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

Year 2

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## How to use this ITT curriculum

This ITT curriculum outlines what trainees in year 2 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 2 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 2 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 2 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 2 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 2 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. For example, in week 14 trainees are encouraged to learn how to adapt their teaching, pedagogical approaches in mathematics to scaffold and respond to the needs of all pupils, while in week 34 trainees reflect on the effectiveness of adaptive teaching and the strategies in place to support individuals to access learning within the mathematics curriculum. Similarly, although there is strong emphasis on, for example, utilising research-informed practice of behaviour management into teaching and learning in week 18, trainees are also encouraged to reflect on how their understanding of behaviour management has changed while on placement in week 32.

##  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*What does research suggest may be features of High Quality Mathematics?* | * The main objective of research in mathematics education is the generation and application of knowledge on learning and teaching.
* The curriculum is the Progression model; getting better at Mathematics means pupils knowing more and remembering more of the Mathematics curriculum they have been taught.
* Explicitly teaching pupils the knowledge and skills they need to succeed within Mathematics is beneficial.
 | * Use literature to inform Mathematics teaching.
* Understand how to revisit the big ideas within the mathematics curriculum over time and teach key concepts through a range of examples.
* Effective use of mathematical vocabulary and terminology promotes links to reading and literacy in mathematics.
 | *What does the literature state about the importance of learning mathematics?* *How do teachers ensure this happens?* | SC5 | WDS |
| CCF evidence base | Biesta, G. (2009) Good education in an age of measurement: on the need to reconnect with the question of purpose in education. Educational Assessment, Evaluation and Accountability, 21(1). |
| 2 | * Learning involves a lasting change of pupils’ knowledge or capabilities
* Continuing to develop subject knowledge allows for more secure understanding of alternative mathematical methods.
* Research informs good practice in Teaching Mathematics
 | * Promote inclusion and diversity in Mathematics teaching.
* Design medium term plans that demonstrates appropriate coherence within the curriculum.
* Contribute to departmental planning and development of resources in mathematics.
 | *What do you understand about the two disciplines in Mathematics?* *How might a mathematics teacher make these explicit?* | SC3 | 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>  |
| 3*What does effective pedagogy mean in Mathematics?* | * Mathematical problem solving can be used to challenge and extend pupils’ thinking.
* Guides, scaffolds and worked examples can help pupils apply new ideas but should be gradually removed as pupil expertise increases.
* Effective Mathematics teachers introduce new material in steps, explicitly linking new ideas to what has been previously studied and learned.
 | * Design and manage group work in a structured way to ensure mathematical understanding is developed.
* Enable critical thinking by first teaching the necessary foundational content knowledge.
* Provide sufficient opportunity for pupils to consolidate and practise applying new knowledge and skills.
 | *Why must mathematics be objective, and pluralistic?* | CP2 | WDS  |
| CCF evidence base | Donker, A. S., de Boer, H., Kostons, D., Dignath van Ewijk, C. C., & van der Werf, M. P. C. (2014) Effectiveness of learning strategy instruction on academic performance: A meta-analysis. Educational Research Review, 11, 1–26. <https://doi.org/10.1016/j.edurev.2013.11.002>  |
| 4 | * The curriculum intent and implementation in mathematics is driven by national and local stakeholders who may have competing interests.
* Where prior knowledge is weak, pupils are more likely to develop misconceptions, particularly if new ideas are introduced too quickly.
* 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.
 | * Draw upon appropriate mathematical topics and concepts that permeates other subject specialism.
* Make effective links between existing and new mathematical knowledge.
* Linking what pupils already know to what is being taught (e.g. explaining how new content builds on what is already known).
 | What pedagogy have you observed on your introductory (Year 1) placement? | SC7 | WDS |
| CCF evidence base | Sweller, J., van Merrienboer, J. J. G., & Paas, F. G. W. C. (1998) Cognitive Architecture and Instructional Design. Educational Psychology Review, 10(3), 251–296.https://doi.org/10.1023/A:1022193728205  |
| 5*How do we plan for progression in Mathematics?* | * Supporting pupils’ learning involves self-auditing their own subject and curriculum knowledge; identifying potential gaps and using mathematical definitions and terminology in a meaningful way.
* Pupils make progress at different rates, but are all capable of meeting the high expectations set for them in Mathematics.
* Ensuring pupils master foundational concepts and knowledge before moving on is likely to build pupils’ confidence and help them succeed in Mathematics.
 | * Pupils’ misconceptions in mathematics are pivotal in planning for effective pupil progression.
* Connect learning to pupils’ prior knowledge.
* Sequence Mathematics lessons so that pupils secure foundational knowledge before encountering more complex content.
 | *What does progression look like in Mathematics?**How do we know if our pupils are making progress?* | HE3SC3 | WDS |
| CCF evidence base | Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013) Improving students’ learning with effective learning techniques: Promising directions from cognitive and educational psychology. Psychological Science in the Public Interest, Supplement, 14(1), 4–58. <https://doi.org/10.1177/1529100612453266>. |
| 6Academic Achievement Week | * High-quality teaching has a long-term positive effect on pupils’ life chances, particularly for children from disadvantaged backgrounds. This is particularly important in primary education.
 | * Build upon prior knowledge (including from KS2)
 | *What have you learnt about progression in mathematics skills and knowledge from visiting a Primary School?**How do mathematics specialists in the primary phase prepare pupils for the secondary phase?* | HE6 | WDS |
| CCF evidence base | Deunk, M. I., Smale-Jacobse, A. E., de Boer, H., Doolaard, S., & Bosker, R. J. (2018) Effective differentiation Practices: A systematic review and meta-analysis of studies on the cognitive effects of differentiation practices in primary education. Educational Research Review, 24(February), 31–54. https://doi.org/10.1016/j.edurev.2018.02.002. |
| 7 | * A serious of well-planned lessons that draw upon pupils’ knowledge retrieval enables pupils’ learning to occur in a meaningful way.
* 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.
* A spiral curriculum is important in helping pupils build cumulatively enough knowledge and develop skills in Mathematics.
 | * Plan sequences of learning that build upon prior knowledge.
* Provide opportunity for all pupils to learn and master essential concepts, knowledge, skills and principles of Mathematics.
* Planned use of discourse can support pupils’ thinking and reasoning in mathematics.
 | Do you agree that you can teach any concept in mathematics to pupils at any age?What would a spiral mathematics curriculum look like? | HPL2 | WDS |
| CCF evidence base | Wittwer, J., & Renkl, A. (2010) How Effective are Instructional Explanations in Example-Based Learning? A Meta-Analytic Review. Educational Psychology Review, 22(4), 393–409. <https://doi.org/10.1007/s10648-010-9136-5>. |
| 8*How do Mathematics teachers Create a Secure and engaging Learning Environment where all are progress?* | * Planning formative assessment tasks is linked to lesson objectives.
* Pupils make progress at different rates, but are all capable of meeting the high expectations set for them in mathematics.
* Teachers can influence pupils’ resilience and beliefs about their ability to succeed, by ensuring all pupils have the opportunity to experience meaningful success.
 | * Plan and adapt learning based on formative assessment.
* Increase challenge with practice and retrieval as knowledge becomes more secure (e.g. by removing scaffolding, lengthening spacing or introducing interacting elements).
* Plan for pupils’ response and question time within lessons and use self and peer assessment in a structured manner.
 | Give some examples of good formative assessment you saw on placement which improved pupils progress in mathematics.How can we engage pupils and help build their resilience when facing challenging mathematical topics? | HE2MB4 | WDS |
| CCF evidence base | Lazowski, R. A., & Hulleman, C. S. (2016) Motivation Interventions in Education: A Meta-Analytic Review. Review of Educational Research, 86(2), 602–640. <https://doi.org/10.3102/0034654315617832>. |
| 9 | * A predictable and secure environment benefits all pupils, but is particularly valuable for pupils with special educational needs.
* Pupils’ investment in learning is also driven by their prior experiences and perceptions of success and failure.
 | * Ensure activities chosen clearly link to the intended learning outcomes of each lesson, and build towards the ambitious end goal of the sequence.
 | How did the best teachers encourage you to work hard in school? How did teachers encourage pupils, on your introductory year placement, to work hard? | MB2MB7 | WDS |
| CCF evidence base | Zins, J. E., Bloodworth, M. R., Weissberg, R. P., & Walberg, H. J. (2007) The Scientific Base Linking Social and Emotional Learning to School Success. Journal of Educational and Psychological Consultation, 17(2–3), 191–210. <https://doi.org/10.1080/10474410701413145>  |
| 10*How do children learn in Mathematics?* | * Teaching key mathematical concepts through modelling and intelligent practice should usually precede problem-solving.
* An important factor in learning is memory, which can be thought of as comprising two elements: working memory and long-term memory.
* Lessons need clear learning objectives – a key question for each lesson is useful in focussing learning.
 | * Invoke mathematical curiosity in all learners and provide pupils with the opportunity of applying mathematics to a variety of real-life meaningful contexts and the misapplication of mathematics in news and media.
* Explicitly teach pupils the knowledge and skills they need to succeed in Mathematics
* address some simple misconceptions in pupils’ knowledge and understanding of spelling, punctuation and grammar.
 | What are the most important skills for a good Mathematics pupil? | HPL3 | WDS |
| CCF evidence base | Sweller, J. (2016). Working Memory, Long-term Memory, and Instructional Design. Journal of Applied Research in Memory and Cognition, 5(4), 360–367. http://doi.org/10.1016/j.jarmac.2015.12.002.  |
| 11 | * 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.
* A variety of recall and retrieval activities, regularly planned as part of the Mathematics curriculum can be beneficial in helping pupils make progress
 | * Present information to pupils clearly and in small chunks.
* Successfully use modelling techniques, to aid pupils’ cognitive skills.
* Promote mathematical literacy, curiosity and love for the subject in all learners irrespective of their background or previous experiences in mathematics.
 | Describe some good methods of helping pupils learn key fact, methods and formulae in mathematics (such as how to solve simultaneous equations). | HPL2HPL8 | WDS |
| CCF evidence base | Baddeley, A. (2003) Working memory: looking back and looking forward. Nature reviews neuroscience, 4(10), 829-839. |
| 12-13 Christmas break |
| 14*How do we adapt teaching in Mathematics?* | * Teachers can inspire pupils by having high expectations.
* Scaffolds are useful, such as writing frames or sentence starters, but must be temporary and need removing.
* Adaptive teaching should be at the centre of learners-focused activity rather than extensions of different tasks for specific groups.
 | * Adapt their teaching, pedagogical approaches and teaching resources in mathematics to scaffold and respond to the needs of all pupils.
* Address a variety of mathematical misconceptions and insecure knowledge to support pupils with a range of educational needs including EAL and SEND.
* Set challenging objectives for all pupils and support learners by scaffolding tasks – look at layers of scaffolding and consider when these could be removed.
 | Explain how adaptive teaching helps pupils learn. | HE1 | WDS |
| CCF evidence base | Van de Pol, J., Volman, M., Oort, F., & Beishuizen, J. (2015) The effects of scaffolding in the classroom: support contingency and student independent working time in relation to student achievement, task effort and appreciation of support. Instructional Science, 43(5), 615-641. |
| 15-16Assessment Weeks |
| 17Start of Semester 2 | * Inclusive mathematics teaching should reflect the ability of all learners and framing questions provide greater scaffolding and greater challenge.
* Some pupils need more support than others to progress through the Mathematics curriculum.
* Additional adults and peers can be used to help pupils to learn, when they are used effectively.
 | * Design appropriate mathematical tasks that provide appropriate level of support to all pupils.
* Accommodate learners with Specific difficulties such as dyslexia, dyspraxia, ADHD
* make accurate decisions – with support from colleagues, about the kinds of support that individual learners need.
 | *What is an EHCP? How should we as Mathematics teachers use them?* | AT7PB5 | WDS |
| CCF evidence base | Blatchford, P., Bassett, P., Brown, P., Martin, C., Russell, A., & Webster, R. (2009) Deployment and impact of support staff in schools: Characteristics, Working Conditions and Job Satisfaction of Support Staff in Schools. Retrieved from <http://eprints.uwe.ac.uk/12342/>.  |
| 18*How do we manage behaviour in the Mathematics classroom?* | * Engaging with parents, carers and colleagues is essential in supporting and managing pupils’ behaviour.
* Pupils are provided with an effective learning community based on teacher implementation of school and departmental policies.
* Behaviour is built upon Routines, Responses and Relationships.
 | * Utilise research-informed practice of behaviour management into teaching and learning of mathematics.
* Have high expectations of pupils’ behaviour and remind pupils of the school’s behaviour system consistently.
* Plan individual and a sequence of lessons that minimise opportunities for pupils to be off task leading to poor behaviour and use effective language that encourage, support and reward good behaviour and hard work.
 | *What systems and policies have you observed to help mathematics teachers manage behaviour?* *How were these applied by mathematics teachers?* | MB1HE4 | WDS |
| CCF evidence base | Sabornie, C. Evertson, & C. Weinstein (Eds.). Handbook of classroom management: Research, practice, and contemporary issues (2nd ed., pp. 363–386). New York, NY: Routledge. |
| 19 | * non-verbal signals can be useful in quietly managing behaviour in the class.
* Careful lesson planning can minimise potential disruption, looking for potential ‘hot spots’ such as transitions during collaborative learning.
* Establish and build positive and professional relationships which assist with managing pupils’ behaviour in the mathematics classroom.
 | * Establish clear behavioural expectations and routines which create a consistent and inclusive learning environment.
* Seek the right level of support when dealing with challenging behaviour.
* Develop their own approach that motivates all pupils and manage pupils’ behaviour.
 | *How are good relationships built in the mathematics classroom?**What non-verbal signals to manage behaviour have you witnessed in the mathematics classroom?* | MB3 | WDS |
| CCF evidence base | DuPaul, G. J., Belk, G. D., & Puzino, K. (2016) Evidence-Based Interventions for Attention Deficit Hyperactivity Disorder in Children and Adolescents. Handbook of Evidence-Based Interventions for Children and Adolescents, 167. |
| 20*How do we assess in Mathematics?* | * Pupils’ data can be used carefully to inform future planning and assessment of their mathematical skills.
* Effective assessment is critical to teaching because it provides teachers with information about pupils’ understanding and needs.
* Formative assessment is ‘in the moment’ and should help pupils to make progress.
 | * Provide accurate assessment and feedback to pupils in line with department policy and examination specifications and mathematics mark schemes.
* Ask questions that enable pupils to know more and remember more.
* Use questioning and non-verbal reactions as formative feedback in the mathematics curriculum.
 | *Explain what formative assessment is, with some examples of good ways to do it in mathematics.* | A1 | WDS |
| CCF evidence base | Speckesser, S., Runge, J., Foliano, F., Bursnall, M., Hudson-Sharp, N., Rolfe, H. & Anders, J. (2018) Embedding Formative Assessment: Evaluation Report. [Online] Accessible from: <https://educationendowmentfoundation.org.uk/public/files/EFA_evaluation_report.pdf> |
| 21 | * Quality feedback can take a variety of forms which may be verbal as well as written and that pupils respond to feedback in different ways.
* Summative Assessment is a tool for judging how much of the Mathematics curriculum a pupil has learnt at a moment in time
* Formative assessment, done well, helps to improve summative assessment results in Mathematics
 | * Develop a range of questioning approaches that assess pupils’ current mathematical understanding.
* Include summative and formative assessments as part of planning
* adapt teaching so that all pupils progress through the Mathematics curriculum in order to succeed in summative assessments.
 | *What are the key differences between summative and formative assessment?**Why is it important to use both to assess pupils’ progress in mathematics?* | A6 | WDS |
| CCF evidence base | Harlen, W. & James, M. (1997) Assessment and Learning: differences and relationships between formative and summative assessment, Assessment in Education: Principles, Policy & Practice 4:3, 365-379.Kluger, A. N., & DeNisi, A. (1996) The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. Psychological Bulletin, 119(2), 254–284. <https://doi.org/10.1037/0033-2909.119.2.254>. |
| 22AAW | * Mathematics Teachers can inspire pupils by having high expectations, particularly of learners with EAL.
* Some pupils need more support than others to progress through the Mathematics curriculum.
* Additional adults and peers can be used to help pupils to learn, when they are used effectively.
 | * Set challenging objectives for all pupils
* Support learners by scaffolding tasks and providing support as well as accommodate learners with EAL.
* make accurate decisions – with support from colleagues, about the kinds of support that individual EAL learners need.
 | How would you plan to support a learner with EAL in Mathematics? | PB6AT1 | WDS |
| CCF evidence base | Tsiplakides, I. & Keramida, A. (2010) The relationship between teacher expectations and student achievement in the teaching of English as a foreign language. English Language Teaching, 3(2), P22. Retrieved from <http://files.eric.ed.gov/fulltext/EJ1081569.pdf>. |
| 23 *How do we use collaborative learning in Mathematics*? | * Paired and group activities can increase pupil success in Mathematics, but to work together effectively pupils need guidance, support and practice.
* How pupils are grouped is also important; care should be taken to monitor the impact of groupings on pupil attainment, behaviour and motivation.
 | * consider the factors that will support effective collaborative or paired work (e.g. familiarity with routines, whether pupils have the necessary prior knowledge and how pupils are grouped).
 | *When planning for collaborative learning, what should mathematics teachers consider when planning for collaborative learning in mathematics?**What different types of groupings might we use in the classroom? What are the advantages and disadvantages of each?* | CP9CP10AT5 | WDS |
| CCF evidence base | Tereshchenko, A., Francis, B., Archer, L., Hodgen, J., Mazenod, A., Taylor, B., Travers, M. C. (2018) Learners’ attitudes to mixed-attainment grouping: examining the views of students of high, middle and low attainment. Research Papers in Education, 1522, 1–20. <https://doi.org/10.1080/02671522.2018.1452962>. |
| 24*What is good Mathematics learning out of school?* | * Homework can improve pupil outcomes in Mathematics, particularly for older pupils, but it is likely that the quality of homework and its relevance to main class teaching is more important than the amount set.
 | * Plan home learning that extends or reinforces learning in school.
 | *What homework policies have you observed in school?**How do we ensure homework is meaningful and purposeful?* | CP11 | WDS |
| CCF evidence base | Zimmerman, B. J. (2002) Becoming a Self-Regulated Learner: An Overview, Theory Into Practice. *Theory Into Practice*, *41*(2), 64–70. <https://www>.jstor.org/stable/1477457?seq=1#page\_scan\_tab\_contents.  |
| 25 *How do we deliver High Quality Mathematics?* | * Pupils’ assessment and marking informs future planning of mathematics lessons.
* High-quality classroom talk can support pupils to articulate key ideas, consolidate understanding and extend their mathematical vocabulary, therefore class discussion of difficult concepts or challenging subject matter is vital.
* Modelling helps pupils understand new processes and ideas; good models make abstract ideas, such as figurative language, concrete and accessible.
 | * Including a range of types of questions in class discussions to extend and challenge pupils (e.g. by modelling new mathematical vocabulary or asking pupils to justify answers).
* Providing appropriate wait time between question and response where more developed responses are required.
* Narrate thought processes when modelling to make explicit how experts think (e.g. asking questions aloud that pupils should consider when working independently and drawing pupils’ attention to links with prior knowledge).
 | *Write the commentary for modelling any mathematics topic of your choice.* | CP7CP3 | WDS |
| CCF evidence base | Alexander, R. (2017) Towards Dialogic Teaching: rethinking classroom talk. York: Dialogos.  |
| 26 | * 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 how much new information to introduce.
* 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).
 | *How could you gauge pupils’ prior knowledge when beginning a new mathematics topic, such as ‘solving simultaneous equations’?**Look at the lesson plan you produced for your SEC1003 assessment – Are there distractions in your plan that might take attention away from your learning objective?* | HPL4HPL5HPL8 | WDS |
| CCF evidence base | Agarwal, P. K., Finley, J. R., Rose, N. S., & Roediger, H. L. (2017) Benefits from retrieval practice are greater for students with lower working memory capacity. Memory, 25(6), 764–771. <https://doi.org/10.1080/09658211.2016.1220579>. |
| 27-28 Easter Break |  |
| 29*What are my wider responsibilities as a Mathematics teacher?* | * 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 mathematics teachers?How do these differ from contractual responsibilities? | PB6 | WDS |
| CCF evidence base | \*Education Endowment Foundation (2015) Making Best Use of Teaching Assistants Guidance Report. [Online] Accessible from: <https://educationendowmentfoundation.org.uk/tools/guidance-reports/> |
| 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 mathematics teaching and learning developed so far?Beyond teaching Mathematics, how might you contribute to the wider school culture? | PB2PB3 | WDS |
| CCF evidence base | Allen, B. and Sims, S. (2018) The Teacher Gap. Abingdon: Routledge. |
| 31Developmental Placement 1 | * Mathematics Teachers are key role models, who can influence the attitudes, values and behaviours of their pupils.
* High-quality teaching has a long-term positive effect on pupils’ life chances, particularly for children from disadvantaged backgrounds.
* DSLs and other specialist colleagues also have valuable expertise and can ensure that appropriate support is in place for pupils.
 | * Use inspirational and consistent language that promotes challenge, aspiration, resilience, and praises pupil effort in RE.
* Set tasks in mathematics lessons 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.
* Contact the DSL and related colleagues and how to report safeguarding concerns (and what such concerns may look like)
 | What have you learnt about the importance of having high expectations in all mathematics lessons?What do you think a positive learning environment looks like in Mathematics lessons? 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 examples of this? | HE2HE6PB6 | WDS |
| CCF evidence base | Johnson, S., Buckingham, M., Morris, S., Suzuki, S., Weiner, M., Hershberg, R., B. Weiner, Hershberg, R., Fremont, E., Batanova, M., Aymong, C., Hunter, C., Bowers, E., Lerner, J., & Lerner, R. (2016) Adolescents’ Character Role Models: Exploring Who Young People Look Up to as Examples of How to Be a Good Person. Research in Human Development, 13(2), 126–141. <https://doi.org/10.1080/15427609.2016.1164552>. |
| 32Developmental Placement 2 | * Establishing and reinforcing routines, including through positive reinforcement, can help create an effective learning environment.
* A school’s Mathematics curriculum enables it to set out its vision for the knowledge, skills and values that its pupils will learn.
* Mathematics must be objective, critical and inclusive. A culture of mutual trust and respect supports effective relationships between Mathematics teachers and their pupils.
 | * Include appropriate learning activities in an mathematics lessons and continually reflect on their teaching and pupils’ progress to improve their own teaching abilities
* Teach key concepts through a range of examples and apply rules, sanctions, rewards, and praise in line with the school policy.
* Establish and build positive and professional relationships which assist with managing behaviour (e.g. learning pupil names).
 | 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?Have you been able to identify any inspirational or challenging language? What impact did this have on the learning in that classroom? | MB1MB2SC1 | WDS |
| CCF evidence base | Education Endowment Foundation (2018) Improving behaviour in schools. Accessed from: <https://educationendowmentfoundation.org.uk/education-evidence/guidance-reports/behaviour>  |
| 33Developmental Placement 3 | * Working memory is where information that is being actively processed is held, but its capacity is limited and can be overloaded.
* Effective Mathematics teachers introduce new material in steps, explicitly linking new ideas to what has been previously studied and learned.
* Seeking to understand pupils’ differences, including their different levels of prior knowledge and potential barriers to learning, is an essential part of teaching.
 | * Plan sequences of lessons that ensure foundational knowledge is secure before moving onto new, or more complex content and break complex material into small steps and also ensure sequences of lessons build upon pupils' prior knowledge.
* Ensure sequences of lessons consider possible misconceptions and are not overly 'cluttered', distracting from the key content being taught.
* Consider strategies for adapting teaching by identifying pupils who may need new content breaking down and liaising with the SENDCO/staff to support individual needs within lesson interventions.
 | What have you learned about the importance of carefully sequencing content of mathematics lessons?Have you identified clear learning objectives / outcomes for each lesson that focus on the key concepts being learned?What have you learned about the nature of your classes, including any individuals with specific needs? | HPL4CP2AT2 | WDS |
| CCF evidence base | Education Endowment Foundation (2018) SPECIAL EDUCATIONAL NEEDS IN MAINSTREAM SCHOOLSHigh-quality teaching for pupils with SEND. [Online] Accessible from: EEF\_High\_Quality\_Teaching\_for\_Pupils\_with\_SEND.pdf (educationendowmentfoundation.org.uk )  |
| 34Developmental Placement 4 | * Adapting mathematics teaching in a responsive way, including by providing targeted support to pupils who are struggling, is likely to increase pupil success.
* Teachers of mathematics 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.
 | * Consider the effectiveness of adaptive teaching and the strategies in place supporting individuals to access learning and make progress in all mathematics lessons.
* Contribute to the wider life of the school and its culture to enable a shared responsibility for improving the lives of pupils and personalise systems and routines which promote efficient time and task management.
* Protect time for rest and recovery and how to promote good mental well-being.
 | What strategies have you used to adapt your teaching of mathematics this week? What has worked well / not so well?What opportunities are you able to take up to become involved in wider school life beyond the mathematics department?Why are professional duties / responsibilities important (eg break duty)?How do experienced mathematics teachers manage their workload effectively? | AT3PB3 | WDS |
| CCF evidence base | Sisk, V. F., Burgoyne, A. P., Sun, J., Butler, J. L., & Macnamara, B. N. (2018) To What Extent and Under Which Circumstances Are Growth Mind-Sets Important to Academic Achievement? Two Meta-Analyses. Psychological Science, 29(4), 549–571. <https://doi.org/10.1177/0956797617739704>.  |
| 35 Half Term Break |  |
| 36Developmental Placement 5 | * Good assessment helps Mathematics teachers avoid being over-influenced by potentially misleading factors, such as how busy pupils appear.
* High-quality feedback can be written or verbal; it is likely to be accurate and clear, encourage further effort, and provide specific guidance on how to improve in Mathematics
* Questioning is an essential tool for teachers; questions can be used for many purposes, including to check pupils’ prior knowledge, assess understanding and break down problems.
 | * 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 mathematics misconceptions.
* 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 your mathematics teaching? How effectively do you utilise your formative feedback to help pupils progress in mathematics?How does the mathematics department assess pupils? 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? | A2A5CP6 | WDS |
| CCF evidence base | Christodoulou, D. (2017) Making Good Progress: The Future of Assessment for Learning. Oxford: OUP. |
| 37Developmental Placement 6 | * Establishing and reinforcing routines, including through positive reinforcement, can help create an effective learning environment.
* A predictable and secure environment benefits all pupils but is particularly valuable for pupils with special educational needs.
* Setting clear expectations can help communicate shared values that improve classroom and school culture.
 | * Manage low level disruption in the Mathematics classroom, particularly through positive reinforcement and use the school's BM policy consistently to manage classrooms.
* Review lesson plans to ensure correct level of challenge / pupil activity to avoid drift.
* Provide the necessary scaffolds for pupils and decide how and when to remove them and aim to develop pupils' recall of prior knowledge.
 | How do experienced teachers use non-verbal signals to manage their classroom?When should sanctions be escalated - according to the school's Behaviour Management policy?How does careful planning support behaviour management by avoiding or minimising issues? | MB1MB2HE4 | WDS |
| CCF evidence base | Gutman, L. & Schoon, L. (2013) The impact of non-cognitive skills on the outcomes of young people. [Online] Accessible from: <https://educationendowmentfoundation.org.uk/public/files/Publications/EEF_Lit_Review_Non-CognitiveSkills.pdf>  |
| 38Developmental Placement 7 | * Effective assessment is critical to teaching because it provides teachers with information about pupils’ understanding and needs
* Over time, feedback should support pupils to monitor and regulate their own learning.
* Working with colleagues to identify efficient approaches to assessment is important;
 | * How to utilise externally validated material (such as past papers) to structure assessment tasks.
* Draw conclusions about pupil learning based on patterns of performance over a period and structure self and peer assessment, making use of model answers which highlight key details.
* Provide specific and helpful feedback which assist pupils in progressing, focussing on specific actions for pupils and giving them time to respond to such feedback (e.g. responding to feedback in their book).
 | How do assessment practices in the mathematics department motivate pupils to take ownership of their learning? How does it prepare them for GCSE or future study?What are some of the misconceptions pupils can have in mathematics? How do you plan to check for prior knowledge and these pre-existing misconceptions?How are you managing the workload of assessment? Have you been able to identify any effective practice which would make assessment less onerous? | A1A6A7 | WDS |
| CCF evidence base | Hattie, J., & Timperley, H. (2007) The Power of Feedback. Review of Educational Research, 77(1), 81–112. <https://doi.org/10.3102/003465430298487>  |
| 39Developmental Placement 8 | * Effective professional development is likely to be sustained over time, involve expert support or coaching and opportunities for collaboration.
* Reflective practice, supported by feedback from and observation of experienced colleagues, professional debate, and learning from educational research, is also likely to support improvement.
* SENCOs, pastoral leaders, careers advisors and other specialist colleagues also have valuable expertise and can ensure that appropriate support is in place for pupils.
 | * Reflect on progress made, recognising strengths and weaknesses and identify next steps for improvement.
* Seek challenge, feedback and critique from mentors and other colleagues in an open, trusting and professional environment
* Reflect upon their own personal and professional conduct and seek appropriate support when dealing with specific issues (such as dealing with misbehaviour).
 | How well are you collaborating with other expert colleagues in your department and/or school?How effective is your understanding of the school’s safeguarding policy? Has this knowledge been put to the test?Thinking about your personal and professional conduct, attendance, and punctuality, could these be improved? Why are they important? | PB1PB2PB6 | WDS |
| CCF evidence base | Wubbels, T., Brekelmans, M., den Brok, P., Wijsman, L., Mainhard, T., & van Tartwijk, J. (2014) Teacher-student relationships and classroom management. In E. T. Emmer, E. Sabornie, C. Evertson, & C. Weinstein (Eds.). Handbook of classroom management: Research, practice, and contemporary issues (2nd ed., pp. 363–386). New York, NY: Routledge. |