

Year 8 Design Technology Rotations

1. 3D Design

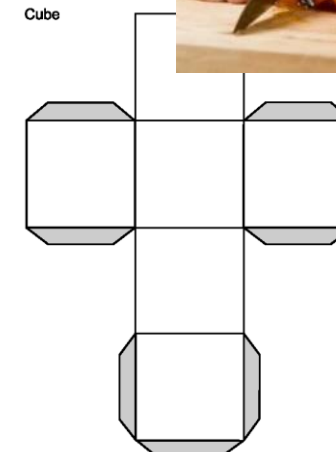
- [Journey of Knowledge](#)
- [Knowledge Organiser](#)

2. Resistant Materials

- [Journey of Knowledge](#)
- [Knowledge Organiser](#)

3. Food Technology

- [Journey of Knowledge](#)
- [Knowledge Organiser](#)



Year 8 3D Design: Journey of Knowledge

Context and Introduction to Unit

3D Design at Key Stage 3 is skills based and revolves around building students' knowledge of design and its impact locally and around the world. Students will build knowledge of design through design briefs, planning, drawing, 3D Modelling and real-world situations. Students will investigate the design cycle and revisit the importance of design briefs. Students will research into colour and its use in modern day branding. Students will create a cereal box net and then build.

The bigger picture:

*Personal development opportunities.
Career links.*

*structural engineer,
joiner, H&S officer,
draftsman.*

CORE KNOWLEDGE

Net: A net is a designed 2D shape / pattern that can be folded into a 3D object. In most cases the net is then covered in a graphic packaging design

Measurements: In 3D design, measurements are crucial for creating accurate and proportional models. Key measurements include height, width, and depth, corresponding to the Z, X, and Y axes, respectively

Analysis: refers to the process of evaluating a 3D model to understand its characteristics, behavior, and performance under various conditions. This involves using specialized software to simulate real-world scenarios and assess factors like stress, strain, heat distribution, fluid flow, and more

Consumer: a person or entity that uses or acquires the final product, whether it's a physical object or a digital file, created through 3D design and printing processes, primarily for personal, social, family, or household purposes, and not for commercial or business activities

Audience: refers to the specific group of people the designer aims to reach with their 3D model or animation. Understanding the audience is crucial for tailoring the design choices to their needs, preferences, and technical capabilities.

Design: the process of creating a plan or specification for something to be built or made. It involves using creativity to solve problems and shape ideas into practical solutions

SKILLS

Products made:
Mascot designed
Quote/Catchphrase designed
Cereal Box created.

ABOVE AND BEYOND

- Visiting galleries and workshops
- Analysing product and researching into new inventions
- Finding products in every day life and linking it back to classroom work

VOCABULARY

- ☐ Identify
- ☐ Research
- ☐ Specify
- ☐ Design
- ☐ Make
- ☐ Evaluate
- ☐ Manufactured
- ☐ Novelty
- ☐ Serif
- ☐ Sans Serif
- ☐ Design Brief
- ☐ Net
- ☐ Aesthetically pleasing

Personal Development

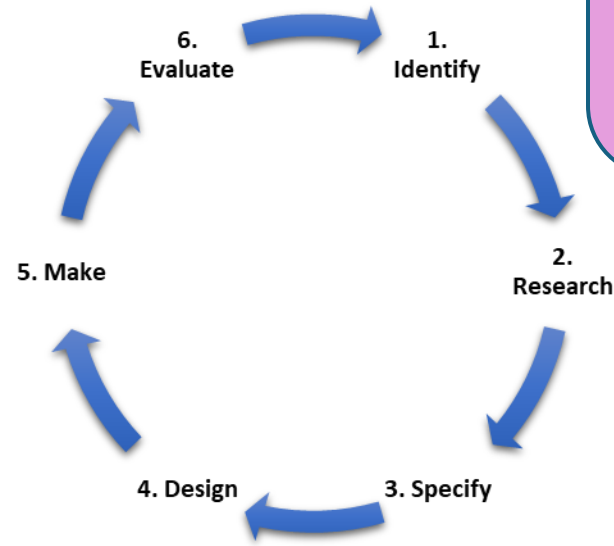
Discussions regarding the relationships between user, client, designer and manufacturer. Inclusive design promoted. Use of nature to inspire products.

Literacy/Numeracy Focus

Nets,
Measurements
Analysis
Discussion of key terminology:
Client, customer, profile,
profession
Consumer
Audience
WHERE NEXT?
Confident and safe use of hand tools with other materials. KS4 material, design cycle and tools and equipment knowledge. KS3

Year 8 3D Design

The Design Cycle



- **Identify**- What is it that you need to create?
- **Research**- Gather information needed
- **Specify**- Get very specific on the direction your product will take
- **Design**- Create a design for your product
- **Make**- Physically make your product
- **Evaluate**- Reflect, what went well?

Target Audience

- Gender
- Relationship status
- Living arrangements
- Age bracket
- Their professions
- Their interests
- What they like, and what they dislike
- How will your product enrich their life
- How will they use your product



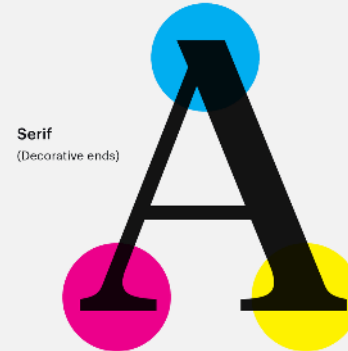
Decorative

Functional



www.senteacher.org

Sans Serif= no decorative ends



Serif= decorative ends

Logo design

Cube

Barcode

Price

Ingredients

Image

Logo design
(top of box/ lid)

The 'net' of a shape (also called a geometry net) is a term used to describe what a 3D shape would look like if it was opened out and laid flat.

Word rich bank

Identify
Research
Specify
Design
Make
Evaluate
Manufactured
Novelty
Serif
Sans Serif
Design Brief
Net
Aesthetically pleasing

Design brief is a set of instruction that will say what you are going to design and make.

Novelty means based on a theme, new and unusual.

Aesthetically pleasing means something looks good.

Manufactured means something that is made.



HILLSIDE
HIGH SCHOOL

Year 8 Resistant Materials : Journey of Knowledge

Context and Introduction to Unit

Resistant Materials at Key Stage 3 is skills based and revolves around briefs based on local companies and industries. Each rotation students focus on a design brief, completing product analysis while developing designs for a final outcome/product. Students will understand the importance of Biomimicry in our society and develop understanding of market research. Students will be introduced to a variety of joints and the importance of measurements and conversions. Students will make a bug hotel using coping saws and nails.

The bigger picture:
Personal development opportunities.
Career links.

Career link – CAD designer, structural engineer, joiner, H&S officer, draftsman.

CORE KNOWLEDGE

- ☐ **Health & Safety:** crucial for ensuring a safe learning environment during practical activities. This involves a combination of preventative measures, including risk assessments, proper use of equipment, and appropriate personal protective equipment (PPE), along with a strong emphasis on following safety rules and procedures
- ☐ **Market Research:** gathering information about potential customers and the market to inform the design and development of products, services, or systems. It helps designers understand user needs, preferences, and market trends, leading to more successful and relevant designs.
- ☐ **Biomimicry:** involves drawing inspiration from nature to create innovative and sustainable solutions in design and engineering. By observing and mimicking natural forms, processes, and systems, designers can develop novel products, processes, and even entire systems that are more efficient, effective, and environmentally friendly.
- ☐ **Finger and Interlocking Joints:** refers to a type of joint called a finger joint, also known as a comb joint or box joint. It's characterized by interlocking fingers or protrusions that create a strong and aesthetically pleasing connection between two pieces of wood. In the context of finger locking as a medical condition, it refers to trigger finger, where a finger or thumb gets stuck in a bent position and then suddenly pops straight.
- ☐ **Iterative Design:** a cyclic process where a design is repeatedly modeled, tested, and refined to achieve gradual improvements. This approach involves creating prototypes, evaluating their performance, and making changes based on the feedback received, ultimately leading to a more effective and user-friendly product.

SKILLS

Understanding Biomimicry, Understanding product analysis, Measuring and converting, Accurately cutting, Use of coping saw and files.
Products made:
Finger Joints
Interlocking Joints
Bug House/Hotel

ABOVE AND BEYOND

- **Visiting galleries and workshops**
- **Analysing product and researching into new inventions**
- **Finding products in everyday life and linking it back to classroom work**

VOCABULARY

- ☐ Aesthetics
- ☐ Target Audience
- ☐ Creativity
- ☐ Market Research
- ☐ Biomimicry
- ☐ Specification
- ☐ Design Brief
- ☐ Joints

Personal Development

Inclusive design promoted
Understanding of Ecosystem and importance of

Literacy and Numeracy Focus

Measurements

Conversion

Reading Comprehension

WHERE NEXT?

Confident and safe use of hand tools with other materials.
KS4 material, design cycle and tools and equipment knowledge.
KS3

TECHNOLOGY / RESISTANT MATERIALS

Design & Technology Keywords

Manufactured board Man-made wood product bonded with resin. + Uses waste wood, stable, cheap + Flat pack furniture, model bases	MDF Finewood fibres pressed with resin. + Smooth surface, easy to shape + Furniture carcasses, prototypes	Plywood Thin wood veneers glued in layers at 90°. + Strong, resists warping + Shelving, construction projects	Hardwood Wood from slow-growing deciduous trees. + Very strong and durable + Furniture, flooring, tool handles	Softwood Wood from fast-growing coniferous trees. + Lightwork, easy to work + Construction, joinery
Oak Common hardwood. + Hard-wearing, attractive grain + Furniture, flooring	Beech Hard, tough hardwood. + Resists dents, smooth finish + Toys, workbenches	Safety goggles Protective eyewear. + Prevents eye injuries + Used when cutting or sanding	Pine Common softwood. + Cheap and lightweight + Furniture, interior joinery	Apron Protective clothing. + Keeps clothing clean and safe + Used in workshop
Vice Holds work firmly on bench. + Keeps hands free + Holding wood when cutting or drilling	Tenon saw Fine-toothed hand saw for straight cuts. + Accurate and clean + Cutting joints in wood	Coping saw Narrow-blade saw for curves. + Cuts intricate shapes + Model making, design work	G-clamp Adjustable metal clamp. + Straight, holds work securely + Clamping pieces for gluing	
Bench hook Wooden guide for sawing. + Keeps work steady + Cutting wood safely	Try square Measuring and marking 90° angles. + Accurate marking + Woodworking joints	Steel rule Straight metal ruler. + Precise measurements + Marking out lines on materials	Marking gauge Tool with a pin for parallel lines. + Ensures accuracy + Marking across timber	
Sandpaper Abrasive paper for smoothing. + Creates smooth finish + Finishing wood before painting	File Metal tool with teeth for shaping. + Removes rough edges + Finishing metal or plastic	Drill Power or hand tool for making holes. + Accurate holes quickly + Fitting screws or dowels	Countersink bit Drill bit for widening screw holes. + Allows screw heads to sit flush + Wood joints and fixings	

ONE OFF PRODUCTION

In one-off production a single product is designed and made to a client's specification. Prototypes are classed as one-off's.



MASS PRODUCTION

Mass production is the industrial scale manufacture of large quantities of products, usually on a production line. Like Ikea furniture.



BATCH PRODUCTION

In batch production set quantities of a product are made to order. Materials are cost-effective and manufacturing costs are lower. Seasonal items are usually Batch produced.



CONTINUOUS PRODUCTION

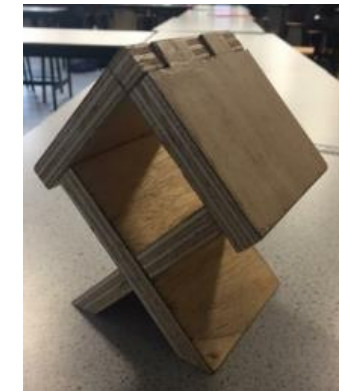
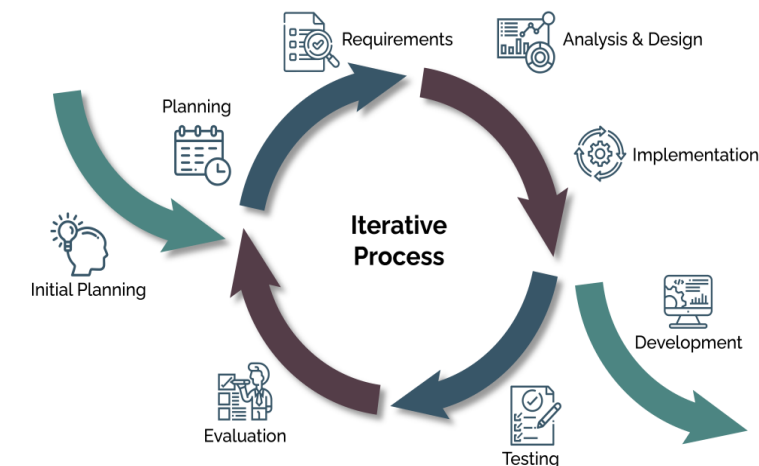
Continuous production is the manufacture of an item 24/7 – 365. The system is usually completely automated using a production line. Due to the scale on which the items are manufactured, they are extremely cost effective.

Biomimetic design is where nature inspires a designer / scientist / engineer, to design a product. Sometimes a designer / scientist will look at the way nature has solved a problem through evolution and then he / she will apply it to a design problem.

	Bug House	Mimics	Bug Habitat	
	Planes	Mimics	Birds Wing	
	Velcro	Mimics	Bur Seeds	
	Swimsuit	Mimics	Shark Skin	
	Shoe Grips	Mimics	Snake Skin	

Iterative design process

Iterative Process Model



TECHNOLOGY / RESISTANT MATERIALS

ACCESS FM

Aesthetics

How does the product look and feel? Is it attractive to look at and touch? Are the colours and style to your liking?

Cost

How much does it cost to buy, manufacture or purchase the product? Is it value for money? What is the cost of materials used to make the product?

Client

Who is the product designed for? What is their demographic (gender, age etc)? Does it improve the life of the client? Is there a demand for the product?

Environment

Does the product have a positive or negative impact on the environment? Has the designer thought about the "six Rs"?

Size

What are the dimensions of the product? Is it large, small, long, short, wide or narrow. Are the proportions appropriate? Have ergonomics been thought of?

Safety

Is the product safe to use? Could it cause harm to the user in any way? Does the product meet safety standards?

Function

What purpose does the product have? What does it do? Does it achieve its purpose? Is it easy or difficult to use?

Material

What materials is the product made from? Are these the best materials for the product? Have manufacturing processes been thought about?

WOOD PLANE

Shaves the surface of the wood to reduce the thickness of material. Can be adjusted to take more or less material.



CHISEL

Used to remove timber. Useful for creating joints or hollowing out areas.






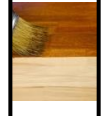

Design Brief

A new study suggest insect populations have declined by 75% over the last three decades. Insects are really important for our wildlife and back garden habitats. They are essential for pollinating plants and for breaking down all leaves and woods.

The National Trust have asked you to design a bug hotel using recycled wood and materials found in nature or at home. The project must be able to accommodate a number of different species of bug. The outcome will be a high quality product suitable for the back garden.



Surface Treatments and Finishes

Name		Description	Name		Description
Oil		Soaks into timber. Protects and enhances appearance	Paint		Usually needs a Primer. Wide range of colours.
Bees Wax		Rubbed into wood. Enhances natural grain.	Wood Stain		Colours wood. Does not protect.
Varnish		Protects from moisture. Enhances appearance.	Distressing and Scorching		Gives a Worn/ Vintage look. Popular in furnishings

ABRADING

DISC SANDER

Mechanical machine which removes more material than hand methods.



RASP

A 'file like' tool with rough teeth for fast removal of material. Different profiles available.

SAND PAPER

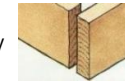
Best for 'hard to reach areas. Different grades available. Good for surface preparation.



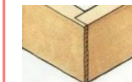
JOINING METHODS

BUTT JOINT

Two pieces stuck together using only wood glue. Low Strength.



LAP JOINT



Glued. Aesthetically pleasing. Neat. Medium Strength.

COMB JOINT

Interlocking sections. Aesthetic and High Strength.



DOVETAIL JOINT



Interlocking sections at angles. Aesthetic. Strongest joint.

FIXINGS

NAILS

Nails are hammered in place at angles to stop them loosening.



SCREWS



Pilot hole is drilled and screw is used to attach two pieces. Screws provide a stronger hold than nails.

ADHESIVES

WOOD GLUE (PVA)



Wood glue absorbs into the surface of the 2 joining pieces and dries to form a solid bond.

HOT GLUE

Hot Glue is not very strong. Commonly used for modelling or smaller tasks.



Year 8
Design Technology
Bug Hotel

Year 8 Food Technology: Journey of Knowledge

Context and Introduction to Unit

In this unit, pupils will learn what food technology is and when it is relevant in society. Teachers will gauge prior knowledge pupils have within the subject. They will be given an introduction to health and safety guidance to the kitchen and the importance of good hygiene. Pupils will learn about nutrition and Food types and their properties. They will learn about manufacturing food and special diets. They will also learn a number of cooking/ baking methods and apply these to producing a range of food products.

The bigger picture:

*Personal development opportunities.
Career links.*

Nutritional therapist, food technologist, quality manager, catering, chef, food vender, business owner.

CORE KNOWLEDGE

Health and safety- rules, risk assessment, hazards and precautions, hygiene
Bacteria, causes, prevention, cooking temperatures for raw meat 75oC.
Nutrition
Micro/macro nutrients
Food types/properties and functions of ingredients/Edible casings
Recipe adaptations
Sensory Evaluation
Manufacturing food and quality control
Eatwell Guide
Production methods
Storing/cooking food safely

SKILLS

Safe and compliant use of the kitchen oven/grill/hob
Use of basic kitchen equipment
Cleaning and effectively removing bacteria
Combining ingredients
Weighing and measuring
Methods such as; all in one, creaming, rubbing, kneading, boiling, blending
Chopping skills
recipe adaptations
Sensory evaluations

Food Products

Sausage rolls, shortcrust pastry, jam parcels, fajitas, muffins

ABOVE AND BEYOND

Independently working through methods
Recipe adaptations for special diets
Investigating own design ideas.

Acceleration tasks

- Cooking at home, developing skills in chopping, mixing and measuring at home
- Continuing with personal hygiene and healthy eating.
- Analysing tastes of food items outside of school.

VOCABULARY

Ingredients, combine, method, hygiene, nutrition, properties, manufacturing, diets, bacteria, micro, macro, creaming, rubbing, chopping, kneading, adaptations, evaluation, sensory, blend, mix, separate, combine, seasonal, balanced, evaluation, quality control, edible, casing, snack foods, eatwell guide.

Personal Development

Rse

Food miles, packing and its impact on the environment.
Symbols on packaging, reading food labels. Cultural influences on food products.

Literacy Focus

Word rich meanings of tier 3 terms

Numeracy Focus

Measuring in ml, grams, weighing out, portion sizes, dividing.

WHERE NEXT:

Year 9 – Multicultural foods

Cooking Methods

Cooking techniques commonly used in cooking and food preparation

Baking

The oldest cooking method. Bakery products include bread, rolls, cookies, pies, pastries, and muffins



Grilling



Grilling involves heat applied to the surface of food, commonly from above, below or from the side

Unlike grilling, barbecued foods are cooked at low temperatures over long cooking time

BBQ



Roasting



Roasting uses dry heat where hot air covers the food, cooking it evenly on all sides

Poaching

Poaching involves heating food in a liquid, such as water, milk, stock or wine



Stir-frying



Stir frying is when are fried in oil while being stirred or tossed in a wok.

Chopping Skills

Learning how to hold a knife and cut ingredients safely is a fundamental cooking skill

Slice

Slicing means to cut across the grain into thin, uniform pieces



Mince

Mincing is the finest level of chopping



Bias Slice



A bias slice lets you create a long, tapered slice

Dice



Dicing when the item is cut into small blocks or dice

Career Links

If you have a passion for food and would like to be in a service industry, there are various careers you can pursue to fulfil your aspirations

- Caterer
- Chef
- Pastry Chef
- Baker
- Cake Decorator
- Food Scientist
- Food Blogger
- Recipe Tester
- Factory Worker
- Personal Trainer
- Health Teacher
- Restaurant Owner
- Food Stylist
- Recipe Tester
- Cookbook Writer



Portions for children

Children should also eat 5 different types of fruit or veg each day, but a portion depends on their size and age. As a rough guide, 1 portion of fruit or veg for a child is the amount they can fit in the palm of their hand.



Hi 5!

A total of 5 portions of fruit and veg combined is the minimum number of servings to aim for. You do not need to eat 5 portions of fruit and 5 portions of veg to get your 5 A Day – although the more the better!

Use of Oven, Hob and Grill



The hob is perfect for boiling, frying, sautéing, poaching, and more. To the front of the hob you'll find the controls. Depending on the type of hob you have these might be dials or touch controls.

Controls

Oven Door

Ovens are used as kitchen appliances for roasting and heating. Foods normally cooked in this manner include meat, casseroles and baked goods such as bread, cake and other desserts. In modern times, the oven is used to cook and heat food in many households around the globe.



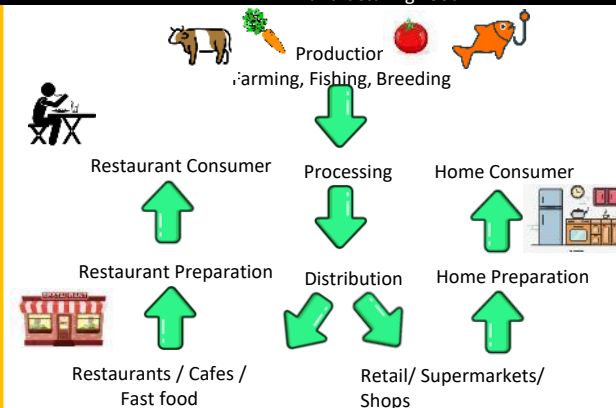
The grill function is best suited for cooking different cuts of meat such as steak, chops, sausages and fish, or for making toasted sandwiches and other quick-cooking foods.

What is a design brief?

A design brief is a document that defines the core details of your upcoming design project, including its goals, scope, and strategy.

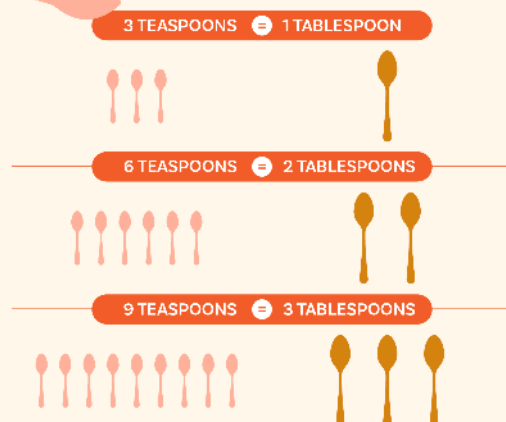


Manufacturing Food



Measurements in the Kitchen

How Many Teaspoons are in a Tablespoon?

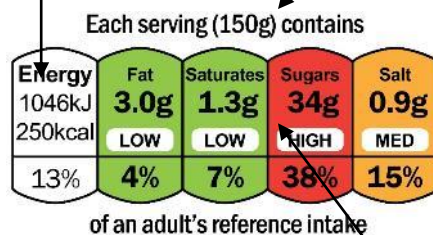


Know your Label

Checking the nutrition label is a good way to compare products, make healthier choices and eat a balanced diet.

Know your Calories. Use calorie information when comparing products

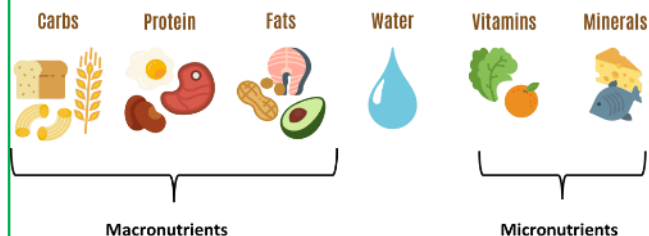
Know your portions. Check the pack for the portion size



Know your daily allowance. An average man needs 2,500kcal and an average woman needs 2000kcal but this depends on age, weight, height and your fitness

Know your colours. The red, amber and green colours show at a glance whether a product is high, medium or low for fat, saturates, sugars or salt.

SIX ESSENTIAL NUTRIENTS



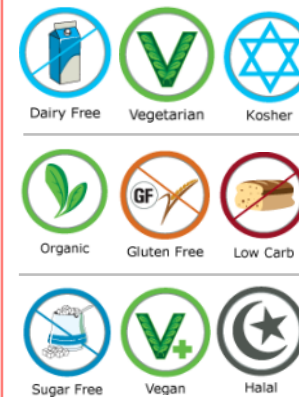
Health and Safety in the

Risks in a kitchen	Hazards in a kitchen
Fires	Gas, open flames
Cuts	Knives / sharp objects
Burns	Ovens / heat
Scalds	Boiling water / steam
Slips	Spillages
Trips and falls	Objects on the floor

Weighing and Measuring

Equipment	Uses	Picture
Digital scales	Weighing ingredients usually in grams (g) and kilograms (kg).	
Measuring jug	Measuring liquids. The side of the jug is usually marked with millilitres (ml)	
Measuring cups	Some American recipes use cups for dried ingredients such as flour and sugar.	
Measuring spoons	Measure an accurate teaspoon or tablespoon. 1 tsp = 5ml 1 tbsp = 15ml	
	Tolerance – The amount of variation allowed within a recipe $\pm 5g$ without it affecting the taste, texture and appearance.	

Special Diets



A special diet is one that cannot be selected freely from the main choices available. This could be due to an allergy, intolerance or other medical need; or because they are following a religious or cultural diet; or a vegetarian or vegan diet.



Measuring in ml / Millilitres

