



20 March 2019

Dear Parents and Carers

Year 10 Science PPE examinations

To help support our year 10 students in their upcoming PPE examinations in science the topics included in their exams are listed below. We have also included some useful websites the students can access. The list is also available on the i: drive → science → year 9/10/11 → year 10. In addition, on the i: drive in the GCSE revision folder, there are revision question packs, checklists and basic revision notes.

All students will sit three exam papers. The duration of each exam for students in sets one and two will be 1 hour 45 minutes; the duration of each exam for students in sets three to six will be 1 hour 15 minutes.

Students in sets one and two need to revise everything including the topics in red and bold. Students in sets three to six need only revise the topics in black.

In addition, we recommend students bring their own revision guides to science lessons to support their learning. The revision guides that we recommend are detailed below:

- AQA Collins All-in-one revision guide (Combined Sciences for sets three to six and the separate books for sets one and two)
- CGP AQA revision guide and work book

Please ensure these books are for the nine to one specification and AQA examination board.

PHYSICS

ENERGY - 4.1

- energy stores and systems
- changes in energy
- energy changes in systems
- power
- energy transfers in a system
- efficiency
- national grid and global energy resources

ELECTRICITY - 4.2

- standard circuit diagram symbols
- electrical charge and current
- current, resistance and potential difference
- resistors
- series and parallel circuits
- direct and alternating potential difference
- mains electricity
- power
- energy transfers in everyday appliances
- the national grid
- static charge
- electric fields

PARTICLE MODEL OF MATTER - 4.3

- density of materials
- changes of state
- internal energy
- temperature changes in a system and specific heat capacity
- changes of heat and specific latent heat
- particle motion in gases
- **pressure in gases**
- **increasing the pressure of a gas**

ATOMIC STRUCTURE - 4.4

- the structure of an atom
- mass number, atomic number and isotopes
- the development of the model of the atom (common content with chemistry)
- radioactive decay and nuclear radiation
- nuclear equations
- half-lives and the random nature of radiation decay
- radioactive contamination
- **background radiation**
- **different half-lives of radioactive isotopes**
- **uses of nuclear radiation**
- **nuclear fission and nuclear fusion**

CHEMISTRY

ATOMIC STRUCTURE AND THE PERIODIC TABLE - 4.1

- atoms, elements and compounds
- mixtures
- the development of the model of the atom (common content with physics)
- relative electrical charges of subatomic particles
- size and mass of atoms
- relative atomic mass the periodic table
- development of the periodic table
- metals and non-metals
- group 0, group 1, group 7
- **comparison of transition metals to group 1**
- **typical properties of transition metals**

BONDING, STRUCTURE, AND THE PROPERTIES OF MATTER - 4.2

- ionic bonding, covalent bonding and metallic bonding
- the three states of matter
- state symbols
- properties of ionic compounds
- properties of covalent molecules
- polymers
- giant covalent structures
- properties of metals and alloys
- metals as conductors
- diamond and graphite
- graphene and fullerenes
- **uses and properties of nanoparticles**



QUANTITATIVE CHEMISTRY - 4.3

- conservation of mass and balanced chemical equations
- relative formula mass
- mass changes when a reactant or product is a gas
- chemical measurements
- **moles**
- **amounts of substances in equations**
- **using moles to balance equations**
- **limiting reactants**
- concentration of solutions
- **percentage yield**
- **atom economy**
- **using concentrations of solutions**
- **use of amount of substance in relation to volume of gases**

CHEMICAL CHANGES - 4.4

- metal oxides
- the reactivity series
- extraction of metals and reduction
- oxidation and reduction in terms of electrons
- reactions of acids with metals
- neutralisation of acids and salt production
- soluble salts
- the pH scale and neutralisation
- **titrations**
- **strong and weak acids**
- the process of electrolysis
- electrolysis of molten ionic compounds
- using electrolysis to extract metals
- electrolysis of aqueous solutions
- **representation of reactions at electrodes as half equations**

ENERGY CHANGES - 4.5

- energy transfer during exothermic and endothermic reactions
- reaction profiles
- **the energy change of reactions**
- **cells and batteries**
- **fuel cells**

BIOLOGY

CELL BIOLOGY – 4.1

- eukaryotes & prokaryotes
- animal and plant cell including structure
- cell specialisation
- cell differentiation
- microscopy
- **culturing microorganisms**
- chromosomes
- **mitosis & the cell cycle**

- stem cells
- diffusion
- osmosis
- active transport

ORGANISATION - 4.2

- principles of organisation
- the human digestive system
- the heart & blood vessels
- blood
- coronary heart disease: a non-communicable disease
- health issues
- the effect of lifestyle on some non-communicable diseases
- cancer
- plant tissues
- plant organ system and active transport

INFECTION & RESPONSE - 4.3

- communicable (infectious) diseases
- viral diseases
- bacterial diseases
- fungal diseases
- protist diseases
- human defence systems
- vaccination
- antibiotics and painkillers
- discovery and development of drugs
- producing monoclonal antibodies
- uses of monoclonal antibodies
- plant diseases
- plant defence responses

BIOENERGETICS - 4.4

- photosynthesis reaction
- rate of photosynthesis
- uses of glucose from photosynthesis
- aerobic and anaerobic respiration
- response to exercise
- metabolism

<https://www.bbc.com/education/subjects/zrkw2hv>

<https://www.s-cool.co.uk/gcse>

Yours sincerely

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