

# Aylsham High School Y8 Outcomes

## Biology

### B1 Cells and Body Systems

- State the content of a healthy human diet: **carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed**
- Explain the importance of bacteria in the human digestive system
- Make calculations of energy requirements in a healthy daily diet
- Describe the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases
- Explain how enzymes work including the terms active site and enzyme specificity
- Explain (and investigate) how enzymes can become denatured due to changes to its active site
- Explain the use of enzymes in breaking down carbohydrates, proteins and lipids into sugars, amino acids and fatty acids and glycerol
- Identify where in the digestive system enzymes are used, what the enzymes function is for each of the key organs (mouth/stomach/small intestine) including the substrate, enzyme names and products formed
- Describe how the small intestine is adapted to transfer sugars, minerals and nutrients into the blood
- Describe the structure and functions of the human skeleton, to include support, protection, movement and making blood cells
- Describe the biomechanics of the skeletal system – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles
- Describe the function of muscles and examples of antagonistic muscles

### B2 Respiration

- Describe what is meant by gas exchange
- Label the structure of the lungs (trachea, bronchi, bronchioles and alveoli)
- Describe how gases are diffused across the alveoli into/out of the blood
- Describe how alveoli are adapted to allow efficient diffusion of gases across their "membrane?"
- Observe alveoli under a microscope (you could provide an image), measure its size and calculate how big it would be in real life using a magnification equation
- Define respiration
- Identify cell organelles and identify where respiration takes place in a cell
- Explain the difference between breathing and respiration
- Define aerobic respiration
- State the word equation for aerobic respiration and state where the reactants come from
- Describe what causes anaerobic respiration
- Describe the effects of anaerobic respiration including production of lactic acid and oxygen debt
- Recall the word equations for aerobic, anaerobic respiration and the breakdown of lactic acid
- The use of anaerobic respiration in micro-organisms for fermentation

### B3 Genetics

- State what is meant by sexual and asexual reproduction
- Describe sexual and asexual reproduction
- Describe what happens during reproduction in plants including the structure of the flower
- Describe the purpose of fruits in plants
- Describe how plants use different seed dispersal techniques
- Identify cell organelles and describe their function
- Define cell, nucleus, chromosome and DNA
- Describe what happens during fertilisation, how a sperm and egg cell has half the number of chromosomes compared to a normal cell, and they join together to form a zygote with the total number of chromosomes needed to make an embryo
- Describe the basic process of mitosis including it producing 2 genetically identical daughter cells
- Define meristem, elongation and differentiation
- State where meristems are found
- Describe how plants grow
- Describe the importance of mitosis for growth and repair
- Describe the use of mitosis for asexual reproduction

### B4 Ecosystems

- Describe the process of photosynthesis
- Recall the equation for photosynthesis
- Describe the function of chloroplasts
- Describe the function of chlorophyll and state its characteristic green pigment
- Describe the structure of the leaf, in particular describing the function of the waxy cuticle layer, palisade layer, spongy layer and stomata
- Describe/suggest the impact of temperature, light intensity and CO<sub>2</sub> levels on the rate of photosynthesis
- Describe what transpiration is
- Describe/suggest how the rate of transpiration can be affected by temperature
- Describe the function of the root hair cell
- Describe the function of the phloem and xylem
- Describe how sucrose, minerals and water are transported around a plant
- Describe where sucrose is stored in plant
- How excess sucrose produced from photosynthesis is stored as starch/carbohydrates in roots
- Describe how plants are adapted to different environments (relate to abiotic and biotic factors in the environments)

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## Chemistry

### C1 Atoms and the Periodic Table

- Burn magnesium in oxygen and review learning of elements (magnesium & oxygen), compounds (magnesium oxide), mixtures (air), the naming of the product, products and reactants as well as writing a word equation
- Investigate and predict masses of compounds produced and then suggest why this may not be the case**
- Use of particle diagrams for chemical reactions
- Representing chemical reactions using formulae and using equations**
- Write balanced symbol equations
- Use state symbols when writing balanced symbol equations
- The definition of atomic number and mass number
- Use the atomic number and mass number to calculate the number of protons/electrons/neutrons
- Calculate the relative formula masses of compounds
- Describe the order of elements in the periodic table and how this relates to the atomic structure of each element**
- Define period, identify elements in a given period**
- Define group, identify elements from a given group, state that elements in groups have similar properties**
- Identify where metals and non-metals are located in the periodic table, use this information to suggest metals and non-metals**
- Recall which group number the following types of elements are found: alkali metals, transition metals, halogens and noble gases
- Research uses of some of the elements found in the alkali metal, transition metal, halogens and noble gas groups
- Maximum capacity of electrons on each energy level
- Describe the relationship between the group/period number and the electronic arrangement/configuration of elements
- State and suggest the number of protons/electrons and neutrons in the first 20 elements of the periodic table

### C2 The Particle Theory

- Name the state changes and identify where they take place**
- Recall that a state change is a physical change, and is reversible
- Investigate the changes of state of a substance like salol when temperature increases/decreases
- Draw a temperature-time graph for salol's change of state
- Describe the forces of attraction between particles in solids, liquids and gases**

### C3 Chemical Reactions

- Explain and investigate how distillation separate mixtures**
- Explain and investigate how filtration separate mixtures**
- Explain and investigate how chromatography separate mixtures**
- Identify unknown substances with known substances using chromatography**
- Suggest a suitable separation technique for separating a given mixture based on their solubility** (rock salt separation investigation is in y9)
- Create a pure substance from rock salt using a range of separation techniques
- Describe the difference between chemical and physical changes**
- Define endothermic and exothermic reactions**
- Investigate whether a reaction is an endothermic or exothermic reaction**

### C4 Earth Sciences

- Describe how sedimentary rocks are formed using the key stages sedimentation, pressure, cementation.**
- Explain how fossils are formed**
- Explain how metamorphic rocks are formed when rocks are subjected to both heat and pressure and this can form crystals**
- Explain how igneous rocks form from magma or lava and relate the size of the crystals grown in the igneous rocks to the rate of cooling**
- Describe how some impurities in fossil fuels result in sulphur dioxide
- Describe how acid rain is formed; Use periodic table to identify that sulphur dioxide forms a non-metal oxide solution and that would produce an acid
- Describe the effects of acid rain

### C5 Metals

- Investigate and identify the reactivity of metals (Mg, Zn, Fe, Sn and Cu) by reacting them with acid/s**
- Suggest a reactivity series of metals investigated
- Write word and balanced symbol equations; use state symbols
- Prepare copper sulphate crystals by reacting copper oxide with sulphuric acid; apply knowledge of solubility and the boiling points of copper sulphate and water to the separation of the mixture; describe/explain the process of evaporation
- Carry out displacement reactions**
- Explain what happens during a displacement reaction**
- Write word and balanced symbol equations; use state symbols
- Explain how reactive metals are found in ores in the ground and need to be extracted from their compounds by heating with carbon or using electrolysis**
- Use the reactivity series to identify and explain which metals are extracted using carbon or electrolysis, or are found in the ground as pure compounds**
- Write word and balanced symbol equations for displacement reactions that occur for extracting metals with carbon

# Aylsham High School Y8 Outcomes

## Physics

P1 Forces	P2 Motion	P3 Energy	P4 Waves	P5 Electricity and Magnetism	P6 Astronomy
<input type="checkbox"/> Recall and investigate Newton's first law of motion <input type="checkbox"/> Recall and investigate Newton's second law of motion <input type="checkbox"/> Describe relative motion: trains and cars passing one another- describe how cars of differing speeds will move in relation to each other	<input type="checkbox"/> Describe and investigate the effects of friction on the interaction between objects <input type="checkbox"/> Describe the effect of pressure in gases as you change height <input type="checkbox"/> Explain why pressure varies in gases as you change height <input type="checkbox"/> Describe the effect of pressure in liquids as you change depth <input type="checkbox"/> Describe why upthrust is an effect on objects in water <input type="checkbox"/> Use balanced and unbalanced forces to explain floating and sinking <input type="checkbox"/> Explain why pressure varies in gases and liquids as you change height/depth <input type="checkbox"/> Investigate and describe the effects of pressure measured by the ratio of force over area and apply to pressure applied by solids	<input type="checkbox"/> Explain why heat transfers <input type="checkbox"/> Explain how heat is transferred from hot objects to cold objects through heat transfer methods (conduction, convection, radiation) <input type="checkbox"/> Describe and investigate how heat is transferred by conduction <input type="checkbox"/> Describe and investigate how heat is transferred by convection <input type="checkbox"/> Describe and investigate how heat is transferred by radiation <input type="checkbox"/> Describe/Investigate how heat transfer causes the original hotter object to reduce in temperature	<input type="checkbox"/> Recall the similarities and differences between light waves and sound waves <input type="checkbox"/> Describe how pressure is detected by microphones and ear drums and transferred into electrical signals <input type="checkbox"/> State the auditory range of humans and animals <input type="checkbox"/> Describe the uses of ultrasound for cleaning and physiotherapy <input type="checkbox"/> Draw how light travels from a source to an object, to an eye to be observed <input type="checkbox"/> Investigate how a pinhole camera works <input type="checkbox"/> Draw ray diagrams to explain the formation of images in pinhole cameras <input type="checkbox"/> Define the terms incident, reflected and refracted <input type="checkbox"/> Illustrate how light waves can be reflected in a mirror <input type="checkbox"/> Use a protractor to measure in incident and reflected angle of light waves interacting with a mirror <input type="checkbox"/> Draw a ray diagram to illustrate refraction of light waves <input type="checkbox"/> Use a protractor to measure in incident and reflected angle of light waves refracted by a glass block <input type="checkbox"/> Investigate the relationship between incident and refracted angles when light waves enter a more and less dense material <input type="checkbox"/> Describe what is meant by refraction <input type="checkbox"/> Investigate what happens to light waves interacting with a convex lens (the production of a real image) <input type="checkbox"/> Draw a ray diagram to illustrate the merging of light waves and formation of a real image when light waves enter a convex lens	<input type="checkbox"/> Investigate the effect of changing potential difference on the power supply on the current and energy in the circuit, including the brightness of bulbs <input type="checkbox"/> Plot a graph of potential difference against current <input type="checkbox"/> Investigate and describe what happens to potential difference in series circuits <input type="checkbox"/> Describe uses of permanent and temporary magnets <input type="checkbox"/> Explain the difference between permanent and induced magnets <input type="checkbox"/> Induce a current using a magnet <input type="checkbox"/> Describe how a direct current is generated in a simple motor <input type="checkbox"/> Investigate the generation of a magnetic field when a current pass through a wire <input type="checkbox"/> Describe what happens to the strength of the magnetic field as distance increases from wire <input type="checkbox"/> Investigate the effects of coil number on the strength of the magnetic field or the current induced	<input type="checkbox"/> Name some celestial objects scientists have discovered in the night sky (planets, galaxies, [different types of] stars, black holes) and describe what they are <input type="checkbox"/> State what is meant by light year <input type="checkbox"/> Use light years to describe distances of celestial objects from Earth across the known universe and the size of these objects (such as galaxies or galaxy clusters) <input type="checkbox"/> Describe the life cycle of a star like our sun <input type="checkbox"/> Describe how black holes are formed <input type="checkbox"/> Describe the relationship between weight and gravitational field strength <input type="checkbox"/> Describe the relationship between gravitational field strength and mass of planet <input type="checkbox"/> Describe the relationship between gravitational field strength and distance from planet