Rewarding Learning

GCSE Science: Double Award (Non-Modular) (Summer Series) 2006

Chief Examiner's Report

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Grade Boundaries: 2006 (GCSE)

	Grade	A*	A	B	C	D	E	F	G	U
F	**Mark Range**				400-236	235-194	193-152	151-110	109-68	67-0
H	**Mark Range**	400-353	352-307	306-252	251-197	196-174	173-162			161-0

General Comments

Candidates generally found the papers accessible with a wide spread of marks and there was no evidence that they were short of time to complete the question papers. It is good to see that there were signs of improvement in some question areas which have previously been highlighted as posing difficulties. It is still noticeable however that failure to read questions carefully results in many candidates underperforming since they did not answer the question that was asked.

Also more candidates seem to be aware that where questions carry several marks, their responses need to include several points. The presentation of many candidates' responses is excellent but some need to be guided to enlarge their writing to enable examiners to read their answers. Spelling continues to deteriorate but is generally sufficient to convey the correct meaning.

Foundation Tier

Paper 1

Q.1 & Q.2 These were well answered by the majority of the candidates.

Q.3 Surprisingly some candidates did not attempt the first part of the question and many showed the diaphragm position for breathing in rather than out.

Q.4 Whilst part (a) was well answered few candidates could give two functions of water in plants.

Q.5 Naming B as the ureter posed the biggest difficulty in this question.

Q.6 The answers to this question showed improvement on previous papers with more candidates correctly answering antagonistic in (b).

Q.7 This was a straightforward question which posed little difficulty for the candidates.

Q.8 Parts (a) & (b) were well answered but very few candidates were able to correctly label the liver as the organ where glycogen is stored.

Q.9 This was a straightforward question which posed little difficulty for candidates.

Q.10 The concept of osmosis still provides difficulty for a large number of candidates.

Q.11 This was not a difficult question on the eye but it was very badly answered.

Q.12 The only part of this question that caused difficulties was naming the process of phototropism.

Q.13 (a) The first parts of the question were well answered but food tests still caused some problems.

(b) There were some excellent explanations of protein digestion but also some poor ones. The answers to (ii) and (iii) were better.

(c) Parts (i), (ii) & (iv) were well answered but how insulin produces a reduction in blood sugar proved surprisingly difficult form many candidates.

(d) In part (d) some candidates still mix up the direction of blood flow through the heart.

Q.14 (a) & (b) Parts (a) and (b)(i) were well answered but many candidates still gave predation as a factor even though they were asked for other factors.

(d) A large number of candidates correctly matched the pyramids with the food chains and most were able to successfully complete part (d).

(e) In part (e) many candidates successfully answered this question although part (ii) proved more difficult.

(f) Part (f) also proved to be a very accessible question to the majority of candidates.

(g) In part (g) most candidates answered these questions correctly.

Q.15 Parts (a) & (b) were generally well answered although a substantial number of candidates mixed up ovulation and fertilisation which has been asked previously. In (b)(ii) a few candidates started descriptions before conception and then stopped before explaining the process of birth.

Part (c) was well answered but fewer candidates completed (d) correctly.

Most candidates correctly identified the sex chromosomes and were able to explain how to tell that these were from a baby boy and part (f) was very straightforward. Part (g) showed quite mixed responses with the full range of marks being awarded. Part (h) was straightforward.

Paper 2

Performance in this paper was similar to last year, with little, if any, evidence that candidates should have been entered at the Higher tier. Very few poor scripts were seen.

Q.1 Hazard symbols are very well understood. Most candidates gained full marks here.

Q.2 The uses of materials question was very well answered.

Q.3 In this question candidates had to select properties from a list. The question was well answered.

Q.4 Candidates were asked to complete word equations by circling the correct missing substances. Answers were good, apart from part (d) where iron sulphide was rarely selected.

Q.5 Advantages and disadvantages of peat cutting were clearly articulated, which gained the quality of written communication mark. Most gave at least two correct responses and it was pleasing to see that references to pollution were usually specific rather than generalized.

Q.6 The fossil fuels question had parts (b), (c) and (d) well answered though hydrogen was sometimes thought to be present in all fossil fuels (a) or to be needed for burning fossil fuels (e).

Q.7 Using the Periodic Table proved to be straightforward for some and very difficult for others.

Q.8 The formula question was generally well answered with most scoring at least three of the available 5 marks.

Q.9 Changes of state are generally known, though sublimation proved to be slightly more difficult.

Q.10 Better candidates had little trouble deducing that changing steam to water in a closed container had no effect on the mass. This question was a good discriminator.

Q.11 Most candidates know that the test for hard water involves soap but many did not make their test fair by using equal volumes of water and a smaller number did not link hardness to the lather produced. Permanent hardness was not well understood.

Q.12 Completion of a table on atomic and electronic structure provided many candidates with at least 6 of the available 8 marks.

Q.13 In part (a) properties of the gases were not well known and, in part (b) although most knew that oxygen relights a glowing splint, hydrogen and carbon monoxide were often found in fire extinguishers and fizzy drinks.

In past papers, candidates have often wrongly suggested a lit splint as a test for carbon dioxide. This year, in order to help students avoid the same error, the stem of the

question made it clear that other gases also put out a lit splint. This additional help made no difference to a significant number of candidates who proceeded with the lit splint test in part (c)(i). Word equations for the formation of carbon dioxide were an alchemists dream with carbon appearing in the products from a variety of other, metal and non-metal reactants.

Part (d) proved that the term 'inert' is not well known and many did not know the effect of temperature or pressure on the volume of a gas.

Q.14 This was the worst answered question on the paper. It was uncommon to find Foundation tier scores of more than 5 marks out of a possible 20. Chemical formulae proved too much for the vast majority in (a). Candidates did not know that water and not hydrogen is formed when HCl reacts with NaOH; $MgOH_2$ was hardly ever identified as being incorrect and it therefore came as no surprise to find that the third equation had a balancing error.

Candidates were unable to deduce the correct order of reactivity from the set of observations and it was common to find silver or copper as the most reactive. Most did put the metal which came top in part (iii) as the most reactive in part (iv) and were given credit for this.

Foundation tier candidates, in general, could not use the information given about any of the three substances in (c) to identify the substances. Even the colourless liquid which is a solvent defeated most.

Answers to part (e) were incredibly poor with 0 or 1 being the most common. Even the $S + O_2 \rightarrow SO_2$ reaction was rarely identified as combustion.

Q.15 The first part of this question showed that, just as goggles are the preferred safety precaution, so also, the reaction of a named metal with water invariably produces the sodium answer – calcium moves about the surface, fizzes and forms a ball. Few knew that calcium hydroxide is formed and, although an alkaline solution was correctly identified, most candidates think that magnesium is more reactive than calcium.

The burning of magnesium in air is well known and the subsequent equation often gained 1 or 2 marks but rarely all 3.

In part (c) the electronic structures of a calcium atom and an oxygen atom were well drawn and many, well written and correct descriptions of the electron transfer to form calcium oxide, were seen. Hardly anyone knew that limewater contains calcium hydrogen carbonate.

Paper 3

Candidate performance in this paper was marginally better than last year and there was evidence that most students had been entered at the correct tier.

Q.1 This question on energy changes in a car was well answered by most candidates.

Q.2 While most candidates answered this question well, a few associate CFCs with burning fossil fuels. Some are also unaware of the predictable nature of the tides.

Q.3 This question on the effects of a resultant force was well answered by most candidates.

Q.4 Most candidates scored well in this question. A few were unaware of the effect of the season on the length of shadows.

Q.5 This question was well answered by most candidates. A few were unable to identify the Sun as the largest object in the solar system. The most common incorrect response was Jupiter.

Q.6 This question on conduction posed difficulties for many candidates. While they gained marks in (a) and (b), most were unable to identify the electron as the particle responsible for thermal conduction in metals. Descriptions as to how the electron brought about conduction were very poor. A significant minority confuse thermal and electrical conduction.

Q.7 This question was generally well done. The major difficulty arose in part (d)(ii) where candidates were expected to relate the insulator to its ability to trap air.

Q.8 Most candidates were able to score well in the question on Hooke's Law. However, some were unable to express the idea of direct proportion in part (c). Others were unaware that the spring had passed its elastic limit after 4.0 N. Common incorrect responses were that the spring would be deformed and break.

Q.9 Many otherwise good candidates failed to give a satisfactory description of centre of mass (gravity) as the point where the weight of an object appears to act. In part (b) specific reference was made in the question to the design of the bus and responses in those terms were expected.

Q.10 Part (a) required students to appreciate that distance = speed x time. In many cases examiners saw the equation speed = distance x time and were unable to give these candidates any marks. In part (b), many were aware that the acceleration is the gradient of the v-t graph, but in determining the numbers to substitute they counted squares rather than use the numbers on the axes.

Q.11 Many attempted to explain in terms of force how a fine wire cuts through cheese. They ignored the instruction to give their explanation in terms of pressure. A large minority of candidates misquoted the equation for pressure and gained no credit for their explanations.

Q.12 A large number of candidates appeared to be unfamiliar with the idea of a centripetal force and the direction in which it acts. Lines to show the directions of the force and velocity were often carelessly drawn without the use of a ruler.

Q.13 (a) In part (a) candidates were expected to identify the responsible particles as electrons and state the direction of their movement. Many candidates attempted to give an explanation in terms of positive electrons and gained no credit. In

(iii) and (iv) candidates were expected to realise that a positive charge on the car would attract the negatively charged paint droplets.

(b) Most candidates made a fair attempt at part (b) and while the mark scheme was designed to reward generously positive responses from candidates, examiners frequently saw circles inscribing a letter 'B' as the symbol for a lamp/bulb.

(c) Part (c)(i) was well answered. However, in part (ii), few candidates could divide the battery voltage correctly across the resistors.

Most candidates knew that three 6-ohm resistors in series gave a combined resistance of 18 ohms. However, only a small number recognised that two 6-ohm resistors in parallel combined to give 3 ohms.

Q.14 (a) Part (a), a question on shadows, has been asked before. While the majority of candidates were able to score well, some lost marks needlessly. The most common errors seen were drawing rays without a ruler and/or through the opaque object. In part (iii) the four rays were expected to originate at the extremes of the slit, glance off the ball and travel on to the screen.

(b) Part (b) examined the application of the Laws of Reflection. Some ray diagrams appeared to be drawn without regard to the angle of incidence being equal to the angle of reflection. A minority confused the glancing angle with the mirror and the angle of incidence.

(c) Part (c) was generally well done, although some showed the refracted ray in air bending towards, instead of away, from the normal.

(d) Part (d) was also well done, although some confused radio waves and gamma waves in part (i)

Q.15 (a) Part (a) was difficult for those candidates who confused longitudinal and transverse waves.

(b) In part (b) most were able to calculate the wavelength correctly. The majority were able to calculate the number of waves passing the marker every second, but many were unable to recognise this as the frequency of the ripples. A surprising number of candidates were unable to supply the correct unit for frequency (Hz). In part (iv) many tried to use speed = distance / time and got lost in seeking the substitutions, instead of using the more straightforward $v = f\lambda$.

(c) Part (c) was done well by many, but only the better candidates realised that the microphones needed to be further apart.

(d) While most candidates were able to plot the points accurately and draw the straight line of best fit in part (d), many were unable to convert from milliseconds to seconds and 10^n errors in responses to part (ii) were common. Such candidates were able to pick up 3 of the available 4 marks.

Higher Tier

Paper 1

Q.1 (a) There was plenty of scope for candidates to gain marks here especially if they read the stem of the question. These questions were well answered by a large number of candidates.

(b) Many candidates gave an advantage to the grower rather than the plant.

Q.2 The nitrogen cycle is a difficult topic but this question allowed candidates to score well if they used the information in the diagram carefully. Some candidates then in (b) just referred to the wording from the diagram without any explanation.

Q.3 This also proved to be a very accessible question to the majority of candidates.

Q.4 (a) In part (a) a surprising number of candidates were unable to name the quadrat. Other responses included punnett squares, pitfall traps and magnifying glasses.

(b) Part (b) posed few problems.

Q.5 Having named a quadrat as a pitfall trap in Q.4 a large number were unable to name it correctly in this question. Good answers were given in (b) and (c) suggesting that candidates have experience of using a pitfall trap, even if they couldn't name it.

Q.6 The first parts of the question on respiration were well answered but in part (c) some candidates talked about changes in the beaker rather than in the flask.

Q.7 The concept of limiting factors still proves difficult for all but the most able.

Q.8 This question was generally well answered by those who understood the concepts involved but candidates need to be reminded that they need to be careful how they express their answers. In (c) answers such as 'because we need salts in the blood' did not gain credit. Kidneys were popular places for urea formation.

Q.9 After the first part of the question it became apparent that some candidates still find the process of osmosis and the concentration gradients involved confusing.

(a) As usual some diagrams were carelessly drawn and many candidates did not draw the cell membrane pulled away from the cell wall showing either a lack of understanding of osmosis or and inability to read and interpret the question.

(b) (i) Knowledge of minerals and their functions has improved slightly-these are easily gained marks and on this specification only knowledge of three plant minerals is required. In the next parts of (b) there were some excellent answers as well as some very poor ones.

(iv) Similar questions have been asked over the years and some candidates wrote very clear well structured answers. Others would benefit from taking some more time to gather their thoughts before starting to write

their response. Some candidates do not appear to have seen a potometer or were not familiar with its operation or what it is designed to measure.

(c) The first part was well answered but many candidates mixed up the roles of platelets and red blood cells. In part (iv) bacteria was a popular incorrect answer and in part (v) active and passive immunity were well answered by the more able candidates.

Q.10 (a) The first parts of the question were well answered but food tests still caused some problems.

(b) There were some excellent explanations of protein digestion but also some poor ones. The answers to (ii) and (iii) were better.

(c) Parts (i), (ii) & (iv) were well answered but how insulin produces a reduction in blood sugar proved surprisingly difficult for many candidates.

Q.11 (a) This was well answered

(b) Drawing a pyramid of numbers still produces confusion among some candidates and even more have difficulty sketching a pyramid of biomass.

(c) These responses showed an improvement in working out energy transfers and reasons for energy losses.

(d) Over-fishing needed to include some concept of removing more fish than are being replaced by reproduction and in part (iii) candidates need to be careful to indicate that you would increase the mesh size of the nets –not increase the size of the nets.

Q.12 (a) This genetics question was well answered by most candidates but some candidates did not have the central gametes correct.

(b) & (c) These were well answered by many candidates but others showed a lack of understanding of backcrosses.

(d) A large number of candidates answered this question well but some seemed unfamiliar with the processes involved and gave very unspecific answers.

Paper 2

Performance in this paper was down on 2005, with little, if any, evidence that candidates should have been entered at the foundation tier. Few very poor scripts were seen.

Q.1 The hard water question was generally well answered. Most candidates understood that, for the test to be fair, equal volumes of water from each sample are needed.

Q.2 Part (a) of this question gave candidates equations containing errors. It was uncommon to see three correct answers with only the better candidates recognising firstly that water is formed when an acid reacts with a base, secondly that the formula

$MgOH_2$ was incorrect and thirdly that 2HCl was needed in the final equation. While most could identify an alkali, a salt proved more troublesome.

Q.3 This question was about the reactivity series. In past papers information tends to have been given in a 5 x 5 grid with metals on one axis and metal compounds on the other. This time the information was presented slightly differently but in such a way as to enable students to deduce the order of reactivity from a small number of observations. The question was very poorly answered by weaker candidates. Few could deduce or recall the colour of the solid formed in (a); answers to (b) were even poorer and only a minority deduced the order of reactivity correctly.

Q.4 Here students needed to evaluate information given about one element and two compounds, in order to identify the substances. The question was generally badly answered. Few recognised that (i) was a copper compound despite the reference to the formation of a blue solution. In (ii) the majority did give the formula of a gas but O_2, H_2 and He were more common than the correct, N_2. A significant minority identified water in (iii).

Q.5 The better candidates were able to match all five reactions to their types but it was common to see answers in which only one mark was gained. Responses overall were disappointing.

Q.6 The burning of magnesium in air was well known. Equations often had correct formulae but were rarely balanced.

Q.7 Electronic structures were almost always drawn correctly and most gave excellent answers to (b) which showed a good understanding of ionic bonding. Very, very few knew that limewater contains calcium hydrogen carbonate; calcium carbonate was the usual answer.

Q.8 The electrolysis question produced very mixed responses and was a good discriminator. Better candidates knew and understood the reaction whilst at the other extreme some gained no marks at all.

Q.9 Despite the fact that the aluminium question was carefully structured and that there were 13 marking points from which 8 were required, many answers to this question gained three marks or fewer, of which one was for quality of written communication. Most candidates did fill the page and there were excellent answers from top candidates. The question was a good discriminator.

In part (b) those who referred to the blast furnace were often on their way to two or all three marks but all too many simply gave vague answers which essentially said that iron was easier to extract.

Some parts of calcium chemistry are well understood but again, this question proved to be a good discriminator. Candidates will get limited credit if all metal and water reactions are described as if the metal was sodium. Only the better candidates knew both products from the reaction of calcium with water and, whilst most knew that the solution formed is alkaline the majority thought that magnesium is more reactive than calcium.

Q.10 Good definitions of the term molecule were often missing though most gained one of the two marks. Many gained both marks for drawing the electronic structure of a chlorine molecule though chlorine atoms were often seen. Very few linked the low boiling point to weak bonds between molecules or to the idea of a simple molecular structure.

Part (b) of this question asked candidates to evaluate information from a table which gave properties of substances. The question discriminated well. The type of bonding in C was covalent and answers which gave simple covalent were not accepted.

The ammonia question again proved to be a good discriminator. Many knew the conditions for the Haber Process but it was important to include units of temperature and pressure. Few correct equations were seen because many candidates did not know the formula for ammonia. Correct uses of ammonia were commonly given.

Q.11 It was pleasing to see a significant number of completely correct calculations and even the weaker candidates usually gained the first two marks. In part (b) the drawn curves were consistently excellent and most labelled the x-axis correctly. The graph was usually read correctly but 42 seconds was a common, wrong answer. In (b)(iv) there were many good explanations involving collision theory.

The radioactivity part of this question was poorly answered by all but the better candidates. Nuclear equations were invariably wrong and the mass of a beta particle was also wrongly given by many.

Q.12 Many candidates scored well on this organic question. It was common to see all six marks being gained for correct molecular and structural formulae in part (a). Those who knew the bromine water test gained three or four marks. The lost mark was usually due to bromine alone being used. A significant number gained one mark for the left hand side of the propane combustion equation but did not know the products. Only the best candidates could balance the equation.

Part (d), dealing with ethanol, was generally well answered but, despite the fact that the molecular formula was given, relatively few could give the structural formula for ethanoic acid. Many were able to give correct observations for the reaction of ethanoic acid with magnesium.

Paper 3

Candidate performance in this paper was up on last year and there was evidence that most students had been well-prepared. Only a few very poor scripts were seen.

Q.1 This question was generally well answered. The most common mistake was in part (e) where the expected response was a cell/battery.

Q.2 Those candidates able to recall the equation for gravitational potential energy scored well in parts (a) and (b). In part (c) many appeared to misread the question and responded it terms of what happened to the ball after it bounced.

Q.3 The mark scheme gave credit for a wide variety of responses to part (a) and allowed many candidates to obtain the mark. In part (b) some candidates appeared not to understand the meaning of 2×10^{-4}. In an attempt to be helpful to candidates the number was also given as 0.0002 in parentheses, but a minority interpreted 2×10^{-4} (0.0002) as a product. Part (c) was poorly answered with many candidates responding with a freehand arrow pointing from the satellite away from the planet. A tangent, drawn with a ruler and in the correct sense was expected.

Q.4 Part (a) was generally well answered. In part (b) those who realised that satellite A experienced the larger gravitational force usually went on to pick up at least one of the two marks awarded for the explanation.

Q.5 Most people were able to pick up at least one of the two marks available in part (a). Part (b) has been asked in different forms on earlier papers and candidates were clearly familiar with the material.

Q.6 This was a numerical question on work and power. Those who were able to recall the appropriate equation, make the correct substitutions and then do the arithmetic scored highly. In part (a) the most common mistake was a failure to convert 20 cm to 0.2 m. Although many candidates scored full marks in part (b), a large minority gave an incorrect answer with no evidence of method and scored zero marks.

Q.7 Most candidates were able to obtain all three marks in this question. However, some quoted an incorrect equation for efficiency as the ratio of input to output energy. These candidates then appeared to realise that the useful output energy is less than the input energy and fudged the arithmetic to arrive at the correct numerical answer! They were given no credit for the incorrect physics.

Q.8 This question required candidates to understand what is meant by the moment of a force and to apply the Principle of Moments. In calculating the moment in (a) some divided the force by the distance to the pivot and clearly failed to use the clue given by the unit on the answer line. The better candidates were able to score well in part (b). Some were only able to pick up the single mark by indicating that ACWM = CWM.

Q.9 (a) Part (a), a question on shadows, has been asked before. While the majority of candidates were able to score well, some lost marks needlessly. The most common errors seen were drawing rays without a ruler and/or through the opaque object. In part (iii) the four rays were expected to originate at the extremes of the slit, glance off the ball and travel on to the screen.

(b) Part (b) examined the application of the Laws of Reflection. Some ray diagrams appeared to be drawn without regard to the angle of incidence being equal to the angle of reflection. A minority confused the glancing angle with the mirror and the angle of incidence.

(c) Part (c) was generally well done, although some showed the refracted ray in air bending towards, instead of away, from the normal.

(d) Part (d) was also well done, although some confused radio waves and gamma waves in part (i).

Q.10 (a) Part (a) was difficult for those candidates who confused longitudinal and transverse waves.

(b) In part (b) most were able to calculate the wavelength correctly. The majority were able to calculate the number of waves passing the marker every second, but many were unable to recognise this as the frequency of the ripples. A surprising number of candidates were unable to supply the correct unit for frequency (Hz). In part (iv) many tried to use speed = distance/time and got lost in seeking the substitutions, instead of the more straightforward $v = f\lambda$.

(c) Part (c) was done well by many, but only the better candidates realised that the microphones needed to be further apart.

(d) While most candidates were able to plot the points accurately and draw the straight line of best fit in part (d), many were unable to convert from milliseconds to seconds and 10^n errors in responses to part (ii) were common. Such candidates were able to pick up 3 of the available 4 marks.

Q.11 (a) While many candidates were able to obtain full marks in (a)(i), a large number appeared to be unfamiliar with the effect of a short-circuit on the size of the current flowing through a network of resistors.

(b) Candidates were expected to draw a smooth curve in part (b) and it is gratifying that so few joined points together with straight lines. The rest of part (b) was well answered.

(c) While most realised that part (c) was testing the use of $P = IV$, many failed to recognise the appropriate equation in part (ii) was $Q = It$. Many who did so lost marks by not converting 3 minutes to 180 seconds.

Q.12 (a) In part (a) very few students were able to sketch the two-way switch circuit. A large minority joined wires to the box instead of the appropriate terminal.

(b) In part (b) most scored some marks when describing the deflection of the ammeter needle, but there were very few indeed who could relate this to the direction in which the current was flowing.

(c) Part (c) was well done by most candidates.

(d) In part (d) most candidates were able to identify the step-up transformer and explain why it used in an electricity transmission system. It was also pleasing to see a very large number of candidates gaining all 3 marks in part (e) where the use of the transformer turns-ratio equation was examined. This is in stark contrast to the performance of candidates on a similar question in 2005.

Principal Moderator's Report

The reports submitted by the moderators this year commented on the good quality of work submitted, in particular the annotation and the standard of internal standardisation.

The team of moderators also passed comment on the generally high standard of marking and only a small number of centres had to be penalised for non compliance with the mark descriptors.

Included in the submitted moderators' reports the following points were brought to my attention:-

1 The range of investigations is getting even narrower. There were few other experiments than Physics, Chemistry and Biology classics.

2 This was the best year yet for annotation. As has been mentioned before, it helps the moderators so much in determining from what part of the coursework the marks have been awarded.

3 Only a handful of centres had not carried out the administrative procedures correctly ie did not indicate from which experiment the marks were being awarded or had not transferred the correct total of marks for the candidate from the experiment to the Candidate Record Sheets.

4 A small number of centres had not carried out proper internal standardisation. This was patently obvious when a centre has only a handful of candidates that are out of tolerance level whilst the rest of the candidates were well within the limits.

5 It would have been expected that with the advancement and the availability of technological appliances more, and more centres would have been using ICT devices within their investigations, but surprisingly very few have. The only IT that is being used would be word processing and graph packages. It must be stressed that the use of some graph software may be detrimental to the students overall mark, as often they do not produce graphs with appropriate axes and units. It is also essential that a proper line of best fit should be present; all too often this was missing.

6 Some centres used prompt sheets or writing frames to help their students. There is nothing wrong with this. In fact, it is quite appropriate to use this with the lower ability students. However, sometimes it is hard to differentiate between a prompt sheet and a marking grid which can appear to be very prescriptive. It would be useful if there was some information/indication as to the purpose of these sheets that accompany the scripts.

On the administration side of the moderation process, the team of moderators have asked again this year, to highlight with the utmost emphasis, that scripts were not submitted in mark/numerical rank order as requested in CCEA's *Instructions To Teachers*. To be pedantic, most of the scripts were returned with no discerning order or logic to their assembly. It must be stressed that by not having the material in the correct order adds considerably to the length of time it takes to moderate the material submitted.

Application Of Marking Criteria

The moderators listed the following as to where the most discrepancies occurred in the marking.

Skill Area: Planning

- There is still quite a substantial number of centres which are awarding top marks for 'detailed scientific knowledge' when in reality the material contains only basic knowledge or a lot of superfluous material which is not relevant to the investigation.

- Only a small number of centres awarded marks for P8b incorrectly. The large majority applied the mark criteria properly ie the student had said exactly what mathematical process they were going to use their results for.

Skill Area: Obtaining Evidence

- There are quite a large number of candidates who still do not present their table of results correctly. ie with headings, units and appropriate raw data.

Skill Area: Interpreting and Evaluating

- As with previous years, a significant number of candidates did not use what would be deemed to be 'detailed scientific knowledge and understanding' to explain or draw conclusions from their results.

- A substantial number of candidates did not provide explanations as to why a result was anomalous or as to how accurate their evidence was.

As mentioned in the previous Principal Moderator's reports, it must be appreciated that for the awarding of top marks, the investigation must be demanding, of a high quality and that all the mark criteria have been met.