# Advanced Mathematics
# Support Programme

# About the AMSP

- A government-funded initiative, managed by <u>MEI</u>, providing national support for teachers and students in all state-funded schools and colleges in England.

- It aims to increase participation in AS/A level Mathematics and Further Mathematics, and Core Maths, and improve the teaching of these qualifications.

- Additional support is given to those in priority areas to boost social mobility so that, whatever their gender, background or location, students can choose their best maths pathway post-16, and have access to high quality maths teaching.

# Core Maths across the curriculum

Tom Rainbow

*"While Core Maths is likely to be particularly valuable for students progressing to higher education courses with a distinct mathematical or statistical element such as psychology, geography, business and management, such qualifications will also be valuable for any student aiming for a career in a professional, creative or technical field."*

*"Core Maths courses should prepare students for the varied contexts they are likely to encounter in vocational and academic study and in future employment and life, for example, financial modelling and analysis of data trends."*
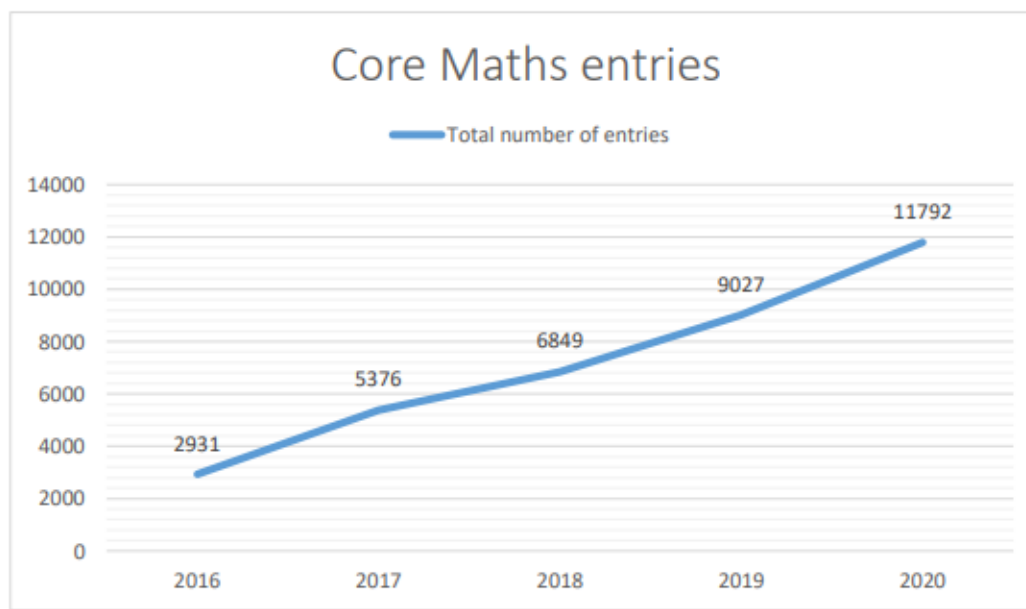
# Benefits

- Authenticity

- Practise

- Use of maths

# Challenges

- Complexity

- Inconsistency

- Timings

# Core Maths Entries

| Year | Total number of entries | Percentage Increase |
|------|------------------------|---------------------|
| 2016 | 2931 | |
| 2017 | 5376 | 83.42 |
| 2018 | 6849 | 27.40 |
| 2019 | 9027 | 31.80 |
| 2020 | 11791 | 30.62 |



Core Maths entries

| Subject grouping | June 2019 | June 2020 | % change in entries |
|---|---|---|---|
| Mathematics | 86,185 | 89,730 | 4% |
| Psychology | 62,685 | 63,490 | 1% |
| Biology | 64,460 | 61,130 | |
| Chemistry | 55,615 | 53,435 | |
| History | 47,920 | 41,645 | |
| English literature | 37,475 | 38,310 | |
| Sociology | 36,295 | 36,9 | |
| Physics | 36,420 | | |
| Business studies | 30,820 | | |
| Economics | 30,095 | | 3% |
| Geography | 32,050 | | -14% |
| Political studies | 1 | | -11% |
| English language | | | 7% |
| Religious studies | | ,680 | -11% |
| Mathematics | | 14,475 | 4% |
| Core | | 11,791 | 31% |
| C | | 11,730 | 11% |
| Law | | 11,275 | 0% |
| Phys | ,905 | 10,355 | 5% |
| Design | 9,375 | 9,185 | -2% |
| Drama | 9,320 | 8,685 | -7% |
| Spanish | 7,995 | 8,225 | 3% |
| French | 7,680 | 7,685 | 0% |

What do you notice? What do you wonder?

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| Business studies | 30,820 | 33,260 | 8% |
| Economics | 30,095 | 30,865 | 3% |
| Geography | 32,050 | 27,470 | -14% |
| Political studies | 18,495 | 16,455 | -11% |
| English language | 13,815 | 14,715 | 7% |
| Religious studies | 16,455 | 14,680 | -11% |
| Mathematics (further) | 13,920 | 14,475 | 4% |
| Core Maths | 9,027 | 11,791 | 31% |
| Computing | 10,550 | 11,730 | 11% |
| Law | 11,245 | 11,275 | 0% |
| Physical education | 9,905 | 10,355 | 5% |
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# Maths in other A levels

- Geography, Economics (at least 25%)
- Biology, Business, Design Technology and Psychology (at least 10%)
- PE (no specific percentage)
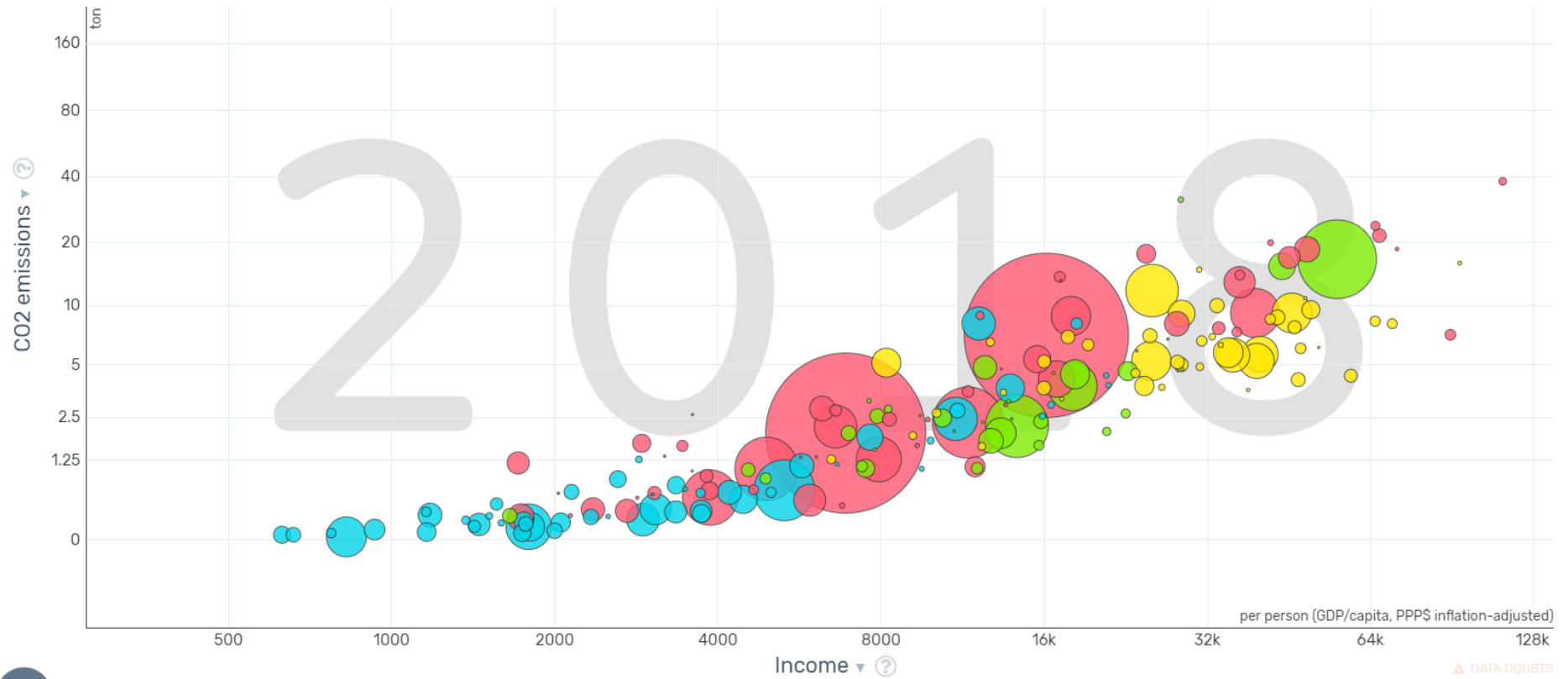- Sociology (no specific percentage but you will be analysing data)

Getting students talking
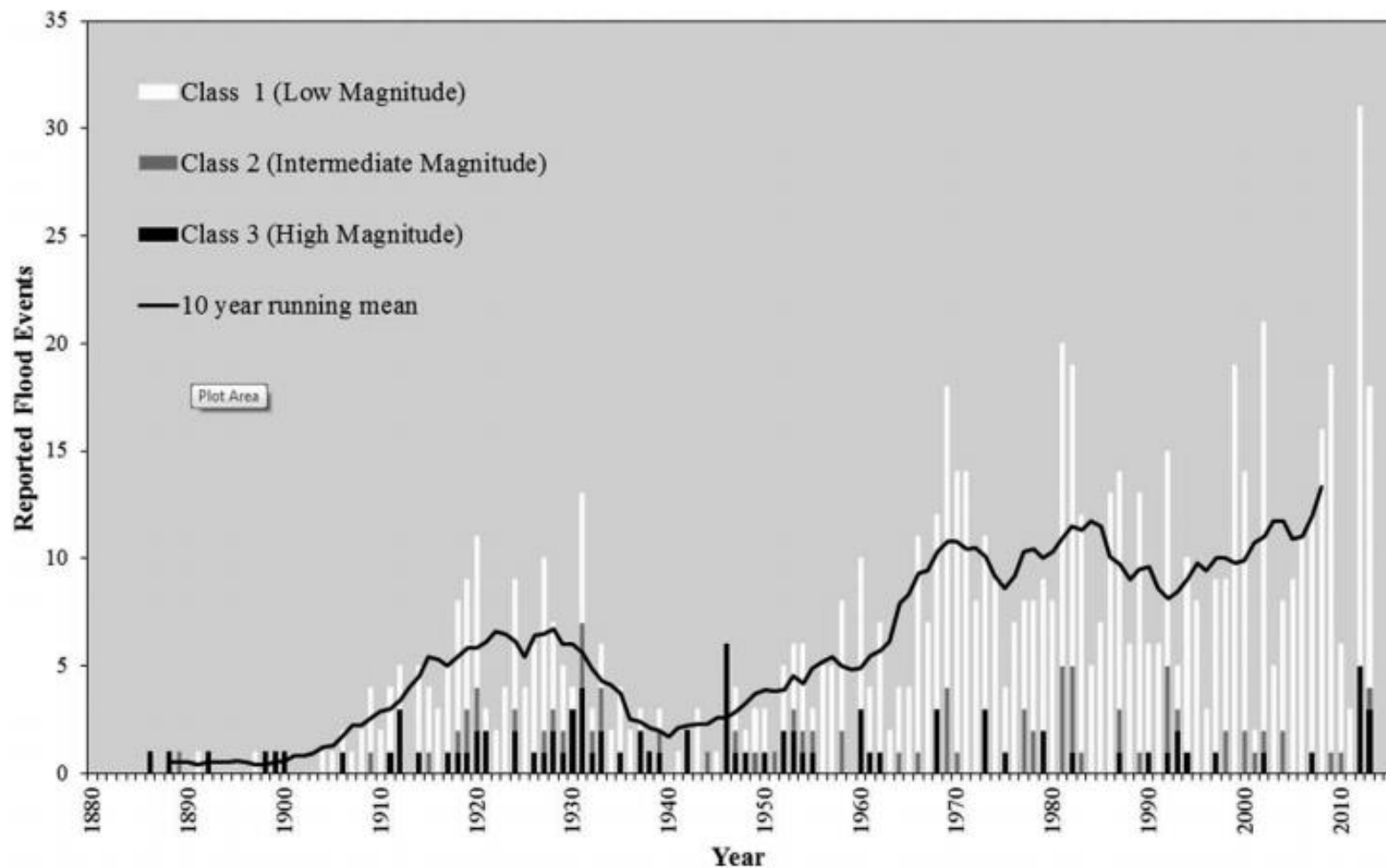
**Figure 9.** Instances of reported flooding in the UK each year 1884–2013 using combined Met Office/CEH data.

Source: Gapminder

Graph B1 shows the percentage of people in Argentina living below the poverty line of US$ 1.90 per day from 1991 to 2014. So in 2002 14% of Argentina's population (5.3 million out of 37.9 million) were living on less than US$ 1.90 a day.
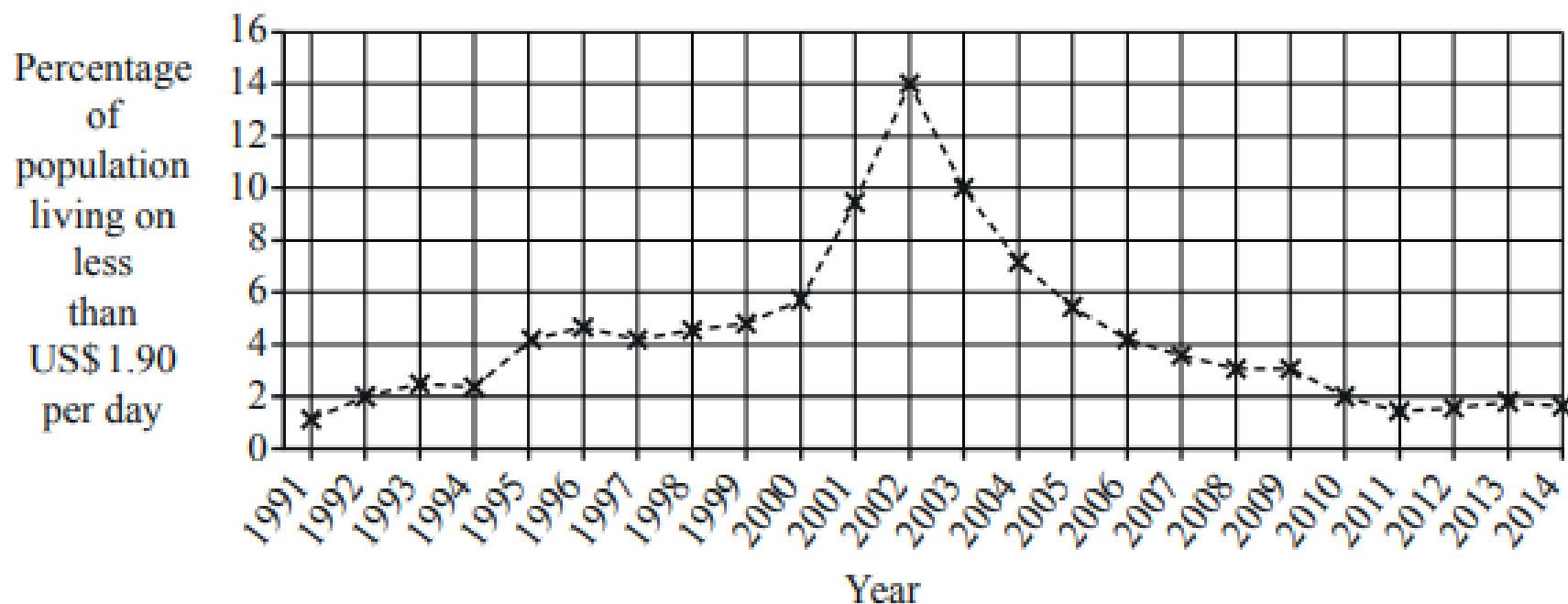
Engel's coefficient is used to measure poverty.

$$\text{Engel's coefficient} = \frac{\text{Amount spent on food}}{\text{Total income}}.$$

(It can also be used to measure the poverty of a group of people.
The total amount of money the group spends on food and their total income are used.)

Table 4.2 shows the descriptions used by the United Nations to describe poverty and wealth using Engel's coefficient.

| Engel's coefficient, $E$ | UN description |
|---|---|
| $E < 0.2$ | Extremely wealthy |
| $0.2 \leqslant E < 0.3$ | Rich |
| $0.3 \leqslant E < 0.4$ | Affluent |
| $0.4 \leqslant E < 0.5$ | Moderate prosperity |
| $0.5 \leqslant E < 0.6$ | Only basic needs met |
| $E \geqslant 0.6$ | In poverty |

**Mobile phone usage forecast**
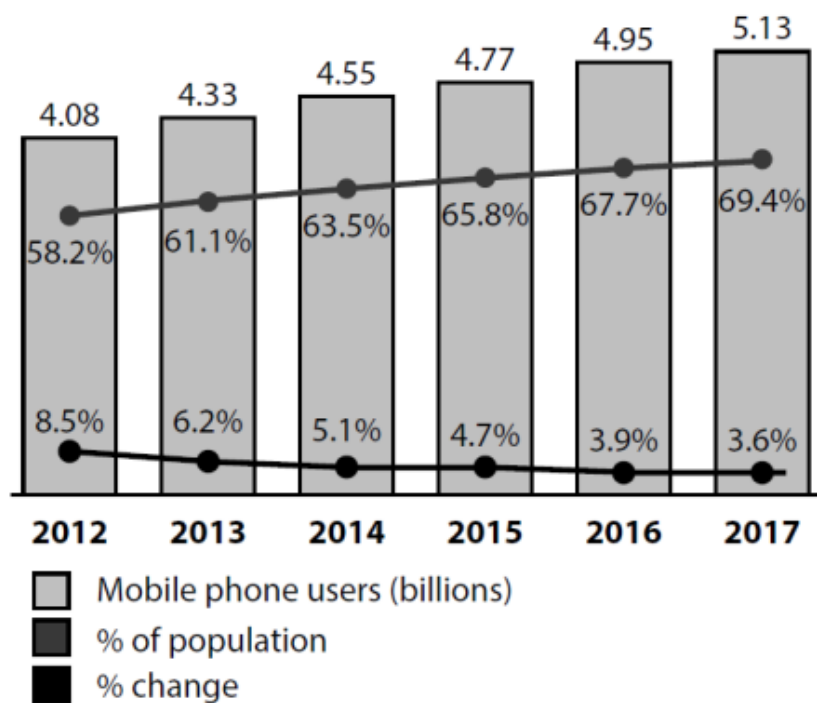
Figure 1

**Mobile Phone Users Worldwide,
2012–2017 (billions, % of population and % change)**

(Source: © eMarketer Inc)

Scientists investigated how the concentration of protein in blood plasma changes in people between the ages of 60 and 95.

**Figure 4** shows the scientists' results. The bars show ±1 standard deviation.

**Figure 4**
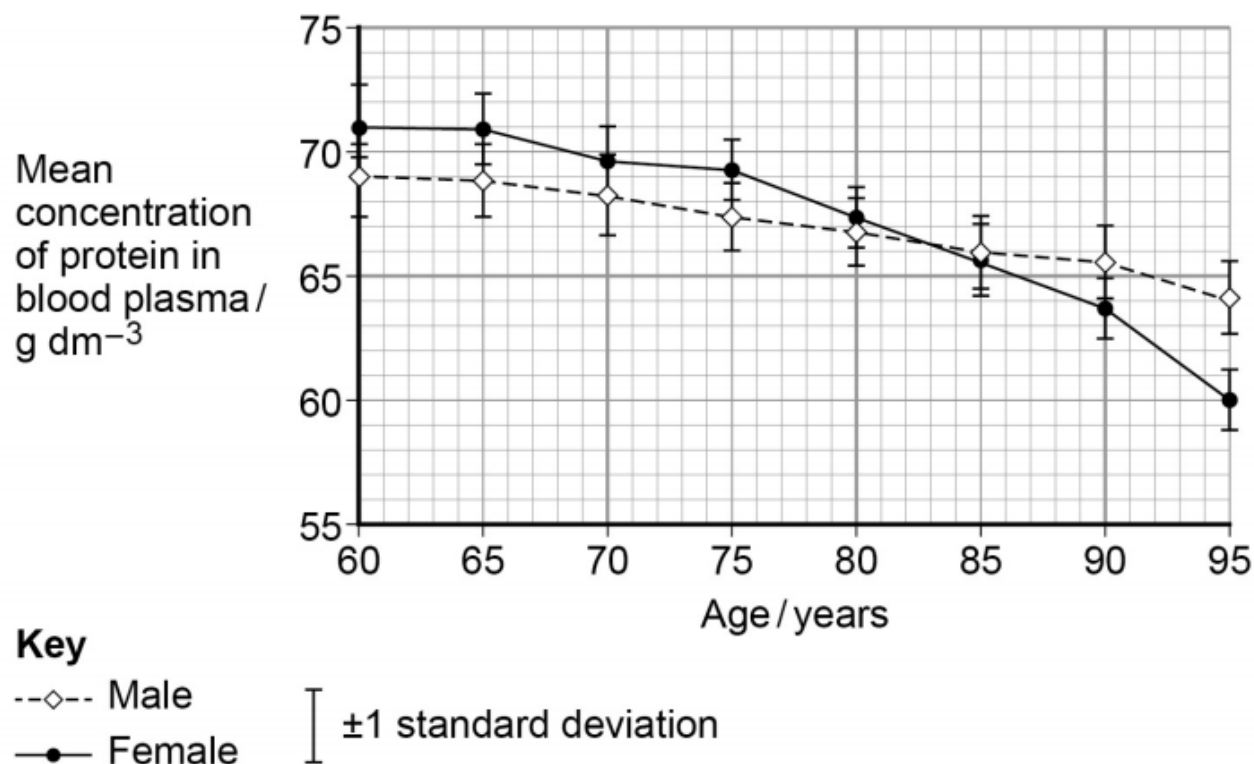
Joel was interested in the relationship between environmental temperature and aggression. He noted down the average temperature for his school year and recorded the number of aggressive incidents that took place.

**Table 1** below shows the data Joel collected.

| Month | Average temperature (degrees Celsius) | Number of aggressive incidents |
|---|---|---|
| September | 20 | 11 |
| October | 13 | 20 |
| November | 10 | 4 |
| December | 7 | 18 |
| January | 7 | 11 |
| February | 8 | 11 |
| March | 9 | 14 |
| April | 11 | 6 |
| May | 14 | 18 |

**Table 1**

| Countries | Size of economy GDP (US$ billions) | Population (millions) | GDP per capita (US$) |
|---|---|---|---|
| Brunei | 16.2 | 0.4 | 40 500 |
| Cambodia | 16.2 | 15.2 | 1 066 |
| Indonesia | 868.4 | 250.8 | 3 462 |
| Laos | 11.0 | 6.8 | 1 617 |
| Malaysia | 313.2 | 29.7 | 10 545 |
| Myanmar | 44.9 | 62.0 | 724 |
| Philippines | 272.1 | 98.4 | 2 765 |
| Singapore | 297.9 | 5.4 | 55 167 |
| Thailand |  | 67.0 | 5 781 |
| Vietnam | 170.6 | 89.7 | 1 902 |
| ASEAN (total) |  |  |  |

**Table 1**

**Economic and population data for the 10 ASEAN countries**

# Cross Curricular aims

- **Offer Core Maths**

- **Collaborate with other subjects**
  - Overview of curriculum
  - Methods of delivery
  - Inconsistencies
  - Student recruitment and support

# Contact the AMSP

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🐦 Advanced_Maths