



St George's School
Aim Higher

Sixth Form Options

Physics

A Level Course - AQA



Helen Arney
(Comedian)
Physicist



Brian Cox
(TV presenter)
Physicist

Rosalind Franklin
(DNA, Xray
Crystallography)



Guess
Who!



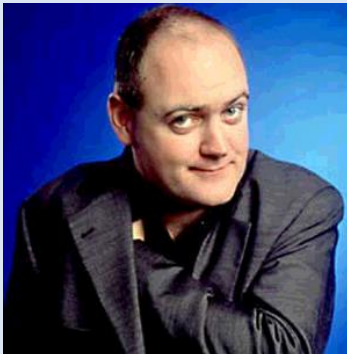
Ben Miller (comedian)
Physicist



Angela Merkel
(Chancellor)
Research
Scientist



Brian May
(guitarist)
astronomer



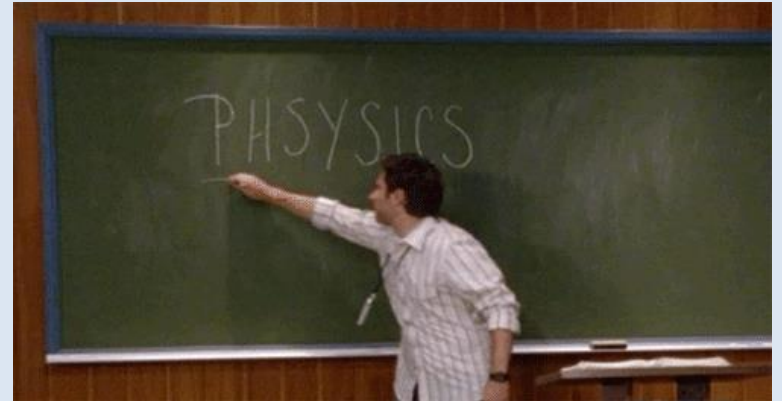
Dara O' Briain
(comedian)
cosmologist



Marie Curie
(Physicist)
Radioactivity

Why Physics?

YOU ENJOY IT



You want to:

- Open doorways to a career in: engineering, architecture, medicine, astronomy, dentistry, pharmacy, physiotherapy, armed forces, radiography, telecommunications, electronics, meteorologist, geophysics . . .

Physics and...

Mathematics – mechanics and skills

Chemistry – atomic structure

Geography – physical processes (forces + fluids)

Economics – maths / graphs

Technology – practical skills & applications

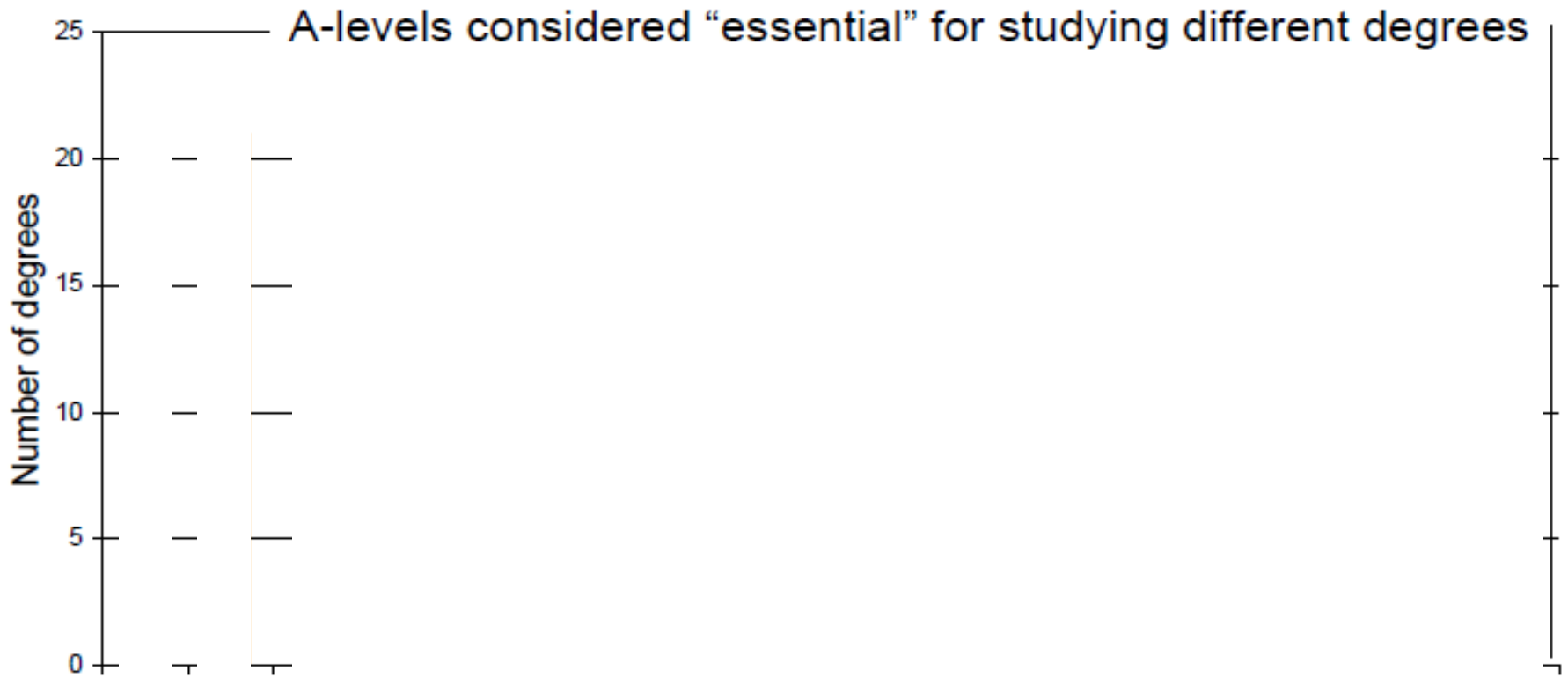
Biology – bio-mechanics

Psychology – testing theories

... think seriously about it because ...

Why Physics?

Russell-Group report

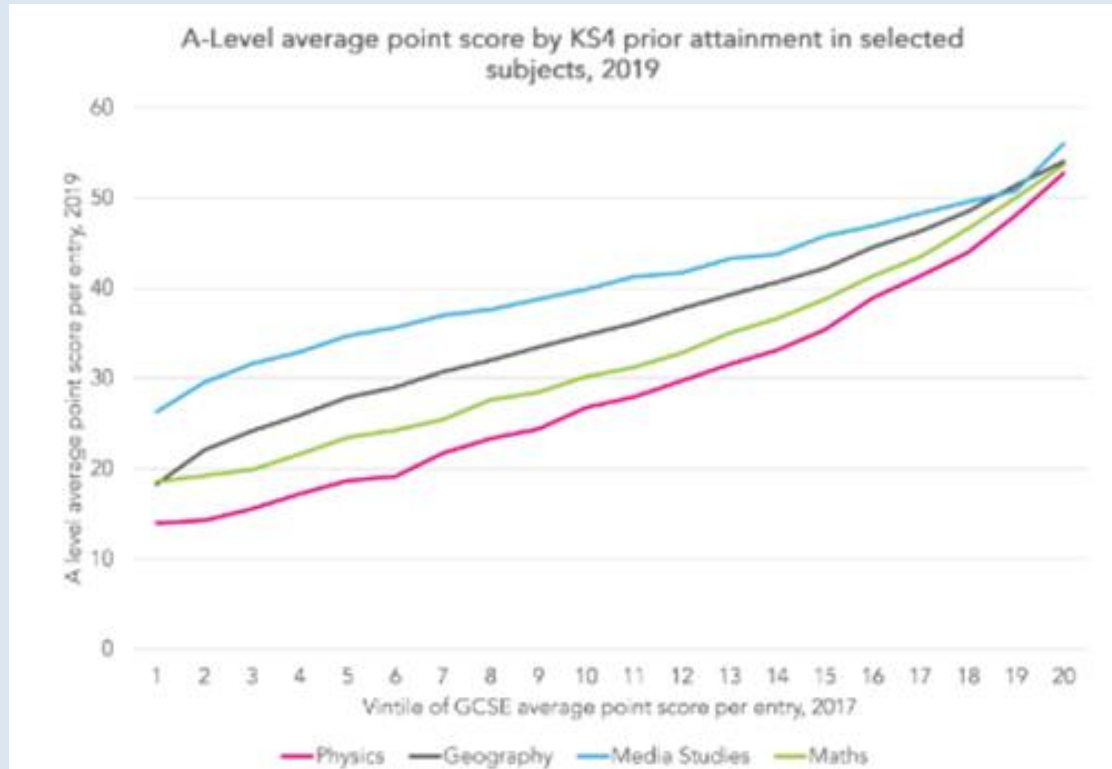


What do you need?

- 6-6 in Combined Science *or* 6 in Physics
- 6 in Maths

However, if you're achieving a 6 – think carefully...

The FFT research says....



The lines tend to converge among students with very high levels of prior attainment. This suggests their grades tend to be fairly similar.

But at the lower ends of the distribution, there are wide gaps. The line for physics in some places is a whole grade (10 points) lower than geography and a grade and a half (15 points) lower than media studies. And remember here I have only included students who have entered A Levels, I've not included anyone who started an A-Level but dropped out.

The FFT research says....

“On average, students with a grade 7 in GCSE maths go on to achieve 15.5 points on average (**between a grade C and grade D**) in A-Level Physics.

On average, students with grade 7 in GCSE maths go on to achieve 25.5 points on average (between grade C and grade D) in A-Level physics. In computer science this figure was 29.3 points (almost exactly grade C).

What do you need?

- 6-6 in Combined Science *or* 6 in Physics
- 6 in Maths

However, if you're achieving a 6 – think carefully...

- A continued commitment to hard work
- Enthusiasm
- Interest in practical activities & theoretical processes
- Ability to laugh in the right places

*It is **not** essential that students also study AS Mathematics although it is recommended*

What was that about Maths?

There are no mathematical concepts needed in year 12 that you have not already covered at KS4.

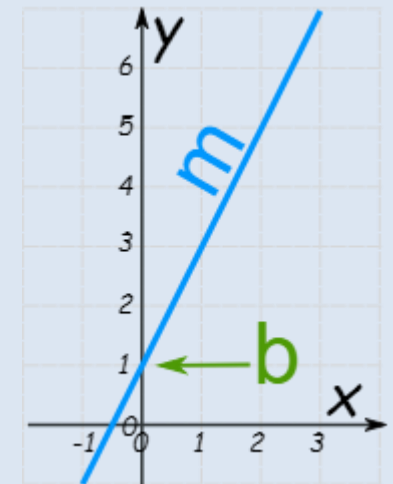
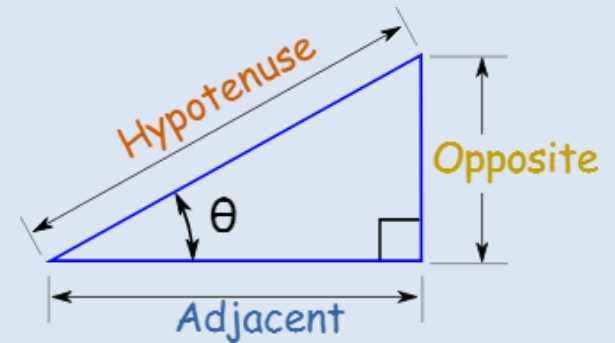
It is the application and combinations that are new.

$$\begin{aligned} & g^2 s_w^2 (A_\mu W_\mu^+ A_\nu W_\nu^- - A_\mu A_\mu W_\nu^+ W_\nu^-) + g^2 s_w c_w [A_\mu Z_\nu^0 (W_\mu^+ W_\nu^- - W_\nu^+ W_\mu^-) - 2A_\mu Z_\mu^0 W_\nu^+ W_\nu^-] - g\alpha [H^3 + H\phi^0\phi^0 + 2H\phi^+\phi^-] - \\ & \frac{1}{8}g^2\alpha_h [H^4 + (\phi^0)^4 + 4(\phi^+\phi^-)^2 + 4(\phi^0)^2\phi^+\phi^- + 4H^2\phi^+\phi^- + 2(\phi^0)^2H^2] - \\ & gMW_\mu^+W_\mu^-H - \frac{1}{2}g\frac{M}{c_w^2}Z_\mu^0Z_\mu^0H - \frac{1}{2}ig[W_\mu^+(\phi^0\partial_\mu\phi^- - \phi^-\partial_\mu\phi^0) - \\ & W_\mu^-(\phi^0\partial_\mu\phi^+ - \phi^+\partial_\mu\phi^0)] + \frac{1}{2}g[W_\mu^+(H\partial_\mu\phi^- - \phi^-\partial_\mu H) - W_\mu^-(H\partial_\mu\phi^+ - \\ & \phi^+\partial_\mu H)] + \frac{1}{2}g\frac{1}{c_w}(Z_\mu^0(H\partial_\mu\phi^0 - \phi^0\partial_\mu H) - ig\frac{s_w^2}{c_w}MZ_\mu^0(W_\mu^+\phi^- - W_\mu^-\phi^+) + \\ & igs_wMA_\mu(W_\mu^+\phi^- - W_\mu^-\phi^+) - ig\frac{1-2c_w^2}{2c_w}Z_\mu^0(\phi^+\partial_\mu\phi^- - \phi^-\partial_\mu\phi^+) + \\ & igs_wA_\mu(\phi^+\partial_\mu\phi^- - \phi^-\partial_\mu\phi^+) - \frac{1}{4}g^2W_\mu^+W_\mu^-[H^2 + (\phi^0)^2 + 2\phi^+\phi^-] - \\ & \frac{1}{4}g^2\frac{1}{c_w^2}Z_\mu^0Z_\mu^0[H^2 + (\phi^0)^2 + 2(2s_w^2 - 1)^2\phi^+\phi^-] - \frac{1}{2}g^2\frac{s_w^2}{c_w}Z_\mu^0\phi^0(W_\mu^+\phi^- + \\ & W_\mu^-\phi^+) - \frac{1}{2}ig^2\frac{s_w^2}{c_w}Z_\mu^0H(W_\mu^+\phi^- - W_\mu^-\phi^+) + \frac{1}{2}g^2s_wA_\mu\phi^0(W_\mu^+\phi^- + \end{aligned}$$

Maths Requirement

If you can answer the following then you will be okay:

- What is the sine of an angle equal to?
- State Pythagoras's theorem.
- What is the equation of a straight line?
- Rearrange this equation to make “a” the subject: $v = u + at$



The Course and Extra-Curricular

AQA Physics 7408

Extra-Curricular

Core content

- 1 Measurements and their errors
- 2 Particles and radiation
- 3 Waves
- 4 Mechanics and materials
- 5 Electricity
- 6 Further mechanics and thermal physics (A-level only)
- 7 Fields and their consequences (A-level only)
- 8 Nuclear physics (A-level only)

- Olympiads
- Science Live

Resources

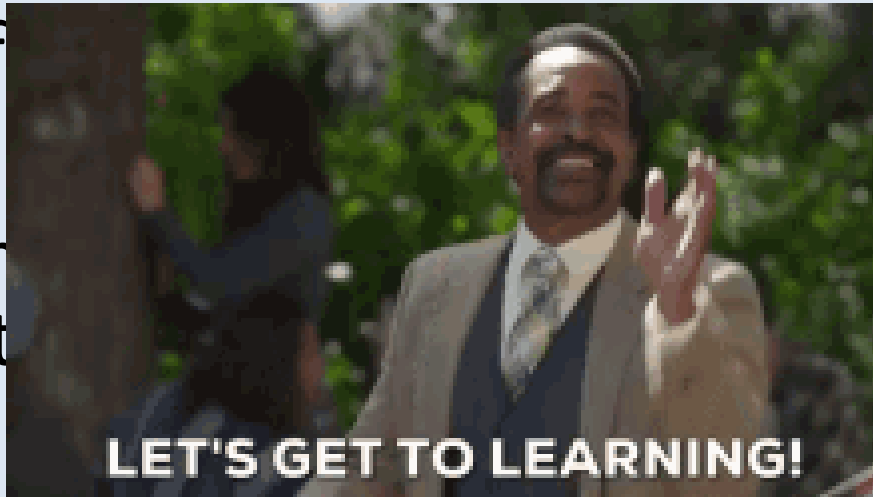
- Course specific (AOA endorsed) text book

Experienced and enthusiastic teachers!

- P

- Variety of

- Equipment
unusual, t



Questions?

Email me with questions:
tbensley@stgeorges.herts.sch.uk

YOU'RE TRYING TO PREDICT THE BEHAVIOR
OF <COMPLICATED SYSTEM>? JUST MODEL
IT AS A <SIMPLE OBJECT>, AND THEN ADD
SOME SECONDARY TERMS TO ACCOUNT FOR
<COMPLICATIONS I JUST THOUGHT OF>.

EASY, RIGHT?

SO, WHY DOES <YOUR FIELD> NEED
A WHOLE JOURNAL, ANYWAY?

FIELDS ARRANGED BY PURITY

MORE PURE →

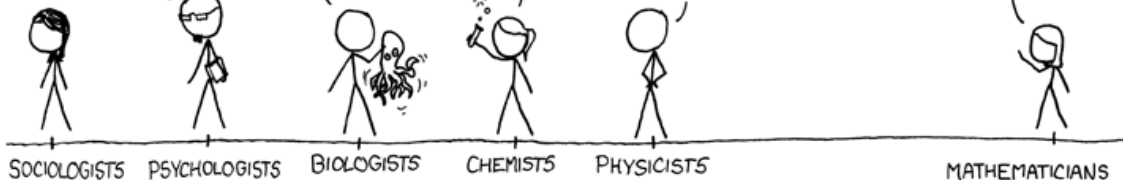
SOCIOLOGY IS
JUST APPLIED
PSYCHOLOGY

PSYCHOLOGY IS
JUST APPLIED
BIOLOGY.

BIOLOGY IS
JUST APPLIED
CHEMISTRY

WHICH IS JUST
APPLIED PHYSICS.
IT'S NICE TO
BE ON TOP.

OH, HEY, I DIDN'T
SEE YOU GUYS ALL
THE WAY OVER THERE.



LIBERAL-ARTS MAJORS MAY BE ANNOYING SOMETIMES,
BUT THERE'S *NOTHING* MORE OBNOXIOUS THAN
A PHYSICIST FIRST ENCOUNTERING A NEW SUBJECT.