



Design and Technology

Year 5



Unit	Food and Nutrition 	Mechanisms (cams) 	Structures 
National curriculum Purpose of Study & Aims	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. 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.		
National Curriculum: Key Stage 2	Key stage 2: 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 relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. When designing and making, pupils should be taught to: Design • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Make • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately		

	- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. Evaluate - investigate and analyse a range of existing products - evaluate their ideas and products against their own design criteria and consider the views of others to improve their work - understand how key events and individuals in design and technology have helped shape the world Technical knowledge - apply their understanding of how to strengthen, stiffen and reinforce more complex structures - understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] - understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] - apply their understanding of computing to program, monitor and control their products. Cooking and Nutrition As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Pupils should be taught to: - 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.		
Title of Unit (Enquiry Question)	How can you design, make and evaluate a seasonal soup recipe to be used on the school lunch menu?	How can we design, make and evaluate a moving toy for a year 3 child that incorporates cam-driven components?	How can we design a strong, stable frame structure for a bird hide that blends with the natural environment?
Unit Link			
Theme	Celebrating Culture and Seasonality-soup	Cams-moving toy	Frame structures-bird hide
Know-ledge	Lesson 1 Evaluate and research existing products I understand the benefits of seasonal fruits and vegetables and their impact on the environment I know that climate affects where foods grow. Lesson 2 Design own product	Lesson 1 Evaluate and research existing products I know that some toys use cams- they turn round and change that turning movement into up and down movement	Lesson 1 Evaluate and research existing products I can investigate existing products (how structures are built + their purposes)

I know that recipes can be adapted to suit seasonality and can identify seasonal ingredients from the UK.

Lesson 3

Focused practical tasks

I can identify seasonal ingredients from the UK.
I know how to safely use equipment and utensils

Lesson 4

Make your own product

I can follow my recipe to make my product

Lesson 5

Evaluate your own product and the products of others

I can evaluate how effectively my design has met the initial design brief

Lesson 2

Design own product

I know that I can use annotated diagrams to show where my moving parts will go and what they will do.

Lesson 3

Focused practical tasks

I know that cams can be used to produce different types of movement and change the direction of movement

Lesson 4

Make your own product

I know that when making a cam and lever mechanism, the distance between the cam and the pivot point of the lever will affect the amount of movement, with more movement close to the pivot.

Lesson 5

Evaluate your own product

I can test my product with the intended user, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.

I can examine examples of real structures (bird hides, shelters, towers, playground frames), identifying key features: beams, joints, strengthening, triangulation.

Lesson 2

Focused practical tasks

I can test simple frame models using straws, spaghetti, dowels to discover what makes structures strong

I can explore and practise joining techniques: card gussets, pipe-cleaner twists, masking-tape joints, glue-gun joints, building triangles and squares from dowels/straws to compare strength.
I can test joints under load (gentle pushing, weights)

Lesson 3

Design own product

I can design my product against set criteria: safety, stability, weather resistance, sightlines.

I know that I can use annotated diagrams to show what materials I will need and how I will ensure is strong and stable

Lesson 4

Make your own product

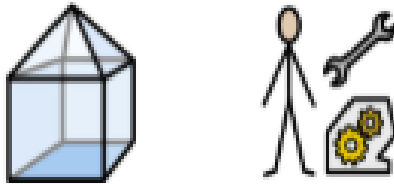
I can select and use a wide range of tools accurately (cutting, shaping, joining, finishing) I understand how to reinforce complex structures for strength and stability

Lesson 5

Evaluate your own product

I can evaluate ideas and products against design criteria

			I can consider the views of others to improve my work
Skills	Lesson 1 Evaluate and research existing products I can identify seasonal ingredients from the UK. I can taste seasonal ingredients. I can describe the benefits of seasonal fruits and vegetables and their impact on the environment Lesson 2 Design own product I can research and evaluate existing recipes. I can choose ingredients based on a design brief. I can analyse nutritional content. Lesson 3 Focused practical tasks I can peel foods by hand or with a peeler. I can cut and prepare ingredients safely. Lesson 4 Make your own product I can follow a recipe I can use safe food preparation skills I can select the appropriate utensils for each step of the task Lesson 5 Evaluate your own product I can evaluate my final outcome against design criteria I can describe the texture and flavour of ingredients.	Lesson 1 Evaluate and research existing products I can look at examples of toys that use cams to see how they work and evaluate my preferences. Lesson 2 Design own product I can produce an annotated diagram showing my design and highlighting where and how the cams will be used. Lesson 3 Focused practical tasks I can produce a simple cam prototype Lesson 4 Make your own product I can use my design to make a moving toy using cams to enable different parts to move. Lesson 5 Evaluate your own product I can evaluate my final product against the original design criteria	Lesson 1 Evaluate and research existing products I can analyse structural features for strength. I can compare different structure types and explain advantages and disadvantages. Lesson 2 Focused practical tasks I can explore and practise joining techniques: card gussets, pipe-cleaner twists, masking-tape joints, glue-gun joints, building triangles and squares from dowels/straws to compare strength. I can test joints under load (gentle pushing, weights) Lesson 3 Design own product I can develop design ideas that match criteria. I can use technical vocabulary (beam, joint, triangulation, stability). I can produce clear sketches and diagrams Lesson 4 Make your own product I can accurately measure, cut and shape. I can join components securely. I can check strength during construction and adapting as needed. Lesson 5

			Evaluate your own product I can write an evaluation referencing their design criteria by testing: stability (gentle pushes from different sides), load-bearing ability with small weights, camouflage/appearance (how well does it suit the environment?). I can provide peer feedback and use this to suggest improvements
Vocabulary	Vitamins, allergen, affordable , portion, grate, seasonality, balanced diet, recipe, organic flavour	reciprocating motion, G-clamp, bradawl, spacer, frame mechanism, cam, follower, movement, design criteria	Modelling Compression impermeable weather resistant Tension stability Diagonal , Horizontal Vertical Triangulation frame structure
Career Links	Cookery instructor Cookery instructor 	Architect Architect 	Environmental engineer Environmental engineer 
Designer	Agnes Marshall	Antoni Gaudi	Norman Foster



Cookery instructor



Architect



Environmental engineer

Resources

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

Useful resources at
www.designtechnology.org.uk

- Levers and Linkages
- Working with wheels and axles
- Mechanisms with a message
 - Gears and Pulleys

Useful resources at
www.designtechnology.org.uk

- Primary Subject Leaders' File Section 5.9
- Bird Hides Design and Make Challenge

Assessment



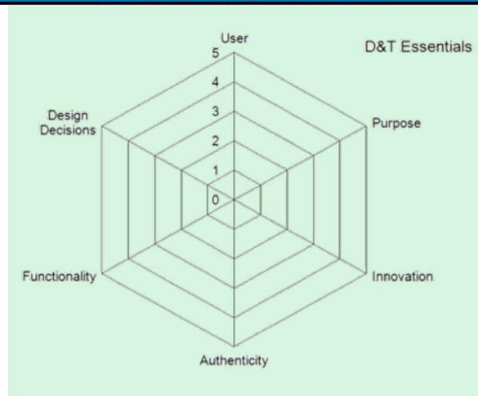
Upper Key Stage 2 - End of Unit Assessment



My Design Criteria

- User: School canteen chef
- Purpose:
 - To select seasonal ingredients based on nutritional balance to create a healthy soup.
 - To prepare and make my soup by following a recipe and using accurate, safe food-handling and preparation techniques
- To adapt my design to meet a specific user's preferences or dietary needs
- To evaluate the finished meal and suggested realistic improvements for next time.

Peer Review of My Design and Final Product



Peer Review: Is the Design Criteria Met?

Yes ☐ No ☐ Partly ☐



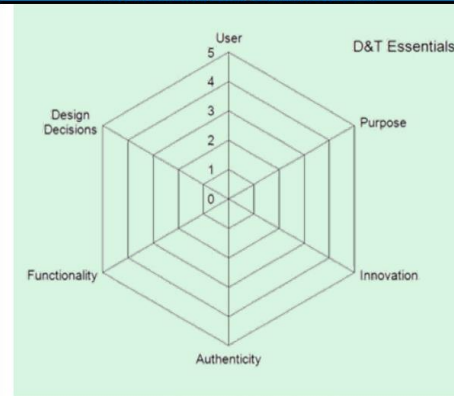
Upper Key Stage 2 - End of Unit Assessment



My Design Criteria

- User: A friend or younger sibling
- Purpose:
 - My mechanism works properly, with the axle, follower and cam moving smoothly.
 - My frame is stable and well made.
 - My design is creatively decorated and fits the theme and purpose.
- I worked safely and used equipment correctly.

Peer Review of My Design and Final Product



Peer Review: Is the Design Criteria Met?

Yes ☐ No ☐ Partly ☐



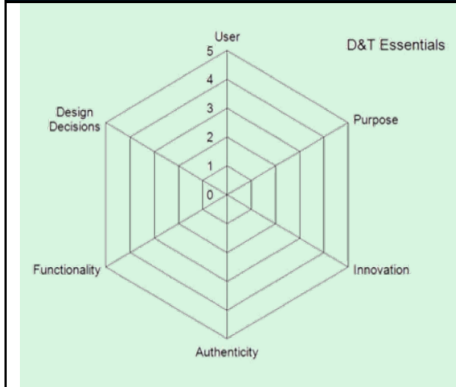
Upper Key Stage 2 - End of Unit Assessment



My Design Criteria

- User: School site supervisor/gardener
- Purpose:
 - My design communicates a clear message, matching the style and purpose of the product.
 - My model is accurate, uses correct dimensions and the frame is stable, well constructed and weather resistant.
 - My product decoration blends well with the environment and is well matched to its purpose.
- I designed more than one concept, tested variations, and chose the strongest option based on the brief.

Peer Review of My Design and Final Product



Peer Review: Is the Design Criteria Met?

Yes ☐ No ☐ Partly ☐

Self Evaluation of My design and Final Product

0 1 2 3 4 5

Not achieved Fully achieved

Self Evaluation: Is the Design Criteria Met?

Yes ☐ No ☐ Partly ☐

Self Evaluation of My design and Final Product

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Not achieved Fully achieved

Self Evaluation: Is the Design Criteria Met?

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Self Evaluation of My design and Final Product

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Self Evaluation: Is the Design Criteria Met?

Yes ☐ No ☐ Partly ☐