Science education – are we losing the plot?

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Discover
Imagine

Launch by Tony Blair, March 2006

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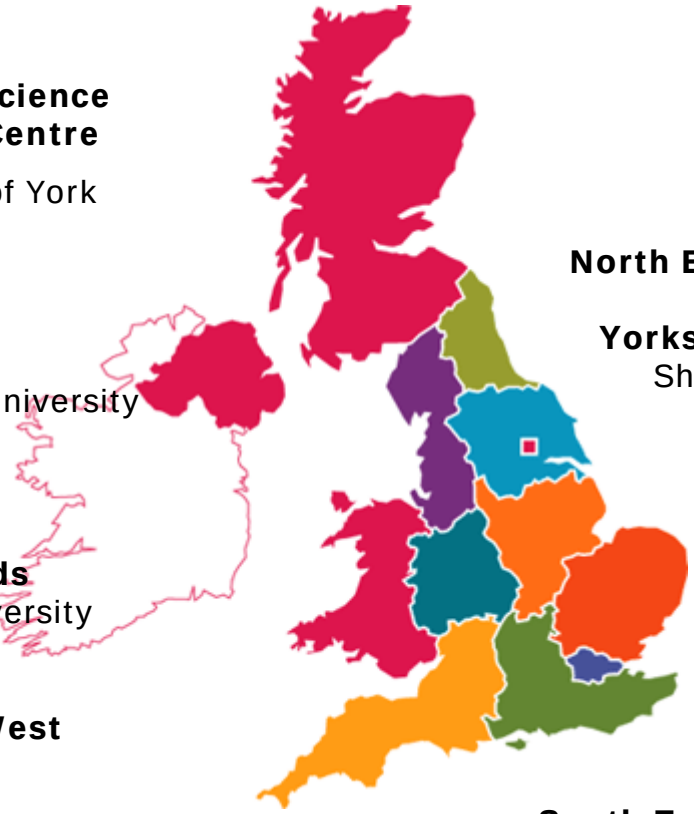
The National Network of Science Learning Centres



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East Midlands University of Leicester

East of England
University of Hertfordshire

West Midlands
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South East
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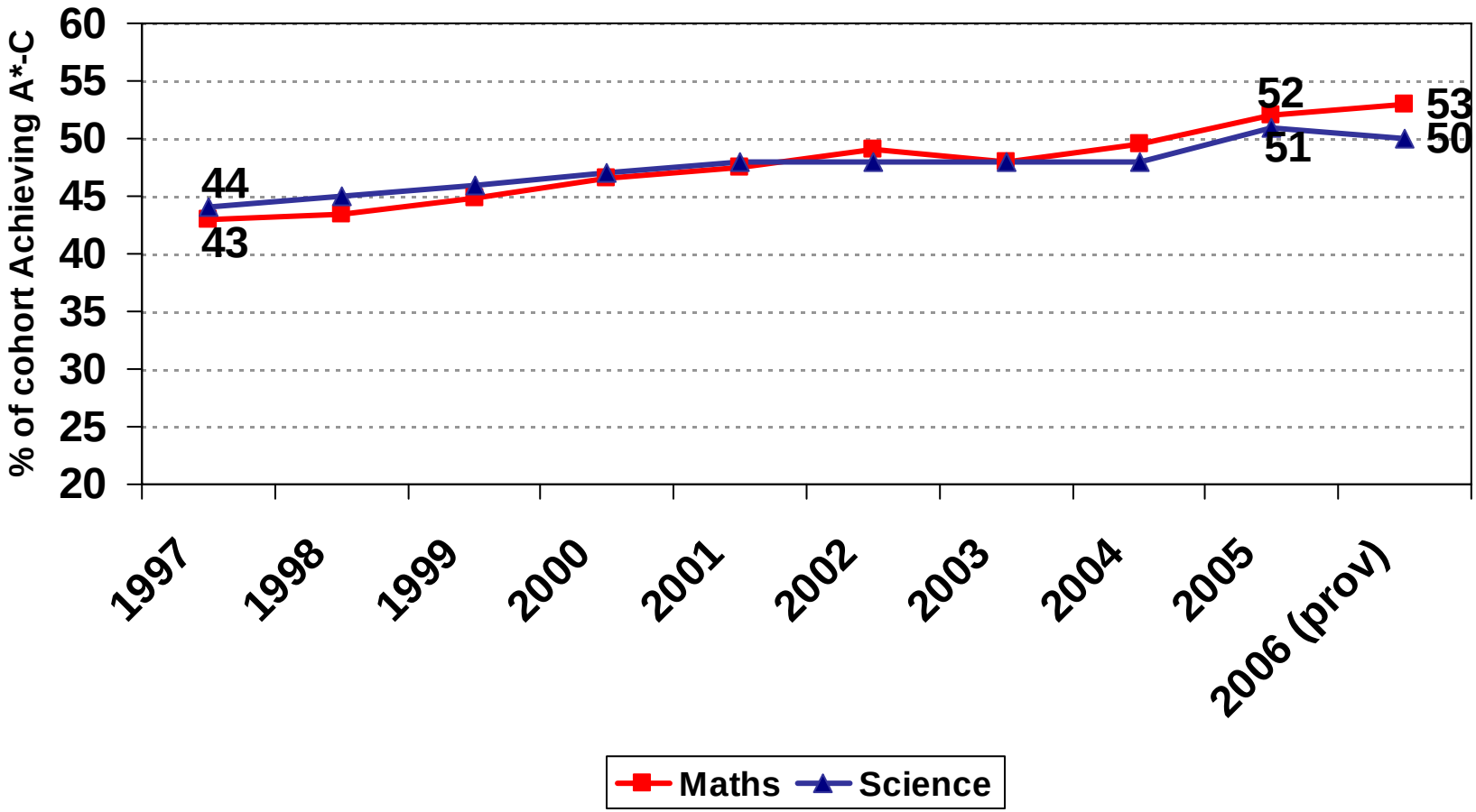
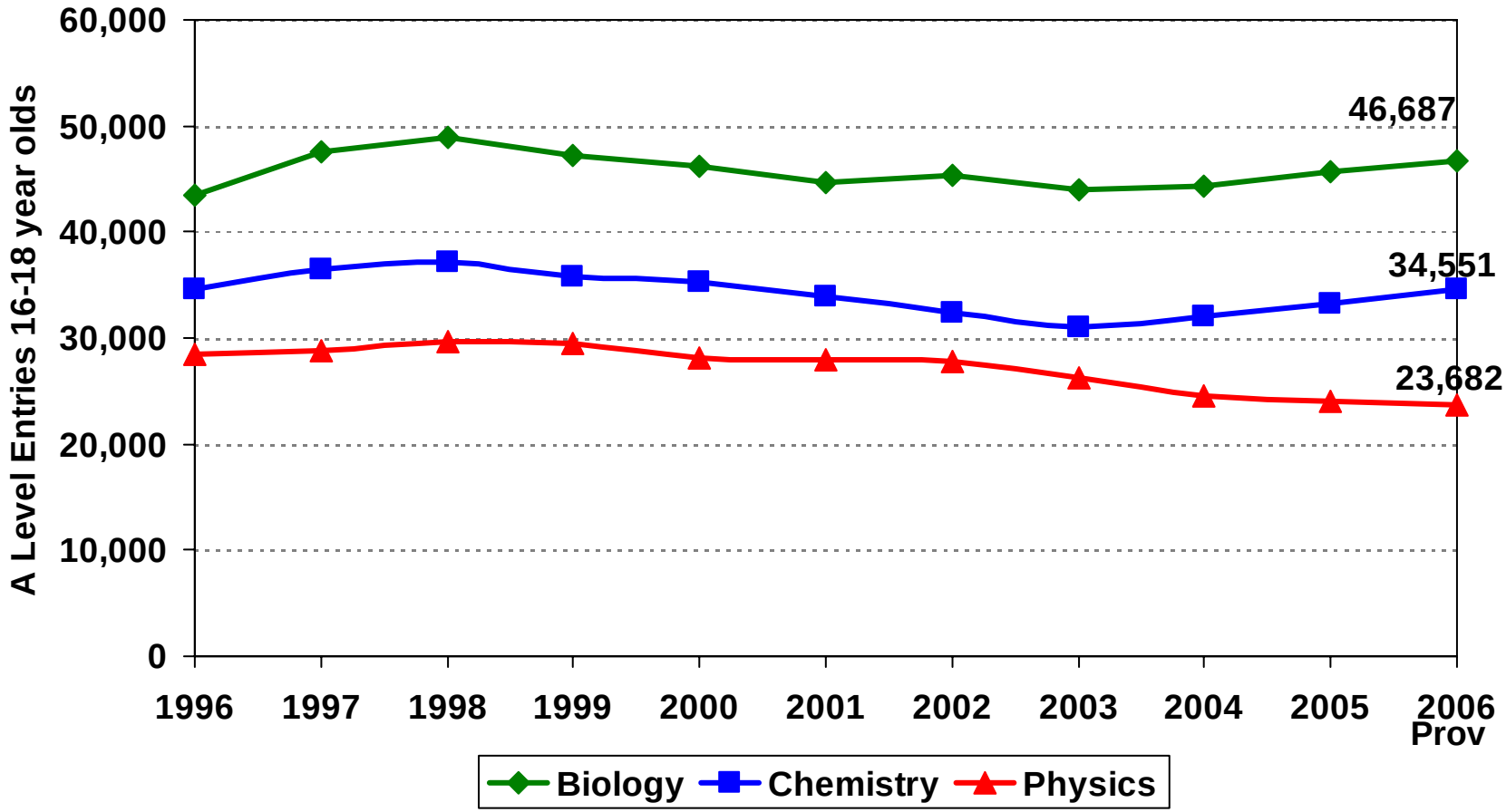
The plot in England

GCSE Science and Maths A* - C



2005 and 2006 figures are for pupils at the end of KS4. All previous figures are for pupils aged 15

A level Science entries



What made you study Chemistry?

Survey of 148 first year Chemistry and Biochemistry undergraduates at the University of York

How important was each of these in influencing you?

(1 = not important; 5 = very important)

	Average
Course and textbooks	**3.18**
Quality of school labs	**2.92**
Your chemistry teacher	**3.93**
Your parents	**2.20**
The job prospects	**3.98**
What your friends were choosing	**1.39**
Your exam grades at GCSE	**3.15**
Your exam grades at AS Level	**3.68**

UCAS Data gives hope to troubled subjects THES, 27.10.06

- Science degrees surviving better than arts following introduction of top up fees
- More chemistry students than any year since 1999
- Chemistry up 3.7% on 2005
- Maths/ Physics stationary – following 5 years of decline
- Only biology down - 11.7%

Some trends

- **From science for an elite to science for all**

The dual mandate
(Lord Jenkin of Roding)

The science curriculum has to provide:

Access to basic scientific literacy	**The first stages of a training in science**
for all	***for a minority***

Twenty First Century Science - a core science curriculum that:

engages with contemporary scientific issues

covers the central Science Explanations*

develops key Ideas about Science*

**** The two foundations of scientific literacy***

Twenty First Century Science structure

Science (Core)

10% curriculum time

Emphasis on scientific literacy

(science for citizenship)

for *all* students

(1 GCSE)

Additional Science (General)

10% curriculum time

or

Additional Science (Applied)

10% curriculum time

for *many* students

(1 GCSE)

The Times October 11, 2006

Science elite rejects new GCSE as 'fit for the pub'

By Mark Henderson and Alexandra Blair

A NEW science GCSE that replaces traditional physics, chemistry and biology with discussions about topical issues such as GM crops and the MMR vaccine is attacked today by leading academics as “more suitable to the pub than the schoolroom”.

Challenges …….

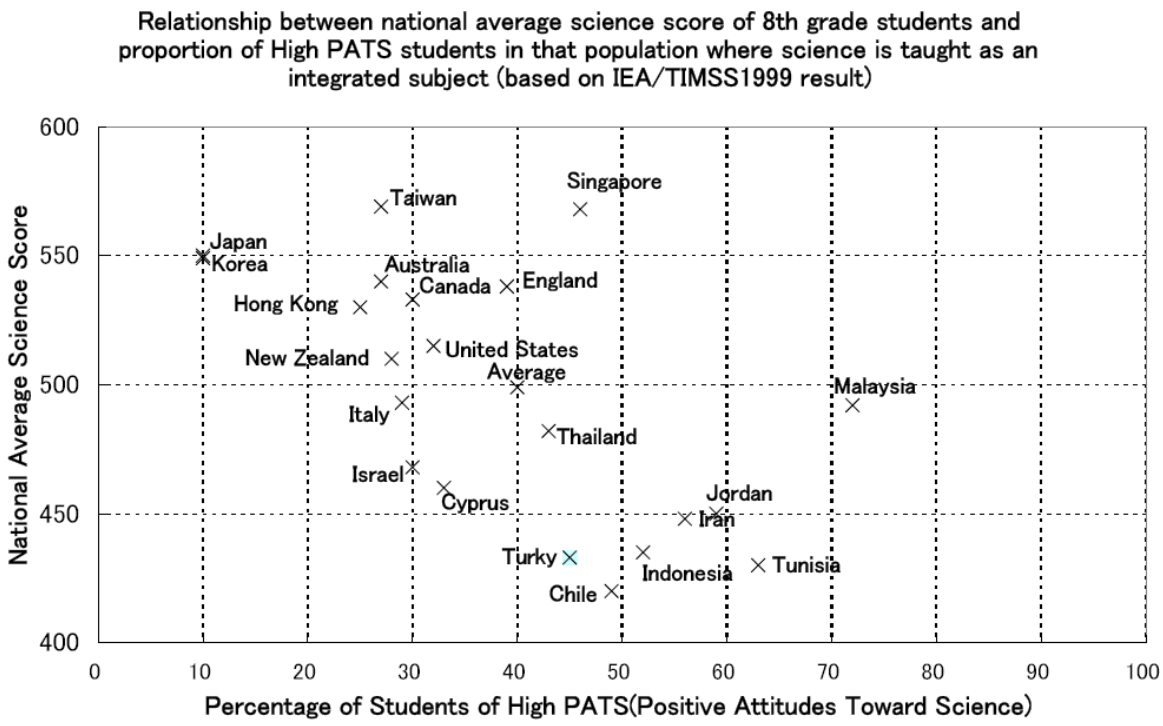
- Teaching science for scientific literacy
- How to teach science to less academic students
- How to engage the interest of the more academic students so they will continue to study science

Some trends

- **From science for an elite to science for all**
- **Increasing accountability - more ‘teaching to the test’?**

International comparisons

Science attitudes and science attainment



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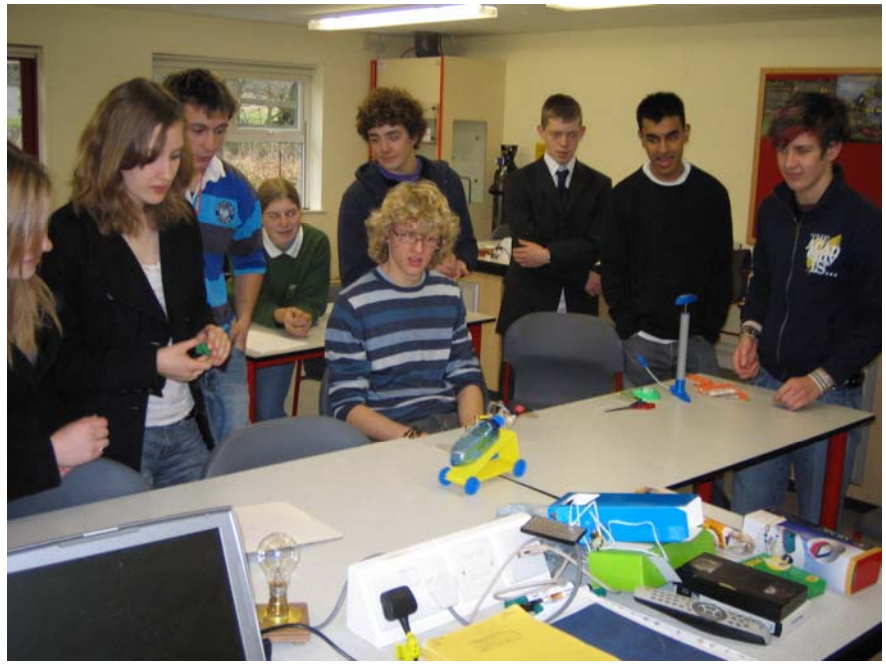
Some trends

- **From science for an elite to science for all**
- **Increasing accountability leading to ‘teaching to the test’**
- **Increasing realisation of the importance of teachers**

Inspiring post-16 Physics

An intensive residential course at the National Science Learning Centre, November 2005 and March 2006



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Mathematics and Science in Secondary Schools: The deployment of teachers and support staff to deliver the curriculum. NFER, commissioned by DfES, 2006

Results from mathematics and science departments in one in four maintained secondary schools in England during 2004/5.

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Main findings (1)

Of all teachers of science

- **44% are Biology specialists**
- **25% are Chemistry specialist**
- **19% are Physics specialists**

Among 11 – 16 schools, 25% have no Physics specialists at all

At AS/A2 level, the percentage of teaching time taken by those with a degree in the subject concerned is

- **59% Biology**
- **60% Chemistry**
- **52% Physics**

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Some current DfES policy drives

linked to the 10 year Science and Innovation Investment Framework

- Ambitious targets for increasing numbers taking physics and chemistry A level
- Recruiting more teachers of physical science, and retraining non-specialists
- Encouraging schools to offer three separate sciences
- Rising attainment at the end of key stages 3 and 4
- The STEM Programme Report: an overhaul and rationalisation of schemes to support teaching of science, technology, engineering and maths , in partnership with key stakeholders.

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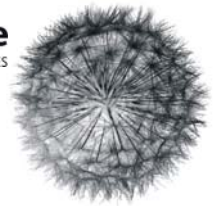

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On track for chemistry target but a long way to go for physics