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Dear Mr Burrowes

Ofsted 2010–11 subject survey inspection programme: design and technology (D&T) and mathematics

Thank you for your hospitality and cooperation, and that of the staff and students, during my visit with my colleague Stephen Abbott HMI on 15 and 16 February 2011 to look at work in D&T and 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 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 eight lessons in D&T and nine mathematics lessons and short visits to four others.

The overall effectiveness of D&T is satisfactory.

Achievement in D&T

Students' achievement in D&T is satisfactory.

- Attainment in 2010 was below the national average for D&T. Students gained 50% A* to C grades at GCSE. Well-considered interventions have been put in place to promote the progress of students at the end of Key Stage 4. The school's careful tracking system indicates that students are on course to attain better results in 2011.
- The legacy of low achievement is steadily being addressed. Students understand and use technical language well. They understand the design process and use it effectively to design and make products for specific users. For example, in a Year 8 textiles lesson, students had clearly identified the target group for which their pencil cases were being

designed. Consequently, their designs reflected a thoughtful analysis of the design brief and good understanding of the intended market. Students were supported well to achieve a high quality of finish and accuracy in their work. Students are proud of their work and, overall, their work shows satisfactory progress. The majority of students know the level or grade they are aiming for, but they are not always clear about what they need to do to improve their current work.

Quality of teaching of D&T

The quality of teaching of D&T is satisfactory.

- Teachers have good subject knowledge about specialist technical skills and use this well to maintain students' interest in the subject. Where teaching is good, learning moves at a brisk pace with appropriate levels of challenge and opportunities for independent learning. Students particularly enjoy the opportunities for practical activity and problem-solving. Students are good at working in pairs and in groups, especially when the activity is tightly focused and linked to the learning objectives. At times, teachers monopolise the talking in class and spend too little time questioning to check that students securely understand the work before moving on to the next topic. Too often, students' performance is limited by insufficient challenge in the teaching.
- Students' evaluation of their work is often superficial and does not help them to consolidate their knowledge and understanding. As a consequence, they are often insufficiently prepared to tackle their next project. When assessment is used well, students are clear what they have achieved and can set their own appropriate targets. For example, in a Year 8 resistant materials lesson, carefully structured evaluation of their clocks was closely matched to National Curriculum Levels. This ensured that students understood the specific strengths and priorities for improvement in their work and could explain how to improve it further. Opportunities are missed to develop students' understanding of National Curriculum Levels through reference to the displays and examples of students' work.

Quality of the curriculum in D&T

The quality of the curriculum in D&T is satisfactory.

- The curriculum is adequately matched to students' needs. Overall planning is inconsistent because it is insufficiently informed by the expectations of assessment using National Curriculum Levels and this limits progression and students' development of designing and making capabilities. Some staff ensure that this is done well and students can build on their previous learning. Students have too few opportunities to use new technologies and apply them to manufacturing techniques.
- Enrichment and extra-curricular activities are appropriately, regularly offered. But opportunities are missed to develop students' experiences of these activities in the classroom.

Effectiveness of leadership and management in D&T

Leadership and management in D&T are satisfactory.

- The subject leaders are knowledgeable and dedicated to seek further improvement. They are well supported by a hardworking team. They monitor students' progress accurately and have begun to use challenging targets. Self-evaluation is accurate and suitable plans are in place to improve areas of weakness. Currently, opportunities to share good practice are too few.
- Health and safety are secure. Students are encouraged to follow safety rules and can explain the risks attached to different D&T activities.

Areas for improvement, which we discussed, include:

- improving students' knowledge and understanding of new technologies so that they are better equipped to achieve challenging targets
- ensuring that National Curriculum Levels inform teachers' planning of schemes of work so that levels of challenge are appropriate for all students
- improving progression throughout the key stages so that students are able to build effectively on their previous learning.

Mathematics

The overall effectiveness of mathematics is inadequate.

Achievement in mathematics

Achievement in mathematics is inadequate.

- Students join the school in Year 7 with a range of prior attainment in mathematics, but overall their starting points are above average. By the end of Year 11, standards are broadly average. In recent years, progress has been satisfactory for students with above average prior attainment, but inadequate for others.
- In the sixth form, students are prone to make algebraic errors and this restricts their progress to satisfactory. Last year, nearly half of the students taking AS mathematics failed the examination. The department has responded sensibly by tightening up its entry requirements to require at least grade B in GCSE mathematics.
- The school has made a determined effort to improve examination results in mathematics. In the current Year 11, students with average and below average prior attainment took the foundation tier GCSE examination in November 2010. Students who did not achieve their target grades will take the foundation or higher level examination again in June. The results so far indicate that these students are making satisfactory progress.
- This improvement does not yet extend to other year groups. Lesson observations and work scrutiny show that too many students in the middle

and lower attaining sets are still making slow progress. Students are passive learners because the predominant teaching style does not help to develop their initiative by challenging them to find their own strategies. Many topics are not covered in enough depth to secure satisfactory learning. Students typically complete only a few straightforward exercises before the teacher moves them on to a new topic. In the weakest cases, some students disengage and attempt very little work, lesson after lesson.

Quality of teaching of mathematics

The quality of teaching of mathematics is inadequate.

- Teaching was inadequate in three of the observed lessons because students did not complete enough new work. Partly this was because the starter activities took too long, but mainly because students found the teachers' introductions confusing and therefore did not understand what they were supposed to be doing. Some could not get started and others tackled the tasks incorrectly and eventually gave up.
- Checks on students' books showed that this is not uncommon. Typically, students copy down a learning objective and then attempt only a few, routine questions. Except in the high attaining sets, it is rare to find convincing evidence that a topic has been pursued to a point where students have secured mastery.
- In an inadequate functional skills lesson, students were provided with a scenario about decorating costs and a number of linked questions. Rather than talk about the bigger picture, the teacher guided students step by step on each question, thereby stifling the very initiative that the lesson should have been developing.
- Most of the satisfactory lessons began with a starter activity to practise existing skills before the teacher introduced a new topic through a worked example, taking suggestions from volunteers at each step. In the better cases, students were asked to work through some steps independently. This engaged more students, but some simply waited for the teacher to write up the solution and then copied it down. Opportunities were sometimes missed to make connections with other areas of mathematics or to promote conceptual understanding.
- In the one good lesson seen, students were fully engaged because they were given suitably challenging problems to work on in groups. The teacher spent time with each group, asking probing questions. This generated some worthwhile discussion among the students that helped to develop their understanding of coordinate geometry.
- Marking is regular, and provides some useful feedback on how to improve, especially for the higher attaining students. However, teachers' informal assessment during lessons is underdeveloped. They do not always realise when students are having difficulties because they do not monitor them closely enough as they are working. Consequently, teachers do not always adapt their lessons well enough to address students' emerging needs.

Quality of the mathematics curriculum

The quality of the mathematics curriculum is satisfactory.

- The department has clear schemes of work for each teaching group. Suitable adaptations are being made to cater for the new GCSE specifications. However, some teachers interpret the schemes of work too rigidly, moving on from a topic before students are ready.
- Teaching is organised in an innovative way, with each class in Years 7 to 10 being split between two teachers. In most cases, the main teacher focuses on new content while the subsidiary teacher focuses on using and applying mathematics and the development of functional skills. However, the quality of the latter lessons is currently weak and few activities promote independent thinking. Consequently, students do not have enough opportunities to learn to use and apply their existing knowledge.
- From Year 9 onwards, higher attaining students are prepared for the GCSE statistics examination in Year 10, returning to GCSE mathematics in Year 11. This arrangement links successfully with the A-level course offered in the sixth form, where students take two statistics modules.
- Further mathematics is also offered in the sixth form. This is supported through a partnership with another school and teachers' goodwill in taking lessons before and after the usual school hours.

Effectiveness of leadership and management of mathematics

The effectiveness of the leadership and management of mathematics is inadequate.

- The mathematics team includes teachers with a range of experience and skills, including some who could serve as role models. Teaching ideas are shared informally but, except in the sixth form, there is little guidance to ensure that teachers use a consistent approach to key topics. The department includes an Advanced Skills Teacher (AST), but most of her professional development work is with other schools.
- The head of department is well organised, and undertakes regular monitoring of teaching and students' books. Together with senior leaders, he tracks students' progress in Key Stage 4 against their targets. This has contributed to some improvement in Year 11. However, progress remains inadequate for middle and lower attaining students in the lower years.
- Leaders are aware that the quality of teaching needs to improve. The split deployment of teachers to classes means that most students have some access to the most effective teaching. However, there has not been enough action to tackle the weaknesses in assessment or to eliminate inadequate teaching. The improvement plan makes few references to professional development for individual teachers.

Areas for improvement, which we discussed, include:

- improving the progress made by students with average and below average prior attainment by:
 - ensuring that lessons on using and applying mathematics and on functional skills teach students how to devise their own strategies
 - ensuring that all teachers monitor the progress of students during lessons and adapt their teaching accordingly
 - modifying schemes of work to provide teachers with more flexibility to vary the time spent on topics and to revisit areas of weakness

- improving the quality of teaching by:
 - taking more vigorous action to address weaknesses that become apparent from monitoring and evaluation, including the provision of appropriate professional development
 - reviewing the balance of outreach and in-house work by the AST.

I hope that these observations are useful as you continue to develop D&T and mathematics in the school.

As I 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. Except in the case of academies, a copy of this letter is also being sent to your local authority.

Yours sincerely

Michelle Parker
Her Majesty's Inspector