

Year 10 Chemistry Learning Outcomes

Chemistry Unit 5: Energy Changes

- Define exothermic and endothermic reactions.
- Evaluate the applications of exothermic and endothermic reactions.
- Explain how energy changes when bonds are broken and made.
- Calculate the overall energy change of a reaction using bond energies, including the correct units.
- Explain why non-rechargeable batteries stop working.
- Evaluate the use of hydrogen fuel cells.

Unit 6: Rates and Equilibrium

- Plot and use a graph to calculate the gradient to measure the initial rate of reaction.
- Explain how to use collision theory to explain the effect of surface area on reaction rate.
- Explain how altering the temperature affects the rate of reaction using collision theory.
- Explain, using collision theory, how changing concentration or pressure alters the rate of reaction.
- Explain, using collision theory, how adding a catalyst alters the rate of reaction.
- Predict the observations of a familiar reversible reaction when the conditions are changed.
- Predict the effect on the rate of forward and reverse reactions by applying the Le Chatelier's Principle when the conditions of a dynamic equilibrium are changed.
- Predict the effect on yield of changing temperature, concentration, or pressure in a given equilibrium system.

Unit 7: Organic Chemistry – Crude Oil and Fuels

- Describe the composition of crude oil.
- Explain how fractional distillation is used to separate fractions in crude oil.
- Link the size of the molecule to the boiling point, viscosity and flammability.
- Describe how cracking takes place and compare the products obtained.

Unit 8: Chemical Analysis

- Distinguish a pure substance from an impure substance using melting point data.
- To describe how chromatography works to separates mixtures.
- To identify gases chlorine, oxygen, carbon dioxide and hydrogen from their chemical tests.
- To identify the positive ions in a compound using flame tests and other chemical tests.
- Describe the chemical tests for some negative ions and their results.
- Describe how instruments can be used to identify elements and compounds.

Unit 9: The Earth's Atmosphere

- Describe how oxygen was formed in the development of the atmosphere.
- Explain, using word equations, how gases were formed in the atmosphere and how oceans were formed.
- Explain why the composition of the Earth's atmosphere has not changed much for 200 million years.
- Explain how greenhouse gases increase the temperature of the atmosphere.
- Explain the possible effects of global climate change and why they are difficult to predict.
- Describe how carbon monoxide and soot (carbon) can be made from the incomplete combustion of fossil fuels.

Unit 10: The Earth's Resources

- Explain the use of natural, sustainable, and finite resources.
- List the key processes to make drinking water.
- Explain reasons for filtration and sterilisation in water treatment.
- Describe the main processes in sewage treatment.
- Describe the processes of phytomining and bioleaching.
- Carry out Life Cycle Assessments for different products when data is supplied.
- Evaluate the environmental, economic, and social impacts of reusing and recycling products.