

## Curriculum Summary – Chemistry (Year11)

### Autumn

#### **C8: Rates and equilibrium**

In this chapter, students will:

- Calculate the rate of reaction from data.
- Learn about the factors that affect the rate of a reaction and explain the effect of each factor on the rate of reaction using collision theory.
- Explain the effect of catalysts on the rate of a reaction in terms of providing an alternative reaction pathway with a lower activation energy.
- Learn about reversible reactions and dynamic equilibrium. and predict the effect of temperature changes on the position of the equilibrium.
- Use Le Châtelier's principle to explain the effect of temperature and pressure on the position of equilibrium.

#### **C9: Crude oil and fuels**

In this chapter, students will:

- Learn about hydrocarbons and alkanes.
- Identify alkanes from their formulae and be able to name and draw the displayed formula of the first four alkanes.
- Learn about some of the reactions of hydrocarbons, including combustion (both complete and incomplete) and cracking.
- Write balanced symbol equations for the complete combustion of hydrocarbons and to describe the conditions of cracking.
- Describe the test for alkenes (a product of cracking).
- Learn about crude oil as a source of hydrocarbons and the fractional distillation of crude oil.
- Describe how the size of the hydrocarbon molecule affects its properties, including viscosity, boiling point, and flammability.

### Spring

#### **C12: Chemical analysis**

In this chapter, students will:

- Learn about various techniques for analysing substances.
- Understand the difference between a pure substance, a mixture, and a formulation, and what is meant by purity.
- Build upon their understanding of chromatography experiments and be able to analyse a chromatogram using  $R_f$  values.
- Describe the different experimental tests for gases, including both the procedure and positive result.

#### **C13: The Earth's atmosphere**

In this chapter, students will:

- Learn about the Earth's atmosphere and describe the volcanic activity theory of the origin of the atmosphere
- Interpret evidence concerning other theories and be able to evaluate them.
- Understand how the atmosphere has evolved over time including how the general composition of the atmosphere has changed and how the atmosphere is currently being affected by human activity.
- Describe the human activities that are thought to cause global warming and be able to explain some of the effects this has on the climate of the Earth.
- Explain the effect of other pollutants on the Earth, including carbon monoxide, sulfur dioxide, nitrogen oxides, and particulates.

## Summer

### **C14: The Earth's resources**

In this chapter, students will:

- Learn about the difference between finite and renewable resources.
- Understand that renewable resources are not an infinite supply but are replaceable at a rate similar to the rate they are used up, whereas finite resources are used up faster than they can be replenished.
- Apply this understanding to the need to reuse and recycle and evaluate ways of reducing the use of finite resources
- Carry out life cycle assessments on products.
- Describe the different ways that water is treated to create potable water and to remove waste products so it is safe to release into the environment.
- Learn about alternative biological methods used to extract copper from low grade ores.