



Dedication Respect Engagement Achievement Motivation Success

Trafford Alternative Education Provision

Deep Dive into Maths Q & A

<i>Subject Curriculum</i>	<p>Does the subject curriculum match or exceed the breadth of the National Curriculum?</p> <p>At TAEP, each group is taught Maths daily. The Maths scheme of work has been designed and planned with TAEP's transient cohort of students in mind. The curriculum content matches that of the National Curriculum. The Maths department aims to enable each student with the necessary skills to solve problems and become competent and successful individuals, confident in their own mathematical abilities. Senior leaders and heads of department conduct regular book scrutinies to check curriculum coverage and quality of work. This also helps to identify any necessary support or interventions required to ensure the full school maths curriculum is being taught.</p>
	<p>Is challenge understood in terms of curriculum end points?</p> <p>Teachers in the Maths Department are familiar with AQA Curriculum Route Map which informs them of what the children learn in the previous year group and what they will go on to learn next. Teachers and support staff attend Professional Development Meetings including ones led by the maths head of department in which staff see the mathematical understanding and abilities expected in year groups. Every student is expected to achieve at least one maths qualification by the end of year 11 – whether Entry Level Certificate, Functional Skills or GCSE.</p>

<p><i>Curriculum components</i></p>	<p>Do pupils have the prior knowledge necessary to learn new curriculum content? The Maths scheme of work has been planned to ensure sequential, layered knowledge acquisition so that pupils are continuously embedding key mathematical concepts and knowledge. This allows them to learn the necessary skills to become fluent mathematicians who can apply their knowledge to problem solving. As part of this, continuous retrieval of prior knowledge is understood by staff as essential for effective teaching - especially in mathematics, where the development of secure mathematical ideas is necessary to learn new concepts. Applying the knowledge learned in one area of maths to solving problems in another area is key to becoming a successful mathematician. To support the embedding of essential prior knowledge and promote rapid mental recall, a whole school Maths Challenge is performed daily. Retrieval of prior knowledge is also encouraged through lesson starters, plenaries and group discussions; all of which help to embed key mathematical concepts and any arbitrary information required to access future learning.</p>
	<p>Does curriculum planning identify small enough component steps so that all pupils can ultimately achieve ambitious end points? The progression of each mathematical topic has been mapped to enable teaching staff to know what the 'next steps' are in the delivery of each topic. The maths scheme of work is planned so that relevant prior learning is taught at the start of a sequence of lessons. This allows for students' prior knowledge to be retrieved and brought to the front of their thinking and also shows teachers which component steps require teaching at that point. This obviously entails differentiation by staff of the component steps to ensure each pupil can access the learning. The maths scheme of work revisits topics and builds gradually on prior knowledge, this supports the working memory of students rather than place unnecessary strains on it which in turn supports the development of new learning without overwhelming students. Students are thus able to make sound progress, reach their full potential and achieve ambitious end points.</p>

<p><i>Curriculum sequencing</i></p>	<p>Does planning consider the sequencing of content at different scales to create readiness for future learning:</p> <p>Maths lessons are sequenced to follow on distinctly from relevant prior learning. At the start of lessons, prior learning is reviewed with the class. Throughout the lessons, questioning and formative assessments are woven into teaching practice. At the end of the independent practising part of the lesson, teacher’s review what has been taught in the lesson, helping to lead on appropriately to the learning which will take place in the next lesson.</p> <p>Lessons within a topic in maths are planned to ensure sequential, layered knowledge acquisition. At the start of a topic, teachers identify what the students have been taught previously in that topic – either in previous year groups or at their previous mainstream schools. Lessons are then taught in components which lead to the composite task of being able to apply new learning in a range of ways in order to develop fluency and reasoning and thus solve mathematical problems. This is additional to any reasoning and problem solving which forms part of each maths lesson and which is recognised as an essential part of everyday maths.</p> <p>The sequence in which topics are taught is progressive so that they naturally follow on and build on prior knowledge. Medium Term Plans are produced each term in line with the Maths Scheme of Work and topics are planned with the individual students in mind. This allows for differentiation at an individual level to ensure topic content is sequenced appropriately and made accessible to each student. Pupils are then in a position to apply what they have learned effectively and build further on that knowledge in future learning.</p>
<p><i>Rigour (where relevant)</i></p>	<p>Do pupils gain disciplinary knowledge of how the subject ‘works’ and engage in disciplinary practices?</p> <p>Teachers use mathematical vocabulary and encourage students in the correct use of subject specific language. Maths text books and written examples/key words are used in each class to support this and maths vocabulary/literacy in Maths is used overtly within classrooms. The Maths department recognises that effective readers make effective mathematicians, therefore interactive displays show vocabulary, methodology and key knowledge relevant to the learning in that class. Students are encouraged to use the displays to aid their understanding and to reflect on their current grades and ‘next steps’. Pupils are taught effective methods and algorithms to perform calculations and solve problems. More able students are able to derive formulae and use proofs to solve problems. Teachers are able to model different methods to solve the same problem – being flexible in this regard makes the content more accessible to students (after all, students learn or interpret problems in different ways). Pupils are encouraged to model their methods/answers to their peers – this helps to embed the methodology in their own mind and aids knowledge retrieval. Independent work encourages personal learning and thinking skills and group discussions encourage students to share their own thoughts and ideas which in turn helps to deepen understanding and build self confidence in the subject.</p>

	<p>Do teachers ensure pupils are drawing on enough knowledge to answer subject specific questions or engage meaningfully in subject disciplinary practices? In maths, problem solving is taught in all lessons and reasoning is required throughout lessons. Reading is promoted throughout each subject in school and in particular, wordy questions are used in mathematics. Pupils are required to read and interpret the questions effectively so that they are able to extract the ‘maths’ from the given context to enable the problem to be solved. Problems are chosen specifically with the current level of knowledge and understanding of the pupils in mind. Therefore, prior knowledge and component steps are taught beforehand to enable students to access the given tasks. Tasks and given problems are differentiated to match student ability whilst simultaneously challenging and stretching the student.</p>
	<p>Do teachers confuse ‘learning through doing’ (a pedagogy) with the curriculum goal of acquiring disciplinary knowledge? In lessons, new knowledge is taught in small steps and modelled explicitly by teachers, this allows disciplinary knowledge to be taught prior to children practising what has been taught to them. Occasionally, and due to the nature of the subject, it is appropriate for students to carry out their own investigations and derive a solution for themselves – in this sense, they are effectively ‘learning through doing’.</p>
<p><i>Memory</i></p>	<p>Do teachers identify crucial components, emphasise and repeat these and ensure they are remembered long term? Teachers teach mental/oral sessions in which students recall different key components of maths such as number bonds, times tables and division facts, fraction, decimal and percentage equivalents etc. Teachers embed practices of teaching for fluency and make connections between areas of maths where possible. This is seen in pupils books and lesson visits and coaching. The whole school daily maths challenge raises the profile of fluency in mathematics and helps to improve memory recall.</p>
	<p>When pupils struggle, do teachers check which prior knowledge components are missing/not automatic? Teachers work alongside pupils in lessons. We recognise that the most valuable way to identify an individual pupil’s misconceptions or missing prior knowledge is by seeing how they work. This may be as part of a class, group or on their own. When a teacher identifies the barrier to automaton or understanding, they can work with the student to teach them the correct method or, if a longer-term approach is required, they can organise for this to be put in place either through use of teaching assistants working one-to-one in class or for a separate intervention session.</p>
<p><i>Pedagogy</i></p>	<p>Do teachers apply generic pedagogies, e.g. differentiation, feedback) without considering curricular intent? Teachers tailor their pedagogies dependant on the topic taught and the class cohort. All teachers explicitly model knew content before students are expected to practise it. At TAEP it is essential that teachers ‘get to know’ their students – their levels, learning styles, barriers etc. Only then can the teachers differentiate effectively within the classroom. Differentiation, feedback, engagement etc. are all dependent on the current class cohort and are planned with the curricular content and learning outcomes in mind. Teachers use differentiation thoughtfully and purposefully to ensure that all students maintain a steady progress.</p>

	<p>Is 'challenge' misunderstood as generic activity types? Teachers understand that challenge in maths relates to the depths of knowledge required in an activity, rather than 'more of the same' activity. NCETM Teaching for Mastery supports the understanding of the types of challenge appropriate for topics in different year groups. Open ended investigations are also useful for challenging and stretching students and can be used for all ability levels and year groups.</p> <p>Do activities require confident knowledge of too many 'fragile' components, overloading working memory? Maths is planned to be taught in a way the does not overload working memory. At TAEP, we are conscious that some of the students have recognised working memory difficulties. Lessons include scaffolds and differentiation allows for adaptive teaching/learning enabling students to access lesson content in such a way that they are not reliant on too many 'fragile' components. Teachers understand how schemas work in the brain and that component knowledge must be secure for students to develop confident knowledge in maths. This understanding is incorporated into the planning and delivery of lessons for all pupils and takes into consideration those specific students with SEND and working memory difficulties.</p>
<i>Assessment</i>	<p>Is formative assessment fit for purpose, e.g. a timely check that curriculum components have been remembered, rather than, more problematically, a summative test of composites being used to identify components? Within lessons and between lessons in a sequence, component aspects of knowledge are checked and re-taught if necessary, so that children are able to develop secure schemas of knowledge. Next lessons are planned based on formative assessments made by the teacher in prior lessons so that sequential, layered knowledge acquisition is gained and lessons are informed by previous learning in the class.</p>

Is summative data collection disproportionate, inefficient or unsustainable for staff?

At TAEP, it needs to be understood that, due to the nature of the provision, the student population is very transient. In order to show progress for students who are with us for a very short time (in some cases only a matter of a few weeks), it is necessary to perform assessments at frequent intervals. Therefore, summative assessments are carried out every half term. Six data collection points per year would be considered extreme for a mainstream school, however with a current population of approximately 80 students, here at TAEP, it is both manageable and necessary.

Are pupils who fall behind identified within the lesson sequence, or less helpfully, are interventions based on data from a summative assessment?

During a lesson, teachers work alongside the children to assess understanding and misunderstandings, move learning on and teach away from misconceptions. Therefore, pupils who fall behind are identified in the lesson or immediately after prior to the next lesson, so that interventions and support are given in a timely fashion and do not exacerbate misconceptions. In fact, within Maths lessons, it is often useful to 'highlight' misconceptions and eliminate them at source, so to speak.

Culture

A climate of high expectations where pupils' love of the subject can flourish

How do teachers get the best from pupils?

Across the school, a culture of high expectations is fostered. This is therefore the same in maths lessons. Teachers insist on children being focused and engaged in learning, producing a good amount of work in lessons and working hard. Teachers model this constantly in all lessons, particularly in maths. Teachers' expectations of how children work, their presentation and work produced is made clear to children in lessons and is celebrated when achieved using positive praise and the school's reward systems. Good work is also showcased within displays, both in class and around the school.

How do teachers enrich the curriculum subject?

Teachers enrich mathematics in our school by linking maths to the real world in a way that is relatable to the lives of the students in our cohort. Woven throughout the teaching of maths is 'real life examples' such as measuring themselves or things around them. Problems are made to be realistic and can help them in their own lives, e.g. when using money, recipes, timetables etc. Teachers are well practised in the use of concrete and pictorial objects to enrich the teaching and learning of maths and this way of teaching is understood as essential in every day maths lessons. This brings maths 'to life' for the pupils.

Are there mechanisms for taking action when pupils display low effort, for example in written work and homework?

The school's behaviour policy is clear and understood by children, and is used as needed to maintain a culture of high expectations. Teachers are well-practised in seeking support from senior leaders if needed if an occurrence persists where a child is displaying low effort. Teachers also make effective use of the SENCO if a child's learning or behaviour and attitude is of concern. The school aims to maintain good communication with parents/carers. If a child's work or effort is of concern, parents will be invited to discuss this with teachers and next steps will be identified, actioned and monitored.



<i>Systems</i>	Subject processes and staff support
	<p>What do the strengths or weaknesses already identified indicate about effective functioning to deliver a quality subject curriculum?</p> <p>Subject pedagogy and processes for maths are systemic. Pedagogical approaches to teaching maths are well-considered so that knowledge is taught explicitly and skills are thus acquired. The school is rigorous in identifying students who need additional support and plans are actioned in a timely manner and then monitored to ensure knowledge gaps are bridged. Furthermore, children with SEND are supported so that they can achieve well in our ambitious curriculum. A culture of high-expectations is fostered across year groups and there is consistency in class of what is expected from the children in lessons and in their work. Reasoning and problem solving is a focus in our school and teachers are confident in ensuring this is part of every lesson.</p>
	<p>Probe systems for staff support and subject CPD, curriculum construction and to ensure consistent quality of subject education.</p>

When new teachers are recruited, subject leaders lead coaching meetings to induct staff as to the effective teaching of maths and monitor and support the new staff member. Where appropriate guided observations are organised for new staff to observe best practise alongside a senior leader. CPD is led by leaders from across the school and is designed to be useful and impactful for teachers. Teachers' workload is well-considered when planning the maths curriculum. The curriculum is adapted from the AQA Route Map which the school subscribes to by way of GCSE examinations and informs teachers of how they should teach topics and lessons so that the curriculum is covered in the breadth and depth expected. Teachers are responsible for sourcing their own preferred resources, however there is a successful culture of sharing resources within the maths department. The school marking policy is effective and not onerous on staff. All teachers are coached by senior leaders in professional development days. Book scrutinies by the subject leader and senior leadership are frequent and allow for coaching teachers and monitoring curriculum coverage to be checked and support made available to teachers if needed.



<i>Policy</i>	Impact of whole school-wide policies on subject delivery?
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How whole-school timetabling, marking, assessment, CPD policies and priorities etc affect the quality of subject education.

- Timetabling – This is done by a senior leader and ensures maths is taught every day.
- Marking – Marking policy in maths is effective and not onerous on staff. Stickers available to make marking easier and less onerous in respect to writing
- Assessment – Formative assessment is continuous within and between lessons. Summative assessments are carried out half termly to cater for the transient population and show progress for each student.
- CPD policies – This is planned according to the needs of the subject in the school at the time in order to be purposeful and impactful.