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**International Comparison Study of
Science in the Primary Curriculum:
England and Top Performing
Countries**

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TIMSS 2007 RESULTS: PRIMARY SCIENCE

Grade 4 Science (Y5)

37 Countries

3 Countries Outscored England			England outscored 26 other countries including:		
	Score	% Correct		Score	% Correct
Singapore	587	69	Germany	528	56
Chinese Taipei	557	63	Australia	527	57
Hong Kong	554	62	Sweden	525	56
England Part of a Group of 8 Countries			Netherlands	523	56
Japan	548	60	Denmark	517	54
Russian Federation	546	60	New Zealand	504	52
Latvia	542	60	Scotland	500	51
England	542	59	International average score	500	49
United States	539	59	Norway	477	47
Hungary	536	58			
Italy	535	58			
Kazakhstan	533	58			

TIMSS 2007 RESULTS: PRIMARY MATHEMATICS

Grade 4 Maths (Y5)

37 Countries

4 Countries Outscored England			England outscored 28 other countries including:		
	Score	% Correct		Score	% Correct
Hong Kong	607	77	United States	529	59
Singapore	599	74	Germany	525	57
Chinese Taipei	576	69	Denmark	523	57
Japan	568	67	Australia	516	55
			Italy	507	53
England Part of a Group of 5 Countries			Sweden	503	51
Kazakhstan	549	64	International average score	500	
Russian Federation	544	62	Scotland	494	50
England	541	61	New Zealand	492	49
Latvia	537	60	International average % correct		48
Netherlands	535	59			

Countries selected

The final selection of countries and subjects for comparison, based on TIMSS 2003 was:

Science	Mathematics
Singapore	Singapore
Chinese Taipei	Chinese Taipei
Hong Kong	Hong Kong
	Netherlands
Latvia	Latvia
Ontario	Ontario

Objectives



To establish how the England curriculum for key stage 2 mathematics, science and literacy compared with those of countries showing a high level of performance in international comparative surveys.

In particular attention was paid to:

- The overall structure of the curricula;
- The relative breadth of the curricula;
- The relative difficulty of the curricula;
- How the difficulty of what is taught is matched to the ability of the pupil;
- Prescription of such features as time allocated to a subject, order of teaching topics,
- Specifics of how the curriculum is implemented.

Key Findings:

Science

- The structure of our science curriculum, Scientific enquiry and then divided by content, is just one of a variety of structures seen in the comparator countries. Thematic structuring is one of the alternatives found.
- The basic division of content into biology, chemistry and physics (with other nomenclature) was not widely shared, with several curricula breaking content down into more discrete areas.
- The emphasis on scientific enquiry is shared by all of the other curricula, but not all have it as a structural element.

Key Findings: Science



- England's curriculum for Physical processes is judged to be narrower and less demanding than the majority of the other curricula.
- England's curriculum for Life processes and living things is judged to be narrower than those elsewhere, but not always less demanding.
- For both Scientific enquiry and Materials and their properties the tendency is for the level of demand to be similar to most of the other curricula.

Key Findings: Mathematics

- The structure of our mathematics curriculum, by content, is similar to most of the others in comparator countries.
- The basic division into number, geometry and data handling is common amongst the curricula.
- The emphasis on process is shared by most of the other curricula.
- England's curriculum for number is judged to be narrower and less demanding than the majority of the other curricula.
- In data handling, by contrast, the curriculum in England is broader and more demanding than those elsewhere.
- In geometry the emphasis in England on visualization and transformational geometry is not shared by the other countries.

Key Findings: Differentiation

Accommodating A Wide Spread of Ability

- Only one country, Singapore, was found to have a system with differentiation built in. This takes the form of streaming.
- The other systems regard it as the role of the teacher to deal with pupils of different ability. Practice in England is similar to all of the other countries studied except for Singapore.

Implementation



- For teaching mathematics around 3 hours per week was the most common time allocation.
- Science allocations were lower than for mathematics, substantially so in some countries.
- No consistency was found in whether the time allocated to subjects increased with time, stayed the same or decreased.
- None of the curricula examined were accompanied by mandatory instructions on how mathematics, science or literacy were to be taught. England is not unusual in this respect.

How was it done?



- Comparison made twice, once at NFER and once in the comparator country
- Excel spreadsheets with programme of study for England

Judgments



Breadth:	Broader, similar or narrower
Difficulty:	More demanding, similar in demand or less demanding
Confidence:	Very confident, quite confident or not confident

Example



English National Curriculum Programme of Study	English National Curriculum Reference Number	Comparison country Programme of Study nearest equivalent	Is comparison country easier (E) or harder (H) or similar (S)	How sure are we about the difficulty comparison?	Is the comparison country curriculum narrower or broader?	How sure are we about the breadth and depth comparison?
to recognise differences between solids, liquids and gases, in terms of ease of flow and maintenance of shape and volume.	3/1e	groups the substances according to their aggregate state (solid, liquid, gasiform)	Similar	Very confident	Similar	Very confident



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