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May 1999

Regulars

Editorial

by Robert Hunt



Darkened Skies

The total eclipse of the Sun on 11th August 1999 will be a tremendous opportunity for science teachers across the UK, despite the fact that it will occur during the school holidays. Even in northern Scotland 75% of the Sun will be obscured, and in London it'll be 95%. So although the eclipse will only be total in the far South-West (it'll be truly spectacular for people there), the rest of us will still get a pretty impressive view. PASS Maths hopes that it'll be a cloudless day across the whole country!

No doubt many science teachers will be planning Sun-related activities for their students to carry out on the great day, with the aim of getting reports back from them in September on what they saw. (Having scared them first with warnings of the dire consequences of looking directly at the Sun, of course.) Plenty of opportunity for chemistry and physics teachers to explain "how the Sun works" before the summer holidays and then talk about it when everybody returns to school, and ask whether it's just coincidence that the Sun and Moon project images of the same size on the Earth. But Maths teachers might find themselves rather more at a loss.

Of course, it's easy to bring mechanics into it – it really is amazing to reflect that we can now predict the precise moments when eclipses are due, down to the second, centuries in advance. The laws of gravitation and of planetary motion are made much more immediately interesting by understanding how you can use them to predict the position of the Moon (in its "orbit round an orbit"). But there are plenty of other mathematical ideas which can be brought into a discussion of the inner workings of the Sun, such as the algebraic description of standing waves, and we hope that this issue's article on [The Dynamic Sun](#) will explain how! See also the Sun Block '99 web site at <http://www.sunblock99.org.uk>.

Interesting times

Students who start their A-level studies in the year 2000 will be the first to experience the Government's new plans for 6th-form students. It will certainly be interesting times for them, and even more so for their teachers! The Government intends that instead of studying for just three A-levels as at present, students will

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study five subjects in their first year, and then continue with just three of them into their second year. In those subjects which they end up studying for only the first year, students will gain an AS-level. So it seems that students will not now need to make a final decision on which subjects to take to a full A-level until they have actually entered the 6th form. This is good news for mathematics, as there are sure to be many students wishing to study maths for just one year who previously would have dropped it completely after GCSEs, and some of those might even be persuaded to continue to a full A-level after their AS-level.

PASS Maths strongly supports this small move towards a broader range of studies. England and Wales have rightly been criticised in the past for having too narrow a specialisation at an early age. Scotland, of course, has been doing this sort of thing much better for a long time, and many European schools use the International Baccalaureate, which takes the idea even further (and does so extremely successfully). We would support the move towards a broad curriculum even more strongly if there were also a suggestion that *every* student should study at least one arts subject and at least one science subject in their first year of 6th form. It is important that we continue to increase the level of understanding which the general public has of scientific issues; and at the same time it is important that future scientists have a wider outlook on life.

At first, you might think that the penalty for a broader curriculum would be a more shallow one; but the Government intends to simply increase the amount of work students are expected to do so that the depth of the three full A-levels can remain the same. The Government claims that this increase in the amount of work 6th form students do – from an average of 15 – 18 hours per week at present to around 30 hours per week – will put us in line with the rest of Europe. Whether they intend to match the amount of extra time students are expected to spend learning with money to provide teachers for those lessons remains to be seen.

A-levels will also have a "synoptic" element: that is, candidates will be required to demonstrate ability to apply their knowledge across different parts of the syllabus when they reach the end of their two years of study. This is an important change: at degree level there has certainly been a problem with students who have got used to "module-cramming".

S-levels are at the same time going to be replaced with some as-yet-unnamed "world class tests" to stretch the brightest students. They would perhaps be modelled on the existing STEP papers ("Sixth Term Examination Papers") used by some Universities. The Government intends that these new examinations could be taken regardless of which school the student has attended or which syllabus he or she has followed: an extremely laudable aim, as the provision of teaching for S-levels and STEP is at present highly variable, but it remains to be seen how they will achieve this.

All in all, the Government's plans look excellent on paper. We can only hope that they work out as well in practice!

A and AS Update

The Qualifications and Curriculum Authority's update on A and AS qualifications.

More details

More details from the QCA on the changes.

About the author

Dr. Robert Hunt is the Editor of PASS Maths.

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Plus is part of the family of activities in the Millennium Mathematics Project, which also includes the NRICH and MOTIVATE sites.