### Fundamental Ideas in Chemistry

- Annotate a diagram of an atom with names and features of each part.
- State numbers of protons and electrons in an atom and use this to explain the overall charge.
- Define ‘element’, ‘mass number’ and ‘atomic number’.
- Draw diagrams to show electronic structure of the first 20 elements.
- State and explain the relationship between elements in the same group.
- State what noble gases are and explain why they are so unreactive.
- Define ‘compound’ and ‘molecule’.
- Explain how ionic compounds are formed from metals and non-metals.
- Explain how molecular compounds are formed from non-metals.

### Limestone and Building Materials

- Give the chemical name and formula for limestone.
- Describe how limestone is quarried.
- Describe the thermal decomposition of carbonates calcium, magnesium, zinc and sodium carbonates.
- Describe the reaction of calcium oxide with water and of limewater.
- Describe how limestone is used to make cement and how cement is used.

### Metals and their Uses

- Link how metals are found in the earth’s crust to their reactivity.
- Describe how metals can be extracted by reduction or electrolysis.
- Choose which method of extraction would be used, depending on the reactivity of a metal.
- Describe how copper, aluminium and titanium are extracted and purified.
- Evaluate the benefits of recycling.
- Explain the properties of different iron and steels.
- Link some properties of everyday alloys to their uses.
- Define transition metals. Link some properties of transition metals to their uses.
- Link the properties of copper to its uses in electrical wiring and plumbing.

### Crude Oil and Fuels

- Define ‘mixture’ and describe what crude oil is and what it is made up of.
- Recognise & define ‘alkanes’, name & draw the first 4 hydrocarbons in formulae/diagrams.
- Describe how fractional distillation is used.
- Link the size of molecule to its boiling point, viscosity and flammability.
- State products of combustion of fuels, e.g sulphur dioxide, nitrogen oxides, carbon monoxide.
- Give the environmental problems with some of these products.
- Describe how levels of sulphur dioxide can be reduced.
- Evaluate the advantages of biofuels.