

PROTECT – INSPECTION

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Mr B Roberts
Headteacher
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Dear Mr Roberts

Ofsted 2011–12 subject survey inspection programme: science

Thank you for your hospitality and cooperation, and that of the staff and students, during my visit on 21 and 22 September 2011 to look at work in science.

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 without their consent.

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

The overall effectiveness of science is outstanding.

Achievement in science

Achievement in science is outstanding.

- Students' attainment on entry to the school is average. Almost all make outstanding progress in science, and achieve high standards overall both at GCSE and at A level. Boys achieve as well as girls, across all science programmes of study, irrespective of their backgrounds or circumstances.
- Students speak enthusiastically about their enjoyment of science, and demonstrated very high levels of commitment to work in the lessons observed. The expert use of practical work to teach concept, and to develop students' investigative skills and understanding of the scientific method is enjoyed by almost all students. It is the key strength of the science department and the primary reason for its success.

- Sixth-form students thought the balance of time devoted to practical work was about right. They also expressed the satisfaction of grasping difficult theoretical ideas as their understanding developed over time.
- Students of all ages were able to explain science concepts as well as recall knowledge of key ideas; their ability to talk and write about the historical context and wider application of science demonstrated high levels of scientific literacy and excellent communication skills.
- A high proportion of Key Stage 4 students (20%) continue to study science in the sixth form and elsewhere. About 25% of university entrants from the sixth form go on to study a science-related degree.

Quality of teaching in science

The quality of teaching in science is outstanding.

- Lessons are characterised by very high expectations of what students are capable of achieving. Hardly any time is wasted in setting the aims of the lesson, so that students begin the primary activity quickly, and also have to think carefully about how to go about it.
- Teachers consistently ask open-ended questions that demand explanations and reasons from students. Students respond in full, well-argued sentences both verbally and in writing. The teacher-student dialogue that ensues is stimulating for both students and staff, establishing a strong culture of learning, debate and enquiry in the classroom and is an excellent characteristic of all lessons seen.
- Students participate in deciding the level of demand of a task, and are expected and guided to attempt work that challenges their prior knowledge and understanding. Written resources include the use of formal scientific journals, as well as conventional school texts.
- Practical investigation work is central to the way in which teachers introduce and illustrate scientific principles. This enables students to discover key ideas for themselves, a process that is both rewarding and memorable, and this sustains their interest and motivation for further study. For example, students re-enacted an experiment with gases, discovering for themselves the unsettling notion of absolute zero temperature and no volume.
- Marking is consistent, involving acknowledgement of work and its correction. Frequent summative assessments ensure that teachers and students know how well they are progressing. This results in additional personalised support for students as required. Planned opportunities for students to reflect upon their understanding are sometimes missed.

Quality of the curriculum in science

The quality of the curriculum in science is outstanding.

- The department, with excellent support from senior management, continuously reviews the curriculum, making annual adjustments to courses in response to performance data and feedback. The current

programme ensures that all Year 9 students begin a course leading to completion of core science in Year 10. About 30% of students then study the three separate sciences; 60% continue to complete additional science, and 10% follow a BTEC level 2 science course, very successfully. Students are directed to the courses; some students expressed that better advice on the consequences of the various pathways would have been helpful. The school has subsequently adjusted individual sixth-form timetables to ensure that no student has been disadvantaged.

- At A and AS level, in addition to the three separate science A levels, about 25 students wishing to maintain some advanced science learning in all disciplines study A level Applied science.
- The specialist knowledge of staff and support technicians is a strong feature of the curriculum experienced by students, because the way in which lessons are delivered results in high levels of curiosity from students. This requires high levels of response and debate from teachers; it is this culture of debate, investigation, argument, and explanation that is central to the excellent achievement of the vast majority of students.

Effectiveness of leadership and management in science

The effectiveness of leadership and management in science is outstanding.

- Senior leaders know accurately how well students are progressing in science, and work sympathetically with department leaders to investigate and support students at risk of underachievement. The culture within the faculty is one where science is celebrated, and ways of improving teaching are discussed regularly. Teachers are committed to ensuring students get as wide an experience of science as possible, and routinely explore ideas beyond the restriction of a syllabus in response to students' inquisitiveness.
- Over time the popularity of science has increased, putting pressure on the accommodation for teaching science in specialist rooms; the department is good at working round these restrictions but it limits some opportunity for practical work, and prevents spontaneous practical illustrations that might arise as a result of a question from a student.

Areas for improvement, which we discussed, include:

- No significant areas for improvement were identified.

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

As explained previously, a copy of this letter will be published on the Ofsted website. It may be used to inform decisions about any future inspection.

Yours sincerely

Brian Cartwright
Her Majesty's Inspector