

## Year 9 Design Technology Rotations

### 1. 3D Design

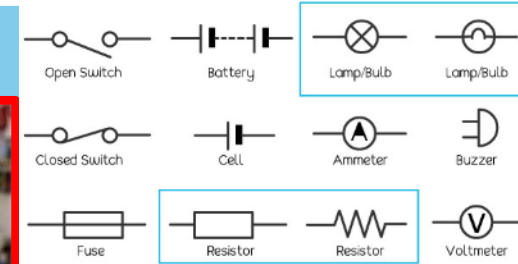
- [Journey of Knowledge](#)
- [Knowledge Organiser](#)

### 2. Resistant Materials

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

### 3. Food Technology

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



# Year 9 3D Design : Journey of Knowledge

## Context and Introduction to Unit

In this unit pupils will follow the 3D design route and assessment objectives for art and design. They will produce a mini project based on the work of Eric Cremers. Pupils will build upon their knowledge of different materials used in the design and manufacture of installations. They will learn about mark making, manufacturing processes and different finishes used on 3D artwork. Pupils will have the opportunity to use practical equipment in focused practical tasks that will encompass the theory learned in the unit as well as key literacy and numeracy skills. The knowledge gained will allow pupils to make informed choices when choosing their option subjects. Students will develop knowledge of 3D artist Eric Cremers through analysing and research tasks. Students will revisit isometric drawing and perspective drawing. Students will develop knowledge of measuring, planning and designing leading to building and constructing their own buildings.

## The bigger picture:

*Personal development opportunities.*

*Career links.*

*Career link – Advertiser*

*Publisher, Logo designer, Web*

*Developer, Art director, Printmaker,*

*Game Artist, Interior Design*

## CORE KNOWLEDGE and SKILLS

### **3D Design Route & Assessment Objectives**

Understand the expectations and criteria for art & design (3D design pathway).

### **Artist Study: Eric Cremers**

Learn about Eric Cremers' work, style, and techniques, Analyse and research his approach to 3D art and installations.

### **Materials & Processes**

Explore different materials used in the design and manufacture of installations, Understand various manufacturing processes, Learn about different finishes used on 3D artwork.

### **Drawing & Design Skills**

Revisit **isometric drawing** techniques, Revisit **perspective drawing** (1-point and 2-point), Develop skills in mark making to support design communication.

### **Practical Skills**

Use practical equipment safely and effectively in focused tasks, Apply theory to practical outcomes, Develop measuring, planning, and designing skills, Build and construct a 3D building as a final outcome.

### **Evaluation & Decision-Making**

Apply knowledge to make informed design choices, Reflect on design and making processes to improve outcomes.

### **Cross-Curricular Skills**

Apply key **literacy skills** (e.g., analysing, written evaluations, research), Apply **numeracy skills** (e.g., measuring, scaling, proportion).

### **Future Learning**

Use the knowledge gained to make informed decisions about future option subjects.

Products made:

3D Constructed shanty town house

## 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

## CORE VOCABULARY

- Sculpture
- Bold
- Vibrant
- Emotive
- Layered
- Shanty town
- Realistic
- Rustic
- Dull
- Worn
- Concept
- Orthographic
- Isometric
- Perspective

## Personal Development

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

## Literacy/Numeracy Focus

Nets,  
Measurements  
Analysis  
Discussion of key terminology:  
Client, customer, profile,  
profession  
Consumer  
Audience

## WHERE NEXT?

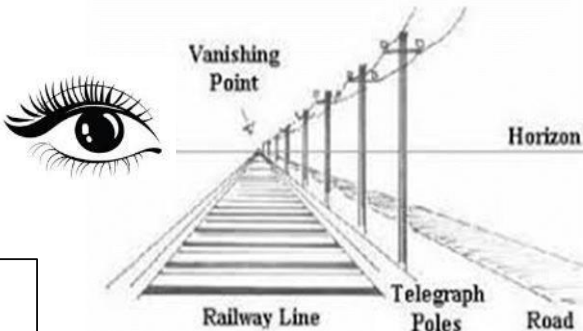
Pupils have a fuller knowledge of the 3D design course and can make informed choices for their KS4 pathway

## ARTIST BIOGRAPHY

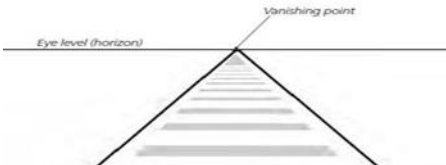
Eric Cremers creates 'Habitats' (architectural objects that show how people all over the world shape or could shape their buildings). He uses cardboard, wood, textiles and organic things like palm leaves, branches, cocoa and cactus. The theme of Habitats fascinates him most and has therefore become his main subject. Eric Cremers was once an art teacher and was born in Holland but now lives on the Dutch Island of Bonaire.



## PERSPECTIVE DRAWING



- Perspective, the art of representing Three dimensional (3D) drawings onto a two dimensional (2D) surface.
- 1-point perspective drawings only have one vanishing point on the horizon line located somewhere within the picture plane and all the lines are directed towards it.
- Common examples of such perspectives show a view down the street or a railway.



HILLISIDE  
HIGH SCHOOL

## WHAT YOUR FINAL PIECE WILL LOOK LIKE

## Shanty Towns



A Habitat is a home, the place where humans get all that they need to survive. Like all animals, a habitat is where humans satisfy the most basic survival requirements - the food, water, cover and places to raise young.

## WAGOLL

### Step One:

Choose an image from your work sheet and draw the outline. Make sure you are pressing light with your pencil.



### Step Two:

Add detail and tone using your pencil, then add colour using colouring pencils.



### Step Three:

Add colour and refine your artist's study with black thick to thin lines.



## WORD RICH

Linear means the use of straight lines.  
A **Vanishing Point** is the furthest point away from the viewer. It is where all lines are directed towards.  
The **Horizon Line** or **Eye Level** is to represent where the viewer's eye is, or where the sky meets the land.

A **shanty town** or squatter area is a settlement of improvised buildings known as shanties or shacks, typically made of materials such as **mud and wood**.  
A typical shanty town lacks adequate infrastructure, including **proper sanitation** (sewage system), **safe water supply**, **electricity** and **street drainage**.

# Year 9 Resistant Materials: Journey of Knowledge

## Context and Introduction to Unit

### Wooden Toy / Electronics

*Students will understand what sustainability is whilst investigating and researching the FSC. Students will develop skills creating isometric drawings whilst revisiting the importance of conversion and measurements. Students will make a toy wooden train using coping saws and the belt sander. Students will develop knowledge of circuitry symbols and closed circuits leading to building their own circuit using solder and other components*

The bigger picture:  
Personal development opportunities.  
Career links.  
Discussion Based  
Designer  
Engineer  
Mechanics  
Carpenter  
Architect

## CORE KNOWLEDGE

### 1. Sustainability and FSC (Forest Stewardship Council):

**Sustainability:** Understanding the importance of using resources in a way that does not deplete them for future generations. Involves environmental, economic, and social considerations.

**FSC:** An organization that certifies forests and wood products as sustainably sourced, ensuring responsible forest management that protects ecosystems and workers’ rights.  
Importance of choosing FSC-certified materials to support sustainable practices.

### 2. Isometric Drawings, Conversion, and Measurements:

**Isometric Drawing:** A method of 3D drawing that represents an object where the three axes are equally spaced at 120° angles, helping visualize designs accurately.

**Conversion and Measurements:** Revisiting skills to convert units (e.g., mm to cm), accurately measure materials, and apply precise dimensions to drawings and real objects.

### 3. Practical Woodworking Skills:

**Coping Saw:** A hand saw used for cutting curves and shapes in wood.

**Belt Sander:** A power tool used to smooth and finish wooden surfaces by sanding.  
Techniques for safely and effectively using these tools to create wooden toys.

### 4. Circuitry Knowledge and Skills:

**Circuit Symbols:** Understanding standard symbols for components like batteries, resistors, switches, LEDs, and wires.

**Closed Circuits:** Concept of a complete electrical loop allowing current to flow and power components.

**Building Circuits:** Developing practical skills in assembling circuits, including soldering components together securely.

### Products made:

Toy wooden train with working LED lights

## SKILLS

- Using coping saw accurately
- Using belt sander/disk sander
- Accurate measuring and conversion
- Clean painting
- Following instructions for using adhesives

### 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
- Find other FSC products.

## VOCABULARY

- ☐ Design Brief
- ☐ Target Audience
- ☐ Circuitry
- ☐ Material
- ☐ Solder
- ☐ Sustainability
- ☐ Creativity
- ☐ Force
- ☐ Manufactured Board
- ☐ Motion
- ☐ Dowel
- ☐ LED
- ☐ Specification -

## Personal Development

Understanding of Ecosystem and importance of

### Literacy Focus Numeracy Focus

Measurements

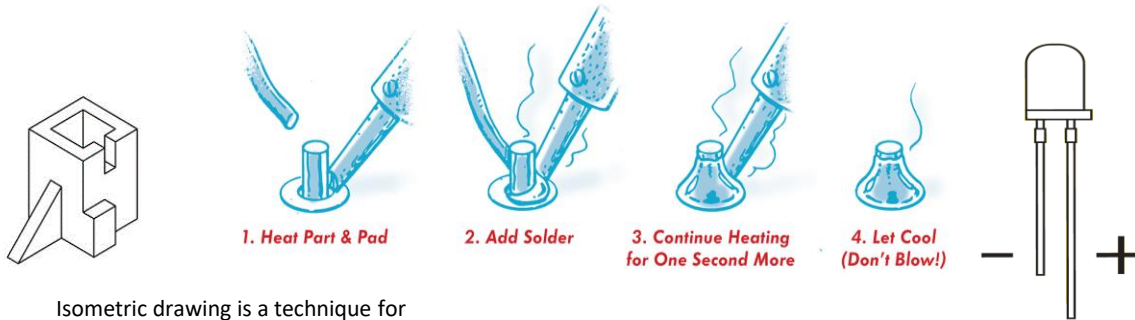
Conversion

Reading Comprehension

### WHERE NEXT:

Developing skills and knowledge at KS3 can lead to GCSE design technology and GCSE 3D design.

# TECHNOLOGY / RESISTANT MATERIALS



Isometric drawing is a technique for representing 3D objects in 2D, often used in technical and engineering drawings. It's also known as isometric projection

**CE CERTIFICATION IMPLIES, THE TOY CONFORMS TO EUROPEAN STANDARDS**

**Age Warning! This mean toys are not suitable for the under 3s.**

**Buy toys according your Child's Developmnet.**

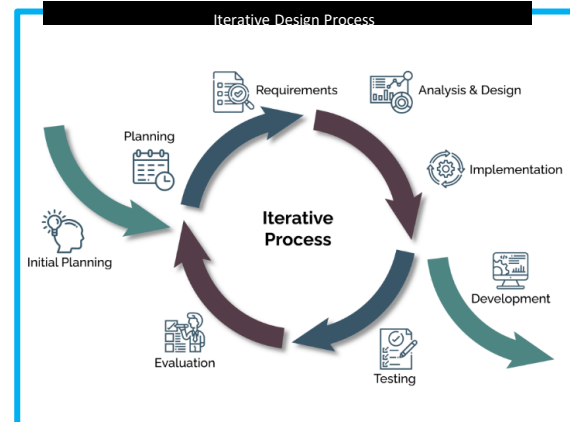
**The Kitemark symbol is a sign of reliability and safety as it Complies With the British Standards Institution.**

**Conforms to British Toys and Hobbys Association Standards**

**WARNING- Choking hazard. Toy contains small parts and/or sharp edges**

**Health and Safety in the**

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



## Design & Technology Keywords

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

# TECHNOLOGY / RESISTANT MATERIALS

## MDF



- Cost Effective
- High Density
- Strong
- Durable and Sustainable
- Environmentally Friendly
- Insect Proof

## PLYWOOD



- Stability
- Impact Resistant
- High strength to weight ratio
- Chemical Resistance
- Affordable
- Easily cut and shaped

The FSC, or Forest Stewardship Council, is a non-governmental organization that promotes responsible forest management worldwide. They are an international non-profit dedicated to ensuring forests are managed to high environmental, social, and economic standards.



Zero deforestation



Environmental protection



Indigenous Peoples' rights respected



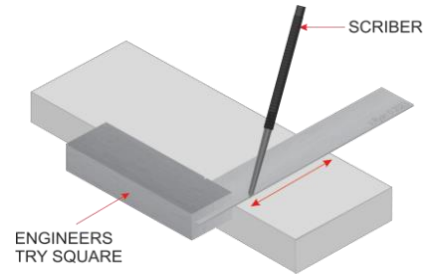
Fair wage and work environment for workers

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

- Interior Designer
- Product Designer
- Video Game Design
- Civil Engineer
- Mechanical Engineer
- Robotics Engineer
- Aeronautical engineer
- Joiner
- Design Engineer
- Jewellery designer
- Electrical Engineer
- Sound Engineer
- Architect
- Dress Maker
- Electrician
- Surveyor



The engineers try-square is composed of two parts, the stock and the blade. They are usually made from bright mild steel with the blade being hardened and tempered so that it resists damage. It is normally used during engineering / metalworking projects



## Design Brief



The FSC (Forest Stewardship Council) are collaborating with the early learning centre. They want us to create a toy train from sustainable timber. They want it decorated in bright colours and for it to be child safe.



### The Journey:

- We will research into sustainable materials
- We will design and measure our toy
- We will investigate into force and motion
- We will then use equipment to cut and create
- Finally, we will paint and Decorate

Interested in continuing Design technology or 3D Design for GCSE? Speak to Mr. Lambert

| Component                    | Symbol | Function   |
|------------------------------|--------|--|
| Battery                      |        | Provides a potential difference to push current around the circuit.  |
| Switch                       |        | Opens to break a circuit, closes to complete a circuit   |
| Bulb                         |        | Converts electric current into light   |
| Resistor                     |        | Reduces the flow of electric current.  |
| Variable resistor            |        | The resistance can be changed usually by turning a knob.   |
| Light Dependent Resistor LDR |        | The resistance is affected by light. High resistance in darkness, low resistance in bright light.                          |
| Thermistor                   |        | The resistance is affected by temperature. High resistance when cold, low resistance when hot.                             |
| Diode                        |        | Allows current to flow in one direction only.  |
| Fuse                         |        | Used as a safety device. Breaks the circuit when the current is too high.  |
| Light Emitting Diode LED     |        | Produces light with only a small amount of current. Must be connected with a resistor in series to protect it from damage. |
| Voltmeter                    |        | Measures voltage or potential difference in Volts (v). Must be connected in parallel to a device.                          |
| Ammeter                      |        | Measures current in Amps. Must be connected in series.   |
| Ohmmeter                     |        | Measures the resistance of a device in Ohms.   |
| Motor                        |        | Converts electric current to movement.   |
| Buzzer                       |        | Converts electric current to sound.  |



# Year 9 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. They will learn about different cultures and how foods are used and celebrated within different cultures.

## The bigger picture:

*Personal development opportunities.  
Career links.*

Nutritional therapist, food technologist, quality manager, catering, chef, hospitality industry, business owner

## CORE KNOWLEDGE

Health and safety- rules, risk assessment, hazards and precautions, hygiene, PPE, HACCP.

Bacteria, causes, prevention, cross contamination

Nutrition

Micro/macro nutrients

Properties and functions of ingredients

Manufacturing food

Special diets

Storing/cooking food safely

Cultural influences and cultural cuisine

Food miles

## 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

Chopping skills

recipe adaptations

Sensory evaluations and product analysis

Production methods

Time plans

## Food Products

Shortcrust pastry, cheese and onion triangles, bread dough, pizzas, fruit plait.

## ABOVE AND BEYOND

Independently working through methods

Recipe adaptations for special diets

Developing own recipes

Producing time plans for individual tasks

Acceleration tasks

## VOCABULARY

Ingredients, combine, method, hygiene, nutrition, properties, manufacturing, diets, bacteria, micro, macro, creaming, rubbing, chopping, origin, kneading, adaptations, evaluation, sensory, blend, mix, separate, culture, aroma, texture, sensory, taste, palatable

## Personal Development

### Rse

Healthy lifestyle,

Food miles, packing and its impact on the environment.

Symbols on packaging, reading food labels. Ethical choices, cultural choices.

### Literacy Focus

Word rich meanings

Comprehension task

### Numeracy Focus

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

### WHERE NEXT:

KS4

## Popular food around the world

### ITALY / ITALIA



The most common foods in the Italian diet include pasta, cheese, vegetables, olive oil, meats. Italians give a lot of importance to fresh ingredients. Meals consists of breakfast (colazione), lunch (pranzo), and dinner (cena).

Japan's most famous dish, sushi is also widely misunderstood. Most people believe that sushi is simply raw fish. Rather, good sushi is a combination of rice, raw fish and vegetables and comes in many different forms.

### JAPAN / 日本



### UNITED STATES / USA



American cuisine includes milkshakes, BBQ, and a wide range of fried foods. A lot of American dishes are unique takes on food originally from other traditions.

Paella is the national dish and is prepared with rabbit meat and vegetables. Today, however, there are countless variations: with fish and seafood, with meat and fish or even vegetarian.

### SPAIN / España



### GREECE / ΕΛΛΑΔΑ



Greece is known for its Olive Oil. Olives grown in Greece are known for their high-quality taste and flavour. Many Greek olive oil producers still use traditional methods of production, such as cold pressing and hand-harvesting.

### FRANCE / LA FRANCE



France's signature dish is considered to be escargot, a dish of cooked land snails. However bread is widely a staple with items such as baguettes and croissants.

## Career Links

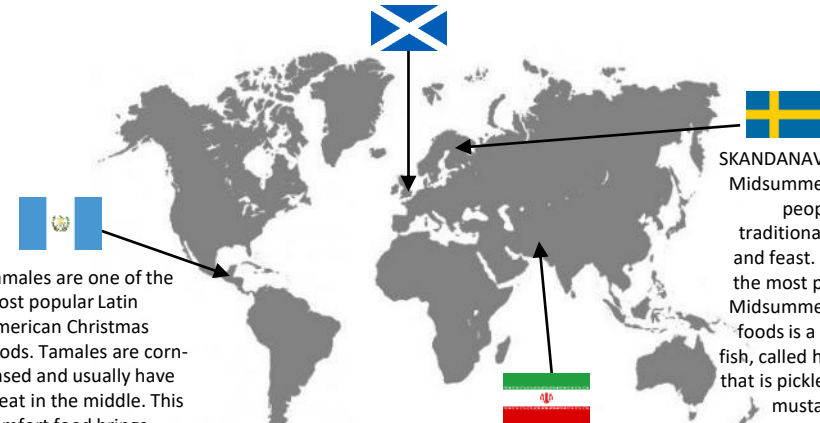
If you have a passion for food and would like to be in a service industry, there are various careers you can pursue to fulfil your aspirations

- 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



## Holidays and Feasts from around the world

SCOTLAND: Burns Night is a time to enjoy Scottish traditions and celebrate the renowned poet Robert Burns with a classic combination of haggis, neeps, tatties, with some poetry

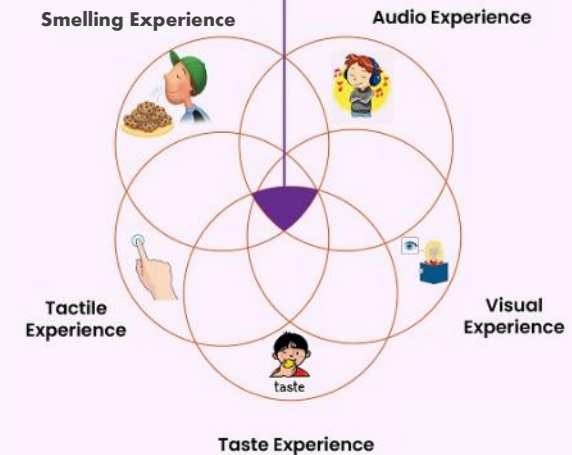


Tamales are one of the most popular Latin American Christmas foods. Tamales are corn-based and usually have meat in the middle. This comfort food brings families together for Christmas.

SKANDANAVIA: On Midsummer's Eve people sing traditional songs and feast. One of the most popular Midsummer's Eve foods is a kind of fish, called herring, that is pickled with mustard and onions.

IRAN : Nowruz, the Persian New Year, takes place in March. The foods eaten are specifically chosen to evoke spring and renewal and welcome the coming year.

## How to Evaluate your food/drink



# Popular food around the world

## CHINA / 中国



Eating traditional Chinese food: Dumplings, fish, rice cakes, dim sum, green onion cakes, sweet rice balls, whole fish, chicken or crab and spring rolls. These foods are believed to bring good luck and prosperity.

Corn is the most eaten food and ingredient in Mexico. It is the base ingredient of tortillas, used for the preparation of tacos, quesadillas, and other dishes.

## MEXICO / México



## JAMACIA



Ackee, Jamaica's national fruit, is sautéed with salt fish (cod) fish, onions, tomato, sweet pepper, and other seasonings after being boiled

The national dish of Ukraine is red borscht, a well-known beet soup. However, varenyky (boiled dumplings) and a type of cabbage roll known as holubtsi are also national favourites

## UKRAINE / Україна



## INDIA / भारत



Rice is the staple food of India. It is a rich source of carbohydrates mainly starch. It is the most widely consumed staple food for a large part of the world's human population, especially in Asia.

## GERMANY / DEUTSCHLAND

Germans are known for their love of pork. Some popular dishes include schnitzel, which is a breaded and fried pork cutlet, and bratwurst, a type of sausage.



## NIGERIA / Naijeriya



Traditional Nigerian foods include maiz, yams, cassava, and plantains. Typical Nigerian meals are tomato stew, porridge, soups such as egusi soup, and jollof rice.

# 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   |

# Making Dough

## Step 1

Combine flour, yeast and sugar in a large bowl. Stir in salt. Make a well in the centre. Add milk and butter.



## Step 4

Punch down the centre of the dough with your fist. Turn onto a lightly floured surface. Knead for 2 minutes or until the dough is elastic and has returned to its original size.

## Step 2

Use a wooden spoon to stir the mixture until well combined, then use your hands to bring the dough together in the bowl. Put onto a lightly floured surface and knead for 10 minutes or until the dough is smooth and elastic. Brush a large bowl with olive oil to grease. Place the dough in the bowl and cover with a damp tea towel. Set aside in a warm, draught-free place to prove for 45 minutes-1 hour or until the dough has almost doubled in size.

# How does Bacteria Grow?

Bacteria need this  
to Multiply

FOOD TIME



ACIDITY

OXYGEN

MOISTURE

TEMPERATURE



# 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

Interested in continuing Catering and Hospitality at GCSE? Speak to Mr. Lambert



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