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20 November 2006

Mr N Melvin  
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Dear Mr Melvin

### Ofsted survey inspection programme – Science and Mathematics

Thank you for your hospitality and co-operation, and that of your staff, during our visit on 06-07 November 2006 to look at work in science and mathematics.

As outlined in my initial letter, as well as looking at key areas of the subject, the visit had a particular focus on the response of the College to recent Key Stage 4 changes in science, access to continuing professional development, and student transition to post 16 science courses. In mathematics the focus is on students' enjoyment and understanding of mathematics.

The visit provided valuable information which will contribute to our national evaluation and reporting. Published reports are likely to list the names of the contributing institutions, but individual institutions will not be identified in the main text. All feedback letters will be published on the Ofsted website at the end of each half-term.

### Science

The overall effectiveness of science was judged to be satisfactory.

The evidence used to inform the judgements made included: interviews with staff and students, scrutiny of relevant documentation, analysis of students' work and observation of 11 lessons.

### Achievement and standards

- In Key Stages 4 and post-16 achievement and standards are satisfactory overall. Those students following the GCSE applied science course made good progress.

- Overall standards achieved in science were lower in 2006 than the previous year, although still broadly satisfactory. This was the first year of new courses in applied science, and separate sciences.
- Standards at A level were broadly average in Biology and Chemistry, and below average in Physics.
- Students responded well when accorded high levels of trust. For instance, they took great care when working with hazardous materials to produce nylon. They worked well in groups and showed a willingness to collaborate in mixed gender situations. They particularly enjoyed opportunities to work competitively to achieve outcomes.

#### Quality of teaching and learning of science

- Teaching and learning is satisfactory overall, with several examples of good and outstanding practice.
- A feature of both outstanding lessons was the strong link to real life applications of science.
- Good relationships and effective behaviour management have contributed to a sound learning environment. Practical work is enjoyed and students collaborate well to achieve the expected outcomes. They responded particularly well when presented with more challenging activities, and showed a willingness to persevere.
- The department is staffed with an enthusiastic team of colleagues with appropriate subject expertise who are eager to improve provision through the new GCSE science framework.
- Assessment practice is satisfactory. Medium term assessments relating to module tests and course work are carefully monitored, and appropriate interventions are now taking place to ensure expected progress is made. Teachers repeatedly commented on the wide range of ability even within sets, but, as yet, planning usually only includes the identification of outcomes at a single attainment level.

#### Quality of curriculum in science

- There is good curriculum provision for science. There is an increasing range of pathways that is enabling students of all ages to achieve and enjoy science. The school is fully exploiting its specialist science status to offer alternative science GCSEs. Applied science provision has improved achievement of the less able students, and has contributed to enhanced inclusion; all Year 11 students gained at least G grades.
- The school is collaborating with schools from all phases, including an MLD school. Collaborations of this kind have already resulted in exciting practical bridging activities involving topics like forensic science.
- Students appreciate the business and industrial experience of some of their teachers because this helps them appreciate better the relevance of science. The current faculty discussion about how to deliver new

aspects like 'Science in the News' show it is well placed to enhance this aspect for all students.

### Leadership and management of science

- Judged by current outcomes for students, these are satisfactory.
- Specialist science status has been a key factor in securing new, permanent well qualified specialist teachers. The faculty now has a good capacity to make further improvements.
- The whole school focus on better identification of lesson outcomes has convinced staff of the importance of being clear about what is expected in lessons.
- The decline in student numbers has been reversed, and the increase in number of sixth form science students has enabled the school to implement a more diverse curriculum to better meet the needs of the full ability range.
- Effective departmental and senior leadership has minimised the detrimental impact of past staffing difficulties.
- Attendance and exclusion figures have improved substantially and significantly as a result of effective whole college leadership. A wide range of strategies has helped achieve this, including curriculum changes that have improved enjoyment levels, not the least in science.

### Inclusion

- Applied science has improved the achievement of some lower attaining pupils.
- Good learning ethos is evidenced by good working relationships between boys and girls in all years, and with teachers.
- Skilful questioning in outstanding lessons ensured all learners participated.
- The school links with the special school on its shared campus is improving science provision for their students, and also uses their expertise in managing the minority of challenging students in the college.

Areas for improvement in science, which we discussed, included:

- further develop the delivery of science through everyday applications, and the diversity of curriculum pathways
- refine marking and assessment practice to consistently inform learners of the steps they need to take to improve, and to better inform teachers of the prior knowledge of students in order to plan appropriately challenging activities.

I hope these observations are useful as you continue to develop science in the school.

## Mathematics

The evidence used to inform the judgements made included: interviews with staff and students, scrutiny of relevant documentation, analysis of students' work and observation of eight lessons.

The overall effectiveness of the subject, mathematics, was judged to be satisfactory.

## Achievement and standards

Students achieve satisfactorily throughout the school.

- Students enter Year 10 with standards that are a little below average overall. Standards at GCSE are improving modestly, but remain below average, representing broadly satisfactory achievement. The college's improving attendance is a factor in this improving trend.
- The faculty is aware that not all students who have the potential to gain a C grade or better do so. Some strategies to improve this have been set in place, for example, a higher focus on the completion of coursework, but the faculty is not rigorous enough in addressing potential underachievement.
- Standards and progress are good for those students who complete the A level course, but too few stay on into Year 13. A principal factor is that too many students do not get a pass grade in AS examinations at the end of Year 12. The faculty has a variety of strategies to help students catch up, but is not proactive enough in making sure students take advantage of the opportunities provided.
- Throughout the college, students are well behaved and compliant, rarely becoming restless in class. Relationships with staff are positive.
- The use of self-assessment in lessons enables students to know how well they are doing.

## Quality of teaching and learning

Teaching and learning are satisfactory.

- Positive relationships in lessons ensure that time is not wasted in the management of behaviour.
- Teachers successfully use a variety of techniques to motivate students who have different learning styles.
- Formal assessment and tracking of students' progress enables those in danger of underachievement to be readily identified, but the faculty has not used this information well enough in the past to ensure that students benefit from opportunities to help them catch up.
- Classes are formed on the basis of past attainment, but still have students with a range of capabilities in them. Planning and informal assessment do

not always ensure that tasks are varied enough to suit the needs of all in the class.

- Throughout the school, including the sixth form, opportunities are missed to teach in a way that generates understanding rather than the learning of mechanical, rote methods.
- The faculty has a good policy on the marking of students' work. However, it is not followed consistently so that some marking does not help students to understand where errors lie and how they might improve.
- The use of information and communication technology to support learning is underdeveloped.

### Quality of the curriculum

The curriculum is satisfactory.

- All required areas are covered in a way that ensures students meet progressively harder work.
- Schemes of work do not include enough guidance on the methods to be used, leading to missed opportunities to plan lessons that really engage students in learning. However, the planned inclusion of practical and investigative methods in the scheme of work is well in hand.
- The mathematics area includes lots of motivational and challenging display to inspire students.

### Leadership and management

Leadership and management are satisfactory.

- Members of the faculty share a clear vision of mathematics as a living, vibrant subject, as is shown by the quality of displayed work and the commitment to practical and investigative methods.
- Good teamwork is evident, for example, in faculty meetings at which ideas to enliven teaching are regularly shared.
- Self-evaluation, including the analysis of data and the identification of potential underachievement, is not rigorous enough, nor is the response sufficiently robust, leading to the high drop-out rate after Year 12 and some underachievement by students at GCSE.

### Subject issue: students' enjoyment and understanding of mathematics

The faculty is committed to enjoyment and understanding and this is clear in its use of display and its sharing of good interactive practice. However, not all lessons reflect this commitment, and there are times when understanding is not fostered through teaching methods. Nevertheless, students spoken to claimed to understand and enjoy their lessons, and were able to demonstrate clear thinking in response to some problems. They reported that staff were helpful and said that they did not usually undertake problems they did not

understand. 'I feel like I'm learning new things every lesson', said one student in Year 11. Mathematics is 'challenging, but worth it' added a sixth former.

## Inclusion

The use of classes formed by prior attainment helps to ensure that the faculty is satisfactorily inclusive because students with learning difficulties and disabilities are identified and support is available in lessons to ensure they also make satisfactory progress. However, weaknesses in academic guidance and monitoring of students' progress on AS-level courses contribute to a low success rate.

Areas for improvement in mathematics, which we discussed, included:

- monitor the work of the faculty rigorously to identify more precisely the reasons for variations in performance and take effective action
- improve the use of short-term assessment, including marking, so as to ensure that all students are challenged at the right level in lessons
- improve the quality of support and guidance to students in Year 11 considering A-level mathematics and those in Year 12 to reduce the rate of students dropping out or failing to achieve a pass grade.

As I explained in my previous letter, a copy of this letter will be sent to your local authority and will be published on Ofsted's website. It will also be available to the team for your next institutional inspection.

Yours sincerely

Brian Cartwright  
Her Majesty's Inspector