# ITT Course Curriculum: BSc. (Hons) Secondary Mathematics Education with QTS\*

Year 1

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## How to use this ITT curriculum

This ITT curriculum outlines what trainees in year 1 on this course are expected to know and be able to do for each week they are on their ITT and the method by which trainee progression will be assessed. It is subject specific, informed by pertinent research and underpinned with the Core Content Framework and its associated evidence (as necessary for those seeking to be recommending for QTS at the conclusion of their ITT). It is sequential in its approach, mapped against the various components of the Core Content Framework and shows a purposeful integration of centre-based (university-based) learning into Professional Practice. There is no separate ‘Professional Practice’ curriculum for year 1 trainees to follow. Instead, there is one single curriculum which encompasses all the learning which should take place throughout the ITT course.

### **If you are a trainee:**

This is the curriculum you will follow each week throughout your ITT course both when you are at university and when you are on Professional Practice (these weeks are shown in orange). It provides the learning which will be delivered to you in your subject, the knowledge, and skills you will be expected to demonstrate each week and the questions which assist you, your tutor, and your mentor (during Professional Practice) in assessing if you are making progress or if further support is needed. You need to complete every week of this curriculum to meet the necessary Standards required for QTS recommendation at the end of this course and to ensure you are able to transition into your Early Career Teaching (ECT) phase.

### **If you are a school-based expert colleague (mentor or lead):**

This curriculum outlines what year 1 trainees in this subject should know and be able to do throughout their ITT. This includes the weeks when they are on Professional Practice being supported by their expert mentor (these weeks are shown in orange). There is no separate ‘Professional Practice’ curriculum, rather one single subject specific curriculum which encompasses every week of ITT allowing you to see the prior learning and what trainees can already do and understand prior to working with you. Throughout their course trainees will continue to have their learning delivered by Edge Hill colleagues (this will be online throughout Professional Practice). We ask our expert-colleagues to provide opportunities for trainees to demonstrate, practise, receive feedback, or get better at the skills which they are expected to be ‘able to do’ each week. We also ask mentors to assess the extent to which the trainee has made progress each week using the ‘key questions’ provided and completing the relevant section (2) on the Weekly Development Summary (WDS) during the weekly mentor meeting in addition to confirming on the form if the trainee is making sufficient progress. Additional support for mentors is available via the weekly communications and the [FoE mentor space.](https://sites.google.com/view/foementorspace/secondary-and-further-education/pp-paperwork)

## Rationale of curriculum coverage and sequence including use of pertinent research:

The curriculum for year 1 Undergraduate Secondary Mathematics Education course ensures complete coverage of the ITT Core Content Framework and its associated evidence basis (Department for Education, 2019) as appropriate for Secondary ITT. The content contained in early sessions provides trainees with an understanding of the importance of mathematics in the curriculum including the current debates and key issues related to the subject; for example, in the way in which the teaching of mathematics for mastery programme influences much of the current thinking in mathematics education and is fundamental to curriculum design.  This knowledge of mastery for mathematics is strongly aligned to the Subject and Curriculum strand of the CCF regarding how children master foundational concepts and knowledge before moving on whilst, at the same time, this aspect of the curriculum aligns with the key ideas about How Pupils Learn as teaching for mastery reflects the importance of understanding how memory works.  Prioritising the ideas centred on teaching mathematics for mastery provides a sound base of knowledge for the trainees in readiness for appreciating the implications for the key themes of the mathematics national curriculum programmes of study; for example, an understanding of mathematical fluency and coherence directly supports and prepares trainees for the way in which mathematical thinking underpins the structure of the curriculum.  These aspects are underpinned by Hodgen et al. (2018). This broad discussion on the principles of mathematics education supports the trainees in considering the finer details of subject knowledge, specific pedagogical approaches, and an understanding of how mathematical misconceptions impact on learning and how this is linked to the curriculum (Ofsted, 2021).

## Delivery of curriculum outcome(s) into composite and component elements:

Curriculum outcomes have been broken down into composite and component elements to aid the year 1 trainees in gaining a secure knowledge and understanding of the key learning. For example, to ensure that trainees can assess pupils’ mathematical understanding effectively, they are required to understand some of the differences in assessments, how to plan for assessment tasks, and how to use questioning as an effective tool.

## How the curriculum enables trainees to develop their sense of social justice including the importance of inclusion and representation in their subject:

The importance of how mathematics education can support all aspects of equity, diversion and inclusion is embedded into all sessions as well as through discrete sessions. For example, in addition to sessions dedicated to content such as inclusion and colonisation, trainees are encouraged to promote a philosophy that mathematics is accessible to all pupils with positive language in every session.

## Opportunities to revisit key learning:

 Year 1 trainees routinely revisit key learning regularly throughout the programme and build on the earlier work on the curriculum to consider how pupils learn mathematics.  They gain knowledge of a range of learning theories by being asked to consider the ways in which teaching and learning of mathematics is influenced by key theorists.  There are strong and coherent links between this work and subject-specific content in the earlier curriculum; for example, trainees are required to practice and apply their knowledge of mathematical pedagogical approaches (initially considered in week 5) to the content on assessment, adaptive teaching and planning in relation to their understanding of the mathematics curriculum (in weeks 11-18). Similarly, although there is a strong emphasis on the way in which, for example, Cognitive Load Theory relates to effective mathematics teachers in week 14, trainees are also encouraged to reconsider this content in how it supports approaches to modelling and scaffolding in week 18.

## References

* Department for Education (DfE) 2019. ITT Core Content Framework <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/974307/ITT_core_content_framework_.pdf> (Last Accessed 03/08/22)
* Hodgen, J., Foster, C., Marks, R., & Brown, M. (2018). Evidence for Review of Mathematics Teaching: Improving Mathematics in Key Stages Two and Three: Evidence Review. London: Education Endowment Foundation. Available from: <https://educationendowmentfoundation.org.uk/evidence-summaries/evidencereviews/improving-mathematics-in-key-stages-two-and-three>
* Ofsted (2021) Research Review Series: Mathematics. Available from: <https://www.gov.uk/government/publications/research-review-series-mathematics/research-review-series-mathematics>

| Week (starting 3.10.22) | For the subject they are training in trainees should know that:*(max 3 bullet points)* | For the subject they are training in trainees should be able to:*(max 3 bullet points)* | Key questions *(2-3 as indicators of progress)* | CCF | Method of Assessment |
| --- | --- | --- | --- | --- | --- |
| 1 | * Mathematics is a universal language and that mathematics teachers are key role models, who can influence the attitudes, values and behaviours of their pupils within the mathematics learning environment.
* A culture of mutual trust and respect supports effective relationships between mathematics teachers and their pupils.
* A predictable and secure environment benefits all pupils but is particularly valuable for pupils with special educational needs.
 | * Communicate their passion and commitment of mathematics to pupils.
* Demonstrate a belief in the academic potential of pupils and begin to evaluate what a ‘good’ mathematics learning experience looks like in the classroom environment.
* Communicate their ideas about the value of mathematics as a subject and the ability to create a sense of mathematical curiosity in all pupils.
 | *Reflect on the role and purpose of education: what does a good mathematics classroom look like?* | HE 2, 5MB2 | WDS |
| CCF evidence base | \*PISA (2015) PISA in Focus: Do teacher-student relations affect students’ well-being at school? Accessible from: https://doi.org/10.1787/22260919.  |
| 2 | * Establishing and reinforcing routines, including through positive reinforcement, can help create an effective learning environment within the mathematics classroom.
* Seeking to understand pupils’ differences, including their different levels of prior knowledge and potential barriers to learning, is an essential part of mathematics teaching.
* Adapting teaching in a responsive way, including by providing targeted support to pupils who are struggling, is likely to increase pupil success and engagement in mathematics.
 | * Provide scaffolding when breaking down new mathematical concepts into smaller accessible steps.
* Develop a positive, predictable and safe environment for all pupils and support pupils with a range of educational needs.
* Use different mathematical techniques that develop pupils’ fluency in Mathematics in order to increase pupils’ engagement in the classroom (such as using different ways to factorise quadratic equations).
 | *Is equity or equality more important in education?**What role should a mathematics teacher have to create a successful learning experience for all pupils?* *How much freedom should students have to learn independently and develop as independent pupils?* | MB1AT2AT3 | WDS |
| CCF evidence base | \*Davis, P., Florian, L., Ainscow, M., Dyson, A., Farrell, P., Hick, P., Rouse, M. (2004) Teaching Strategies and Approaches for Pupils with Special Educational Needs: A Scoping Study. Accessible from: http://dera.ioe.ac.uk/6059/1/RR516.pdf.  |
| 3 | * Learning involves a lasting change in pupils’ capabilities or understanding.
* A school’s curriculum enables it to set out its vision for the knowledge, skills and values that its pupils will learn, encompassing the basic and national curriculum within a coherent wider vision for successful learning.
* Reflective practice, supported by feedback from and observation of experienced colleagues, professional debate, and learning from educational research, is also likely to support improvement.
 | * Discuss the rationale for curriculum choices, the process for arriving at current curriculum choices and how the school’s mathematics curriculum materials inform lesson preparation.
* Reflect on progress made, recognising strengths and weaknesses and identifying next steps for further improvement.
* Engage critically with research using evidence to critique practice and be aware of the current debates and national foci around mathematics as a subject.
 | *Why do we need a mathematics curriculum?**What are the difficulties to overcome in becoming a reflective students and practitioner and why is it important to do so?* | HPL1SC1PB2 | WDS |
| CCF evidence base | Fordham / Counsell curriculum as progress model. Narrative. Not in CCF EB |
| 4 | * Secure subject knowledge helps mathematics teachers to motivate pupils and teach effective mathematics lessons.
* Mathematics is a statutory part of the basic curriculum in all maintained schools and that pupils’ prior knowledge plays an important role in how they learn.
* The subject of Mathematics contributes to the development of literacy and numeracy across the curriculum.
 | * Audit their own mathematics subject knowledge, devise an action to address gaps of knowledge and use the library to develop wider reading strategies around mathematics subject knowledge.
* Evaluate strengths and weaknesses of different agreed mathematics syllabi.
* Promote literacy within mathematics teaching as this contributes to the way in which pupils develop their learning.
 | *How can you ensure that your reading is purposeful and effective?**What is the place of mathematics within the School Curriculum?**What are locally agreed mathematics syllabi?* | SC2 | WDS |
| CCF evidence base | Ball, D. L., Thames, M. H., & Phelps, G. (2008) Content knowledge for teachers: What makes it special? *Journal of Teacher Education,* 2008 59: 389 DOI: 10.1177/0022487108324554 [Online] Accessible from: https://www.math.ksu.edu/~bennett/onlinehw/qcenter/ballmkt.pdf.  |
| 5 | * Ensuring that all pupils master foundational concepts and knowledge before moving on, is likely to build pupils’ confidence and help them succeed in mathematics.
* Explicitly teaching pupils the knowledge and skills they need to succeed in mathematics is beneficial.
* Outstanding subject knowledge and awareness of the different pedagogical approaches are essential to teaching mathematics.
 | * Create various opportunities for all pupils to become more secure in their conceptual understanding of curriculum topics of Mathematics.
* Design mathematics lessons which include opportunities for teaching, practice and assessment and build on prior mathematics subject knowledge.
* Develop cross-curricular links between mathematics and other subjects.
 | *What are the foundational concepts in mathematics?**What is the key to successful learning in mathematics?* | SC3SC5 | WDS |
| CCF evidence base | \*Coe, R., Aloisi, C., Higgins, S., & Major, L. E. (2014) *What makes great teaching. Review of the underpinning research*. Durham University: UK. Available at: http://bit.ly/2OvmvKO  |
| 6Academic Achievement Week | * An important factor in learning is memory, which can be thought of as comprising two elements: working memory and long-term memory.
* In Mathematics and all subject areas, pupils learn new ideas by linking those ideas to existing knowledge, organising this knowledge into increasingly complex mental models (or “schemata”); carefully sequencing teaching to facilitate this process is important.
* Mathematics Teachers can make valuable contributions to the wider life of the school in a broad range of ways, including by supporting and developing effective professional relationships with colleagues.
 | * Balance exposition, repetition, practice of critical skills and knowledge in Mathematics lessons.
* Observe how expert colleagues use retrieval and spaced practice to build automatic recall of key knowledge and how to deconstruct this approach.
* Develop as a professional, by receiving clear, consistent, and effective mentoring on the duties relating to Part 2 of the Teachers’ Standards in a partner high school.
 | *What have you learnt about teachers’ professionalism and how pupils learn from your visit to a high school?* | HPL3SC7PB3 | WDS |
| CCF evidence base | \*Cordingley, P., Higgins, S., Greany, T., Buckler, N., Coles-Jordan, D., Crisp, B., Saunders, L. & Coe, R. (2015) Developing Great Teaching. Accessible from: https://tdtrust.org/about/dgt. [accessed 18 October 2018].  |
| 7 | * Sequencing of subject knowledge in mathematics plays an important role in how pupils learn; committing some key facts to their long term memory is likely to help pupils learn more complex ideas.
* In order for pupils to think critically in Mathematics, they must have a secure understanding of knowledge within the subject area they are being asked to think critically about.
* Setting high expectations in relation to pupils’ outcomes by designing engaging and challenging mathematical learning experiences is an essential aspect of teaching.
 | * Create various opportunities for all pupils to become more secure in their conceptual understanding of curriculum topics of mathematics.
* Draw explicit links between new content and the core concepts and principles in Mathematics.
* Establish clear expectations and routines in the mathematics classroom which create a consistent and inclusive learning environment for all pupils and protect time for rest and recovery and be aware of the sources of support available to support good mental wellbeing.
 | *Why is it important as mathematics teachers to know and understand how learning takes place?**How do you understand wellbeing and self-care in education?* | HPL2Sc6PB | WDS |
| CCF evidence base | \*Rosenshine, B. (2012) Principles of Instruction: Research-based strategies that all teachers should know. *American Educator*, 12–20. https://doi.org/10.1111/j.1467-8535.2005.00507.x.  |
| 8 | * Pupils are likely to struggle to transfer what has been learnt in one discipline to a new or unfamiliar context – for example using the four different operations to solve complex problems.
* Regular purposeful practice of what has previously been taught can help consolidate material and help pupils remember what they have learned in Mathematics.
* Pupils are motivated by intrinsic factors (related to their identity and values) and extrinsic factors (related to reward including grades).
 | * Provide tasks that support pupils to learn key ideas – such as using faded worked examples to provide scaffolding of mathematical methods.
* Give manageable, specific and sequential instructions and check pupils’ understanding of instructions before a task begins.
* Avoid overloading working memory, by taking into account pupils’ prior knowledge when planning how much new information to introduce.
 | *Why is it important as Mathematics teachers to know and understand how learning takes place?**How can intrinsic and extrinsic rewards be used to support behaviour management in Mathematics?*  | SC8HPL7MB6 | WDS |
| CCF evidence base | Hattie, J. (2012) Visible Learning for Teachers. Oxford: Routledge.  |
| 9 | * Teacher expectations can affect pupil outcomes; setting goals that challenge and stretch pupils is essential.
* There is a common misconception that pupils have distinct and identifiable learning styles. This is not supported by evidence and attempting to tailor lessons to learning styles is unlikely to be beneficial.
* Attitudes to mathematics can impact on the behaviour of pupils.
 | * Engage critically with mathematics research knowing that mathematics teaching is informed by and informs educational policy.
* Use intentional and consistent language that promotes challenge and aspiration.
* Create a positive and respectful learning environment, one that promotes ‘can do’ attitude to learning mathematics, and where making mistakes and learning from them are part of the daily routine.
 | *Are Learning Styles simply a myth?**What is educational research for?* | HE3AT6 | WDS |
| CCF evidence base | Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008) Learning Styles: Concepts and Evidence. *Psychological Science in the Public Interest*, *9* (3). Willingham, D. T. (2010) The Myth of Learning Styles, *Change*, 42(5), 32–35.  |
| 10 | * Effective Mathematics teachers introduce new material in steps, explicitly linking new ideas to what has been previously studied and learned.
* Explicitly teaching pupils metacognitive strategies linked to subject knowledge, including how to plan, monitor and evaluate, supports independence and academic success.
* A culture of mutual trust and respect supports effective relationships between Mathematics teachers and their pupils.
 | * Create a culture of respect and trust in the classroom that supports all pupils to succeed (e.g. by modelling the types of courteous behaviour expected of pupils).
* Sequence Mathematics lessons so that pupils secure foundational knowledge before encountering more complex content.
* Provide opportunities for pupils to develop their reasoning, problem-solving and fluency in mathematics and set achievable tasks that stretch pupils within the curriculum.
 |  *What are the key Mathematics skills that support learning and how can they be developed?**What are considered high expectations at the different key stages?*  | CP2CP5HE5 | WDS |
| CCF evidence base | Education Endowment Foundation (2017) Metacognition and Self-regulated learning Guidance Report. [Online] Accessible from: https://educationendowmentfoundation.org.uk/tools/guidance-reports/  |
| 11 | * Effective Mathematics teaching can transform pupils’ knowledge, capabilities and beliefs about learning.
* Practice is an integral part of effective Mathematics teaching; ensuring pupils have repeated opportunities to practise, with appropriate guidance and support, increases success.
* Pupils learn at different rates and that adaptive teaching does not mean more of the same tasks; it is designing mathematical activities that aim to develop deeper mathematical thinking in all pupils.
 | * Set high expectations in relation to pupils’ outcomes by designing engaging and challenging mathematical learning experiences within the mathematics learning environment.
* Balance exposition, repetition, practice and retrieval of critical knowledge and skills.
* Provide scaffolding by breaking tasks down into constituent components when first setting up independent practice (e.g. using tasks that scaffold pupils through meta-cognitive and procedural processes).
 | *What does effective teaching and learning look like in Mathematics and how can this be achieved?*  | CP1CP8 | WDS |
| CCF evidence base | Willingham, D. T. (2009) Why don’t students like school? San Francisco, CA: JosseyBass. |
| 12-13 Christmas break |
| 14 | * Guides, scaffolds and worked examples can help pupils apply new ideas, but should be gradually removed as pupil expertise increases.
* Modelling helps pupils understand new processes and ideas; good models make abstract ideas accessible.
* Mathematics teachers should be aware of the current debates and national foci around mathematics as a subject.
 | * Use modelling, explanations and scaffolds, acknowledging that novices need more structure early in a domain.
* Remove scaffolding only when pupils are achieving a high degree of success in applying previously taught material.
* Provide sufficient opportunity for pupils to consolidate and practise applying new knowledge and skills.
 | *How can critical thinking be developed within Mathematics lessons?**How could you model critical thinking to pupils in mathematics?* | CP3 CP4 | WDS |
| CCF evidence base | Kirschner, P., Sweller, J., Kirschner, F. & Zambrano, J. (2018) From cognitive load theory to collaborative cognitive load theory. In International Journal of Computer-Supported Collaborative Learning, 13(2), 213-233.  |
| 15-16Assessment Weeks |
| 17Start of Semester 2 | * Effective mathematics teaching can transform pupils’ knowledge, capabilities and beliefs about learning mathematics as a subject.
* Effective assessment in mathematics is critical to teaching because it provides teachers with information about pupils’ understanding and highlights misconceptions.
* In Mathematics planning of assessment tasks should be linked to learning outcomes.
 | * Include a range of types of questions in class discussions to stretch and challenge pupils (e.g. by modelling new vocabulary or asking pupils to justify answers).
* Plan formative assessment tasks linked to lesson objectives and think ahead about what would indicate understanding (e.g. by using hinge questions to pinpoint knowledge gaps).
* Structure assessment tasks to check for prior knowledge, gaps and mathematical misconceptions.
 | *How can questioning be used as a form of formative assessment?**What is the difference between formative and summative assessment?**Why are both important?* | CP1A1A2 | WDS |
| CCF evidence base | \*Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2004). Working inside the Black Box: Assessment for Learning in the Classroom. Phi Delta Kappan, 86(1), 8–21. Accessible from: https://eric.ed.gov/?id=EJ705962  |
| 18 | * Assessment of learning in mathematics is a critical part of the teaching and learning cycle and that modelling and scaffolding contributes to assessment in mathematics.
* To be of value, teachers use information from assessments to inform the decisions they make; in turn, pupils must be able to act on feedback for it to have an effect.
* High-quality feedback in mathematics can be written or verbal; this needs to be accurate, clear, encouraging, and provide specific guidance on how to improve.
 | * Monitor pupils’ work during lessons including checking for misconceptions, focusing on specific actions for pupils and providing time for pupils to respond to feedback.
* Using pupils’ data to build assessment tasks into their lesson plans that support, challenge and inform future learning.
* Adapt their assessment techniques to meet the needs of SEND pupils and be inclusive of all pupils.
 | *What constitutes good assessment practice in Mathematics?**How could you use the data and information from assessment to inform your planning and adapt your teaching?* | A3A4A5 | WDS |
| CCF evidence base | Wiliam, D. (2017) Assessment, marking and feedback. In Hendrick, C. and McPherson, R. (Eds.) *What Does This Look Like in the Classroom? Bridging the gap between research and practice*. Woodbridge: John Catt.  |
| 19 | * To access the curriculum, early literacy provides fundamental knowledge; reading comprises two elements: word reading and language comprehension; systematic synthetic phonics is the most effective approach for teaching pupils to decode.
* Every teacher can improve pupils’ literacy, including by explicitly teaching reading, writing and oral language skills specific to mathematics.
* High-quality Mathematics teaching has a long-term positive effect on pupils’ life chances, particularly for pupils from disadvantaged backgrounds.
 | * Teach new mathematical vocabulary and plan for pupils to be repeatedly exposed to high-utility and high-frequency vocabulary in problem solving.
* Model and require high-quality oral language, recognising that spoken mathematical language underpins understanding of the question and explaining of workings out (e.g. requiring pupils to respond to questions in full sentences, making use of relevant mathematical vocabulary).
* Promote reading for understanding and responding to mathematical problems.
 | *Are we all literacy teachers?**How could you introduce unfamiliar vocabulary in a new mathematics topic?**How can we approach promoting reading and understanding for pleasure?* | SC9SC10HE6 | WDS |
| CCF evidence base | Machin, S., McNally, S., & Viarengo, M. (2018) Changing how literacy is taught: Evidence on synthetic phonics. American Economic Journal: Economic Policy, 10(2), 217–241. https://doi.org/10.1257/pol.20160514.  |
| 20 | * Prior knowledge plays an important role in how pupils learn; committing some key facts to their long-term memory is likely to help pupils learn more complex ideas in Mathematics.
* Where prior knowledge is weak, pupils are more likely to develop misconceptions, particularly if new ideas are introduced too quickly.
* In mathematics pupils learn new ideas by linking those ideas to existing knowledge, organising this knowledge into increasingly complex mental models (or “schemata”); carefully sequencing Mathematics teaching to facilitate this process is important.
 | * identify essential concepts, knowledge, skills and principles within Mathematics.
* Ensure pupils have relevant domain-specific knowledge, especially when being asked to think critically within Mathematics.
* sequence lessons so that pupils secure foundational knowledge before encountering more complex content.
 | *What is mathematics literacy?**How would you sequence your mathematics curriculum?* | HP2HP6SC7 | WDS |
| CCF evidence base | Young, M. F. D. (1998) *The curriculum of the future : from the "new sociology of education" to a critical theory of learning*. London: Falmer Press |
| 21 | * Seeking to understand pupils’ differences, including their different levels of prior knowledge and potential barriers to learning, is an essential part of Mathematics teaching.
* Adapting teaching in a responsive way, including by providing targeted support to pupils who are struggling, is likely to increase pupils’ success in Mathematics.
* Adaptive teaching is less likely to be valuable if it causes the teacher to artificially create distinct tasks for different groups of pupils or to set lower expectations for particular pupils.
 | * Adapt mathematics lessons that meet the needs of all pupils by designing mathematical activities that aim to develop deeper mathematical thinking in all pupils.
* decide whether intervening within lessons with individuals and small groups would be more efficient and effective than planning different lessons for different groups of pupils.
* Apply high expectations to all groups, and ensuring all pupils have access to a rich curriculum.
 | *What differences are there between adaptive teaching and differentiation?**How can we ensure that learning in Mathematics is inclusive?* | AT1AT3AT4 | WDS |
| CCF evidence base | Hattie, J. (2009) Visible learning: a synthesis of over 800 meta-analyses relating to achievement. London: Routledge. |
| 22Advance Achievement Week | * Seeking to understand pupils’ differences, including their different levels of prior knowledge and potential barriers to learning, is an essential part of Mathematics teaching.
* Teaching assistants (TAs) can support pupils more effectively when they are prepared for Mathematics lessons by teachers, and when TAs supplement rather than replace support from teachers.
* A predictable and secure environment benefits all pupils and is particularly valuable for pupils with special educational needs.
 | * support pupils with a range of additional needs, including how to use the SEND Code of Practice, which provides additional guidance on supporting pupils with SEND effectively.
* work with the SENDCO and other professionals supporting pupils with additional needs, including how to make explicit links between interventions delivered outside of lessons with classroom teaching.
* Discuss with expert colleagues how to share the intended lesson outcomes with teaching assistants ahead of lessons to ensure that support provided by teaching assistants in lessons is additional to, rather than a replacement for, support from the teacher.
 | *What have you learnt from your visit to a SEND school?**How were experienced teachers using TAs to support students?* | AT2PB6MB2 | WDS |
| CCF evidence base | Department for Education (2018) Schools: guide to the 0 to 25 SEND code of practice, <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/349053/Schools_Guide_to_the_0_to_25_SEND_Code_of_Practice.pdf>.  |
| 23 | * Establishing and reinforcing routines, including through positive reinforcement, can help create an effective learning environment.
* Teachers can influence pupils’ resilience and beliefs about their ability to succeed, by ensuring that all pupils have the opportunity to experience meaningful success in Mathematics.
* Building effective relationships is easier when pupils believe that their feelings will be considered and understood.
 | * Establish routines at the beginning of the school year, both in the mathematics classroom and around the school.
* Develop as a professional Mathematics teacher by upholding the duties outlines in Part 2 of the Teachers’ Standards.
* respond quickly to any behaviour or bullying that threatens emotional safety.
 | *How important are routines, relationships and response to managing behaviour in the mathematics classroom?**How might you create a positive learning environment in your Mathematics classroom?* | MB1MB4MB5 | WDS |
| CCF evidence base | \*Institute of Education Sciences (2008) Reducing Behavior Problems in the Elementary School Classroom. Accessible from https://ies.ed.gov/ncee/wwc/PracticeGuide/4.  |
| 24 | * Pupils are motivated by intrinsic factors (related to their identity and values) and extrinsic factors (related to reward).
* Pupils’ investment in learning is also driven by their prior experiences and perceptions of success and failure in Mathematics.
 | * Establish a supportive and inclusive environment with a predictable system of reward and sanction in the Mathematics classroom.
* Give manageable, specific and sequential instructions using consistent language and non-verbal signals for common classroom directions.
* Use early and least-intrusive interventions as an initial response to low level disruption.
 | *What are the particular difficulties in motivating pupils to study mathematics and how might the teacher overcome them?**How might we challenge negative perceptions about mathematics learning?* | MB6MB7 | WDS |
| CCF evidence base | Sibieta, L., Greaves, E. & Sianesi, B. (2014) Increasing Pupil Motivation: Evaluation Report. [Online] Accessible from: https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/increasing-pupil-motivation/  |
| 25 | * Working memory is where information that is being actively processed is held, but its capacity is limited and can be overloaded.
* Long-term memory can be considered as a store of knowledge that changes as pupils learn by integrating new ideas with existing knowledge.
* Requiring pupils to retrieve information from memory, and spacing practice so that pupils revisit ideas after a gap are also likely to strengthen recall.
 | * How to take into account pupils’ prior knowledge when planning on introducing new mathematical topics.
* How to reduce distractions that take attention away from what is being taught (e.g. keeping the complexity of a task to a minimum, so that attention is focused on the content).
 | *What is the difference between working memory and long-term memory?**What is spaced retrieval practice?* | HPL4HPL5HPL8 | WDS |
| CCF evidence base | \*OECD (2015) Pisa 2015 Result: Policies and Practices for Successful Schools. Accessible from: https://doi.org/10.1787/9789264267510-en.  |
| 26 | * High-quality PSHE teaching has a long-term positive effect on pupils’ life chances, particularly for children from disadvantaged backgrounds.
* Explicitly teaching pupils the knowledge and skills they need to succeed within PSHE is beneficial.
 | * Use resources and materials aligned with the school PSHE curriculum (e.g. textbooks or shared resources designed by expert colleagues that carefully sequence content).
* Be aware of common misconceptions and discussing with expert colleagues how to help pupils master important concepts.
 | *What does a good PSHE curriculum look like?**How can we relate learning in the mathematics classroom to the PSHE curriculum?* | HE6SC5 | WDS |
| CCF evidence base | Darling-Hammond, L. (2009) Professional Learning in the Learning Profession. |
| 27-28 Easter Break |  |
| 29 | * DSLs and other specialist colleagues also have valuable expertise and can ensure that appropriate support is in place for pupils.
 | * Know who to contact with any safeguarding concerns and having a clear understanding of what sorts of behaviour, disclosures and incidents to report
 | *What are the legal responsibilities of schools and teachers?**How do these differ from contractual responsibilities?* | PB6 | WDS |
| CCF evidence base | DfE Keeping Safe in Education  |
| 30 | * Reflective practice, supported by feedback from and observation of experienced colleagues, professional debate, and learning from educational research, is also likely to support improvement.
* Mathematics teachers can make valuable contributions to the wider life of the school in a broad range of ways, including by supporting and developing effective professional relationships with colleagues.
 | * Engage critically with research and using evidence to critique practice.
* Work as part of a professional team in a mathematics department.
* Contribute positively to the wider school culture and developing a feeling of shared responsibility for improving the lives of all pupils within the school (e.g. by supporting expert colleagues with their pastoral responsibilities, such as careers advice).
 | *How has your knowledge of teaching and learning of mathematics developed so far?**Beyond teaching Mathematics, how might you contribute to the wider school culture?* | PB2PB3 | WDS |
| CCF evidence base | Basma, B. & Savage, R. (2018) Teacher Professional Development and Student Literacy Growth: a Systematic Review and Metaanalysis. Education Psychology Review. 30: 457 <https://doi.org/10.1007/s1> |
| 31Introductory Placement 1 | * Setting clear expectations can help communicate shared values that improve classroom and school culture.
* Establishing and reinforcing routines, including through positive reinforcement, can help create an effective learning environment in Mathematics.
 | * Model courteous and aspirational behaviour.
* Use inspirational and consistent language that promotes challenge, aspiration, resilience, and praises pupil effort. Set tasks which stretch pupils, but which are achievable.
* Create a positive and respectful learning environment in which making mistakes, resilience and perseverance are part of a daily routine.
 | *What have you learnt about the importance of having high expectations?**How has your understanding of managing behaviour developed this week? Can you link this to any learning from your university learning?**Have you been able to identify any effective/ineffective practice during your observations this week? What was it? Why did it work/not work?* | HE4MB1 | WDS |
| CCF evidence base | Chapman, R. L., Buckley, L., & Sheehan, M. (2013) School-Based Programs for Increasing Connectedness and Reducing Risk Behavior: A Systematic Review, *25*(1), 95–114.  |
| 32Introductory Placement 2 | * Teachers have the ability to affect and improve the wellbeing, motivation and behaviour of their pupils in Mathematics lessons.
* Mathematics teachers can challenge pupils’ resilience and beliefs and ensure that all pupils have the opportunity to experience meaningful success in Mathematics.
* Considering and understanding pupils’ feelings helps in building effective positive relationships with pupils.
 | * Set clear behavioural expectations and routines which establish a consistent and inclusive learning environment by consistently applying rules, sanctions, rewards, and praise in line with the school policy.
* Respond to any behaviour or bullying which threatens pupil’s emotional safety.
* Establish and build positive and professional relationships which assist with managing behaviour (e.g. learning pupil names).
 | *Have you been able to identify any inspirational or challenging language and what impact did this have on the learning in that classroom?**What do you think a positive learning environment looks like in Mathematics? How would you plan for this?**How do staff in your school ensure there is a culture of respect and trust? Have you seen any effective/ineffective examples of this?**Choose the pupil that will be the focus of the case study which forms part of the module assessment.* | HE1MB4MB5 | WDS |
| CCF evidence base | Kern, L., & Clemens, N. H. (2007) Antecedent strategies to promote appropriate classroom behavior. Psychology in the Schools, 44(1), 65–75. <https://doi.org/10.1002/pits.20206>. |
| 33Introductory Placement 3 | * A school’s mathematics curriculum enables it to set out its vision for the knowledge, skills and values that its pupils will learn, encompassing the national curriculum within a coherent wider vision for successful learning.
* Ensuring pupils master foundational mathematics concepts and knowledge before moving on is likely to build pupils’ confidence and help them succeed in Mathematics.
 | * Identify essential concepts, knowledge and skills within a carefully sequenced and coherent mathematics curriculum and provide opportunity for all pupils to learn and master essential concepts, knowledge and skills in that subject
* Plan and deliver a carefully sequencing curriculum which encompasses the school’s vision for its knowledge, skills and values.
* Ensure that pupils’ thinking is focused on key ideas and principles within RE
 | *What are your areas for subject knowledge development? How will you address these?**What are the essential skills, knowledge, concepts and principles in Mathematics? Can you identify this in the department’s approach to T&L?**Have you been able to identify how students are supported in mastering important concepts in Mathematics? What made this effective?**Discuss what you have learnt about your case study pupil.* | SC1SC3 | WDS |
| CCF evidence base | Willingham, D. T. (2002) Ask the Cognitive Scientist. Inflexible Knowledge: The First Step to Expertise. American Educator, 26(4), 31-33. Accessible from: <https://www.aft.org/periodical/american-educator/winter-2002/ask-cognitive-scientist>  |
| 34Introductory Placement 4 | * Anticipating common misconceptions within mathematics is an important aspect of curricular knowledge; working closely with colleagues to develop an understanding of likely misconceptions is valuable, particularly in the teaching of literacy.
* Every teacher can improve pupils’ literacy, including by explicitly teaching reading, writing and oral language skills specific to individual disciplines.
 | * Collaborate with colleagues to effectively use resources and materials (such as shared planning or textbooks).
* Ensure that learning is sequenced so that pupils’ master foundational mathematics concepts before moving on.
* Anticipate, plan for and encourage pupils to share common misconceptions to they can be addressed, and pupils have relevant and accurate subject specific knowledge.
 | *Which aspects of the EHU ITT pillars do you feel you have covered this week?**How effective have you been in helping to address pupils’ misconceptions? How could you develop this?**How do you feel you are developing in your use of questioning and effective classroom talk?**Check that the draft of the case study is accurate, and includes sufficient detail.* | SC4SC10 | WDS |
| CCF evidence base | Education Endowment Foundation (2018) Preparing for Literacy Guidance Report. [Online] Accessible from: https://educationendowmentfoundation.org.uk/public/files/Preparing\_Literacy\_Guidance\_2018.pdf  |
| 35 Half Term Break |  |
| 36Introductory Placement 5 | * Prior knowledge in mathematics plays an important role in how pupils learn; committing some key facts to their long-term memory is likely to help pupils learn more complex ideas in Mathematics.
* Where prior knowledge is weak, pupils are more likely to develop misconceptions, particularly if new ideas are introduced too quickly.
 | * Start expositions at the point of pupil understanding and avoid overloading working memory by taking prior learning into account when introducing new content and breaking such content into smaller steps/the constituent parts.
* Sequence learning so pupils are secure in foundational knowledge before introducing more complex material and provide pupils with opportunity to consolidate and practise new knowledge and skills.
* Use modelling, scaffolding and explanations to assist with structuring learning, and recognise the need to remove this when pupils can apply such structures to prior learning.
 | *How is learning structured in your mathematics department? Can you link this to any of your university learning?**How have pupils learnt in your lessons this week? How do you know this? What promotes this? What hinders?**In what ways have aspects of learning been broken down into manageable chunks for the pupils – when have things needed to be broken down and why?**How do mathematics specialist colleagues in school support pupils – particularly your case study pupil?* | HPL2HPL6 | WDS |
| CCF evidence base | \*Deans for Impact (2015) The Science of Learning [Online] Accessible from: https://deansforimpact.org/resources/the-science-of-learning/.  |
| 37Introductory Placement 6 | * Pupils are likely to learn at different rates and to require different levels and types of support from teachers to succeed in Mathematics.
* Adapting mathematics teaching in a responsive way, including by providing targeted support to pupils who are struggling, is likely to increase pupil success in Mathematics.
* Adaptive mathematics teaching is less likely to be valuable if it causes the teacher to artificially create distinct tasks for different groups of pupils or to set lower expectations for particular pupils.
 | * Identify pupils who need new content further broken down and/or who benefit from additional adaptions.
* Support pupils with a range of educational needs including how to use guidance in the SEND code of practice.
* Ensure that all pupils have the opportunity to meet high expectations, rather than artificially creating distinct tasks for specific classes/pupils. Plan and include mathematics questions and discussions to extend and challenge pupils.
 | *How have you adapted your teaching to meet the needs of SEND pupils? How effective has this been?**What does challenging pupils look like in your lessons? How could you develop this?**Thinking about one of your mathematics lessons this week, how did this fit into the broader curriculum picture?**Ensure that you have taught your case study pupil.* | AT1AT3AT4 | WDS |
| CCF evidence base | \*Education Endowment Foundation (2018) Sutton Trust-Education Endowment Foundation Teaching and Learning Toolkit: Special Educational Needs in Mainstream Schools Accessible from <https://educationendowmentfoundation.org.uk/education-evidence/guidance-reports/send>  |
| 38Introductory Placement 7 | * Effective mathematics assessment is critical to teaching because it provides teachers with information about pupils’ understanding and needs in Mathematics.
* Before using any assessment, teachers should be clear about the decision it will be used to support and be able to justify its use.
* To be of value, teachers use information from assessments to inform the decisions they make; in turn, pupils must be able to act on feedback for it to have an effect.
 | * Plan formative assessment tasks linked to lesson objectives and how to think ahead about what would indicate understanding (e.g. using hinge questions).
* Structure assessment tasks to check for prior knowledge, knowledge gaps, and pre-existing misconceptions and prompt pupils to elaborate on their responses to check secure understanding.
* Monitor pupil understanding during lessons (inc. checking for misconceptions) as opposed to how busy they are or their understanding of the task.
 | *Where have you been able to utilise summative and formative assessment in mathematics? How effectively do you utilise your formative feedback to help pupils progress in mathematics?**How does your department assess pupils in mathematics? How is this reflected in your planning and teaching?**How do you plan for formative assessment tasks linked to lesson objectives? How could you develop this area of your practice?**Ensure all elements of portfolio are complete.* | A1A3A4 | WDS |
| CCF evidence base | Black, P., & Wiliam, D. (2009) Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, 21(1), pp.5-31.  |