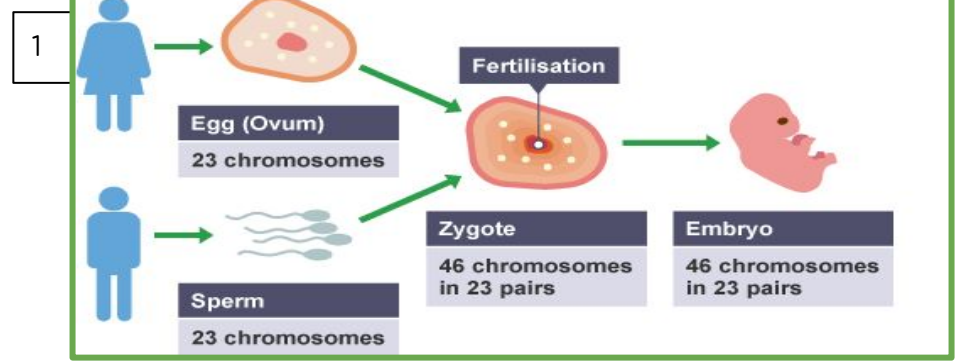


# Biology

# GCSE Inheritance and Evolution

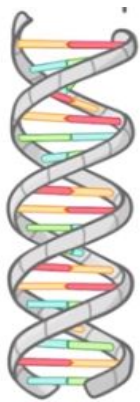
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| N° | Keyword          | Definition   |
|----|------------------|--|
| 2  | Alleles          | Different forms of the same gene.  |
| 3  | DNA              | Deoxyribonucleic acid. The material inside the nucleus of cells, carrying the genetic information of a living being. |
| 4  | Dominant allele  | Represented with a capital letter. It is always expressed, even if only one copy is present.                         |
| 5  | Gamete           | Sex cell (sperm in males and ova/eggs in females).   |
| 6  | Genome           | Entire set of genetic material in an organism.   |
| 7  | Recessive allele | Represented with a lowercase letter. It is only expressed if two copies of it are present                            |

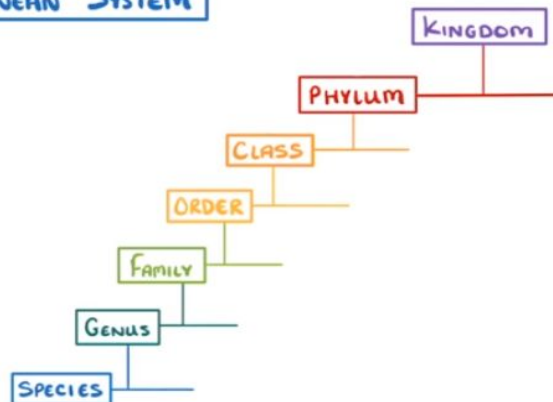
## 8 Structure of DNA



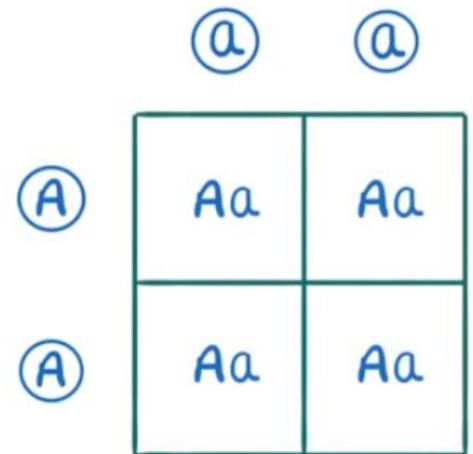
'DOUBLE HELIX'

## 9 Classification of living organisms

### LINNEAN SYSTEM



## 10 Punnett Square



## Key facts

|    |                        |   |
|----|------------------------|---|
| 11 | Natural selection      | All species of living things have evolved from simple life forms over a period of time.                           |
| 12 | Genetically modified   | Describes a cell or organism that has had its genetic code altered by adding a gene from another organism.        |
| 13 | Genetic engineering    | Process which involves the artificial transfer of genetic information from one donor cell or organism to another. |
| 14 | Evidence for evolution | Fossils, extinction, DNA analysis and antibiotic resistance.  |

# GCSE Ecology

Learned    Revised    Confident

\_\_\_\_\_ % Achieved: \_\_\_\_\_

## Maintaining biodiversity

- Breeding programmes
- Protection and regeneration of rare species
- Reintroduction of field margins and hedgerows.
- Reduction of deforestation and carbon dioxide emissions
- Recycling resources rather than dumping waste in landfill.

| N° | Keyword         | Definition   |
|----|-----------------|--|
| 1  | Abiotic factor  | A non-living factor that can affect a community, e.g. light intensity and temperature  |
| 2  | Adaptation      | Special features that allow living organisms to survive and be successful in their habitat.  |
| 3  | Biodiversity    | The variety of all the different species of organisms on Earth, or within an ecosystem.  |
| 4  | Biotic factor   | A living factor that can affect a community, e.g. availability of food and new predators.  |
| 5  | Community       | Two or more populations of organisms occupying the same area.  |
| 6  | Ecosystem       | The interaction of a community of living organisms (biotic) and the non-living (abiotic) parts of their environment.   |
| 7  | Interdependence | The dependence of each species on other species for food, shelter, pollination, seed dispersal etc. If one species is removed it can affect the whole community. |
| 8  | Quadrat         | A square frame used to take a representative sample of plants or slow-moving animals in an area.   |
| 9  | Transect        | A line across a habitat or part of a habitat used to sample the number of organisms at regular intervals.  |

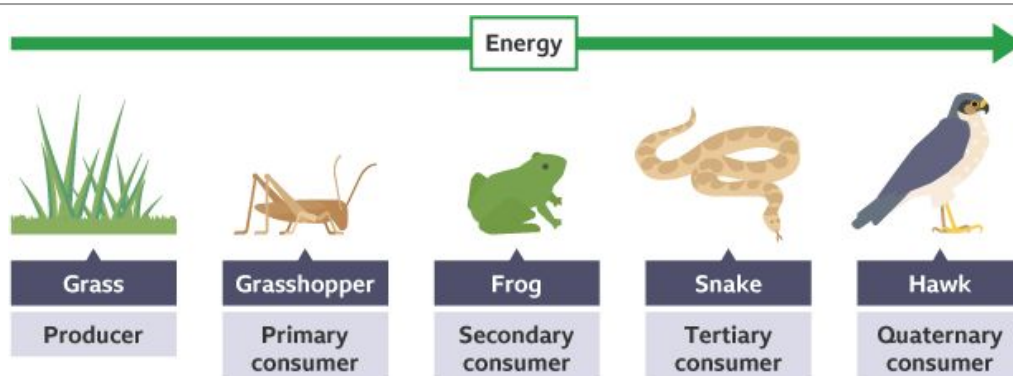
## Facts

**Carbon cycle** - the main process involved are respiration, combustion and photosynthesis.

**Water cycle** - evaporation, condensation, precipitation, percolation, transpiration, respiration.

**Global warming** impacts living things by causing changes in the distribution of organisms, rising sea levels and habitat loss, changing weather patterns and changing migration patterns.

**Land use** for dumping waste, quarrying, farming and building - this reduces biodiversity.



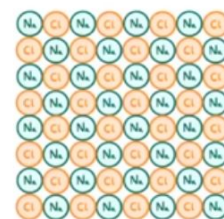
Chemistry

# GCSE Chemical analysis



## PURE SUBSTANCE

- CONTAINS ONLY ONE TYPE OF COMPOUND OR ELEMENT
- MELT AND BOIL AT SPECIFIC TEMPERATURES



## PURE SODIUM CHLORIDE

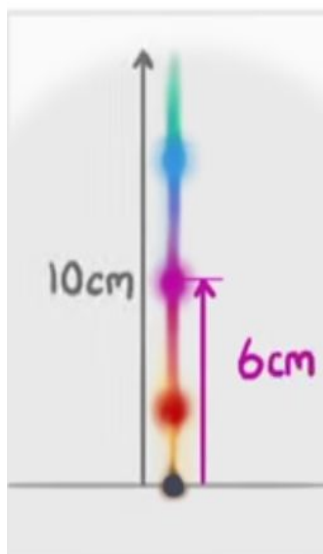
## FORMULATIONS

MIXTURES THAT HAVE BEEN PREPARED USING A SPECIFIC FORMULA

|                         |         |           |
|-------------------------|---------|-----------|
| Learned                 | Revised | Confident |
|                         |         |           |
| _____ % Achieved: _____ |         |           |

| N° | Keyword          | Definition   |
|----|------------------|--|
| 1  | Pure             | A substance that contains only one type of compound or element   |
| 2  | Formulation      | A mixture that has been prepared using a specific formula for a specific purpose   |
| 3  | Chromatography   | A physical technique used to separate substances with different solubilities from a liquid mixture                         |
| 4  | Mixture          | Two or more different substances that are mixed but not chemically bonded  |
| 5  | Mobile phase     | The phase in chromatography that moves, this is usually the solvent  |
| 6  | Stationary phase | The phase in the mobile phase that does not move, for example, the paper in paper chromatography                           |
| 7  | Solute           | The part of a solution that dissolves in the solvent, for example, the salt in seawater                                    |
| 8  | Solubility       | A measure of how soluble a substance is in a certain liquid  |
| 9  | Solvent          | The liquid that the solute dissolves into to form a solution   |
| 10 | Rf Value         | This is a ratio of how far the solute has traveled compared to the solvent. We can use this to identify unknown substances |

11 'Rf VALUE' =  $\frac{\text{DISTANCE TRAVELLED BY THE SUBSTANCE}}{\text{DISTANCE TRAVELLED BY THE SOLVENT}} = \frac{6}{10} = 0.6$



| Testing for common gases |                |                           |                           |
|--------------------------|----------------|---------------------------|---------------------------|
| N°                       | Gas            | Test                      | Result                    |
| 12                       | Hydrogen       | Insert a lit splint       | Squeaky pop noise         |
| 13                       | Oxygen         | Insert a glowing splint   | Relights the splint       |
| 14                       | Chlorine       | Insert damp litmus paper  | Bleaches the litmus paper |
| 15                       | Carbon dioxide | Bubble through lime water | Lime water turns cloudy   |

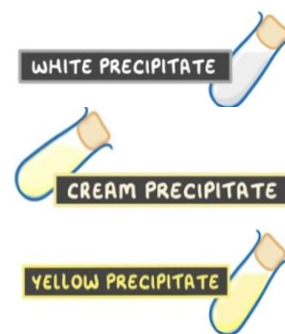
# GCSE Chemical analysis - triple only



Flame tests



Precipitate tests

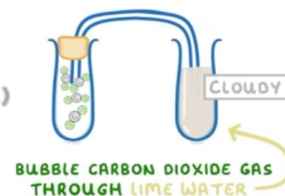
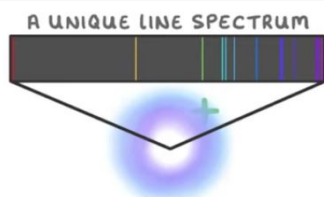


Learned

Revised

Confident

\_\_\_\_\_ % Achieved: \_\_\_\_\_



| N° | Keyword  | Definition  |                                    |
|----|--|---|------------------------------------|
| 1  | Anion  | An atom or group of atoms that have gained electrons and become negatively charged  |                                    |
| 2  | Cation   | An atom or group of atoms that have lost electrons and become positively charged  |                                    |
| 3  | Flame test   | A qualitative identification technique where samples are heated and the metal ions present are identified by characteristic flame colours |                                    |
| 4  | Halide   | A halide ion is an ion formed when a halogen atom gains one electron. Halide ions have a single negative charge.                          |                                    |
| 5  | Ion  | Electrically charged particle, formed when an atom or molecule gains or loses electrons.  |                                    |
| 6  | Precipitate  | A solid particles in a liquid that form when a dissolved substance (aq) reacts to form an insoluble substance (s)                         |                                    |
| N° | Metal ion  | Flame test colour   | Precipitate colour with NaOH (aq)  |
| 7  | Lithium  | Crimson red   |                                    |
| 8  | Sodium   | Yellow  |                                    |
| 9  | Potassium  | Lilac   |                                    |
| 10 | Calcium  | Orange-red  | White                              |
| 11 | Copper   | Green   | Blue                               |
| 12 | Iron (II)  |   | Green                              |
| 13 | Iron (III)   |   | Brown                              |
| 14 | Aluminium  |   | White - Redissolved in excess NaOH |
| 15 | Magnesium  |   | White                              |
| 16 | We can distinguish between Ca, Al and Mg using excess NaOH to identify Al and then the flame test to identify the Ca with its orange-red flame |   |                                    |

# Physics

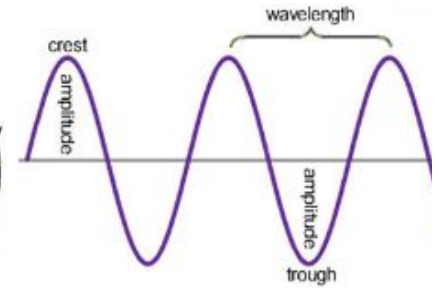
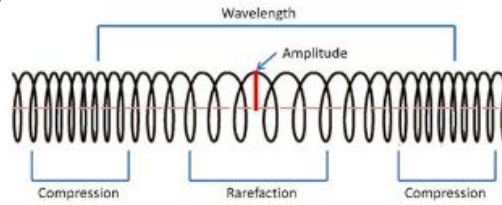
# GCSE Waves

1

Longitudinal wave

2

Transverse wave

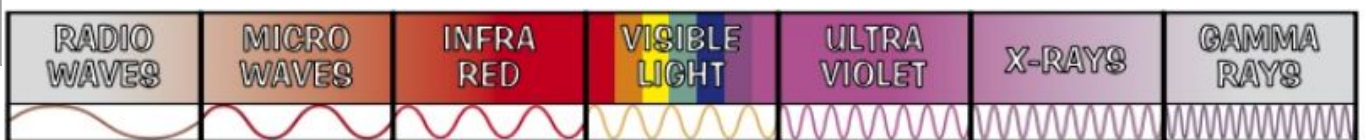


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| Nº | Keyword           | Definition   |
|----|-------------------|--|
| 3  | Amplitude         | Maximum displacement of a point on a wave from its undisturbed position (m)                              |
| 4  | frequency         | Number of waves passing a fixed point per second (Hz)  |
| 5  | Period            | Time taken for one complete wave to pass a fixed point (s)   |
| 6  | Wavelength        | The distance from one point on a wave to the equivalent point on the next wave (m)                       |
| 7  | Longitudinal wave | Oscillations are <u>parallel</u> to the direction of energy transfer                                     |
| 8  | Transverse wave   | Oscillations are <u>perpendicular</u> to the direction of energy transfer                                |
| 9  | Normal            | A line that is perpendicular (90°) to a surface.   |
| 10 | Reflection        | When a wave bounces back when it meets a boundary between two materials                                  |
| 11 | Reflection        | When a wave changes direction when it reaches a boundary between two materials at an angle to the normal |

12



Long wavelength  
Low frequency



Short wavelength  
High frequency

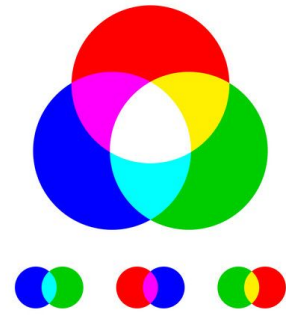
| Nº | Facts  |
|----|--|
| 13 | Waves transfer energy without transferring matter                  |
| 14 | The law of reflection is: angle of incidence = angle of reflection |

| Nº | Equations to learn                    |
|----|---------------------------------------|
| 15 | Period = $\frac{1}{\text{frequency}}$ |
| 16 | Wave speed = frequency x wavelength   |



# GCSE Waves 2 TRIPLE ONLY

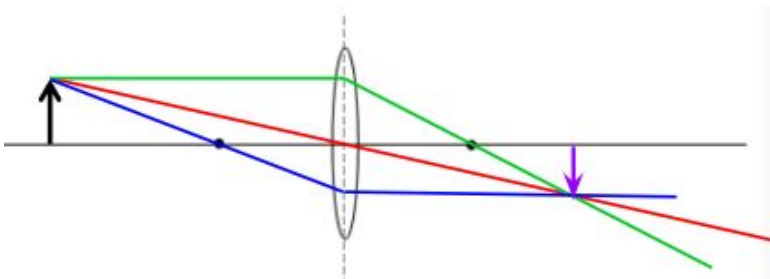
1 Primary colours of light



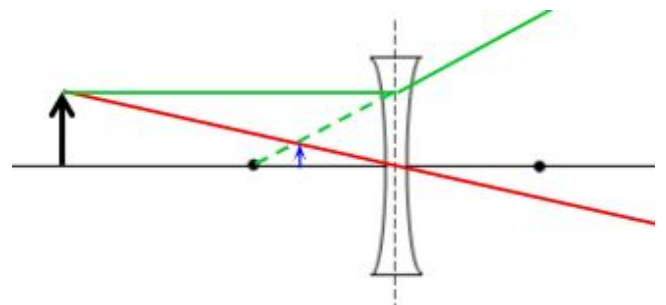
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| Learned                 | Revised | Confident |
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| _____ % Achieved: _____ |         |           |

| Nº | Keyword       | Definition   |
|----|---------------|--|
| 2  | Black body    | Maximum displacement of a point on a wave from its undisturbed position (m)                              |
| 3  | Concave       | A lens that curves inwards and causes light to diverge.  |
| 4  | Convex        | A lens that bulges outwards and causes light to converge..   |
| 5  | Focal point   | The distance from one point on a wave to the equivalent point on the next wave (m)                       |
| 6  | Intensity     | The power per unit area ( $W/m^2$ )  |
| 7  | Lens          | A line that is perpendicular ( $90^\circ$ ) to a surface.  |
| 8  | Seismic waves | A wave which travels through the Earth when an earthquake occurs. P-waves and S-waves are seismic waves. |
| 9  | Sound wave    | A longitudinal wave caused by vibrating particles.   |
| 10 | Ultrasound    | Sound with a frequency that is higher than the range of human hearing (above 20,000 Hz).                 |

11 Convex lens ray diagram



12 Convex lens ray diagram

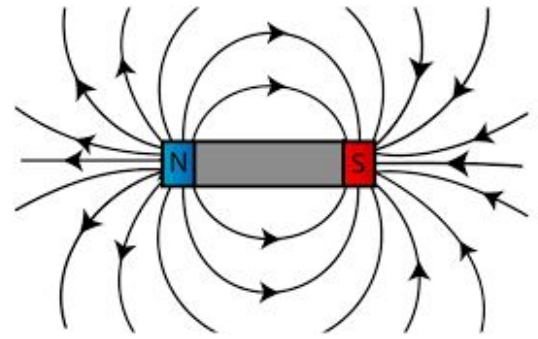


| Nº | Facts  |
|----|--|
| 13 | As the temperature of an object increases, the intensity of every wavelength increases |
| 14 | As the temperature of an object increases, the peak wavelength decreases.              |

# GCSE Magnets and electromagnets

1

Bar magnet magnetic field



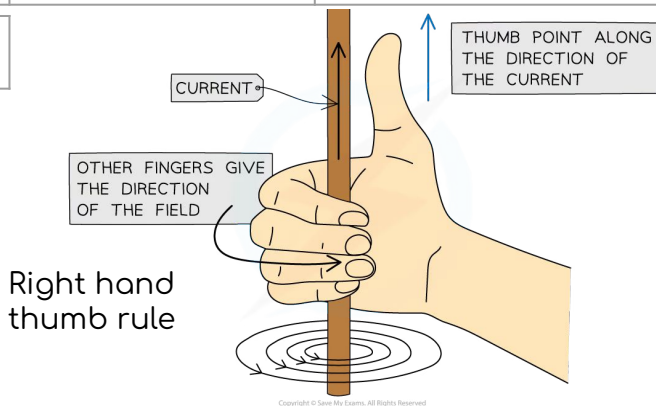
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| Nº | Keyword          | Definition   |
|----|------------------|--|
| 2  | Magnetic field   | The region around a magnet where another magnet, or magnetic material will experience a force due to the magnet. |
| 3  | Permanent magnet | Produces its own magnetic field which is always there  |
| 4  | Induced magnet   | An object that becomes magnetic when it is placed in a magnetic field  |
| 5  | Electromagnet    | A solenoid with an iron core   |

## HIGHER ONLY

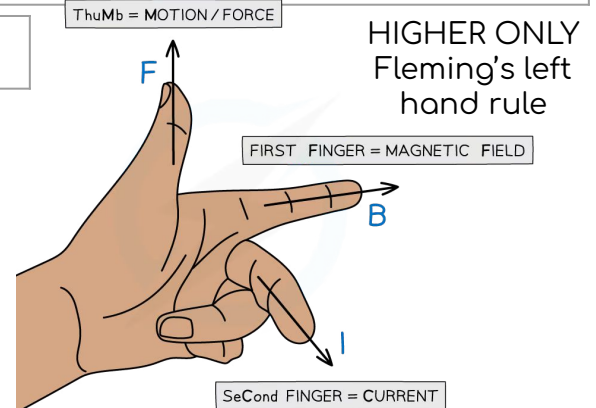
|   |                       |  |
|---|-----------------------|--|
| 6 | Motor effect          | When a current carrying wire in a magnetic field experiences a force |
| 7 | Magnetic flux density | How many field (flux) lines there are in a region                    |

8



Right hand thumb rule

9



HIGHER ONLY  
Fleming's left hand rule

| Nº | Facts   |
|----|---|
| 10 | All magnets have a north and south pole                               |
| 11 | Like poles (eg. north and north, or south and south) repel each other |
| 12 | Unlike (opposite) poles (eg. north and south) attract each other      |
| 13 | The magnetic metals are iron, steel, cobalt and nickel                |
| 14 | The closer together magnetic field lines are, the stronger the magnet |
| 15 | Magnetic field lines always point from north to south                 |