Review topic: Calculation

	Ways to practice skills	R	A	G	Comment
3.1 Formulae					
1	State the formulae of the elements and compounds named in the subject content	☐	☐	☐	
2	Define the molecular formula of a compound as the number and type of different atoms in one molecule	☐	☐	☐	
3	Deduce the formula of a simple compound from the relative numbers of atoms present in a model or a diagrammatic representation	☐	☐	☐	
4	Construct word equations and symbol equations to show how reactants form products, including state symbols	☐	☐	☐	
5	Define the empirical formula of a compound as the simplest whole number ratio of the different atoms or ions in a compound	☐	☐	☐	
6	Deduce the formula of an ionic compound from the relative numbers of the ions present in a model or a diagrammatic representation or from the charges on the ions	☐	☐	☐	
7	Construct symbol equations with state symbols, including ionic equations	☐	☐	☐	
8	Deduce the symbol equation with state symbols for a chemical reaction, given relevant information	☐	☐	☐	

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3.2 Relative masses of atoms and molecules					
1	Describe relative atomic mass, Ar, as the average mass of the isotopes of an element compared to 1/12th of the mass of an atom of ^{12}C	☐	☐	☐	
2	Define relative molecular mass, M_r, as the sum of the relative atomic masses. Relative formula mass, M_r, will be used for ionic compounds.	☐	☐	☐	
3	Calculate reacting masses in simple proportions. Calculations will not involve the mole concept	☐	☐	☐	

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3.3 The mole and the Avogadro constant					
1	State that concentration can be measured in g/dm^3 or mol/dm^3	☐	☐	☐	
2	State that the mole, mol, is the unit of amount of substance and that one mole contains 6.02×10^{23} particles, e.g. atoms, ions, molecules; this number is the Avogadro constant	☐	☐	☐	
3	Use the relationship amount of substance $\frac{\text{mass (g)}}{\text{molar mass(g/mol)}}$ to calculate: a. amount of substance molar mass (g/mol) b. mass c. molar mass d. relative atomic mass or relative molecular / formula mass e. number of particles, using the value of the Avogadro constant	☐	☐	☐	
4	Use the molar gas volume, taken as 24 dm^3 at room temperature and pressure, r.t.p. in calculations involving gases	☐	☐	☐	
5	Calculate stoichiometric reacting masses, limiting reactants, volumes of gases at r.t.p., volumes of solutions and concentrations of solutions expressed in g/dm^3 and mol/dm^3, including conversion between cm^3 and dm^3	☐	☐	☐	
6	Use experimental data from a titration to calculate the moles of solute, or the concentration or volume of a solution	☐	☐	☐	
7	Calculate empirical formulae and molecular formulae, given appropriate data	☐	☐	☐	
8	Calculate percentage yield, percentage composition by mass and percentage purity, given appropriate data	☐	☐	☐	

	Ways to practice skills	R	A	G	Comment
12.2 Acid–base titrations					
1	Describe an acid–base titration to include the use of a: a. burette b. volumetric pipette c. suitable indicator	☐	☐	☐	
2	Describe how to identify the end-point of a titration using an indicator	☐	☐	☐	