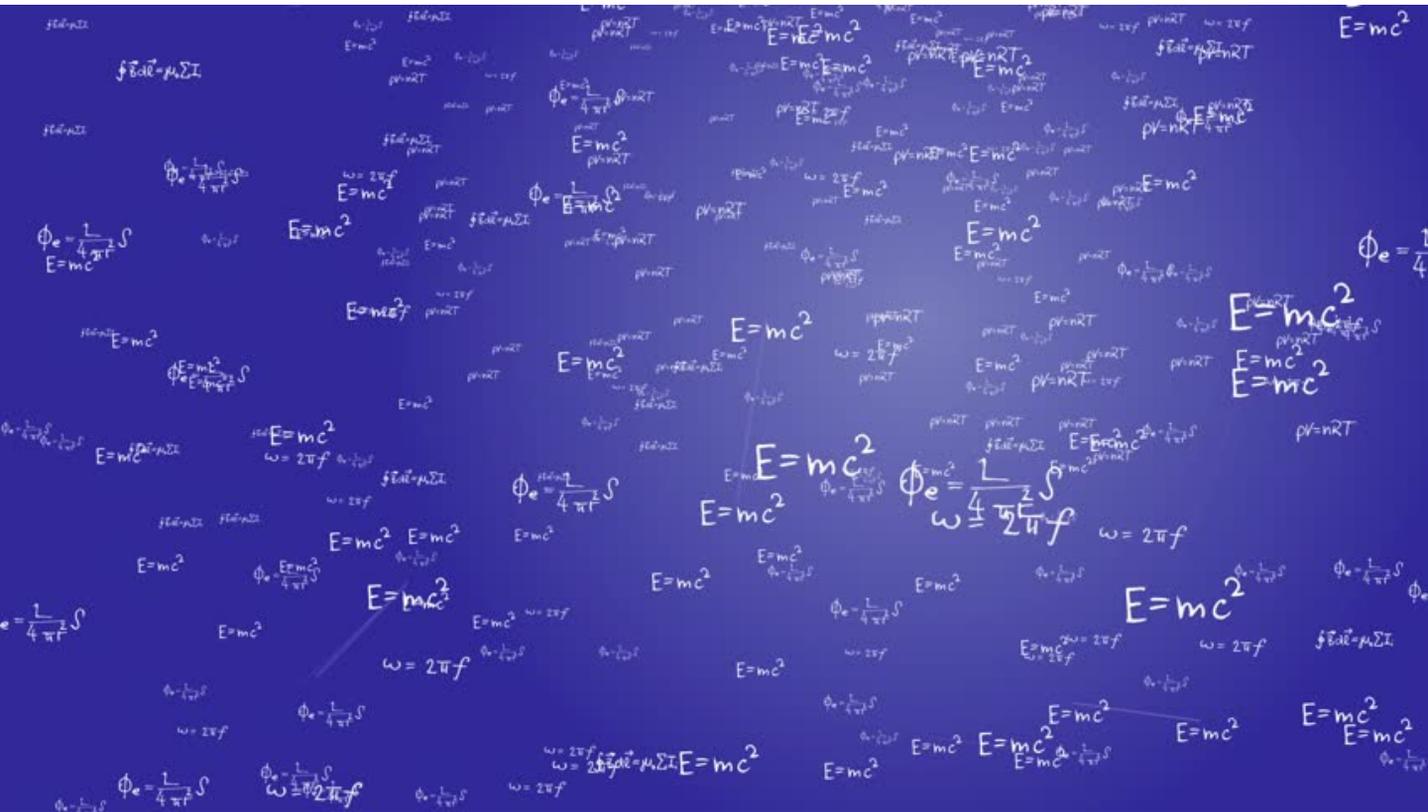




# **TEACHER SUBJECT SPECIALISM TRAINING [TSST]**



## **SECONDARY MATHEMATICS COURSE HANDBOOK [2017-18 cohort]**





## **PROGRAMME OUTLINE**

In March 2016, the Secretary of State for Education published a white paper setting out plans to deliver *Educational Excellence Everywhere* which includes reference to: 'Ensuring that teacher subject specialism training (TSST) is available to improve the maths subject knowledge of existing non-specialist teachers'<sup>2</sup>.

The TSST programme is a national programme and is coordinated, monitored, evaluated and funded through the National College for Teaching and Leadership. The TSST programme started in 2015-16, in which there were 98 lead schools with 2900 participants recruited, as of 23<sup>rd</sup> May 2016. For 2016-17, there were approximately 101 lead schools with over 3500 places available. In 2016-17 academic year, Highdown lead its first TSST programme in secondary Mathematics which saw 100% of colleagues from different educational institutions successfully graduate.

### **(a) Purpose of Teacher Subject Specialism Training [TSST]:**

- To improve the mathematical subject knowledge of non-specialist teachers by offering school-led teacher subject specialism training opportunities.
- To provide greater support to teachers who could potentially teach mathematics in addition to their main subject, teachers who want to retrain as mathematics teachers, teachers wishing to return to the profession, or primary phase teachers wishing to move to secondary phase.
- To develop pedagogy and practice in mathematics teaching to support delivery up to and including Higher Tier entry GCSE Mathematics.

### **(b) Design of the course:**

The course will be comprised of:

- three full one day conferences, approximately one per term
- six afternoon/twilight sessions, approximately one per half term

During the course, there will be mandatory modules to complete and some bespoke training provision. Participants are also invited to attend the weekly twilight Joint Professional Learning (JPL) programme offered at Highdown School free of charge as part of their course. Details regarding this programme are available separately.

The course will comprise of a combination of subject knowledge and generic teaching skills related to mathematics. It is expected and acknowledged that an area of strength may still need development – just to a higher level, e.g. beginners and advanced. Modules will be accompanied by knowledge tests throughout the course, for example GCSE style questions and assessment of student work.

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<sup>1</sup> Based on a programme by Taunton Teaching Alliance

<sup>2</sup> Educational Excellence Everywhere (DfE, 2016, p.26, section 2.10, point e)

Participants will be asked to complete a subject knowledge audit at the start of the course. This will take the form of a baseline assessment, for example this may be a past GCSE examination paper. This will help identify areas of strength and areas for development and will inform bespoke support and training.

Throughout the course, participants will work on their areas of strength and areas for development and record their progress using a Personal Learning Record (see below). These should include evidence of:

- personal lesson reflection
- lesson observation (and/or learning walk) feedback forms
- evidence of peer observation and reflection
- data to evidence impact on student achievement

Classroom experience is an important part of the TSST programme and includes lesson observation, team teaching and planning/teaching full lessons.

## **EXPECTATIONS**

### **(a) A Teacher Subject Specialism Training (TSST) participant's school/academy should:**

- provide a mentor for the TSST participant who is already trained in mathematics and who is willing to be observed and undertake observations
- provide non-contact time to TSST participants so that they can undertake observations, complete reading and research and prepare for monitoring visits
- provide release time for TSST participants to attend all training sessions, including an early departure for afternoon/twilight training sessions
- be willing and able to accommodate visiting tutors and representatives who may from time to time need to quality assure the programme or provide external verification of an TSST participant's progress

### **(b) A Teacher Subject Specialism Training participant should:**

- be familiar with all the requirements of the course as outlined in this document
- attend **all** scheduled sessions and complete all subject knowledge audits as requested by the course tutor
- complete **all** evaluation forms and 'impact' analyses
- be willing to be observed teaching during the process and understand that this observation does not form any part of their own school's Performance Management Processes
- be willing to engage in wider reading and research

Failure to meet these expectations will mean a participant will no longer be able to complete the course.

## **ASSESSMENT FRAMEWORK**

The programme will be assessed across the academic year. Assessment will be through a range of mechanisms, based on experience:

- formal observations by an in-house or visiting specialist
- work sampling to evidence student progress

- data analysis
- review of participant's lesson observations and evaluations
- attendance to afternoon/twilight training sessions
- practical subject knowledge test(s) and subject knowledge skills audit
- formal presentation. Participants will share their evidence with a panel made up of their peers and TSST Lead School assessors.

## **INDEPENDENT PROFESSIONAL LEARNING**

There is no core text or compulsory reading material. It is not proposed that participants will all have the same teaching styles, rather that participants gain the confidence, tools and enhanced subject knowledge to teach mathematics in their own way at GCSE level.

Reference will be also be made to materials offered by the NCETM (National Centre for Excellence in Teaching Mathematics), the FMSP (Further Mathematics Support Programme), associated organisations under the JMC (Joint Mathematical Council), and CIMT (Centre for Innovation in Mathematics Teaching) at Plymouth University.

**NCETM:** <https://www.ncetm.org.uk>

**CIMT:** <http://www.cimt.org.uk>

**FMSP:** <http://furthermaths.org.uk>

**JMC:** <http://www.jmc.org.uk>

The following texts are recommended as useful/interesting/enjoyable:

### **(a) Teaching and Learning:**

- The Teacher's Toolkit: Raise Classroom Achievement with Strategies for Every Learner by Paul Ginnis
- The Lazy Teacher's Handbook: How your students learn more when you teach less (Independent Thinking Series) by Jim Smith
- Research Methods in Education by Louis Cohen
- The Wisdom of Practice-Collected Essays of Lee Shulman: Vol 1 by Lee S. Shulman
- Visible Learning and the Science of How We Learn by John Hattie Embedded Formative Assessment by Dylan Wiliam
- INSIDE THE BLACK BOX: Raising Standards Through Classroom Assessment: 1 by Dylan Wiliam
- Cooperative Learning by Spencer Kagan
- Professor Povey's Perplexing Problems: Pre-University Physics and Maths Puzzles with Solutions by Thomas Povey

### **(b) Mathematics:**

- The Perfect Totally Practical Maths Lesson by Ian Loynd (2014)
- 100 ideas for Secondary Teachers: Outstanding Mathematics lessons by Mike Ollerton (2014)
- Teaching Mathematics in the Secondary School (Developing as a Reflective Secondary Teacher) by Paul Chambers
- Mathematics Inside the Black Box by Jeremy Hodgen
- To Infinity and Beyond: A Cultural History of the Infinite (Princeton Paperbacks) by Eli Maor

## MODULES

The course consists of three full day conferences covering aspects of teaching, learning and assessment in mathematics, together with six afternoon/twilight sessions which focus on developing specific subject knowledge. All sessions will take place at Highdown School and Sixth Form Centre. Afternoon/twilight training sessions will take place from 2.30pm to 4pm. Refreshments will be provided at each conference and training event. Below is a draft programme for the conference days, although these will be subject to change and participants will be notified of final programmes in advance of each conference day.

### (a) Conference day one [17/11/17]:

|                          |  |
|--------------------------|--|
| Session 1<br>9.30-9.50   | Welcome and introductions<br>Course Outline                                |
| Session 2<br>9.50-11.20  | Audit of subject knowledge and completing selection of GCSE exam questions |
|                          | Coffee   |
| Session 3<br>11.40-12.25 | Principles of Maths teaching, common themes, concepts and misconceptions 1 |
| Session 4<br>12.25-13.25 | Observation of GCSE Mathematics lesson(s)                                  |
|                          | Lunch  |
| Session 5<br>2.00-2.30   | Principles of Maths teaching, common themes, concepts and misconceptions 2 |
|                          | End of Conference Day 1  |

### (b) Conference day two [13/3/18]:

|                          |  |
|--------------------------|--|
| Session 1<br>9.30-10.50  | Using a range of teaching approaches to engage learners in Maths 1                     |
|                          | Coffee   |
| Session 2<br>11.15-12.45 | Planning for problem-solving in Maths  |
|                          | Lunch  |
| Session 3<br>1.20-2.20   | Assessment as learning in Maths<br>[including marking, questioning, use of data, etc.] |
| Session 4<br>2.20-2.30   | Plenary  |

### (c) Conference day three [6/7/18]:

|                          |   |
|--------------------------|---|
| Session 1<br>9.30-10.50  | Using a range of teaching approaches to engage learners in Maths 2                  |
|                          | Coffee  |
| Session 2<br>11.15-12.45 | Completing selection of GCSE exam questions   |
|                          | Lunch   |
| Session 3<br>1.20-2.20   | Using a range of teaching approaches to engage learners in Maths 3<br>Presentations |
| Session 4<br>2.20-2.30   | Plenary: Course evaluation  |

**(d) Afternoon/Twilight modules:**

As the course progresses, topics and areas for study may be proposed by the participants. The initial twilight sessions will be based on outcomes of the initial subject knowledge audits. Twilight sessions will take place at Highdown School from 2.30-4pm on the following provisional dates:

|             |
|-------------|
| 1: 14/12/17 |
| 2: 25/1/18  |
| 3: 22/2/18  |
| 4: 3/5/18   |
| 5: 24/5/18  |
| 6: 14/6/18  |

**Possible themes for twilight modules include:**

- Probability
- Gradient lines and straight lines
- Surds
- Functions

**PERSONAL LEARNING RECORD**

| Activity  | Date | Notes |
|---|------|-------|
| <input type="checkbox"/> Observe another teacher<br><input type="checkbox"/> Formal observation<br><input type="checkbox"/> Attendance of a Professional Learning activity<br><input type="checkbox"/> Data analysis<br><input type="checkbox"/> Attendance to training<br><input type="checkbox"/> Knowledge Tests<br><input type="checkbox"/> Independent Professional Learning<br><input type="checkbox"/> Other |      |       |

**COURSE FACILITATORS**

Mr Matt Gunbie [Curriculum Leader for Mathematics]  
Mr Will Dineley [Teacher i/c KS4 Mathematics]

**CONTACT**

If you have any queries concerning the TSST Mathematics programme please contact Mr Matt Grantham at Highdown School via email on [magrantham@highdown.reading.sch.uk](mailto:magrantham@highdown.reading.sch.uk).

**Matt Grantham**

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