

Aviation House
125 Kingsway
London
WC2B 6SE

T 0300 123 1231
F 020 7421 6855
enquiries@ofsted.gov.uk
www.ofsted.gov.uk



5 April 2011

Mr M Roden
Headteacher
King Edward VI Camp Hill School for Boys
Vicarage Road
Kings Heath
Birmingham
B14 7QJ

Dear Mr Roden

Ofsted 2010–11 subject survey inspection programme: mathematics

Thank you for your hospitality and cooperation, and that of the staff and students, during my visit on 21 and 22 March 2011 to look at work in 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 seven lessons and brief visits to three others.

The overall effectiveness of mathematics is outstanding.

Achievement in mathematics

Achievement in mathematics is outstanding.

- Students join Year 7 with high attainment and it remains high throughout the school. By the end of Year 11, many students have moved well beyond GCSE level and, in 2010, 25 Year 11 students gained grade A in the additional Free Standing Mathematics Qualification. Although attainment at A level dipped in 2010, analysis of current sixth-form assessment data shows that this slight fall was temporary.
- Students take part in regional, national and international mathematics challenges. In 2010, two students were in the British team for the International Mathematical Olympiad. This is an unprecedented achievement for a maintained school. The school's senior and junior teams have qualified for the UKMT Team Challenge finals in each of the past two

years. On average, 60 students each year qualify for and take part in further rounds of national mathematics challenges. They describe this experience as tough but enjoyable.

- Participation in mathematics in the sixth form and beyond is high. Out of a sixth form of 243, currently 111 students are studying AS level in Year 12 and 85 are studying the full A-level in Year 13. A total of 65 are also following further mathematics courses. Over the past three years, 101 students have chosen to study mathematics or mathematically related courses at university. This year again 35 students have applied for such courses. A dozen students each week attend after-school preparation lessons for Cambridge University's Sixth Term Entrance Paper in mathematics.
- Students enjoy the subject. They describe their lessons as varied in style, commenting that their teachers really care about their progress and that nothing is too much trouble. Without exception, they are fully engaged in their lessons. They enjoy producing short videos that explain topics in mathematics, such as using the sine rule to find the height of a tower. Their experience of problem-solving in lesson starters, throughout the main lesson and in extra-curricular settings is exceptional: it provides an environment where the solving of interesting problems is part of the mathematical atmosphere that students breathe.
- One student has written a high-quality essay describing infinite processes for the Extended Project Qualification. This involved researching a range of published sources and exploring, for example, the summation of famous infinite series important to the history of mathematics.

Quality of teaching in mathematics

The quality of teaching in mathematics is outstanding.

- Teachers have excellent subject knowledge which they use alongside very good, interactive, whole-class teaching. High-quality questioning ensures that students really understand concepts. Teachers engage fully with the questions that students ask, and press students to clarify and debate until they are sure that the correct concept is understood completely.
- Teachers make very good use of practical and group work. Year 7 students, working in small groups, used a matching card exercise that the teacher had designed to meet their specific revision needs in algebra. In a Year 13 class, groups of students followed a carousel of activities and analysed the forces acting on objects. A different class of Year 10 students took rapid photographs of a basket ball in flight and then fitted a parabola over the path taken by the ball while others used a video clip of a diver to analyse the forces and accelerations involved in the dive. A Year 10 student described having measured pulse rates for data analysis both before and after running round the school field.
- Teachers maintain detailed records of students' progress. They mark assessments helpfully. Students' written work shows many examples where they have redone sections of exercises to correct their errors. 'If it's not right, it's not left', one student commented, echoing his teacher's

advice. The high-quality questioning and practical activities enable teachers to have a good knowledge of the depth of their students' understanding. In all the practical work observed, the teachers engaged individuals and groups in close questioning about their work.

Quality of the curriculum in mathematics

The quality of the curriculum in mathematics is outstanding.

- The schemes of work are detailed and make frequent reference to opportunities for using and applying mathematics and the use of information and communication technology. Many such approaches are innovative, involving the use of video clips and hand-held technology. Students routinely use graphical calculators to explore the transformation of graphs and polynomial approximations to functions. They use software for numerical integration to investigate the logarithmic nature of the integral of the reciprocal function and tailor-made software to model sorting in decision mathematics and hypothesis testing in statistics.
- A high-quality programme develops the most able mathematicians. Specific texts are used in class to provide extra challenge. A lunchtime club for able students in Years 7 to 9 enables them to cut their teeth on Olympiad problems. Students describe a Saturday morning programme of master-classes as stimulating. They particularly enjoy mathematical team competitions with local schools. Last year, two students organised and ran their own problem-solving club.
- Teachers provide support at lunchtime for students who have missed work or have a particular difficulty with an area of mathematics. Students say also that their teachers are eager to support whenever the need arises.
- An enthusiasm for solving problems permeates the department. Such problems range from the small scale, such as writing the date as a formula, through to a full searchable database of graded problems from national competitions that are integrated into class teaching.

Effectiveness of leadership and management in mathematics

Leadership and management in mathematics are outstanding.

- Department leaders have a clear vision of high-quality teaching and learning. They are innovative teachers with very high-quality subject knowledge and teaching skills. They are fascinated by mathematics and problem-solving and that enthusiasm is shared throughout the department. They have established a culture of excellence in mathematics and its teaching. The capacity for further sustained improvement is outstanding.
- Department leaders maintain detailed self-evaluation of the department's work and its performance. A separate self-evaluation of the progress of the Gifted and Talented programme indicates the importance of this strand.

- The departmental team is cohesive with high morale. While teachers share ideas and resources, they do not have enough opportunity for peer and joint observations of each other's teaching, and insights drawn from some teachers' practice are consequently missed.

Areas for improvement, which we discussed, include:

- enabling teachers to have more opportunity to observe each other teaching.

I hope that these observations are useful as you continue to develop mathematics 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. A copy of this letter is also being sent to your local authority.

Yours sincerely

Robert Barbour
Her Majesty's Inspector