

LGfL Maths Bootcamp



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1. Premise of the project

- 1.1. The majority of GCSE intervention is around the notion of 'more of the same' exam practice which does not secure the desired rapid improvement in attainment.

2. Identify the key problems and issues in the case study.

- 2.1. Intervention and revision in schools is predominantly based around exam practice.
- 2.2. The most popular websites and tools in the maths community are based around exam practice which support this hypothesis including *Method Maths*, *Just Maths*, *Test Base*, *Exam Wizard*, *Corbett Maths*.
- 2.3. It is suggested that the majority of revision is based around teaching that focuses on fluency and revision that focuses on AO1 objectives (1-step familiar problems).
- 2.4. Understanding the score report in 2009 suggests that maths is taught predominately 'to rules, methods and facts.' This research was developed further in 2012 by the '[Made to measure report](#)' and follow up research by the [NCETM in 2015](#) which led to the creation of 34 maths hubs. 20% of students within England are taught by non-maths specialists, In 2012 City and Gills survey found that student judged maths to be 'Boring, irrelevant and Hard.'. **As a result, it is suggested that the mathematic diet within many schools does not support conceptual understanding and a love of Maths.**
- 2.5. Low self confidence in Mathematics is often a hurdle to their learning. To support this most maths interventions are local, within the school building and surrounding area.

3. Intended outcomes

- 3.1. To improve achievement for students who fall behind in mathematics.
- 3.2. Encourage students to seek mathematic opportunities in further education.
- 3.3. To reconnect students with mathematics to find enjoyment of mathematics by making it relevant.
- 3.4. To encourage students to engage with their peers from other geographic areas around the country.

3.5. Improve conceptual understanding and thereby deepen student’s awareness of mathematic connections.

4. Background

4.1.1. Grahame Smart is an independent consultant and former maths teacher who works with London Grid for Learning and Academies Enterprise Trust (AET) among a range of other clients in the UK, Bermuda, USA and Denmark. Grahame and the AET Trust have led a number of School holiday revision sessions for including schools over many years.

4.1.2. Five underperforming academies were selected for involvement in the bootcamp project with a disproportionate number of students that should have been tracking at 4+ and 5+ but were actually performing below national average.

4.1.3. Rationale for 2015 changes to the national mathematics curriculum suggested that standards in UK mathematics in the UK have been falling behind rival countries.

Figure 1. 2017 performance of academies within this case study

	% 4+	Diff. to national	% 5+	Diff. to national
Alyward Academy	52%	-17%	35%	-15%
Bexleyheath Academy	56%	-13%	38%	-12%
Four Dwellings Academy	53%	-16%	26%	-24%
Nightingale Academy	37%	-32%	23%	-27%
Sir Herbert Leon Academy	47%	-22%	23%	-27%

4.2. Alternatives

4.2.1. Holiday revision delivered by student’s regular teachers in school.

4.2.2. Continuation of current teaching strategies.

4.2.3. Commission private companies to deliver a package of revision which is less bespoke and extremely expensive. Three of the five academies within this case study have previously used a private company for Easter revision at a cost of over £100 per student per day.

4.2.4. Explain why alternatives were rejected

4.2.5. High costs at a time when academies are budgeting within a 2 % surplus.

4.2.6. Little evidence of impact from previous years.

5. Proposed Solution

5.1.1 The AET Mastery Flow Model (figure 2) was adopted as the core teaching approach.

5.1.2 Google chrome books were used to input all activity by students via keyboard and stylus data entry. The G Suite platform allowed real time tracking of students learning activities.

5.1.3 High intensity teaching was maintained throughout with pro active monitoring of students progress both visually and through the real time data tracking systems.

5.1.4 Booster sessions were delivered from 9am to 3pm over 4 days within an office environment to expose students to an adult work place.

5.1.5 Lunch, tea and coffee were all provided for students to provide an environment conducive to concentration and inspiration.

5.1.6 External speakers including a barrister and a former CEO of a FTSE 100 company delivered keynotes to inspire students at the end of each day.

5.1.7 Benchmark attainment testing was administered before and after the project.

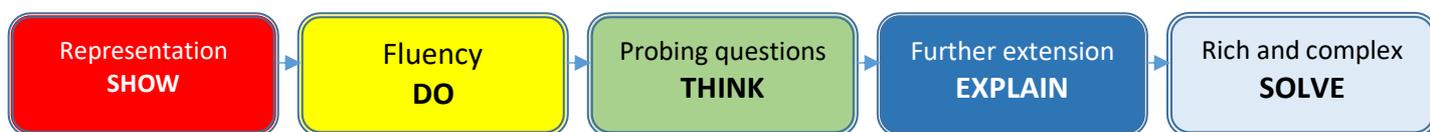


Figure 2. Academies Enterprise Trust (AET) Mastery Flow Model

6. The Context:

- 6.1. All academies chosen were low performing below national averages for maths performance.
- 6.2. All students were currently tracking at grade 3 whilst performing at national average in KS2, therefore students were targeted a grade 5 in GCSE.
- 6.3. 5 students from each school were targeted and participated in the 'Bootcamp' experience
- 6.4. The case study was delivered by one teacher and one LGfL/Google Educator. The teacher was Grahame Smart, AET and LGfL Maths Consultant. The LGfL Consultant was Oli Trussell, a Google educator and former Maths Advanced Skills Teacher, hosted within AET central service offices in Euston.
- 6.5. Grahame is a former Maths AST who spent most of his career working in Lewisham South East London. Grahame is an outstanding maths teacher who also has expertise in Maths assessment and Curriculum development and advises governments and exam boards on their assessment frameworks.

7. Impact

7.1. The average increase was 11 marks for pupils that sat both papers. This is significant as the two assessments were out of 64 marks and the improvements made by pupils were not exclusively in the areas/topics we had covered during boot camp. This represented an average 17% increase over the 2 papers. This would equate to an full 1 grade increase based on recent grade boundaries, although this does depend on which tier the pupil has been entered for.

7.2. The pupils were also asked some questions to uncover their attitudes towards maths. These are summarised below

	Pre (18)	Post (23)	Change	Percentage swing
Enjoyment	3.16	4.43	1.28	26%
Ready for summer exam	2.42	4.04	1.62	32%
Relevance	3.21	3.91	0.70	14%

The above table was a simple survey graded from 1 (Lowest) to 5 (Highest). Enjoyment went up from 3.16 to 4.43 and the data suggests that pupils feel more ready for this summers exam as this has seen a jump from 2.42 to 4.04. The data also reveals that pupils thought that maths was more relevant to their lives with a 0.7 increase between the start and finish of Bootcamp.

8. Summary

Bootcamp delivered improvements in pupils test scores in the run up to the 2018 summer GCSE examinations. There was also an increase in enjoyment of the subject which will hopefully encourage some of those pupils to study maths at a higher level.

This case study was made possible through the generous support for the following organisations:



Watch this case study and more on the LGfL TV Maths channel at www.mathstv.lgfl.net