

For Science you will complete a recall test in your Biology, Chemistry and Physics lesson. The facts you will be tested on are from your Year 9 learning. Please learn as many of the facts on the attached sheets as possible. This information is also in your Google Classroom.

Year 9 Biology Sept 2021 B6 fact sheet (For those who were year 8 July 2022)

You will also be using some of your knowledge from B4 (Gas exchange and respiration) and B5 (Genetics and Evolution).

- 1) Photosynthesis requires light energy for it to take place.
- 2) Photosynthesis takes place in the chloroplasts.
- 3) The green pigment in the chloroplasts is called chlorophyll.
- 4) Glucose and oxygen are the products of photosynthesis.
- 5) Carbon dioxide and water are the reactants for photosynthesis
- 6) Carbon dioxide is an example of a greenhouse gas.
- 7) Glucose is stored within the plant.
- 8) There are more chloroplasts in the upper layers of a leaf.
- 9) Xylem transports water in the plant.
- 10) Phloem transports sugars in a plant.
- 11) Xylems only transport water upward.
- 12) Phloem transport sugars upward and downward.
- 13) The movement of gases through leaves is called diffusion.
- 14) Stomata are controlled by guard cells.
- 15) Stomata allow gases in and out of the leaf.
- 16) Stomata is plural, stoma is singular.
- 17) Stomata are mainly located on the underside of leaves.
- 18) Carbon dioxide, light and temperature are limiting factors of photosynthesis.
- 19) The main food groups are carbohydrates, fats, proteins, vitamins, minerals, water, fibre.
- 20) Digestion can be broken down into physical and chemical.

From B4

- Aerobic respiration is the chemical reaction inside mitochondria that releases energy from food
- Energy is used to power all the chemical processes necessary for life
- The formula for aerobic respiration is
$$\text{Oxygen} + \text{Glucose} \longrightarrow \text{Water} + \text{Carbon dioxide (+ energy)}$$
- Respiration without oxygen is called anaerobic respiration and involves the partial breakdown of glucose releasing less energy
- The equation for anaerobic respiration is
$$\text{Glucose} \longrightarrow \text{Lactic Acid (+ energy)}$$
- The lungs are the organs of breathing and gas exchange
- Oxygen diffuses into the blood through the alveoli in the lungs
- Carbon dioxide diffuses from the blood into the alveoli and is then breathed out of the body
- Gas exchange in the lungs is effective because the alveoli provide a large surface area, are moist and thin and have a good blood supply

From B5

Genetic characteristics are controlled by our DNA.

DNA is found in the nucleus of a cell on **Chromosomes** and has a **double helix** structure.

There are **23 pairs** of chromosomes in a body cell nucleus.

The **Double helix** is made up of base pairs, **A + T and C + G**. Your unique combination of these gives you your unique genetic characteristics.

Evolution is the process where organisms develop over millions of years from simple lifeforms.

Darwin's theory of evolution is Natural selection. The best adapted organisms survive and reproduce.

P6 Magnets and Generating Electricity

Poles	Magnets have a North (seeking) and a South (seeking) pole.
Magnetic field	The shape of the magnetic field around a bar magnet is observed as a series of field lines which curve outwards from one pole, returning at the opposite pole; achieved by using iron filings or a plotting compass.
	Magnetic field lines are drawn as curved line with arrows leading away from the North (seeking) pole and in at the South (seeking) pole.
Attraction and repulsion	Like poles repel each other and opposite poles attract each other.
Earths field	The Earth also as a magnetic field with a similar field pattern to a bar magnet.
Compass	A compass is a small mobile magnet that has poles which are attracted to the Earth's own magnetic poles. The North (seeking) pole is attracted to (seeks) the Earth's North pole. The South (seeking) pole does the reverse.
Electromagnet	When current flows a magnetic field is produced at right angles to that current; the wire acts as an electromagnet. The field lines are arranged concentrically around the wire in a clockwise direction if the current flow is away from the observer.
	Coiling current carrying wires and wrapping them around ferromagnetic materials such as iron, can increase the strength of electromagnets.
Motor effect	Electromagnets can interact with permanent magnets to produce movement such as is observed in electric motors, door bells, and relay switches.
Turbines and generators	Turbines are turned using kinetic energy and turn a magnet in a coil generating a current.
Stores of energy	Chemical energy is a store of energy found in foods and fuels. Kinetic energy is the store for anything that is moving.
Joule	The unit for energy
kCal	The unit for energy in food
Fossil fuels	Coal, oil and natural gas
Non- renewable energy	Finite resources that can't be quickly reformed. Examples are fossil fuels and nuclear
Renewable energy	Resources that don't run out or can be reformed. Solar, wind, biomass, hydroelectric, geothermal, tidal and wave
Polluting	These resources produce gasses that are harmful or polluting to environment. Biofuels and fossil fuels.
Sun	All forms of electrical generation ultimately get their energy from the sun. Except geothermal which uses the earths heat?

Power stations	Electrical energy is generated in these
Power	Energy ÷ time measured in Watts
Mains electricity	measured in kWh
Cost of electricity	Power(kW) X time (h) X cost (pence)

Key physics points:

A force can cause a change in shape or a change in motion and is measured in Newton's

A wave transfers energy without a net change in particles

Electrical current is the flow of electrons and measured in Amps

The amount of energy transferred between two points in an electrical circuit is potential difference and is measured in Volts.

Resistance is anything that opposes the flow of current and is measured in ohms.

Force and energy are related by the work done equation: work done (J)= force (N) x distance (m)

Year 8 ,C5 materials fact list (For a 25 question test in Sept)

also you need review the facts about:

- *the early and modern periodic table, symbols, formula, particle diagrams C4 (year 8)*
- *elements, mixtures , compounds C2 (year 7)*

Year 8 fact sheet C5

1. The substances that make up the world around us are called materials.
2. Physical properties are what a substance is like eg its colour, if it is hard or soft,
3. Chemical properties are how a substance reacts eg if it is flammable, reacts with acid.
4. Combustion (Burning) is an oxidation reaction.
5. The products of combustion are called oxides.
6. When magnesium burns it gains mass as oxygen atoms add to it.
7. Metals react with acid to make a salt plus hydrogen gas.
8. Hydrogen produces a squeaky pop when a lit splint is placed in it. This is the test for hydrogen.
9. Hydrochloric acid produces salts called chlorides.
10. Sulfuric acid makes salts called sulfates.
11. Nitric acid forms salts called nitrates.
12. Metals that are less reactive than hydrogen do not react with acid.
13. Group 1 metals are very reactive. It is too dangerous to react them with acid.
14. Group 1 metals react with water to form hydrogen gas and the metal hydroxide.
15. When a group 1 metal reacts with water it makes an alkaline solution. Group 1 metal are called the alkaline metals.
16. In a displacement reaction, a more reactive metal takes the place of a less react metal in a compound.
17. Reactions can be exothermic (heat energy is given out) or endothermic (heat energy is taken in)
18. Carbon can be used to extract a metal from a compound if the metal is less reactive than carbon.
19. Composite materials are made from joining different materials together; each material keeps its own properties.
20. The order of reactivity from most reactive to least reactive is called the reactivity series. The reactivity series is;

Potassium
Sodium
Lithium
Calcium
Magnesium
Aluminium
Carbon
Zinc
Iron
Tin
Lead
Hydrogen
Copper
Silver
Gold

Extract from C4

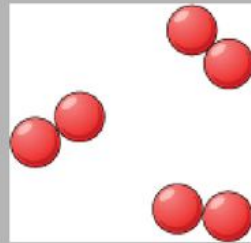
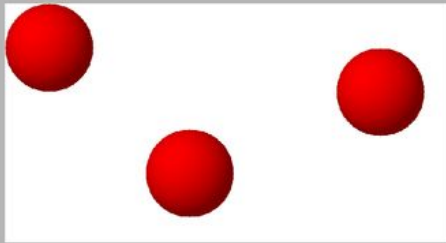
- The periodic table shows all the elements.
- The elements on the modern periodic table are arranged in increasing atomic number.
- The early periodic table was arranged in order of atomic weight but Mendeleev changed this slightly to make elements fit in groups with similar properties.
- Rows across the periodic table are called periods.
- Columns going down the periodic table are called groups.
- Elements are represented by a capital letter or a capital and a lower case letter called symbols.
- Compounds are represented by formula; these show the types and numbers of atoms in each molecule.

Extract from C2

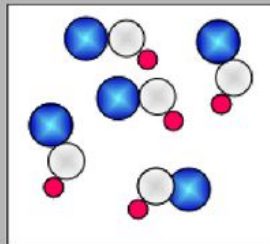
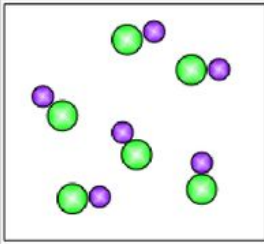
1. Elements are materials that only contain one type of atom.
2. Compounds are materials that contain more than one type of atom chemically bonded together.
3. Pure substances contain only atoms or molecules of that substance eg pure water only contains H₂O molecules.
4. Mixtures, or impure substances, contain two or more different substances that are not chemically joined together.

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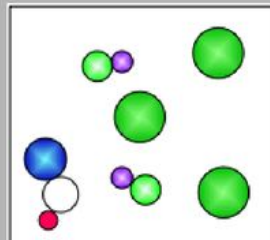
Particle diagrams



Examples of **elements**:
only 1 type of atom! (On
the right is an element
that is a molecule, like O_2)



Examples of **compounds**:
Two or more different
atoms **chemically bonded**
together.



Examples of mixtures:
different elements or
compounds mixed
together – **not bonded!**