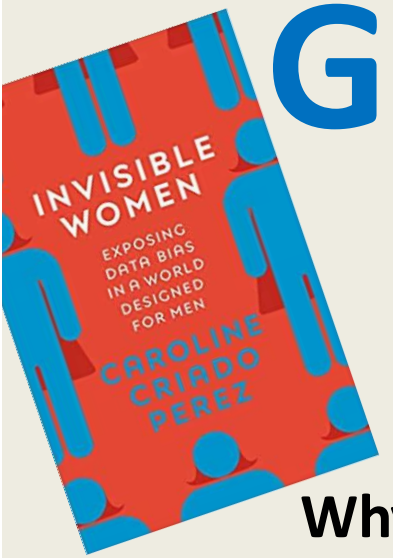
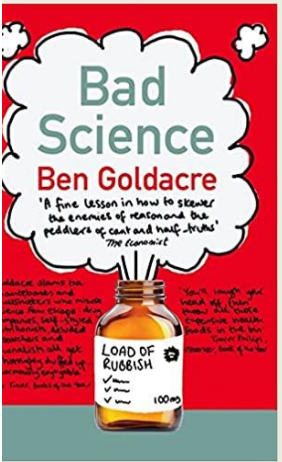


Get ready for Core Maths Level 3!

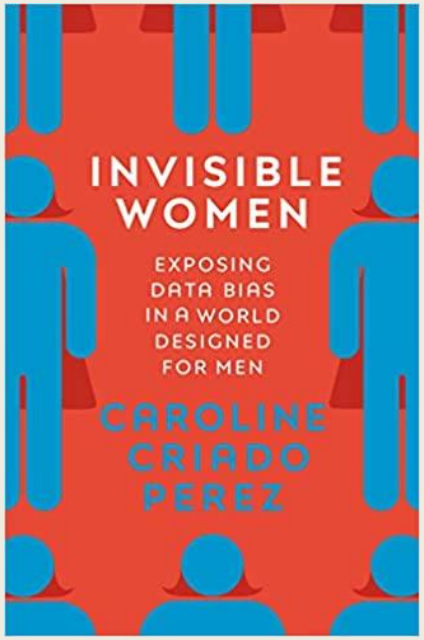
Why is Core Maths useful? Core Maths will help you understand the world and develop applicable numeracy skills that go beyond GCSE. This is particularly important when you're at university – many courses that do not require Maths A-level still require you to do maths and statistical analysis.

Beyond university, many jobs require you to do online numerical assessments like this one. These are very similar to the types of things you will learn to do in Core Maths.

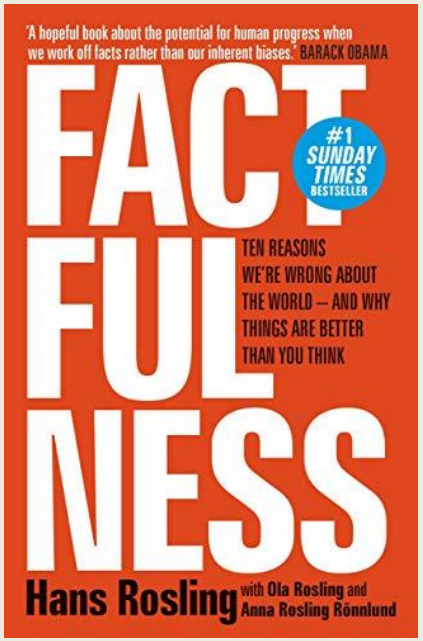


Recommended reading

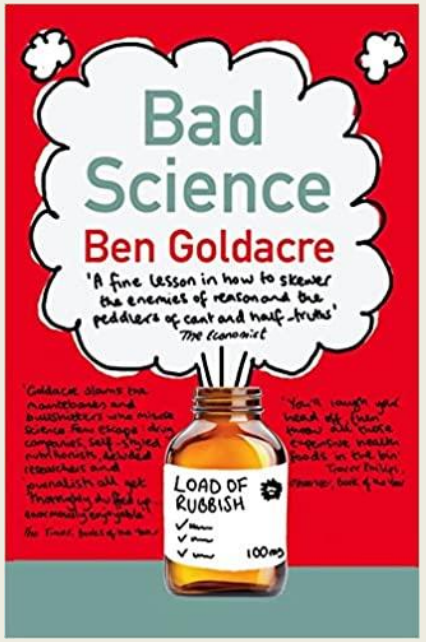
Click on the book covers for where to buy and the links in the descriptions for free online extracts and videos



'Invisible Women' explores statistics that will get you thinking about the way the world is designed and who it is designed for. This article contains an extract of the book and you can watch the author speak here.



'Factfulness' looks at the statistics which show that things aren't as bad as we might think. This video and this article will give you a snapshot of Hans Rosling's ideas.



In 'Bad Science', Ben Goldacre exposes dodgy medical data and how it can be used mislead us about everything from cosmetics, vaccines and superfoods. You can watch his TED talk here and read one of his newspaper columns here.

Gapminder

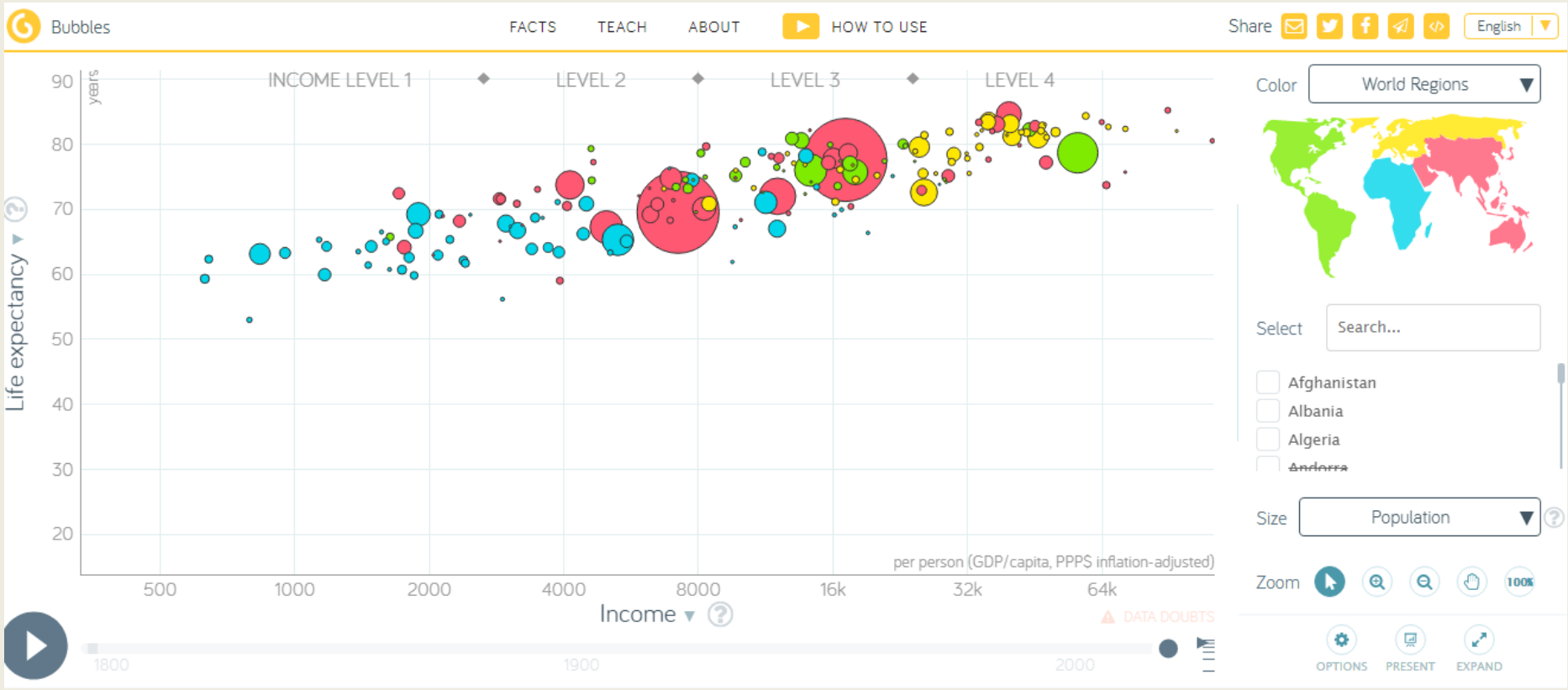
Have a play around with [Gapminder]

a) Can you find the UK?

b) Slide the slider along the bottom. Do you notice any big drops in life expectancy or income, which countries do they happen in? Use Google to find out which historical events could have caused these. Are there any sudden increases? Why?

c) Change the labels on the axes to compare different data sets.

d) Write down 5 interesting things you've noticed from using Gapminder.



Try some Core Maths questions

Core Maths contains about 80% GCSE content and 20% A-level Maths content. You will learn how to apply these skills to practical and real life scenarios such as finances, population increase, spread of disease, probability, risk and scientific and social science research. Have a go at the attached Core Maths practice questions attached to give you an idea of how you will use real-life data to answer questions. **These will be marked when you start the course in September.**

1 Social networking

1.1 Social network usage

Data source

A teacher at a sixth-form college wants to investigate how students use social media.

The college has 1400 students. The teacher asks a sample of 50 of them how many different social networking accounts they each have and how long they spend social networking during their lunch hour.

This list shows the number of social networking accounts that each student has.

6, 2, 5, 1, 8, 6, 4, 7, 8, 4, 7, 3, 3, 10, 9, 1, 2, 9, 8, 2, 8, 2, 2, 6, 9, 4, 5, 8, 8, 1, 9, 1, 5, 7, 5, 3, 9, 3, 6, 3, 8, 4, 5, 4, 3, 9, 5, 3, 6, 7

Table 1 shows information about the times that the students in the sample spend social networking during their lunch hour.

Table 1 Time spent social networking

Time, T (minutes)	Midpoint	Frequency
$0 < T \leq 4$	2	5
$4 < T \leq 8$	6	6
$8 < T \leq 12$	10	4
$12 < T \leq 16$	14	11
$16 < T \leq 20$	18	7
$20 < T \leq 24$	22	9
$24 < T \leq 28$	26	4
$28 < T \leq 40$	34	4

Table 2 shows values for the estimated mean and median and the upper and lower quartiles. The values were calculated using Microsoft Excel®.

Table 2

Estimated mean	16.08 minutes
Estimated median	14 minutes
Lower quartile	10
Upper quartile	22

Look at the data source

1 How could the teacher make sure that they choose a fair sample?

2 Find the mean number of social networking accounts using the data for the sample of students.

Key point 1

This formula can be used to find the mean of a set of data:

$$\bar{x} = \frac{\Sigma fx}{\Sigma f}$$

where

x is the variable

$\bar{x}$ is the mean of the frequency distribution

f is the frequency with which the value x occurs

Σ is the sum of the values. The capital sigma (Σ) means 'add all the values together'.

Example

Number of posts per day, x	Frequency, f	fx
1	5	$5 \times 1 = 5$
2	10	$10 \times 2 = 20$
3	2	$2 \times 3 = 6$

$$\bar{x} = \frac{\Sigma fx}{\Sigma f} = \frac{5 + 20 + 6}{5 + 10 + 2} = \frac{31}{17} = 1.82 \text{ (to 2 d.p.)}$$

3 Draw a cumulative frequency graph using the data in Table 1.

Q3 hint

Create a cumulative frequency table first.