

# **Human Biology**

Advanced GCE A2 H423

Advanced Subsidiary GCE AS H023

## **Report on the Units**

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**June 2009**

**HX23/MS/R/09**

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This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

OCR will not enter into any discussion or correspondence in connection with this Report.

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**Advanced GCE Human Biology (H423)**  
**Advanced Subsidiary GCE Human Biology (H023)**

**REPORT ON THE UNITS**

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## Chief Examiner's report

This series marks the first occasion on which all three units of the new specification, F221, F222 and F223, were offered and when candidates were able to aggregate the 'new' AS Human Biology qualification (H023). There has been a significant increase in entries for the new specification, with the legacy unit 2857 summer entry being 2048 candidates and F222 (the new specification successor unit) having an entry of over 3000 candidates. The Human Biology specification still attracts a significant proportion of private candidates and candidates from FE and tertiary colleges. This reflects the appeal of a 'context' based approach to teaching biology and the feedback from INSETS has been very positive regarding the effect on retention and performance of students.

The quality of the work seen by examiners seems to indicate that there is a real improvement in the calibre of the candidates in the June exams – particularly in F222.

Candidates who re-sat F221 did not appear to show a significant improvement overall and it is debatable whether the potential gain from the re-sit is off-set by a depression of the mark obtained on the longer F222 paper. Performance suggests that time would be better spent preparing candidates for F222 using the Advance Notice and ensuring thorough coverage of the content of the unit.

Regarding the accessing of the Advance Notice, centres are reminded that this will be in an electronic format via the OCR secure extranet, Interchange. OCR has gone to considerable lengths to remind centres that the material is available and the need to download this is clear from the specification. It is the responsibility of centres to use the most up to date version of both the specification and the Practical Skills Handbooks. This is always the version which is published on the web. An e-mail updates service is available to notify centres when changes are made to the Human Biology page on Interchange and it is strongly recommended that all centres register for this service as it notifies centres both when Advance Notice articles become available and when AS Tasks are made available. To register simply e-mail [GCEScienceTasks@ocr.org.uk](mailto:GCEScienceTasks@ocr.org.uk) with the subject line Human Biology and include a contact name centre name, contact e-mail and centre number.

### Understanding and answering the questions

On F221, a surprisingly high number of candidates did not respond to questions requiring definitions of terms used in the specification. There are many key terms and definitions on the specification which can be 'rote learned'. They make good 'starters' for lessons and good 'quick tests' and 'word banks'. On both F222 and F221, where the command word was 'suggest', a lot of candidates failed to give any response. Where a definition is required and the answer is not known then the only possible strategy is to move on to the next question. However, omitting 'suggest' questions infers that candidates are expecting to be able to 'recall' answers. The design of the question papers covers all assessment objectives. Candidates need to be prepared to 'have a go' – 'suggest' implies that some thought is required and that a variety of correct answers are possible and tests AO2. Certainly more of the AO2 type questions will appear on F224 and F225 papers.

### Teaching tip

Make it clear when you are asking a 'suggest' question – graphs and tables of data are good prompts. For example looking at incidence of TB varying over time,

'...Why do you **think** there was a peak in the data from 1939 to 1946?...'

The action word is THINK – write this up on the board or have an 'icon' to prompt (light bulbs!) Collect written responses in anonymously. Don't accept 'I don't know' as an answer – they weren't being asked to 'know'. Evaluate the response as a group into answers which are reasonable suggestions (could be due to refugees – this is war time) and could score and those that would not score (could be an antibiotic resistant strain appeared (no because this is pre-antibiotics!) – but avoid using the terms 'right' and 'wrong'.

As ever, there were several questions on both F221 and F222 papers where the candidates did not marshal their knowledge to address the question being asked [see Question 1(a) on F222]. Candidates also confused 'Describe' with 'Explain' and *vice versa*. This can result in a 'knock on' effect where the first part of the question asks for a description and the next section for an explanation. Where candidates write an explanation for the 'description' part of the question, they feel they have 'explained' so they rarely go on to repeat themselves in the second part of the question. Hence, though knowledge is evident, the marks scored are zero since the 'explanation' has not answered the question.

Again, there is some evidence on F221, as in January, that candidates' understanding of the heart structure and function is less than that seen in previous years.

### Information, figures, tables and graphs

The new format for practical skills assessment requires data handling skills to be taught and the presentation of data in terms of correct units and decimal points is one of these skills. The rigour that is expected in the AS Tasks is the same as that expected in the externally assessed papers. Candidates should expect to give data quotes with correct units and calculations to the correct number of decimal places or to the nearest whole number. While a prompt is sometimes given at AS, this will not be the case at A2 and candidates should appreciate the need for consistency in decimal points where tables are being completed using calculated data.

### Mathematical requirements

Candidates should expect to see questions that require calculations on most papers but the poor response to Question 1(a) on F221 suggests they have little appreciation of scale. An 'introduction' to the microscope and magnification would benefit from a discussion of scale and the relationship between size and the most appropriate units. As in previous series, there was evidence that several candidates sat the exam without the benefit of a calculator.

In F222, an explanation of how BMI is calculated was required. Many otherwise good candidates did not seem to appreciate the difference between 'height in  $m^2$ ' and '(height in  $m$ )<sup>2</sup>'. These both 'sound' the same so a 'question and answer' oral check in class would not necessarily pick up that this may be a problem for some candidates.

## **Presentation**

Centres will notice several references to 'loose' terminology in the report (see particularly F222 Questions 4 and 5). Candidates need to be reminded that examiners cannot mark what a candidate 'means' – only what they 'write'. Extended writing will be a significant feature of both F222 and F225. With extensive use of 'student presentations' in teaching and the ability of candidates to 'google' explanations / descriptions to construct their presentations, they often have little practice in structuring descriptions or explanations 'from scratch'.

### **Teaching tip**

Give them a word bank of 'key words' or have them on the wall – this works well for DNA structure and replication. Give them time to 'sort' and select them and prepare the answer 'What do you mean by complementary base pairing?' for example. Then they talk the answer through but listen to the 'sequence' – are they saying what they mean?  
Can the rest of the class improve on the answer – praise, polish, perfect?

## **Practical assessment**

As well as the enclosed report from the Principal Moderator centres are advised to review the guidance supplied in the Practical Skills Handbook (available from the OCR website and from Interchange).

## **INSET**

OCR INSET meetings are held in the Autumn and Spring terms. Details can be found on the OCR website at:

[www.ocr.org.uk/Data/publications/training/Science\\_Training\\_Programme\\_2009.pdf](http://www.ocr.org.uk/Data/publications/training/Science_Training_Programme_2009.pdf)

## F221 Molecules, Blood and Gas Exchange

### General comments

The paper proved to be a positive experience for the majority of candidates. Some candidates were experiencing this paper as their first AS level Human Biology examination. All questions were answered well by at least some candidates and the teaching of this unit had clearly prepared the candidates to be able to access the questions on the paper. Questions on the heart and circulation proved to be the most challenging, and this may be partly due to the fact that this topic is now studied for the first time at AS level. It is important that centres provide candidates with the opportunity to consolidate their knowledge and understanding of this complex topic. Human Biology aims to teach biological concepts in the context of applications of their relevance to the modern world. It is therefore important that centres provide opportunity for candidates to develop a sound understanding of the concepts and do not just focus on the interesting applications.

### Comments on individual questions

- 1(a) This question was only answered well by a few higher attaining candidates. Many candidates appeared to have little perception of the size of molecules and many considered water to be the largest.
- 1(b)(i) Most candidates gained credit for the correct response of preventing the patient being infected.
- 1(b)(ii) Most candidates gained credit for the correct response of making the veins stand out or become more visible.
- 1(b)(iii) Most candidates gained credit for the correct response of the blood pressure being lower in the vein or to prevent too much blood loss.
- 1(c)(i) It was pleasing to see that many candidates answered this question well and gained credit for correctly stating that the macrophage is larger, has a kidney bean shaped nucleus and granular cytoplasm. A few candidates lost marks because they were confused between the structure of different leucocytes.
- 1(c)(ii) Very few candidates gave the expected answer of allowing the erythrocyte to become biconcave or develop a larger surface area to volume ratio. Some candidates gained credit for saying that there was space for haemoglobin.
- 1(d)(i) Most candidates gained credit for the correct response of stating that the person had an infection.
- 1(d)(ii) Most candidates gained credit for the correct response of stating that the person had recently been injured.
- 1(e) Very few candidates gave the expected answer of living at high altitude or use of erythropoietin.

*Report on the Units taken in June 2009*

- 2(a) There were many good responses to this question and candidates correctly named and described the ciliated cells and goblet cells. Some candidates failed to gain the Quality of Written Communication mark for the correct spelling of cilia or ciliated. A few candidates gained no marks by describing the function of the epithelium without reference to its structure. Very few candidates stated that the epithelium is a tissue made up of different types of cells on a basement membrane.
- 2(b)(i) Very few candidates were able to define vital capacity correctly as the maximum volume of air that can be moved in and out of the lungs in one breath.
- 2(b)(iii) Very few candidates were able to define forced expiratory volume 1 correctly as the volume of air that can be breathed out in the first second of forced expiration.
- 2 c)(i) Most candidates gained credit for correctly calculating the percentage lung function of patient C as 80.
- 2(c)(ii) Most candidates gained credit for the correct response of linking asthma to patient C and D and COPD to patient E.
- 3(a)(i) Most candidates gained credit for the correctly identifying X as the SAN and Y as the AVN.
- 3(a)(ii) This question was generally well-answered. Candidates correctly described the SAN as the pacemaker sending out electrical impulses that make the atria contract and that the AVN delays the impulse and then conducts it via the Purkyne fibres to the ventricles making them contract.
- 3(b)(i) This question was only answered well by higher-attaining candidates who correctly stated that three of the following: no clear peaks or waves at Q, T or P and the spikes or peaks at R were more frequent and irregular. Quite a few candidates did not realise that they were simply being asked to compare the patterns in trace 1 and 2 and went on to explain how the traces related to what was happening in the heart.

## F222 Growth, Development and Disease

### General comments

This was the first opportunity for candidates to experience the longer exam paper format. There was no evidence of candidates struggling to complete the paper in the time allowed. The first two questions on the paper addressed learning outcomes signposted in the Advance Notice. Some candidates had been well prepared and there was clear evidence that issues had been discussed in detail. However, many candidates wrote at length without addressing the actual question being asked (see Questions 1a and 2d for example).

There was evidence that some candidates were not well prepared by centres. The ethos of the 'Case Studies' has not changed markedly from the legacy specification and the intention is that candidates are 'prepared' through class discussion and homework. Candidates need their attention drawn to the links to the learning outcomes in F222.

### Teaching tip

As a class exercise, challenge students to identify learning outcomes from the four modules in F222 which have links to the Advance Notice. The use of HIGHLIGHTERS and/or colour can help them to make links across the unit.

Centres are reminded that the Advance Notice is available for download from OCR Interchange and from the OCR website from 17 November (for the January session) and from 13 March (for the June session). An e-mail updates service is available to notify centres when Advance Notice articles become available. To register simply e-mail [GCEScienceTasks@ocr.org.uk](mailto:GCEScienceTasks@ocr.org.uk) with the subject line Human Biology and include a contact name centre name, contact e-mail and centre number. It is strongly recommended that all centres register for this free service.

### Comments on individual questions

- 1 This was intended as a relatively easy introduction to the paper but many otherwise able students did not score particularly highly with the main problem being a failure to address the actual question being asked - particularly in part (a). In (i) many candidates answered in term of the design of the trial rather than the selection of the placebo. Part a(ii) was answered well with excellent comments on the need for reliable data. Historically, candidates seem to find describing the structure of lipids difficult and poorly labelled diagrams sometimes contradicted reasonable descriptions. A surprising number omitted the question completely suggesting this is an area where considerable reinforcement is needed.
- 1c(i) Candidates were required to give the answers to the correct decimal place. This is something that they should have training for in F223 – that in tables, the figures given need to be consistent in terms of decimal places with 'trailing zeroes' being used if necessary (e.g. 2.0). In line with previous policy an 'error carried forward' was applied. In c(ii) the most common mistake was to explain rather than describe the pattern shown on the graph. Data quotes were credited as long as they were given with units. Some interesting answers were given in 1(d). The commonest reason for not gaining marks was for not making three clear and separate points. Weaker candidates wrote at length but only on one issue such as cost and did not make it clear that the cost would be excessive – 'it would cost money' was not credited. The commonest marking points were for reference to the scale of the problem of obesity and the temporary solution offered by the drug.

2a(i) The examiners were surprised by how few candidates could describe how BMI is calculated. Too many candidates made mistakes on the formula or gave a very vague description. In part 2 a BMI greater than 30 was credited. In part (b) the graph was read well but relatively few candidates could explain why different countries might show different patterns with cultural and dietary differences being the commonest response.

Part (c) require candidates to appreciate that, as equipment was standard, improvements to accuracy would require calibrating the equipment. A few good candidates suggested that the scales be allowed to 'settle' before taking a reading and this was credited. The need for repeat readings to improve reliability was not seen as frequently as had been anticipated. In part (d) the commonest mistake was to describe the causes of Type 2 diabetes. Many candidates also lost marks for loose descriptions such as saying 'test' rather than 'measure' glucose and for not referring to blood glucose or, where they did, for referring to blood 'sugar' rather than blood glucose.

For the Quality of Written Communication mark, a description of a named test was required and some candidates did not gain this mark despite scoring maximum marks otherwise.

On the longer papers (F222 and F225), the Quality of Written Communication is not assessed on the basis of spelling, punctuation and grammar OR use of technical terms but rather what is required is indicated clearly in the rubric and candidates should use this to plan their answer. This is a change from the legacy specification. In part (e) the commonest reason for not scoring marks was for ignoring that 'further uses' of the information was required – it is already used to evaluate the changes to school meals policy etc.

- Q3. The stages of meiosis were well known with many candidates scoring full marks on a(i) and b(i) and (ii). Where marks were lost it was generally for either not labelling the centromere or for drawing a chromosome that was not 'homologous' in terms of shape. Part (c) proved demanding with only the most able students being able to describe both the production of haploid gametes and the contribution to genetic variation. Weaker students answered in very loose terms – 'so reproduction can happen'.
- Q4. Few candidates gained both marks on part a(i) with the commonest mistakes being to suggest DNA replicated during mitosis or a stage of mitosis or to give 'interphase' but not give 'S' stage. However, the most surprising and disappointing response was seen to part (ii) where a significant number of candidates scored zero. This was largely due to confusion between *cell division* and *DNA replication*. Given the poor responses to (i) this suggests that many candidates do not fully appreciate the sequence of events in the cell cycle. Where DNA replication was described, the detail given by some students was impressive. However, again 'loose' descriptions which did not describe new 'molecules' of DNA with one old and one new 'strand' were not credited – 'each copy has half of the old and half of the new DNA' did not gain credit and candidates frequently use the term 'base' or even 'letter' when they should be referring to nucleotides. Parts (b) and (c) were done well although having answered correctly that X-rays can induce cancer, weaker candidates went on to give techniques such as mammography and CAT scans as alternative methods of detection despite the fact that these rely on X-rays.
- 5(a) Blood grouping based on agglutination tests was well understood. Some candidates did not appear to appreciate that each empty 'box' on the table required an answer and gaps were left. In addition, some candidates used 'hybrid' ticks – a tick crossed through, these should not be used. On (b)(i) it was disappointing that only about half of candidates could give 'haemocytometer' and (ii) proved very demanding with only the most able candidates

recognising that blood cell counts would vary from person to person or from time to time for one person. It was worrying to see how many candidates assumed it would vary depending on which part of the body a sample was taken from.

Part (c)(i) was answered very poorly. The disulfide bonds were labelled but this did not deter candidates from identifying the hinge region as a disulfide bond. The heavy and light chains were described as 'long' and 'short' which was not accepted. The length of the chain is immaterial in the context of globular proteins. The binding site or variable region was identified by most students who scored on this question but the term 'active site' was not credited.

In part (c)(ii) examiners were looking for the idea that different pathogens have different antigens – too many candidates said 'different diseases have different antigens'. The idea of antibody specificity appeared in many answers but the basis of this – the variable region SHAPE and the complementarity of this to the antigen – was not well explained.

#### Teaching tip

Molecular shape is an over-arching 'synoptic' concept across biology – receptors, antibodies, enzymes etc. As a revision lesson, review protein structure – particularly tertiary structure – and then 'spider diagram' those links that incorporate this – immunity, synapses (in A2). This is a good 'bolt on' to the learning outcomes which address protein synthesis in F224.

In 5(d) many candidates either confused this with amniocentesis and cited the 'risk' to the unborn child of having the test done or they answered in terms of the child being at risk of catching HIV.

- 6 In part (a) nearly two thirds of candidates scored five or more marks. The 'circular' DNA mark was the one most often missed with 'loop' and 'non-linear' not being credited. In part (a) there was much confusion between antibiotics and antibodies and again loose terminology 'some bacteria can become immune to antibiotics' was given by weaker candidates. A common misconception was that the antibiotics are not used because they can cause bacteria to become resistant. Only very able candidates were able to present both lines of argument – that some diseases are caused by viruses against which antibiotics are ineffective AND that either some strains of bacteria are resistant OR overuse of antibiotics can lead to resistance.
- 7 The question was certainly a topical one and had several easy marks for straightforward definitions. The commonest errors were to confuse morbidity and mortality or to suggest that a pandemic was 'a sudden outbreak of a disease with no cure causing panic' – possibly reflecting the intense media coverage and the impression given by this. Unfortunately in part (b)(ii), many good answers referring to lack of information on population size failed to gain full marks since data from the table was not used to support statements. In part (c) most candidates scored at least two marks – reflecting both common sense and an awareness of the current issues surrounding swine flu.

## **F223 Practical Skills in Human Biology**

As the first session of F223 and a new method of assessment for practical skills, it was encouraging to see a marked increase in the number of centres and also a 50% increase in the total number of candidates entered.

Moderators were pleased with the standard of work submitted by centres and there was clear evidence of hard work by many teachers and candidates.

As the Tasks remain live for the life of the specification, it is not possible for comments to be made on specific questions or Tasks, but the following report aims to cover general areas in which centres can improve.

### **1. Administration**

#### **Internal standardisation**

Teachers are reminded that it is the responsibility of the centre to award coursework marks to produce a single, valid and reliable order of merit that reflects the attainment of all the candidates at the centre. This will mean that candidates who have demonstrated the same level of achievement will receive the same mark irrespective of their teaching group. Evidence to show that effective internal moderation has been carried out must be retained in all cases where the centre's single order of merit is the result of combining two or more orders of merit within the centre.

#### **Candidate marks**

There were a significant number of clerical errors in the marks submitted by centres this session.

These fell into three main categories:

- Errors in addition of marks within a Task
- Errors in addition of marks across the three Tasks for individual candidates
- Transcription errors on the MS1 etc.

Centres should make sure that all work is checked and accurately recorded before submitting marks to OCR.

Please note that OCR has provided an Excel<sup>®</sup> Marks Spreadsheet on Interchange (in the Supporting Materials area of the Human Biology page) for use in determining the best Tasks for each candidate and recording performance.

#### **Mark submission & sample requests**

Centres should note that it is possible to submit candidate marks for this unit to OCR using Interchange (more details are in the Exams Officer Update, April 2009, Issue 14, p. 4; see [www.ocr.org.uk/Data/exams\\_officers/Exams\\_Officer\\_Update\\_Issue14.pdf](http://www.ocr.org.uk/Data/exams_officers/Exams_Officer_Update_Issue14.pdf)). This greatly accelerates the whole moderation process, allowing centres to receive details of the moderation sample much more quickly than by use of handwritten MS1 forms. Teachers may need to consult with the Examinations Officer to gain the relevant access rights.

During the moderation process, it was apparent that a significant number of e-mail addresses supplied by centres to OCR were incorrect. All sample requests are automated and it is vital that

the supplied e-mail address for the Examinations Officer is correct. Your Examinations Officer can check their details on Interchange by selecting 'Admin' and then 'View your centre details'. For authentication purposes any change to the e-mail address must be sent by fax to Centre Services on 01223 552646 on centre-headed paper.

### **Submission of the moderation sample**

It is essential that the following areas are addressed when sending the work to the Moderator:

#### **Mark collation**

- Centres are advised to use the Marks Spreadsheet provided on Interchange (in the Supporting Materials area of the Human Biology page) for use in determining the best Tasks for each candidate and recording performance.
- All internal marking and moderation procedures must be completed before external moderation can take place. Marks must be recorded on the candidate's work and the relevant totals must be transferred to form MS1 **or** keyed in to the appropriate software package. Care must be taken to ensure that all mark calculations and transfers are correct. OCR cannot accept responsibility for the submission of incorrect total marks.

#### **Task selection**

- Only the three Tasks contributing to the final mark out of 40 should be submitted i.e. one Qualitative, one Quantitative and one Evaluative Task (the best in each case). If a candidate has the same mark in any category it remains the responsibility of the centre to select a single best Task and to submit that one Task.

#### **Organisation of scripts**

- The work should be arranged by candidate (not by Task or category) and should be **not** be placed in plastic wallets or folders but instead collated in order (Qualitative, Quantitative and Evaluative) and attached together by a treasury tag in the top left hand corner.

#### **Centre Authentication Form (CCS160)**

- The teacher/supervisor responsible for the marking must complete a Centre Authentication Form, CCS160. The form should be signed to confirm that steps have been taken to ensure that the work submitted is solely that of the candidates concerned. A completed copy of the form must accompany the MS1 sent to the Moderator. This is a JCQ requirement and failure to submit a CCS160 will delay the publication of the centre's results until it is received. A copy of this form can be downloaded from:

[www.ocr.org.uk/Data/publications/forms/CCS160\\_All\\_GQ\\_Form\\_Centre\\_Authentication.pdf](http://www.ocr.org.uk/Data/publications/forms/CCS160_All_GQ_Form_Centre_Authentication.pdf)

#### **Centre data**

- The Moderators appreciated receiving a copy of the centre observations/results for the Qualitative and Quantitative Tasks, especially where the observations/results were different from the expected.

#### **Despatch of the samples**

- The work of the specified candidates should be despatched to the Moderator as soon as possible after receiving a sample request. Centres are advised to have the work of all candidates available so that the appropriate work can be extracted and despatched to the Moderator without delay.

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- Teachers are advised to include notification to the Moderator with the name of the person the Moderator should contact if necessary. Moderators would be grateful to also receive an e-mail address as this facilitates rapid communication.
- It is essential that samples of coursework should be packed securely to ensure their safe delivery by the Post Office or other carrier. It is advisable to obtain a certificate of posting.

### **Candidates who wish to improve their marks for F223**

Note that completed Tasks remain confidential and assessment material should not be returned to candidates.

Only OCR Tasks from Interchange clearly marked with the current assessment year, e.g. 1 June 2009 to 14 May 2010, can be used for Practical assessment during that period. However, if a candidate wishes to improve their mark they could re-submit their best 1 June 2008 to 14 May 2009 Qualitative and Quantitative Tasks along with a new (from the 1 June 2009 to 14 May 2010 selection on Interchange) Evaluative Task. However, the marks confirmed by the Moderator when the Task was first submitted cannot be 'carried forward'. Teachers will be able to re-mark the Task in light of any comments made by the original Moderator (Archive Mark Schemes are provided on Interchange to facilitate this process) and it will be re-moderated when it is re-submitted. Up to two Tasks per student may be re-submitted (for example a student may have performed well in their Qualitative and Quantitative Tasks in June 2009 and re-submit them for Moderation with a new Evaluative Task in June 2010 – chosen from the Evaluative Tasks available for assessment in the June 2010 session).

Thus, centres should retain Tasks securely until such time as they are clear that candidates will not wish to re-submit work to OCR in future sessions. At this point the work should be securely destroyed.

## **2. Teacher guidance**

### **Marking the Tasks**

The annotation this summer was on the whole appropriate and helpful however the moderation process is made more difficult when it is not clear how or why marks have or have not been credited.

The following are useful points that would help Moderators when reviewing where marks have been awarded:

- using one tick per mark awarded
- including supporting comments such as benefit of the doubt where it has been given by the teacher.

The more annotation provided by the centre the easier it is for the Moderator to understand why the mark was given (or not).

### **Task specific advice**

There were some aspects of the practical skills Tasks which candidates struggled with and these are areas in which centres are advised to teach the required skills ahead of the assessment session.

## Qualitative Tasks

### **Observations**

- Observations in the qualitative tasks should be descriptions and not conclusions. Candidates also used inappropriate terms to describe colours such as clear (as opposed to colourless). This was also true for the description of common 'food tests' such as the colour changes when using iodine.

### **Drawing up tables**

- Teachers are directed to the guidance in the Practical Skills Handbook, available from the OCR website and Interchange.

## Quantitative Tasks

### **Calculations**

- It is important that candidates learn how to calculate means and standard deviations as well as the other mathematical requirements stated in the specification.
- Mark Schemes must be followed regarding the use of significant figures.

### **Graphs**

- Teachers are directed to the guidance in the Practical Skills Handbook, available from the OCR website and Interchange.

### **Command words**

- As with written papers, candidates who fail to recognise the difference between command words such as 'Describe' and 'Explain' limited the marks they could achieve. These skills can be developed by using past exam questions from the written papers.

## Evaluative Tasks

### **Evaluation terminology**

- There was evidence in scripts seen by Moderators that many candidates were uncertain of the distinction between terms such as:

accuracy vs. precision  
reliability vs. validity  
accuracy vs. reliability  
error(s) vs. limitation(s)

Definitions for these terms can be found in the Practical Skills Handbook.

### **Ethical issues**

- This is an area in which candidates find the expression of their answers difficult. Teachers should discuss various issues which are inherent within the specification and develop candidates' ability to express themselves concisely and coherently.

**Further advice and support**

Teachers are directed to the guidance in the Practical Skills Handbook, available from the OCR website and Interchange.

OCR INSET meetings are held in the Autumn and Spring terms. Details can be found on the OCR website at:

[www.ocr.org.uk/Data/publications/training/Science\\_Training\\_Programme\\_2009.pdf](http://www.ocr.org.uk/Data/publications/training/Science_Training_Programme_2009.pdf)

# Grade Thresholds

Advanced GCE Human Biology (H423)  
 Advanced Subsidiary GCE Human Biology (H023)  
 June 2009 Examination Series

## Unit Threshold Marks

Unit		Maximum Mark	a	b	c	d	e	u
F221	Raw	60	44	39	34	30	26	0
	UMS	90	72	63	54	45	36	0
F222	Raw	100	70	62	54	47	40	0
	UMS	150	120	105	90	75	60	0
F223	Raw	40	31	28	25	23	21	0
	UMS	60	48	42	36	30	24	0

## Specification Aggregation Results

Overall threshold marks in UMS (ie after conversion of raw marks to uniform marks)

	Maximum Mark	A	B	C	D	E	U
H023	300	240	210	180	150	120	0

The cumulative percentage of candidates awarded each grade was as follows:

	A	B	C	D	E	U	Total Number of Candidates
H023	6.3	17.8	32.6	50.5	72.1	100	0

**2275 candidates aggregated this series.**

For a description of how UMS marks are calculated see:  
[http://www.ocr.org.uk/learners/ums\\_results.html](http://www.ocr.org.uk/learners/ums_results.html)

Statistics are correct at the time of publication.

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