

## Motivation questionnaire analysis

We asked 444 Year 7 students from four Sparx schools to complete a questionnaire consisting of 18 questions relating to student motivation. Statistical analysis of the data revealed three underlying motivation factors: maths confidence, maths enjoyment and perceived importance of maths. Looking at the students' pre- and post-test performance at the start and end, respectively, of each of two half-terms, we found that maths confidence was most strongly associated with student progress and attainment on these tests, followed by maths enjoyment and perceived importance of maths. Using a more complex statistical modelling approach, we adjusted for demographic factors such as gender, class and school membership as well as the students' mathematical ability. We found that maths confidence remained significantly associated with student attainment, which shows that it isn't simply a surrogate for mathematical ability. Exploring the Sparx Maths Homework completion data of these students, we discovered that students who scored highly on any of the three traits had a significantly greater tendency to complete their optional homework. Our findings indicate that student motivation is multifaceted and important not only for exam performance but also students' day-to-day engagement with maths learning.

	Progress in maths	Pre-test attainment	Post-test attainment
Maths enjoyment	r = <b>0.122</b> , p = 0.005	r = <b>0.111</b> , p = 0.011	r = <b>0.139</b> , p = 0.001
Maths confidence	r = <b>0.160</b> , p = 0.0002	r = <b>0.290</b> , p = $1.3 \times 10^{-11}$	r = <b>0.322</b> , p = $3.7 \times 10^{-14}$
Perceived importance of maths	r = <b>0.102</b> , p = 0.020	r = 0.027, p = 0.54	r = 0.058, p = 0.18

**r**: Spearman's rank correlation coefficient

