LIVERPOOL JOHN MOORES UNIVERSITY

The LJMU Mentor Guide to the curriculum in Phase 2a Secondary Mathematics 2023/24

Phase 2a student teachers will start to develop their independence for planning and teaching with the support of expert colleagues. With support, they will plan lessons which match the needs of groups and individuals, and develop longer term planning through sequences of lessons as part of an ambitious curriculum.

At the end of Phase 2 we expect student teachers to:

- Create a learning environment which reflects consistently high expectations and manage pupils' behaviour in line with school policies.
- Plan and teach lessons which demonstrate understanding of how pupils learn and develop, and which select and use appropriate teaching strategies for the subject matter and classes taught.
- Demonstrate secure subject knowledge in their daily teaching and be proactive in addressing any areas of need.
- Use a range of assessment strategies to accurately evaluate both their own teaching and pupils' learning and progress, and be able to use this information to design, adapt and sequence future plans.
- Adapt planning and teaching to respond to a range of learning needs, and if necessary, know where to seek help and advice to support pupils with SEND.
- respond constructively to challenge, feedback and critique, and continuously improve their understanding and practice.
- Have a positive impact on pupil progress and an increasing confidence in teaching across the curriculum.

Prior to Phase 2a; student teachers will have been taught about:

- Behaviour management
- Rosenshine's Principles
- Curriculum and progression
- Questioning and dialogue in learning
- Subject knowledge and pedagogy

They will also have been taught about: *(the timing & sequence of these may vary for School Direct students)*

- The role of their subject in the wider curriculum and statutory requirements
- Fundamental principles of how children learn
- Cognitive science and memory
- Principles of assessment
- Observing learning & deconstructing learning following observation
- Preparing for Phase 1 (the QTS file and mentoring expectations)
- Anti-racist education / inequality in education / teachers' responsibilities in respect of equality & diversity.

In Mathematics: Prior to Phase 2a they have looked at the following areas:

What is an effective maths teacher?
Skemp: Instrumental & Relational Understanding.
Ofsted Research review: Declarative, procedural and conditional knowledge.
Developing number skills and calculation strategies in four operations/fractions/decimals (KS2 to KS3).
Mathematical Pedagogies & mastery.
Classroom & behaviour management.
Development of Number work KS3/KS4 (Powers/Standard Form/Surds)

The Phase 2a ITE Curriculum:

In Phase 2a, the centre – based curriculum focuses on subject knowledge and pedagogy. We ask you to support students in exploring these further in schools.

Date	Taught LJMU session	School-based focus	Mentor curriculum in weekly meeting and Professional Development Activities.
Friday 10 NOV	Planning for what pupils will be thinking about: Trigonometry	Sequencing learning in the topics of Pythagoras & trigonometry.	**Trainee:** To consider a number of real life /practical questions that require the application of trigonometry & Pythagoras. **Mentor weekly meeting discussion:** Best order to organise the teaching of trigonometry. Which comes first angle or side? Which ratio should be looked at first etc
Friday 17 NOV	Assessment: Frequent low-stakes testing helps pupils Teaching Small Groups	All Day in Ridgeway High School Diagnostic Assessment How school uses assessment and feedback to inform progression.	**Trainee:** Trainee should be aware of both formal and informal assessment policies within school. How is data used to track progress? Trainee to carefully plan questions to help children verbalise their understanding. **Mentor weekly meeting discussion:** Discuss with trainee their upcoming 'critical incident' assignment in rfelation to assessment.
Friday 24 NOV	Planning for what pupils will be thinking about: Geometry Methods for working algebraically 1: Algebra as an extension of number	If possible, to observe geometry in KS3 curriculum. Otherwise to appreciate how geometry is covered within the school curriculum Observing any teaching of algebra (especially in KS3)	**Trainee:** Identify the difficulties and misconceptions children can have in geometry. How can these be best addressed? If possible observe some teaching of geometry within school. **Mentor weekly meeting discussion:** Discuss some of how your school's maths curriculum develops children's understanding in algebra. In particular, look at progression over KS3 and links to KS2
Friday 1 DEC	Scaffolds as aids, not crutches Methods for working algebraically 2: Extending Algebra in to KS4	Variation Theory • Conceptual Variation • Procedural Variation • Devising Tasks to evidence variation Observing any teaching of algebra (especially in KS4 higher level)	**Trainee:** Identify any methods of factorising and solving quadratic equations that are favoured by your department? **Mentor weekly meeting discussion:** Discuss how variation theory is included within your school's own mathematics curriculum. Identify a specific upcoming lesson where this approach would be helpful.

Friday 15 DEC	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.

In Phase 2b, student teachers go to their alternate placement with no centre-based Curriculum but with continued support from their Liaison Tutor. The Phase 2b mentor guide will be accessible via www.itt-placement.com website.

Questions to Consider when observing mathematics lessons

Subject Knowledge
Are mathematical misconceptions considered and addressed? How?
Does personal subject knowledge assist with questioning, responding to questions explanations, modelling and lesson design?

Coherence
Are lessons broken down into small, connected steps that develop the mathematical concept?
How does the teaching build on prior mathematical knowledge?

Fluency
Are children using efficient, accurate and flexible mathematical strategies to develop their understanding?

Mathematical Thinking
Are the children engaged in thinking mathematically? How do you know?

Conceptual and Procedural Variation
Is there a clear rationale for the choice of both mathematical questions and/or tasks? (Choices of examples for intelligent practice)

Representation and Structure
Are the chosen representations and resources carefully considered and do they effectively support the mathematics being taught?

Mathematics Curriculum Content as Classified by Ofsted 2021

Declarative Knowledge (What) = facts/ formulae, principles and rules.
Procedural Knowledge (How) = using a sequence of steps to achieve desired outcomes
Conditional Knowledge (When) = Reasoning and deep understanding of the adaptability and purposeful rationale to justify decisions.
In addition to above: Conceptual knowledge (Why) = Deep understanding of how mathematical ideas are integrated and connected.

The 5 Big Ideas in Teaching for Mathematics Mastery (NCETM 2017)