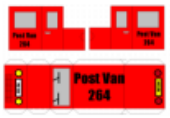
Years 3/4

Structures
Shell structures using CAD

Instant CPD



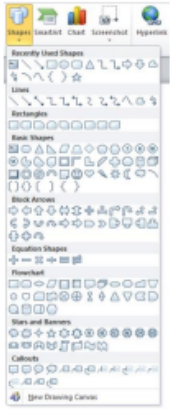

Tips for teachers

- ✓ Please also refer to the Instant CPD guidance in 'Year 3/4 Structures – shell structures' when carrying out this project
- ✓ Many software packages have demonstration versions with tutorials that you can try out without paying a charge.
- ✓ Visit a local shop or supermarket to investigate different types of card packaging.
- ✓ Make a collection of shell structures of various shapes and, where possible, flatten them to show the nets and for storage.
- ✓ Put together an image board of packaging so children can see the range of fonts and consistency with a brand.
- ✓ Discuss environmental issues relating to the wastage of materials when packaging items including the three R's - reducing, recycling and reusing.
- ✓ If children are designing and making packages for a food product, they will need to choose materials appropriate for direct contact with food.
- ✓ You may want to restrict children to using particular standard shapes when designing their nets and final products.
- ✓ Ensure that the children include sufficient tabs in their drawings for assembling their nets.
- ✓ Use the options in Microsoft Word and other software to display rulers and grids that can help with generating nets and other items.
- ✓ Using copy and paste will ensure that objects are of a consistent size.
- ✓ Ensure that the children have a good understanding of the associated vocabulary and of 2-D and 3-D shapes in maths before carrying out this project.

Useful resources at www.data.org.uk

- Primary Subject Leaders' File Section 5.9
- Banish broken biscuits! Box them brilliantly
- Working with Materials
- Packaging – with links to Maths
- Nets for packaging

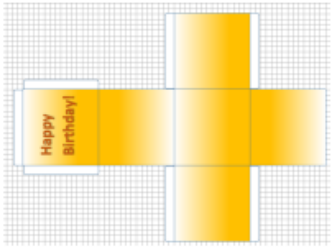
Using Microsoft Word



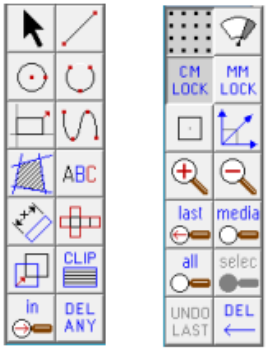
Turn on gridlines and use the pre-set shapes to draw simple nets. Shapes can be edited if you choose.

Text boxes and colouring using the format tab will allow children to come up with a range of designs.

Microsoft Word has many features that allow children to draw and manipulate accurate shapes, import or paste in graphics and print the final designs without having to use dedicated CAD software.

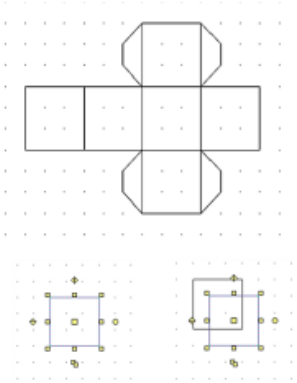


Using TechSoft 2D Primary



Explore and use the different drawing tools and zoom, grid and locking tools to help ensure accurate drawings.

Demonstrate how to draw a simple net and ask children to practise using the copy and move 'handles'.



When to use CAD

- When children understand the value of using it to improve the accuracy and appearance of their products
- Where it achieves learning objectives more efficiently
- Where children have been taught and practised the necessary computing skills
- Wherever possible, to design the functional and aesthetic features of a product

When not to use CAD

- When children do not have sufficient understanding of the product they are designing
- As a substitute for practical activities with actual materials and components
- When a project can be delivered as effectively without it

Designing, making and evaluating CAD-based packaging to protect and display a food product for sale

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
What product am I designing and making the packaging for? How will it safely protect the product? How will my product appeal to my intended user?	Discussing and researching ideas, generating design criteria, drawing annotated sketches
How can CAD help me make a package that is accurate, strong and appealing? Which materials will I use?	Investigating and evaluating possible tools and materials
Which shape(s) will be the best to keep the food safe? How will I strengthen my structure?	Discussing, constructing and comparing different nets Exploring strengthening techniques Evaluating prototypes against success criteria
How can I use CAD to get the graphic effects that I want?	Discussing, exploring, trialling and evaluating graphic effects
Will I work with someone else? How long will it take? What order will I work in? What tools, techniques and skills will I use?	Negotiating, developing and agreeing a plan of action, evaluating actions
Do I need to adjust or change anything?	Discussing, trying out and modifying the design
Will my product meet the needs of the user?	Evaluating the product with the intended user and against the success criteria

Glossary

- **CAD** – computer-aided design.
- **Shell structure** – a hollow structure with a thin outer covering.
- **Edge** – where two surfaces meet at an angle.
- **Face** – a surface of a geometric shape.
- **Vertex** – the corners of a geometric shape where edges meet.
- **Font** – a printer's term meaning the style of lettering being used.
- **Net** – the flat or opened-out shape of an object such as a box.
- **Cuboid** – a solid body with rectangular sides.
- **Prism** – a solid geometric shape with ends that are similar, equal and parallel.

Years 3/4

Food
Healthy and varied diet

Instant CPD

Tips for teachers

- ✓ When choosing bought products to evaluate, choose some with simple fillings (such as cheese) and others with more variety (such as bacon, lettuce and tomato). Include some with fillings from a variety of cultures.
- ✓ Children may need help to develop design criteria for their product. You can model this by discussing what the design criteria may have been for an existing product that the children have previously evaluated before encouraging them to create their own.
- ✓ If you grow edible plants in the school grounds such as herbs, lettuce or tomatoes, encourage the children to use these in their food product. When possible, use some ingredients which are seasonal and locally sourced.
- ✓ It is advisable to have additional adult support when children are learning to prepare ingredients.
- ✓ Use a range of fresh and processed ingredients.
- ✓ Some ingredients can be cooked using a heat source with adult supervision to introduce children to techniques such as boiling an egg or roasting a pepper.
- ✓ Hygiene: tie long hair back, wear aprons, cover cuts with blue plasters and wash hands thoroughly with soap and dry with a paper towel. More details on www.foodafactoflife.org.uk
- ✓ Homework idea 1: Ask children to collect pictures of related food products from magazines etc. Research which similar products are used around the world.
- ✓ Homework idea 2: Ask members of the children's family which is their favourite lunch snack and why.

Useful resources at www.data.org.uk

- Dips and Dippers
- Super Salads
- Sandwich Snacks
- Soups - Celebrating culture and seasonality

Other useful web-based resources:

- www.foodafactoflife.org.uk
- http://www.nhs.uk/livewell/5aday/pages/5adayhome.aspx

Wraps | Pitta bread sandwich | Sandwich

Skills and techniques

Grating cheese

Spreading butter on bread

Cutting using the bridge technique

Cutting using the claw technique

Investigating and Evaluating Activities

Children can analyse existing products related to their project using sensory evaluations and record their results in a table. Explain that tasting is not the same as eating. Provide kitchen towel so children can spit out food they do not like. Provide water to cleanse palette between tasting products.

Analysing existing products

Filling	Appearance	Smell	Flavour/ Taste	Texture	Dislike	Neither	Like
1							
2							
3							
4							
Word bank	Colourful Dark/pale Greasy Moist	Fruity Meaty Smoky Oniony Garlicky Fishy	Salty Herby Spicy Fishy Smoky	Crispy Crunchy Soft Chewy Sticky Smooth Hard			

Designing, making and evaluating a bread-based product with a filling for lunch, such as a wrap, a sandwich, a roll, a blini or a toastie

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 food product for? How can I make it appealing for the range of users?	Discussing and communicating ideas, researching existing products, drawing annotated sketches, generating design criteria.
What kind of food product shall I make that can be carried easily? What ingredients could it contain?	Referring back to sensory evaluations carried out in IEAs.
How will I make sure it looks appealing as well as tastes and smells good?	Discussing ideas and how the type of food product and way it is eaten will affect the design.
What techniques will I use to prepare the ingredients and what equipment do I need?	Peeling, chopping, slicing, grating, spreading. Using tools such as round ended knives, vegetable peelers, apple corers, strawberry hullers and graters.
How long will it take? What order will I work in?	Listing the equipment required. Planning the order of the activity and timescale.
More thoughts... appraising, reflecting and refining.	Acting on ongoing evaluation to make appropriate changes.
Has the snack met the needs of the user and achieved its purpose?	Evaluating the food product against the design criteria including the user and purpose. Recording final product through an annotated sketch.

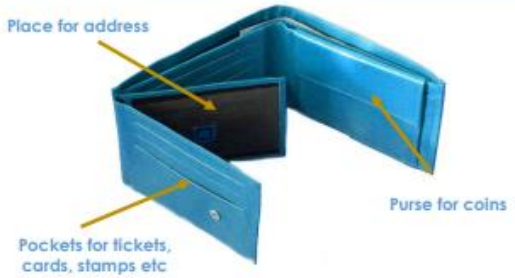
Glossary

- **Appearance** – how the food looks to the eye.
- **Texture** – how the product feels in the mouth.
- **Sensory evaluation** – evaluating food products in terms of the taste, smell, texture and appearance.
- **Preference test** – trying different foods and deciding which you like best.
- **Strawberry huller** – tool to remove the stalk and leaves from a strawberry.
- **Processed food** – ingredients that have been changed in some way to enable them to be eaten or used in food preparation and cooking.

Years 3/4

Textiles
2-D shape to 3-D product

Instant CPD



Tips for teachers

- ✓ Have simple patterns available for children who may find it difficult to create their own.
- ✓ Demonstrate stitching techniques and have help sheets showing stitch instructions for the children to practise independently.
- ✓ Complete sewing practice in small groups. Use adult helpers to provide additional support. Possibly set up a rotation of activities.
- ✓ Demonstrate finishing techniques; let the children practise on small pieces of fabric.
- ✓ Have a limited range of fasteners.
- ✓ Use recycled fabrics e.g. old clothing, ensuring they are easy to work with.
- ✓ Use dipryl or J-cloth type fabric for prototypes.
- ✓ Have a range of products and pictures for children to investigate. Try to use at least one product that can be disassembled so children can see all the parts.
- ✓ Games could be made with technical vocabulary cards e.g. pairs.

Useful resources at www.data.org.uk

- Aprons
- Fancy a bag?
- Designing with textiles
- Bendy bags (Years 1/2)
- A to Z of D&T
- Working with Materials

Teaching aids – joining techniques


Back stitch


Backwards running stitch


Over sew stitch


Blanket stitch


Running stitch

Cutting out techniques


Ensure template is secured to fabric to allow for accuracy. Double sided tape can be used instead of pins to do this.


Place pattern pieces carefully to avoid wastage.

To move children's learning on, as enhancement activities, children could research into different types of fabrics and how they are constructed. They could carry out tests to check e.g. strength, waterproofness or flexibility to ensure their chosen fabric can be used to create a product that meets the needs of user and is fit for purpose.


Bonded

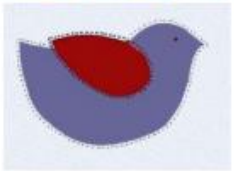

Woven


Knitted


Felted

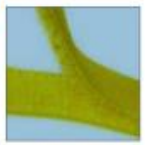
Decorative Techniques


Embroidery stitches e.g. cross-stitch


Appliqué by gluing or stitching

Possible fastenings


Buttons


Velcro

Designing, making and evaluating a holder/purse/wallet for a friend or relative

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 is it for? What will it hold? e.g. phone, money, plastic cards, pencils.	Discuss ideas; create a list of likes and dislikes of the user Generate design criteria
What shape will the holder be? How will it fasten?	Investigate a range of templates/patterns and choose the most appropriate one for purpose Create initial design ideas
What fabric should I use?	Discuss and explore different fabrics suitable for purpose Possibly test fabrics for strength/waterproofness
Which joining techniques would be the best for the fabric and pattern?	Discuss and test out different joining techniques on mock ups Evaluate these against the design criteria
How can I make my holder aesthetically pleasing for the user?	Test out a range of decorative techniques and decide on the one/s which are appropriate
How long will it take to make? What tools will I need? What order should I do it in?	Create the holder following the design
Reflection and refining What isn't working very well? What could I improve on?	Make suitable adjustment during the making process Develop the plan during the making
Will my holder/purse/wallet fulfill its function? Is it suitable for the user?	Test out the product Make an evaluation with the user against the initial design criteria and design ideas

Glossary

- **Appliqué** – means 'applied' - describes method of stitching/gluing patches onto fabric (originally to mend holes in worn clothes) to provide decoration.
- **Pattern/Template** – a shape drawn to exact shape and size and used to assist cutting out.
- **Seam** – a line of stitching that joins pieces of fabrics together.
- **Seam Allowance** – extra fabric allowed for joining together - usually 1.5cm.
- **Prototype** – a model that is made to test whether a design will work.
- **Aesthetics** – the way in which the product looks with the nature and expression of beauty.