

Design and Technology Knowledge organiser

Year 8 Food: Nutrients, origin & function of ingredients



Gelatinisation: using a starch to thicken a liquid

Getting warm



COLD
Flour particles suspended in liquid. They don't dissolve so they form a **SUSPENSION** (solid particles floating in a liquid)

I'm swelling up



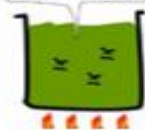
60°C
Getting warmer... 60 degrees Celsius
The walls of the flour particles soften and start to absorb water so start to swell up

I'm Bursting!!



HOT..... 80°C
At 80 Degrees Celsius Flour particles swell to 5 times normal size then burst, releasing their starch into the liquid thus thickening it

Didn't we do well



HOT..... 100°C
Degrees Celsius
Flour particles continue to swell and burst right the way to 100°C at which point the process is complete.



Why do we need to 'knead'?
The dough is kneaded to give the bread its texture.
The protein in the flour (**gluten**) is stretched to make an elastic dough and pockets of gas are formed.



KEYWORDS

NUTRITION
MACRONUTRIENT
KNEAD
GELATINISATION
SUSPENSION
DENSE
COMPOSITE

Micronutrient- Vitamins

Vitamin A	Beneficial in treating eye disorders, skin infections
Vitamin B9	Reduces risk of neural tube defects during pregnancy
Vitamin B12	Provides relief from symptoms of anemia, kidney and liver disorders
Vitamin C	Helps treat scurvy, cancer and common cold
Vitamin D	Aids in treating arthritis, tooth decay, diabetes and rickets
Vitamin E	Improves blood circulation and slows down aging process
Vitamin K	Reduces risk of menstrual pain and internal bleeding



The **Eatwell Guide** is based on the 5 food groups and shows how much of what you eat should come from each group.

The 5 different groups are:

Fruit & Veg: Vitamins and minerals

Starchy Carbs: Our body's chosen source of energy

Protein: Build & repair muscle cells, a source energy

Dairy & Alternatives: good source of calcium

Fats/oils: helps body absorb vitamins, source of energy

YouTube



See FoodTech 101 for all KS3 practicals

Energy value of the major 'macronutrients':

Fat: 37kJ (9 kcal) per gram
Carbohydrates: 17kJ (4 kcal) per gram
Protein: 17kJ (4 kcal) per gram



How much of your daily calorie allowance is taken up with your favourite foods? Use the following formula to work it out:

calories (in food) x 100

RDA (recommended daily amount e.g. 1600 teen girl, 1800 teen boy)

Function of ingredients in baking:

- Butter: adds moisture/ softens
- Flour: main bulking agent
- Water: helps combine ingredients
- Salt: used to add flavour
- Fat: helps tenderize pastries & cakes
- Sugar: feeds/activates the yeast
- Warm water: perfect temp for yeast
- Oil: Prevents dough from sticking



Composite Meals:

Nutrient Dense Foods=



Energy Dense Foods=



Composite meals are: meals made up of foods from different parts of the Eatwell Guide. Much of the food people eat is in the form of dishes or meals with more than one kind of food in them. For example, pizzas, casseroles, pies, lasagne, spaghetti Bolognese and sandwiches are all made with foods from more than one of the five food groups.

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Year 8 Design: Metals & Ergonomics



Metals

Ferrous

- Contain iron
- Magnetic
- Rust
- Cheaper
- Environment friendly

Non Ferrous

- No iron
- Non magnetic
- Don't rust
- Expensive
- Sustainable?

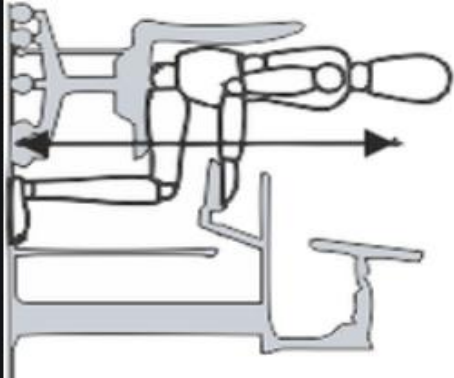
Alloys

- 2 or more metals
- Improved properties
- expensive



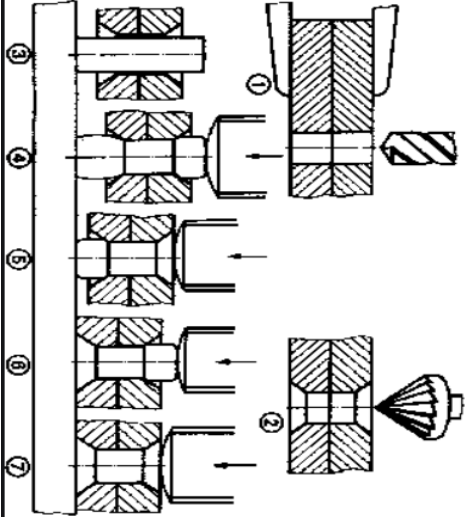


Pillar Drill



Ergonomics: human factors that affect the design of products or places

Anthropometrics: is the study of average human measurements



Countersink Head Riveting

Permanent:	Temporary:
When we do not want to take the pieces apart again	When we will, or might need to take pieces apart again
Glues, welding, rivets	Screws, bolts, nails



Scribe



Machine Vice



Hand Vice



Ball Pein Hammer



Centre Punch



Countersink Bit

Material PHYSICAL properties

Absorbency

An ability to take on/attract another element such as water, heat or light

Density

The mass of a material per unit of volume/how compact it is

Fusibility

The ability of a material to combine with another material when heated into a liquid, and then cooling as one

Electrical Conductivity

The ability to conduct electricity

Thermal Conductivity

The ability of a material to conduct heat

Material WORKING properties

Strength

The ability to withstand force without breaking

Elasticity

The ability to stretch and return to their original shape

Ductility

The ability to be drawn or stretched out onto a thin strand without snapping

Malleability

The ability to be deformed and to remain in that shape

Hardness

The ability to withstand scratching or denting

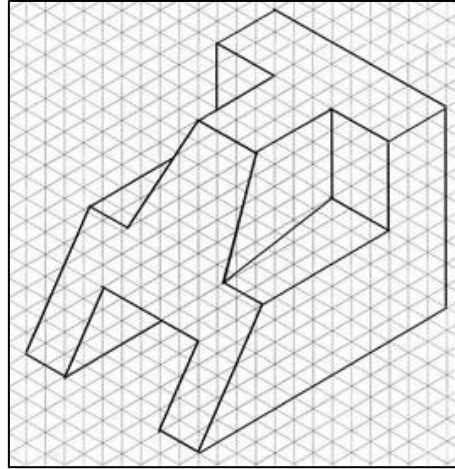
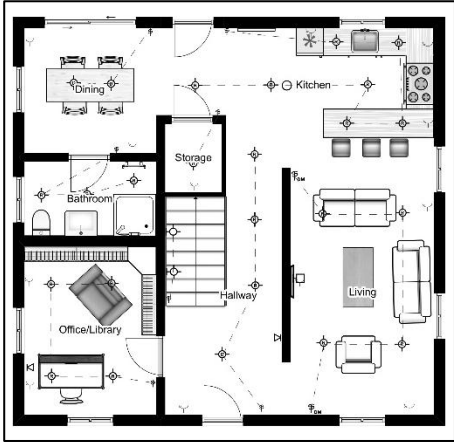
Toughness

The ability to withstand breaking or snapping

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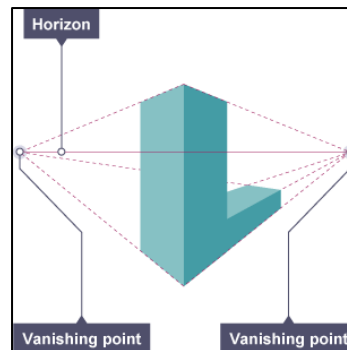
Year 8 Technology: Architecture & mechanisms

A **floor plan** is like a map in pictures of a floor in a building. It helps architects and designers understand how the space inside a house or office looks and how everything is arranged and flows. It is a to-scale drawing of a single room, one floor, or an entire building. Each wall, ceiling, and hallway is measured and then drawn to scale.



Isometric drawing, method of graphic representation of three-dimensional objects, used by engineers, technical illustrators, and architects. The technique uses a drawing grid with lines at angles of 30, 60 and 90 degrees. It is a technical drawing that required pencil and ruler and is a technique that creates drawings that can be enlarged and reduced accurately.

Perspective drawing is a way of communicating design ideas in three-dimension – this technique requires a pencil and ruler and is classified as technical drawing. The drawing technique also needs 2 vanishing points and shows the object being drawn getting smaller as it goes into the distance. This is a popular drawing technique however the objects being drawn cannot be accurately enlarged or reduced.



Deign Brief / Engineering Brief

A is the statement a gives to a designer outlining what they want their product to be like, eg 'Design a drinks bottle holder for use while riding a bicycle'. The designer could also produce a brief on behalf of the client, as the client might have a problem but not know how to proceed.

Design Specification

A is a list of criteria a product needs to address. Using the brief as a starting point for research, a specification can be written when more facts are known. Information needs to be found through research to help produce early design solutions and improvements. If the criteria are measurable, it makes it easier to later measure how effective the design ideas are, eg 'How much will the design cost to produce?'

Inspirational Architects:



Richard Rogers



Zaha Hadid

