"A, B, C, it's as easy as 1, 2, 3"

Towards new assessments for Numeracy, Literacy and Digital Fluency

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AQA
Questions matter

About the author

Adam Steedman Thake is the Policy and Evidence Manager at AQA, where he leads the development of evidence-based policy. He has a decade of experience working in education and began his career in education as a primary school teacher in Tottenham. He then moved into the Civil Service and worked in policy and strategy roles across the Department for Education and Ministry of Justice. Adam has an MSc in Social Research from Birkbeck College, University of London and an MA in History from the University of Manchester.

About the report

This report is informed by desk research of material published by other organisations, particularly the OECD, EDSK, official UK Government statistics, and surveys by Ofqual, among others. Where other sources have been referenced, hyperlinks to the original reports or findings have been provided. The report also contains the findings of two roundtable discussions held by AQA with well-respected experts in numeracy, literacy and digital skills, and including representatives from the post-16 and further education sectors. The report includes summaries of the discussions that took place in those roundtables, and quotes from some attendees who consented to be quoted in this report.

About AQA

AQA is an independent education charity with over 120 years of expertise and knowledge; we are experts in assessments and qualifications.

AQA designs, creates and delivers rigorous and fair assessments to more than one million students every year, making us the most chosen general qualifications awarding body in England. We provide high quality assessments that are fair and reliable which is why they are valued by students, universities and employers around the world.

We are more than an exam board. AQA is passionate about improving education and assessment outcomes for learners, teachers and policy-makers. Our aim is to advance education, using our world-class research and expertise to help every learner, wherever they are. We fund cutting edge research which sits at the heart of our assessments and supports our initiatives to help young people facing challenges in life realise their potential. We also share our knowledge and insight to help inform policy by engaging with teachers, students, parents, politicians, policymakers and thought leaders. One of the ways we do this is by publishing policy reports, like this one.

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Foreword from the Chief Executive

Numeracy, Literacy and Digital Fluency are fundamental skills that all individuals need to develop to function effectively in society, work and life. But there is a problem: large numbers of young people are leaving education without a firm grounding in these core skills, with poor outcomes in work and life. There are also large numbers of adults with low levels of skills, who are much more likely to face a life of struggling to gain employment, work out their weekly budget, or read their children a bedtime story. This is a long-standing problem that will remain stubbornly in place, unless we take a novel approach.

All of those working in education have a duty to ensure that young people leave education prepared for the wider world outside the school or college gate. Young people need to be able to communicate confidently, demonstrate their oracy skills and navigate information in a digitally sophisticated world. They also must be capable when confronted with common numerical problems that require their numeracy to work out changes in prices and household finances. Failing to equip them with these vital skills and knowledge sets up large numbers of young people to struggle when they should thrive.

Of course, Maths and numeracy, or English and literacy, are linked. But they are not the same. Literacy is a suite of skills and knowledge that enables people to understand written information and to communicate clearly and persuasively both orally and in writing, in person and when digitally mediated. Being numerate entails, among other things, being able to understand and make good decisions about financial products, manage budgets, and make sense of tables, charts and basic statistics. These skills are fundamental but are far from basic.

Many good qualifications are out there now, doing different things, but there is a gap. GCSEs provide an established and respected means for understanding which candidates achieved better outcomes than others and are therefore suited for determining further study options, and some forms of employment. Clearly someone who lacks the ability to read a manual, write a message or calculate percentages, will struggle to access broader GCSE content, as well as limit their career opportunities. But GCSE grades are hard to use as a proxy for fundamental numeracy and literacy, even though that is how they are sometimes used. Even with maths and English resits as a condition of funding, around one-in-five students leave education at 19 without Level 2 qualifications in those core subjects.

We believe that raising the level of numeracy, literacy and digital fluency in this country, to prepare our young people for the world they will enter after education in a meaningful and beneficial way, requires a new type of assessment that is on demand, reaches all students, and which focuses on the workplace. A different challenge needs a different kind of assessment, less focussed on sorting by grade and more focussed on passing a universal standard of proficiency.

This is why AQA – as an educational charity and assessment expert – is exploring how a new, digital, on-demand assessment of core competences, focused on the fundamental skills and knowledge required to be literate, numerate and digitally fluent, could show us the way. We will be exploring assessment of numeracy

as a first step, before beginning on assessing literacy and digital fluency afterwards. These new assessment tools will be complementary to the existing qualifications landscape, sitting alongside GCSEs, BTECs, FSQs, A-levels and other qualifications. Since everyone needs to be literate and numerate, and everyone can benefit from checking their skills are still up to scratch, the assessments will be targeted at all students.

We are at the start of this journey and are open to discussion about what should be included within literacy and numeracy, and what digital fluency looks like. What skills and knowledge do we need to certify that someone is 'numerate' and 'literate'? What position does financial literacy have? How do we best assess digital fluency, to ensure young people can engage safely and confidently with the increasingly digital world in which they live?

We at AQA are exploring how this could work, and what it might look like. This report sets out the case for change and why a new approach is needed. It outlines what a new assessment must do to succeed in our aims. We welcome – indeed, hope to provoke – discussion and debate on this crucial area of education, and will be engaging far and wide as we continue to develop our plans.

Colin Hughes
Chief Executive of AQA

Executive summary

Numeracy and literacy skills are the ability to use maths in everyday life and to read, write and speak in English. While the difference between a gerund and the gerundive, or how to solve a quadratic equation, may not be relevant in all walks of life, everyone needs to be able to read instructions, communicate clearly, and add up.

Numeracy and literacy are used in every aspect of our lives at work, at home and beyond. We use numeracy when we go shopping, or when planning a trip. We use literacy when cooking from a recipe, or when looking up reviews. All young people should leave full-time education competent and confident in numeracy and literacy. Reading, writing, and adding up are fundamental skills, but we need to go further and ensure our young people can communicate confidently and have the skills and knowledge to navigate our increasingly digital world safely and effectively. That means that young people are, for example, able to understand and make key decisions about financial products; to manage budgets; to make sense of tables, charts, and statistics; to communicate clearly and persuasively both orally and in (digitally mediated) writing.

Numeracy and literacy are vitally important, no one would argue otherwise, but there is a third fundamental competence we should also be developing in our young people: digital fluency. Digital fluency should not be considered an optional extra, but a core suite of knowledge and skills which are important now and in future. Digital fluency should be put on par with numeracy and literacy, and taken as seriously throughout school as all three will underpin our future development and growth. While not everyone needs to know how to unpick reams of complex coding, digital fluency is needed to use common IT tools such as office applications and to navigate the internet and the digital sphere, including outputs of generative AI (Artificial Intelligence), safely and with critical understanding.

The problem is that not everyone has these skills. Without the ability to read, write and add up, communicate confidently, and negotiate digital realms, people struggle to engage with the world around them. In short, they find it difficult to be fully functioning members of modern, digital society.

For those who struggle to achieve a firm foundation in these skills, life can be a struggle. For society as well, having large proportions of the population who struggle with fundamental numeracy, literacy and digital fluency is costly. Among the other pressing issues facing the education sector which may grab headlines, we should not neglect the importance of improving numeracy, literacy and digital fluency for all young people.

Improvements in numeracy, literacy and digital fluency can, of course, be driven by numerous different parts of the education system: teaching and learning, pedagogy, teacher recruitment, and funding decisions, to name a few. Assessment is just one area, but it can have a large impact on teaching and what happens in the classroom. Reliable and valid assessments provide rich and important information about what students know and can do. Assessments tell us what a student has learned, how well they have grappled core skills and knowledge, and what areas they are finding difficult. Without good assessment, there is no sure-fire way to know whether learning has taken place. We believe that to drive better numeracy, literacy and digital fluency skills, we need to have a reliable, effective way to assess and measure them. As assessment is an important part of the education system, and where AQA has particular expertise, we are focused on the role assessment has to play in cracking this particular problem. We hope the measures recommended in this report will be implemented alongside improvements in other areas of the education sector, to ensure it is a success.

This report highlights the long-standing issues with numeracy, literacy and digital fluency in England and recommends a particular solution which could help support improvements. The report is structured as follows: it begins with a discussion of "numeracy", "literacy" and "digital fluency" and how they differ from the academic subjects of Maths, English and Computer Science. Secondly, the report outlines the key issues with numeracy, literacy, and digital fluency within England and makes the case for change. Third, it reviews the current policy and assessment landscape, with a particular focus on GCSE resits and Functional Skills Qualifications, and the limitations of both in tackling issues outlined earlier sections. It concludes with our key proposal: new-style assessment tools focused on Numeracy, Literacy, and Digital Fluency. These would be on-demand, 'when-ready' assessments focused on core knowledge and skills. All young people should find them useful, with particular benefits for young people who have struggled to lock in the fundamentals needed. The different form of challenge means we need a different type of assessment, less focussed on sorting by grade and more focussed on passing a universal standard of proficiency.

"We have got to value maths and what it can do for our children's futures. Giving our children a world-class education is the single most important thing we can do."

Rishi Sunak
Speech on improving attainment in mathematics: 17 April 2023

Many good education programmes currently exist, doing different things, but there is at present a gap. Mainstream education begins with approaches like systematic synthetic phonics which teach the critical building blocks to decoding words, one of the foundations of learning to read. Approaches like [Maths Mastery](#) are focused on core knowledge and can have real benefits, but do not provide much help for someone who cannot add up their bank account. As students move through their education, GCSEs provide an established and respected means for understanding which candidates achieved higher outcomes than others and so may be more suited for further study or employment. Functional Skills Qualifications provide excellent learning opportunities for those who may struggle with GCSEs, but they have a reputational problem and are poorly understood by employers, which may lead to variability in the understanding of what they are and what they are not. Our proposal does something different, ensuring students have all that is necessary to be 'literate' and 'numerate', to be able to make sense of the world and to lead fulfilling lives.

There are, of course, practical considerations, given teacher recruitment and retention issues currently in the workforce. If we were to increase the numbers of students taking advanced maths courses or project qualifications to further boost numeracy, literacy and digital fluency skills, these need to be delivered by knowledgeable and expert teachers. These considerations are already at the forefront of our minds, and will continue to be so while we proceed with this work.

By 'assessments' we mean both tasks that students do (and obtain feedback on) as they are working through the content, and a summative component or components that can be taken, when ready, to obtain a certification of competence. The tasks could be, for example, practice activities that students might do on an app on their phone; there could be gamified elements to engage and motivate students to practise and progress; and the aim would be to make the constructs and assessment tasks as 'authentic' (reflective of realistic scenarios students may face once they have left school) as possible.

As the UK's largest provider of general qualifications with over 120 years expertise in assessment, we believe AQA has a key role to play in moving the debate forward on this critical issue. AQA is more than just an exam board; as an independent education charity, we also want to ensure that the education system works well now and in the future. This is why this report has been created, after conducting a review of evidence and existing literature and convening two roundtable discussions of well-regarded experts in education, literacy, numeracy, and digital fluency we are clear that something needs to change. All those with a passion for education want to make education the best it can be. We are clear that what is not needed is a radical reform which lurches too far in the wrong direction just for the sake of change. We will be taking a measured, evidence-led approach, guided by an expert advisory panel. We will be creating a numeracy assessment as the first phase of this work, to work as a proof of concept and demonstration of what is possible, before moving to develop literacy and digital fluency assessments at a later stage. We are focusing primarily on numeracy and literacy in this report, as these are what we are focusing on initially, and will be focusing on digital fluency later. This is why we are engaging in this debate now, to help shape policy in an evidence-based way, for the benefit of all learners. This report marks the opening of a conversation, not the end of one.

There are still numerous questions to be answered and plenty of work to do around creating an accessible digital form of assessment. Teachers, employers, young people, parents, government and awarding organisations all have a role to play in defining and delivering numeracy, literacy and digital competencies and their assessment, and ensuring they evolve, are accessible to all and fit for the future. We welcome – indeed, hope to provoke – discussion and debate on this crucial area of education policy and will be engaging far and wide as we continue to work on this project. The future of literacy, numeracy and digital fluency in England can be bright, and we look forward to playing our part in making it so.

What are "Numeracy", "Literacy" and "Digital Fluency"?

We can throw around the words 'numeracy,' 'literacy' and 'digital fluency' and people will nod their heads and agree they are important. But what one person imagines them to be may be quite different from someone else's understanding. They are nuanced terms, with many complexities. Whilst there is some variation in definition, numeracy and literacy are widely recognised as one's ability to apply English and maths skills in a way which enable an individual to positively engage in society. Similarly, digital fluency is much more than reading and writing online or using the latest technology, it requires people to find, evaluate and communicate information in an effective way.

For the purposes of this report, which focuses specifically on assessment to ensure the right skills are developed, a greater level of specificity is required. We need to be specific to ensure any assessment is reliable and valid; that is, it measures what it sets out to measure, and it does so in a way that yields consistent results regardless of when and by whom the thing is assessed. There are also some additional complexities around the role of extra categories of numeracy, literacy and digital fluency (e.g., oracy or health numeracy) that could be included within what is measured.

Similarly, there is often confusion around whether we are talking about Maths or Numeracy and English or Literacy. In the public imagination, numeracy skills are often conflated with maths and literacy skills with English as academic subjects, reflecting the English tradition of using the teaching and assessment of these skills through academic subjects.

However, numeracy is different from Maths. Numeracy skills include: Counting and conversions; routine calculations; budgeting; and measurement and data analysis. Maths, however, is more traditionally seen as giving learners access to mathematical ideas and knowledge, for example algebra or calculus. Knowledge and understanding of these academic mathematical concepts are useful and can be applied in specific sectors, but these tend to be highly complex and technical industries such as economics. Numeracy is more focused on applying more straightforward mathematics in every-day situations.

The same can be said for literacy and English. Literacy is a suite of skills and knowledge that enable people to be able to read, write and communicate effectively. English at GCSE level is an academic subject, designed as a progression from Key Stages 1-3 on the basis that students should be able to read and engage with high-quality, challenging texts from the past and present day, which can mean that there is little space for teaching the nuts and bolts required to engage with the curriculum to students who have made less than expected progress in their numeracy and literacy skills.

While there is, of course, a link between Maths and numeracy and between English and literacy, they should be treated as distinct. Being numerate and literate should be attainable by everyone and without these fundamental skills people will not be able to be masters of Maths or exceptional at English. Furthermore, we believe digital fluency should be included as well; without being digitally skilled, our young people will struggle to negotiate the world as it is now and will increasingly be in future. The importance of numeracy, literacy and digital fluency should not be underestimated. They are core skills and knowledge that are fundamental to functioning in society; as such, they require our attention.

Using the terms 'numeracy', 'literacy' and 'digital fluency' may seem like they should be consigned to conversations about primary schooling or the early years, and that 'serious' and 'grown-up' policy should focus on 'Maths,' 'English' and 'Computer Science.' This would be a mistake. Numeracy, literacy and digital fluency are core competencies, fundamental to an individual's ability to function in society, which should run through the entirety of education. All those in education policy – whatever their particular area of interest – should pay attention to the foundations of numeracy, literacy and digital fluency.

Below we outline some of these nuances and complexities and explore some of the different 'types' of numeracy and literacy that could be included. We welcome discussions and debates – indeed we encourage them – with others to arrive at a clear definition of what numeracy and literacy should be defined as, and what skills and knowledge are required to be literate and numerate.

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Defining Literacy

Traditional definitions of literacy focus on 'the ability to read, write, speak and listen in a way that lets us communicate effectively and make sense of the world.' This is skill-centred, functional and individual focussed, meaning that it is well-suited to developing assessments as it operationalises the skills to measure. International definitions of literacy broadly follow this convention. The OECD (Organisation for Economic Co-operation and Development) use the phrase 'reading literacy' for their survey of adults' skills (PIAAC) and Programme for International Student Assessment (PISA) assessments. Reading literacy is 'understanding, using, evaluating, reflecting on and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential and to participate in society'. The United Nations Educational, Scientific and Cultural Organization (UNESCO) identify that literacy has a 'conventional concept' of being about reading, writing and counting skills but expand this definition to explain how literacy 'is now understood as a means of identification, understanding, interpretation, creation, and communication in an increasingly digital, text-mediated, information-rich and fast-changing world'. In other words, literacy goes beyond just the skills of reading or writing and needs to be contextualised within the wider world.

Looking at some of the highest performing countries on the PISA 2018 assessment of reading literacy (for example Estonia and Ireland) the definitions of literacy across the countries had a commonality where communication is regarded as a key competency. In Estonia for example, literacy is not mentioned as a specific subject in the national curriculum, but a major emphasis is placed on the Estonian language and literature across subjects.

Literacy, therefore, is a suite of skills and knowledge that add up to being able to read, write and communicate effectively. The communication aspect is particularly key for advocates of oracy. Oracy is the ability "to articulate ideas, develop understanding and engage with others through spoken language." It can be a powerful skill to develop, as it can help build important wider skills that can help an individual shine in an interview, discuss a complex problem in a group meeting, or argue their case effectively in front of magistrates. Evidence from the Education Endowment Foundation (EEF) demonstrates that focusing on oracy helps pupils to make academic progress. According to the EEF's Teaching and Learning Toolkit, oral language interventions have an average impact of six months of additional progress.

Indeed, the importance of oracy has been stressed by Sir Keir Starmer's recent announcement that a Labour government would "raise the importance of speaking skills". Sir Keir talked about "structured classroom discussion", "overcoming shyness" and "an inner belief to make your case in any environment".

Financial literacy is the knowledge and skills needed to make important financial decisions. Financial education features in the National Curriculums for England, Scotland, Wales and Northern Ireland. In England, it made its first appearance in 2014 as part of the Citizenship syllabus. It is often taught in secondary schools as part of Personal Social Health and Economic (PSHE) education and represents one of many important topics within PSHE.

There are [several fundamental aspects](#) of being financially literate:

- Budgeting. Understanding how money flows in and out of your bank account is the first step toward building your financial literacy.

- Managing Debt – Ensuring that if you do borrow money, you understand the consequences and interest rates.

- Saving – The importance of putting money aside for expensive purchases or for unexpected expenses; this is a habit to develop early.

- Investing – The potential long-term growth money can have if invested wisely and finding the right balance between risk and reward.

Many young people report that they feel they lack these important fundamentals. The London Institute of Banking and Finance surveyed more than 2,000 15–18-year-olds across the UK for its [2021/22 Young Persons Money Index](#) and found that 81% said that they worry about money, and 67% said that they had become more anxious about money as a result of Covid. 72 percent also said they wanted to learn more about money and finance in school with just 15% citing school as their main source of financial education. Other surveys have found that more than a third of adults in the UK say they do not feel confident about managing money, and around a fifth rarely or never save.

[Santander](#) surveyed a large sample of adults in the UK and found that 70% reported that better financial education would have improved their ability to manage their finances during the cost of living crisis and 68% of adults responded that financial education should be part of the primary school curriculum.

In 2021, the [UK Strategy for Financial Wellbeing](#) was launched by the Money and Pensions Service, an arms-length government body. Its goal is to see an additional two million children and young people get a meaningful financial education by 2030, up from 4.8 million to 6.8 million.

OECD research has estimated that [10 million people](#) in the UK are financially illiterate and the UK ranks in the bottom half of OECD countries in financial literacy. There is an All Party Parliamentary Group on [Financial Education for Young People](#), launched in 2011, that has found evidence that people who are financially literate are much more likely to have savings, to avoid scams and fraud and to invest their money effectively.

There is an appetite for improving financial literacy in the UK. To what extent this would be included in a new assessment is a question we are interested to explore.

Defining Numeracy

Numeracy has been defined as 'the ability to understand the maths used in everyday life'. In this way, it can be understood as applied to specific contexts. There is little variation in definitions of numeracy internationally, with the OECD defining numeracy as 'accessing, using and reasoning critically with mathematical content, information and ideas represented in multiple ways in order to engage in and manage the mathematical demands of a range of situations in adult life' for the purpose of the PIAAC survey.

However, some definitions also include an individual level of confidence, as well as skill. For example, researchers have highlighted the importance of this confidence when looking at numeracy in Singapore, China and Finland and in Australia. Beyond simply knowing the skills and mastering the knowledge, having the confidence to apply them is also crucial.

Numeracy is often broken down further into five distinct areas or contexts:

- health numeracy: the skills required to understand and make health decisions often requires specific maths that is not used in the rest of life. Poor health numeracy can lead to poor health outcomes, which has financial implications for the NHS

- financial numeracy: levels of numeracy impact an individual's ability to manage their money and make sensible financial decisions. Financial numeracy requires understanding of the maths of handling money but also literacy in understanding financial products

- digital numeracy: the ability to handle data and the maths required for ICT and engaging with the digital world

- civic numeracy: the numeracy skills required to handle bureaucratic processes and engage as a productive citizen

- workplace numeracy: the numeracy skills required for the workplace, this differs depending on the individual and their role.

There is potential overlap between some of these concepts with some conceptions of literacy, in particular the links between financial literacy and financial numeracy. To work out household budgets, confidence with numbers is obviously important to work out the price per weight or the best value of items, but there is also the confidence in interpreting information presented to you about financial plans, borrowing or investing. Similarly, digital numeracy is an important component of being digitally fluent.

Workplace numeracy is a particularly nuanced concept as the numeracy required for the workplace varies depending on where an individual is employed. Scientists, accountants, electricians and plasterers work in different contexts, although all will use their numeracy skills, albeit in different ways.

Defining Digital fluency

Numeracy and literacy, while vitally important, should not be viewed in isolation. In the modern world, young people need to be equipped with a third, equally important skillset: digital fluency. Digital fluency is much more than reading and writing online or using the latest technology. With the explosion of social media, being digitally literate not only means being able to access and read online content but knowing how to navigate it safely. To be digitally fluent, people are required to find, evaluate, create, curate and communicate information in a way that makes them effective digital consumers. Moreover, digital fluency skills should also encourage cyber awareness and cyber safety while consuming digital content, ensuring that your personal information remains yours and that we share it by choice.

Digital fluency is therefore underpinned by getting the right knowledge to the right people at the right time and ensuring the workforce and those in training are skilled, confident and equipped to work in a digital environment.

> "New technologies will constantly emerge and that is why the focus needs to be on digital literacy which is as much about attitudes as it is about skills."
>
> – Henrietta Mbeah-Bankas, Health Education England.

The 'NFER Skills Imperative 2035' ranks 'information literacy' as one of the top six skills needed in 2035. This involves appraising, dissecting, synthesising, and interpreting information from increasingly digital sources. Helping people to develop the skills and experience to ascertain the veracity of digital information, examine data, and determine appropriate actions of recommendations will continue to be important as we move into an increasingly digital world.

Everyone needs a base level of digital fluency and competence. Provision for this in schools is shaky – and not having a qualification which counts towards school metrics, timetabling constraints, parents' influence on subject choice, its absence from teaching standards and Ofsted's indifference about this during inspections, were all cited as reasons for this by members of our focus group. Young people do not necessarily need to learn coding to work a spreadsheet or a collaborative document, they need digital fluency.

Digital fluency is also associated with positive outcomes for individuals and wider society. There are a variety of impacts digital fluency can have on employment, earnings, personal finance, access to government support services, health and wellbeing, and community engagement.

The Covid pandemic increased the adoption of digital working practices, with many organisations rapidly pivoting to an increasingly digital work environment. The need to be digitally literate is going to continue to be important for everyone, in all industries and walks of life, so we need to seriously consider how best to bake it into our education system. On a note of optimism, the proportion of schools using these digital tools has increased substantially since lockdown. There are a wide range of questions around digital fluency more broadly, for example around the difference between computing and ICT. We will be exploring these nuanced questions around digital fluency in more detail in future.

The case for change for Numeracy, Literacy, and Digital Fluency

Numeracy, literacy and digital fluency skills are a problem in England now and have been for a long time. Currently, some estimates are that 9 million adults have low basic skills in literacy or numeracy, of which 5 million have low skills in both, and 18 per cent of adults aged 19-64 are not qualified to at least Level 2[1]. Some estimates calculate that digital skills gap costs the UK economy and workers £12.8 billion, and over half (57%) of the most digitally intensive businesses have found it difficult to find staff with good digital skills. These figures are nothing new, indeed these rates have proven stubbornly high for years and low levels of numeracy and literacy have persisted in the general population for some time. Indeed, attendees at our roundtable agreed that there is a substantial issue with numeracy and literacy in England which has stubbornly persisted for a long time. Some attendees argued that a large amount of the primary school day is taken up with making sure children can read, write and count, but once young people move to secondary school it can fall by the wayside as schools begin focusing on specific and discrete academic subjects.

In April 2023, the Prime Minister Rishi Sunak re-stated the problem in one of the key policy speeches of his premiership. He said "… we simply cannot allow poor numeracy to cost our economy tens of billions a year or to leave people twice as likely to be unemployed as those with competent numeracy. We have to fundamentally change our education system so it gives our young people the knowledge and skills they need."

England is one of the least numerate countries in the developed world, with more than 8 million adults having lower numeracy than a 9-year-old. Some estimates suggest that low levels of numeracy cost the UK over £20bn. The key issue for the Prime Minister was tackling the 'social acceptability of not doing maths.' This demonstrates there is a renewed focus on increasing mathematical and numeracy skills across the education policy debate.

While it is certainly important for young people to be confident in numeracy, to be fully functioning members of society they also need other skills; first and foremost, they also need to be literate. To be numerate without literacy would cause tremendous issues in work and life, as is being literate without being numerate. It follows that any push for improving numeracy must be combined with a similar push for literacy.

> "All those with an interest in education have a duty to ensure people are equipped with the skills they need to be fully functioning members of society - fundamental to this is the ability to read, write and count."
>
> – Tom Richmond, Founder and Director of the EDSK think tank

England differs from other high-performing countries in terms of the skills performance of younger cohorts at lower levels. According to the government, the proportion of under-24-year-olds who attain high numeracy and literacy proficiency is lower in England than in many other high-performing countries.

> "Among 19–24-year-olds… just 9% reaching Levels 4 or 5 in England compared with 15% or higher in the majority of high-performing nations."
>
> – International Evidence Review of Basic Skills: Learning from High-performing and Improving Countries (publishing.service.gov.uk)

The core skills of literacy, numeracy and digital fluency should not be underestimated or taken for granted. The 2021 'Employer and Skills survey' by the CBI (Confederation of British Industry) found numeracy and literacy skills were seen as one of the top three most important factors for

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1   A 'Level 2' qualification is Equivalent to a GCSE grades 4 and above, or other qualifications taken at level 2, e.g. a Level 2 Functional Skills Qualification.

half of employers (51%) when recruiting school and college leavers, and that digital skills were one of the priorities for firms. Indeed, low rates of numeracy are linked to difficulties in adult life, with those with poor numeracy far more likely to be unemployed than those with decent levels of numeracy.

> "Those with poor numeracy are more than twice as likely to be unemployed compared to those with competent numeracy at age 30, … [and there is] a strong link between basic numeracy and higher wages."
>
> – Nick Gibb, Minister for School Standards, Education Committee 18 July 2023 Parliamentlive.tv - Education Committee

Numeracy should not be taken in isolation, however. Those adults with low skills in numeracy often have low skills in literacy as well, further compounding the issues they have. There is a pressing need to up-skill low-skilled adults and foster core skills in the school-age population to maintain national prosperity, especially in the context of structural changes and projected population ageing.

In the PISA rankings – which measure 15-year-olds' ability to use their reading, mathematics and science knowledge and skills to meet real-life challenges – the UK performs relatively well and is above average compared to other countries. Indeed, in the PISA Reading tests, the UK has risen up the rankings from 25th place in 2009 to 14th place in 2018. This is positive news to be sure but does not provide the entire picture.

As the English population progresses further into education and into adult life, the picture is far from positive. England is the only country where the older population out-perform their younger counterparts in the PIACC survey of adult skills. In short, while the general trend in the OECD nations is for younger generations to have better skills than their parents' generation, this is not

the case in England. This represents a particular risk of a significant shrinkage in the talent pool of highly skilled adults in England, especially in comparison to other countries.

> "In England, adults aged 55-65 perform better than 16–24-year-olds in both literacy and numeracy. In fact, England is the only country where the oldest age group has higher proficiency in both literacy and numeracy than the youngest age group."
>
> – Country note - United Kingdom.pdf (oecd.org)

As the government has noted, data and digital skills are important not only for companies but also individuals. Data-literate individuals are more likely to benefit from and contribute to the increasingly data-rich environments in which they live and work. The 2021 Quantifying the Data Skills Gap Report found that nearly half of UK companies have found it difficult to recruit for data-driven roles as there a limited number of people with specialist digital data skills.

> "Even for those with GCSEs that include maths and English, the basic skills outcomes are weaker than for many upper secondary qualifications obtained in other OECD countries… Around one in ten of all university students in England have numeracy or literacy levels below level 2."
>
> – Building Skills For All Review of England, OECD (oecd.org)

Even those who achieve highly in the English education system, however, are not immune from this trend. The OECD's review of skills in England found that around one in ten university graduates have low skills in numeracy and literacy, indicating a major challenge. These skills gaps can have significant impacts on their future earning potential and the OECD warns that graduates with poor skills undermine the currency of an English university degree.

Review of current policy and assessment landscape

Numeracy, literacy and digital fluency development in schools

Throughout primary school, there are several tests across different key stages. Tests at the end of Key Stage 1 and Key Stage 2 cover English reading, grammar, punctuation and spelling, as well as maths. In numeracy, pupils are expected to leave primary school fluent in addition, subtraction, long multiplication and division, and be able to work with fractions, decimals and percentages. In literacy, pupils should be able to read fluently and write accurately and coherently. However, not all students achieve this foundation.

In 2019, 65% of pupils leaving primary school reached the expected standard in reading, writing and maths, compared to 53% in 2016. The majority of children, therefore, leave primary school with expected levels of numeracy and literacy, but this leaves more than one third (35%) leaving primary school without a firm grasp of the fundamentals. These figures were from before the Covid pandemic, which had significant impacts on learning.

> "In 2022, two in five pupils (41 per cent) completed year 6 without meeting the expected standards in reading, writing and maths (combined). In total, over 275,000 children left year 6 without a secure grasp of foundational skills."
>
> – Cracks in our foundations: Addressing the longstanding attainment gap in England's primary schools - The Centre for Social Justice

The Schools White Paper from March 2022, Opportunity for all: strong schools with great teachers for your child contains clear targets for numeracy and literacy. By 2030, the Government wants 90% of children to achieve expected standards in English reading, writing and maths by the end of primary school. In 2019, 65% of pupils achieved the expected standard; 90% therefore is a significant increase nationally and would represent an even more substantial challenge in areas of low performance. This is clearly an ambitious programme, and we whole-heartedly endorse the ambition. We are also arguing that these core skills are important and welcome the attention they are being given.

> "… just 40 per cent of teachers said that they were confident that most of their pupils would meet expected standards in 2023. Even starker, just 17 per cent of teachers are confident that this will be true for most of their disadvantaged pupils."
>
> – Cracks in our foundations: Addressing the longstanding attainment gap in England's primary schools - The Centre for Social Justice

The '90% target' has received a critical reaction from certain sectors, with the Association of School and College Leaders (ASCL) concerned this focus could narrow the curriculum and a target alone will not address underperformance, including poverty and deprivation.

Analysis by University College of London's Faculty of Education and Society has criticised how National Curriculum and other Department for Education (DfE) guidance on developing literacy has shifted to narrow focus on synthetic phonics only, to the detriment of teaching children to read whole texts.

> "The main approach used to teach young children how to read in England needs urgent reform and does not follow the most robust evidence"
>
> – Government's approach to teaching reading is uninformed and failing children | IOE

One of the flagship programmes implemented by the government is the English and maths 'hubs', designed to develop expertise in a teaching a specific subject or discipline, which complements the early career framework and national professional qualifications. Currently, there are 34 English hubs and 40 maths hubs. Maths hubs are intended to reach 75 per cent of primary schools and 65 per cent of secondaries by 2025. Evaluation of the hubs programme is not particularly rigorous; small-scale qualitative research in ten schools in one maths hub has shown positive emerging outcomes for pupils. Some of these outcomes were deepened understanding of maths concepts; improved problem solving and reasoning skills; increased skills in justifying answers; and improved engagement with, and enjoyment of, maths, often linked to increased confidence in their maths ability. However, there has yet to be large scale evaluation of the hubs approach and the jury is still out on their overall effectiveness.

The current system also has different impacts on different groups of children, and the impact is not uniform. At the end of KS2 boys, pupils on free school meals, disadvantaged, SEND pupils, and the ethnic groups Gypsy/Roma, traveller of Irish heritage, Pakistani and Black Caribbean all tend to be the lowest attainers in numeracy and literacy (Department for Education, 2017). Low attainment is often due to complex interactions of a variety of social/demographic factors. There is a need to ensure that all students develop their skills, and particularly those who experience disadvantage in other spheres should be equipped with the skills to mean they are not further disadvantaged in their education. These are the students who need the vitally important catch-up programmes for students who have made less than expected progress. For this group who progress at a different speed through their education journey, a new style of assessment tool could be revolutionary as it would allow them extra time to master the fundamentals and be assessed when they are ready.

GCSEs

GCSE Maths and English are the widely accepted benchmark for proficiency in numeracy and literacy in secondary school. Many further and higher education courses, as well as employers, use a grade 4 or above at GCSE Maths and English as a requirement for candidates.

GCSE Maths is intended to "encourage students to develop confidence in, and a positive attitude towards, mathematics and to recognise the importance of mathematics in their own lives and to society. They should also provide a strong mathematical foundation for students." The specification for GCSE Maths is explicit in the mathematical functions and concepts that students need to know to succeed, ranging from number, ratio and rates of change to probability, algebra, equations and inequalities and gradients of graphs. In this way, a good grade at GCSE Maths can provide a firm grounding in numeracy fundamentals, but it also includes a large amount of higher complexity, abstract mathematical knowledge and skills which are hard to access for those who have struggled with the fundamentals. While this is important for high-achieving students who will progress to study science and/or maths at A-level and beyond, it does not include much of other numeracies previously discussed which are useful for all students to learn about. Further, the higher tiered paper – with its focus on abstract mathematical concepts – develops less of the numeracy aspects discussed in this report; there is an assumption that they have already developed their numeracy, and require no further practice or use of these skills.

To achieve a good grade in GCSE English Language, students are expected to "read fluently and write effectively. They should be able to demonstrate a confident control of Standard English and they should be able to write grammatically correct sentences, deploy figurative language and analyse texts." Further, there is a speaking and listening aspect of GCSE English Language which although it does not form part of the final grade, should enable students to use spoken Standard English effectively.

In this way, a GCSE English Language certificate should provide learners with a strong demonstration of a suite of skills and knowledge that add up to being able to read, write and communicate effectively; their literacy and oracy, in short. A GCSE English Language can help learners develop important wider skills but has substantial drawbacks. Most obviously, it does not provide much in the way of wider literacies (financial, digital etc.). Wider literacies may be taught and developed in other lessons such as Personal, social, health and economic (PSHE) education or Computer Science; although these are, respectively, non-assessed and not taken by everyone. Further, the oracy portion of GCSE English Language does not form part of the overall grade. Indeed, some of our roundtable experts argued that it could often be simply seen as a 'tick box' exercise, meaning that it does not provide enriching and stretching experiences for students. It should be stressed that a GCSE in large part is an academic qualification, as opposed to a competency measure. In this way, English Language - while being close to one - has drawbacks in being used as a proxy for 'literacy.'

For developing digital fluency, GCSE Computer Science offers a stretching course of study for high aptitude coding generalists, to help them develop the fundamental skills they will need to work in computing. Courses in Computer Science are popular and uptake is growing. In 2019, just over 10,300 students took Computing A-level compared to 17,251 in 2023 – a staggering 67.5% growth. GCSE Computer Science entries grew nearly 13% from 77,707 to 87,405 over the same period. These are demanding courses, however, which are not designed to develop and cover digital skills that are needed in daily work and life. There is more work to be done in the area of digital fluency which we will be exploring in more detail in due course.

As GCSEs are graded on a comparable outcomes framework, introduced to tackle grade inflation, GCSE Maths and English have their grade boundaries made comparable each year at a national level. The basic principle that underpins the comparable outcomes framework is that for a qualification where the entry cohort is similar to previous years, the overall proportion of students achieving each grade should also be similar to previous years. The relative steady state of attainment rates is therefore not necessarily a symptom of stagnating performance standards, but a deliberate policy intention. Indeed, comparable outcomes have been heralded as having 'halted' grade inflation. The proportion of GCSE grade 4 and above has been broadly steady across numerous years – the increase in grade 4 and above being awarded in 2020 and 2021 being due to the different approaches taken to awarding during and immediately following Covid-19 disruption. What this means is that in normal years at age 16, only 60.3% of students achieved a Level 2 in English and maths, leaving two-fifths who do not. Not all students can be 'average' or 'above average' in an assessment that is not criterion referenced. Many of the one-in-three students who do not achieve a GCSE 'pass' (grade 4 or higher) enter a policy of GCSE-resits or take Functional Skills Qualifications. While there are merits to these approaches, they have their own specific issues, which will now be examined.

40%

of students **do not** achieve a Level 2 in English and Maths at age 16.

Resit policy

For those who do not achieve a grade 4 in GCSE Maths and English, there are two options open to them: they can attempt to re-take their GCSE exams to achieve this level at the subsequent attempt, or they can take Functional Skills Qualifications (FSQ) at a Level 2. Entries to Level 2 FSQs are significantly driven by the government's conditions of funding for Level 3 study, which require students who have not achieved a Level 2 (either at GCSE or in FSQs) to continue progressing towards this while undertaking their further education.

Students with a grade 3 in maths or English GCSE normally retake GCSE exams, whereas those who achieved a grade 2 or below have the option to study towards a pass in FSQs level 2 or they can still study towards a GCSE grade 9 to 4. Once they have achieved this, there is no requirement to undertake further maths or English qualifications to meet the condition of funding.

The cohort of 19 year olds with a Level 2 qualification in English and Maths (either GCSE or FSQ) has increased over time. In 2021/22 75% of 19 year olds achieved a level 2 qualification (GCSE grade 4 or above, or equivalent) in maths, compared to 61.5% in 2010/11, and 46.5% in 2004/5. There remains,however, a large cohort of young people – around one-in-four – who leave education at age 19 without Level 2 qualifications in maths and English, the benchmark certificates for demonstrating numeracy and literacy. Also, the high rate in 2021/22 is skewed by the generous marking standards stemming from the Covid mitigations, meaning that the figures are likely to drop.

In 2014 the 'condition of funding' policy was introduced to require those who did not achieve a GCSE grade 4 or above in English and maths by the end of key stage 4 to continue studying these subjects as part of their 16-19 study programme. However, the resit policy has had low rates of success and after an initial bump in the numbers of young people achieving a Level 2 at age 19 who had not done so aged 16, numbers stalled, although they increased further over the pandemic with the introduction of teacher assessed grades (see Figure A for more detail).

In 2018-2019 academic year, the last pre-pandemic data available, only 29 per cent of students who had not achieved Level 2 (GCSE standard) in English and Maths at age 16 had reached Level 2 by age 19. This means that around one fifth of the general population do not achieve the benchmark of a Level 2 qualification in English and Maths, and these rates have remained stubbornly low over time. Increases in 2020/21 and 2021/22 will be in part linked to more generous standards because of Covid and may fall back below 30% by 2025.

1/4 of students **do not** achieve a Level 2 in English and Maths at age 19.

This shows that that those who do not meet the Level 2 threshold by age 16 are unlikely to have achieved this by 19, despite the resit policy. In this regard, the GCSE resit policy has struggled to achieve its goal and effectively consigns these young people to repeatedly studying for a qualification they have only a small chance of achieving. This can lead to many young people becoming disengaged from studying and developing negative attitudes towards education, particularly in maths.

> "The GCSE resits policy compounds this issue as labelling pupils as having 'failed' English and / or maths at age 16, only to insist that they should study these subjects beyond age 16, is counterintuitive at best."
>
> – EDSK, 'Reassessing the Future'

> "It is unfathomable that after 12 years of schooling, hundreds of thousands of pupils are assessed in public examinations at age 16 to have not met the required standards in English language and maths."
>
> – Lee Elliot Major and Sam Parsons CLS-Working-Paper-2022-6-The-forgotten-fifth.pdf (ucl.ac.uk)

Figure A: Percentage of those who had not achieved Level 2 in English and/or Maths at 16, but had achieved both by age 19
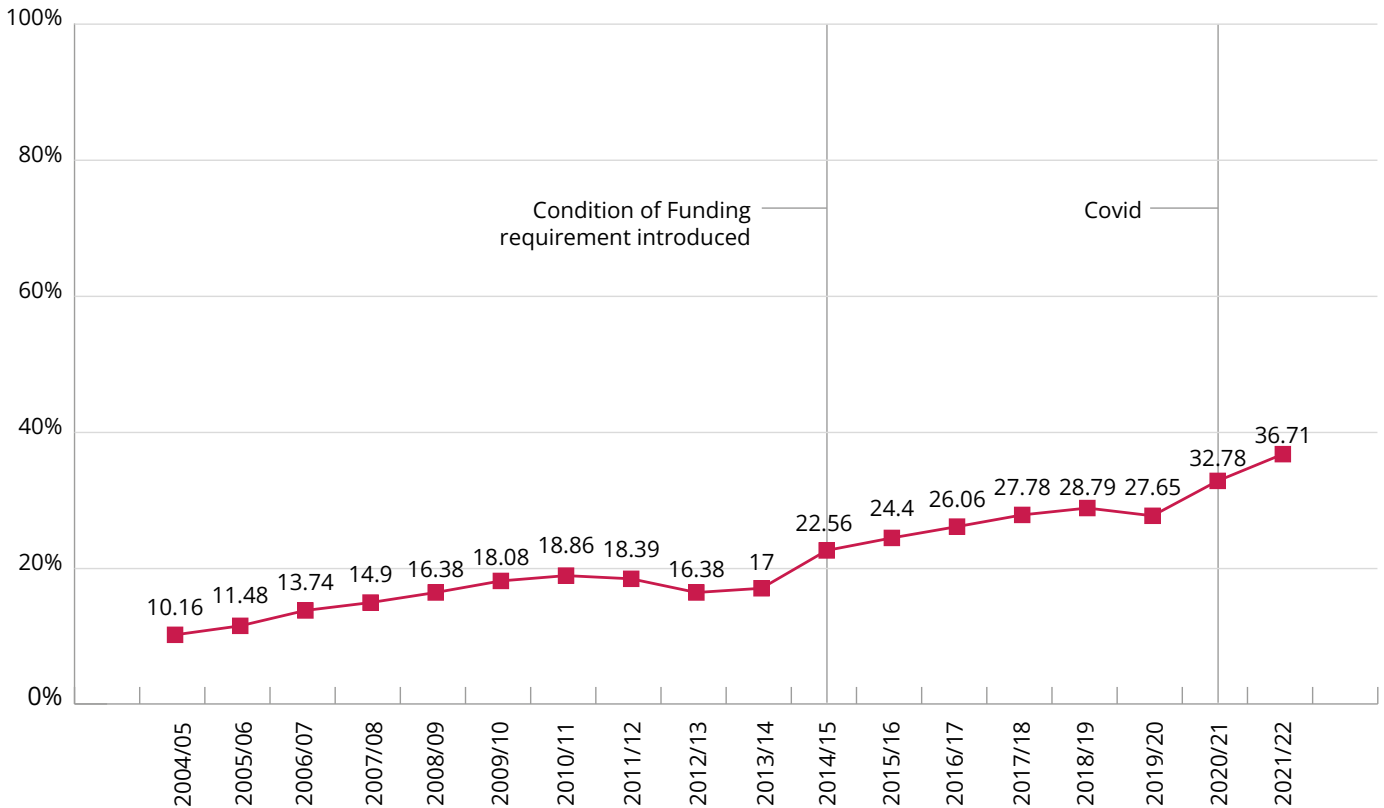
Data from: Level 2 and 3 attainment age 16 to 25, Academic year 2021/22 – Explore education statistics – GOV.UK (explore-education-statistics.service.gov.uk)

Ofsted has also joined the criticisms of the current resit policy, noting the damaging impact the resit policy can have on students. Not achieving the 'standard pass' can make learners feel like a failure. If they then go on to struggle to achieve a Grade 4 in their resits, this feeling of failure can compound, and severely knock a person's confidence in their abilities.

"We continue to be worried about the effectiveness of the government's policy… Resit pass rates are low… and the impact of repeated 'failure' on students should not be underestimated. Rather than creating the perception that English and mathematics study in FE is a punishment for not getting a grade 4 at an earlier stage of education, it should instead be pitched as a core part of vocational training."

 – Ofsted Annual Report 2017/18: education, children's services and skills - GOV.UK (www.gov.uk) [emphasis added]

"Many of these young people have substantial achievements but they often feel like failures. Their post-16 transitions tend to be more complex and difficult than for higher achieving peers, with more time and support needed to help them realise their potential."

– Post-16 transitions for lower attainers, (nuffieldfoundation. org)

Even the architect of the GCSE resits policy, Baroness Wolf, has suggested a new approach might be necessary, telling the Education Select Committee in Parliament in 2019 that "one of the problems is that Ofqual says that you only can have one maths GCSE… when adults do want to come back into adult education and improve their English and maths – there's huge demand for it – they are faced with a single curriculum [which may not be right for them]" due to the

focus on GCSEs. Baroness Wolf emphasised that while she remained convinced that maths and English should be compulsory up to age 18, alternative curricula should be developed to allow for all to develop their skills and confidence rather than stay on a resit carousel. When viewed through the lens of disengaging learners from future study that might be more appropriate to their individual needs at a specific point in their life, the amount of time and effort spent on re-sits is substantial, for not very remarkable results.

> "The sheer logistics and cost of re-sits and the pressures on staff continue to be cause for concern."
>
> – Association of Colleges English and Maths Survey 2022

Consigning such a substantial number of young people to the demoralising and ineffective GCSE resit carousel is a bad system for education providers, young people and employers. There is a strong case for changing the policy direction to ensure that young people leave education with a strong grounding in core skills and are literate and numerate to function effectively in society.

> "[GCSE] 'failure' is both an issue of academic concern and one of dignity for young people. Few nations would think it acceptable to embed in the education system this rate of apparent underachievement and its consequent impact on productivity and skills in the national economy."
>
> – The Forgotten Third, ASCL (ascl.org.uk)

Functional Skills Qualifications (FSQs) were first introduced in 2006, to recognise numeracy, literacy and digital ICT skills and provide learners with the essential knowledge, skills and understanding to operate confidently, and independently in life and the workplace. In 2019, the Department of Education (DfE) reformed aspects of FSQs to introduce specific, common content with greater emphasis on the underpinning knowledge and skills that learners need.

FSQs are positioned as an alternative to the GCSE route, offering a vocational and practical route to develop English and maths with the added flexibility of being able to sit assessment at several times throughout the year. The key differences between FSQs and GCSEs is in the breadth of content.

Functional Skills Mathematics assessments consist of mathematical problem solving and decision-making using numbers, with tasks simulating the natural occurrence of numerical reasoning within real life contexts. Functional Skills English assessments consist of speaking and listening, as well as reading and writing tasks simulating the need for English language skills within real life contexts, including usage of spelling and grammar and presentation skills. In this way, they could be seen as helping young people develop and certify their oracy and communication skills, which employers often say young people lack. FSQs, however, have numerous problems which mean they are not suitable for certifying the skills and knowledge of all young people.

When FSQs were being conceived, there was a debate and argument about what should be included in the curriculum. The DfE and the Qualifications and Curriculum Authority (QCA) decided that FSQs should not be an alternative to GCSE, meaning that it was people in Further Education (FE) who actually took FSQ exams. Further, to achieve a pass at FSQ Mathematics candidates are required to demonstrate their knowledge and skills both with and without a calculator. The existence of a non-calculator paper – when most people have access to a calculator in their pockets on their mobile phones – coupled with the complex mathematical concepts and knowledge in the syllabus means there is significant overlap between FSQ Maths and the Foundation tier GCSE maths papers.

These decisions have resulted in a suite of qualifications which struggle with their perceptions. The below charts – using data taken from Ofqual's Public Sentiment Survey, 2021 – shows that around half of the public felt that FSQs were a good judge of what students could do prior to the pandemic, and numbers dropped to around four-in-ten feeling positive that FSQs are good measures. In comparison to GCSEs, FSQs have markedly lower perceptions across all groups sampled. In particular, the positive perceptions of FSQs are lower, and the 'Don't know' responses substantially higher. The following charts (Figures B-G) go into more detail.

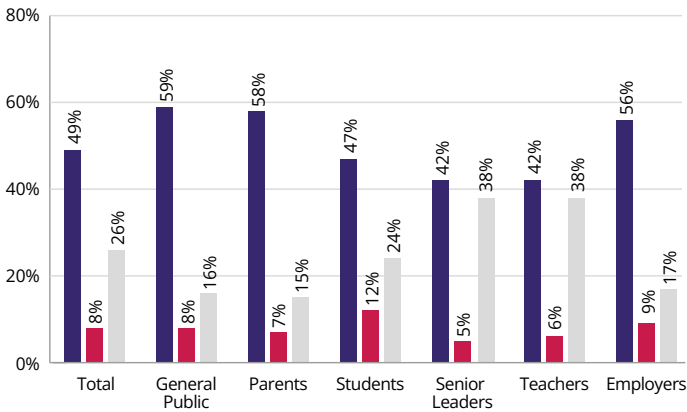## Figure B: "Functional Skills Qualifications were reliable before the pandemic"

	Total	General Public	Parents	Students	Senior Leaders	Teachers	Employers
Net Agree	49%	59%	58%	47%	42%	42%	56%
Net Disagree	8%	8%	7%	12%	5%	6%	9%
Don't Know	26%	16%	15%	24%	38%	38%	17%

Figure C: "GCSEs were reliable before the pandemic

	Total	General Public	Parents	Students	Senior Leaders	Teachers	Employers
Net Agree	68%	63%	69%	62%	72%	71%	70%
Net Disagree	14%	12%	10%	18%	18%	13%	13%
Don't Know	3%	7%	3%	4%	1%	1%	3%
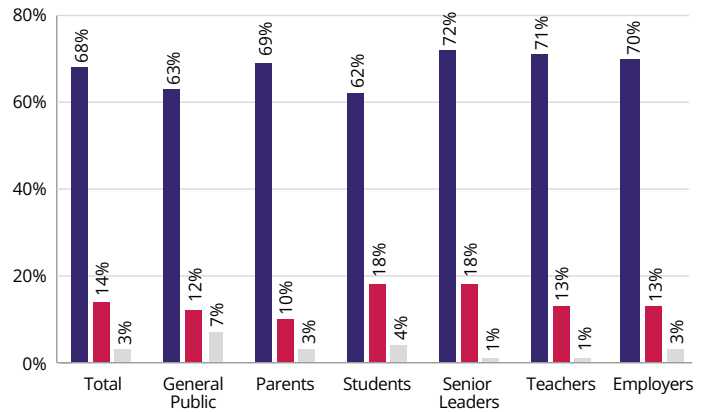
Figure D: "Functional Skills Qualifications were useful for judging what a student knows, understands and can do before the pandemic"

	Total	General Public	Parents	Students	Senior Leaders	Teachers	Employers
Net Agree	51%	62%	62%	51%	41%	44%	56%
Net Disagree	9%	6%	7%	10%	7%	7%	12%
Don't Know	24%	15%	12%	22%	39%	36%	16%
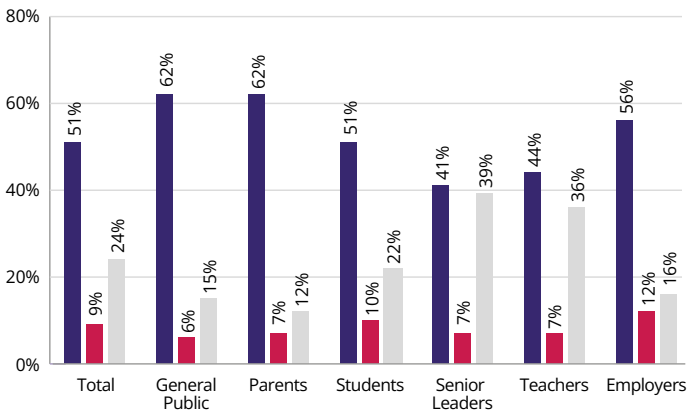
Figure E: "GCSEs were useful for judging what a student knows, understands and can do before the pandemic"

	Total	General Public	Parents	Students	Senior Leaders	Teachers	Employers
Net Agree	67%	64%	68%	55%	72%	72%	69%
Net Disagree	17%	13%	13%	27%	19%	17%	14%
Don't Know	3%	7%	4%	4%	1%	1%	3%
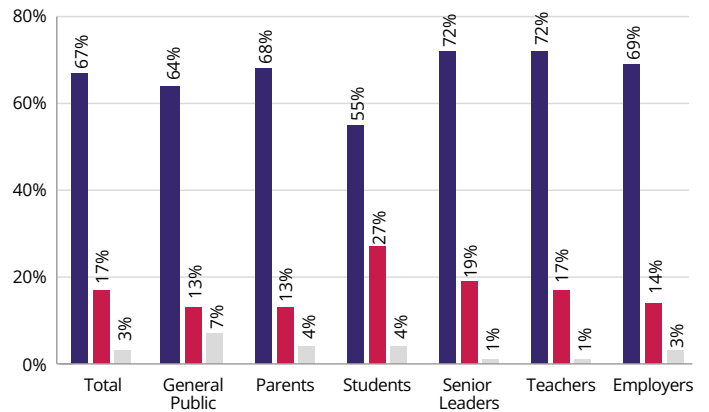
Figure F: "Functional Skills Qualifications were useful for job recruitment before the pandemic"

	Total	General Public	Parents	Students	Senior Leaders	Teachers	Employers
Net Agree	49%	58%	59%	45%	42%	42%	58%
Net Disagree	12%	8%	9%	15%	12%	8%	14%
Don't Know	23%	15%	12%	21%	34%	34%	15%
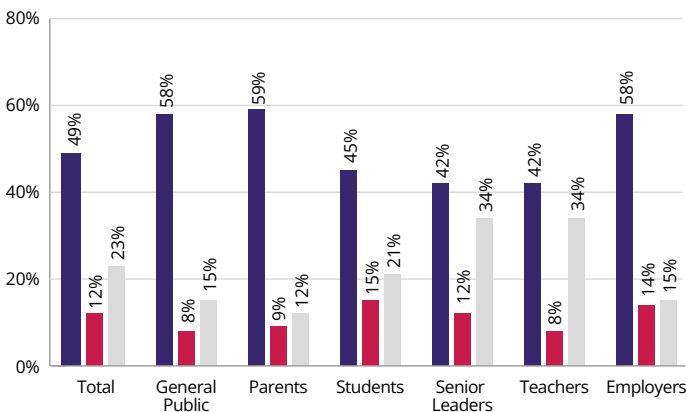
Figure G: "GCSEs were useful for job recruitment before the pandemic"

	Total	General Public	Parents	Students	Senior Leaders	Teachers	Employers
Net Agree	64%	59%	66%	53%	70%	71%	65%
Net Disagree	15%	15%	9%	24%	13%	11%	16%
Don't Know	4%	7%	5%	5%	2%	2%	3%
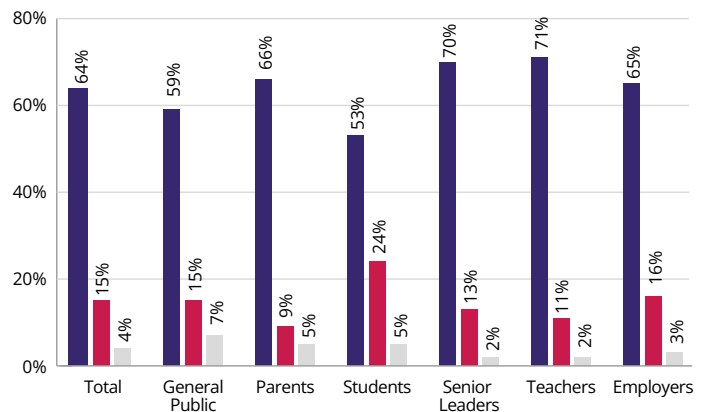
Legend: Net Agree, Net Disagree, Don't Know

Figure H: Number of certificates in Functional Skills qualifications
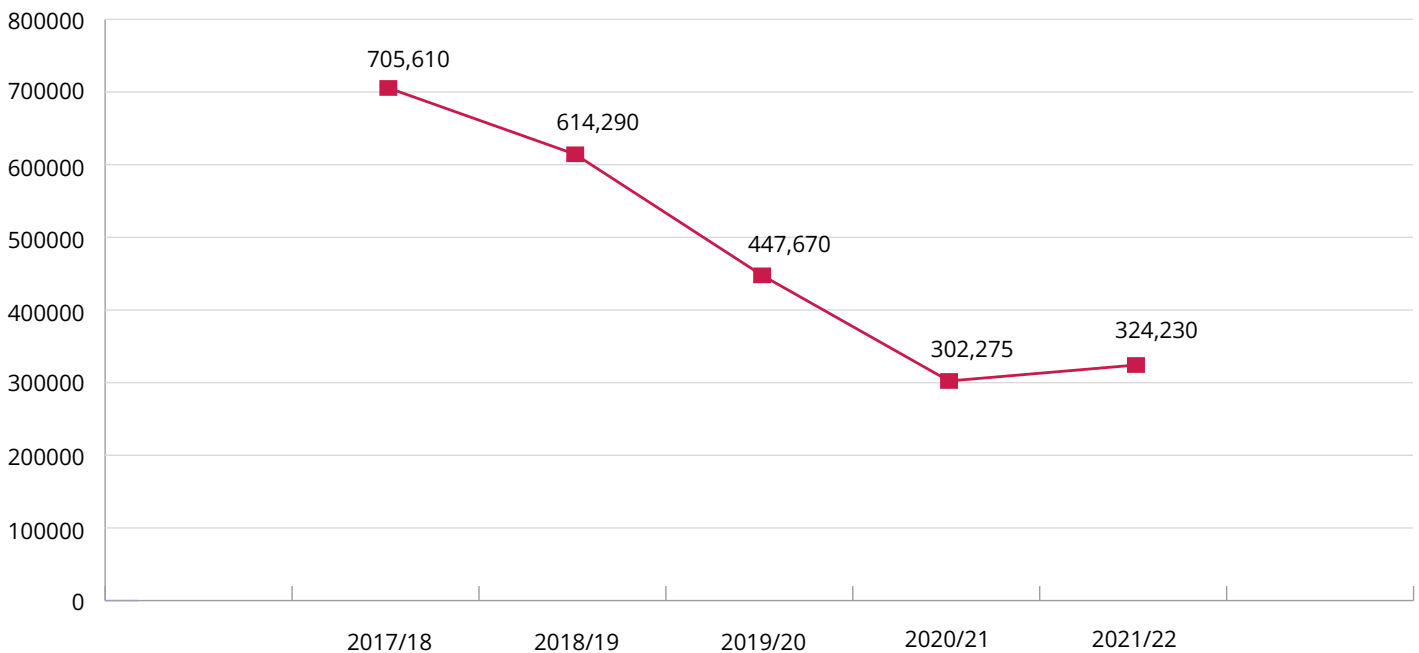
Number of certificates by subject and level: Annual Qualifications Market Report: 2021 to 2022 academic year - GOV. UK (www.gov.uk)

Since their launch, a number of issues with FSQs have been flagged. In its annual qualifications market report, the exams regulator Ofqual found that entries to FSQs were declining, although showed a small improvement in 2021/22 (324,230) compared to 2020/21 (302,275). Any increase in numbers must be seen in the context of having more than halved since 2017/28, when there were over 700,000 FSQs awarded – see Figure H for more detail. As can be seen clearly from the numbers taking them, there is something that means that FSQs are not seen as attractive by students or providers.

Since their launch, a number of issues with FSQs have been flagged. In its annual qualifications market report, the exams regulator Ofqual found that entries to FSQs were declining, although showed a small improvement in 2021/22 (324,230) compared to 2020/21 (302,275). Any increase in numbers must be seen in the context of having more than halved since 2017/28, when there were over 700,000 FSQs awarded – see Figure H for more detail.

In our roundtable discussion with a range of well-respected experts in numeracy and literacy, which contained representatives from post-16 and further education sectors, there was clear agreement about the reasons for the decline in FSQ numbers. One of the clearest reasons

stated was that the Level 2 condition of funding requirement offered a choice between GCSEs and FSQs. Students with a grade 3 in Maths or English GCSEs tend to resit the qualifications with the aim of achieving a grade 4 or higher, and many of those who achieved a grade 1 or 2 also choose to resit rather than take an FSQ. Another reason highlighted was that GCSEs are more highly regarded in performance tables, as education providers can show improvement from a grade 1 to a grade 3, whereas the pass-fail dichotomy of an FSQ means it can seem not as attractive a proposition for education providers. A final point raised by some in the roundtable focused on the content of FSQs. FSQs were originally intended as a non-academic route to a Level 2 qualification, with large amounts of real-world skills and knowledge in practical situations, without much abstract academic content; some of the attendees felt that FSQs still contain too much of an academic curriculum to be fit for the purpose they were originally intended for.

Further, the five-year decline in Level 1 certificates and Level 2 certificates reflects changes in the qualifications offered in schools. Reforms following the Wolf Report mean that the range of qualifications which can contribute to performance tables or towards the EBacc have changed. FSQs, with their pass/fail dichotomy, impact performance tables differently from GCSEs,

Figure I: Results for 'Please indicate your levels of understanding about Functional Skills qualifications (Employers)
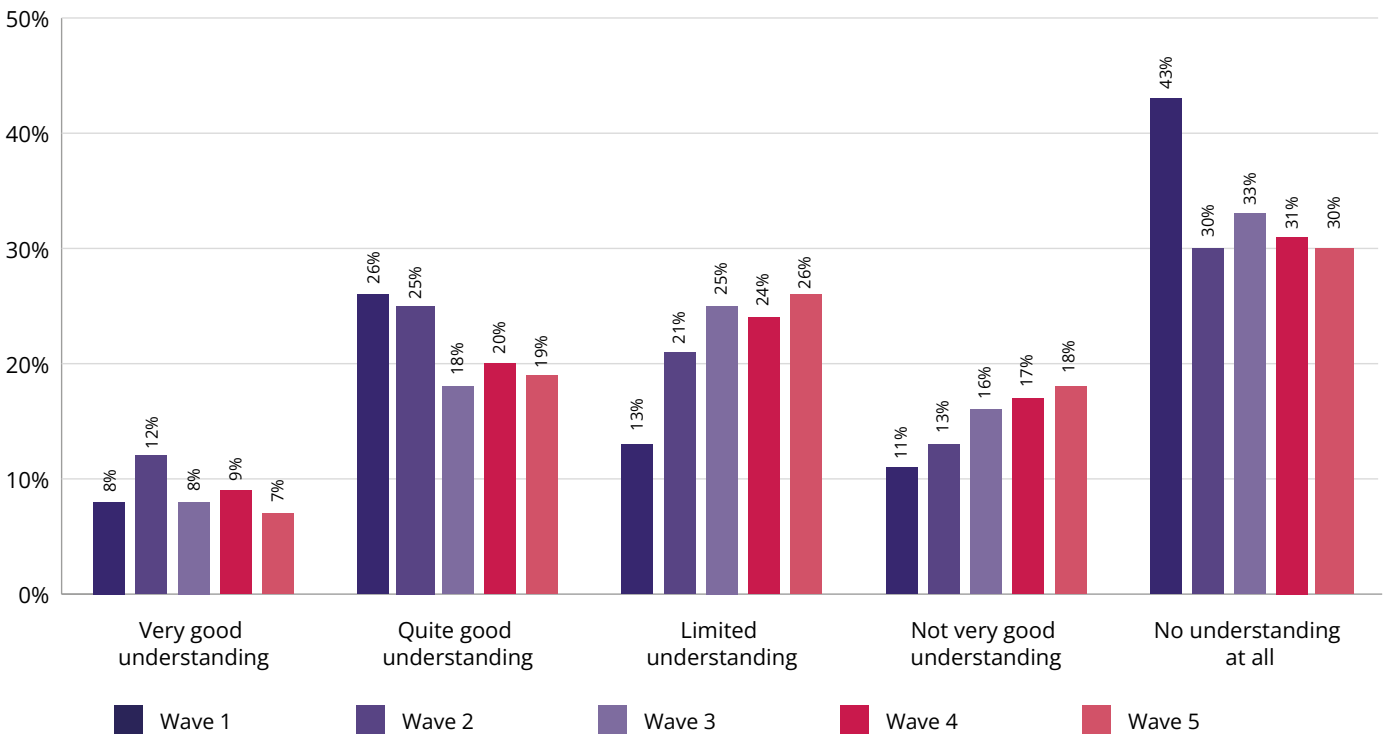
Source: Perceptions of Vocational and Technical Qualifications in England - wave 5 - GOV.UK (www.gov.uk)

so there may be a disincentive to offer them.

Further, FSQs are not well understood by employers and the wider public. In a regular survey conducted by Ofqual about perceptions of qualifications, only a quarter (26%) of employers reported having a very or quite good understanding of FSQs. While the rates of those saying they have 'no understanding at all' have dropped (from 43% to 30%), it remains the most chosen response across several waves of surveying (Figure I).

The perceptions of FSQs are in stark contrast to the perceptions of GCSEs, as shown in Figure J, where 70% of employers surveyed in the most recent wave of Ofqual's Perceptions Survey of GCSEs and A-levels agreed that GCSEs are well understood.

Further doubt has been cast on FSQs as less than half of employers felt that people holding FSQs have the appropriate level of English needed. Around a quarter (27%) of employers agreed that those holding FSQs have the appropriate level of skill in numeracy needed by their organisation. The lack of understanding of FSQs among employers poses challenges to the currency of FSQs.

Figure J: Results for "GCSEs are well understood by people" - Employers
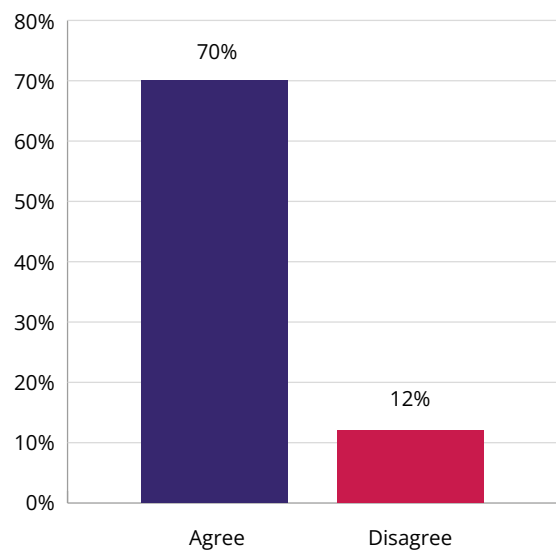
Source: Perceptions Survey Wave 20 - Report - GOV.UK (www.gov.uk)

Figure K: Composite confidence score in Functional Skills qualifications - Pre pandemic results

Senior Leaders	Teachers	Students	Parents	Employers	General Public	All
3.61	3.62	3.52	3.69	3.58	3.69	3.56
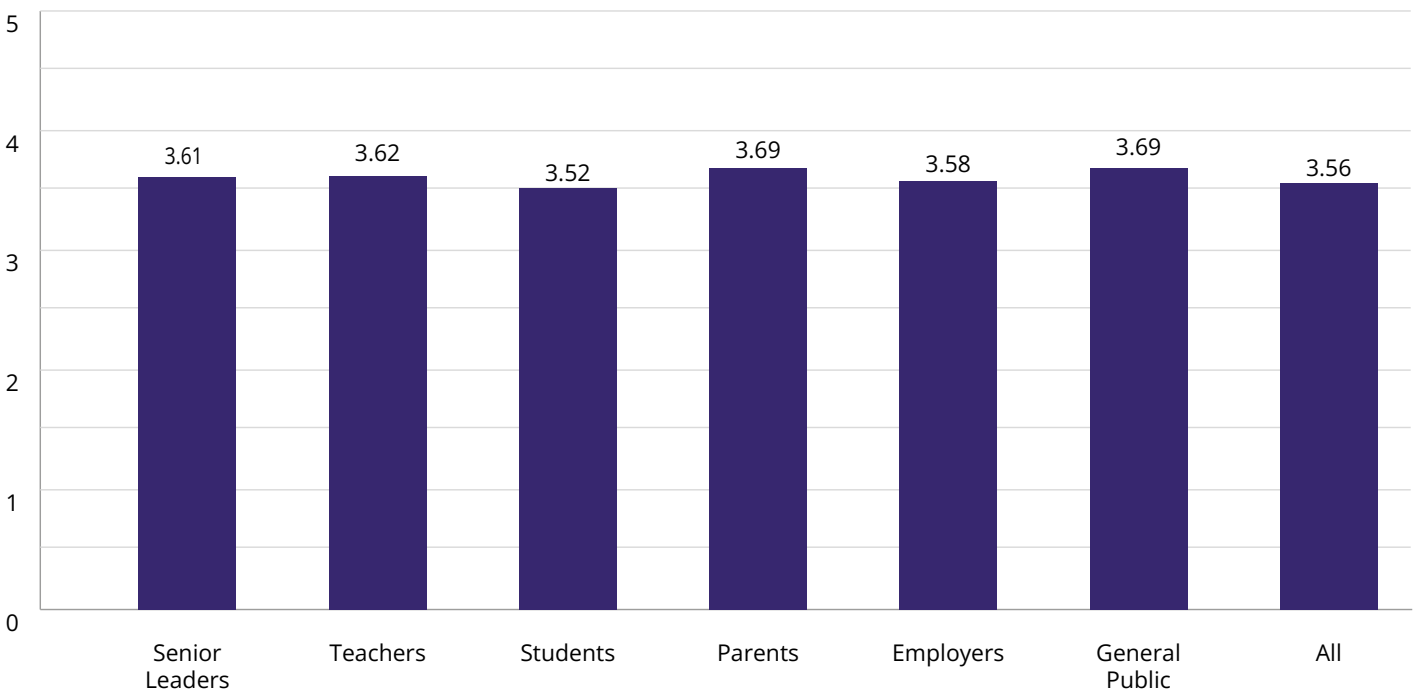
Figure L: Composite confidence score in GCSEs - Pre pandemic results

Senior Leaders	Teachers	Students	Parents	Employers	General Public	All
3.77	3.79	3.48	3.76	3.76	3.69	3.71
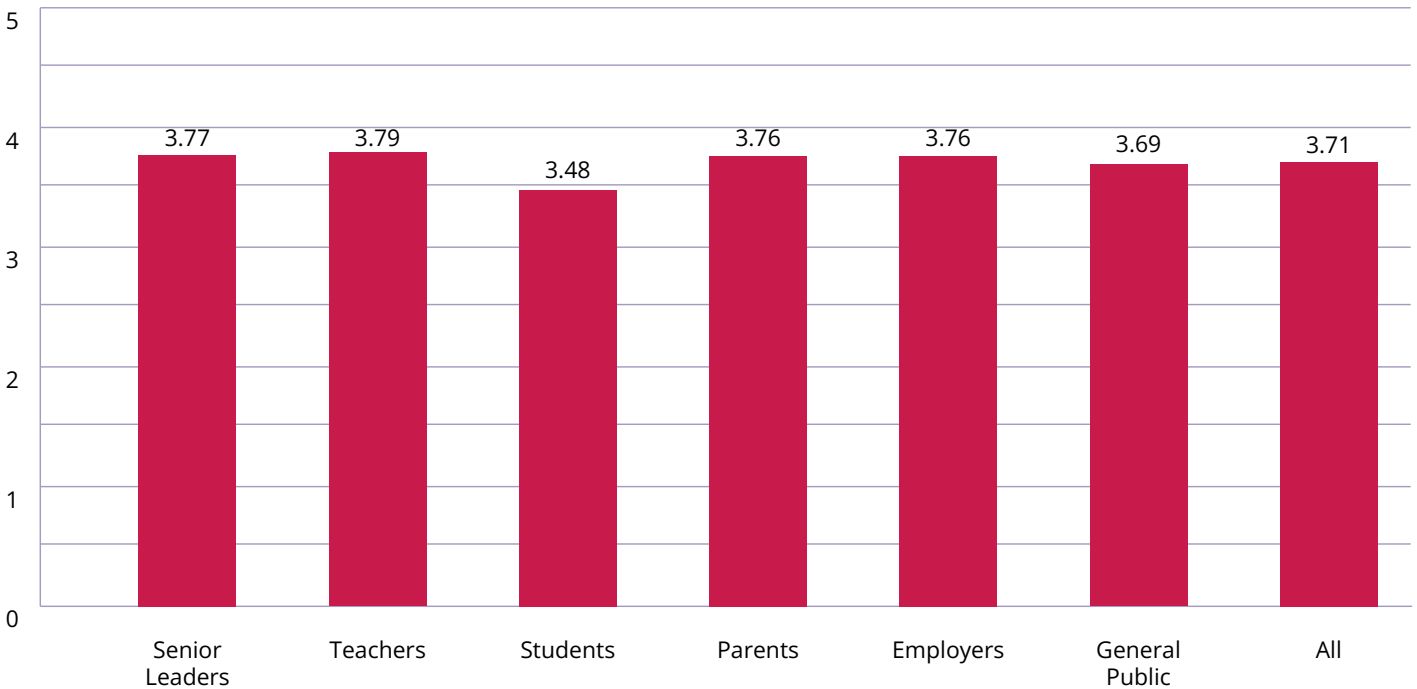
Source: Ofqual Public Sentiment 2021 - GOV.UK (www.gov.uk)

Across many different groups, confidence in FSQs is generally low. Figure K – taken from Ofqual's Public Sentiment survey – reveals that the average confidence all respondents had in FSQs was generally low. The average confidence in FSQs across all groups was 3.56 pre-pandemic, but this was on a 5-point Likert scale, where 3 represents 'neither agree nor disagree'. The responses tend towards positive and no group averaged under 3, which would indicate negative attitudes. The results for FSQs are generally lower than confidence in GCSEs (Figure L), although for the general public confidence was equally high. FSQs certainly have their place, and are well-respected courses which have real value for learners, but, FSQs struggle to achieve strong recognition and confidence in their 'brand.' As a result, they have struggled to establish themselves and are unlikely on their own to be a suitable measure for numeracy, literacy and digital fluency for everyone, which is why we argue a new approach is needed to tackle this problem. FSQs, while laudable in their intention and of real use to some learners, have significant problems. Declining rates of participation coupled with a lack of understanding mean they are not working as a method for increasing numeracy, literacy and digital fluency.

> "We need a different approach towards core skills for people who are not academically inclined to help them develop their skills and confidence, which show what a person can do."
>
> – Julie Baxter, Head of Maths, Education and Training Foundation

The re-sit policy has had significant impacts in terms of workload and stress on school sixth forms, colleges, teachers and students, with only very marginal gains. Repeatedly trying to get round pegs into square holes has not worked and a new approach is necessary.

Core Maths and EPQs

For those who achieve a good standard at GCSE Maths, there exists a Level 3 'Mathematical Studies' course, commonly known as 'Core Maths'. Core Maths offers a route to Level 3 in practical mathematical concepts and knowledge, which could represent a route for achieving the Prime Minister's intention for 'maths to 18.'

Core Maths is designed for those who have achieved a Level 2 in GCSE Maths (Grade 4 or higher), who wish to continue developing their mathematical skills in an applied manner. In its core modules, it covers data analysis, personal finance, estimation, and critical analysis of data and models. There is a variety of optional content for those who want to go deeper into correlation and regression, cost benefit analysis or rates of change, amongst others. While Core Maths is an excellent, high-quality course for developing further applied numerical and mathematical skills, it is aimed at students who have already achieved the fundamentals of numeracy.

To accompany Core Maths, the Extended Project Qualification (EPQ) provides further opportunities to develop their literacy and analysis skills and present their findings in a professional way. EPQs are voluntary year-long self-directed research projects undertaken by Year 12 students alongside their other studies. Under the guidance of a supervising teacher, students drive their own learning from conception through research to project completion. Projects are independently conceived, planned, researched and executed. The EPQ is suitable for learners who may not have chosen to study AS or A-level English to develop their analysis and communication skills. Indeed, some of the benefits of EPQs are that students:

- become more critical, reflective and independent learners;
- develop and apply decision-making and problem-solving skills;
- increase their planning, research, analysis, synthesis, evaluation and presentation skills;
- learn to apply technologies confidently;
- demonstrate creativity, initiative and enterprise.

While Core Maths and EPQs are high quality programmes of study which are hugely beneficial to those who take them, they are not designed to be suitable for all students. Core Maths is likely to be too advanced for those who struggle to develop core numeracy. EPQs succeed as people are motivated to study a specialist subject, so may not be suitable for all learners. Similarly, EPQs require a certain level of literacy and digital skills to do the required amount of research, so would not have the right impact on the large group of young people we have been discussing. For this reason, these are not an appropriate solution for improving the numeracy, literacy and digital fluency of all.

Recommendation

Three principles for new assessments of numeracy, literacy and digital fluency

Clearly there is a problem with the development of core skills in young people which requires significant attention and the ambition to improve. To raise the level of numeracy, literacy and digital fluency in this country and engage all students in a meaningful and beneficial way, we believe a new form of assessment practice is required. A re-framing of the 14-18 education landscape for numeracy, literacy and digital fluency could reap rewards, as this new challenge requires a new approach. A new, on-demand assessment would allow all young people to do the kind of numeracy, literacy and digital fluency required for an apprenticeship, further or higher education course, or employment. The 16 to 18 cohort are very diverse and heterogeneous with learners who are well served by the existing framework and those who are not. What learners who are not well served by the existing set of qualifications and programmes have in common is that many of them are frequently not in school or at least do not have a stable and accessible school experience. Therefore, AQA believes that the most effective change one could make to reach and serve these learners would be by providing a qualification or assessment that is assessed digitally and on-demand when the student is ready.

While linear exams remain desirable in most circumstances, for some learners assessment can become de facto a non-linear experience that involves multiple failures and repeated attempts at finding alternative qualifications that could put them 'back on track'. This feels needlessly aggravating where standardised, on-demand and adaptive assessment is successfully used for high-stakes decisions in comparable countries. Any new assessment would carry value only if it can avoid being seen as 'second class', which is why we argue for the need for it to be universal.

AQA are also in a good place to make this a reality and deliver these new kinds of assessments. AQA is already doing this in the "readiness for GCSE maths" digital assessment product that will launch in 2024; this will be aimed at students at the end of KS3 and used in the context of GCSE re-sits, to check whether students have grasped the key knowledge and skills required. The GCSE readiness tests will provide us with useful framework for building new bespoke assessments for numeracy, literacy and digital fluency. We will also be able to learn from the implementation of this GCSE readiness tests, building on its successes and learning from issues, to make sure new assessments of numeracy, literacy and digital fluency are successful.

Exactly what would be included in this assessment is open to discussion – should it include statistical analysis? What role does 'oracy' play? But the direction of travel is one we hope those who care about the education of our young people will welcome.

There is an issue with numeracy, literacy and digital fluency. We at AQA think that a new form of assessment could have huge potential for addressing these issues. There are many more conversations and discussions to have as we research the best form of assessment. As a first step, we are setting out the key guiding principles we believe should underpin this new-style assessment. These are:

1. Universal and Accessible for all,

2. Digital and On-screen,

3. On-demand and When-ready.

Universal and Accessible for all:

As outlined above, there are already many high-quality qualifications and assessments which each have their own strengths. What is lacking is a truly universal assessment to properly engage all students in a meaningful and beneficial way, focused on the core suite of knowledge and skills to be numerate and literate. This would be beneficial for all learners, but with particular benefits for young people who have not achieved a good grade on their Maths or English GCSEs but who want to do further study, training, or apprenticeships. There could also be benefits for those who are returning to learning later in life, perhaps because of a career change or change in family circumstances.

The assessment would show what a young person can do (i.e., statistics, proportions, reading extended texts etc.), focused on ensuring they meet an accepted benchmark. With appropriate development and testing of tasks, the assessment could be broadly criterion referenced, with clear criteria, goals or outcomes against which candidates are measured - similar to a driving test. By having a clear understanding of what is expected, students, teachers, assessors and other interested parties can all make reasonably objective judgments about whether a student has achieved the expected outcomes, or not. Further, if they were unsuccessful, a candidate could receive insights into which areas they struggled with. An assessment that is digital, on-demand would have broad appeal to a range of learners, including high achieving students.

We want to develop something which is challenging and meaningful for all students: high attainers and low attainers alike. Even those with grade 9 in GCSE Maths, or an A* in A-level Maths can benefit from practising their functional numeracy skills. Someone who is proficient at calculus or trigonometry is not necessarily confident in working out common numeracy problems they will be faced with on a daily basis. The same goes for literacy, someone with high grades in English Language GCSE could still benefit from practising their literacy, to ensure their language and expression are clear, concise and convincing. Numeracy, literacy and digital fluency are fundamental skills but are far from basic. In the same way as a muscle, they can slacken over time, so practising the fundamentals can have benefit for all, even those who may think they have mastered it all.

While this would be aimed at young people in the first instance, there is no reason it could not be extended to the adult population also. In the first instance, our assessment will be focused on school-age population, as this is where our expertise resides. Our vision for the potential of a new style assessment of numeracy, literacy and digital fluency is wider. Increased access to this assessment, when properly tested and trialled, could have huge potential benefits for the adult population also. Many jobs require verbal and numerical reasoning tests before a candidate can proceed to interview, and a successful, recently completed on-screen digital assessment could provide adults with proof of their competence, without having to complete multiple different assessments for different applications.

Digital and On-screen:

There are many potential benefits to moving to an increasingly digital, on-screen form of assessment. As this is a new style of assessment intended to do something different, we believe it should be delivered in a new way: digitally and on-screen, rather than using pen and paper.

There are numerous benefits to conducting this sort of assessment on-screen, on a digital device. For one, it would be less onerous to run for centres, as they would not have to set up large exam halls. It would also allow for flexibility around when the assessment was done. Further, the assessment could be gamified to make it more accessible and exciting for learners by making numeracy, literacy and digital fluency assessment more fun. Also, with on-screen digital assessment, teaching and learning materials can be embedded in the product. Feedback could be provided quickly and efficiently, with clearly identified areas for improvement. In this way, it can be shown quickly how a candidate has done, and what particular knowledge or skills they need to work on in order to pass next time. The learning and practice materials could be accessed by learners on a phone app, for instance, and we would envisage looking at the application of techniques from artificial intelligence – such as chatbot-style feedback, and bespoke question/task creation, provided this can be done in a valid and educationally effective way. Moreover, gamified practice materials can motivate learners to engage with the content regularly and build up the competence and confidence until they feel ready to take the formal assessment.

There is also the potential for having adaptive assessments, meaning that learners would be presented with appropriate questions for their level of confidence. An incorrect answer would mean the subsequent question would be less demanding, a correct answer meaning a more challenging question was presented next. This would mean that students would be better able to show what they can do, rather than being confronted with material that was too complex, or too straightforward. Adaptive tests also require instant marking, so can be free from biases and nuance, increasing the reliability of their outcomes.

We know that teachers' understanding of individual students' knowledge gaps is not always complete – and the problem is that if some of these core concepts are not understood at an early stage, they will prevent learning later. This creates stress for the young person and a strain on the school, which has to focus scarce resources on targeted catch-up for the student. Instead, adaptive assessment can help teachers understand earlier on which concepts students have not fully mastered, allowing teachers to focus on those then and there, rather than trying to catch up on them years later.

AlphaPlus, now owned by AQA, is the lead contractor for national testing in Wales and Scotland. They utilise on-screen assessment to give teachers information about their students, rather than for external accountability measures. They have large databases of questions, and an algorithm judges which questions should be presented to each student. If they are answered correctly, the student gets harder questions; if not, different questions are presented before the student can progress further: this allows the programme to assess the level a student is at, as well as giving teachers an idea of the student's 'strengths' and 'weaknesses.'

An easily run, flexible, gamified experience coupled with formative assessment of teaching and learning holds the potential for a truly engaging way to help develop the numeracy, literacy and digital fluency skills for all learners.

On-demand and When-ready:

Finally, the assessment needs to be 'when-ready' and on-demand, so that students can sit it when it is appropriate for them, avoiding the need for large-scale assessments of entire cohorts, as we see during the summer exam series for GCSEs.

By being on-demand and taken at any time between 14-19, it will be aimed at the individual student. A confident and proficient learner might take them at 14 for example; another learner might take them at 18. Like the driving test, they could be taken as many times as necessary for a learner to be able to demonstrate the required level of competence and allow more time to gain a solid foundation in core numeracy, literacy and digital fluency and build their confidence. An assessment that is digital could be accessed anywhere, mitigating the adverse effect of physical presence on achievement.

If a learner did not pass at the first attempt, the on-demand nature would mean they could focus on the areas they needed to develop and – when they felt confident – could take it again without having to wait. Further, if the assessment were modular, learners could take each module at their own pace and proceed through the different assessments when they were ready for each part. There are still questions to be answered and practicalities to work out and we will be thinking carefully about whether modularity would be beneficial and practical to implement.

A final benefit to being on-demand is that it could be sat again later, to enable learners to brush up on their skills. Our current system of assessment assumes that numeracy, literacy and digital fluency skills acquired by 16 are banked permanently by young people, to be rolled out when needed. The time from someone sitting their GCSEs and entering the workplace can be several years, leaving a question of whether they retain the numeracy, literacy and digital fluency skills they acquired when studying for their GCSEs.

An on-demand assessment would mean anyone, at any stage, could retake a literacy or numeracy assessment to see whether their skills and knowledge were still up to standard – even if they had passed previously.

A final benefit to being on-demand is that it could be sat again later, to enable learners to brush up on their skills.

What others propose and why we disagree

Some critics of the current system argue the solution is to reform GCSE Maths and English to have a greater emphasis on core numeracy, literacy and digital fluency. GCSEs have evolved since their inception in the 1980s and will continue to do so in future. It is perfectly possible that a shift towards numeracy, literacy and digital fluency could occur in future, although there are trade-offs involved.

All specifications of qualifications are a balance between particular knowledge and skills. A move to focus on one area in particular would lead to another area being removed. The strength of the current GCSE content is that it is well understood and provides strong grounding in the knowledge required to do further study at higher levels. A move towards more fundamental numeracy, literacy and digital fluency within GCSEs could mean sacrificing higher-level knowledge and skills which lay important groundwork for further study – for example at A-level.

The current GCSE framework was designed as an assessment for all young people in a specific age cohort at the end of their secondary schooling, with grades given based on how well a candidate performed in the assessment. GCSEs inform selection decisions post-16, when the majority of students change institution. Without national exams at 16, how students move from 11-16 to college could need radical overhaul. This system for delineating between candidates within an age cohort enables further and higher education providers and employers to work out which individuals within the cohort may be more suited for particular further study or employment. While this is useful, it is difficult to use it as a proxy for fundamental literacy and numeracy for everyone, even though that is sometimes how GCSEs are used.

There are also calls for a reduction in the number of GCSEs used in performance measures. Proponents of this point of view argue that high-stakes summative assessment place additional pressure on timetables and reduce the time available to focus on core skills. Many critics flag the onerous nature of taking numerous academic qualifications, and the limiting effect it can have on the curriculum.

It is perfectly possible that a shift towards numeracy, literacy and digital fluency could occur in future, although there are trade-offs involved.

Currently, the accountability framework requires eight different qualifications under the Progress 8 measures and five traditionally academic subjects make up the EBacc suite of subjects. Some suggestions for improvements focus on reducing the number of required subjects and qualifications, to free up space for other areas of study. A trade-off for reducing the required number of subjects could in fact be a narrowing of the curriculum, particularly hitting the lowest-achieving students. By reducing the number of required subjects and re-focusing on firm foundations in numeracy, literacy and digital fluency, this could mean many low-achieving students spend a large amount of their 14-16 education studying two topics. This would take away the opportunity to study the natural world, the past, or drama, removing the chance to have a passion for a particular subject ignited, or to experience joy and wonder in a lesson.

Reforming performance measures by reducing the number of required qualifications in the hope it would remove the tall trees of Progress 8 subjects to allow other subjects to spring up in the clearings is a nice idea in theory; but it is not clear whether it would have the desired effect. "Build it and they will come" – or in this case 'remove it and others will come' – will not necessarily work in practice.

While achieving a Level 2 standard is an important threshold, it is not the be-all-and-end-all. Having a Level 2 in English and maths does not reliably show skills in oracy, and how well someone can articulate their ideas both in writing and through spoken language. Similarly, it can be difficult to know how proficient an individual is with digital programs or how confident they are using the latest technology and interrogating data they find online. It is for these reasons that we do not argue in favour of the arguments outlined above, but instead call for a new style of assessment process which complements the existing qualification landscape.

Conclusion

Numeracy, literacy and digital fluency are hugely important skills used in every aspect of our lives at work, at home and beyond. Without the ability to read, write and add up, people struggle to be fully functioning members of society. They struggle to know how much filling up their car will cost, how to read instructions for medications, or make sense of the digital world. These skills are fundamental, but far from basic.

There is a clear and persistent problem in England with low levels of numeracy, literacy and digital fluency among the population. There are many good qualifications out there at the moment, doing different things, but we believe that to truly raise the level of numeracy, literacy and digital skills in this country and to properly engage all students in a meaningful and beneficial way, a new type of assessment that is on demand, for all students, and which focuses on the workplace, is needed.

This is why AQA – as the largest provider of exams in England – is calling for the change that needs to be made. Reforming our assessment system is one part of the solution, but one which can have a significant impact. A new assessment, aimed at demonstrating numeracy, literacy and digital fluency, taken whenever the learner is ready between 14-19 or even as an adult, de-coupled from high-stakes exams, has the potential to reap huge rewards. This would be an on-demand, when-ready assessment focused on core knowledge and concepts needed by all young people. We propose to explore the potential of creating a numeracy assessment as the first phase of this work, to work as a proof of concept and demonstration of what is possible, before moving to develop literacy and digital fluency assessments at a later stage.

We are realistic in proposing this recommendation, however. We know it is not a magic wand, a panacea for all educations' ills. We have a duty to ensure that people are equipped with the skills they need to be fully functioning members of society, and this new style of assessment could help to move us in the right direction.

We are excited to work on developing this further and scoping out potentials and hope you will join us in these discussions as they develop. There are still questions to be answered, not least around what someone should be able to do if they are 'literate' and 'numerate.' The assessment constructs need rigorous further development as to precisely what they should cover, and what 'good' performance would look like; in short, what we would like learners to demonstrate.

In the first instance, we would welcome views and feedback on this project and the potential it has for supporting the development of numeracy, literacy and digital fluency in young people in England. We will be approaching each area sequentially, working on numeracy first, before focusing on literacy and digital fluency subsequently. We will convene an expert advisory panel in early 2024 to guide and shape the development of the new assessments of numeracy, literacy and digital fluency throughout the process of design, piloting and implementation.

In parallel, and in consultation with the expert steering group, we also plan to develop a basic model of learning for the constructs and an approach to standard-setting and maintenance to allow us fairly, validly, and consistently to classify candidates' performances on the on-demand tests. Potential approaches need to be carefully explored and tested. It is important we get them right, because we want these products to be as fair and trustworthy as should be expected of a product with AQA's name on it.

The future of numeracy, literacy and digital fluency in England can be bright, and we look forward to playing our part in making it so.

For any further information
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