

**The LJMU Mentor Guide to the curriculum in Phase 3a
Secondary Mathematics**



The ITE Curriculum in Phase 3 further extends student teachers' critical engagement with research and practice, within the relevant subject(s) and age phase(s). Most of Phase 3 is school based, as the student teacher completes their final placement, extending their knowledge and skills to achieve a recommendation for Qualified Teacher Status (QTS).

The Phase 3 curriculum (centre based) includes a focus on:

- Subject pedagogies and strategies across the Secondary age range.
- Curriculum design.
- Transition between key stages.
- Statutory assessment.
- Deepening Subject knowledge and curriculum knowledge.
- Adaptive practice.
- Preparing for the ECT year.

School based training:

During Phase 3, the ITE curriculum will be extended and contextualised within school placements.

Training will enable student teachers to successfully demonstrate a range of teaching approaches, appropriate to subject, age, and individual needs, and contribute to the development of curriculum thinking, drawing on evidence from research.

Whilst we expect the ITE curriculum to be increasingly personalised during Phase 3, in order to meet individual areas for development and school priorities, it is likely that student teachers' understanding and experience of working with other adults (including parents), and of assessment and adaptive teaching will need deepening during this final period, supported by expert colleagues.

During Phase 3 student teachers have more independent responsibility for planning and teaching lessons which are well matched to the needs of groups and individuals, and for planning units of work as part of an ambitious curriculum, with a positive impact on pupil progress.

Expected outcomes

Mid-point and end of Phase reviews are completed by ITT Mentors in schools. In Phase 3, these reviews assess progress against the Teachers' Standards. By the end of Phase 3 we expect student teachers to:

- Compile evidence in the placement experience folder and demonstrate achievement of ALL of the teachers standards (including part2).
- Respond constructively to challenge, feedback and critique, and demonstrate a commitment to continuously improve their understanding and practice, reflected in their Career Entry and Development profile.

In Mathematics sessions:

Please see the ITE Curriculum for Mathematics for the full programme throughout the year.

A key focus for the mathematics sessions in Phase 1 has been number and how work in number supports the development of mathematical thinking in KS3. The sessions during phase 2 then focussed on algebra, geometry and trigonometry in KS3/4. We have also looked at assessment and classroom management in mathematics as well the demands of the higher tier GCSE topics.

Our Phase 3 sessions will enable trainees to further develop their understanding of Variation Theory and Problem Solving (with a focus on data and probability). We spend some time looking at specific GCSE Higher Level topics and how these link with learning in KS5. Before Easter, LJMU mathematics trainees will be running a whole day Booster Programme in Core Mathematics for over 100 Year 12 students from schools and colleges across Merseyside.

The Phase 3a ITE Secondary Mathematics Curriculum:

In Phase 3a, the centre – based curriculum focuses on subject knowledge and pedagogy. We ask you to support students in exploring these further in their schools.

Date (LJMU)	Taught LJMU session	School-based focus	Mentor curriculum in weekly meeting and Professional Development Activities.
Friday 23 rd Feb	Strategies for solving classes of problem	Looking closely at investigations and problem solving to deepen mathematical understanding Using problem solving and investigation work to develop concepts in probability & statistics	Trainee: Try to identify if it is possible for you to use some of the activities you worked on today (or similar), in one of your classes? Mentor weekly meeting discussion: Ensure your trainee understands how your school embeds problem solving within the maths curriculum.
Friday 1 st March	Strategies for solving classes of problem: Higher Level GCSE	Effective pedagogy for higher level GCSE topics	Trainee: To discuss nature of session and identify any areas here they need to develop further in terms of their own subject knowledge. Mentor weekly meeting discussion: Looking at approaches to introduction of these higher level topics. If possible identify opportunities in near future to observe or teach some of these topics.
Friday 8 th March	Pedagogy: consolidation of learning KS4/5 transition	Developing Learning in K5 Briefing & planning for Teaching at KS5	Trainee: Go through all of the materials that have been given to you today to ensure you feel confident in using these at Cardinal Heenan in two weeks time. Decide which problems you wish to utilise in the live teaching. Mentor weekly meeting discussion: Discuss the KS5 materials shared in today's session and their confidence in delivering these materials.

<p>Friday 15th March</p>	<p>Core Maths : Mathematics Teaching beyond GCSE</p> <p><i>Core Maths is an umbrella term for a specific type of level 3 maths qualification. These qualifications are equal in size to an AS level qualification and are graded A-E. They have the same number of UCAS tariff points as an AS level qualification. Core Maths is intended for students who have passed GCSE Maths at grade 4 or better, but who have not chosen to study AS or A level Mathematics. It can be studied in a single year or over a two-year period and can be taken alongside A levels or other qualifications, including vocational courses</i></p>	<p>Today's session is led by Cat Van Saarloos who works on the Advanced Mathematics Support Programme (AMSP) supporting schools and colleges deliver Level 3 Core Maths.</p> <p>Today's session looks at the Core Maths curriculum which is a opportunity to continue study maths until 18 without having to do A Level.</p>	<p>Trainee: Today you have been given a number of different web sites that we feel can be valuable in your teaching (across all years). From these identify at least 4 tasks that you could use in your teaching during phase 3b.</p> <p>Mentor weekly meeting discussion: Discuss maths post 16 in terms of progression for children. Should maths be made compulsory until 18. Also discuss some of the real world activities that were used in today's session.</p>
<p>Friday 22nd March</p>	<p>Pedagogy: consolidation of learning KS5</p>	<p>Today's session is at Cardinal Heenan Sixth Form Centre. Students working either individually or in pairs will deliver a whole day workshop to over 100 sixth form pupils from across Merseyside, focussing upon coordinate geometry and differential calculus.</p>	<p>Trainee: Reflect on today's work. In particular, how the workshop was delivered and how some of the ideas used in the delivery could be developed within your teaching.</p> <p>Mentor weekly meeting discussion: Discuss today's experiences. How did they find it? How has it enhanced their SK? What did they learn? Has this given your trainee more confidence for teaching KS5 in the future?</p> <p>Also, if your school has a sixth form can you arrange for your trainee to spend some time observing KS5 mathematics (this maybe easier at a later time within phase 3).</p> <p>If your school does not have a sixth form, discuss how the school facilitates transfer to KS5 with external post 16 institutions.</p>

Questions to Consider when observing mathematics lessons

1	<p><u>Subject Knowledge</u> Are mathematical misconceptions considered and addressed? How? Does personal subject knowledge assist with questioning, responding to questions explanations, modelling and lesson design?</p>
2	<p><u>Coherence</u> Are lessons broken down into small, connected steps that develop the mathematical concept? How does the teaching build on prior mathematical knowledge?</p>
3	<p><u>Fluency</u> Are children using efficient, accurate and flexible mathematical strategies to develop their understanding?</p>
4	<p><u>Mathematical Thinking</u> Are the children engaged in thinking mathematically? How do you know</p>
5	<p><u>Conceptual and Procedural Variation</u> Is there a clear rationale for the choice of both mathematical questions and/or tasks? (Choices of examples for intelligent practice)</p>
6	<p><u>Representation and Structure</u> Are the chosen representations and resources carefully considered and do they effectively support the mathematics being taught?</p>
	<p><u>Mathematics Curriculum Content as Classified by Ofsted 2021</u> <i>Declarative Knowledge (What) = facts/ formulae, principles and rules.</i> <i>Procedural Knowledge (How) = using a sequence of steps to achieve desired outcomes</i> <i>Conditional Knowledge (When) = Reasoning and deep understanding of the adaptability and purposeful rationale to justify decisions.</i> <i>In addition to above: Conceptual knowledge (Why) = Deep understanding of how mathematical ideas are integrated and connected.</i></p> <p><u>The 5 Big Ideas in Teaching for Mathematics Mastery (NCETM 2017)</u></p>