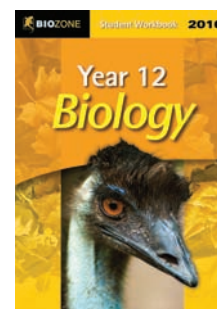


# 2010: What's New in Year 12 Biology

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



## Organisational and general changes

There have been no major organisational changes in this years edition. However, there are several new activities, and many that have been revised or updated. As was the case last year, additional material to supplement the core content has been provided on the Teacher Resource CD-ROM (TRC). As with the activities in the workbook, this material has been updated and revised. Spreadsheets, which can be used in conjunction with the workbook to develop the ICT and data handling skills, are available on the TRC. **In response to popular request**, the model answers are now provided with a show-hide feature on the non-printable PDF version of the workbook, also on the TRC.

### ☆ New activities in this edition

#### Page Activity and description

- 63 The Hypothalamus and Pituitary**  
This new activity discusses the role of the hypothalamus and pituitary in linking the nervous and endocrine systems together. This material was previously found as part of 'The Endocrine System'.
- 87 Kidney Transplants**  
This activity looks at the nature of kidney failure and how it can be corrected using transplants.
- 90 Transport and Effects of Auxins**  
This activity describes the role of auxin in plants, how it is transported, and its effects on plant growth.
- 99 Reflexes**  
In this activity, various types of reflex, and the nervous pathways they involve, are described.
- 184 Herceptin: A Modern Monoclonal**  
This exercise describes how the monoclonal antibody Trastuzumab recognises and helps to destroy specific cancer cells and what causes those cells to become cancerous in the first place.
- 229 Interpreting Gel Electrophoresis**  
This activity gives the students a series of gels to interpret, including DNA sequencing and using DNA profiles to determine relatedness.
- 230 Preparing a Gene for Cloning**  
Students are introduced to the steps required to prepare a gene for cloning in a bacterial cell and the biochemical tools used.
- 333 In Vivo Gene Cloning**  
Students are taken through the process of recombining and inserting DNA into a bacterial cell for amplification. Methods for successfully identifying transformed cells are also described.
- 241 Golden Rice**  
In this activity, the rationale and techniques for development of transgenic rice are discussed. Examples of other transgenic plants are also given.
- 253 Forensic Applications of DNA Profiling**  
This activity describes the applications of DNA to forensics. Students must use DNA profiles to decide the innocence or guilt of an alleged offender.
- 267 Oestrogen, Transcription and Cancer**  
Students are shown the link between oestrogen and cancer and how a protein that causes useful mutations can also cause harmful ones.

#### 283 The Test Cross

This activity describes the use of the test cross to identify an unknown genotype.

#### 331 The Evolution of Drug Resistance

This activity describes the development of antibiotic resistance in bacterial populations.

#### 335 Selective Breeding in Animals

This activity includes aspects of 'Selective Breeding' from the 2009 edition but includes more examples. The questions have been revised accordingly.

#### 339 Breeding Modern Wheat

This short exercise describes how the original wheat plant has become the wheat commonly grown today.

#### 356 Isolation and Species Formation

Geographical and ecological isolation and how these contribute to the formation of a new species.

#### 390 Bipedalism and Nakedness

The reasons for the loss of body hair and upright walking in humans are discussed. The influence of changing climate is emphasised. There are no questions, but the page provides useful background for *Adaptations for Bipedalism*.

### △ Existing material upgraded in this edition

Activities revised in order to clarify ideas and improve the stimulus material, questions, format, or general content:

#### Page Activity and description

##### Objectives and Resources in all topics

Texts and periodicals have been updated. Where necessary, the objectives have been revised to accommodate any new or changed activities.

#### 49 Photosynthetic Rate

The introduction, explanation of the graphs, and questions have all been revised for this edition.

#### 55 Principles of Homeostasis

This activity has been substantially revised and includes both negative feedback (thermoregulation) and positive feedback (fever and childbirth). The questions have been revised.

#### 57 Maintaining Homeostasis

The text accompanying the illustrations has been revised and bold type added for key words.

#### 61 Hormonal Regulatory Systems

The diagram now includes definitions for neural, hormonal, and humoral stimuli for endocrine activity. These definitions are important for understanding and answering Q3 of 'The Endocrine System'.

#### 62 The Endocrine System

The introduction has been revised and the pineal added to the list of endocrine glands. Extra material on the hypothalamus and pituitary is now covered in a separate activity.

#### 64 Cell Signalling

The artwork on this page has been revised for clarity but the intent of the activity is unchanged.

#### 80 Control of Blood Glucose

The graph has been revised to show fluctuations in both insulin and blood glucose. The questions have been revised accordingly.

#### 81 Waste Products in Humans

The questions for this activity have been revised



although the information and graphics are unchanged.

- 83 The Physiology of the Kidney**  
The diagrammatic summary of the processes in the kidney nephron has been clarified. The questions are unchanged.
- 93 Auxins Gibberellins and ABA**  
This activity has been revised to remove the emphasis on auxin and any overlap with the new activity focussing solely on auxin transport and effects.
- 96 The Human Brain**  
The *Sensory and Motor Regions in the Cerebrum* graphic has been slightly modified in this edition.
- 97 Neurone Structure and Function**  
The artwork for this page has been revised to describe both myelinated and non-myelinated nerves as well as saltatory conduction. Material on reflexes is now covered in a separate activity.
- 105 The Physiology of Vision**  
Question 4-8 have been revised.
- 114 Infection and Disease**  
This page has been revised to include a visual representation of the steps used to determine the aetiology of a disease and how Koch arrived at his postulates. The questions have changed accordingly.
- 115 Transmission of Disease**  
The labelling of the graphic has been slightly revised.
- 116 Patterns of Disease**  
This activity has been revised to focus on Australian cases of swine flu up until July, 2009. It clearly shows the rapid spread of the disease across Australia.
- 132 Cholera**  
This activity has been revised to cover the treatment of cholera using oral rehydration. The emphasis is on how cholera disrupts normal gut function.
- 135 Emerging Diseases**  
These pages now have an emphasis on diseases emerging in the Australasian region.
- 155 The Immune system**  
The diagram covering clonal selection has been revised to clarify the content.
- 161 Immunisation**  
This activity replaces 'Vaccination' to concur with the revised National Immunisation Program provided.
- 167 Health vs Disease**  
This activity and has been extensively revised with more appealing graphics and more questions, including those requiring interpretation of data. It also includes the relevant material from the activity 'Substance Abuse' which has been removed.
- 177 Cardiovascular Disease**  
The CHD incidence data in this activity have been updated and the questions revised accordingly.
- 179 Correcting Heart Problems**  
The introductory material for this activity has been updated.
- 193 Human Karyotype Exercise**  
This activity has been revised to produce a different result from last year <Down Syndrome Male>
- 231 In Vitro Gene Cloning by PCR**  
This activity (previously *Polymerase Chain Reaction*) describes the steps that occur during PCR and how this can be used to greatly amplify a segment of DNA or gene of interest. The questions are unchanged.
- 237 Vectors in Transgenesis**  
Improved artwork adds to the visual appeal of this activity. The questions are unchanged.
- 239 Genetically Modified Plants**  
The tabulated material previously in this activity is now found in part in 'Golden Rice' and has been replaced by specific photographic examples.
- 245 Gene Therapy**  
Updated graphics provide a better illustration of how

gene therapy works inside the cell. The questions have been revised accordingly.

- 247 Gene Delivery Systems**  
This activity has been revised to include Severe Combined Immune Deficiency, which is also being treated by gene therapy. The questions have been revised accordingly.
- 255 Automated DNA Sequencing**  
The introduction for these pages has changed but the focus and intent remain the same.
- 259 The Human Genome Project**  
The URL gdb.org is no longer active and has been removed. A percentage break down of what constitutes the human genome is also provided.
- 278 The Advantages of Sex**  
This activity has been substantially revised to include specific examples and the Red Queen hypothesis).
- 303 Interactions Between Genes**  
Graphics and information on this page have been revised to better illustrate the nature of the gene interactions described. Extra examples are included and the questions have been revised.
- 323 Natural Selection**  
This activity has been to include real examples, including the role of natural selection in determining skin colour in humans.
- 325 The Evolution of Darwin's Finches**  
The title of this activity has changed from 'Darwin's Finches'. The material at the bottom of the page has been substantially revised although the focus of the page remains the same.
- 337 Selective Breeding in Crop Plants**  
This activity includes aspects of 'Selective Breeding' from the 2009 edition, as well as new material. The questions have also been revised.
- 357 Reproduction Isolation**  
The graphics and information for this activity have been extensively reorganised to focus on isolating factors other than geographical or ecological. Additional real examples are provided, although the focus of the activity and the questions are unchanged.
- 387 The Origin of Modern Humans**  
This activity has been expanded to three pages with a two page spread of the human dispersal map which now displays much greater information of the dispersal journeys of early humans.

### Activities removed, renamed, or shifted

The following activities have been removed or renamed in this year's edition of the workbook.

#### Plant Hormones

Renamed '*Plant Hormones and Applications*' and now on the Teacher Resource CD ROM and as a web link.

#### Immunisation

This activity replaces 'Vaccination' from last year.

#### Edible Vaccines

This activity can now be found on the TRC.

#### Mutagens

This activity is now available as a web link and on the TRC.

#### Point Mutation Problems

'Point Mutation Problems' is now available on the TRC.

#### Lethal Alleles

This activity is provided on the TRC (*Inheritance supplement*).

#### Sexual Selection

This activity can be found on the TRC as extension.

#### Human Evolutionary Models

This activity is now available as a web link and on the TRC.

*We hope that you enjoy using Year 12 Biology this year. We welcome comments and constructive criticism and will endeavour to implement suggestions wherever possible*

... the staff at Biozone.

