

The importance of maths: ten reasons, with the evidence

Reason	Evidence
1. It pays	A-level maths associated with about 10% higher earnings at 30, after other qualifications (UK longitudinal studies, Dolton and Vignoles 2002; IFS)
2. It opens careers	Most of the fastest-growing, best-paid US occupations need quantitative skills (Bureau of Labor Statistics)
3. It is the language of the other subjects	Physics in equations, chemistry in ratios and logs, biology and medicine in statistics, economics in calculus, computing in logic
4. It builds reasoning	The only subject whose whole content is 'show that this follows from that'
5. It runs daily life	Money, time, measurement, risk, the numbers in the news
6. Numeracy predicts adult outcomes	OECD adult skills survey: low numeracy linked to unemployment, poor health and low trust, independent of literacy
7. Early maths predicts later success	Maths at school entry predicts later achievement across subjects (Duncan 2007); fractions at 10 predict algebra at 16 (Siegler 2012)
8. It is the gate to the degrees	Engineering, CS, physics, economics, medicine, finance require calculus or statistics
9. It teaches persistence	A problem worked at until it yields is the most reliable productive struggle in school
10. It is beautiful	Children who meet maths as worth understanding keep it for life

What matters at each age

Age	The maths that matters most
5 to 7	Counting with meaning; place value; addition and subtraction facts
7 to 9	Multiplication facts automatic; fractions as pieces; reading a graph
9 to 11	Fractions as numbers; decimals and percent; long multiplication and division
11 to 14	Ratio and proportion; negatives; algebra as a language; basic statistics
14 to 16	Fluent algebra; geometry and proof; everyday statistics; the exam course
16 to 18	Calculus and statistics for the quantitative routes

Five home habits, and a maths-in-your-week log

- [] Let maths appear in ordinary life, out loud: the bill, the score, the recipe, the journey
- [] Never say anything negative about maths
- [] Praise the method, the checking and the persistence, not speed or cleverness
- [] Keep daily practice short and automatic, no timer
- [] Treat a wrong answer as information: find the step, together, without comment

Maths met this week (write one thing a day the child saw or used)

Day	Where maths appeared	What we did with it
Mon		
Tue		
Wed		
Thu		
Fri		
Sat		
Sun		

'I'm not a maths person'

The belief itself lowers results (children who hold it choose easier problems and give up sooner); maths anxiety lowers working memory and is learned from timed tests, public mistakes and anxious adults; and nearly every 'not a maths person' has a specific gap (fractions, multiplication facts, negatives) that made everything after it fail. Close the gap and the identity changes within a term.

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