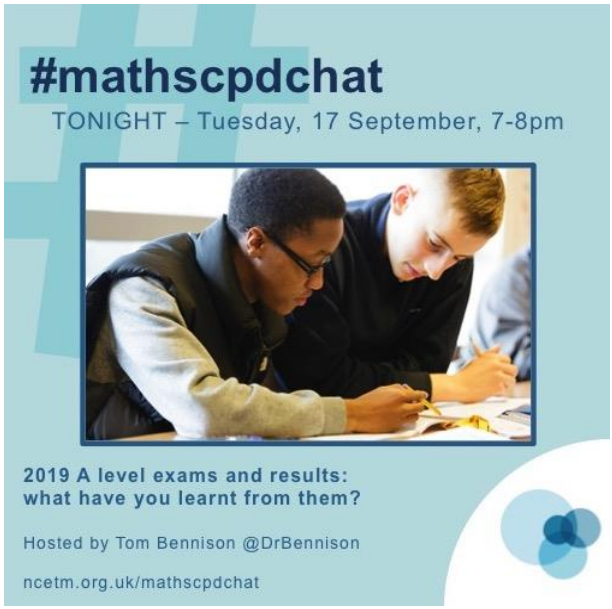
#mathscpdchat 17 September 2019

2019 A level exams and results: what have you learnt from them?

Hosted by Tom Bennison

This is a brief summary of the discussion – to see all the tweets, follow the hashtag ***#mathscpdchat*** *in Twitter*



Some of the areas where discussion focussed were:

- that the **2019 Mathematics A level papers were 'nothing like' the papers of previous years** … that students were required to use their knowledge and understanding appropriately to solve unfamiliar problems, rather than respond to familiar prompts by applying remembered routines;
- teachers were concerned that their **lower-attaining students** could not engage in the kind of thinking that the 'new-style' questions required … that the **lack of AS content** in the final exams this year made the papers less accessible to lower-attaining students;

- that students embarking on A level Mathematics with **GCSE grades below Grade 8 may need extra curriculum time** in order to acquire the depth of understanding necessary to access the 'new-style' questions;
- that the proportion of the candidates (from the schools of teachers contributing to the chat) who were **awarded 'middle' grades (B/C) dropped this year** … that in previous years 'AS modules had pulled students up' … whether adjustments to teaching now will eventually 'restore the balance';
- **fears** that some students who in previous years would have been likely to achieve **'middle' grades (B/C) will not**, in future years, **in spite of the best teaching**, be capable of acquiring the depth of understanding required to **solve the hardest problems of the kind included in the 2019 papers** (not all contributors to the chat held these fears);
- **'baseline entry tests'** for students requesting to embark on maths A level courses, including assessment of their **abilities to construct proofs**;
- that students were not happy after the exams … that **on-the-whole high attaining students** accurately **predicted their performance**, **middle attaining students did worse** than they expected, and the **lowest attainers did better**;
- students who came out of the exams **feeling worried because they couldn't finish questions** actually did better than they expected;
- that, even though students achieved adequate grades (in line with the grades of students of similar attainment levels in previous years), the **lowered grade boundaries and more demanding questions left many students feeling bad about both themselves and mathematics** … some students were made to think 'I can't do maths' … this negativity filtered through/down the whole school impacting-on **(reducing) the number of students choosing to start studying maths A level** this year;
- students in one school found that the **'high mark questions' on Applied maths were more accessible than those on Pure maths** … teachers wondered whether this was a national pattern;
- that using/working-well-with the **'new-style' 2019 mark schemes** makes more demands on teachers (than did using mark-schemes in previous years), but that they result in much **fairer assessments** … one of the Further Maths mark schemes was found to be 'harsh' where students were awarded zero marks even though it was clearly evident that the student had understood what to do but had made one initial mistake;
- that teachers seeing how different examiners approach assessment-by-exam-questions in different topic areas is an **aspect of their professional development**;

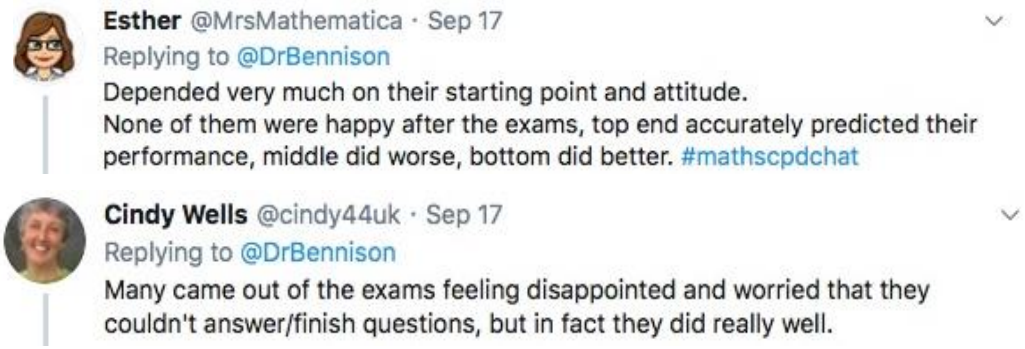
- teachers **undertaking marking for exam boards** as a form of professional development, which thereby benefits their students;
- that it is helpful to **use past-paper-questions from all the exam boards** … that learning to respond adequately to all their various different 'styles' helps students become 'flexible in their thinking';
- **changes and adjustments to teaching this year that have been prompted by the 2019 exams** … for example, more frequent 'little assessments', increased focus on 'non-standard' approaches, searching for sources of 'non-standard' questions;
- the struggle for teachers to **find the time required to create themselves suitably challenging practice problems** … teachers concerns that that they will not be able to 'second guess the kinds of questions that examiners will come up with next';
- advising (pushing) **students to do more work 'outside of lessons'** … adding a 'private study' column to A-level schemes of work;
- the **A-level topics that are seen** (by some teachers) **as 'introductory'** … for example, indices and surds, 'most of quadratics' excluding discriminant and modelling, most of 'simultaneous equations' excluding graphing, 'tree diagrams' and Venn diagrams';
- that 'cuts in teaching time' are making it **harder to fit in valuable student explorations** of the kind that can result from using the Underground Mathematics materials (link provided below);
- whether the 2019 exams have caused teachers to make **changes to the resources that they use for topic assessments** … for example more teachers are now using *Integral Maths* resources … teachers also use *Zig Zag* topic tests and *Mad As Maths* topic booklets (links provided below);
- **basing judgements about students' progress on continual observation** of what they do and say, rather than only on their performances in 'mock-exams-compiled-from-past-papers';
- as a result of the 2019 exams **deciding to change the 'delivery time' weightings for topics** … for example, giving more time to 'groundwork' in Y12 (first A level year), moving 'Y13 calculus' to earlier in the course in order to give students more time to practise integration, moving radians from Y13 to Y12, pushing 'Applied maths' to the very end of Y13 (although some teachers prefer to retain 'early Applied maths' in Y12);
- setting **'mock exams using past AS papers' in the October of Y13, followed by 'mock exams using full past A level papers' (that include all Y13 content) in March** … this procedure is helpful for indicating where to target intervention and revision sessions;

- that it's easy to **overestimate the benefits of a topic being 'fresh in the students' minds'** at the time of the exam, and **underestimate the benefits of allowing time for ideas to become embedded**;
- providing students with **'Summer homework packs'** (sent out as documents) at the end of Y12 … 'all of the students came in at the start of Y13 with it done';
- organising an **'A level Mathematics Induction Day'** for Y11 students in July;
- **questions from the 2019 maths A level exam papers that were teachers' 'favourites'** … including Question 16 from AQA's A level Paper 1, a binomial expansion question from Edexcel, a question in which differentiation of x^x was the target, and a question in which students had to understand and use a 'proof by exhaustion' … any question that 'links different topics in a beautiful way';
- whether, at this time, students in Y12/13 should or should-not to be **allowed to see the Summer 2019 A-level questions**;
- that the ***Advanced Maths Support Programme*** **(AMSP) website** provides great support and many resources for teaching the 're-styled' A level Mathematics curriculum (link provided below).

In what follows, click on any screenshot-of-a-tweet to go to that actual tweet on Twitter.

This is part of a 'conversation' of tweets, about how students felt about the exams while taking them, how they thought they had done, how their predictions did not always correspond with their actual results, and how students' negative experiences while doing the exams impacted negatively on the numbers of students wishing to start on A level maths courses this year. The conversation was generated by this tweet from Tom Bennison:

including these from Esther, Cindy Wells, Sheena and Tom Bennison:



and these from Susan Whitehouse, Miguel Pimentel and Sheena:

(to read the discussion-sequence generated by any tweet look at the 'replies' to that tweet)

Among the links shared were:

Integral which is comprehensive, high-quality support for AS/A level Maths and Further Maths. It was shared by Sheena

A level Mathematics which is an excellent source of support from the Advanced Maths Support Programme (AMSP) for all aspects of teaching maths at A level. It was shared by Mary Pardoe

AS/A level Mathematics resources (from the ASMP) which directs you to mathematics resources in *Integral,* FMSP resources, schemes of work and other excellent additional materials to support the teaching of AS/A level Mathematics and AS/A level Further Mathematics. It was shared by Mary Pardoe

A* in A level Mathematics support which explains how MEI is working with Imperial College on a project designed to improve students' understanding of the subject requirements for an A* grade and to develop their mathematical thinking skills. It was shared by Mary Pardoe

Underground Mathematics: our philosophy which is where Underground Mathematics share their beliefs about mathematics and mathematics education that underlie all their lovely material to support A level teaching and learning. It was shared by Mary Pardoe

MadAsMaths which are free resources for students and teachers of mathematics, including practice papers with full solutions. It was shared by Tom Bowler

ZigZag Maths which are purchasable Topic Tests designed for all the AS and A level 2017 specifications. It was shared by Tom Bowler