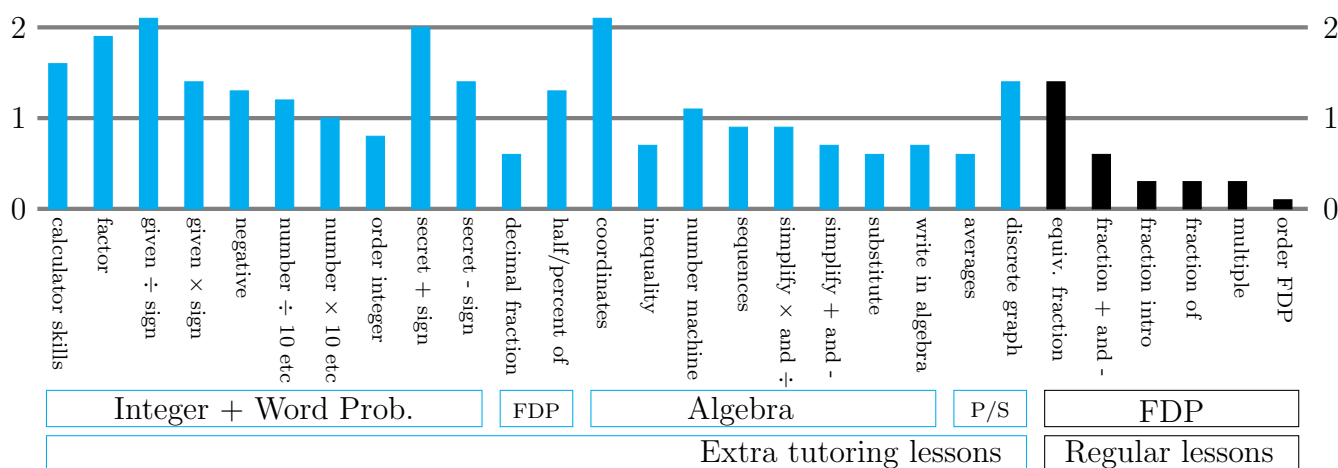


In one school extra maths tutoring is offered to selected learners in year 7 or 8 within the Special Educational Needs Department. For two connective years, the tutor used **timely practice**, to more deeply embedding the teaching in the learners' long term memory by:

- using retrieval practice, scheduled by **timely practice** and
- only teaching a small bite from each topic (but teaching more topics).

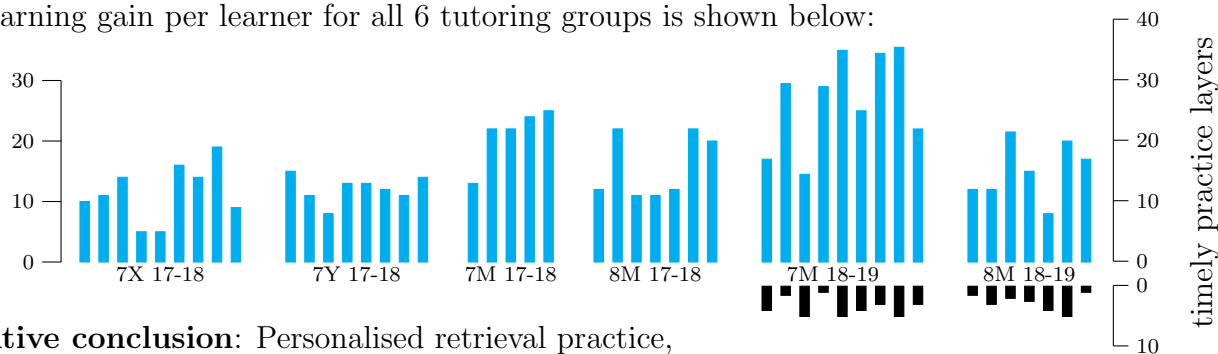
Unfortunately, but predictably, most learners in 2017-18 forgot much of the new learning within 2 to 3 months of the intervention. So in 2018-19 the teaching phase was reduced by 2 weeks and retrieval practice continued weekly for 3 weeks for 7M 18-19 (8Ms lessons were too close to the end of term to make this change). The mean learning gain per learner, measured in timely practice layers - small bites of learning - for each of the topics taught to 7M is shown below:



The class size, number of lessons and teaching style are different for tutoring:

Type of maths lessons	Tutoring	Regular
Teaching and learning time within trial	10 hours	23 hours
Number of teachers, teaching assistants and learners	1, 1 and 9	1, 1 and 20
Number of topics taught	22	6
Mean time to teach/learn/practise a topic	27 minutes	3 hours 50 minutes
Mean personal teacher time (hours ÷ learners)	67 minutes	69 minutes
Scheme of learning used	breadth first	depth first
Method used to embed learning	retrieval practice	homework + unit test

The learning gain per learner for all 6 tutoring groups is shown below:



Tentative conclusion: Personalised retrieval practice, appears to be effective for tutor intervention. To permanently close the learning gap, retrieval practice should be done for at least 15 minutes thrice a week, every week. Tutoring within maths lessons will be cost effective with a rate of teaching between 1 and 2 topics per lesson.