

CE13+ Science Revision Checklist

Biology

- Cells and organisation
 - Structures of plant and animal cells
 - Roles of each organelle
 - 7 characteristics of life (MRS GREEN)
 - Using microscopes and making slides
- Gas exchange systems
 - Structure and adaptations of the lungs
 - How we breathe (inhale and exhale)
 - Structure of the circulatory system
 - How smoking affects the gas exchange system
 - Effect of exercise on heart rate and breathing rate
- Cellular respiration
 - Equations for aerobic and anaerobic respiration in animals
 - Equation for anaerobic respiration in plants and yeast
- Photosynthesis
 - Equation for photosynthesis
 - Adaptations of the leaf for photosynthesis
 - Factors affecting the rate of photosynthesis
 - Testing for starch in a leaf
 - Experiment for testing the rate of photosynthesis
 - Role of magnesium and nitrates in the growth of plants
 - The carbon cycle
- Reproduction in plants
 - Structure of a flowering plant
 - Stages of reproduction in a flowering plant
 - Pollination
 - Fertilisation
 - Seed dispersal
 - Germination
- Reproduction in animals
 - Structures of the male and female reproductive systems
 - Structures and adaptations of sperm and eggs cells
 - Fertilisation and the development of the fetus (including the function of the placenta and umbilical cord)
 - Birth
 - Puberty in boys and girls
 - Stages of the menstrual cycle
- Nutrition and digestion
 - Names and of the substances required for a balanced diet (including examples of foods containing each substance)
 - The tests for starch and glucose
 - Experiment to determine the amount of energy in different foods
 - Structure of the digestive system (including adaptations of the small intestine and the role of enzymes)

- Health
 - Effects of smoking on health
 - Examples of diseases caused by viruses and bacteria
 - Reproduction of bacteria and factors affecting this (competition)
 - Human defences against pathogens (including the immune system)
- Relationships in an ecosystem
 - Food chains and food webs
 - The accumulation of toxic materials
 - Pyramids of numbers and biomass
 - Experiment to estimate the population of a species within an area (using quadrats)
 - Population curves
 - Competition and its effects on population
 - Conservation
- Variation, classification and inheritance
 - Kingdoms and the characteristics of their cells
 - Characteristics of:
 - Reptiles
 - Amphibians
 - Mammals
 - Birds
 - Fish
 - Insects
 - Spiders
 - Adaptations of various organisms
 - Types of variation

Chemistry

- Atoms, elements and compounds
 - Diagrams for solids, liquids and gases
 - Properties of solids, liquids and gases (including movement, arrangement, intermolecular forces and energy)
 - Diffusion and Brownian motion
 - Changes of state (including heating curves)
 - Definitions for element, compound, molecule, mixture and atom
 - Chemical symbols for various elements, molecules and compounds (see Memory Workout for details)
 - Properties of metals/non-metals
 - The composition of air
- Pure and impure substances
 - Filtration
 - Chromatography
 - Distillation
 - Crystallisation
 - How to identify a pure/impure substance using melting/boiling points
 - Solubility
- Acids and alkalis
 - pH scale
 - Indicators (including Universal Indicator, litmus paper and indicators made from plants)
- Chemical reactions
 - The difference between physical and chemical changes
 - These general equations:
 - Hydrocarbon + oxygen \rightarrow carbon dioxide + water (complete combustion)
 - Hydrocarbon + (little) oxygen \rightarrow carbon monoxide + soot + water (incomplete combustion)
 - Metal + oxygen \rightarrow metal oxide (oxidation)
 - (reactive) metal + water \rightarrow metal hydroxide + hydrogen
 - Metal + acid \rightarrow salt + hydrogen
 - Metal oxide + acid \rightarrow salt + water (neutralisation)
 - Metal hydroxide + acid \rightarrow salt + water (neutralisation)
 - Metal carbonate + acid \rightarrow salt + water + carbon dioxide (neutralisation)
 - Metal carbonate \rightarrow metal oxide + carbon dioxide (thermal decomposition)
 - The type of salt formed by different acids:
 - Hydrochloric acid = _____ chloride
 - Sulfuric acid = _____ sulfate
 - Nitric acid = _____ nitrate
 - Why incomplete combustion is a problem
 - Displacement reactions (including recalling the reactivity series of metals)
 - Rusting (including how to prevent rusting)
 - Suck-back
- Gas tests
 - Hydrogen
 - Carbon dioxide

- Water
 - Oxygen
- Environmental chemistry
 - Causes of pollution (including acid rain, carbon dioxide and carbon monoxide)
 - The water cycle
 - The greenhouse effect

Physics

- Equations
 - $Pressure = \frac{force}{area}$
 - $Speed = \frac{distance}{time}$
 - $Moment = force \times distance\ from\ pivot$
 - $Density = \frac{mass}{volume}$
 - $Weight = mass \times gravitational\ field\ strength$
 - Units for all of the quantities above
- Energy
 - Energy resources (including identifying renewable vs. non-renewable and giving advantages/disadvantages of each)
 - Energy stores and transfers
 - The law of conservation of energy (including the idea of dissipation to the surroundings)
- Motion and forces
 - Types of forces
 - Balanced forces (including identifying how we know that forces are balance – constant velocity)
 - Friction and air/water resistance (including how to reduce these forces)
 - Distance-time graphs (including calculating speed)
 - Calculations
 - How a spring stretches (including reaching the elastic limit)
 - Springs in series and parallel
 - Stopping distances
- Forces, rotation and pressure
 - Moments (including applications of moments)
 - Calculations
 - Pressure (including how it is used in everyday life)
 - Calculations
- Density
 - Calculations
 - Measuring density of regularly and irregularly shaped objects
 - Calculating volume
 - Floating and sinking
- Sound waves
 - How sound travels (including relative speed in a solid, liquid and gas)
 - The effect of increasing frequency
 - The effect of increasing amplitude
 - Experiment for measuring the speed of sound in air
- Light waves
 - How light travels
 - Reflection (including periscopes)
 - Refraction
 - Dispersion
 - Opaque, translucent and transparent objects
 - The different colours of light

- Electric circuits
 - Symbols for electrical components (see Memory Workout)
 - Current in series and parallel circuits
 - The effect of resistance on current
 - Truth tables (including AND and OR circuits)
 - Relay circuits
 - Effect of light intensity on the resistance of an LDR
 - The use of fuses
 - The placement of LEDs (or diodes) in a circuit
- Magnetism/electromagnetism
 - Diagrams showing the shape of the magnetic field (for a bar magnet and an electromagnet)
 - Experiment to determine the shape of the magnetic field
 - How to make an electromagnet
 - How to change the strength of an electromagnet
- Space physics
 - Time taken for:
 - Earth to spin on its axis
 - Moon to orbit Earth
 - Earth to orbit the Sun
 - The order of the planets
 - Seasons
 - Eclipses
 - Satellites (including their uses)
 - The relative size of: a moon, a planet, a star, a solar system, a galaxy, the universe