Young People's Attitudes to Mathematics

A Research Study Among 11-13 Year Olds on behalf of
The National Audit Office

January - March 2008

Contents

Introduction

This report presents findings from the 2008 Survey of Secondary School Pupils, carried out by Ipsos MORI Social Research Institute on behalf of The National Audit Office. The computer tabulations can be found in a separate volume.

Objectives

The overall aim of this study was to gather information regarding school pupil's perceptions of maths in Years 7 and 8. Specifically, the survey set out to cover the following key issues:

- What pupils think of maths in primary schools;
- The transition from primary school maths to secondary school maths; and
- How useful the pupils think maths is.

Methodology

The sample of schools drawn to take part in the Young People Omnibus comprised 350 middle and secondary state schools in England and Wales. The sampling universe included LEA, voluntary aided/controlled and foundation schools, but excluded special schools and sixth form colleges. This sampling frame was stratified by Government Office Regions (GORs) and within each stratum; schools were selected proportional to the size of the school register, thus producing a nationally representative sample of secondary and middle schools.

The age groups included in the survey were 11-13 year olds in curriculum years 7 and 8. Each school was randomly allocated one of these curriculum years, from which Ipsos MORI interviewers selected one class at random (using a random number grid) to be interviewed. Interviewing was carried out through self-completion questionnaires with the whole class in one classroom period. An Ipsos MORI interviewer was present to explain the survey to pupils, to reassure them about the confidentiality of the survey, to assist them in completing the questionnaire, and to collect completed questionnaires. In classes where four or more children were absent during the self-completion session, up to two follow-up visits were arranged to interview absent pupils.

Fieldwork for the study was conducted between 11th January and 28th March 2008. Of the 350 schools approached, 39 declined to participate at the invitation stage (a letter sent to the headteacher), while a further 194 declined during the fieldwork period. In total, 100 schools participated and we interviewed a Year 7 or 8 class in 48 of them. Overall, fully completed questionnaires were obtained from 1,104 pupils in Year 7 or 8, an average of 23 pupils per class.

Data are weighted by gender, age and region. The weights were derived from data supplied by the Department for Children Schools and Families and the Welsh Office. The effect of weighting is shown in the sample profile in the Appendices and in the computer tables.

Acknowledgements

It is clear that schools are increasingly working under great pressure from a number of different sources. They also receive numerous requests to participate in surveys such as this. Consequently, we wish to record our gratitude to the many schools that took part and we are indebted to all pupils and staff who made this survey possible.

Ipsos MORI would also like to thank Jonathan MacKay at The National Audit Office for his help and involvement in the project.

Presentation and Interpretation of Data

When interpreting the findings it is important to remember that the results are based on a sample of the maintained school population, and not the entire population. Consequently, results are subject to sampling tolerances, and not all differences between sub-groups are therefore statistically significant. A guide to statistical significance is included in this document.

In tables where percentages do not add up to 100% this is due to multiple answers, to computer rounding, or to the exclusion of 'Don't know' or 'No response' categories. Throughout the tables an asterisk (*) denotes a value greater than zero, but less than 0.5%.

Publication of Data

As with all our studies, these results are subject to our Standard Terms and Conditions of Contract. Any publication of results requires the prior approval of Ipsos MORI. Such approval will only be refused on the grounds of inaccuracy and misrepresentation.

Checked &Approved:

Adél Várnai

Ali Ziff

Peter Cornick

Summary of Findings

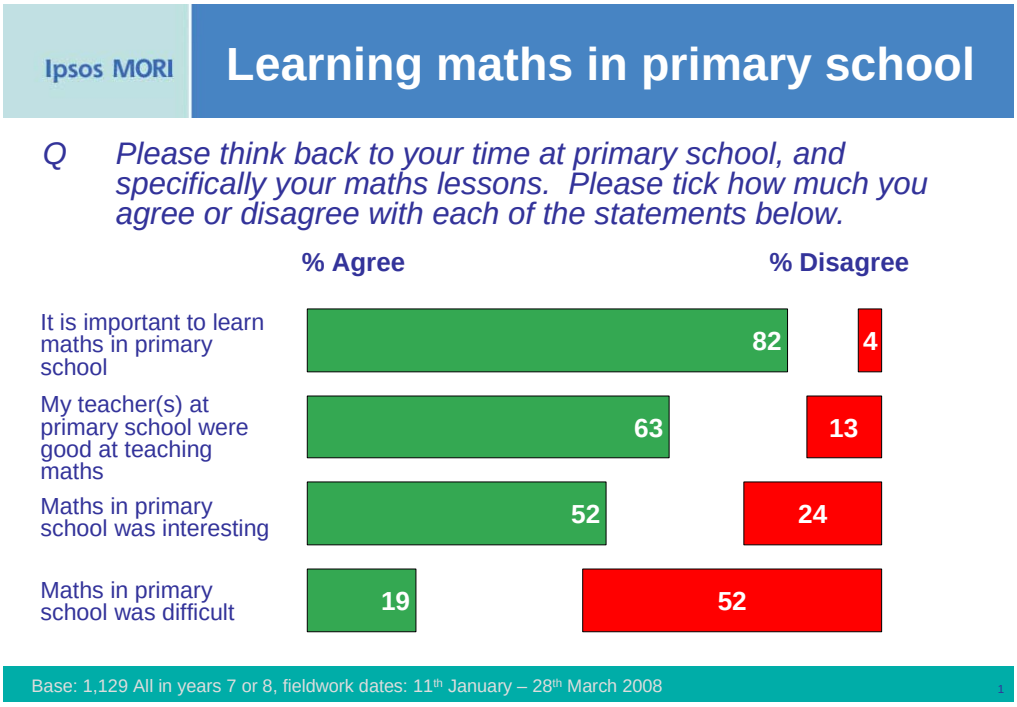
- *Overall the survey findings reveal that Year 7 and 8 pupils are positive about maths; the majority of students think that it is important to learn maths and that it can help them in other areas of life. Two thirds (64%) also say that they find maths to be enjoyable.*

- *Some interesting trends have emerged which suggest that certain groups of pupils are more likely to be favourable towards maths: girls are more likely to say that maths is important and enjoyable, although the figures are also high among boys. Children from the BME subgroup are also more positive about maths in general.*

- *Another clear trend is that Year 8 pupils are more likely to find maths difficult and less likely to find maths enjoyable than Year 7s, suggesting that there is a significant jump in difficulty of the maths taught in these two years.*

Learning maths in primary school

When looking back on their primary maths education, most 11-13 year olds tend to have had positive experiences, as shown in the chart below.



The vast majority believe that it is important to learn maths in primary school - over eight in ten agree with the statement (82%) compared to only four percent who disagree. While the figures are high amongst both boys and girls, there is a gender divide with girls significantly more likely than boys to agree that it is important to learn maths (86% versus 79% respectively). Those from households where no parent works are significantly less likely to think that it is important to learn maths in primary school – just 70% think it is important compared to 82% overall.

Nearly two thirds of pupils agree that their teachers at primary school were good at teaching maths (63%), while just one in ten disagree (13%). Although these figures remain largely constant across all subgroups, BME pupils (and Asian children in particular[1]) are more likely to *strongly* agree (42% and 47% respectively compared to 34% overall).

Half of 11-13 year olds feel that maths in primary school was interesting but a quarter disagree (52% and 24% respectively). Again, there is variation in attitude between ethnic sub groups. White pupils are significantly more likely to disagree that maths in primary school was interesting – 26% disagreed with the statement compared to 15% of BME pupils as a whole. These pupils are also more likely to *strongly* agree that maths was interesting, with 36% of BME pupils compared to only 18% of White pupils. There is also slight regional variation with those from Yorkshire and Humberside the most likely to agree (61%) and pupils in the South East and South West least likely (both 43% compared to 52% overall). Pupils living in an area considered high in the Index of Multiple Deprivation (IMD), that is the most deprived, are more likely to *strongly* agree that maths in primary school was interesting (34% compared to 21% overall).

Relatively few pupils found maths in primary school difficult: only one in five agree that maths was difficult (19%), and only six percent *strongly* agree. Unsurprisingly, those who did not enjoy maths at primary school are the most likely to think it was difficult: 26% of those pupils say it was hard versus 18% of those who enjoyed it. However, across region, gender, age and ethnicity attitudes are broadly consistent.

[1] Due to a small base size, this finding should be treated as indicative only.

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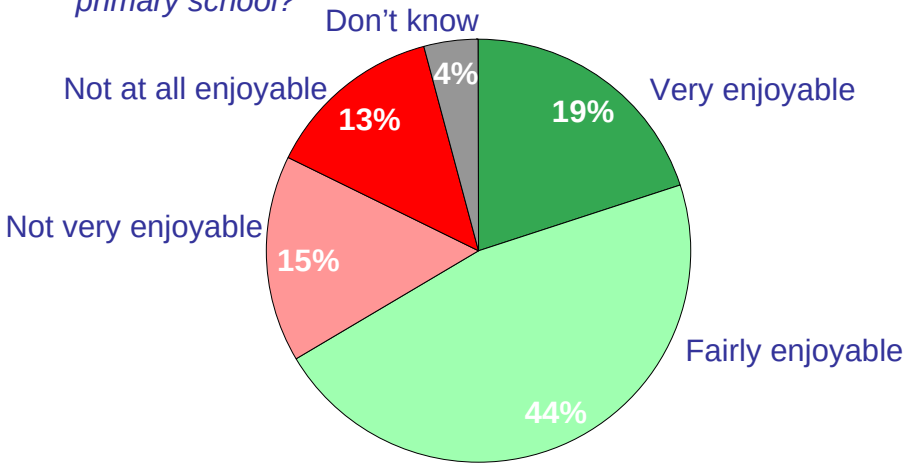
How enjoyable was maths in primary school?

Q Overall, how would you describe your maths lessons at primary school?



Base: 1,129 All in years 7 or 8, fieldwork dates: 11th January – 28th March 2008

In total, nearly two thirds of all 11-13 year olds (64%) say that maths in primary school was enjoyable and a quarter think that it was not enjoyable (28%). Most commonly, children do not have a strong opinion either way, saying they found maths fairly enjoyable (44%).

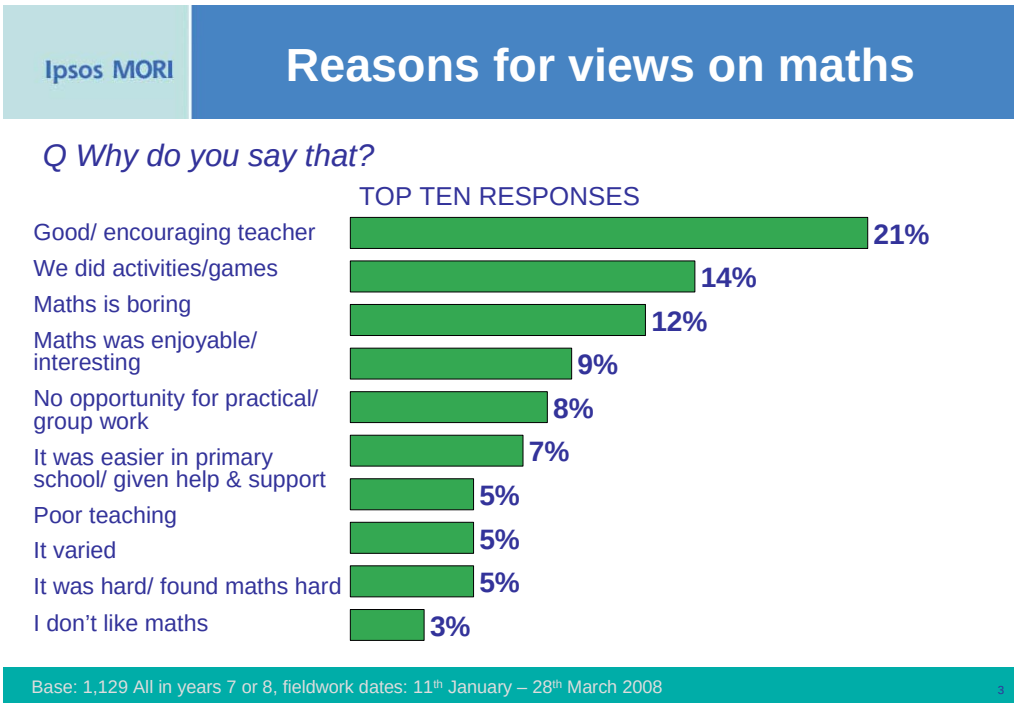
Girls tend to be much more positive about primary school maths, with seven in ten (70%) saying it was enjoyable compared to three in five boys (58%).

Enjoyment levels also vary by age. Twenty-two percent of Year 7 pupils recall maths lessons at primary school as being *very* enjoyable compared to 19% overall. Again, BME children tend to be more positive, with a third of BME children saying they enjoyed maths at primary school (32%) compared to only seven percent of white pupils. Those from the high IMD group (i.e. the most deprived areas) are also more likely to say they found maths lessons at primary school *very* enjoyable (33% compared to 19% overall).

There is also some regional variation with three quarters of 11-13 year olds from the North East saying they have found maths at primary school enjoyable (74%) compared to two thirds overall (64%). In contrast, just six in ten pupils from the South East (58%), South West (58%) found maths enjoyable.

Reasons for views on maths

Pupils in Years 7 and 8 provide a wide range of reasons for their attitudes towards primary school maths.



The most common spontaneously given reason for their positive views was the overall quality of the teacher – one in five 11-13 year olds say they had a good, encouraging teacher (21%). Although there are few differences across subgroups, girls are more likely to give this reason than boys (25% compared to 17% respectively).

Girls are also more likely than boys to suggest that maths was enjoyable because they did activities or games (18% of girls versus 11% of boys and 14% overall). Activities are also significantly more likely to be cited by children from families in which no parent works (23%) and those from rural areas (28%).

The most common justification for not enjoying maths at primary school is that it was boring, a reason mentioned by one in ten pupils (12%) and this rises to a third of those who did not find maths enjoyable at primary school (31%). Other mentions include having no opportunity for practical work (eight percent overall; 21% of those who did not find maths enjoyable); poor teaching (five percent rising to 12% of those who did not enjoy maths); and level of difficulty (five percent overall say it was hard rising 12% of those who did not enjoy maths).

The transition from primary to secondary school

When comparing the maths they are currently learning in Years 7 and 8 to their experience of primary school, three quarters of pupils find the maths they are learning in secondary school harder (74%) – half saying it is a *bit* harder and a quarter saying it was a *lot* harder (48% and 26% respectively). Less than one in ten think secondary school maths is easier (eight percent) and a similar proportion feel there has been no change (12%).

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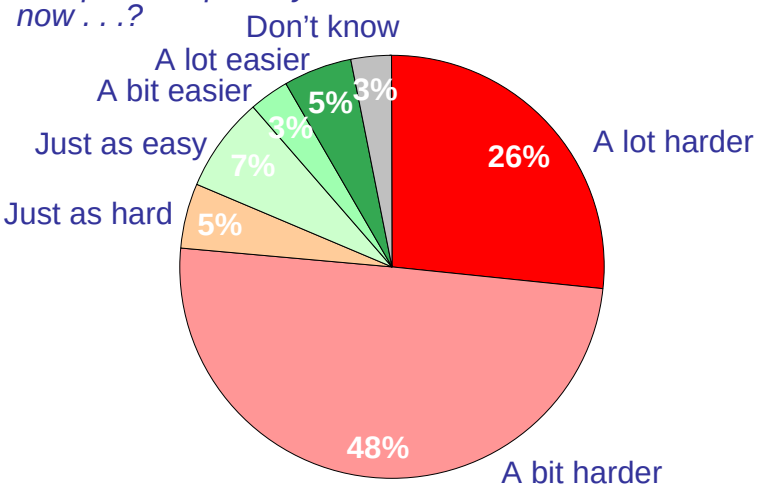
Maths in primary school vs. secondary school

Q Compared to primary school, I find the maths I am learning now . . .?



Base: 1,129 All in years 7 or 8, fieldwork dates: 11th January – 28th March 2008

Perhaps unsurprisingly, the older the child the more likely they are to say the maths they are currently learning is harder than in primary school: while two thirds of Year 7 pupils say maths is now harder (67%), this rises to eight in ten Year 8 pupils (81%). This pattern is also true for those claiming that secondary school maths is a *lot* harder: 34% of Year 8s compared to 19% of Year 7s.

Views on learning maths

Pupils in Years 7 and 8 are generally positive about learning maths. Almost six in ten agree that **maths at primary school has helped them with other subjects** (57% agree and 24% *strongly* agreeing). There are few differences across subgroups but BME pupils are more likely to *strongly* agree (34% versus 24% overall). Those in rural areas are also more likely than those living in urban areas to *strongly* agree (36% compared to 23% of urban pupils).

As well as appreciating the value maths can bring to other subjects, over half of 11-13 year olds **pupils find maths useful outside school** (54%) and just one in seven disagree (14%). Again, levels of agreement remain largely constant across subgroups although BME pupils are more likely to *strongly* agree that the maths they learned at primary school is useful outside school (33% compared to 24% overall).

Overall the majority of pupils recognise they are **learning new things through maths at secondary school.** While just one in six agree that they do not feel that they are learning anything new in maths at secondary school (17%), six in ten disagree (61%). Year 8 pupils were more likely than Year 7s to think that they were learning something new (65% disagree versus 57% respectively) and girls are also much more positive about maths in secondary school. Seven in ten disagree with the statement (68%) compared to half of boys (54%). This positive pattern among girls has been described previously and is common across much of the study.

Although the majority of children find the maths they learn in secondary school harder than primary school, a significant proportion also say that they are **enjoying maths more now** (43% agree while 30% disagree). However, there are significant differences between year groups: while half of Year 7 pupils (47%) enjoy it more now, this falls to two fifths in Year 8 (40%). Combined with the increase in stated difficulty from Year 7 to 8 the findings suggest that, for some, the transition between these years is greater than that from primary school to secondary school.

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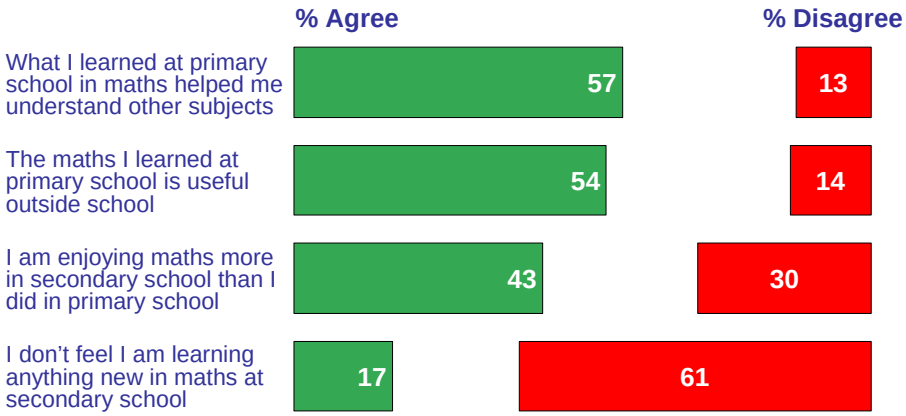
Views on learning maths

Q Please tick how much you agree or disagree with each of the statements below.



Base: 1,129 All in years 7 or 8, fieldwork dates: 11th January – 28th March 2008

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Appendices

Sample Profile

	Number	Unweighted %	Weighted %
Total	**1129**	**100**	**100**
Gender of Pupils			
Male	581	51%	51%
Female	548	49%	49%
Age of Pupils			
11	332	29%	34%
12	559	50%	33%
13	238	21%	33%
Year of Pupils			
7	641	57%	52%
8	488	43%	48%
Ethnic Origin			
White	962	85%	81%
BME	164	15%	19%
Household Composition			
Two parents in household	880	78%	78%
Single parent in household	224	20%	20%
Sibling in household	964	85%	85%
Work Status of Household			
Two parents work	669	59%	60%
One parent works	315	28%	27%
No parent works	145	13%	13%
Region			
London	75	7%	11%
South East	101	9%	16%
South West	115	10%	9%
North East	115	10%	5%
North West (incl. Merseyside)	48	4%	14%
Eastern (incl. Anglia)	188	17%	10%
East Midlands	95	8%	8%
West Midlands	48	4%	11%
Yorkshire & Humberside	146	13%	9%
Wales	198	18%	6%

Source: Ipsos MORI

List of Local Education Authorities by Government Office Region

Eastern: Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Luton, Norfolk, Peterborough, Southend, Suffolk, Thurrock.

East Midlands: Derby, Derbyshire, Leicester, Leicestershire, Lincolnshire, Northamptonshire, Nottingham, Nottinghamshire, Rutland.

London: Barking, Barnet, Bexley, Brent, Bromley, Camden, Croydon, Ealing, Enfield, Greenwich, Hackney, Hammersmith and Fulham, Haringey, Harrow, Havering, Hillingdon, Hounslow, Islington, Kensington and Chelsea, Kingston on Thames, Lambeth, Lewisham, Merton, Newham, Redbridge, Richmond upon Thames, Southwark, Sutton, Tower Hamlets, Waltham Forest, Wandsworth, Westminster.

North East: Darlington, Durham, Gateshead, Hartlepool, Middlesborough, Newcastle upon Tyne, North Tyneside, Northumberland, Redcar & Cleveland, South Tyneside, Stockton-on-Tees, Sunderland.

North West (incl. Merseyside): Blackburn, Blackpool, Bolton, Bury, Cheshire, Cumbria, Halton, Knowsley, Lancashire, Liverpool, Manchester, Oldham, Rochdale, St Helens, Salford, Sefton, Stockport, Tameside, Trafford, Warrington, Wigan, Wirral.

South East: Bracknell Forest, Brighton and Hove, Buckinghamshire, East Sussex, Hampshire, Isle of Wight, Kent, Medway, Milton Keynes, Newbury, Oxfordshire, Portsmouth, Reading, Slough, Southampton, Surrey, West Berkshire, West Sussex, Windsor and Maidenhead, Wokingham.

South West: Bath and North-East Somerset, Bournemouth, Bristol, Cornwall, Devon, Dorset, Gloucestershire, Isles of Scilly, , North Somerset, Plymouth, Poole, Somerset, South Gloucestershire, Swindon, Torbay, Wiltshire.

Wales: Anglesey, Blaenau Gwent, Bridgend, Caerphilly, Cardiff, Carmarthenshire, Ceredigon, Conwyn, Denbighshire, Flintshire, Gwynedd, Merthyr Tydfil, Monmouthshire, Neath Port Talbot, Newport, Pembrokeshire, Powys, Rhondda Cynon Taff, Swansea, Torfaen, Wrexham, Vale of Glamorgan.

West Midlands: Birmingham, Coventry, Dudley, Herefordshire, Sandwell, Shropshire, Solihull, Staffordshire, Stoke-on-Trent, Telford and Wrekin, Walsall, Warwickshire, Wolverhampton, Worcestershire.

Yorkshire and Humberside: Barnsley, Bradford, Calderdale, Doncaster, East Riding of Yorkshire, Kingston-upon-Hull, Kirklees, Leeds, North East Lincolnshire, North Lincolnshire, North Yorkshire, Rotherham, Sheffield, Wakefield, York.

Statistical Reliability

The respondents to the questionnaire are only samples of the total "population", so we cannot be certain that the figures obtained are exactly those we would have if everybody had been interviewed (the "true" values). We can, however, predict the variation between the sample results and the "true" values from a knowledge of the size of the samples on which the results are based and the number of times that a particular answer is given. The confidence with which we can make this prediction is usually chosen to be 95% - that is, the chances are 95 in 100 that the "true" value will fall within a specified range. The table below illustrates the predicted ranges for different sample sizes and percentage results at the "95% confidence interval".

Size of sample on which survey results is based	**Approximate sampling tolerances applicable to percentages at or near these levels**		
	10% or 90%	**30% or 70%**	**50%**
	±	±	±
100 interviews	6	9	10
500 interviews	3	4	4
1,000 interviews	2	3	3
1,129 interviews *(Young People Omnibus)*	1	2	2

Source: Ipsos MORI

For example, with a sample of 1,129 where 30% give a particular answer, the chances are 19 in 20 that the "true" value (which would have been obtained if the whole population had been interviewed) will fall within the range of plus or minus 2 percentage points from the sample result.

When results are compared between separate groups within a sample, different results may be obtained. The difference may be "real", or it may occur by chance (because not everyone in the population has been interviewed). To test if the difference is a real one - i.e. if it is "statistically significant", we again have to know the size of the samples, the percentage giving a certain answer and the degree of confidence chosen. If we assume "95% confidence interval", the differences between the two sample results must be greater than the values given in the table overleaf:

Size of sample compared	Differences required for significance at or near these percentage levels		
	10% or 90%	**30% or 70%**	**50%**
100 and 100	8	13	14
250 and 100	7	11	12
500 and 250	5	7	8
500 and 500	4	6	6
1,000 and 500	3	5	5
1,000 and 1,000	3	4	4
1,500 and 1,000	2	4	4

Source: Ipsos MORI

Letter to Schools

NAME
ADDRESS
ADDRESS
ADDRESS,
ADDRESS,

December 2007

Ipsos MORI ID:

Dear TITLE SURNAME,

Ipsos MORI National Young People Omnibus 2008

Ipsos MORI has been commissioned by a range of public and voluntary sector organisations to undertake a large-scale survey of pupils in compulsory secondary education (aged 11 to 16) throughout England and Wales. The survey will aim to discover what pupils think about a number of educational and social issues, including for example, global issues, entry into higher education and internet usage.

I am writing to ask you for your school's participation in this important survey, due to begin on the 11th January 2008. Your school is one of 300 randomly selected to produce a nationally representative sample of schools in England and Wales. We aim to keep disruption to the school routine to an absolute minimum by randomly selecting **only one class** to participate. During one school period an Ipsos MORI interviewer will attend the class, explain the survey process and hand out a self-completion questionnaire. She/he will be on hand to answer any queries and will then collect the completed questionnaires at the end of the session. Each pupil will be given an Ipsos MORI Young People Omnibus pen in order to complete the survey, but also as a thank you for taking part.

Participation in the survey is completely confidential and your school and pupils will not be revealed to the organisations who have commissioned the survey, nor identified in any analysis.

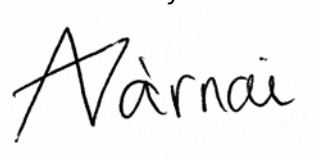
The survey is due to start on the 11th January and continue until early March 2008. We are extremely conscious of the heavy demands currently placed on pupils and teachers. We are therefore anxious to stress that **all the administration connected with the survey will be carried out by representatives from Ipsos MORI.** As a thank you for taking part, participating schools will receive a resource pack to assist with the planning and teaching of modules relating to citizenship issues.

An Ipsos MORI interviewer will be contacting you in the near future to explain the process to you in more detail. In the meantime, we would be grateful if you could complete the enclosed fax-back reply form to let us know whether or not you would be able to take part in the study.

I should stress that Ipsos MORI will endeavour not to contact your school again in the current school year.

I very much hope that your school is able to take part in the study. A summary of the findings will be available on the Ipsos MORI web site (www.ipsos-mori.com/youngpeopleomnibus) after the survey has been completed. If you have any queries or would like any further information, please do not hesitate to contact Ali Ziff, Amy Lee or myself at Ipsos MORI on 020 7347 3000.

Yours sincerely



Adél Várnai

Ipsos MORI Young People Omnibus Director