

# GCSE

Science: Single Award B (1535)

Science: Double Award B (1536)

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

Summer 05

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Mark Scheme (Results)

1B/5657

1B/5627

4B/5658

4B/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 be 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.

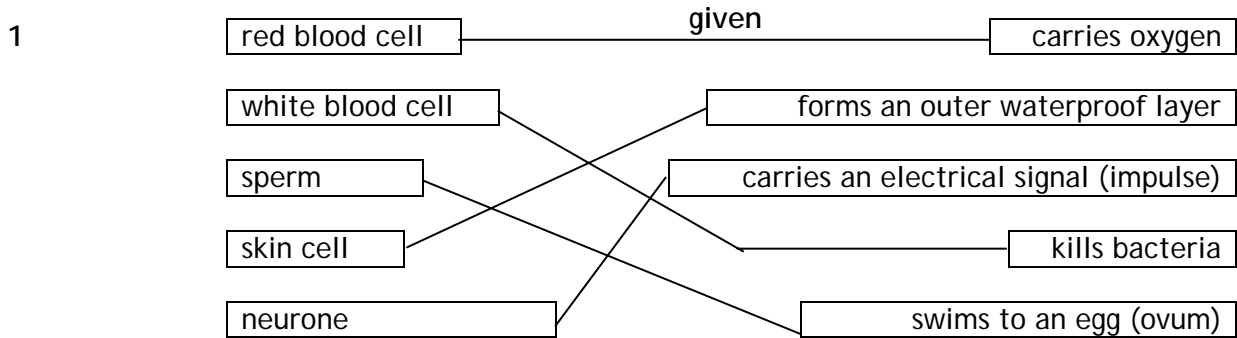
### QUALITY OF WRITTEN COMMUNICATION

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.



one mark for each correct link; ; ; ;

4

Total 4 marks

- 2 a) i) kidney; 1  
 ii) ureter; 1  
 iii) bladder; 1  
 b) liver; 1

Total 4 marks

- 3 a/b) two adaptations explained from:  
 gills to breathe/get oxygen/get rid of carbon dioxide/gas exchange;  
 ignore air  
 fins to swim/ or move qualified e.g through water/away from  
 predators/push against water/change direction/stability;  
 (slimy) scales for easy movement/ less drag;  
 accept waterproofing/defence against parasites/protection  
 streamlined shape for easy movement/less drag/faster; 2  
 c) idea of camouflage; ignore hide 1

Total 3 marks

- 4 a) gametes correct; 1  
 Punnet square correct/own diagram fully correct, offspring genotype  
 correct; 1  
 award both marks if the offspring genotypes fully correct;;  
 reject if two diagrams where one diagram is wrong  
 b) 1:1, ½, 50/50 or any other acceptable description; 1  
 c) i) 46; 1  
 ii) 23; 1  
 d) fertilisation; 1

Total 6 marks

- 5/1 a) idea of: two distinct phenotypes/characteristics in outcome e.g some long, some short/no intermediates; 1  
 accept idea of offspring not same as parents/different to parents
- b) any two from: 2  
 did two/more than one experiment(s);  
 lots of data/plants/large sample size/quote of numbers;  
 one variable per experiment;  
 chose distinct/obvious/not easily confused features;  
 ignore refs to close to expected ratios/3:1  
 answers must relate to design not *just* repeat of experimental data  
 accept actual procedures adopted by Mendel e.g. qualified use of muslin bags/paintbrushes etc for one mark;
- c) DNA/chromosome/RNA; 1
- d) (particular) form of a gene; 1  
 reject two/different genes/types of genes  
 ignore examples

Total 5 marks

- 6/2 three from: 4  
 large surface area;  
 so more food absorbed;  
 rich blood supply;  
 to maintain high diffusion gradient;  
 thin (wall);  
 to reduce diffusion distance/allows quick diffusion;  
 microvilli;  
 so large surface area/so more food absorbed;  
 lacteal absorbs fat/fatty acids/glycerol;  
 plus 1 communication mark for presenting relevant information in a form that suits its purpose  
 that is: an attempt to explain the function of one relevant feature correctly

Total 4 marks

- 7/3 a) two from: 2  
 muscles;  
**contraction**;  
 respiration;  
 generates heat;
- b) i) either: 1  
 vasodilation OWTTE or sweating;
- ii) if vaso - radiation/convection/increased evaporation due to increased temperature; 1  
 if sweating - evaporation;

Total 4 marks

- 4 a) relaxes/is stretched; 1
- b) becomes taut/are pulled/tightened; 1  
 ignore stretched reject contract/relax
- c) correct idea of changed shape 1  
 (pulled)thinner/less convex/flatter;  
 ignore taller/longer
- d) cornea ( allow conjunctiva/aqueous/vitreous humour); 1

Total 4 marks

- 5 a) two long, two medium, two short chromosomes; must be single strands reject crossed strands 1  
 b) one long, one medium, one short chromosome; 1  
 c) to allow restoration of diploid number/prevent doubling genetic information/gametes have to be haploid OWTTE; (allow variation) 1

Total 3 marks

- 6 a) glycerol and fatty acids; 1  
 b) i) optimum pH/best pH/for enzymes/lipase/enzymes work best in alkaline conditions; 1  
 ignore best conditions/neutral/less acid  
 ii) emulsifies fat/makes droplets/breaks up into droplets; reject break down or ref to idea of digestion increases/larger surface area (for enzymes/lipase); 2

Total 4 marks

- 7 any four from:  
 required gene found in donor;  
 gene cut out;  
 using restriction enzyme/endonuclease;  
 correct ref to plasmid as a vector;  
 incorporated into recipient DNA/chromosome/genome;  
 using ligase;  
 introduced into zygote (allow embryo/seed/cutting/tissue culture) of recipient;  
 plant grows by mitosis or so that the gene is present throughout plant; 4  
 if no named enzyme, general ref to unnamed enzyme;

Total 4 marks

- 8 a) line to flatten/oscillate in which case line must extend to at least yr11/fall to zero; reject if return to previous peak 1  
 b) line to rise then fall/flatten/oscillate with delay cf above; 1  
 reject line rising above answer to a) except if rabbit popn crashes if rabbits crash, minks can also crash after rabbits

Total 2 marks

TOTAL FOR PAPER: 30 MARKS