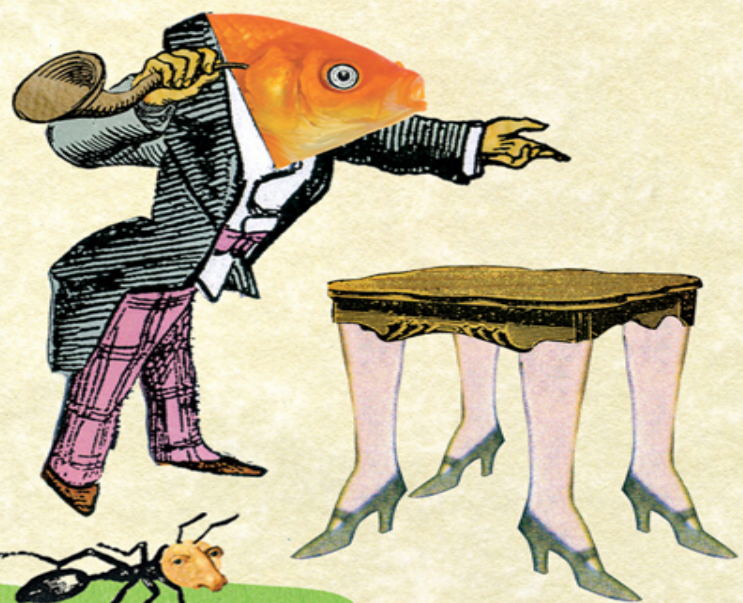# HOMEWORK SUCKS!

A *Drivetime* Book of Really Useful Information

Based on the BBC Radio 2 series

SIMON MAYO

About the Book

Can a crocodile spit?
What does the Queen have for dinner?
How do you measure a rainbow?
Why is q always followed by u?

Originally open for children to phone in with their homework issues, these days the 'Homework Sucks' segment of **Simon Mayo's** award-winning *Drivetime* show invites listeners of all ages to send in questions they've always wanted to ask. Because the chances are that a member of the very clever Radio 2 audience will have an answer. So now all *you* need to do is learn the contents of this book by heart. We apologize if, in the process, you become:

a) smarter
b) more interesting
c) better at pub quizzes
d) all of the above

Got a question? Got a better answer?
Join in! #homeworksucks

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HOMEWORK SUCKS!

A *Drivetime* Book of Really Useful Information

SIMON MAYO

For my daughter Natasha, who loves homework so much

Introduction

There comes a moment in most parents' lives when you suddenly realize how little you remember about your schooling. The friends, foes and teachers you recall with no trouble at all. The buildings, the smells and the food can fill your senses still and you can be back in assembly or the dining room in an instant. It's the education bit that's fraying at the edges. You find yourself trying to come up with an answer for Junior without resorting to Prof. Google or Dr Wikipedia, and failing.

There is pride at stake, of course. All your child's life you have been asked questions like, 'Why is the sky blue?', 'Where do dreams come from?', 'Why do men have nipples?' Each time you have answered to the best of your ability, but as your child gets older, it is with less confidence than before. You detect the flicker of doubt in your offspring. Maybe it's their stance – arms folded, head on one side. Maybe it's the narrowing of their eyes, the time-honoured reflex of the doubtful. Or maybe it's hearing, 'You're talking rubbish, Dad. That's not what Miss Johnson says at all.' This is usually accompanied with a world-weary shrug (where *did* they learn that?) and a slow walk away, the trudge of disappointment. If you also get the reproachful glance over the shoulder, you've had the complete works. The full monty. Welcome to the club.

You might have imagined that if your kids got to university, that would be the time when you'd be no use to them (academically – not financially, clearly). Or maybe the upper reaches of the secondary school would be when you

had to bail out. What you never, ever realized was that you would run out of answers *while they were still at primary school*.

So you have this book just in time.

You might not hold on to the crown of 'all-knowing-parent' for very much longer, but you could keep it in your anxious hands for a little while yet. All you need to do is learn the contents of this book by heart and personalize each answer. This way it sounds as though you really do know what you are talking about.

Of course we – and by this I am making the huge assumption that you are one of the great tribe of the middle-aged – are at a great disadvantage here, one not really understood by the younger generation. It is that we never really had homework, not like they do now. Most of us never got any homework till secondary school. Now you have parents fighting to find the nursery most likely to give their delightful toddler compulsory computing and Mandarin twice a day. If they're not reading Proust for fun (and in the original French, obviously) by year one primary, someone will need to be sacked. 'One hour of algebra, is that all?' seems to be the mood, so extra tutors have to be found to fill the gap left so neglectfully by the school system.

Your alternative is to wield this book with wisdom and judgement.

The internet has, of course, transformed the homework experience. This can be a godsend, for them and for us. You can instantly have the knowledge of the ages appear on your screen, and in no time you know the capital of Uzbekistan, the longest novel in the world and the Latin for 'Beware of the dog'. (Tashkent, *In Search of Lost Time* by Proust – yes, him again – and '*Cave canem*'.) Equally, your screen can fill up with preposterous nonsense and mindless distractions. And so can theirs. And the chances are their distractions are more mindless than yours. Ridiculous as it

might sound, there are some things you can't really Google. There are some occasions when you have to ask someone who might actually Have Gone Out And Done Something. Once upon a time you could ask the elders of the village; now you can ask the Radio 2 *Drivetime* audience. They manage to balance wisdom and cool, wit and erudition and Simon & Garfunkel. That's my kind of town.

What sparked this radio feature was a walk on the beach with Child 2, who was complaining about the amount of school work she had to do that week. 'Homework sucks!' was her cry, and I thought that sounded a great title. (I was concerned for her workload, too, but when an idea takes you …) Originally I had thought of TV but when the Radio 2 call came it seemed a perfect fit. Previous *Drivetime* host John Dunn had a feature called 'Answers Please' and Chris Evans had 'Fox the Fox', so this was another tradition I thought was worth upholding. The definition of what homework is has broadened considerably and now takes in anything you can't work out on your own. Life in general, basically. Many of my favourite queries are here: 'chunking' in maths, why races go anti-clockwise and how different would the world be if it spun in the opposite direction? These are brilliant questions and I hope you enjoy reading the answers (and then learning them. See above). There will be a test after lunch.

There is a clever chapter at the end with no answers. We thought you might like to join in with that one, and it saves us some time. Tweet us your best ideas using the hashtag #homeworksucks!
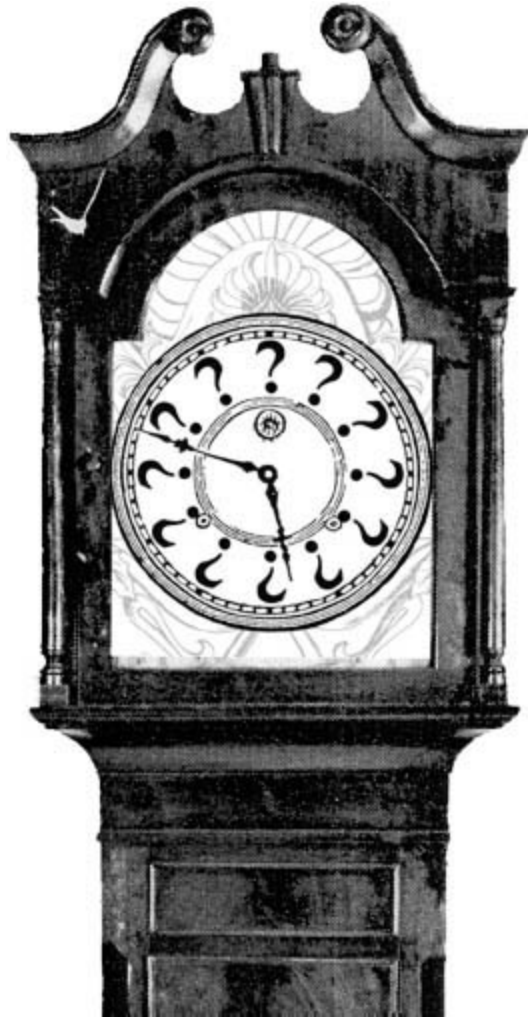
Thanks to the whole *Drivetime* crew who assemble the show lovingly each day. Gary Bones, Fiona Day, Mark Plant, Joe Haddon and Ben Backhouse – take a bow. Curtsey. Shuffle a bit, look embarrassed and leave.

And thanks for listening, buying and reading. Here's to knowing stuff!

'WHO DECIDED THAT AN HOUR IS AN HOUR?'

Mind-Boggling Maths

Simon,

I share my birthday with my handsome husband and his brother – we were born in different years, but all on the same day.

What's the likelihood of three closely linked people sharing the same birthday? And how many people would you need to encounter to make a mutual birthday a probability?

CLARICE in Leeds

JONATHAN from Ludlow
Maths tutor

If you take three people at random, there's only a 0.00075 per cent chance that they will share the same birthday. But it would take just 23 people in a room to make it more likely than not that two of them would have a mutual birthday.

With 41 people, the probability increases to over 90 per cent, and with 57 people it's 99 per cent.

Simon,

I made a cake with two friends. I cut it into three equal pieces, a third for each of us.

My question is, why can't I represent any one of these pieces as a whole number in mathematics? If the whole of the cake is 100 per cent, then why is the sum of the 3 slices 99.999 per cent recurring?
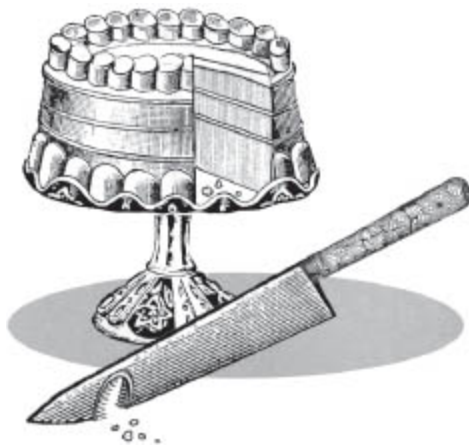
Where has that other bit of cake gone?!

FRANK in Whitstable

CARRIE from Reading
Engineer

We use decimals, which is a nominal way of measuring. The recurring symbol is an illustration of the perfect fraction; 0.9 recurring equals 1.0, so there's no cake missing!

Simon,

With the commodity markets showing an increase in the value of scrap metal, and assuming current interest and inflation rates, how soon will a two-pence piece actually be worth more as scrap metal than as a coin of the realm?

STEVE in High Wycombe

PHIL
From Coin News *magazine*

Pre-1992, when 2ps were 97 per cent copper, it would have been worthwhile. Now, it's a copper-steel alloy. A two-pence piece weighs 7.1 grams, so you would need 140,449 coins – or £2,808.98 – to get a tonne. With a tonne currently worth $435, that would not be a good pay-off. I should stress it is illegal to melt money!

Simon,

Why is the '4' on a clock face with Roman numerals shown as four 'I's when it should be 'IV'? After all, number 6 is shown as 'VI'. No one I've asked seems to know – perhaps you can help.

DAVID in Leigh

RICHARD from Bridport
Antique-clock restorer

Possibly for aesthetic reasons: 'IIII' is used instead of 'IV' to balance the clock face, as in the same position on the opposite side is 8, or 'VIII'. It's also possible that the 'IIII' was used by chance in the old days, and people were so poorly educated at the time that no one raised an objection, and thus the 'IIII' became standard. Interestingly, I know of two – only two – clock faces that use the 'IV', one of which is the Tower Clock, in other words, the Big Ben clock.

Simon,

My partner Liam has an MP3 player, which he loves. He has about 4,000 tracks on it, and plays it for around 40 minutes per day on shuffle – so, about 12 tracks a day. So how is it that he repeatedly hears either the same tracks or the same artist within days?

SARAH **in Nottingham**

SPENCER from London
Presents 'Click' on BBC World News

First of all, there's no such thing as 'random' for computers. Also, if you're syncing every evening, your shuffle resets, so it's not unlikely that the same songs will come around. Or it might be that the MP3 player is choosing songs or artists that you favour, either through previous plays or ratings.

Simon,

We all know the speed of sound and light … but what is the speed of this text or email?

STUART in Hatfield

MITTAL from Elstree

Engineer at a secure systems company, with a background in avionics engineering and transmissions analysis

Texts and emails travel at the speed of light (3×10^8 m/second), but will be slowed down by a number of variables:

- the number of relays (supervised and unsupervised – add 1 or 2 seconds for each);
- the transmission speed of the handset (if a text);
- the network being used (for both emails and texts);
- electromagnetic interference in the atmosphere.

International texts and emails do take longer, because they have more and higher security relays to get through.

Simon,

I'm always amazed at songwriters' ability to come up with totally new melodies. Given that there are a finite number of notes, is there a limit to the number of totally new melodies that can be written?

Many thanks!

RICHARD in Norwich

GAVIN from Cambridge
Director of music at a secondary school

For just a five-note melody you'd have 64 × 64 × 64 × 64 × 64 permutations, which equals just over 1 billion. Create a whole tune and the number of permutations is indeed both frightening and overwhelming, which perhaps explains why it is hard for a composer to write a new tune that is both appealing and memorable. It's not something that 'anyone can do'!

Simon,

Why do runners competing in races such as the 100 metres, 200 metres, etc., run anti-clockwise around a running track, whereas with horse-racing or motor-racing the race can be run either way?

FERGAL in Burnley

MIKE from London
BBC Radio 5 Live's athletics correspondent

Apparently, it all dates back to the 1908 Olympic Games. Running tracks have been standardized since the revival of the Olympics, in order to create a system where world records can be achieved. The shape and size of the track, as well as the direction the runners race in, are also standardized.

Hello Simon – just wondering …

Given that there is a direct relationship between engine revolutions and the rotation of the driven wheels on a car, if I were to attach four-times bigger wheels to my car, would fuel consumption drop by a quarter?

CHARLIE in Gourock

DONALD from Newcastle
Mechanic

If anything, having bigger wheels will increase fuel consumption, because the engine will have to work harder to get through the gears. Think of it like a bike – the smaller the cog at the back in relation to the wheel, the harder you have to pedal.

Simon,

My 8-year-old son had some long division this weekend for homework. However, they are now taught a method called 'chunking'. Can you please explain how to long-divide using chunking?

I wish someone could also explain why it is that methods for learning basic maths keep changing every generation, making it such a challenge for parents to help their children!

PHILIPPA in Hook

CRAIG from Bath
Head of maths

Chunking is division as repeated subtraction. It came in with the national numeracy strategy a few years ago, which introduced techniques to build on what the kids already knew. Example: 567 divided by 7. Multiply 7 by 10 then subtract from 567. Repeat until you can't do it any more! It goes like this:

567 minus 70 = 497 (so that's 10 sevens you've taken away)

497 minus 70 = 427 (that's 20 sevens you've taken away)

427 minus 70 = 357 (that's 30 sevens ...)

357 minus 70 = 287 (40 sevens ...)

287 minus 70 = 217 (50 sevens ...)

217 minus 70 = 147 (60 sevens ...)

147 minus 70 = 77 (70 sevens …)

77 minus 70 = 7, so that's 80 sevens you've taken away, and you've got 1 seven left, and 80 + 1 = 81, which means there are 81 sevens in 567. In other words: 567 divided by 7 equals 81.

Simon,

Why on earth are the numbers on a computer keyboard the other way up to those on a telephone keypad? Why is the keyboard top to bottom – 789, 456, 123 – rather than 123, 456, 789?

Thanks!

PETER from Welford

NICK from Verwood

Electronics engineer who spent many years specializing in the repair of office telephones

When telephone keypads were being developed in the late 1950s, pulses were still used to connect to lines at the telephone exchange, with '0' requiring ten pulses and the '1' requiring one pulse. Office personnel were used to the layout of adding machines and calculators, whose top row was 789 – a layout that computer keyboards were to follow – and regular users were extremely fast at data entry. Therefore, the order on the new telephone keypad was inverted, with 123 along the top, to slow down the dialling process among practised users and allow the pulses to catch up.

That's one theory. Another is that the telephone keypad was designed to be familiar to people who were used to entering the number on a rotary dial. (Interesting that we still talk about 'dialling' a phone number, long since we

ceased to use dials!) On a rotary dial, the number 1 was at the top, so it made sense for the new touch pad to start with 1 at the top too.

Simon,

Can you please explain 'surds' to me? It's my daughter's year-10 maths homework. Apparently, they're based around square roots, supposedly a way of expressing irrational numbers that can't be broken down to simple decimals or fractions. What possible use would they be in real life?

Thanking you!

ANN from Poole

JAMES from Nottingham
Maths teacher

A surd is an irrational number (i.e. a number with no square root) presented in a more manageable form. So, for instance, the surd of the square root of twenty is four lots of the square root of five. They are very useful in lots of areas, including measurements. Basically, if you can't simplify a number to remove a square root, it's a surd. And their decimals go on for ever!