

# Improving science education – a view from the Department for Education

**Katie Farrington**  
**Head of Standards Division**  
**Department for Education**

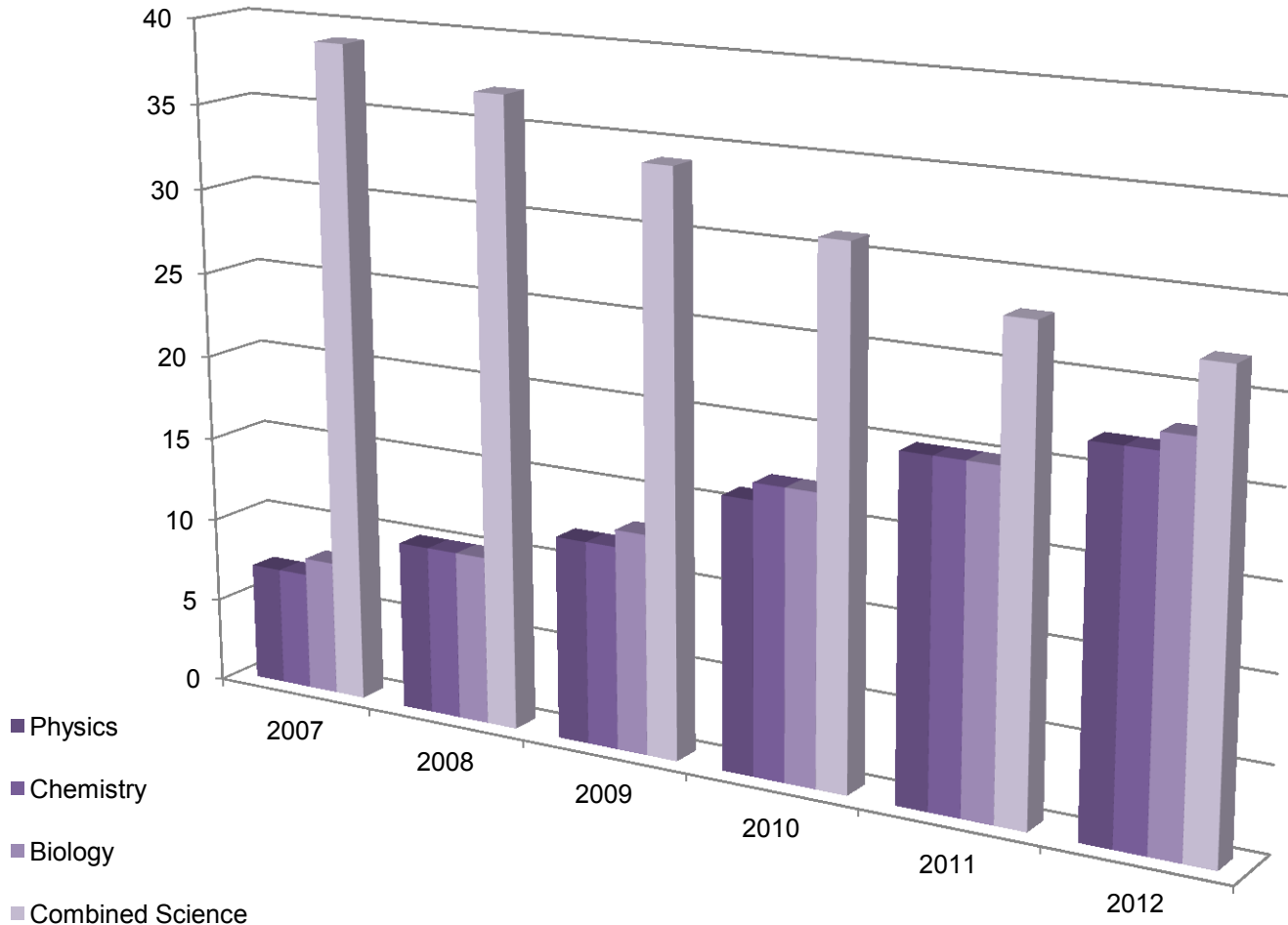
SCORE Conference  
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# An international perspective

Age 10 Ranking			2011		
TIMSS MATHS			TIMSS SCIENCE		
Rank	Country	Mean	Rank	Country	Mean
1	Singapore	606	1	Korea	587
2	Korea	605	2	Singapore	583
3	Hong Kong	602	3	Finland	570
4	Chinese Taipei	591	4	Japan	559
5	Japan	585	5	Russia	552
6	Northern Ireland	562	6	Chinese Taipei	552
7	Belgium (Flemish)	549	7	United States	544
8	Finland	545	8	Czech Republic	536
<b>9</b>	<b>England</b>	<b>542</b>	9	Hong Kong	535
10	Russia	542	10	Hungary	534
11	United States	541	11	Sweden	533
12	Netherlands	540	12	Slovak Republic	532
13	Denmark	537	13	Austria	532
14	Lithuania	534	14	Netherlands	531
15	Portugal	532	<b>15</b>	<b>England</b>	<b>529</b>

# In 2012 the take-up of separate science subjects continued to rise

Percentage of all pupils at the end of Key Stage 4 achieving A\*- C  
Separate Sciences GCSE



# ... but there are some worrying gender trends

## Number of A-level entries in Science subjects from 2006 to 2011 by gender

		2007	2008	2009	2010	2011	2012	Boy/girl gap
Biology	Boys	19,329	20,304	20,510	23,100	23,785	24,302	
	Girls	27,468	28,093	27,468	29,628	30,953	31,515	+12%
Chemistry	Boys	17,671	18,625	19,160	21,124	22,818	23,634	
	Girls	17,406	17,703	17,981	19,255	20,431	21,095	-6%
Physics	Boys	18,693	19,418	19,994	21,934	23,193	24,298	
	Girls	5,194	5,285	5,626	5,852	6,012	6,452	-58%

# We want to improve science education by:

- ❖ Improving the general understanding of scientific concepts for all pupils - **curriculum reform**
- ❖ Improving the quality of teaching at primary and secondary - **recruitment of the best and CPD**
- ❖ Increasing the number of students that study mathematics and science post 16 - **Ebacc and GCSE reform**
- ❖ Increasing the number of students that study science at A level - **A level reform**
- ❖ Encouraging more young people to pursue science careers - **developing talented scientists.**

# National Curriculum review

**Key changes to the draft secondary programmes of study for the sciences:**

- ❖ **increased level of challenge – more detailed specification to provide clarity of requirements and to raise level of demand**
- ❖ **working scientifically – coherent title across phases; less abstract content on scientific methods, processes and thinking**
- ❖ **Mathematical requirements for science – greater clarity and increased emphasis.**

# Reforming GCSEs

The new GCSEs will:

- ❖ be linear – with assessment at the end of the course
- ❖ not force pupils to choose between higher and lower tier papers
- ❖ keep controlled assessment and the use of exam aids to a minimum (with the exception of practical science)
- ❖ in science will have greater emphasis on quantitative problem solving
- ❖ have a new grading scale.

# Reforming A levels

The new A levels will:

- ❖ be linear, leading to greater knowledge and intellectual maturity
- ❖ see AS level delivered over one or two years
- ❖ be informed by involving universities and learned societies;  
and
- ❖ be introduced from September 2015 onwards.



# Post 16 Mathematics study

- ❖ Secretary of State's ambition is that within a decade the vast majority of students should be studying mathematics up to the age of eighteen
- ❖ The primary objective is to move to a situation where every student is strongly encouraged to study mathematics beyond 16
- ❖ There are clear economic benefits from studying mathematics to 18
- ❖ Mathematics is a key foundation for science study and careers.

# Timeline for reform

## National Curriculum/GCSEs

**Sept. 2013**

New NC PoS  
in schools

**Sept 2014**

New NC PoS  
taught in  
schools

**Sept. 2015**

New GCSE\*  
subjects  
taught

**Sept. 2016**

New  
remaining  
GCSEs taught

\* English language, literature, mathematics, biology, chemistry, physics, combined science, history and geography

## A Levels

**Sept. 2013**

Interim  
changes to A  
levels

**May 2014**

Ofqual  
accredit new  
A Levels

**Sept. 2014**

New A Level  
material in  
schools

**Sept. 2015**

New A  
Levels are  
taught

**2017**

First  
examination  
of new A  
Levels