

# Kimberley 16-19 STEM College

## 16-19 academy

<b>Inspection dates</b>		<b>10–13 March 2015</b>
<b>Overall effectiveness</b>	<b>This inspection:</b>	<b>Requires improvement-3</b>
	Previous inspection:	Not previously inspected
Outcomes for students		Requires improvement-3
Quality of teaching, learning and assessment		Requires improvement-3
Effectiveness of leadership and management		Requires improvement-3

### Summary of key findings for students

#### This provider requires improvement because:

- success rates for AS levels were slightly below average for the first cohort of students who joined the college in September 2013
- students do not always make the progress they are capable of because not enough teaching is good or better
- leaders and managers have not had sufficient impact in driving up the quality of teaching and learning
- staff do not use assessment and intervention systems effectively in all departments to pinpoint accurately and precisely which students are underachieving and what needs to be done to accelerate their progress
- science and mathematics provision requires improvement
- too few students who took GCSE mathematics and/or English in 2014 achieved grades A\* to C.

#### This provider has the following strengths:

- leaders have a clear vision and focus on science, technology, engineering and mathematics (STEM) that promotes careers in the field, and actively encourages young people to pursue such careers to meet local, regional and national needs
- very strong partnerships with industry and higher education institutions that lead to very good STEM enrichment opportunities
- good vocational engineering provision that effectively develops knowledge and skills, and prepares young people for employment or higher education in engineering, where there is a skills shortage
- strong pastoral support and effective careers advice and guidance that enable students to make well informed choices.

## Full report

### What does the provider need to do to improve further?

- Refine assessment and systems to provide additional support to ensure that underachievers are identified early and interventions are effective in all departments so that A-level outcomes are good and AS-level results improve.
- Strengthen the consistency of assessment in science and mathematics, including teachers' checking of students' understanding in lessons.
- Swiftly improve the quality of teaching, learning and assessment in the subject areas requiring improvement by ensuring that arrangements for sharing best practice lead to better teaching and more rapid progress for all students.
- Implement comprehensive initial assessment to ensure that teachers have detailed information about individual students' abilities and skills to enable them to plan lessons and additional support that more effectively meet their needs.
- Strengthen quality improvement strategies to increase their impact on teaching and learning, so that outcomes in all subjects are rapidly improved and teaching becomes consistently good or better.

### Inspection judgements

<b>Outcomes for students</b>	Requires improvement
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- All of the college's provision is classroom-based learning for 16-18-year-olds. The majority are studying for AS and A levels. A high proportion are studying at least one science, technology or mathematics subject and many are studying more than one. A minority are on vocational courses, including diplomas in engineering, at level 2 and level 3. The majority of students enrolled have already achieved a grade C in mathematics and English. The first cohort of students joined the college in September 2013.
- Outcomes for 16-18-year-olds on study programmes require improvement. Success rates for AS levels in 2014 were slightly below average, as were high grades. Broadly, progress was in line with expectations given students' prior attainment but between subjects not all students make the progress they are capable of.
- Progression from Year 12 to Year 13 is low for the first cohort of students. The vast majority of these students progress to mainly further education or apprenticeships.
- Current assessment data suggest improvements in results in 2015, but changes to college forecasting systems make it difficult to judge the reliability of this. In 2014, managers did not identify the extent of underachievement in time to address it adequately. They have taken steps to ensure that this is not repeated and collect a large amount of data on student performance, but this requires further improvement since it does not always lead to specific actions with individual students.
- For the small number of students who took GCSE English or mathematics in 2014 the proportions achieving A\* to C grades were low. Data for the current Y12 cohort suggest significantly more should achieve GCSE A\* to C in English in 2015, but the predicted outcomes for GCSE mathematics remain low. The very small number of students who took functional skills mathematics and English in 2014 all gained the qualifications.
- Students develop good employability skills. The college dress code encourages an appropriate professional approach. Attendance and punctuality are good. Valuable enrichment in STEM subjects helps students understand career opportunities and the world of work in STEM.

Examples include visits to CERN, a computer programming course delivered by a Stanford university professor in Istanbul, and project work through industrial partners such as building a 3D printer. Students benefit from these options and recognise that the breadth of the range is a special feature of Kimberley. Good broader enrichment opportunities in the arts, public speaking, and sports develop students' social, interpersonal and communication skills effectively.

- Students on the vocational engineering course develop good practical and technical skills. Teachers encourage independent learning but the absence of a library on the Kimberley site and the range of materials on the virtual learning environment (VLE) require improvement to boost this further.
- Outcomes in 2014 were better for female students than male students in terms of pass rates and high grades. The gap was wider than that found nationally. College assessment data for current students suggest that the gap is closing. Students from minority ethnic backgrounds do well.
- The majority of final year students have established progression plans for next year. Almost all of those who have applied to university have offers, including a significant number of offers from Russell group universities. A high proportion have applied for STEM related courses. Most students on the vocational engineering course are progressing to apprenticeships, many with local industry partners. Two students have secured employer sponsorship for university studies in engineering.

### The quality of teaching, learning and assessment

Requires improvement

- Teaching, learning and assessment require improvement, which is reflected in the outcomes for students, where both pass rates and progress require improvement.
- Most teachers routinely reinforce and extend students' literacy skills well in lessons, for example by introducing highly technical vocabulary and paying careful attention to good standards of English in written assignments. Apart from in mathematics and engineering, teachers do not use naturally occurring opportunities to develop students' numeracy skills well enough.
- Teachers' checking of learning and understanding in lessons requires improvement. For example, too many teachers do not expand on the first response to a question to deepen students' understanding or link to previously learned work. A minority of teachers encourage students to develop their first answer using more probing follow-up questions. Students enjoy these opportunities to show what they know and have learned, and many give very complex, articulate and carefully considered responses.
- Initial assessment requires improvement. Teachers do not have enough information to ensure they are able to set individual, challenging but achievable targets based on the lesson objectives. In a few lessons, abstract concepts are introduced without checking that students are able to work at this level and this slows the pace of learning.
- Written feedback on students' work requires improvement to ensure that all receive clear guidance about how to improve. Feedback is particularly thorough in engineering and teachers often use very short-term targets to ensure students quickly re-submit work that requires amendments. In individual tutorials personal tutors explore in detail students' progress and, where appropriate, personal concerns that might impede success. Tutors challenge students well where their progress is too slow or they are at risk of not meeting their targets but also arrange targeted support to enable them to catch up.
- The VLE is underdeveloped as a tool to support independent learning; although some teachers populate it well with a range of material including links to web-based videos and film clips, many do not use it regularly, and so their students do not recognise it as a useful resource.

- Teachers are well qualified and have good specialist knowledge, supplemented by commercial or research experience and regular update training. Engineering teachers make good use of the growing links with industry to introduce students to cutting-edge developments.
- Information, advice and guidance are good and ensure that students know the various progression routes open to them to pursue their career plan, such as the wide range of engineering apprenticeships, higher education or continuing further education.
- Equality and diversity are promoted well through a wide range of activities including the college website. Tutors introduce topics in group tutorials which follow a diversity calendar; guest speakers are carefully chosen to enable students to hear about other cultures or faiths.

## Science and mathematics

### 16-19 study programmes

Requires improvement

### Teaching, learning and assessment in science and mathematics require improvement because:

- in 2014 AS-level success rates were below average in biology, psychology and use of mathematics
- not enough teaching is good or better to ensure that all students make good progress
- written feedback and follow up to assessments require improvement; students do not receive enough clear, specific and timely guidance on what they need to do to improve their skills and knowledge further
- teachers' records of students' progress in lessons are not sufficiently well developed, particularly when students have more than one teacher for a subject, to ensure continuity from one lesson to another in order to maximise the progress of individual students.
- teachers' checking of learning and understanding is often cursory; for example, questioning is not sufficiently developed to support and build on students' answers in order to lead them to greater understanding and engagement
- teachers do not always use starting points on activities that are commensurate with students' abilities and understanding of different concepts; this reduces the opportunities to build on strengths and support weaknesses through more personalised learning
- a minority of teachers have low expectations; in these lessons, teachers do not tailor teaching to individual needs and do not challenge all students appropriately; in particular, they do not encourage more able students to develop higher-level skills in order to make enough progress towards achieving higher grades.

### In science and mathematics the provider has the following strengths:

- high success rates for AS-level mathematics and further mathematics in 2014
- a small minority of lessons are outstanding; in these lessons students make rapid progress
- teachers are approachable and offer students support and extra help outside lessons; for example students use the VLE to ask for help on specific questions and teachers respond quickly
- one-to-one sessions and after college activities allow students to draw on teachers' good subject knowledge, providing them with further explanations of key concepts and enhancing their understanding
- the excellent culture of mutual respect, fostered and clearly present between students and between students and staff enhances learning well

- teachers use a wide range of interactive resources to support students, including use of the VLE and posting examples from lessons on-line, which encourages independent learning
- students develop a good range of mathematical skills and teachers use and display key words in the classrooms which prepares students well for examinations and their next stage of education or training
- teachers give students good quality information, advice and guidance during their course about relevant mathematical and scientific careers; most students intend to progress onto a mathematical or science related courses.

<b>Engineering</b>  <b>16-19 study programmes</b>	Good
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### **Teaching, learning and assessment in engineering are good because:**

- current level 3 students, due to complete their courses in 2015, achieve high standards of practical, technical and problem solving skills; they also develop good work-related and employability skills
- most teachers use engaging and interesting techniques to stretch students; complex engineering concepts such as computer-aided design are well explained, group and paired working are used well and students enjoy their work and make good progress quickly
- students' assignments are imaginative and innovative; current projects include a heat-generated device to charge mobile phones and tablet computers, a multi-tool set for cycles which is stored in the handlebars and a device for stirring food in cooking pots
- staff have particularly well-developed links to a wide range of employers and higher-education institutions that benefit students, as employers offer apprenticeships and university sponsorship to students and also provide resources, external speakers and opportunities for college projects
- teachers integrate computer-based technology well into lessons so that students gain experience of using word processing, spreadsheets and presentation software and also gain confidence in the use of computer-aided drawing software and three-dimensional printing; for example, one student prepared a portfolio of drawings and three-dimensional generated components to support his application and interview with a well known Formula 1 team
- teachers assess students' work regularly and record the outcomes well; their written and verbal feedback is thorough and supportive so that students understand what they need to do to progress and what deadlines they have to meet to fulfil the strict requirements of the awarding body
- teachers track learning well; they set short term targets in discussion with students and all teachers play an active role in supporting students to achieve these
- teachers give good advice and guidance; all students are fully aware of the opportunities available with a wide range of well-known engineering employers and many have already obtained jobs or sponsorship with a range of advanced technology engineering employers
- mathematics is very well promoted in lessons and college work is rich in the complex application of mathematics relevant to the engineering sector; for example, conversion of miles into nautical and aeronautical miles and then into kilometres.

**Engineering is not yet outstanding because:**

- for the small number of level 2 students, outcomes were low in 2014
- teachers do not reinforce English sufficiently in many lessons; they do not always check spelling of technical words in students' notes and do not use naturally occurring opportunities to promote English skills further
- in a small number of lessons teachers do not sufficiently tailor work to individual students to ensure that all students acquire good levels of knowledge and progress well
- no library or resource centre is available on site for engineering students; the VLE is not sufficiently well developed and contains insufficient up-to-date information so that opportunities for independent learning are restricted.

**The effectiveness of leadership and management**

Requires improvement

- The executive principal and senior leaders at Kimberley College are at an early stage in their pursuit of an ambitious and far-reaching vision to meet regional and national skills shortages in STEM. Their engagement with STEM employers and university departments is particularly strong. This benefits students through increased access to specialists in their chosen area, as well as providing opportunities for practical work experience. As a result, increasing numbers of current students at the college are choosing to progress to apprenticeships in areas of complex technology.
- Governors and directors strongly support the college's aims. They have good access to all pertinent information on the college's performance, and bring high levels of professional expertise to asking the right questions and holding senior leaders to account.
- Significant delays in opening the new college building, planned for September 2013, resulted in temporary accommodation being used by students for the first seven months of the college's operation. Senior leaders recognise that the subsequent move to the new college site, shortly before their examinations, caused disruption and may have contributed to lower than predicted outcomes for the first cohort of students.
- The executive principal and senior leadership team demonstrate the determination and effective capacity to drive through planned improvements. Since occupying the new college site last year, leaders have begun to introduce organisational changes to increase the college's effectiveness in support of its long-term aims. For example, leaders are introducing a new directorate structure to bring greater coherence to the delivery of STEM programmes. It is too soon to assess the impact of these changes.
- Managers' work to raise the quality of teaching requires improvement. Individual teachers identified as needing support are carefully mentored. Other areas for development form the basis of regular staff training events. Despite these positive actions, inspectors found that too many teachers still require further development in some aspects of their teaching in order to help all students achieve their full potential.
- The college curriculum very effectively meets the needs of current students, employers and the local community for the study of STEM subjects, and provides wider opportunities for learning. Managers are carefully developing the college's response to national changes in GCE A-level provision, while also planning to increase the college's capacity to deliver STEM provision. It is too soon to judge the impact of these plans.
- Study programmes are well designed to meet students' individual needs and support their progression plans and career ambitions in STEM related subjects, including medicine. These are extended well through a wide range of enrichment activities, that includes relevant work-related learning.

- Although the current self-assessment report identifies many strengths and areas for improvement, it overstates strengths in teaching and learning in some areas and does not identify the need for improvement in the initial assessment of students. Departmental quality improvement plans require improvement because they do not always contain sufficiently well-focused and measurable targets for improvement.
- Safeguarding is good. Staff are alert to the risks facing young people, and constantly reinforce students' need for on-line safety. Staff work proactively to increase students' awareness of emerging issues, such as the threat of radicalisation, posed by social media. Students understand the importance of following correct health and safety procedures in workshops and laboratories, and know how to report any concerns around bullying and harassment. Consequently students feel safe in the secure learning environment. Managers recognise the increased risk of vehicle accidents among young drivers and so require all students to pass a safe driving course before bringing a car to college. Senior leaders are also working with the local council to improve road safety at junctions near the college.
- Staff promote equality and diversity well. For example, they encourage young female students to consider careers in technology. Students demonstrate a strong ethos of mutual respect and good behaviour around the college. Recently appointed equality and diversity officers are building on the college's calendar of equality and diversity events and personal tutorials to emphasise to students the importance of tolerance for others in modern day Britain. Staff make good use of opportunities in lessons to show students the relevance of equality and diversity within their future lives and careers.

## Record of Main Findings (RMF)

### Kimberley 16-19 STEM College

Inspection grades are based on a provider's performance:  1: Outstanding 2: Good 3: Requires improvement 4: Inadequate	Overall	14-16 part-time provision	14-16 full-time provision	16-19 study programmes	Traineeships	19+ learning programmes	Apprenticeships	Employability	Community learning
Overall effectiveness	3			3					
Outcomes for learners	3			3					
The quality of teaching, learning and assessment	3			3					
The effectiveness of leadership and management	3			3					

Subject areas graded for the quality of teaching, learning and assessment	Grade
<b>Science</b>	<b>3</b>
<b>Mathematics and Statistics</b>	<b>3</b>
<b>Engineering</b>	<b>2</b>



## Provider details

<b>Type of provider</b>	16-19 academy							
<b>Age range of students</b>	16-18							
<b>Approximate number of all students over the previous full contract year</b>	158							
<b>Principal/CEO</b>	Mr Michael Gleeson							
<b>Date of previous inspection</b>	NA							
<b>Website address</b>	<a href="http://www.stemcollege.co.uk">http://www.stemcollege.co.uk</a>							
<b>Provider information at the time of the inspection</b>								
<b>Main course or learning programme level</b>	<b>Level 1 or below</b>		<b>Level 2</b>		<b>Level 3</b>		<b>Level 4 and above</b>	
<b>Total number of students (excluding apprenticeships)</b>	16-18	19+	16-18	19+	16-18	19+	16-18	19+
	0	0	47	0	320	7	0	0
<b>Number of apprentices by Apprenticeship level and age</b>	<b>Intermediate</b>		<b>Advanced</b>		<b>Higher</b>			
	16-18	19+	16-18	19+	16-18	19+		
	N/A	N/A	N/A	N/A	N/A	N/A		
<b>Number of traineeships</b>	16-19		19+		Total			
	N/A		N/A		N/A			
<b>Number of students aged 14-16</b>	N/A							
<b>Full-time</b>	N/A							
<b>Part-time</b>	N/A							
<b>Number of community students</b>	N/A							
<b>Number of employability students</b>	N/A							
<b>Funding received from</b>	Education Funding Agency (EFA)							
<b>At the time of inspection the provider contracts with the following main subcontractors:</b>	N/A							

## Contextual information

Kimberley College is a 16-19 academy, specialising in science, technology, engineering and mathematics (STEM). It opened as a free school in September 2013, and is operated by Wootton Academy Trust, a multi-academy trust. Some sixth form provision is shared with the Trust's other school, Wootton Upper School, where the library is housed. The college was established to address STEM skills needs in the locality. The college advisory body includes a number of representatives from STEM-related employment and higher education institutions.

## Information about this inspection

### Lead inspector

Ruth James HMI

One of Her Majesty's Inspectors (HMI) and four additional inspectors, assisted by the Assistant Principal as nominee, carried out the inspection with short notice. Inspectors took account of the provider's most recent self-assessment report and development plans. Inspectors also used data on students' achievements in 2014 to help them make judgements. Inspectors used group and individual interviews, and online questionnaires to gather the views of students and employers; these views are reflected throughout the report. They observed learning sessions, assessments and progress reviews. The inspection took into account all relevant provision at the provider. Inspectors looked at the quality of teaching, learning and assessment across all of the provision and graded the sector subject areas listed in the report above.

## What inspection judgements mean

Grade	Judgement
Grade 1	Outstanding
Grade 2	Good
Grade 3	Requires improvement
Grade 4	Inadequate

Detailed grade characteristics can be viewed in the *Handbook for the inspection of further education and skills 2012*, Part 2:

[www.gov.uk/government/publications/handbook-for-the-inspection-of-further-education-and-skills-from-september-2012](http://www.gov.uk/government/publications/handbook-for-the-inspection-of-further-education-and-skills-from-september-2012)

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