

# Chemical Sciences

## Description

Students understand that the structure of materials determines their properties and that the processing of raw materials results in new materials with different properties and uses.

### By the end of this unit all of the students will be able to explain that:

- the kinetic theory describes the movement of particles in matter and is used to explain the properties of solids, liquids and gases
- Elements consist of one type of atom while compounds consist of two or more different types of atoms which are chemically combined
- Compounds can be separated by chemical reaction into purer substances but elements cannot
- All matter is composed of atoms with a nucleus containing protons and neutrons and surrounded by electrons
- The atomic and mass number of an atom enable the number of protons and neutrons to be determined
- The number of electrons in the outer shell of an atom determines many characteristics of the substance (e.g. formation of ions, metallic or ionic bonding)
- Recognize formulae of common substances
- Elements can be grouped into metals/non-metals based on common physical characteristics
- Acids and bases have distinct physical properties
- Gases can be identified using tests
- Chemical changes can be observed and described
- Physical and chemical change can be explained in terms of arrangement of particles and type of particle involved, understand that matter is not created or destroyed in these processes
- Chemical reactions occur at different rates
- Write word equations to describe chemical reactions and understand general equations for common reactions

### Extension: Some students will also be able to explain:

- That ions can be described in terms of their number of protons, electrons and their electric charge
- that the formula of a substance contains information about its atoms, ions or molecules
- Conservation of atoms in a reaction can be illustrated using the reactants and products in a balanced equation
- The products of a reaction given the reactants and a general word equation
- Are able to write symbolic equations for reactions, given the word equations
- The properties and use of substances are related to their structure

## Assessments

Mid-topic test: 30% | End of topic test: 30% | Investigation: 30% | Homework: 10%