

Year 7 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](#)



**HILLSIDE
HIGH SCHOOL**

Year 7 DT: 3D Design Journey of Knowledge

Context and Introduction to Unit: In this unit, pupils will learn what DT is and where it is relevant in society. Teachers will gauge what prior knowledge pupils have within this subject area and build on this to create cognitive links. They will be given an introduction to the design process and learn about packaging, typography and their function. They will be taught about isometric projection, marketing and how CAD has revolutionised this industry. They will be shown how to create their own designs. Pupils will be introduced to colour theory and its application in design.

The bigger picture:

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

CORE KNOWLEDGE

What a design brief is and how it fits into a design project.
What a task analysis is and how it fits into a design project.
Paper/Card and their properties (categories, origins and examples)
Typography meaning and styles, functional and decorative type.
Orthographic projection
Isometric projection
Dimensions/units of measure/area (circles, rectangles and circles)/use of a protractor.
Basic annotation using ACCESSFM
Design Eras (Pop Art, Memphis, Art Deco, surrealism and post modernism) and their characteristics.
Function of packaging including the meaning of symbols and development of NETs.
Product analysis

ABOVE AND BEYOND

Mastery of hand tools.

- Completing homework to further enhance skills and knowledge in rotation
- Identifying brands and advertising in everyday life

VOCABULARY

- Design Brief
- Novelty
- Aesthetics
- Manufactured
- Net
- Typography
- Branding
- Perspective
- Isometric

Personal Development

Environmental issues with the use of materials and in the design and manufacture of products. Symbols on packaging, sustainability and Inclusive design promoted. Design in our society and around the world

Literacy Focus

The meaning of the following terms explained in context: TARGET MARKET, AESTHETICS, ERGONOMICS, FUNCTION, SUSTAINABILITY, QUALITY CONTROL, ANALYSIS, DESIGN BRIEF.

Numeracy focus

Area, radius and diameter of circles. Dimensions. Angles. Unit of measure. Use of compass and protractors.

WHERE NEXT?

KS4 –Confident and safe use of hand tools with other materials.
KS4 material, design cycle and tools and equipment knowledge. Application of knowledge/skills in future projects.
Solid understanding of terminology to apply in years 8-11.

SKILLS

Basic sketching and rendering skills
Orthographic projection
Isometric projection

Product make: Chocolate Bar wrapper

Year 7 3D Design

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.

Evaluation is the process of judging or calculating the quality, importance, amount, or value of something.



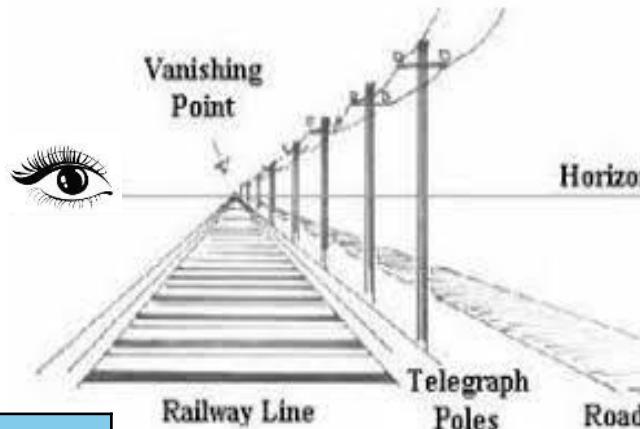
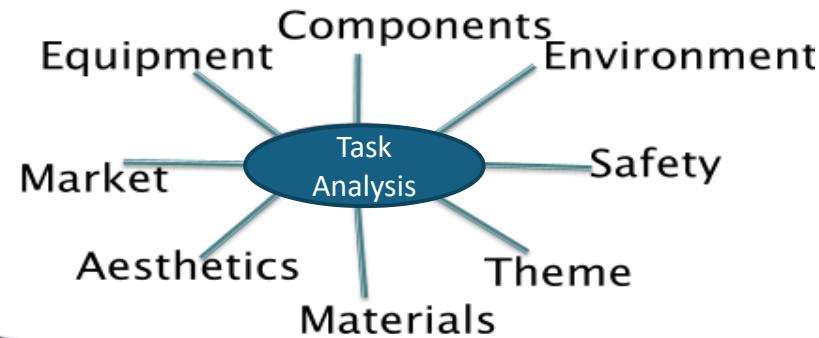
This is a barcode.



This is a QR symbol.



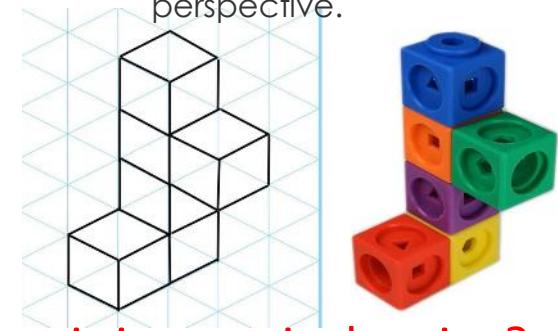
This symbol means the product is fair trade.



Linear Perspective

In linear perspective, there are 4 major types of perspective defined by the number of primary **Vanishing Points** lying on the **Horizon Line**:

- 1-point perspective,
- 2-point perspective,
- 3-point perspective,
- and **Multi-point** perspective.



What is isometric drawing?

Isometric drawing is another way of presenting designs/drawings in **three dimensions**.

Dimension: the length, breadth, depth, or height of an object.



This symbol means the product can be recycled.

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.

This symbol is telling you to make sure you put the product in the bin when finished.



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Year 7 Design and Technology: Resistant Materials Journey of Knowledge

Context and Introduction to Unit: In this unit, pupils will learn what DT is and where it is relevant in society. Teachers will gauge what prior knowledge pupils have within this subject area and build on this to create cognitive links. They will be given an introduction to the design process and health and safety guidance to the workshop. Pupils will learn about timbers and their properties and use these to create a hanging mobile. Pupils will be introduced to structures and the forces that act upon them.

The bigger picture:

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

CORE KNOWLEDGE

Health and 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

Timbers and their properties (categories, origins and examples): Timbers possess diverse properties that influence their suitability for various applications. Key properties include strength (tensile and compressive), hardness, density, durability, elasticity, and resistance to decay

Categories of wood: The three main categories of wood are softwood, hardwood, and engineered wood. Softwoods come from coniferous trees like pine and cedar, while hardwoods come from deciduous trees like oak and maple. Engineered wood is manufactured from wood fibers or veneers, often combined with adhesives

Finishing techniques :

Paint choice and application.

Adhesives – What they are and what they are used for. (PVA glue and hot glue.)

Smart Materials: Smart materials are materials that are manipulated to respond in a controllable and reversible way, modifying some of their properties as a result of external stimuli such as certain mechanical stress or a certain temperature, among others.

Product analysis: Product analysis is a systematic process of evaluating a product to understand its features, performance, and market position. It involves examining various aspects of the product, including its design, functionality, cost, and user experience, to identify strengths, weaknesses, opportunities, and threats.

Sustainability and environmental issues. Environmental symbols. Product life cycle.

Iterative design (structures testing): Iterative design is a design approach where a product or system is continuously refined and improved through cycles of prototyping, testing, and feedback.

SKILLS

Safe and competent use of hand tools (coping saw, sand paper)

Safe and competent use of basic workshop machinery (belt sander)

Basic sketching and rendering skills

ABOVE AND BEYOND

Safe and accurate use of coping saw

Mastery of hand tools.

Mathematical formula in a different context

- **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
- Materials
- Creativity
- Manufactured Board
- Smart Materials
- Specification
- Design Brief

Personal Development

Environmental issues with the use of materials and in the design and manufacture of products. Symbols on packaging, sustainability and Inclusive design promoted. Developing use of own ideas and local businesses

Literacy/Numeracy Focus

Measurements

Conversion

Reading Comprehension

WHERE NEXT?

KS4 –Confident and safe use of hand tools with other materials.

KS4 material, design cycle and tools and equipment knowledge. Application of knowledge/skills in future projects. Solid understanding of terminology to apply in years 8-11.

TECHNOLOGY / RESISTANT MATERIALS

Wood is considered to be a sustainable material, as new trees can be grown to replace those used for timber and fuel. The main issue facing timber production is that it is being used at a far greater rate than it is being replaced causing huge damage to the land in the countries where it is grown. Timber is also a huge culprit of Product Miles. Different woods have to travel thousands of miles to different countries where those tree's aren't otherwise available. That's why it's important to try and use locally sourced timber to help reduce environmental damage.



Health and Safety in the classroom

Workshop Rules:

1. Only enter a DT room when told to do so by a teacher.
2. Keep your work area tidy.
3. Never run or rush around
4. Always listen and follow instructions
5. Only use tools, equipment and machines when told to do so.
6. Never remove anything from a workshop without permission
7. Wear an apron during practical lessons and goggles when instructed to
8. Stack away chairs before beginning practical
9. Tie long hair back with a bobble
10. Do not eat and drink in the workshop – water is permitted
11. Know where the emergency stop buttons are located
12. If you have an accident report it



Mandatory Signs
Colour: White and blue

A blue circle containing a white image denoting that a specific course of action must be taken.



Safe Condition Signs
Colour: White and green

A green rectangle or square with a symbol/text in white providing information about the location and use of fire fighting equipment.



Prohibition Signs
Colour: Black, red and white

A red circle band crossed with a diagonal bar on a white background. A black symbol behind this band indicates the prohibited action.



Fire Equipment Signs
Colour: White and red

A red rectangle or square with a symbol/text in white providing information about the location and use of fire fighting equipment.



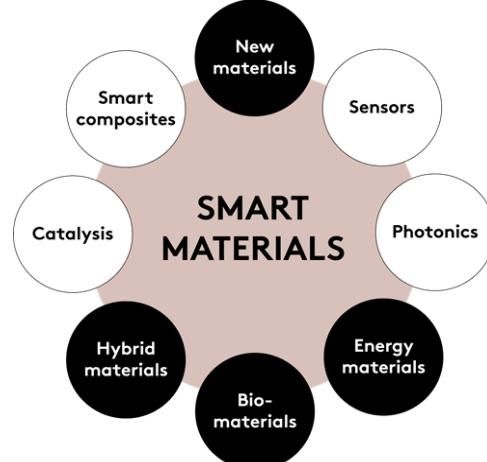
Hazard Signs
Colour: Black, yellow and white

A yellow triangle with a black border and symbol denoting a hazard in the environment.



General Signs
Colour: Any

These are not safety signs and therefore are not governed by a specific colour scheme or format. They are to be used for any non-safety purpose.



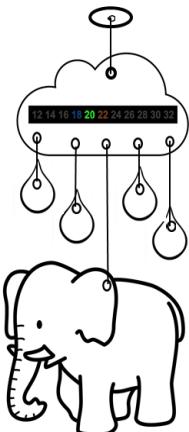
Design Brief

The starting point for any design is the design brief. The brief outlines what problem a design will solve. It should be referred to throughout the project to make sure what you are working on will solve this problem.

You have been asked by Bambinos Boutique in St Johns Market, Liverpool to design and make a mobile thermometer using a Thermochromic heat strip. They would like it made from plywood and would like it to be of a theme to be Animal based for a baby or child's bedroom.

The Journey:

-We will build confidence in using plywood through designing and creating a coaster.
-We will research an idea for a thermometer
-We will design how that thermometer may look
-We will create a card model of our chosen design
-We will then make a plywood prototype of our chosen design.



Design & Technology Keywords



Hardwood

Wood from slow-growing deciduous trees.
+ Very strong and durable
- Furniture, flooring, tool handles



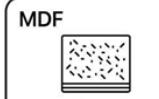
Softwood

Wood from fast-growing coniferous trees.
+ Lightwork, easy to work
- Construction, joinery



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



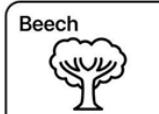
Pine

Common softwood.
+ Cheap and lightweight
- Furniture, interior joinery



Oak

Common hardwood.
+ Hard-wearing, attractive grain
- Furniture, flooring



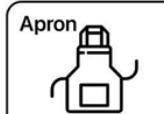
Beech

Hard, tough hardwood.
+ Resists dents, smooth finish
- Toys, workbenches



Safety goggles

Protective eyewear.
+ Prevents eye injuries
- Used when cutting or sanding



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



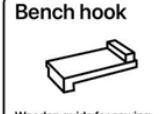
Coping saw

Narrow-blade saw for curves.
+ Cuts intricate shapes
- Model making, design work



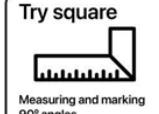
G-clamp

Adjustable metal clamp.
+ Straight, holds work securely
- Clamping pieces for gluing



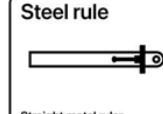
Bench hook

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
- Allows screw heads to sit flush
- Fitting screws or dowels



Countersink bit

Drill bit for widening screw holes.
+ Allows screw heads to sit flush
- Wood joints and fixings

TECHNOLOGY / RESISTANT MATERIALS

SOFTWOODS

Softwoods come from coniferous trees, a tree that usually has needles and cones rather than broad leaves. These trees are commonly referred to as evergreens as most of them keep their leaves all year round. Softwoods are fast growing and can reach full maturity within 25 years. Softwoods generally have a more porous structure. This means that if they are left unprotected, they can absorb moisture and begin to rot more quickly. Softwoods don't come in as many colour varieties as Hardwoods however, they are very easy to stain to make them look like their more expensive counterparts.



PINE

Properties: Lightweight, Easy to work, Can split easily. Common Uses: Interior construction, Cheap furniture and Decking



CEDAR

Properties: Good strength to weight, Durable and Resistant to decay. Common Uses: Construction, Boxes, Boats, Cladding and Musical Instruments.



HARDWOODS

Hardwoods come from deciduous trees. These are trees which lose their leaves in winter. Hardwoods take a long time to grow. In fact, if you were to plant a hardwood tree today, you would need to wait between 80-120 years for it to grow to full maturity. Hardwoods tend to be less porous and more dense which makes them less prone to wearing and rotting. Hardwoods come in a variety of colours and are known for their aesthetic appeal.



OAK

Properties: Tough, Hard, Durable, High quality finish. Common Uses: Flooring, Furniture, Railway Sleepers and Veneers.



FIR

Properties: Machines well, Durable, Stiff and Good strength to weight. Common Uses: Construction, Veneers.



SPRUCE

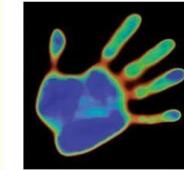
Properties: Easy to work, high stiffness, Common Uses: Construction (Interior/Exterior), Furniture and Musical Instruments



LARCH

Properties: Durable, Tough, Good water resistance, Good surface finish. Common Uses: Electrical fittings, casings, buttons and handles.

Smart Materials



Thermochromic pigments are a type of colour-changing pigment that respond to changes in temperature. They are designed to change colour or become transparent when exposed to heat, and then revert back to their original colour as they cool down.

Evolution of materials in time



MAN-MADE BOARDS

Manufactured Boards are usually sheets made from waste/off-cuts and recycled timber.



Manufactured Boards are usually coated with a thin layer of natural timber called a veneer.

MDF

Properties: Rigid, Stable, Cheap, Easy to finish but Very absorbent which leads to rotting. Common Uses: Flat pack furniture, Toys, Kitchen Units & Construction.



BLOCK BOARD

Properties: Lightweight, Stable, Easy to Work, High resistance to twisting and warping. Common Uses: Construction, Low-end furniture.



CHIP BOARD

Properties: Good compressive strength, Not water resistant, Cheap, Easily damaged. Common Uses: Flooring, Low-end furniture, Kitchen units & tops.



PLYWOOD

Properties: Very stable and strong due to alternate layering at 90°. Aesthetic qualities. Thin, flexible versions are available. Common Uses: Flooring, Low-end furniture, Kitchen units and tops.



HARD BOARD

Properties: Fairly weak, One side smooth, the other is furry. Common Uses: Low-end furniture



A 'smart material' can be defined as a material whose physical properties change in response to an input e.g. making them simpler or safer to use. A smart material reacts to external stimulus changes in the environment without human intervention.



Year 7 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 food technology, 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, baker/cake maker, business owner.

CORE KNOWLEDGE

Health and safety- rules, routines, risk assessment, hazards and precautions, hygiene
Bacteria, causes, prevention, factors that makes bacteria multiply (Moisture, time, food, oxygen, temp.)
Product analysis of food products
Nutrition – Macro and micro nutrients. Protein, Carbohydrates, Fats, Fibre, Vitamins and Minerals)
Food packaging and labelling, symbols including nutritional values.
Key terminology (See Vocab list)
Manufacturing food – See skills list.
Storing/cooking food safely. (fridge, Freezer and ambient foods)
Designing food products for a client

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, melting
Chopping skills (bridge and claw)

Food Products

Pizza wrap, fruit salad, Flap Jacks, fruit crumble, fairy cakes.

ABOVE AND BEYOND

Independently working through methods
Recipe adaptations for special diets.

Acceleration tasks.

VOCABULARY

Ingredients, combine, method, hygiene, nutrition, properties, manufacturing, diets, bacteria, creaming, rubbing, chopping, origin, evaluation, blend, mix. Appearance, aesthetics, aroma, texture, protect, preserve, promote.

Personal Development

Rse
Healthy lifestyle, Symbols on packaging, reading food labels, Packaging and its impact on the environment.

Literacy Focus

Word rich meanings
Comprehension task

Numeracy Focus

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

WHERE NEXT:

Year 8 – Edible casings
Food adaptation, advanced cooking methods and introduction to careers in H&C and food preparation.

Year 7 Food

Good food hygiene means knowing how to avoid the spread of bacteria when cooking, preparing, and storing food. Foods that aren't cooked, stored and handled correctly can cause food poisoning and other conditions.

- A** Wash all fruits and vegetables
- B** Clean work surfaces regularly
- C** Store food at the correct temperature
- D** Cook foods properly
- E** Keep cooked food and raw food separate
- F** Wash and dry all dishes thoroughly



Expiration Dates



Health and Safety



Mandatory Signs
Colour: White and blue
A blue circle containing a white image denoting that a specific course of action must be taken.



Safe Condition Signs
Colour: Green
A green rectangle or square with a symbol/text in white providing information about safe conditions.



Prohibition Signs
Colour: Black, red and white
A red circle with a diagonal line through a symbol on a white background. A black symbol behind this line indicates the prohibited action.



Fire Equipment Signs
Colour: White and red
A red rectangle with a fire extinguisher symbol and text in white providing information about the location and use of fire fighting equipment.



Hazard Signs
Colour: Black, yellow and white
A yellow triangle with a black border and symbol denoting a hazard in the environment.



General Signs
Colour: Any
These are not safety signs and therefore are not governed by a specific colour scheme or format. They are to be used for any non safety purpose.

Cross Contamination



Cross contamination can cause food poisoning when bacteria is transferred onto food that is ready to eat. For example, if raw meat comes into contact with a sandwich, the person eating the sandwich will consume the

Health and Safety in the Kitchen

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	

Personal Protective Equipment



Hairnets must be worn **This is a food production area**



Hygiene - The standards to which people keep themselves or their environment clean.



Bacteria - Microscopic, single-celled living organisms, some of which can cause food poisoning.



Personal - Belonging or affecting a person rather than a group.



Function - The way in which something works or operates

Hand Washing

Food handlers should always wash their hands:

- Before Handling food
- After going to the toilet
- After coming in from outside
- After coughing, sneezing, or blowing your nose
- After touching money
- After handling rubbish or the rubbish bin
- After touching animals or insects
- After handling raw eggs, raw meat, raw fish or raw poultry



Personal Hygiene

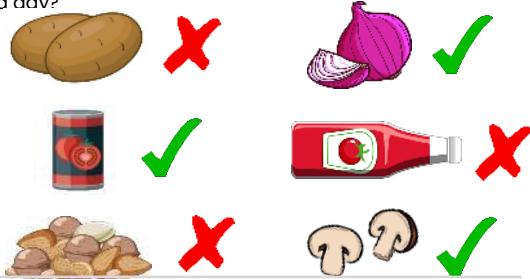


- A** Remove jewellery including watches
- B** Nails kept short and clean
- C** Hands should be dried
- D** Food should not be handled when ill
- E** Aprons should be worn when handling food
- F** Cuts and wounds must be covered with a blue plaster
- G** Hands must be washed
- H** Food should not be handled for long periods of time



Year 7 Food

Fruit and vegetables are a great source of vitamins, minerals and fibre, and an important part of a balanced diet for kids and adults. Eating plenty of fruit and veg helps keep us healthy, and may reduce the risk of disease and some cancers. What is included in your 5 a day?



4 – 6 Year olds	7 – 10 year olds	11 and older

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.	
	Tolerance – The amount of variation allowed within a recipe $\pm 5\text{g}$ without it affecting the taste, texture and appearance.	



Portions for adults

An adult portion of fresh, frozen or tinned fruit or vegetables is 80g. For dried fruit, a portion is 30g



Portions for kids

Kids 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!



Preparation Techniques

Food preparation refers to the process of acquiring raw ingredients and making them ready for consumption. Also, it entails any portioning, packaging, assembling, and processing that alters the form of food



The claw hold
Used to chop and slice foods safely



The bridge hold
Used to chop and slice foods safely



The Rubbing In Method
Using fingertips to rub fat (butter/margarine) into flour. Used to make scones, crumble, shortcrust pastry



Rolling out
Using a rolling pin to roll out dough such as pizza bases and shortcrust pastry

Eating Healthy Guidelines

The recommended guidelines for living a healthy lifestyle are:

- Base your meals on higher fibre, starchy carbohydrates.
- Eat lots of fruit and vegetables - at least 5 portions per day (80g per portion).
- Eat more fish, including a portion of oily fish per week.
- Cut down on saturated fat and sugar.
- Eat less salt: no more than 6g per day.
- Get active and be a healthy weight.
- Do not get thirsty.
- Do not skip breakfast.

