Key Stage 3 Computing and ICT.

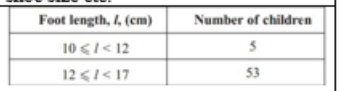
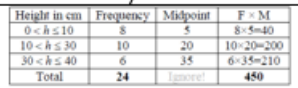
All knowledge organisers are hosted in the ICT and Computing department website which can be accessed directly via the link http://exmouthcollege.moodle.webanywhere.co.uk/

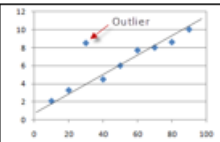
Year 7

Effective digital working practices Knowledge Organiser
Data representation Knowledge organiser
Block structured programming Knowledge Organiser
Software Knowledge Organiser
Hardware Knowledge Organiser
Boolean logic Knowledge organiser

Year 7 Autumn 1

Unit 1 Analysing and displaying data

Topic/Skill	Definition/Tips	Example
1. Types of Data	**Qualitative** Data – **non-numerical** data **Quantitative** Data – **numerical** data **Continuous** Data – data that can take **any numerical value** within a given range. **Discrete** Data – data that can take **only specific values** within a given range.	Qualitative Data – eye colour, gender etc. Continuous Data – weight, voltage etc. Discrete Data – number of children, shoe size etc.
2. Grouped Data	Data that has been **bundled in to categories**. Seen in grouped frequency tables, histograms, cumulative frequency etc.	 Foot length, l, (cm) | Number of children $10 \leqslant l < 12$ | 5 $12 \leqslant l < 17$ | 53
3. Primary /Secondary Data	**Primary** Data – **collected yourself** for a specific purpose. **Secondary** Data – **collected by someone else** for another purpose.	Primary Data – data collected by a student for their own research project. Secondary Data – Census data used to analyse link between education and earnings.
4. Mean	**Add** up the values and **divide** by how many values there are.	The mean of 3, 4, 7, 6, 0, 4, 6 is $\frac{3+4+7+6+0+4+6}{7} = 5$
5. Mean from a Table	1. Find the midpoints (if necessary) 2. Multiply Frequency by values or midpoints 3. Add up these values 4. Divide this total by the Total Frequency If **grouped** data is used, the answer will be an **estimate**.	 Height in cm | Frequency | Midpoint | F × M $0 < h \leq 10$ | 8 | 5 | 8×5=40 $10 < h \leq 30$ | 10 | 20 | 10×20=200 $30 < h \leq 40$ | 6 | 35 | 6×35=210 Total | 24 | [ignore] | 450 **Estimated** Mean height: 450 ÷ 24 = 18.75cm
6. Median Value	The **middle** value. Put the data in order and find the middle one. If there are **two middle values**, find the number half way between them by **adding them together and dividing by 2**.	Find the median of: 4, 5, 2, 3, 6, 7, 6 Ordered: 2, 3, 4, **5**, 6, 6, 7 Median = 5
7. Median from a Table	Use the formula $\frac{(n+1)}{2}$ to find the position of the median. n is the total frequency.	If the total frequency is 15, the median will be the $\left(\frac{15+1}{2}\right) = 8th$ position
8. Mode /Modal Value	**Most** frequent/common. Can have more than one mode (called bi-modal or multi-modal) or no mode (if all values appear once)	Find the mode: 4, 5, 2, 3, 6, 4, 7, 8, 4 Mode = 4
9. Range	**Highest value subtract the Smallest value** Range is a 'measure of spread'. The smaller the range the more consistent the data.	Find the range: 3, 31, 26, 102, 37, 97. Range = 102-3 = 99

10. Outlier	A value that '**lies outside**' most of the other values in a set of data. An outlier is **much smaller or much larger** than the other values in a set of data.	
11. Lower Quartile	**Divides the bottom half** of the data into **two halves**. $\mathbf{LQ} = Q_1 = \frac{(n+1)}{4}\,\boldsymbol{th}$ **value**	Find the lower quartile of: 2, **3**, 4, 5, 6, 6, 7 $Q_1 = \frac{(7+1)}{4} = 2nd$ value → 3
12. Lower Quartile	**Divides the top half** of the data into **two halves**. $\mathbf{UQ} = Q_3 = \frac{3(n+1)}{4}\,\boldsymbol{th}$ **value**	Find the upper quartile of: 2, 3, 4, 5, 6, **6**, 7 $Q_3 = \frac{3(7+1)}{4} = 6th$ value → 6
13. Interquartile Range	The **difference** between the **upper quartile and lower quartile.** $IQR = Q_3 - Q_1$ The **smaller** the **interquartile range**, the **more consistent** the data.	Find the IQR of: 2, 3, 4, 5, 6, 6, 7 $IQR = Q_3 - Q_1 = 6 - 3 = 3$

Try these

1. Here is a list of the numbers of bags some shoppers were carrying when leaving a supermarket.
   1 2 5 4 0 5 4
   a Find the median.
   b Work out the mean.
   c Work out the range.
2. Here are the lengths of some lines measured with a ruler.
   4 cm 7 cm 11 cm 7 cm 1 cm
   a Work out the mean.
   b Work out the range.
3. Here are the ages in years of some people in a sports club.
   8 12 25 18 30 23 35 33 28 18
   9 18 22 10 21 15 29 31 20 23

Complete this grouped frequency table using intervals of equal width.
The first interval has been done for you.

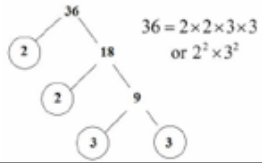
Age (years)	Tally	Frequency
0–9		

4. Students in two classes did a test.
   The mean for class A was 56 and the range was 28
   The mean for class B was 75 and the range was 10
   Make two comparisons between class A and Class B.

Year 7 Autumn 1

Unit 2 Number Skills

Topic/Skill	Definition/Tips	Example
1. Integer	A **whole number** that can be positive, negative or zero.	$-3, 0, 92$
2. Decimal	A number with a **decimal point** in it. Can be positive or negative.	$3.7, 0.94, -24.07$
3. Negative Number	A number that is **less than zero**. Can be decimals.	$-8, -2.5$
4. Addition	To find the **total**, or **sum**, of two or more numbers. 'add', 'plus', 'sum'	$3 + 2 + 7 = 12$
5. Subtraction	To find the **difference** between two numbers. To find out how many are left when some are taken away. 'minus', 'take away', 'subtract'	$10 - 3 = 7$
6. Multiplication	Can be thought of as **repeated addition**. 'multiply', 'times', 'product'	$3 \times 6 = 6 + 6 + 6 = 18$
7. Division	Splitting into equal parts or groups. The process of calculating the **number of times one number is contained within another one**. 'divide', 'share'	$20 \div 4 = 5$ $\frac{20}{4} = 5$
8. Remainder	The amount '**left over**' after dividing one integer by another.	The remainder of $20 \div 6$ is 2, because 6 divides into 20 exactly 3 times, with 2 left over.
9. Multiple	The result of multiplying a number by an integer. The **times tables** of a number.	The first five multiples of 7 are: 7, 14, 21, 28, 35
10. Factor	A number that **divides exactly** into another number without a remainder. It is useful to write factors in pairs	The factors of 18 are: 1, 2, 3, 6, 9, 18 The factor pairs of 18 are: 1, 18 2, 9 3, 6
11. Lowest Common Multiple (LCM)	The **smallest** number that is in the **times tables** of each of the numbers given.	The LCM of 3, 4 and 5 is 60 because it is the smallest number in the 3, 4 and 5 times tables.
12. Highest Common Factor (HCF)	The **biggest** number that **divides exactly** into two or more numbers.	The HCF of 6 and 9 is 3 because it is the biggest number that divides into 6 and 9 exactly.

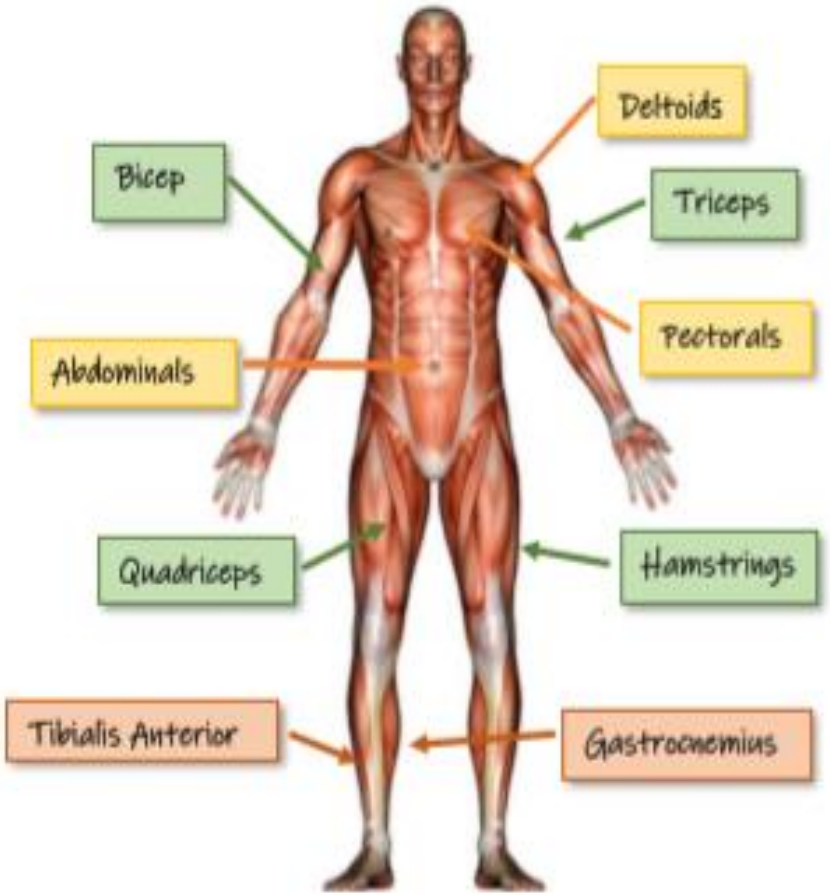
13. Prime Number	A number with **exactly two factors**. A number that can only be divided by itself and one. The number **1 is not prime**, as it only has one factor, not two.	The first ten prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
14. Prime Factor	A factor which is a prime number.	The prime factors of 18 are: 2, 3
15. Product of Prime Factors	Finding out which **prime numbers multiply** together to make the **original** number. Use a **prime factor tree.** Also known as 'prime factorisation'.	 $36 = 2 \times 2 \times 3 \times 3$ or $2^2 \times 3^2$

Try these

1. Find 48 × 100
2. Work out 384 ÷ 4
3. Work out £38 + £2.16 + 42p.
4. Write all the factor pairs of 18
5. Find the lowest common multiple (LCM) of 15 and 20
6. Write down the value of
   a 7^2

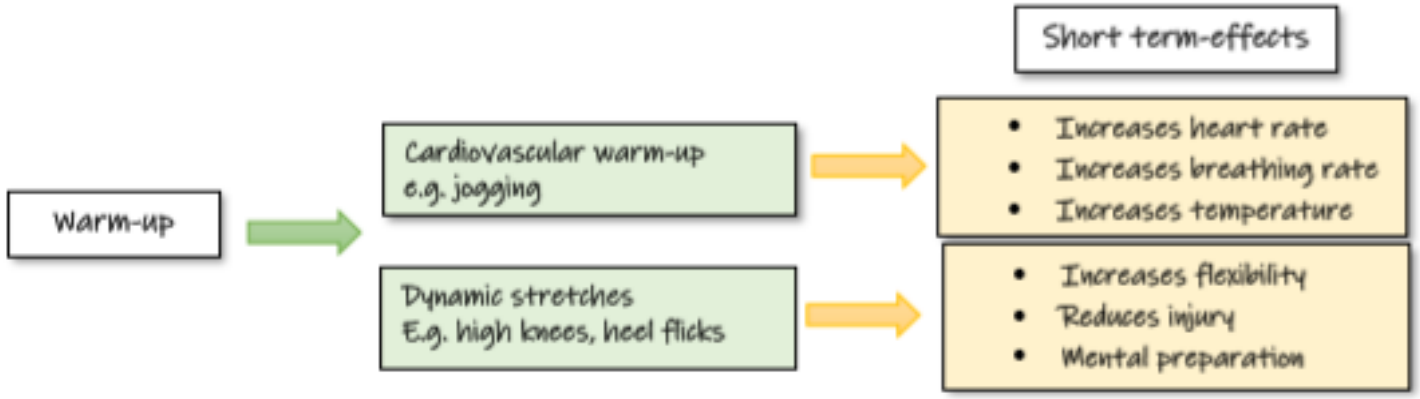
   b $\sqrt{100}$
7. The height of the highest mountain in Scotland is 1344 metres.
   The height of the highest mountain in England is 978 metres.
   Work out the difference between these two heights.
8. Some of the factors of 182 are prime numbers.
   Find one of these numbers.

Year 7 knowledge Organiser



Key	
	Advanced
	Secure
	Developing

		Examples
Flexion	Decreasing the angle at a joint	Preparation phase when kicking a football (Knee bending)
Extension	Increasing the angle at a joint	Execution phase when kicking a football (Knee straightening)
Planta-flexion	Increasing the angle at the ankle joint	Pointing your toes when performing an arabesque
Dorsi-flexion	Decreasing the angle at the ankle joint	Preparation phase during a jump shot in basketball
Abduction	Moving limbs away from the centreline of the body	Abducting the shoulder when preparing to bat in rounders
Adduction	Moving limbs towards the centreline of the body	Adducting the shoulder during the executing phase when batting in rounders
Muscular Endurance	Ability of a muscle or to contract over a sustained period.	Middle-distance running, rowing or swimming
Cardiovascular Endurance	The ability of the heart and lungs to supply oxygen to the working muscles	long-distance runners, team sports performers, endurance cyclists and rowers
Agility	The ability to move and change direction quickly (at speed) whilst maintaining control	A footballer needs agility to change direction quickly whilst dribbling the ball to outwit the defender
Power	Strength x speed	A basketballer needs power in the quadriceps when jumping to perform a lay-up.
Reaction Time	The time taken to initiate a response to a stimulus	A sprinter needs good reaction time to respond to the starting gun.
Flexibility	The range of movements possible at a joint	A gymnast needs good flexibility to be able to perform movements such as, the splits
Coordination	The ability to use different (two or more) parts of the body together, smoothly and efficiently	A cricket player needs coordination when hitting a cricket ball with a bat



Language for learning Physical Education

Year 7 (A01)

Movement Analysis
- **Muscles**
  - Position and location on the body
- **Types of actions/movements**
  - Definitions: Flexion, extension, abduction, adduction, Planta flexion & dorsi-flexion.
  - Linked to practical examples

Fitness & Training
- **Components of fitness**
  - Definitions: Muscular endurance, cardiovascular endurance, agility, reaction time, flexibility and coordination.
  - Linked to sporting examples

Cardio-respiratory
- **Short-term effects of exercise**
  - Linked to components of an effective warm-up.

Year 8 (A02)

Movement Analysis
- **Bones / Types of bones**
  - Position and location on the body
- **Antagonistic pairs**
  - Agonist and antagonist
- **Types of actions/movements**
  - Linked to practical examples (preparation, execution & follow through)

Fitness & Training
- **Components of fitness**
  - Relative of importance to a sports performer.
- **Methods of training / FITT**
  - Linked to component of fitness and specificity of a performer

Cardio-respiratory
- **Types of respiration**
  - Definitions: Aerobic (with O2) Anaerobic (without O2)
  - Link to practical examples
- **long-term effects of exercise**

Year 9 (A03)

Movement Analysis
- **Muscles & bones working together**
  - Actions and movements
  - Analysis linked to practical examples
- **Types of Muscle contractions**
  - Analysis- Isometric, isotonic: eccentric & concentric

Fitness & Training
- **Components of fitness**
  - Analysis & Evaluation
- **Methods of training / SPORT**
  - Comparing sports performers
  - Advantages and disadvantages

Cardio-respiratory
- **Types of respiration**
  - Calculations
  - Analysis to practical examples/ components of fitness
- **Short/ long-term effects of exercise**
  - Evaluate benefits to a performer

Exmouth Community College
Academy Trust

Year7 – Pop-up Book knowledge organiser

Design Brief

A design brief is a summery of the design opportunity. It is typically 1 -2 paragraphs long.

It should:

- State the context
- Identify the client/ User
- State the design opportunity or problem
- Identify any constraints—things that limit what can be done
- It might also contain some user needs and wants

How paper is made

Preparation of Fibres

During the first step of the paper making process, the material used to make the paper is converted to pulp .

Sheet formation

The next step is sheet formation. At this stage in the process, the pulp mixture is diluted some more with water. This is then strained through a moving screen made of fine mesh in order to create a fibrous web.

Drying

The final stage of the paper making process is drying, which is accomplished with time and pressing of the paper.

Processes used to cut paper

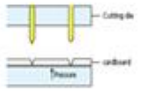
Scissors

Craft knives

Compass cutters

Guillotines

Die cutting is used when many identical parts are to be cut.



Types of paper and board

Type	Common uses	Characteristics	Weight
Cartridge paper	Printed flyers and leaflets. Used for drawing and painting.	Lightly textured (not perfectly smooth), often a light cream colour.	100–150 gsm
Bleed-proof paper	Printed (multi-coloured) flyers and leaflets. Used with felt-tip pens.	Allows sharp images as inks do not seep through the paper. Smooth and relatively hard.	70–150 gsm
Layout paper	Engineering drawings	Allows some light through, but not clear enough to see through; relatively hard.	50–90 gsm

Type	Common uses	Characteristics	Weight
Corrugated cardboard	General purpose material for boxes and packaging	Two layers of card separated by a fluted inner section. Low cost and often made from recycled paper and card.	250+ gsm
Carton board	Food packaging	White surfaces with grey fibres between. Tough and lightly textured. Lower cost than fully bleached card.	230–420 gsm
Foil-lined board	Drinks cartons Ready-meal lids	Made by laminating aluminium foil to one side of another board. Insulating properties, can keep moisture in/out.	250+ gsm
Solid white board	Book covers Quality packaging	Strong, high quality white card made from pure bleached wood pulp. Excellent for printing.	200–400 gsm
Ink jet card	Greetings cards	Strong card. Can be coated to stop ink spreading when printed.	240–280 gsm

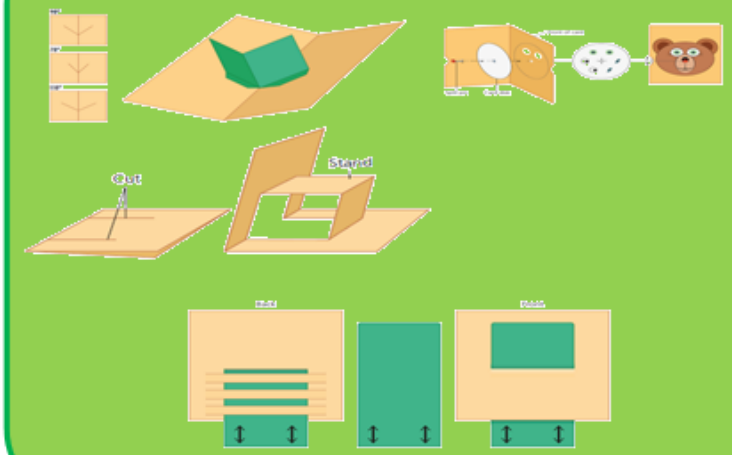
Year 7 – Design & Technology / Graphics – HT1

Year7 – Pop-up Book knowledge organiser

ACCESS FM

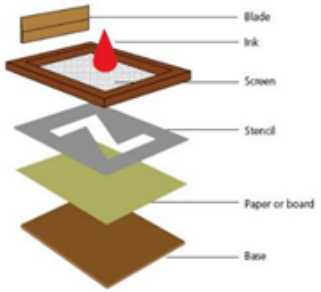
	Questions
Aesthetics	What colours are used? How does the product look and feel?
Cost	How much does it cost to buy?
Customer	Who is going to buy the product? Who is going to use it?
Environment	Does it use recycled materials? Could it be recycled?
Size	How tall/wide/long is it in mm?
Safety	Are there any sharp edges or small parts?
Function	What does it do? How does it do that? What mechanisms are used?
Materials	What is it made from?
Manufacturing	What processes were used to make it?

Pop-up mechanisms

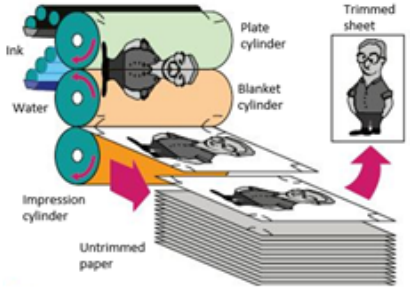


Printing processes

Screen Printing



Offset Lithography



Evaluate

What is the purpose of an evaluation?

- Decide whether it satisfies the brief
- What other people think of your product.
- It can help you decide how and where your product can be improved.
- It test whether the idea will work.

Questions to ask yourself when evaluating.

- Does it work? (could you get other people to test it and record the results?)
- What would I do differently if I could make it again?
- What did I find difficult?
- What was a success?

Year 7 – Design & Technology / Graphics – HT1

Year 7 Food Preparation and Nutrition Block 1: Knowledge Organizer

The Eatwell Guide

The Eatwell Guide is the UK healthy eating model. It shows the proportions in which different types of foods are needed to have a well-balanced and healthy diet. The proportions shown are representative of your food consumption over the period of a day or even a week, not necessarily each meal time.

The Eatwell Guide is based on the Government's *Eight tips for healthy eating*, which are:

1. Base your meals on starchy foods.
2. Eat lots of fruit and vegetables.
3. Eat more fish – including a portion of oily fish each week.
4. Cut down on saturated fat and sugar.
5. Try to eat less salt – no more than 6g a day for adults.
6. Get active and be a healthy weight.
7. Don't get thirsty
8. Don't skip breakfast.

Fruits and vegetables

Eating at least five portions of fruit and vegetables every day is recommended for health. All fruits and vegetables count towards 5 A DAY except for potatoes. Fruits and vegetables can be fresh, canned, dried, frozen or juiced
Fruits and vegetables are low in fat and high in fibre, so help to provide us with a range of important nutrients without exceeding our energy requirements.
We need fibre in our diet to help us maintain a healthy gut.
They also contain vitamins and minerals – the main ones being vitamin C, vitamin A and folate. Some fruit and vegetables are higher in some vitamins and minerals than others, e.g. bananas are high in potassium, whereas dried apricots are high in iron. This is why it is important to eat a range of fruit and vegetables rather than having the same ones all the time.

Top tips:

- Choose fruit or chopped vegetables as a snack.
- Add dried or fresh fruit to breakfast cereals. (To reduce the risk of tooth decay, dried fruit is best enjoyed as part of a meal, not as a between meal snack.)
- Have a salad with sandwiches or with pizza.
- Add vegetables to casseroles and stews and fruit to desserts.
- Try to eat different fruits and vegetables every day.

Key Processes:

Demonstrate the safe use of the hob
by making hot chocolate
Demonstrate the safe use of the grill
by making toast or pizza toast
Demonstrate the safe use of the oven
By making cheese / cheese and courgette muffins

Basic Nutrition

Nutrient	Function
Protein	Growth & repair
Carbohydrate Starch & sugar	Energy
Fat	Energy
Vitamins A, B, C, D	General protection
Minerals Iron Calcium	 Healthy blood Healthy bones & teeth

The Cooker

The safe use of the hob
Do not heat the ring without a pan containing food on it
Keep pan handles facing in
Allow to cool before cleaning

The safe use of the grill
Take care with detachable handles
Do not leave food unattended

The safe use of the oven
Have an oven buddy
Use hole free, dry oven gloves
Stand back when you open the door
Put your food in, and take out without lifting your hands in the oven

Year 7 – Design & Technology / Food & Nutrition – HT1

Click on the images to find hidden content!

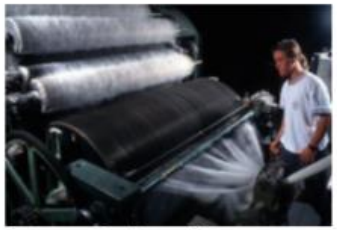
How are Fabrics Made?

Fabrics are made up of different types of fibres. Fibres can come from nature, like cotton from the cotton plant, or wool from sheep and they can also be synthetic (man-made) and be made from chemicals. Fibres often look like hair and they can be processed in different ways to make fabric. How they are processed affects the properties of the fabric, as does the fibre you start with.

There are three main ways to make fabric- Weaving, Knitting and Felting or Bonding.

Woven Fabric

When fibres are collected from nature, they need to be cleaned before they can be turned into fabric, they also are often carded (combed) to remove any debris and help the fibres lay in the same direction. Imagine a sheep's fleece- that needs cleaning and carding before the next stage of the process can begin.

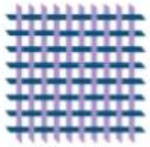


Carding machine

This giant machine spins all the fibres into yarn, ready for weaving.

Once the fibres are clean and ready to use, they are twisted together- this is called spinning. Lots of fibres are spun together making one long strand. The thickness of the strand varies, depending on how you want finished fabric to turn out.

The spun fibres are then woven together on something called a loom. There are lots of different types of weaves and they give a different end result. You might be most familiar one called a plain weave, this is used for fabric that could be made into school shirts, dresses and bedding. If you look very carefully at your school shirt, you might be able to see the different strands woven together. A Twill weave is used to make Denim fabric, which will be used to make Jeans.



Plain weave

Twill weave

Weaving can also be done by hand, this is usually for special fabric, perhaps even using silk.

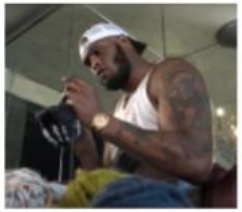
How are Fabrics Made?

Knitted Fabric

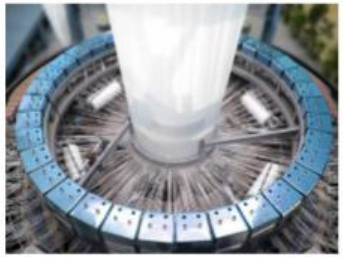
When you think of knitted fabric, you might think of what your grandparents or parents or even you do with knitting needles. Essentially, it is the same process for making knitted fabrics, but on a much larger scale, and using machinery.

Just the same as when making woven fabric, the fibres need cleaning and carding and then spinning before they can be knitted.

After that, the yarn is knitted into either rolls of flat fabric, or sometimes tubes of fabric or even whole garments such as tights or socks.



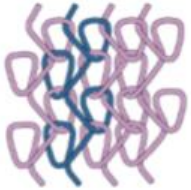
Heavy weight fighter Maurice Greene started knitting before a fight to calm him down. He's recently moved onto crochet.



This is a type of loom that is making knitted fabric that is in the shape of a tube. This could be used to make the body of a t-shirt, the arms and neck hole would be attached separately.

This is a picture of what knitted fabric would look like if you looked at it very closely. You can see the yarn is looped together. This makes knitted fabric stretchy so it's great for making into things like T-shirts and sportswear.

'Weft' knit



'Warp' knit

So it's not just woolly jumpers that are knitted, but also leggings, swim suits, underwear, socks and any other Textiles items that are stretchy, are likely to be made from knitted fabric.

How are Fabrics Made?

Felted and Bonded Fabric

Felted fabric is made directly from the fibres. No spinning is needed, although the fibres are still washed and carded. Wool is one of the best natural fibres to create felted fabric, because each fibre has a scaly structure that looks a bit like a fir-cone. When the fibres are heated up, the scales open up and then lock together with other fibres when they are agitated (rubbed together).

Wool fibre under a microscope

Felt fabric does not stretch, and can be very warm because of the way it is made. Felt does not fray like woven fabric, or unravel or ladder like knitted fabric but it doesn't drape very well so tends to be used for items like hats, bags and coats.

You may have heard of Needle Felting and Wet Felting. These are both crafts that can be done at home to create a variety of different items. Felting is also done on an industrial scale, and felt can be shaped as it's being made- like into the shape of a hat!

Bonded fabrics are also made directly from fibres, rather than yarn. The fibres are laid out in a random pattern, and then bonded together using heat or glue.

These fabrics tend to be very weak, but they don't stretch or fray. They are used for disposable items like J-cloths, surgical gowns and wet wipes.

Q What would be the best method of making fabric for a school bag? Explain why.

Q Why are fibres 'carded' before being spun into yarn?

Q What is the name for the machine that is used to make yarn into fabric?

Click on the images to find hidden content!

Natural Fibres

Textiles are usually made up of fibres. Fibres can come from all sorts of places like plants, animals, insects and even synthetic (man-made) fibres that come from chemicals. Fibres often look like hairs and can be processed in different ways to make Textiles, also called fabric.

Wool

Wool is a fibre that comes from animals. We mostly get wool from sheep, but you can also get wool from camels, alpacas, llamas, goats and even rabbits! It's possible to make wool from anything that is hairy- you could even make wool fabric from a dog!

Angora rabbit

Before and after shearing!

The wool is sheared from the animal (like having a haircut) and then it's washed, combed and processed to turn it into wool fabric. Wool fabric is warm so it's good for making into things like jumpers, scarves and coats. It's also used to make carpets and insulation to keep your house warm. Wool is absorbent and it can also shrink easily so you have to be careful when you wash it.



Cotton

Cotton Boll

Cotton is a fibre that comes from the cotton plant. The plant grows in warm climates and needs lots of water. After the plant has flowered, it produces a 'boll' which contains the seeds of the plant. In nature, these would be blown around by the wind and the seeds would disperse and grow new plants. Instead, we farm the plants and pick the cotton 'bolls', process them and turn them into cotton fabric.

Cotton feels cool to wear when it's hot, but it can crease easily. It can be quite hard wearing so can be washed easily and can last a long time. Cotton is also absorbent so it's good for making things like towels. Other items made from cotton include bedding, t-shirts, socks and underwear, trousers and school shirts. Cotton is cool to wear so it is used for a lot of clothing.

Field of Cotton plants




Silk

Silk comes from the cocoon of a silk worm. The silk worm (which is actually a caterpillar) spins a cocoon of silk around itself when it is ready to turn into a moth. People farm the silk worms, just like people farm sheep and when they make their cocoons it can take them up to 8 days! The farmers then put them in hot water to release the glue that holds the silk fibres together. Then the silk fibres are processed to turn them into silk fabric.

Silk Worm

Silk Worm Cocoon

As each cocoon is very small, silk fabric is very expensive as it takes so much effort to make just one item – it takes around 1,800 cocoons to make one silk dress! Silk is quite a delicate fabric and can be easily damaged when it's wet (eg washing). Silk is often used for special items like wedding dresses, or special occasion shirts or ties but some people have silk underwear! Silk keeps you cool when it's hot, and also keeps you warm when it's cold. It has a natural 'lustre' or shine.

Linen

Flax plant

Linen comes from a plant called the Flax plant. The stem of the plant is used to make fibres. The plants are cut, then the stems are soaked in water to get rid of the soft parts. That leaves the tough fibres behind which are then processed to turn them into linen fabric.

Flax plant drying after cutting

Linen is great for summer clothes because it's very cool to wear. Linen is hardwearing so lasts for a long time but creases very easily. Apart from summer clothes, it can also be used to make tea towels and table cloths among other things.

Q What type of fibre do you think would make a good T-shirt? Can you give reasons why?

Q Why do you think cotton is a good fibre to make summer socks?

Q What fibre would be good to make a blanket from? Why would it work well?

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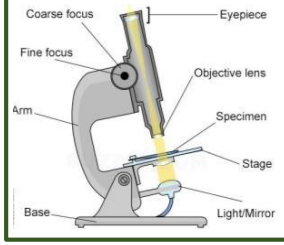
Keyword	Definition
Cell	Basic unit of life. Unicellular organisms only have one cell. Multicellular organisms have many cells.
Cell Membrane	Controls the movement of substances in and out of the cell.
Cytoplasm	Jelly-like substance where chemical reactions take place.
Nucleus	Carries genetic information and controls the cell.
Mitochondria	Where respirations takes place.
Cell Wall	Made of cellulose, provides support to the cell.
Vacuole	Contains cell sap.
Chloroplasts	Contains the green pigment chlorophyll, the site of photosynthesis.
Tissue	Something made from just one type of specialised cell.
Organ	Something made from different groups of specialised cells all working together.
Organ System	When a number of organs work together.
Synovial Joint	A freely moveable joint. Examples include the hip, shoulder, elbow and knee joints.

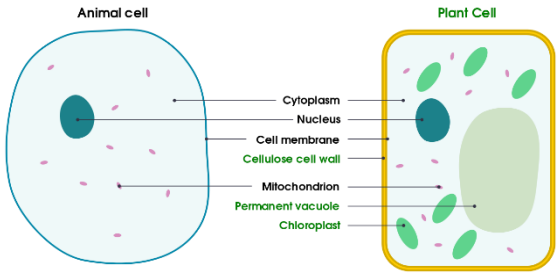
Further Reading:
https://www.bbc.com/bitesize/guides/z9hyvcw/revision/2



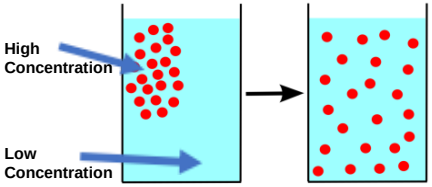
Light Microscope: A device which uses light and a series of lenses to produce a magnified image of an object.

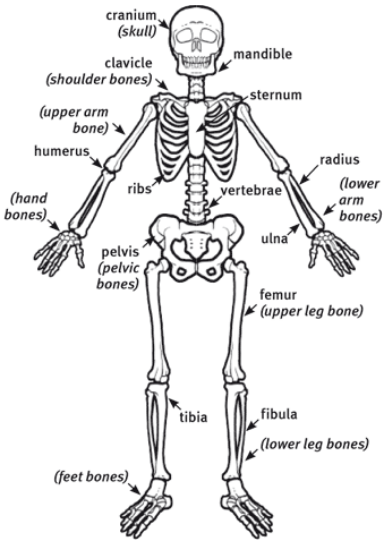
Magnification = How much bigger a sample/object appears under the microscope than it is in real life.

Total Magnification = Eyepiece lens x Objective lens

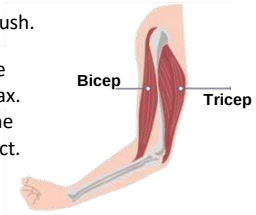


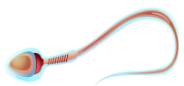
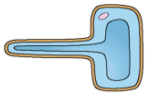
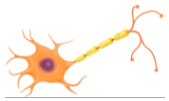
Diffusion: The movement of particles from an area of high concentration to an area of low concentration.
Substances diffuse into and out of cells.





Antagonistic Muscles:
- Muscles work by getting shorter.
- Muscles can only pull and can't push.
- Muscles work in pairs.
- When you raise your forearm, the biceps contract and the triceps relax.
- When you lower your forearm, the biceps relax and the triceps contract.



Red Blood Cell	Sperm Cell	Root Hair Cell	Palisade Cell	Nerve Cell	Egg Cell
					
Carries blood around the body. **Adaptations**: No nucleus, large surface area and biconcave shape.	Carries the male genes. **Adaptations**: Tail for swimming, mitochondria for energy, acrosome to break down the egg cell.	Take in water from the soil. **Adaptations**: Long & thin; large surface area for maximum water absorption. Thin cell walls.	Production of food for the plant. **Adaptations**: Tall and thin. Lots of chloroplasts to absorb sunlight for photosynthesis.	Carry signals around the body. **Adaptations**: Long axon. Myelin sheath.	Carries the female genes. **Adaptations**: Lots of mitochondria. Outer layer hardens once fertilised.

Year 7 – Science / Cells – HT1

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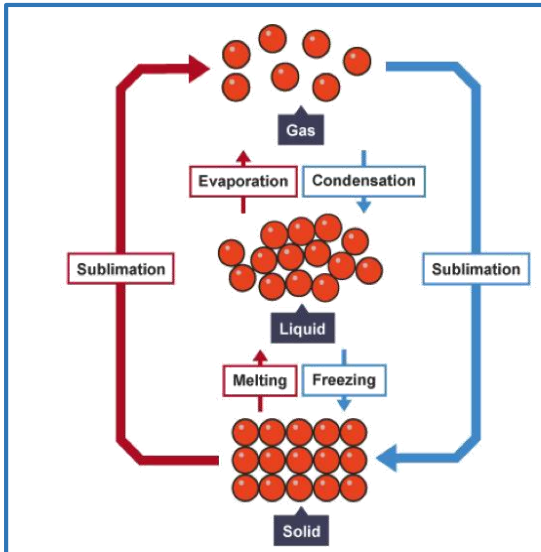
Year 7 – Science / States of Matter – HT1

Keyword	Definition
Particle	The general term for a small piece of matter.
State of Matter	The distinct forms in which matter can exist (solid, liquid, gas)
Solid	A substance with a fixed shape and volume.
Liquid	A substance with a fixed volume but not a fixed shape.
Gas	A substance that does not have a fixed shape or volume.
Change of State	The change of a substance from one physical form to another.
Melting	The change of state when a solid changes to a liquid.
Freezing	The change of state when a liquid changes to a solid.
Condensing	The change of state when a gas changes to a liquid.
Evaporation	The change of state when a liquid changes to a gas.
Density	The amount of mass that $1cm^3$ of a substance has.
Density (formula)	Density = mass ÷ volume p = m ÷ v
Dense	Something which is heavy for its volume.

Further Reading:
https://www.bbc.com/bitesize/guides/z2wmxnb/revision/1

https://www.bbc.com/bitesize/articles/zqpv7p3



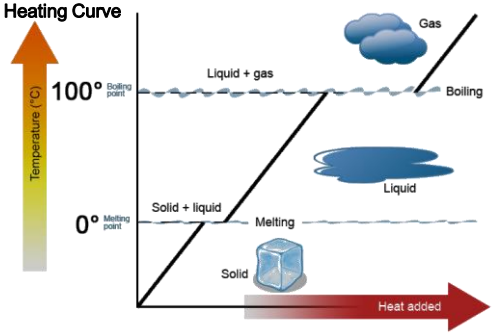
Forces between particles:

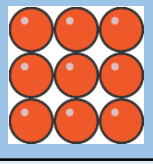
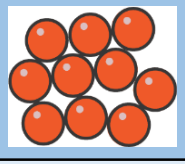
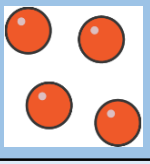
Solid: There are strong forces of attraction between the particles in a solid. Therefore, particles can only vibrate in a fixed position.

Liquid: There are weaker forces of attraction between the particles in a liquid. Therefore, the particles are close together, and are able to move around each other.

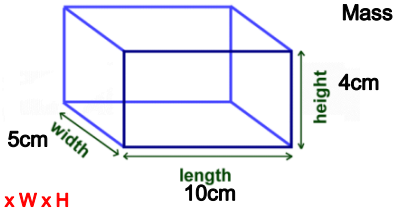
Gas: The forces of attraction between the particles are overcome. Therefore, the particles are far apart and move quickly in all directions.

Heating Curve



Solid	Liquid	Gas
		
The particles vibrate in a fixed position.	The particles are close together and move around each other.	The particles are far apart and move quickly in all directions.
The particles cannot move from place to place.	The particles are arranged in a random position.	The particles are arranged in a random way.
Particles have a fixed shape and cannot flow.	The particles flow and take the shape of the bottom of their container.	The particles flow and completely fill their container.
The particles cannot be compressed (squashed)	The particles cannot be compressed.	The particles can easily be compressed.

Calculating Volume:



Volume = L x W x H
Volume = 10cm x 5cm x 4cm
Volume = $200cm^3$.

Calculating Density:
Density = Mass ÷ Volume
Density = 20g ÷ $200cm^3$
Density = $0.1g/cm^3$

Density:
1kg of a gas has a larger volume than 1kg of a solid. There is empty space between particles in a gas, but in a solid, they're tightly packed together.