

# 2009: What's New in Senior Biology 1

Thank you for purchasing the 2009 edition of *Senior Biology 1, Student Workbook*. Biozone is committed to providing an up-to-date resource that caters for the requirements of students and teachers of biology at senior level (particularly International Baccalaureate (IB), and AP and Honors Biology courses). There have been some organizational changes to this edition. A new chapter, "Cell Division and Organization" has been added which includes some material previously found in the "Cell Structure" chapter, but also includes some new material. Some material previously found in Senior Biology 2 is now located in the "Aspects of Biotechnology" chapter (formerly "Gene Technology") of this workbook. A small amount of material previously located in "Human Impact and Conservation" has shifted from this workbook into Senior Biology 2. This summary provides a record of changes since the previous edition.



## Organizational and General Changes

**Organizational changes:** The main organizational change to this edition is the inclusion of a new chapter "Cell Division and Organization", which covers cell division, differentiation, and organization (some material was previously included in "Cell Structure"). Other new and revised material can be found throughout the workbook as specified below.

### ★ New activities in this edition

#### Page Activity and description

- 119 Apoptosis: Programmed Cell Death**  
This new activity provides an introduction to the important features and various biological roles of apoptosis (PCD), including the mechanisms by which this process occurs and is regulated.
- 128 Animal Tissues**  
This activity discusses the four broad types of animal tissue: connective, nervous, epithelial and muscle, and describes examples of each.
- 129 Plant Tissues**  
A new activity describing the major tissue types found in plants, including their functions and how they are organized into tissue systems.
- 226 Genomic Imprinting**  
A basic introduction to epigenetic inheritance and the means by which genes are inactivated during development. The case study described is that of Prader-Willi v Angelman's syndrome.
- 265 Gene Therapy**  
The basic principles behind gene therapy. The case study discussed is SCID in humans.
- 266 Vectors for Gene Therapy**  
Vectors for gene transfer in gene therapy procedures. Viral vectors are discussed and questions focus on the merits and drawbacks of different methodologies.
- 267 Gene Delivery Systems**  
The feasibility and methodology of gene therapies are discussed, using gene therapy for the treatment of cystic fibrosis as an example. Students are asked to critically evaluate the value of different gene delivery systems.
- 269 Production of Human Proteins**  
The role of GE bacteria in the production of valuable commodities, namely human proteins. Examples are included and questions focus on the costs and benefits.
- 301 Food Chains and Webs**  
Provides a conceptual model of a food chain and provides students with the components of a lake ecosystem so that they can construct a variety of food chains and assemble a food web themselves.
- 387 Pest Control**  
An activity describing and contrasting chemical and biological methods of pest control. The activity lists types of commonly used pesticides together with their persistence and potential for bioaccumulation in the environment. Successful and unsuccessful examples of biological pest controls are also presented.

## △ Existing material upgraded this edition

Existing activities that have been revised in order to clarify ideas and improve the questions, format, or general content:

#### Page Activity and description

- Objectives and Resources in all topics**  
Texts and periodicals have been updated. Objectives have been revised as required to accommodate new and altered activities.
- 48 The Structure of a Report**  
This activity has been rewritten and is now presented in a more visually engaging way using a poster presentation as the example to illustrate the structure of a report. A link to other excellent examples of reports is provided.
- 88 Cell Structure and Organelles**  
This activity has been expanded to a three page activity allowing students to become familiar with the structure and function of a wider range of cell organelles.
- 117 Mitosis and the Cell Cycle**  
This activity has been expanded to two pages, allowing more scope to explore the functions and role of mitosis. Examples illustrating the key functions of mitosis are provided, along with budding in a yeast cell, and a definition of homologous chromosomes.
- 123 Stem Cells and Tissue Engineering**  
A revised activity which now better describes the properties and biological roles of stem cells. Blood cell production from bone marrow is used as an example to illustrate how multipotent cells differentiate. Artificial skin production is provided as an example of an application of stem cell technology. The questions have been altered to reflect the new content.
- 127 Levels of Organization**  
The second page of this activity has been removed. Material previously in this activity has been incorporated into the new activities on animal tissues and plant tissues.
- 196 Antibiotic Resistance**  
The graphics have been updated to provide more visual impact and interest to the students. The nature of the activity and the questions remain unchanged.
- 271 The Human Genome Project**  
Data relating to the number of mapped genes has been updated.
- 279 The Ethics of GMO Technology**  
The table previously in this activity illustrating potential problems of GM has been removed. It has been replaced by photos and text which provide more engaging examples for the students. The questions remain unchanged.
- 282 Components of an Ecosystem**  
The graphic has been replaced with a new version. No information has been lost.
- 290 Habitat**  
This activity has been completely revised. Definitions of habitat, tolerance range and optimum range are provided and are illustrated with an example. Habitat examples are given, and the questions have been rewritten accordingly.



- 300 Energy Inputs and Outputs**  
Now a one page activity. New diagrams compare a grazing food web with a detrital food web and highlight energy losses at each stage. A photo story presents key information about producers, consumers and decomposers. The questions have been altered accordingly.
- 307 The Nitrogen Cycle**  
The activity has been expanded to two pages, and now includes detailed material about nitrogen fixation at root nodules and the impact of human activity on the nitrogen cycle. The number of questions have been expanded to test student knowledge on the new material.
- 340 Features of the Five Kingdoms**  
The graphics have been altered in this activity to provide students with new examples for the Prokaryotae and Protista kingdoms.
- 369 Human Impact on Resources**  
The first part of the activity has been altered to focus on the global distribution of the human population, and highlights the negative impact and implications of dense coastal populations. The questions have been altered to reflect the change in focus.
- 375 Global warming**  
Many aspects of this activity have been revised, including the introduction and information relating to the potential effects of global warming. In addition, graphs presenting levels of carbon dioxide and global temperatures have been updated to include the most recently available data.

## Activities removed or shifted

### Activity and account of change

#### The Chi-Squared Test in Genetics

Has been moved to the Statistical Tests Supplement on the teacher resource CD-ROM. It is also available as a web link.

#### Ecological Niches

This activity has been removed from the workbook to make way for new pages.

#### Energy in Ecosystems

This activity has been removed from the workbook because the material contained within it is presented in other activities within the chapter.

#### Food Chains/Construction of a Food Web

The material contained within these activities have been incorporated into the new activity *Food Chains and Webs*. There has been no loss of information.

#### The Phosphorus Cycle

This activity has been removed from the workbook (peripheral to curriculum requirements).

#### Sewage Treatment

This activity has been moved to the Senior Biology 2 workbook where the activity is a better fit with the material covered in the chapter "*Microbes and Biotechnology*".

#### Pesticides and Bioaccumulation/ Biological Control of Pests

The material from these activities have been rewritten and are now presented in the new activity *Pest Control*. No information has been lost from the Pesticides and Bioaccumulation activity, and all of the key points from the Biological Control of Pests have been retained within the new activity.

#### Energy Resources

This activity has been renamed Biofuels and has been moved to the Senior Biology 2 workbook where it is a better fit with the material covered in the chapter "*Microbes and Biotechnology*".

#### Waste Management

This activity has been moved to the Teacher Resource CD-ROM.

*We hope that you enjoy using Senior Biology 1.*

*We always welcome comments and constructive criticism, and will endeavor to implement suggestions where possible.*

### The staff at Biozone

