# **1** Review of Scientific Method and Inorganic Chemistry for biologists

#### Themes

Science basics, units, quantities, abbreviations and symbols, steps in the scientific method, atomic structure, chemical bonds, acids/ bases, redox reactions, types of energy, thermodynamics' laws

Academic presentation skills Using visuals to enhance the impact of your presentation

Academic reading skills Skimming and scanning

Academic vocabulary skills Academic word lists and collocations

**English for Chemistry skills** Reading a chemical formula

Note-taking skills Linear style with abbreviations and symbols

## 2 Introduction to organic chemistry and key biomolecules

#### Themes

Functional groups, polymers, conformations, isomers, lipids, carbohydrates, protein structure and function, Nucleic acids and base pairings, DNA/RNA comparison

Academic presentation skills

Making Comparisons in science: Venn diagrams

Academic vocabulary skills Synonyms; Vocabulary use in context

Academic writing skills Introduction to paraphrasing; using synonyms

## Academic writing skills

Paragraph cohesion and coherence Peer reviewing student sample paragraphs

## 3 Enzyme Biochemistry

### Themes

Activation energy, substrates, inhibition and regulation of enzyme activity, factors affecting enzyme function, glycolysis pathway, Krebs cycle

#### Note-taking skills

Lecture cues and signposting language: identifying moves in a lecture

### Academic vocabulary skills

Word families Confusing words Adverbs: degree, opinion, frequency, manner

## Academic writing skills

In-text citations and references; Why and how we use them Introduction to formality and academic style

## Note-taking practice

Lecture on respiration and ATP Noticing (in)formality: Transition from informal to formal language

## 4 Cell Biology and Cell Division

## Themes

Phospholipid bilayers, active and passive transport, nucleus, ribosome function, microtubules and microfilaments, chloroplast. The cell cycle, chromosome, and chromosome segregation, cytokinesis, stages in meiosis

## Academic presentation skills

Making analogies to enhance the impact of your presentation; Note-taking

### Academic reading skills

Skimming (subheadings, titles, or topic sentences)

### Academic vocabulary skills

Synonyms

### Academic writing skills

Nominalisations in scientific writing Summarising Peer-Reviewing student sample summaries

### Note-taking practice

Summary practice Lecture on Meiosis 69

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# 5 DNA Replication Processes & Steps; Transcription & Translation 107

### Themes

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DNA replication, DNA polymerase, DNA's leading and lagging strands, transcription of mRNA, regulation of gene expression, intron and exon splicing, codons, translation of mRNA to protein

## Academic presentation skills

Using mind maps to organise ideas and concepts

## Academic vocabulary skills

Word formation and use in context

## Academic writing skills

Style: Avoiding wordiness Accuracy: Subject-verb agreement

# 6 Experimental language in common biological techniques

### Themes

DNA plasmids, restriction enzymes and ligase, electroporation, heat shock transformation, bacterial transformation, recombinant DNA

## Academic discussion skills

Expressing negative purpose

## Note-taking practice

Introduction to Plasmids

## Academic vocabulary skills

Laboratory equipment Definitions/Confusing words in science

## Academic writing skills

Style: Focusing on language of experimental data Common pitfalls in scientific writing: ambiguity, personification, contractions, numerals and phrasal verbs Laboratory report structure Constructing a hypothesis Style: Scientific tables and graphs: Formatting Peer-reviewing a student's sample laboratory report

## Note-taking practice

Following instructions and revising a manuscript after teacher feedback

Note-taking practice Summary practice Lecture on Meiosis

# 7 Genetics; Principles of heredity; Genetic Mutation

## Themes

Allele properties, Mendel's first and second laws, exceptions to simple dominance and independent assortment, chromosomal linkage

## Academic vocabulary

Inferring the meaning of new words from context Style: Distinction between subject-specific and general academic words Style: Avoiding negative statements: using prefixes or antonyms Prepositions and nouns made up of prepositions or prepositional prefixes

### Academic writing skills

Style: Phrasal verbs in science and formal writing Verbs of reference/citations

#### **Note-taking practice**

Mutations

# 8 From Plant cell to Plant development mail Biolog

#### Themes

Plant cell structure, plant stem and leaf structures, shoot system growth, root system, nitrogen, xylem and phloem, sporophytes, tropisms, seasonal growth cycles, mechanisms in plant development

## Academic presentation skills

Predicting what's coming up in a lecture; presentation approaches

## Academic vocabulary

Word formation and use in context Compound words in biology Common prefixes and suffixes

## Academic writing skills

Style: Academic caution

#### Note-taking skills

Identifying key points in a lecture Advances in Materials Science and Biology: Bioluminescence and "glow in the dark" plants 151

## 9 Ecology, Evolutionary change and Bioethics

### Themes

Energy flow in an ecosystem, competition, population density, conservation biology, biogeochemical cycling/ the theory of evolution, the Hardy-Weinberg equilibrium, natural selection and adaptation, allopatric and sympatric speciation; Theories on the origin of life on Earth

#### Academic vocabulary skills

Definitions and word usage in context and easily and an an an and a second second and a second se

## Academic writing skills

Paraphrasing strategies Cause and effect devices as paraphrases tools Cause and effect as a paraphrasing tool Evaluative language Favouring and unfavouring others' views Writing an argumentative essay Peer-reviewing student samples

## 10 Animal diversity and development

### Themes

Animal diversity, embryonic development in the early stages, gastrulation, hox genes, cell fate, fate mapping

#### Academic vocabulary

Inferring the meaning of new words from context

#### Academic writing revision

Academic writing strategies Avoiding wordiness

## Academic writing skills

Genre analysis: Comparing style of informal sources of information to scholarly articles. Rewriting an informal article so that it adheres to academic conventions

Academic vocabulary skills Vocabulary Synonyms

Note-taking practice Fate mapping

## Glossary

Evaluation Checklist Bibliography 243 263 269

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