

Second Year Science Syllabus – Biology Revision Check-list

Where is your learning at?

Green: I know it all. **Orange:** I have some idea – check the answers. **Red:** I need to start studying this section.

Main Topic	Sub-topics	Students should be able to	R	O	G
1. Food	contents of a variety of food products as described on their labels food as a necessary source of energy and as a growth material for the body constituents of a balanced diet	OB1: recall that a balanced diet has six constituents: carbohydrates (including fibre), fats, protein, minerals, vitamins and water, each with different functions OB2: describe a food pyramid and give examples of types of food recommended in a balanced diet OB3: carry out qualitative food tests for starch, reducing sugar, protein and fat OB4: read and interpret the energy values indicated on food product labels and compare the energy content per 100 g of a number of foods, and identify the food types on the label that form part of a balanced diet OB5: investigate the conversion of chemical energy in food to heat energy			
2. Digestion	major parts and functions of the digestive system teeth, types and function	OB6: identify and locate the major parts of the digestive system including the mouth, oesophagus, stomach, <u>liver, pancreas</u>, small intestine and large intestine, and know their functions OB7: identify molars, premolars, canines and incisors, and describe their functions			
3. Enzymes	enzyme action	OB8: investigate the action of amylase on starch; name the <u>substrate</u>, product and enzyme.			
4. Aerobic Respiration	respiration as release of energy from digested food energy conversion from chemical energy to heat energy human breathing rate the breathing system and its role in gaseous exchange, including the effects of smoking	OB9: describe the process of aerobic respiration by means of a word equation and understand that aerobic respiration requires the presence of oxygen OB10: demonstrate the products of aerobic respiration OB11: carry out qualitative tests to compare the carbon dioxide levels of inhaled and exhaled air OB12: describe how oxygen is taken into the bloodstream from the lungs and how carbon dioxide is taken into the lungs from the bloodstream during gaseous exchange and how these processes are affected by smoking			

5. Circulatory system	composition and function of blood structure and function of the heart passage of blood through heart and main body organs factors affecting human pulse rate	OB13: describe the function and composition of blood (white blood cells, red blood cells and platelets in a liquid called plasma) and state the function of each component OB14: state the function of the heart; describe its structure, identifying the four chambers; explain the difference between the left ventricle and the right ventricle OB15: describe the passage of blood through the heart and lungs via arteries and veins, <u>identify the pulmonary artery and vein, aorta and vena cava</u>, and distinguish between arteries, veins and capillaries OB16: demonstrate the effect of exercise and rest on pulse and breathing rate and appreciate that a balance of each promotes good health OB17: recall that the average rate for an adult at rest is 70 b.p.m., and explain why exercise results in increased pulse and breathing rates OB18: recall that the normal temperature of the human body is 37°C, and that illness may cause a change in body temperature OB19: associate the circulation of the products of digestion around the body with their absorption into the bloodstream			
6. Excretion	the functions of the lungs, kidneys <u>and skin</u> in the excretion of waste products made in the body	OB20: state the function of the urinary system; describe its structure, identifying the bladder, renal artery, renal vein, ureter, urethra and kidney OB21: name the products of excretion: CO₂, water and urea OB22: <u>describe the function of the skin in the excretion of waste products made in the body</u> OB23: <u>recall that waste products are removed from the bloodstream by filtration in the kidneys in the form of urine, which contains urea, water and salts</u>; recall that urine is stored in the bladder before being released from the body			
7. Photosynthesis	word equation for photosynthesis conversion of light energy into chemical energy phototropism <u>and geotropism</u>	OB48: describe, using a word equation, how plants make their own food through photosynthesis OB49: show that starch is produced by a photosynthesising plant OB50: investigate the growth response of plants to light (phototropism) <u>and gravity (geotropism)</u>			

Second Year Science Syllabus – Chemistry Revision Check-list

Main topic	Sub-topics	Students should be able to	R	O	G
1. Basic atomic structure	structure of atom location, relative charge and relative atomic mass of the sub-atomic particles atomic number, mass number	OC39: describe the structure of the atom; state the location, relative charge and relative atomic mass of the sub-atomic particles; <u>define atomic number and isotope</u>			
2. Metals	examples of metallic elements and their symbols: copper, zinc, aluminium, iron, silver and gold properties of metals alloys	OC6: recall that metals conduct electricity and heat OC7: identify everyday applications of metals, for example in industry, in the making of jewellery OC8: recall the symbols of the metallic elements Cu, Zn, Al, , Fe, Ag, and Au OC10: recall that metals are shiny (<u>lustrous</u>), can be beaten into shape (<u>malleable</u>) and can be stretched (<u>ductile</u>) OC11: classify an alloy as a mixture and state one use each of the alloys : solder, steel, brass and bronze			
3. Bonding	molecules as groups of atoms <u>Bohr model of atom</u> <u>stability associated with noble gas electronic configuration as a guide for simple bonding</u> simple understanding of ionic and covalent bonding examples of covalent compounds (methane and water) examples of ionic compounds (NaCl and MgO) properties of ionic and covalent substances	OC40: <u>draw the Bohr structure of the first 20 elements</u> OC41: <u>relate the formation of compounds to the combination of atoms</u> OC42: recall that ionic bonding is an attraction between positive and negative ions; <u>describe the bonding in NaCl and MgO as examples</u> OC43: state what a molecule is, recall that covalent bonds involve the sharing of pairs of electrons, and <u>describe the bonding in H₂, O₂, H₂O, CH₄ as examples of covalent bonding</u> OC44: <u>investigate the ability of ionic and covalent substances to conduct electricity</u>			

4. Carbon dioxide	preparation and properties of carbon dioxide density of carbon dioxide (qualitative only) acidity of a solution of carbon dioxide in water	OC27: prepare carbon dioxide (word equation <u>and chemical equation</u>), and show that it does not support combustion OC28: carry out simple tests on carbon dioxide involving its reaction with limewater (word equation and <u>chemical equation</u>), and with moist litmus paper OC29: investigate the density of carbon dioxide relative to air (qualitative only), and state two uses of carbon dioxide			
5. Rusting and Corrosion	rusting as a chemical process conditions necessary for rusting prevention of rusting	OC45: appreciate that rusting is a chemical process that changes iron into a new substance OC46: carry out an experiment to demonstrate that oxygen and water are necessary for rusting OC47: list three examples of methods of rust prevention: paint, oil, galvanising			
6. Metals	<u>properties of Group 1 metals</u> <u>reaction of Group 1 metals with air and water (word equation only)</u> <u>relative reactivities of Ca, Mg, Zn, and Cu</u> alkaline earth metals	OC48: <u>describe the general properties of the alkali metals and recall that alkali metals are in Group I of the Periodic Table and have similar properties</u> OC49: <u>describe the reactions of the alkali metals with air and water: give the word equations for their reaction with water</u> OC50: recall that Group II elements are the alkaline earth metals OC51: investigate the reaction between zinc and HCl, and test for hydrogen (word equation <u>and chemical equation</u>) OC52: <u>investigate the relative reactivities of Ca, Mg, Zn and Cu based on their reactions with water and acid (equations not required)</u>			
7. Acids and bases (note; student's should revise 2A8, from First Year syllabus)	names of the common strong acids and bases reactions of acids and bases production of a sample of salt	OC35: state the names and formulae of common strong acids and bases: H₂SO₄, HCl, NaOH, Ca(OH)₂, and recall that alkalis are soluble bases OC36: show the neutralisation of an acid with a base using an indicator OC37: understand that, when an acid reacts with a base, a salt and water are formed i. <u>HCl + NaOH → NaCl + H₂O</u> (word equation only at Ordinary level) ii. <u>2HCl + CaCO₃ → CaCl₂ + CO₂ + H₂O</u> (word equation only at Ordinary level) OC38: titrate HCl against NaOH, and prepare a sample of NaCl.			

Second Year Science Syllabus – Physics Revision Check-list

Main topic	Sub-topics	Students should be able to	R	O	G
3A1: Measurement in science	Derived data; speed /velocity /acceleration /density (Note: students should revise 3A1 material from First Year syllabus)	OP1: measure length, mass, time and temperature (SI units); perform simple calculations based on these to find the derived quantities: area, volume, density, speed, <u>velocity</u> and acceleration			
3A2: Density and flotation	flotation for solids <u>and liquids</u> <u>relating flotation to density</u>	<u>OP2: measure mass and volume of fixed quantities of a variety of solids and liquids and hence determine their densities</u> OP3: investigate flotation for a variety of solids <u>and liquids</u> in water and other liquids, <u>and relate the results of this investigation to their densities</u>			
3A3: Forces and moments	forces, effects of forces extension of a spring friction, everyday applications of friction, lubrication the force of gravity (weight) <u>and its relationship to mass</u> <u>centre of gravity and its importance in design</u> <u>equilibrium, the law of the lever, everyday applications of levers</u>	OP4: appreciate the concept of force, recall that the Newton is the unit of force, describe forces and their effects OP5: investigate examples of friction and the effect of lubrication <u>OP6: investigate the relationship between the extension of a spring and the applied force</u> OP7: recall that weight is the force of gravity and that weight can vary with location; <u>recall that mass in kilograms multiplied by 10 is approximately equal in magnitude to weight in Newtons on the surface of the earth</u> OP8: <u>find the centre of gravity of a thin lamina; investigate the role of centre of gravity in design for stability and equilibrium</u> OP9: <u>investigate the law of the lever</u> ; recall two everyday of levers			

3A4: Pressure	factors affecting pressure; pressure in fluids air has mass and occupies space atmospheric pressure and <u>its relationship to weather</u> measuring pressure, everyday applications of pressure	OP10: state the relationship between pressure, force and area; perform simple calculations using this relationship OP11: investigate the relationship between pressure and depth for a liquid OP12: show that air has mass and occupies space OP13: associate change in the pressure exerted by the atmosphere with change in altitude OP14: <u>examine weather charts to observe variations in atmospheric pressure and relate these to weather conditions</u>			
3A5: Work and power	definitions and units for work and power	OP15: define and give the units for work, energy and power; state the relationship between work and power <u>and perform simple calculations based on this relationship</u>			
3B1: Heat	expansion of solids, liquids and gases change of state and latent heat	OP22: recall that heat is a form of energy and that it can be converted into other forms of energy OP23: <u>investigate and describe the expansion of solids, liquids and gases when heated, and contraction when cooled</u> OP24: demonstrate the expansion of water on freezing OP25: measure the temperature of various solids and liquids at, above and below room temperature; determine the melting point of ice and the boiling point of water OP26: investigate the effect of pressure on the boiling point of water OP27: explain the difference between heat and temperature OP28: carry out experiments that involve changes of state from - solid to liquid and liquid to solid - liquid to gas and gas to liquid OP29: <u>plot a cooling curve and explain the shape of the curve in terms of latent heat</u> OP30: appreciate that all hot bodies radiate heat			
3B2: Heat transfer	conduction, convection and radiation; heat energy and temperature; insulation	OP31: <u>carry out simple experiments to show the transfer of heat energy by conduction, convection and radiation; investigate conduction and convection in water</u> OP32: identify good and bad conductors of heat and compare insulating ability of different materials			