



## Chemistry and Biology Learning Matrix

### Curriculum Level 6

#### Learning Area Whakataukī:

<i><b>Mā te whakaaro nui e hanga te whare;  mā te mātauranga e whakaū.</b></i>	<i><b>Big Ideas create the house;  knowledge maintains it.</b></i>
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Chemistry and Biology is a consolidated subject that is being developed to support the vision in the NCEA Change Package (2019) of an optional, broad, and foundational qualification at NCEA Level 1. The Significant Learning identified in this subject provides for coherent foundational learning and is assessed by fewer, larger standards than in the current Science matrix. This allows for specialisation at NCEA Levels 2 and 3.

Big Ideas			
<b>All living things contain genetic material that informs whakapapa and provides for continuity and diversity of life</b>	<b>All living things are interconnected within the taiao</b>	<b>Chemicals exist everywhere in the taiao and reactions rearrange these chemicals</b>	<b>Properties of matter are determined by attractive forces between particles</b>
<b>At Curriculum Level 6, students will...</b>			
<ul style="list-style-type: none"> <li>• explore the diverse pathways that have brought people to the Pacific, utilising mātauranga Māori and Pacific knowledges of migration and genealogy so that all students understand their place in New Zealand</li> <li>• examine the universal nature of the molecular structure of DNA at a basic level and examine the relationship between DNA, chromosomes, genes, and alleles</li> <li>• explore current uses of genomic information that utilise unique genomes</li> <li>• consider mutation as a source of variation and explore the importance of variation to living things in a local context</li> <li>• explore the passing down of DNA through the process of fertilisation, which creates further variation</li> <li>• use data and information to predict and interpret past and future genetic inheritance and consider how this informs whakapapa</li> <li>• explore how mātauranga Māori and Pacific knowledges interact with microorganisms</li> <li>• consider microorganisms and the taiao as an interconnected entity and explore the role of microorganisms in the taiao</li> <li>• explore how microorganisms can be beneficial or harmful</li> <li>• investigate how changes in conditions in the taiao affect microorganism growth and the mauri of the taiao, including the role of defences in protecting living organisms against harmful microorganisms</li> <li>• use knowledge of chemicals and their reactions to inform understanding of the mauri of the taiao and the role of kaitiakitanga</li> <li>• link quantities and location of chemicals to positive and negative impacts on the taiao</li> <li>• explore patterns of chemical behaviour in neutralisation, combustion, and precipitation reactions</li> <li>• make predictions using knowledge of patterns of chemical behaviour in neutralisation, combustion, and precipitation reactions</li> <li>• investigate the conservation of matter during chemical reactions</li> <li>• recognise that mauri is present in all matter which exists as particles held together by attractive forces</li> <li>• compare the structures of atoms, ions, and molecules</li> <li>• explore patterns in melting / boiling points, conductivity, malleability, solubility, ductility, and hardness of metallic, ionic, molecular, and macromolecular materials</li> <li>• relate uses of materials to the physical properties of different types of matter</li> <li>• explore how melting / boiling point and solubility are affected by the relative strength of attractive forces between particles.</li> </ul>			