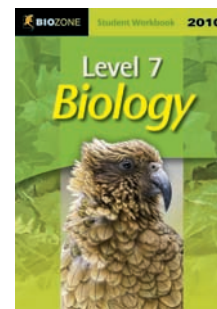


2010: What's New in Level 7 Biology

Thank you for purchasing the first edition of the 2010 *Level 7 Biology Workbook*. Biozone is committed to providing an up-to-date resource that caters for the requirements of students and teachers in New Zealand. The current edition of this workbook expands on the material developed in earlier editions. This summary provides a record of changes since the 2009 edition of *Year 12 Biology*.



Organisational and general changes

There have been a large number of organisational changes in this first edition of the 2010 *Level 7 Biology Workbook* relative to the 2009 *Year 12 Biology Workbook*. This first edition marks the first move in a shift towards more context-based material and an emphasis on scientific literacy and understanding. New features are described in brief as follows:

- Concept maps integrate new curriculum and existing standards. There are four concept maps - one for each of the four main sections of the workbook: "Asking Questions, Finding Answers" (biological investigations), "Genetics and the Cell", (genetics and cell biology), "The Processes of Life" (plant and animal form and function), and "Ecology" (ecology and environmental change).
- Each chapter begins with a concise topic introduction emphasising key concepts, key terms, and brief objectives. The current Achievement Standard(s) to which the chapter applies is clearly indicated. These will be revised according to the new NCEA Achievement Standards when these come into effect in 2012. As an adjunct to this, a teacher's stapled booklet will be provided free with each order of workbooks. This will include detail relevant to each of the numbered Learning Objectives in each topic introduction.
- Material throughout the animal and plant form and function chapters is more comparative than previously. Homeostasis and adaptation are unifying themes throughout.
- Each chapter includes literacy activities, in the form of mix and match, puzzles, games, and concept stories for comprehension and interpretation. The concept stories, together with the contextual approach, provide the opportunity for students to test their understanding within a real-world context.
- Periodical references are reduced to highly relevant articles only and are cited on the page to which they most apply. Keen students/teachers can obtain details of the citation in the Appendix (a new feature).
- The Appendix also includes tables for help with SI units and decimal conversions.
- We have provided an enhanced list of **web links** for activities (videos and animations) accessed through www.biozone.co.nz/webblink/NZL7-2498.html. Note that this resource is distinct from the Biolinks, which have long been a feature of the Biozone website. Each link provides a video clip or animation of particular relevance to the activity page on which it indicated.
- Material in the chapter "*Managing in a Changing World*" now emphasises just three contexts important both in New Zealand and globally: water resources, global warming, and biodiversity.
- Model Answers: In response to popular request, the model answers have been revised with answers now provided in A, M, E format. As an adjunct to this, the model answers are provided as a show-hide feature on the non-printable PDF version of the workbook on the Teacher Resource CD-ROM.

☆ New activities in this edition

Literacy activities:

Key Terms: Memory Card Game

An enjoyable way to help students remember words and definitions, with a competitive edge.

Key Terms: Word Find

A little different from traditional word finds, students must first solve the clue before they can find the word!

Key Terms: Crossword

Crosswords help student literacy in the selected topic. Students will need to know their key terms to solve it.

Key Terms: What am I?

A game requiring students to work in teams to help a team mate correctly determine their unknown word. Flexible format makes it suitable for any size class.

Key Terms: Mix and Match

Match each key term from the topic with its definition.

Concept maps:

There are four concept maps introducing each of the four main sections of the workbook. Although they are not activities, students can refer to them often to map the connections between topics as they cover them and to place their material into a larger context.

Page Activity and description

- | | |
|------------|---|
| 8 | Asking Questions in Field Science
This activity introduces students to how a beginning researcher approaches a problem in field science in a local New Zealand context. |
| 38 | Spotlighting: A New Way to Sample
An introduction to how scientists approach a sampling problem in a real world situation. It also provides an insight into the research work of graduate students and shows where their studies might take them. |
| 77 | The Appearance of a New Word
A comprehension activity takes students through the discoveries that led to our understanding of mutations. |
| 90 | Test Cross
Using pure breeding lines to determine unknown genotypes. This activity complements the suite of crosses already included in the workbook. |
| 138 | How Do We Know? Membrane Structure
This activity describes how the structure of the plasma membrane can be analysed and how the results confirm the fluid mosaic model of the cell membrane. Questions test student understanding of the text. |
| 171 | How Animals Feed
This activity focusses on the diversity of animal feeding methods, although an overview of nutritional patterns in organisms is provided as a reference. |
| 174 | Teeth in Fish
This activity describes the various types of teeth and feeding methods of fish, providing a complement to the material provided in the " <i>Dentition in Mammals</i> ". |
| 183 | Systems for Digesting Food
This activity provides a comparative view of the adaptations for digestion in various animal taxa. |



- 185 Absorbing Nutrients**
A comparative view of the adaptations for nutrient absorption in various animal taxa. The cellular transport processes involved in the absorption of various nutrients by the intestinal villi in mammals is also provided as an example of the way in which animals carry out life processes.
- 193 Gas Exchange in Birds**
Part of suite of activities providing a comparative exploration of animals gas exchange systems.
- 204 Open Circulatory Systems**
This activity describes both simple (insect) and more complex (crab) open circulatory systems.
- 205 Closed Circulatory Systems**
Closed circulatory systems in invertebrates (annelids, cephalopods) are compared with single and double circuit systems in vertebrates.
- 207 The Heart as a Pump**
A comparative examination of heart structure (fish, amphibian, mammal).
- 220 Birds With Runny Noses**
A comprehension activity covering the adaptations of marine animals for excreting excess salt.
- 223 Managing Fluid Balance on Land**
This activity compares and explain daily water transfers in non-desert and desert-adapted animals.
- 229 Animal Skeletons**
Comparative structures for support in animal taxa: endo-, exo- and hydroskeletons.
- 230 Swimming**
This activity describes the adaptations of aquatic animals. for swimming: developing propulsion and maintaining stability and buoyancy.
- 231 Running**
An activity exploring the diversity of ways in which terrestrial animals move. Questions focus on locomotory differences between taxa and structural adaptations for speed and agility.
- 232 Flying**
The possession of powered flight is restricted to only three animal taxa and this activity explores the various ways in which these animals have achieved it.
- 233 Muscle Structure and Function**
The details of muscle structure and a comparison of neuromuscular function in arthropods, vertebrates, and cnidarians.
- 235 Red and White Muscle**
The structural and functional differences between type I and type II muscle fibres and the reasons for their particular distribution in various vertebrate taxa.
- 238 The Variety of Plants**
An overview of plant diversity in both form and adaptation to environment.
- 258 Separating the Wood from the Trees**
A reading and comprehension activity describing the differences in wood in gymnosperms and dicot angiosperms and how features of the wood can be used to determine the age of the tree and analyse past climates.
- 261 A Most Accomplished Traveller**
A reading and comprehension activity describing the reproductive adaptations of the coconut palm.
- 262 Insect Pollinated Flowers**
This activity provides an overview of the structure of a typical insect-pollinated flower and the adaptations of such flowers to maximise pollination efficiency.
- 263 Wind Pollinated Flowers**
This activity examines the structure of wind pollinated

flowers. Questions focus on differences between wind and insect pollination.

- 294 The Rise and Fall of Human Populations**
A comprehension activity examining the reasons for the demise of past human populations and how that information can be used to plan for our own future.
- 297 The Darkest Depths**
This activity describes the nature of the deep ocean hydrothermal vent communities and provides an introduction to food webs.
- 319 The Modern Atlantis?**
This comprehension activity uses a newspaper report to examine the plight of the small island nation of Kiribati in an environment of global warming.
- 320 Primary Succession**
This activity introduces ecological succession by focussing on primary succession. New 3-D, photo realistic artwork provides a very visual representation of community change over time.
- 321 Secondary Succession**
Different scenarios for secondary succession are described using photo realistic artwork. Questions focus on the differences between primary and secondary succession and the important factors in determining successional outcomes.
- 329 Nitrogen Pollution**
This activity describes the effects of excessive human-induced nitrogen inputs and the effects of nitrogen oxides in the atmosphere.
- 341 Carbon Trading**
Carbon trading has a high profile in the current media. What are carbon credits, how do carbon trading schemes work, and who benefits?
- 342 Global Warming and NZ**
An overview of the predicted effects of climate change on the New Zealand environment and its inhabitants.

!! ERRATA

Please replace the text for **Staging a Debate** (as it appears Concept Map < page 270) with the text below.

Staging a Debate

Choosing an issue

- Issues that polarise communities
- Issues with a scientific basis and social or ethical viewpoints

Debating the issue

- Organising your argument
- Considering the evidence
- Acknowledging multiple points view

△ Existing material upgraded in this edition

Activities revised in order to clarify ideas and improve the stimulus material, questions, format, or general content. As this is a first edition, with considerable revision throughout, only significant changes have been indicated here (i.e. those substantially affecting content):

Page Activity and description

Objectives and Key Concepts in all topics

The introduction to each chapter is now a single page, visually appealing synopsis of the material to be covered in the chapter. The objectives are still provided as numbered points, but the emphasis is on key competencies and students should now be



able to more easily identify knowledge requirements. Key concepts for the chapter introduce the learning objectives, and a list of key terms provides a focus for competency in literacy. A teacher's version of the learning objectives, containing more explanatory detail, is provided in the Teacher's Handbook (free with orders) for each chapter.

- 96 Darwin's Theory**
This activity now includes the illustrative example of shell variation in the grove snail, providing a real-world example of natural variation in populations.
- 102 Natural Selection**
This page has had updated graphics, explanations and questions, although the intent remains the same.
- 133 Interpreting Electron Micrographs**
This is now a shorter activity, although its focus and content is largely unchanged.
- 179 Diversity in Tube Guts**
This activity now includes a brief synopsis of peristalsis alongside the comparative view of gut structure. The human gut has been annotated to indicate the phases of food processing in a tube gut.
- 195 Gas Exchange in Mammals**
This activity now includes a comparative view of mammalian lung volumes, although humans still provide the focus for the structure of the mammalian gas exchange system.
- 203 Circulatory Fluids**
This activity now provides a comparative examination of circulatory fluids (insect haemolymph vs mammalian blood). The questions have been revised.
- 225 Osmoregulation in Water**
This stand-alone activity was previously included in "*Excretion and Osmoregulation*". The basic content and questions are unchanged.
- 251 Adaptations in Xerophytes**
Now a one page activity, although with the same focus and intent.
- 277 Ecological Niches**
The examples in this activity have been revised to give more New Zealand based examples.
- 298 Food Chains**
This activity now provides New Zealand examples.
- 299 Constructing a Food Web**
Although the intent of the this activity is unchanged, students must now construct a greater number of food chains. This will assist them in creating their food web.
- 339 Climate Change and Biodiversity**
This activity now provides a wider range of examples of the effects of global warming on biodiversity both globally and within New Zealand.

Activities removed in this edition

Activity and account of change

A number of activities have been changed or removed from the 2009 edition to make room for new activities for the first edition of the 2010 Level 7 Biology Workbook.

Stratospheric Ozone Depletion, Sewage Treatment, Marine Fisheries Research, Fisheries Management, Marine Resources, Ecological Impacts of Fishing

The focus in "*Managing in a Changing World*" is now on three contexts: water resources, biodiversity, and global warming. In line with this change this suite of activities is now provided solely as extension within the chapter "*Human Impact on Resources*" on the TRC.

Habitat Preference in Mudfish

This activity has been provided in a modified form as a reading and interpretation exercise in the *2010 Level 8 Biology Workbook*.

Monitoring Physical Factors

Material in this activity has been incorporated into "*Sampling Populations*".

Circulatory Systems

The material in this activity has been incorporated into "*Open Circulatory Systems*" and "*Closed Circulatory Systems*".

Mammalian Transport, Vertebrate Hearts, Heart Function

Relevant, comparative aspects of these activities are now covered in "*The Heart as a Pump*".

Exercise and Blood Flow

This activity has been removed from the workbook.

Gas Exchange in Animals

Relevant, comparative aspects of this activity are now incorporated into separate, focussed activities.

Oxygen Dissociation

Relevant parts of this activity have been incorporated into "*Gas Exchange in Mammals*".

Modes of Nutrition, Methods of Feeding

Relevant material from these activities is now covered in "*How Animals Feed*".

The Human Digestive Tract, Stomach and Intestines

Relevant material from these activities is now covered in "*Diversity of Tube Guts*".

Nutrient Transport in Humans

Parts of this activity are now covered in "*Absorbing Nutrients*".

Plants as Producers

This activity has been removed from the workbook. Its main focus - the role of plants as producers - is covered in the introduction to "*The Variety of Plants*".

The Angiosperm Life Cycle

Required aspects of angiosperm reproduction are covered in other activities.

Basic Genetic Crosses

This activity has been replaced with "*Test Cross*". Basic genetic crosses are adequately covered in the materia on monohybrid and dihybrid crosses.

The Modern Theory of Evolution

This activity is now available as a weblink.

Sexual Selection

This activity is now provided on the TRC.

We hope that you enjoy using Level 7 Biology this year and find the changes we have made useful. As this edition represents the first stage of an extensive review process, we particularly invite comments and constructive criticism and will endeavour to implement suggestions wherever possible.

... the staff at Biozone.

