

# GCSE

Science: Double Award B (1536)

Separate Sciences: Biology B (1529),  
Chemistry B (1539), Physics B (1549)

Summer 2005

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Mark Scheme (Results)

2B/5667

2B/5627

5B/5668

5B/5628

## USING THE MARK SCHEME

1. This mark scheme gives you; \* an idea of the type of response expected  
\* how individual marks are to be awarded  
\* the total mark for each question  
\* examples of responses that should not receive credit.
2. ; separates points for the award of each mark.
3. / means that the responses are **alternatives** and either answer should receive full credit.
4. ( ) means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
5. Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.
6. **OWTTE** (or words to that effect) and **eq** (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
7. 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.
8. 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.
9. **ORA** (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
10. **ecf** (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

### MARKING

1. You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The total mark awarded for a question should be written in the box at the end of the question.
2. The total marks for a question should then transferred to the front of the script.
3. Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
4. **Do not** award marks for repetition of the stem of the question.
5. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

### AMPLIFICATION

1. In calculations, full credit must be given for a bold, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
2. Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
3. If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
4. If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

### QUALITY OF WRITTEN COMMUNICATION

Students will be assessed on their ability to:

- present relevant information in a form that suits its purpose
- ensure that spelling, punctuation and grammar are accurate, so that the meaning is clear
- use of a suitable structure and style of writing.
- use ✓c or Xc to show if the communication mark is given or not.

## Mark Scheme

If there are two question numbers, the first refers to the Foundation tier paper and the second to the Higher tier paper.

1 a)

area	number of species	number of plants
A	given	given
B	4	10
C	2	10

- areas B and C **both** correct;; 2  
 only one area with one or two error(s); 1  
 b) violet; 1  
 c) photosynthesis; 1

**Total 4 marks**

2 a)

- cancer; 1  
 emphysema; 1  
 either order  
 b) tar/any named particulate e.g soot or carbon particles/smoke particles; 1  
 ignore ash/dust/heat  
 reject nicotine/carbon dioxide/monoxide

**Total 3 marks**

3 a)

- artery correctly identified; 1  
 b) i) both arrow heads correct direction; 1

ii)

blood vessel	artery	vein
A	given	
B		✓
C	✓	
D		✓

- all three ticks correct;; 2  
 one error; 1  
 iii) lung(s); 1

**Total 5 marks**

4 a)

- 10; 1  
 b) excretion; 1  
 respiration; 1  
 either order

**Total 3 marks**

- 5/2 a) diffusion; allow transpiration 1  
 ignore evaporation  
 b) any two from:  
 photosynthesis/to make glucose/sugar/food;  
 idea of: hydrostatic support of cells/turgidity/prevent wilting;  
 aid transport/move (metabolites);  
 ignore explicit reference to movement to the leaf itself  
 allow chemical reactions must be in solution;  
 allow cooling ORA/evaporation; ignore sweating 2

Total 3 marks

- 6/1 a) i) x: oxygen; 1  
 ii) y: carbon dioxide; 1  
 b) water (vapour); 1  
 c) three from:  
 increased contraction/respiration/work (in muscles);  
 insufficient/lack oxygen/oxygen debt builds up;  
 ignore no oxygen gets to cells/muscle  
 (respiration) anaerobic;  
 lactic acid;  
 idea of: threshold level of lactic acid before cramp sets in;  
 she did not warm up;  
 plus 1 communication mark for using a suitable structure and style of writing 4

Total 7 marks

- 7/3 a) two from:  
 space for building or structures e.g. houses/towns/factories;  
 farming;  
 timber/logging for wood/paper, also for building;  
 mining;  
 dams;  
 oil;  
 firewood/fuel/cooking;  
 roads/railways;  
 idea of: selective tree felling involving mass destruction of other trees;  
 greater demand for resources (as in: more people want)/(make way for) 2  
 increased population;  
 b) any sensible suggestion such as:  
 is not recorded/not published/illegal/language problem/hard to  
 estimate/measure/count/hard to keep track of/ no international 1  
 collation/don't know how many trees to start with;  
 c) decomposition/breaking down/putrefying/rotting/decay/respiration; 1  
 by bacteria/fungi/microorganisms/decomposers/detritivores; 1  
 ignore germs or references to named incorrect bacteria

Total 5 marks

- 4 a) two from:  
stimulates uptake of/lowers blood glucose/helps keep glucose within certain levels;  
conversion of glucose to glycogen;
- b) in the liver/muscles; 2  
two from:  
pure/no side effects;  
its human insulin;  
more convenient/easier to obtain/get/process;  
guaranteed supply/plentiful;  
cheaper, only if qualified (e.g. less or fewer transport /purifying/ processing costs);  
allow one ethical point e.g. does not harm animals/religious or vegan objection; 2

Total 4 marks

- 5 a) cramp/tissue necrosis/higher risk of bacterial infection/ breathing difficulties/lethargy/pains in bones/joints or any abdominal organ/jaundice/pale skin patches/fever/blood in urine/persistent/painful erection; 1  
ignore references to descriptions of changed blood cell shape
- b) three from:  
gene therapy does not alter the gametes ORA;  
does not change genotype/parents still carriers/still have the gene to pass on;  
recessive condition;  
both parents homozygous;  
(for two marks: parents homozygous recessive;;)  
so offspring bound to be homozygous;  
if dominant allele argument, first two marking points only - max 2 3

Total 4 marks

- 6 a) more light (for algae); 1  
for photosynthesis; 1
- b) two from:  
absorb/need more nitrate(s);  
to form protein;  
allows more algal growth;  
and so there is more (algae as a source of) food/sugar/oxygen for jellyfish; 2

Total 4 marks

- 7 a) increase density to:16/17/18/19 per m<sup>2</sup> /add fertiliser at 0.5g per m<sup>2</sup>; 1  
b) two from  
osmosis;

water moves from where it is more concentrated to where it is less concentrated/from a low solute concentration to a high solute concentration/from a high concentration (of water)to a low concentration (of water);

across membrane; 2

**Total 3 marks**

**TOTAL FOR PAPER: 30 MARKS**