GCSE Grade Booster:
A* Biology

Dr Andrew Grevatt

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Contents on CD

All of the Boosters are available on the CD.

Editable content

Editable Boosters are included for teachers or students to make their own tasks based on their examination specification. They are:

- Knowledge Booster 5: Create a Knowledge Booster
- Concept Booster 5a: Create a Concept Booster
- Experiment Booster 1a: Explaining Experiments
- Experiment Booster 1b:Explaining Experiments Support Sheet
- Experiment Booster 5: Understanding Graphs and Charts
- Argument Booster 5: Controversial Issues

Rationale

Confidence with the keywords in biology is essential to getting at least an A grade. Both the meaning of the word and the spelling of the word are important. Using activities to encourage the use of the keywords, their meaning and their spelling builds that confidence. These activities require the learner to decide on the keyword from the definition, or they can try defining the keywords themselves.

Activities

These activities aim to engage learners with the keywords and their definitions, encouraging increased familiarity and confidence in these words. In addition, the activities encourage learners to ensure that they can spell these keywords.

Suggested approaches

- Begin with a starter activity to establish current understanding.
- Towards the end of the topic use the activities to consolidate, review or revise.
- Use the activities for independent study in class or as homework.

How to use the self-testers

These are designed so that the answers can be folded back. The learners then write their answers to the first 10 questions. Stop, fold the answers out and check them and their spellings. Give scores out of 10. Concentrate on learning the answers or spellings that were wrong.

At this point, it is best to move on to the next set of questions. Go through the same process. Later, try the first set again and see if there is an improvement.

When supporting learners with this activity, concentrate on praising the improvement rather than the actual score out of 10.

How to use the diagrams

Labelling and defining the parts of diagrams are skills that will boost knowledge. Learners can be given blank sheets to label or, alternatively, laminate the blank sheet with the answer sheet on the reverse. Learners can use a non-permanent marker to label the diagrams and check answers. Wipe off and try again.

Extension activities

Self-testers

- Reverse the activity: look at the answers and write the definitions.
- Teachers could make their own sets of questions and answers using the exam specification or, even better, learners make their own and swap with others.

Diagrams

Define each part of the diagram.

Students that achieve an A* grade can:

- use a wide range of keywords.
- spell all keywords correctly.
- explain in detail what the keywords mean.

Note: some of these words go beyond GCSE specifications.

How to use the self-test questions

1 Read through the questions and answers.

2 Fold back the answers.

3 Answer each question by saying the answer and writing it down.

4 Check your answers, then check your spellings.

5 Repeat until you get most of the answers and spellings correct.

Crossing boundaries	Answer
1 Controls the passage of substances into and out of the cell.	1 cell membrane
2 The passive movement of gas or liquid molecules from areas of high concentration to areas of a lower concentration.	2 diffusion
3 The difference between the highest and lowest concentration of molecules.	3 concentration gradient
4 The diffusion of water.	4 osmosis
5 The transport of an ion or molecule against the concentration gradient, involving energy.	5 active transport
6 A cell that has lost its shape due to lack of water pressure.	6 flaccid
7 The shrinking of the cell membrane away from the cell wall.	7 plasmolysis
8 A plant cell that has enough water pressure to keep it rigid.	8 turgid
9 Root hair cells and red blood cells are adapted to maximise this.	9 surface area
10 When the internal and external concentration of a cell are the same.	10 isotonic

Homeostasis	Answer
1 The monomer of starch.	1 glucose
2 The insoluble storage polymer of sugar found in muscle cells.	2 glycogen
3 The hormone that converts glycogen to glucose.	3 glucagon
4 The hormone that converts glucose to glycogen.	4 insulin
5 The gland that produces the enzymes that control sugar.	5 pancreas
6 A system that acts to return internal conditions to their normal state.	6 negative feedback
7 The gland that controls the levels of water in the body.	7 pituitary gland
8 Organs that secrete hormones.	8 glands
9 Glands that secrete oestrogen and progesterone.	9 ovaries
10 The biological mechanism for keeping body conditions constant.	10 homeostasis

FOLD

Female fertility	Answer
1 The monthly shedding of the uterus wall lining.	1 menstruation
2 The production of an egg.	2 ovulation
3 The organ in which a foetus grows.	3 uterus
4 The organ that produces ova and sex hormones.	4 ovary
5 The organ through which an ovum travels to the uterus.	5 fallopian tube
6 The hormone that controls the shedding of the uterus lining.	6 oestrogen
7 The hormone that causes the uterus lining to grow.	7 progesterone
8 The hormone that causes ova to be released.	8 luteinising hormone
9 The hormone that causes ova to be developed in the ovaries.	9 follicle stimulating hormone
10 When a sperm cell fuses with an ovum.	10 fertilisation

Water balance in the body	Answer
1 The region of the kidney that contains nephrons.	1 medulla
2 The tube that takes urine from the kidneys to the bladder.	2 ureter
3 The tube that takes urine from the bladder to outside the body.	3 urethra
4 The toxic chemical produced in the liver (from excess amino acids).	4 urea
5 The kidney tubule that is involved with filtration of the blood.	5 nephron
6 The ball of capillaries from which blood is filtered in the kidneys.	6 glomerulus
7 The function of nephrons that controls which substances are released into the urine and which are retained by the body.	7 selective reabsorption
8 The pituitary gland releases this to increase permeability of the kidney tubules.	8 antidiuretic hormone
9 The control of the amount of water in the body.	9 osmoregulation
10 The solution of waste substances excreted from the kidneys.	10 urine

Nerves	Answer
1 The nerves that signal an organ to move or secrete a substance.	1 motor neurones
2 The long part of a nerve cell along which an impulse travels.	2 axon
3 The electrical message sent along a neurone.	3 impulse
4 The automatic reaction to a stimulus by the nervous system.	4 reflex arc
5 The nerve that communicates between the sensory neurones and the motor neurones.	5 relay neurone
6 Branched endings of nerve cells that make connections on other cells.	6 dendrites
7 The gap between two nerve cells through which chemical messages are sent.	7 synapse
8 A chemical that passes between synapses.	8 neurotransmitter
9 An automatic change that does not involve conscious thought.	9 autonomous
10 A change in the environment detected by sensory cells.	10 stimulus

FOLD

Students that achieve an A* grade can:

- use a wide range of keywords.
- spell all keywords correctly.
- explain in detail what the keywords mean.

How to use the self-test questions

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2 Fold back the answers.

3 Answer each question by saying the answer and writing it down.

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5 Repeat until you get most of the answers and spellings correct.

Inheritance	Answer
1 A genetic cross using a single trait with two alleles.	1 monohybrid cross
2 The characteristics expressed in an organism.	2 phenotype
3 The genetic makeup of an organism.	3 genotype
4 A pair of genes with two identical alleles.	4 homozygous
5 A pair of genes with two different alleles.	5 heterozygous
6 A different form of the same gene.	6 allele
7 A short length of DNA that encodes a particular characteristic.	7 gene
8 Threads of tightly curled DNA that contain genes within the nucleus.	8 chromosome
9 The alleles that are those expressed whenever they are present.	9 dominant
10 The alleles that are only expressed if the dominant allele is absent.	10 recessive

Natural selection	Answer
1 The process by which a single species becomes two or more species.	1 speciation
2 The process by which evolution takes place.	2 natural selection
3 The gradual process by which all organisms have changed to become diverse species.	3 evolution
4 When the population of a specific species becomes zero.	4 extinction
5 The amount of difference in genes within a species.	5 genetic variation
6 Change in the genetic code that can be harmless, useful or of no use.	6 mutation
7 How individuals or populations secure resources such as food or space.	7 competition
8 The production of offspring.	8 reproduction
9 A geographically or reproductively isolated population.	9 species
10 The organisms that are best adapted usually survive to reproduce.	10 survival of the fittest

FOLD

Reproduction and growth	Answer
1 Sex cells, such as sperm and ova.	1 gametes
2 The process by which new cells are produced for growth.	2 mitosis
3 The process by which gametes are produced.	3 meiosis
4 The process by which two nuclei come together.	4 fusion
5 Type of reproduction that allows for genetic variation.	5 sexual
6 The vacuole in a sperm that contains chemicals to digest the ovum membrane.	6 acrosome
7 A nucleus that contains two copies of each chromosome.	7 diploid
8 What DNA does before a cell divides.	8 replication
9 A nucleus containing one copy of each chromosome.	9 haploid
10 The cell produced after fertilisation.	10 zygote

Adaptations	Answer
1 Features of an organism that help it to survive in an environment.	1 adaptations
2 The ability to stay alive in an environment.	2 survival
3 The outer layer of an organism that is exposed to the environment. The larger this layer, the greater the heat loss.	3 surface area
4 Layers, usually of fat or thick fur, that slow down heat loss.	4 insulation
5 The movement of populations to new environments to improve survival.	5 migration
6 A strategy that some organisms use to survive through winter.	6 hibernation
7 The transfer of heat energy from the body to the environment.	7 heat loss
8 An environment with a particular set of characteristics.	8 niche
9 Characteristics that help an organism blend into its environment.	9 camouflage
10 Organisms that are adapted to survive in very challenging environments.	10 extremophiles

Abbreviations and equations	Answer
1 The process described by this equation: glucose + oxygen → carbon dioxide + water + energy	1 aerobic respiration
2 The process described by this equation: glucose → carbon dioxide + alcohol + energy	2 anaerobic respiration (yeast)
3 The process described by this equation: glucose → lactic acid + energy	3 anaerobic respiration (muscle)
4 The process described by this equation: carbon dioxide + water + energy → glucose + oxygen	4 photosynthesis
5 The abbreviation for deoxyribonucleic acid.	5 DNA
6 The abbreviation for ribonucleic acid.	6 RNA
7 The abbreviation for luteinising hormone.	7 LH
8 The abbreviation for follicle stimulating hormone.	8 FSH
9 The abbreviation for antidiuretic hormone.	9 ADH
10 The abbreviation for in-vitro fertilisation.	10 IVF

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