RECOGNISING ACHIEVEMENT

NOTICE TO CENTRES

FAO: Head of Science/KS4 Science Coordinator/Examinations Officer
Date: January 2008

Subject: Twenty First Century Science Suite

This Notice to Centres provides the following information:

- A. Erratum – Biology A (J633) Specification
- B. Supplementary notes on making entries for units, certification and coursework – Science A (J630), Additional Science A (J631), Additional Applied Science A (J632), Biology A (J633), Chemistry A (J634) and Physics A (J635)
- C. An Assessment Rationale – Science A (J630)
- D. Standard Procedures: Frequently Asked Questions – Additional Applied Science (J632).

A. Erratum – Biology A (J633) Specification

Heterotrophic nutrition (B7.3): Due to an error in the formatting of B7.3.4, learning outcome B7.3.5 appears to be missing. The corrected version should appear as follows:

4. understand the importance of parasites:
    - as causes of human diseases, including malaria;
    - for their impact on food production (both plants and animals);
5. understand that the evolution of a parasite is thought to be closely linked to that of its host;

B. Supplementary Notes – Science A (J630), Additional Science A (J631), Additional Applied Science (J632), Biology A (J633), Chemistry A (J634) and Physics A (J635)

(a) Making Unit Entries

Candidates may re-sit any unit, at any tier, as many times as desired within the shelf-life of the specification.

No single result from an externally assessed unit (written paper) can be used towards more than one qualification, even where there is overlapping content and a unit is common to two qualifications. To fulfil the requirements of two qualifications with a shared unit, the unit will need to be repeated by the candidate. For example, a result for A221 could be used towards Science A or Biology A. To be used towards both, two results for this unit will be required.

(b) Certification

No qualification can be awarded until all required units have been taken and a certification entry has been made.

At the time of certification, all available unit results will be combined together in the most favourable combination of UMS marks for the candidate. Where repeated units could be used towards more than one qualification for which certification has been requested, the higher mark will always be used for the separate science with the next highest mark being used towards Science A or Additional Science A.

Within the shelf-life of the specification, candidates may re-sit one or more units following certification and subsequently enter for certification again. This will replace the previous certification and make use of all existing unit results to generate a new grade based on the most favourable combination of UMS marks. However, common unit results that have already been used towards certification in a different qualification will not be available.

(c) Skills Assessment

All internally assessed coursework must be set in a context appropriate to the qualification in which it is to be used. For example, coursework to be credited towards GCSE Biology must be set in a context drawn from the Biology specification or closely related to it.

Where coursework satisfies the criteria for more than one qualification within the Twenty First Century Science suite, it may be used towards them both. Additional Applied Science (J632) is excluded from this as the Work-Related Portfolio is different from the rest of the skills assessment units in the other Twenty First Century Science qualifications.

Results for skills assessment units for the separate sciences will automatically be available for aggregation into Science or Additional Science (depending on whether the skills assessment is a Data Analysis and Case Study or a Practical Investigation). No additional unit entry is necessary.

However, a result for a Science or Additional Science skills assessment unit cannot count automatically as part of the aggregation towards a separate science qualification, since the context will not be clear from the entry. If this is required, a second entry will need to be made for the desired separate science qualification using the same piece of coursework. In this case, the coursework should be photocopied as it may be requested by the moderator as part of both moderation samples.

It should also be noted that the I and E strands of the Practical Investigation can be used as the Data Analysis task for a second qualification, providing that the context is appropriate to both.

Notice to Centres continued

C. An Assessment Rationale – Science A (J630)

Each of the courses in the Twenty First Century Science suite was designed on the principle of 'fitness-for-purpose', to provide an appropriate learning experience for a particular group of students. The objectives for each course are different, and this is reflected not only in the content, but also in the approaches to teaching and assessment for each course. Hence, for example, the internal assessment for GCSE Science is quite different from that of both GCSE Additional Science and GCSE Additional Applied Science.

The GCSE Science course is designed to enable students to:

- *recognise the impact of science and technology on everyday life;*
- *make informed personal decisions about issues and questions that involve science;*
- *understand and reflect on the information included in (or omitted from) media reports and other sources of information.*

To achieve this, candidates must have a broad understanding of the main scientific concepts that provide a framework for making sense of the world. These are referred to as 'Science Explanations'. Candidates also need to be able to reflect on scientific knowledge itself, the practices that have produced it, the kinds of reasoning that are used in developing a scientific argument, and the issues that arise when scientific knowledge is put to practical use. These are referred to as 'Ideas about Science'.

[extract from the OCR specification GCSE Science A, pages 4-5]

Each of the assessment elements for GCSE Science provides an opportunity for students to demonstrate knowledge of Science Explanations, Ideas about Science, and/or their ability to use knowledge and understanding of these two areas to critically evaluate scientific information which they are provided with. Overall, the assessment weighting given to Science Explanations and Ideas about Science is about equal.

External assessment

Modular examination papers: Objective-style questions mainly testing Science Explanations. The format is designed to be familiar to students beginning their GCSE course.

Ideas in Context paper: Questions requiring some extended writing based on pre-release material, mainly testing Ideas about Science. Questions referring to Science Explanations are restricted to the subject matter of the pre-release material (e.g. an article on developing a new vaccine indicates module B2 *Keeping healthy*). However, questions may test any of the Ideas about Science, not just those taught in the relevant module. This provides students with an opportunity to show knowledge, understanding and application of Ideas about Science as well as holistic Science Explanations, in familiar and unfamiliar contexts.

Internal assessment

Data Analysis: Students interpret and analyse data which they have collected first-hand. All of us, whether we are scientists or not, must make sense of scientific information as we meet it in our daily lives. By collecting, interpreting, and evaluating first-hand data, students have an opportunity to demonstrate their ability to do this, drawing on their knowledge and understanding of three Ideas about Science: IaS1 *Data and its limitations*, IaS2 *Correlation and cause*, and IaS3 *Developing explanations*.

Case Study: Students research a science-related question. Using a variety of sources which they select, students describe the relevant science and critically evaluate the quality of evidence used to support competing claims. They weigh up opposing views and draw their own conclusions. This task gives students an opportunity to demonstrate their knowledge and understanding of many of the Ideas about Science.

Notice to Centres continued

D. Standard Procedures: Frequently Asked Questions – Additional Applied Science (J632)

(a) What sort of activity is suitable for assessment as a Standard Procedure?

A practical activity which includes an observation or measurement.
The level of demand should be that for a normal GCSE practical session.
Many class practicals are suitable.
It will probably be convenient to set a normal class practical which will occupy a full lesson, and to use some part of the work for the assessment of the Standard Procedure.
The activity **must** include a set of **step-by-step instructions** (provided by the centre) and an **observation** (done by the candidate) which can be made to the degree of accuracy which would normally be appropriate at GCSE.

(b) What sort of evidence is required by the external moderator?

A tick in the marking grid is sufficient evidence to show
(a) that the student has followed the instructions independently,
(b) that the student has worked safely.

For criteria (c) and (d), the measurements or observations **must be recorded and submitted** to the external moderator.

The external moderator needs to see the instructions for each activity, the correct answers if appropriate, and the observations or measurements recorded by the candidate.

Many Centres prefer to use one sheet of A4 for each student for each Standard Procedure, with the instructions, a table for recording the results and the marking grid all on the sheet. Units of measurement should be provided on the sheet.

It would be appropriate to give the external moderator correct answers for activities such as: measuring the pH of a solution and the volume and density of some solid blocks. It would be unrealistic to give correct answers for observations of vital signs or for data on heights and weights.

Photocopied work is acceptable provided the copy is good enough for the external moderator to see the evidence clearly (for example, some chromatograms produce poor quality copies).

(c) What if a student needs help?

If a student needs help to follow the instructions then they cannot earn the first mark for working independently.
It is acceptable for the group to practice until they have learned what to do.

(d) Everyone is getting full marks. Am I doing something wrong?

Probably not. The Standard Procedures reflect the workplace, where most people are competent at their job. They are intended to develop essential workplace skills of independent and safe working and only differentiate at a low level. Candidates expected to achieve Grade D or above are capable of full marks on the Standard Procedures, but weaker candidates can also achieve full marks with careful preparation and enough opportunity to learn the particular skills for the assessment.

Notice to Centres continued
(e) My students did the practical work but made mistakes in the calculation. Do they lose a mark?

No. The OCR assessment is based only on the practical tasks.
Your instructions may include a calculation but you do not have to include this in the OCR assessment.
There are several activities where this could occur, for example finding R_f values in chromatography, finding the density of a solid object or finding the electrical conductance of a sample.
There is no need to penalise candidates if an average value is wrong.

(f) How do I determine whether or not to award the 4th mark?

Consider what standards you expect at GCSE and what you expect at KS3. This reflects the distinction between 4 and 3 marks respectively.
Some examples are given in the Teacher Support Booklet and are reproduced here.

Standard Procedure	**3 marks**	**4 marks**
testing pH	distinguish pH1, pH 7, pH13	distinguish pH5, pH7, pH9
comparing thermal conductivity	state which rod becomes hot first	measure the time taken before wax on the rod starts to melt
measuring voltage using an oscilloscope	measure the trace to the nearest centimetre	measure the trace to 0.2 of a centimetre
measuring blood pressure before and after exercise	results outside normal range for adolescents	results as expected

Any enquiry about this notice should be referred to the OCR Customer Contact Centre on phone number, 01223 553998 or email, general.qualifications@ocr.org.uk.