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Maths Outside the Classroom August 2018

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Numeracy in the UK



Something has worked for literacy, but numeracy is getting worse...

Adults with skills equivalent to 'C/4' or above at GCSE in England:



Source: Department for Business Innovation and Skills. 2012. "The 2011 Skills for Life Survey: A Survey of Literacy, Numeracy and ICT Levels in England."



Poor numeracy has a huge impact on the UK...

Cost to UK economy





Poor numeracy has a huge impact on the UK...





So what do we mean by 'poor numeracy'?

An example:

"You are paid £9 per hour and get a 5% pay increase.

What is your new rate of pay?"

(with the use of a calculator)

for everyone, for I	ener:	Wor	k		
Going to W	ork				0
To <u>Endham</u> : M	londay to	B us S Frida	5 99 iy Onl	у	
	0700 072	0 0740	0800	08 20	
Jipham Heston Square	0718 073	8 0758	0818	0838	
Starton Repham Road	0728 074	8 0808	0828	0848	
epham. High Street	0734 075	4 0814	0834	0854	
Repham Farley Road	0738 075	8 0818	0838	0858	
Melsham Heimsdale Street	0742 080	02 0822	0842	0902	
Endham Bus Station	0750 081	0 0830	0850	0910	
She wants to be at work I It takes her 10 minutes to at time is the last bus	walk from E	ndham E n catch	us Stati	on to he	er work. rk on time?
at time will Susie arri	ve at worl	?			



School maths is not delivering a numerate workforce...



Department for Education Statistics

Department for Business, Innovation and Skills "Skills for Life Survey 2011".



Numeracy in the UK: why things aren't working...

- 1. Functional numeracy is assumed but not tested Uni, workplace, finances
- 2. Hidden behind mathematics for all vs. for future mathematicians
- **3. Hidden behind literacy** everywhere in adult Ed + workplace
- 4. GCSE bottom 1/3 fail irrespective of absolute attainment norm-reference
- 5. All-consuming focus on the education system not where biggest issue is
- 6. Attitudes: 'I can't do maths' the heart of the issue!



To what extent do you agree or disagree with the following statement? - I would feel embarrassed to tell someone I was no good at reading and writing...





To what extent do you agree or disagree with the following statement? - I would feel embarrassed to tell someone I was no good with numbers and maths...





Attitudes are the key...





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Numeracy Assessment



The National Numeracy Challenge...





The Essentials of Numeracy...





A numeracy assessment for adults...

We wanted it to be:

- Free
- Accessible
- Easy to use
- Adult
- Not classroom maths

- Adaptive
- As short as possible
- Accurate
- Match adult skills levels
- Available in bite-size chunks



A numeracy assessment for adults...

After scoping we settled on two phases to the functionality:

- 1. Discovery to get a rough idea of the user's level
- 2. Exploratory to make sure this is correct across all four areas



A numeracy assessment for adults...

- 334 questions in bank
- 5 levels: Entry 2, Entry 3, Level 1, Essentials of Numeracy, Level 2
- 4 areas of numeracy
- Clones for each question
- All multiple choice





Cups cost £2 and saucers cost £1. What is the total cost of six cups and six saucers?







The world's population is about seven and a half billion people. How would you write this number in figures?









What is the cost of this item in the sale?







I know that I need to multiply by 1.6 to change miles to kilometres; so what is 32km in miles?







It's late evening, you are catching the 21.57 train, and this is the time on the station clock. How long before the train is scheduled to leave?







It takes eight and a half hours to fly from London to New York, which is five hours behind London time. If you leave London at 16:00, what would be the local time when you arrive in New York?







A wooden shelf is 1.4m long. I saw 12.5cm off each end - how long is it now?









This A4 paper measures 297 by 210 mm, and is marked '80 grams per square metre'. What is the best estimate of the weight of one sheet?





WELL DONE FOR TAKING THE CHECK-UP





WELL DONE FOR TAKING THE CHECK-UP



Scoring 80 or more shows that you have the Essentials of Numeracy, which means that you have the everyday maths skills needed for life and for work.





Overall & Demographics

191,000 people have registered to take the Challenge



Compared to the national population spread, the Challenge population matches quite closely. The greatest difference is 16-29 which is 29% nationally. Non working-age people are greatly under-represented in the Challenge. Far more women have taken the Challenge so far. The national figures are 49:51



Why do people register on the Challenge website?





What scores do people achieve in the Challenge?





What scores do people achieve in the Challenge?





Is there a difference in gender?





Within the Challenge

- **28** minutes is the average time it takes to complete a Check-Up
- **46** is the average number of questions answered in this time.
- **15** minutes is the average time spent in the Check-Up by non-completers.
- 24 is the average number of questions answered by non-completers.



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Attitudinal Assessment



An attitudinal assessment for adults...

We wanted it to be:

- Free
- Accessible
- Easy to use

- Adult
- As short as possible
- Accurate



Attitudinal assessment

What is it ?

A set of attitudinal questions to capture people's attitudes to improving their numeracy and also their reasons for wanting to improve.

How was it developed?

Ten months development in conjunction with Applied Psychology team at University of Portsmouth.

Where does it appear ?

Straight after our numeracy assessment.

What do we ask?

Two interleaved sections with 24 attitudinal and 11 'reasons' questions



I trust my ability to remain calm when facing difficulties







I want to improve my numeracy to get a job



RESULTS SUMMARY

Your confidence:

Self-Confidence



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Confidence with Money

Confidence with Numbers

Appetite for Learning You have faith that you can deal well with unexpected situations which arise. This can help when trying out new things, or applying for new jobs, or working to improve your numeracy skills.

One of the main benefits of good numeracy is to be able to manage your finances well. At the moment you may lack some confidence with managing your money, and might not feel in full control of your finances.

Confidence in situations that involve numbers and data can help you to make the best decisions in daily life and the workplace. It currently looks like you will benefit from improving your confidence with numbers.

You have a healthy appetite for learning new things, and of course this will help you to improve your numeracy... just as improving your numeracy can increase your appetite for wider learning.

Your attitudes:

Value

Belief

Effort



You can see the value of numeracy skills in daily life and the workplace. This means that you see the point in improving your numeracy, and is good news when it comes to improving your skills.

Our research shows that any adult can improve their numeracy. Right now, you don't seem to believe that you are able to improve your skills, and this may block your progress.



If you're going to improve your numeracy, you will need to overcome the barriers of getting started and then sticking with it. This can feel hard, but this doesn't mean you can't do it, just that it's going to take effort.







Your overall score is 66 out of 100

Our research has shown that it's worth doing some work on 'Value, Belief & Effort' before you tackle your numeracy skills – this will give you the best chance of improving. By this we mean understanding the 'value' of numeracy in your daily life, 'believing' that you CAN improve,

and being ready for the 'effort' that will be needed. The 'Building Confidence' resources on your dashboard will help you with this so that you can get the best out of working to improve your numeracy. It's worth having a look at these before you move onto tackling your everyday maths skills.

Your reasons for improving:

You told us that you strongly agree that 'I want to improve my numeracy so that I can':

- Earn more money
- Get a job
- Get on at work
- Get a qualification
- Prove that I can do it

You told us that you agree that 'I want to improve my numeracy so that I can':

- Better manage my money (bills, budgets, bank accounts, etc)
- Get the best deals (shopping around, comparing offers, etc)
- Get better at day-to-day activities (cooking, DIY, time planning, etc)



Attitudes to improving – 24 items / 7 factors

appetite for learning
I like learning new things
When I come across something new, I try to relate it to what I
already know
When I hear or read about new ideas, I try to relate them to
real life situations to which they might apply

confidence with money
I can always find the time to sort out my finances
I feel out of control when it comes to my finances
I think my approach to keeping track of income and
expenditure works well
It is important to keep track of my household's income and
expenditure
effort

r can always be relied upon to infish things of
I don't give up, even when things get tough
I usually see things through to the end once I've got started
I've been very focused on achieving something, but then lost
interest

value
Being good with numbers gives people more opportunities in life
Being numerate helps you think more clearly
People with good numeracy have more chances to get on in life
You need to be good with numbers even if you have a calculator

belief	
I can't change my ability to do maths	
I don't think I can improve my numeracy	
My ability to do maths is set in stone	

self-confidence

I can usually handle whatever comes my way

I trust my ability to remain calm when facing difficulties

If I am in trouble, I can usually think of a solution

contid	ence with n	Imbere
COLING		unibera

I tend to avoid situations which involve numbers and data

My mind goes blank when I have to do maths

When I think about maths, I begin to feel uneasy



Attitudes to improving – 24 items / 7 factors























Reasons for wanting to improve...

- better manage my health and fitness
- better manage my money (bills, budgets, bank accounts, etc)
- better understand statistics in the media
- earn more money
- get a job
- get a qualification
- get better at day-to-day activities (cooking, DIY, time planning, etc)
- get on at work
- get the best deals (shopping around, comparing offers, etc)
- help my children
- prove that I can do it



Reasons for wanting to improve...





Statements predictive of improvement...

- 24 attitudinal questions are asked after the first Check-Up has been completed
- 8 of those questions are highly significant in predicting whether participants are likely to improve their numeracy score.

If you answer more positively to any of this questions, you are **much more likely** to improve.



Statements predictive of improvement...

- 1. "I don't think I can improve my numeracy" (Belief)
- 2. "My mind goes blank when I have to do maths" (Confidence with Numbers)
- 3. "I think my approach to keeping track of income and expenditure works well" (Confidence with Money)
- 4. "I like learning new things" (Appetite for Learning)
- 5. "I can always find the time to sort out my finances" (Confidence with Money)
- 6. "When I think about maths, I begin to feel uneasy" (Confidence with Numbers)
- 7. "If I am in trouble, I can usually think of a solution" (Self Confidence)
- 8. "I trust my ability to remain calm when facing difficulties" (Self Confidence)



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Any questions?



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