Course Description:
In this unit students will be introduced to the basic concepts of genetics such as the structure and function of DNA and how heritable characteristics are transmitted from one generation to the next. The other focus of this unit will explore the history of life on Earth and the mechanisms that have affected evolution of all living things (with particular emphasis on human evolution).

Course Outcomes:
By the end of this unit you should be able to:
- Describe the structure and function of DNA and represent the relationship between DNA, chromosomes and genes.
- Recognise that genetic information is passed on to offspring from both parents by meiosis and fertilisation.
- Represent patterns of inheritance of a simple (monohybrid) dominant/recessive trait through generations of a family and predict simple ratios of offspring genotypes and phenotypes in crosses involving dominant/recessive gene pairs.
- Recognise that mutations to DNA or chromosomes may cause disease but also are a mechanism for evolution.
- Outline the processes involved in Natural Selection including variation, isolation and selection.
- Evaluating and interpreting evidence for evolution including fossil records, comparative anatomy and geographical distribution of species.

Course Organisation:
The organisation of the unit will be:
- The students are presented with both theoretical and practical work, in conjunction with the ‘Science by Doing’ web-based program, to develop their knowledge and skills.

Student’s activities will include:
- Developing a knowledge base using notes, questions, bookwork/worksheets.
- Conduct practical activities to explore and visualise theoretical concepts.
- Practice using terminology and language in oral and written activities.

Course Timeline:

<table>
<thead>
<tr>
<th>Wk</th>
<th>Activity</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td><strong>History of the Earth and living things</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How the earth was formed and the advent of single cells</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Stromatolites and Oxygen – how this changed all living organisms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Autotrophic vs heterotrophic cells</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cambrian explosion</td>
<td></td>
</tr>
<tr>
<td>3-4</td>
<td><strong>Structure and function of DNA</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• What is DNA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Structure of DNA</td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
<td>Activities</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>------------</td>
</tr>
</tbody>
</table>
| 5    | **Monohybrid crosses** | - How to do a monohybrid cross using the punnet square method  
- Predicting genotype and phenotype ratios  
**Week 3 – Genetic Terminology Quiz** |
| 6    | **Revision and test at end of the week** | - Kiwi fruit DNA extraction  
**Week 6 – History of the Earth Quiz** |
| 7-10 | **Human evolution** | - Natural selection  
- Primate characteristics  
- From primates to humans |

**Course Vocabulary:**
- DNA (deoxyribonucleic acid)
- RNA (Ribonucleic acid)
- Chromosomes
- Genes
- Haploid
- Diploid
- Heterozygous
- Homozygous
- Dominant
- Recessive
- Trait or characteristic
- Mutation
- Variation
- Natural selection
- Evolution
- Heterotroph
- Autotroph
- Symbiotic
- Stromatolite
- Multicellular
- Eukaryotic cell
- Prokaryotic cell
- Classification
## Assessment Outline

### Course Assessment:

<table>
<thead>
<tr>
<th>Wk</th>
<th>Assessment type</th>
<th>Weighting</th>
<th>Marks achieved</th>
<th>Your Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Test</td>
<td>40%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-9</td>
<td>Class weekly quizzes</td>
<td>60%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*specific marks to be advised*

### Specific Equipment required for each lesson:

- File/book to write in
- Pens, ruler, calculator