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Welcome to the MEI conference 2026

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To start

"Does when you are born matter? The impact of month of birth on children's cognitive and non-cognitive skills in England", authored by Crawford, Dearden, and Greaves.

….*Summer babies at a disadvantage? It didn't hurt Obama, Clinton or Napoleon!*

Ashton Eaton *set a world record in the men's decathlon in 2015.*

In the 100m, he finished in a time of 10.23 seconds.

In the long jump, he leapt a distance of 7.88 metres.

It is reasonable to assume that he did well in both.

How well?

Was one relatively better than the other?

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Celebrating 10 years of Core Maths in FE, Schools and Sixth-Form Colleges

James Maloney

Lily Tang-Gentile

James Maloney

Local Lead with North Mids Maths Hub

Teaching Core Maths, A-level Statistics, & GCSE Resit at a 6th Form College

Taught Core Maths for 11 years

(AQA 2A/B/C, OCR Core Maths B)

Lily Tang-Gentile

Local Lead with Cambridge Maths Hub

Post-16 Lead, Cambridge Maths Hub

Teaching in a local comprehensive

Previously a Core Maths Lead

Taught Core Maths for 12 years

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Reflecting on 10 years of teaching Core Maths

- how it changed/shaped us

James’ Reflections

Core Maths community is still small but growing. There's no longer quite so many '*What's that?'* comments.

I talk about Maths with a wider variety of students. It’s come out of the basement. Maths is no longer just for people ‘who can do maths.

Core Maths has changed how I teach other qualifications.

Lily’s Reflections

Sense of equity for post-16 learners/students who do not want to do A level maths, because everyone can benefit with doing more maths

Students seeing the transformation in themselves over the course of studying (very gradually at times)

Fundamentally changing the way topics are introduced at KS3/4, especially (for me) GCSE Statistics was taught a lot in a much more ‘grounded way’

Lily- some student survey findings

Core maths was enjoyable and helped my maths skills stay strong for all my other subjects. I would definitely recommend that students who take sciences without A-Level Maths should take this course as it helps with the basic maths skills and statistical techniques that we rely on in science.

Sheffield and UEA both were B B but both were reduced to B C with an A in core maths. The offers were only based on 2 a level grades because I had done an A level already in year 12

Many of those who had messed around in lesson dropped it early into year 13 which made the lessons flow a lot better and had less disruptions. This allowed better relations to be formed with teachers and more time explaining stuff when we didn't understand. Year 13 covered new topics for me which also made it enjoyable as it was new and not the repeated GCSE skills from Year 12

Brunel University of London, offer went from AAB to BBB

Everyone wants to know something

What do you want to know about?

Is this new drug saving life?

What's the view on Cambridge congestion charge?

How's my restaurant business doing?

What's trending on TikTok?

Where did people go on holiday this summer, if they did?

How much do footballers get paid?

Do people like this new T shirt design?

How is the Comberton Sports Centre?

Conclude based on your data

Wants to know something

↓

Collect some data

↓

Summarise and present the data

↓

Conclude based on your data

NOT THE TRUTH!

What to do with this!?

A	B	C	D	E	F	G	H	I	J	K	L	M	N	
yeargrou	location	gend	age	height	footlength	elbowtowrist	armspan	foodtype	meat	ortionsaday	rtionsada	ionsadays	ortionsadaycris	
9	North West	female	14	165	27	29	165	carb	6	4	3	5	4	
7	South West	female	12	157.5	25	26	164	protein	6	2	1	0	0	
11	West Midlands	female	15	156	18	19	140	fruitveg	6	1	2	0	0	
8	West Midlands	female	12	159	21	24	90	dairy	3	1	2	1	2	ur
9	South West	female	14	160	23	23	158	carb	0	4	2	1	1	
9	South	female	13	165	24	23.5	157	dairy	3	2	2	1	1	ur
11	West Midlands	female	15	165	25	25	162	carb	4	1	0	4	2	
8	West Midlands	female	13	160	22	26	164	dairy	6	4	2	3	2	
7	East	female	12	155	24	25	160	fruitveg	0	4	4	1	2	ur
9	South West	female	13	166	24	27	154	carb	5	2	3	1	2	ur
9	East	female	14	170	25	26	163	protein	5	1	2	1	2	
9	Home Counties	female	13	147	25	15	147	carb	3	5	5	1	1	
8	West Midlands	female	12	160	21	25	140	protein	7	3	4	1	2	
9	North West	female	13	169	23	24	171	fruitveg	2	2	1	1	2	
9	West Midlands	female	13	150	22	23	146	fruitveg	6	2	3	2	3	
9	Home Counties	female	13	140	22	21	95	protein	2	1	2	1	1	
	Home Counties	female		152	23	24	154	fruitveg	5	2	5	0	0	
9	South	female	13	164	25.5	26.5	164	carb	7	1	3	1	1	
11	London	female	15	165	21	30	140	carb	3	3	1	2	3	
10	Home Counties	female	15	169	27	28	177	fruitveg	7	4	8	1	1	
9	South East	female	14	156	22	25	151	dairy	3	0	0	1	3	
7	North West	female	12	160	22	25	154	fruitveg	2	2	1	1	1	ur
7	Home Counties	female	12	145	22	21	145	fruitveg	6	4	1	1	2	
8	South	female	12	161	20	22	157	protein	4	3	2	2	1	
10	Home Counties	female	13	167	23	24	164	fruitveg	4	3	1	0	1	
9	East	female	14	168	28	29	180	dairy	7	2	1	0	1	

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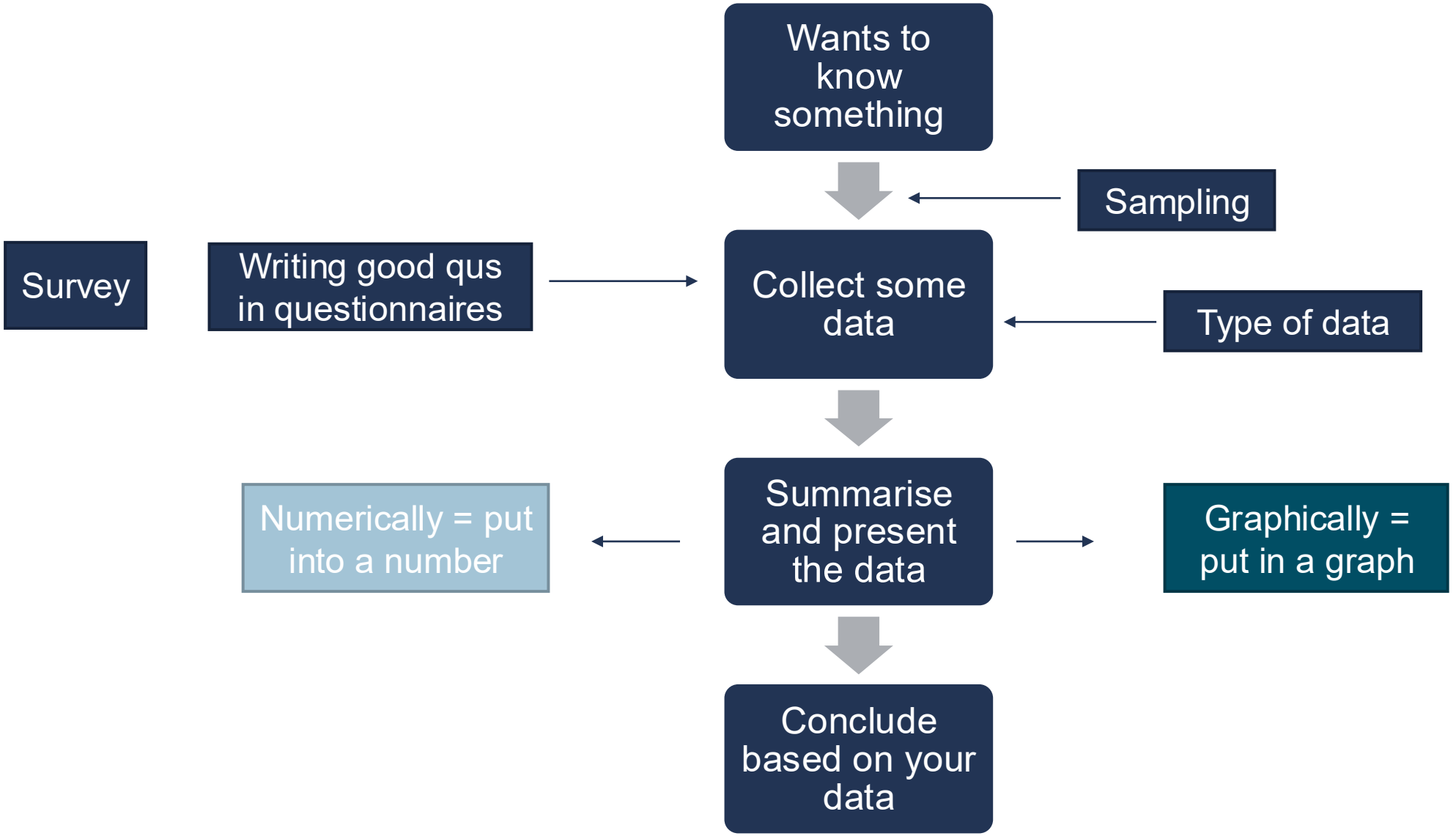
Wants to know something
Sampling
Survey
Writing good qus in questionnaires
Collect some data
Type of data
Summarise and present the data
Numerically = put into a number
Graphically = put in a graph
Conclude based on your data

Your Reflections

How do these reflections compare to your experiences?

If you've not taught Core Maths before what is your perception?

What have we missed?

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Showcasing material that can be used in A level and GCSE teaching

Introducing Normal Distribution

The very first question in the very first OCR Core Maths exam paper my students sat was the following:

1 Athletes in the decathlon take part in ten different events. Points are allocated in each event depending upon how well they do. Shorter times are considered better in running events. Longer distances are considered better in the long jump.

Ashton Eaton set a world record in 2015. He ran 100 m in 10.23 seconds and he jumped 7.88 metres in the long jump. The table below shows statistics summarising the long term performance of decathletes in these events:

Event	Mean	Standard deviation
100 m	10.99 s	0.25 s
Long jump	7.26 m	0.31 m

(Adapted from Cox and Dunn (2002) *An analysis of decathlon data*)

Calculate z-scores for Ashton Eaton's performance in the two events. Should he have been awarded more points in the 100 m or in the long jump event? Explain your reasoning clearly. **[4]**

From OCR Statistical Problem Solving – Introduction to Quantitative Reasoning – Q1 June 2016 Paper

The Normal Distribution questions in A-level that year. Papers S2 & S4

2 The mass, in kilograms, of a packet of flour is a normally distributed random variable with mean 1.03 and variance σ^2. Given that 5% of packets have mass less than 1.00 kg, find the percentage of packets with mass greater than 1.05 kg. **[6]**

5 The independent random variables X and Y have distributions $N(30, \sigma^2)$ and $N(20, \sigma^2)$ respectively. The random variable $aX + bY$, where a and b are constants, has the distribution $N(410, 130\sigma^2)$.

(i) Given that a and b are integers, find the value of a and the value of b. **[5]**

(ii) Given that $P(X > Y) = 0.966$, find σ^2. **[6]**

So what?

Introducing normal distribution through z-scores.

Back to the starter question...

How can we compare performance in different disciplines?

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Just *how* much better is he?

What was your initial reaction? Was Ashton Eaton better at 100m or Long Jump?

The year after that first exam, when we came to Normal Distribution, I gave them the question you had at the start. (It helped that we'd just had an Olympics!)

We had video – pretty close in the 100m! Not even a personal best in the Long Jump.

But how did it compare to the other athletes?

This is where Z-scores came in, and hence the normal distribution.

https://www.desmos.com/calculator/phq55ihwuw

Linking to GCSE teaching

- Data is often taught incoherently
- Data is creating a story, a narrative, a prediction, an investigation
- Taught with more real-life contexts, that doesn’t take a long time to set up

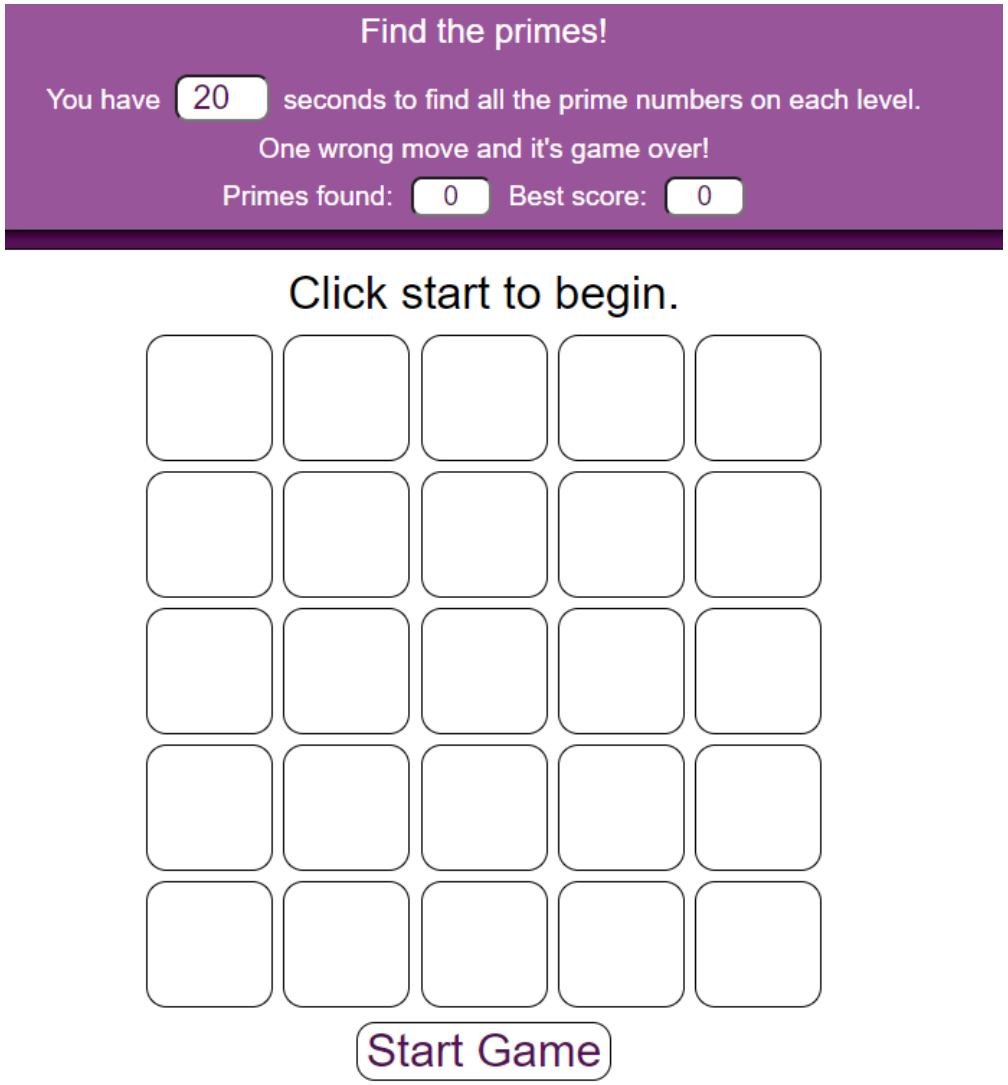
Game time!

https://mathsbot.com/puzzles/findThePrimes

Google search: mathsbot prime numbers

Play the game three times and note down your scores

…when finished- lots of numbers, what do we do?



there are some comments about uk children born older in the school year having a advantage over their younger peers, e.g. a Sept born child does better in school than a child born in July or Aug, is that true?

Yes, there's evidence to support the idea that children born earlier in the school year (such as those born in September) often perform better in school than those born later (such as those born in July or August). This phenomenon is known as the **"birthdate effect"** or **"relative age effect"**. It is particularly noticeable in countries like the UK where the school year runs from September to July.

Reasons for the Advantage:

1. **Age and Maturity**: A child born in September could be almost a full year older than one born in school entry, allowing them to start school a year later, which can level the playing field somewhat.

Conclusion:

The "birthdate effect" is a real and well-documented phenomenon, with September-born children having an advantage over their July or August-born peers, particularly in the early years of schooling. However, individual differences, home support, and school environments also play important roles in determining a child's success.

Aug 14th

July 24th

Something I want to know…

Let's battle!

Group A: birthday before 1st March(older)

Group B: birthday on or after 1st March (younger)

Find out all the numerical summary you can.

Report writing

With the summative data (meaning data has been summarised), write a 100-word report, comparing group A and group B.

- compare the mean, median, standard deviation in context
- Write a conclusion (Group A or B is better, inconclusive)
- Write about the limitations, and why your conclusion might not be the universal truth

Extension- ask me! (it has been a secret)

3.4 Critical analysis of given data and models (including spreadsheets and tabular data)

Students will be expected to use the data and models they are given and to be mathematically critical of these.

C1 Presenting logical and reasoned arguments in context

	Content	Additional information
C1.1	criticising the arguments of others	

C2 Communicating mathematical approaches and solutions

	Content	Additional information
C2.1	summarising and report writing	

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‘Radical Suggestions/ Pleas’

James' Suggestions

Pick and Mix approach?

(Leave out some paper 1 stuff, is correlation more useful than histograms?, T-test, Chi square)

A **L2 Core Maths** qualification?

(Progression doesn't always mean going up a level, sometimes it can mean becoming more fluent/learning new things at the same level.)

Infographics

Lots of different types of graphs out there. Students are more likely to see these everyday than histograms

Refresh

Introduced in a rush so needs an update – could help grow the qualification.

Lily's Suggestions

Universal Provision

Every school should offer full post-16 mathematics provision, even if that means funding just a single Core Maths class for one year.

Assessment revamp

- Questions are in real life situation but often has unrealistic calculations (a glorified algebra question sometimes)
- A more robust assessment of spreadsheet/data

More accountability

- publishing the percentage of students studying post-16 maths

-Ofsted inspection would include asking about their post-16 maths provision in terms of equal opportunity to access

What do you want to see?

What are your ideas for the next stage with Core Maths?

What can we do to grow this qualification?

Some others - We have LOTS!

Full A-level option? Do it as one of their 3 A-levels instead of enrichment etc.

Could the alignment with other subjects be given another look? - NCFE has qualification-specific assessments.

Lack of appropriate resources for some topics – we hear this a lot from teachers.

More connection to other subjects – e.g. Media and Politics

Any Questions?

Thank you!

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