

WHOLE SCHOOL TEACHING AND LEARNING

THE TTA WAY - MATHEMATICS

Lesson structure and routines

- Students will have a Do Now to start on entry. It will be clear to students whether this is to be completed independently and whether in books, on paper or on MWB. The questions are primarily chosen to close gaps informed by assessments. Questions can also be chosen to test prerequisite knowledge or challenge thinking. ^(R1)
- Other than the Do Now every task will be driven by the learning objective; this may span more than a single lesson but will always be referred to every lesson. ^(R2)
- TTA Maths Chants are used whenever a chant relates to what they are learning. Where a chant captures the crux of the lesson it will be incorporated into the LO and the teacher explanation. ^(R2)
- When students learn a new concept they should have at least one example in their books of what a model answer looks like. This may be a question solved whole class with top tips or a model answer they have produced. Students do not blindly write down a model answer which they have not worked out themselves. ^(R4)
- Students practice the concept through a task or sequence of tasks chosen by the teacher. They may spend a lesson working through only one or two complex problems. The goal is for the students to be mentally engaged in practicing the concept and to be held to account for the quality of their efforts. ^(R5,R9)
- Students will complete a minimum of 20 minutes of independent practice every two lessons

Culture of accountability

- Pupils are arranged in pairs or groups to encourage collaboration and peer accountability. Pupils are expected to share understanding and test each other's explanations. Teachers make it explicit that students can only ask them for help if no one on the table knows the answer, although students can check that their answer is correct. ^(R7,R8)
- Teachers make it explicit that students are expected to take responsibility for learning from their mistakes. They hold students to account by:
 - Using AfL and data to question students on weaknesses after they have had time to address them ^(R4,R6)
 - Calling on students to share purple pen corrections and top tips or showing them under the visualiser ^(R6)
- Teachers develop a culture of error by celebrating students who share their mistakes and have demonstrably closed a gap in their understanding. ^(R8)
- Students are expected to listen to one another's responses. Targeted cold calling is used to reinforce this. ^(R3)

Embedding challenge

- In Maths students are pushed to understand the mathematical concepts they are learning rather than simply reproduce a method they are taught. Challenge is embedded into every lesson using strategies such as:
 - Twisting fluency questions ^(R1)
 - Planning for questions which highlight misconceptions ^(R3,R6)
 - Increasing the difficulty of questions in written practice ^(R2)
 - Using mini whiteboard responses or multiple choice answers to get pupils to draw out misconceptions ^(R4,R6)
 - Giving students the 'answer' and asking them to work backwards to work out the missing information ^(R3)
 - Deliberately making a mistake for pupils to identify without letting them know when this will happen ^(R6)
 - Posing problems which students cannot solve before scaffolding gradually to make the problem accessible ^(R8)
 - Presenting questions where the concept being tested is not obvious and students must think of a strategy
 - Multi-step questions involving many different topics that focus on logic/strategy ^(R6)
 - Encouraging students to come with a generalisation of a concept

Planning

- Lessons follow the sequence of the [Schemes of Work](#). Essential topics prioritised for teaching to all groups are highlighted in green. Groups capable of accessing the full curriculum and beyond are stretched to achieve this.
- Teachers have autonomy to plan independently for their classes and will share all valuable and reusable resources on the Maths shared drive.

MATHEMATICS TEACHING AND LEARNING

FEEDBACK

In class

Students get feedback on the quality of their responses and gaps in knowledge from questioning, mini whiteboard practice, peer discussion and individual feedback as the teacher circulates.

In books

- All classwork is marked by pupils or their peers in purple pen or by their teacher in red or green pen.
- Teachers are not expected to mark classwork but to circulate in lesson to check that written work is completed with clear working, is being marked and that corrections are made to address mistakes. Where time is limited teachers will prioritise monitoring underachieving students highlighted in the classport. ^(R6)
- Where students have made a mistake they use their purple pen to mark it and are directed to write tips about their mistake or how to avoid repeating it, referring to TTA Maths Chants where possible. ^(R7)
- The teacher will call on pupils to share meaningful tips to help other students develop this skill. ^(R6,R8)
- If needed the teacher will direct students to write a model answer with top tips to address key misconceptions. ^(R4)
- When pupils review mistakes with each other the teacher will check that corrections are being made and test students' understanding through questioning, targeting pupils who are most likely to have misconceptions. ^(R3,R6)

Assessment

KPIs (Knowledge tests)

- Teachers will mark at least three pieces of work thoroughly each half term, from KPIs and termly assessments. ^(R10)
- Teachers of lower attainers can edit KPIs with HOD agreement so that students are only tested on what they have learnt. Teachers have the option to set a pass threshold and ask underperforming students to re-sit the test. ^(R7)
- KPI results are recorded on a shared tracker. KPI tests are glued into students' books and their results recorded on the front page of their exercise books, including any re-sit scores.

Fluency

- Fluency will be tested through Do Nows. These will serve as a daily review and should be planned so as to systematically review prior content. ^(R1, R10)
- Teachers will use Schemes of Work, QLAs, KPIs or separate fluency tests to identify content which needs revisiting most urgently and most regularly. ^(R1, R10)

Termly assessments

- Students in Y7-10 complete a formal cumulative assessment twice a year with results recorded on a QLA¹ audit. Y11 students complete mock exams throughout the year. ^(R10)
- Teachers use the QLA to identify whole-class gaps to focus on during review lessons. ^(R7) Groups are held to account for the quality of their peer review by questioning students who made mistakes on how they have addressed these. ^(R3&6)
- After reviewing Yr11 mock exams teachers use 'Tippexed copies'² of key questions to ensure whole-class weaknesses have been addressed. ^(R7)

Trackers

- Data from KPIs and termly tests is recorded on a department tracker
- Themes which emerge from data are used for:
 - ☐ Planning interventions to tackle underachievement in each class and year group
 - ☐ Ensuring students are being exposed to the optimal level of challenge
 - ☐ Identifying content which needs to be re-taught or re-reinforced in lessons
 - ☐ Preparing revision resources for cumulative assessments

¹ Question level analysis

² 'Tippexed copies' are copies of the original exam paper with subtle changes made to the questions

MATHEMATICS TEACHING AND LEARNING

THE TTA WAY - Out of Lesson Learning

Homework

Format - Homework will be issued through Hegarty Maths (www.hegartymaths.com) or Sparx (www.sparx.co.uk).^(R9)

- Students will be set approximately one hour's worth of homework per week with guidance on additional tasks they can complete to accelerate their learning.
- Students in years 7-10 students must write out the date, title, quiz answers and working in their homework books and mark their work in purple pen.
- If they do not get 100% or the teacher's target % on the quiz they must repeat it. If the task is too hard the teacher can decide to accept the effort or issue a previous task from the 'Building blocks' tasks.
- For Year 11, depending on the topic and at the teacher's discretion, learners are not required to write out examples or answers but are expected to repeat the quiz until they get an acceptable score.
- Individual classes or pupils can be issued alternative homework assignments in agreement with the HoD such as Times Tables Rockstars, 5 a day questions or challenge work for Higher Y11 students.

The teacher will always use Hegarty Maths tasks to either:

- Consolidate a topic students have recently learnt
- To refresh knowledge of a previously learnt topic in readiness for what is coming next
- To close out gaps identified from QLAs³ or KPIs.

Frequency – Students will be issued homework every Thursday or Friday and will have a week to complete it.

Quality - Teachers will check that students have achieved an acceptable score using www.hegartymaths.com or www.sparx.co.uk and will check books to see that quizzes have been completed and marked. By October half term teachers should have established a routine of setting homework and ensuring it is up to standard.

A nominated member of the team will collate monthly data from Hegarty Maths. Teachers will use this to celebrate the hardest working students and classes and boost the quantity and quality of Hegarty learning in their classes.

Follow Up – If homework is late or incomplete students will be issued a consequence which may be referral to a central Maths Homework detention. Teachers will pre-empt the need to issue detentions where possible, for example by arranging for students to complete homework in advance of the deadline with after-school support in the library or with their teacher.

Extra curricular Activities

Purpose – To engage learners in Maths beyond the classroom and to deepen their mathematical thinking and fluency.

Clubs Maths Challenge club to stretch students and help them develop strategies for tackling challenging problems

Wider Competitions – UK Maths Challenge, Times Table Rockstars Tournament.

School trips – Possibilities include visits to universities with a high profile in STEM courses, maths in context such as a visit to Bletchley Park, regional Maths enrichment days and other opportunities that arise.

Reward trips – for example for high performers on Hegarty Maths.

³ Question Level Analysis