements themselves in relation to the purpose of their product.

They decide which woodwork skills are most appropriate for the task.

Children independently decide when their work needs refining and how to do so.

Teaching Activities

1. Look on the website below to research the different types of bird boxes and the suitability for different birds.
2. Plan own bird box design. Include specific measurements. Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
3. Make over a series of lessons. Refine work as they go, including sanding.
4. Review. Evaluate the design of their finished product, suggesting improvements to be made for two specific contrasting users.

Books/resources

<https://www.perkypet.com/articles/types-birdhouses-types-birds>

<https://www.birdguides.com/news/rspb-keep-nest-boxes-simple/>

Sticky Knowledge

Conservationist Charles Waterton invented the first nesting box in the early 19th century.