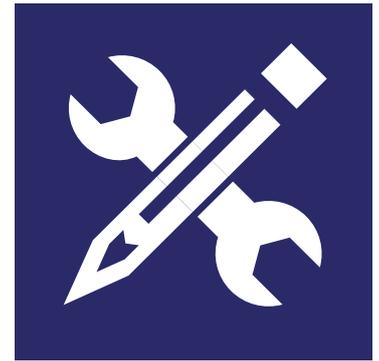


Developing skills



The opportunity

We are building on some strengths in our education system. We have an additional 1.8 million children in good and outstanding schools than there were in 2010³⁸. We had a record 2.4 million apprenticeship starts in the last Parliament, and we are on track to deliver a further 3 million by 2020³⁹, with closer links to employers through the new apprenticeship levy.

The UK has one of the most accomplished higher education systems in the world, with three universities in the top 10 in international rankings and 12 in the top 100⁴⁰. A university education was once reserved for a small minority of school leavers; it is now estimated that around half of all 17-year olds will participate in higher education by the age of 30⁴¹. The United Kingdom has a larger proportion of people with degrees than the OECD average⁴². The Government's Higher Education and Research Bill, currently before Parliament, will build on strengths of the UK's universities, put in place a 21st Century regulatory framework and enable innovative ways of learning.

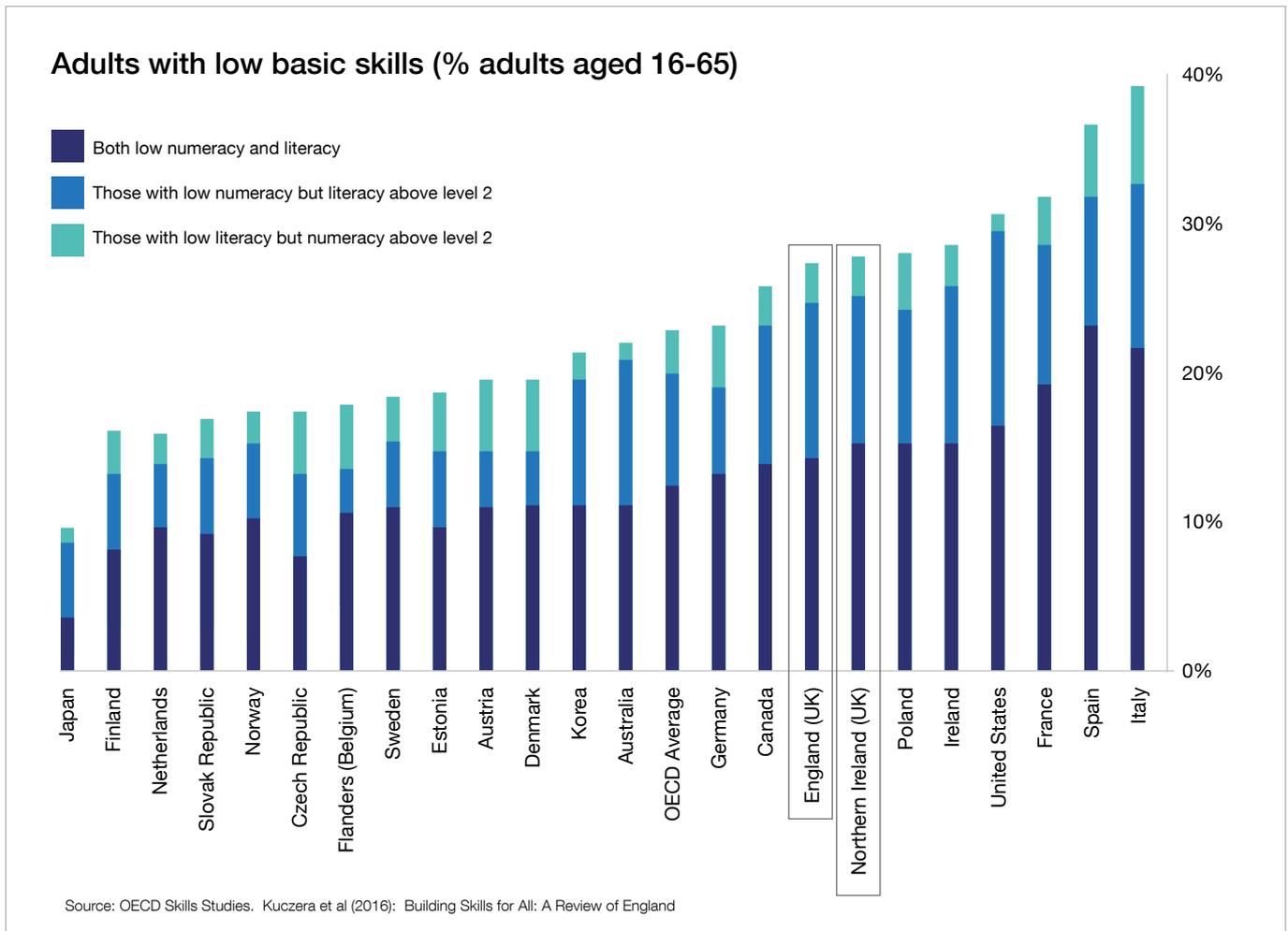
Raising skill levels is an important way to drive higher incomes over the long term. The Government has a key role to play as the major contributor to investment in skills but it is not the only player. It needs industry to help shape qualifications and the curriculum – for technical qualifications in particular – to ensure they are

useful to future employers, and needs more involvement of industry experts in delivering technical education to drive up standards. The new Apprenticeships Levy ensures business invests in apprenticeships, and it puts business in control of apprenticeship provision. Companies invest in skills and training for their own staff and in some cases, such as PhD funding, business and government are jointly providing skills investment. A modern industrial strategy can help create the right framework to incentivise business to invest in skills alongside public investment.

The challenge

While our higher education system has its strengths, our poor performance in basic and technical skills is key to the UK's persistently lower levels of productivity compared with other advanced economies. Skills shortfalls in some parts of the country contribute to imbalances in productivity in the UK, as shown in a recent CBI report⁴³ highlighting education and skills as the biggest determinants of regional variations in productivity.

Apprenticeships aside, technical education for those not pursuing the academic path has fallen behind. The existing system can be complex and confusing, which often does not deliver either for individuals, for the skills needs of employers, or for the wider economy. Our failure to address skills shortages has increased our reliance on flows of migrant labour.



There is progress now being made but we need further action to address a number of key issues:

First, there remain significant **problems with basic skills**. England is the only OECD country where 16 to 24-year olds are no more literate or numerate than 55 to 64-year olds⁴⁴. In 2011, 49 per cent of adults had numeracy levels at or below those expected of an 11-year old, and 15 per cent were at or below this level for literacy⁴⁵. In 2011 to 12 our 16 to 18-year olds were the worst performing on literacy and second worst for numeracy out of 18 OECD countries⁴⁶. Within the next two decades, 90 per cent of jobs will require some digital proficiency, yet 23 per cent of adults lack basic digital skills⁴⁷. This is a barrier to people fulfilling their potential and to a more productive workforce.

Second, we have a **shortage of high-skilled technicians below graduate level**. Reflecting the historic weakness of technical education in the UK, only 10 per cent of adults hold technical education as their highest qualification⁴⁸, placing us 16th out of 20 OECD countries. Unlike academic education, the progression path between levels of technical education is insufficiently clear, meaning that around 125,000 young people in each year are studying for qualifications at the same or lower level than they have already achieved⁴⁹. Students face a bewildering choice of thousands of qualifications, some of which are poor quality. Both students and employers find it difficult to select the option that adds most value to their career ambitions.



While there is good provision, too many of our further education (FE) colleges only offer a broad, generalist curriculum at lower qualification levels; the sector has too little provision of higher level technical qualifications.

Third, we face particular **shortages in sectors that depend on science, technology, engineering and maths (STEM) skills**.

For example, nearly half of businesses report a shortage of STEM graduates as being a key factor in being unable to recruit appropriate staff⁵⁰. The number of STEM undergraduates has been increasing over the last few years, but there remains unmet demand from employers. We must ensure the higher education sector is able to meet this need.

Fourth, there are also skills shortages specific to certain **sectors**, which force some employers to look overseas to fill certain vacancies. Even with shortfalls in STEM skills and technical education addressed, we could be left with shortages in particular specialisms – such as those faced by the nuclear industry – unless we develop a better system to identify and fix emerging gaps.

Fifth, we need to do more to empower students, parents and employers to make **confident and informed choices** about their education and careers options, whether they are in schools, technical education or higher education. The quality of careers advice is a particular issue for disadvantaged students who lack the social capital to get advice or work experience opportunities via family members⁵¹.

Finally, the accelerating pace of technological change means there is a growing challenge with **lifelong learning**: supporting people to up-skill and re-skill across their working lives. People are living and working longer, but training across working life is going down. The world of work is changing too, with one study stating that 35 per cent of existing UK jobs estimated to be at high risk of replacement by technology in the next 10 to 20 years, particularly at medium-skill levels⁵². Older workers and low to medium-skilled groups are less likely to undertake learning opportunities and adults in the highest socio-economic groups are twice as likely to participate in training as those in the lowest⁵³.

We need to address these concerns at the same time as we continue to drive up the number of good school places in every part of the country.

Our approach

To meet the six challenges set out above we propose the following actions:

1. Action to improve basic skills

A key part of any effective technical education system – as well as any academic education – must be a firm grounding in basic skills. In the last five years, the Government has taken steps to improve literacy and numeracy at all stages of education. For under-16s, the national curriculum and GCSEs have been reformed to be more stretching at the top, and to provide better assurance of core literacy and numeracy than previous standards.

The Government has also introduced the requirement that every 16 to 18-year old who achieves a ‘D’ grade or below in GCSE English and maths should continue to study these subjects, resulting in a significant increase in young people retaking their GCSEs.

There has been progress, but the challenges set out above show more needs to be done to help students achieve their potential.

Emerging evidence from Professor Sir Adrian Smith’s independent review into post-16 maths provision points to a number of areas where action will need to be taken to improve basic mathematics provision in FE colleges. A total of 70 per cent of young people who do not achieve A*-C GCSEs in these vital subjects and who go on to full-time post-16 study, do so at FE colleges. Yet still too far many of these young people fail when they retake them⁵⁴.

So the Government is reviewing the effectiveness of current policy to help as many young people as possible leave compulsory education with a good standard of maths and

English. We will explore how to support FE colleges to be centres of excellence in teaching English and maths, spreading teaching and curriculum best practice as has been done successfully in the schools system. We have also recently asked the Education Endowment Foundation to expand their remit to cover post-16, specifically investigating what works in relation to teaching and learning in English and maths for disadvantaged students in FE colleges. We welcome the work to date of the Behavioural Research Centre for Adult Skills and Knowledge, a collaboration with the Behavioural Insights Team. The Centre’s pioneering work has provided insight into how behavioural science can be used to help learners with basic skills.

There is also an issue with the number of young people with weak basic skills who ‘churn’ through a series of low-level vocational and other qualifications that do not prepare them for further study or employment.

So through the Skills Plan, published in July 2016, we committed to putting in place a ‘transition year’ at age 16 for students who have substantial basic skills gaps and are not ready for more advanced study or employment. This is a major step forward, providing intensive support in basic skills for those who need it most and reducing significantly the numbers of young adults at risk of leaving full-time education without the skills needed for employment. The primary purpose of the transition year will be to develop achievable career plans and the skills needed for them, including numeracy and literacy. For some, the transition year will be an opportunity to ‘catch up’ with their peers before progressing to technical education the following year; for others it will be about developing the skills to make them more employable and continuing their education in the workplace. The transition year will help ensure no-one drops out of education at the age of 16.

A recent report by Ipsos Mori/Go ON UK⁵⁵ found that more than 10 million adults in England lack basic digital skills. New legislation being introduced through the Digital Economy Bill will mean that, where it is offered, basic, publicly-funded, digital skills training will be available free of charge to those adults in England who need it.

We will also work to improve digital skills among those still in education. We will work with the Institute for Apprenticeships and Technical Education to determine what digital content will be included in the new technical education routes.

2. The creation of a new system of technical education

If we are to boost growth and address regional imbalances in our economy, we must also create a proper system of technical education – as exists in countries such as Germany and Norway. This system, which will sit alongside the academic track, will benefit in particular the half of our young people who do not do A-levels or go to university, and those parts of the country where more people take a technical track. Reforming traditional FE into a new system of technical education means the following changes:

(a) Clear, high quality routes for technical education

A high performing technical education system needs a clear, simple framework of high standard qualifications that enable progression up through different skill levels and into skilled employment.

The Skills Plan was the start of a major programme of reform to address the UK's long-term structural failings in this area. It accepted the recommendations of the independent panel led by Lord Sainsbury for a new framework for technical education.

Commitments in the plan build on key features of international exemplars, including Denmark, Germany, the Netherlands, Norway and Singapore. Rather than having thousands of qualifications, and some low quality, we are creating 15 core technical “routes” which will be defined through rigorous labour market analysis. This will be the fundamental basis for our technical education system. Each route will start with high quality two-year programmes for 16 to 19-year olds and extend to the highest skills levels, leading to full professional competence in a number of defined occupations. Students will be able to progress on the routes either through an apprenticeship or college-based provision.

It will be essential for routes to be led by employers to meet the needs of our industrial strategy. Government will have the first employer panels to design and develop the new qualification requirements up and running this spring, with the first routes delivered in September 2019. In addition, it is our aspiration that every student undertaking one of the technical education routes in college will be entitled to a high quality, substantive work placement. This will give these students the opportunity to develop the knowledge, skills and behaviours required for work, making them more attractive to employers and generating a future pipeline of skilled labour. We will be launching pilots with employers and colleges later in the year to test and learn how to roll out such work placements more widely.

(b) High quality technical education providers with excellent teaching

A high-quality technical education system needs high-quality and resilient colleges and other providers to deliver it. The reforms outlined in this chapter will represent a major endorsement of the crucial role that FE colleges play in the economy, and will represent a major development in what they teach, with the opportunity for more training at higher levels and wholly new qualifications designed to meet the needs of industry.

The new technical routes and expanding apprenticeships, especially at higher levels, will increase the need for excellent teachers who have a strong industry background and high-level specialist and technical knowledge.

We will work with the sector to explore ways to attract more industry specialists to work with and in the sector to increase the quality of this training.

(c) Higher level technical education and new Institutes of Technology in all regions

Students should have a clear view of their progression, whether to higher levels of training including undergraduate and post-graduate degrees, or to direct entry into skilled employment.

We will create a clear single framework of approved technical qualifications at Levels 4+ (above the equivalent of A-level standard) based on standards developed by employers and overseen by the Institute for Apprenticeships

and Technical Education. This will allow young people who have studied for technical qualifications for full-time education to progress to higher skill levels. We will work with qualification providers and learning institutions to ensure new courses are developed to enable part-time and distance learners to participate, to appeal more to those already in the workforce looking to re-skill or up-skill.

Further to these measures, the Government recognises that it needs to do more to stimulate provision at higher technical levels and make the infrastructure available to support this teaching.

The Government will support the creation of new Institutes of Technology. These institutes will increase the provision of higher-level technical education, which only exists on a limited scale in the UK today, to ensure that it is available in all areas. For example, a person could study a level 3 (A-level equivalent) at a local college, before moving on to study a higher-level technical qualification at an Institute of Technology in a nearby city.



The Government has already announced it will create a network of Institutes of Technology to ensure we have sufficient provision targeted at delivering high-quality technical education at higher skills levels, tailored around the needs of employers in local areas. The Government will provide £170 million of capital funding to deliver this commitment.

These institutions will help to deliver excellence in technical education across the country, providing students with a clear route to employment or higher education. They will harness the expertise of local employers, both in leadership and design of the curriculum, to fill local skills gaps.

We would expect most Institutes of Technology to grow out of high-quality provision. All Institutes of Technology would be expected to: specialise in technical disciplines (such as STEM) that are aligned to technical routes; offer high quality provision at levels 3, 4 and 5 (i.e. the equivalent of A-level to just below degree); and have a local focus to deliver qualifications of value that meet the skills needs of local employers.

Within this framework there will be flexibility for Institutes of Technology to adopt different models suited to their local needs. We have worked with stakeholders to test the viability of some delivery and governance models. The lessons learned from this work will feed into the process to be launched this year to establish new Institutes of Technology.

(d) Ensuring Technical Education routes are demanding

We need to ask more of post-16 education and training to ensure that everyone has the chance to develop the skills crucial to their future and the economy. This is central to the Government's mission to make Britain a country that works for everyone, not just the privileged few.

Further education students currently receive fewer than 17 hours per week of tuition over a 36-week teaching year, compared with over 27 hours per week typically within schools pre-aged 16⁵⁶. We know high-performing countries often have bigger and broader programmes, some with nearly twice as many hours: at least 30 hours a week in Shanghai, 27 in Singapore, 26 in Canada and 28 in Norway⁵⁷.

The Sainsbury panel on technical education recommended that teaching the new routes may, in some cases, require more specialist expertise, rather than teaching existing lower-value qualifications. The Government will review how we can best deliver the increased level of ambition we have for the new routes, including whether there are ways to drive up quality and make the new routes more demanding.

For those people aged 19 or older we will review the current loan system for technical education and the various restrictions on accessing it. We have also consulted on and are reviewing the option to create maintenance loans for technical education.

(e) Creating a course-finding process for technical education similar to the UCAS process

Effective information and support should be available for everyone, regardless of their education and training choices. People choosing apprenticeships or courses in colleges currently face significant complexity when selecting and applying a course. Applications for higher education institutions, in contrast, are much more straightforward, with a way of searching and applying for courses similar to the UCAS process. We will therefore explore how to give technical education students clear information and better support throughout the application process, with a similar platform to UCAS, which will also make it easier for students to compare options in technical education and higher education.

3. Addressing STEM shortages

As well as addressing the UK’s weakness in technical education, we need to address across the board shortfalls in STEM skills and the issues these cause. The Government has committed to make Britain the best place in the world to study maths, science and engineering. In March 2015 the Government announced a five-year package worth £67 million to train an additional 2,500 specialist maths and physics teachers, and to improve the skills of 15,000 non-specialist teachers in those subjects.

Professor Sir Adrian Smith’s review of post-16 mathematics has identified that one factor contributing to the shortage of STEM skills is the take up of advanced mathematics qualifications, including A level mathematics, further mathematics and core mathematics. We have already made substantial progress on this since 2010: the proportion of people studying mathematics is now at its highest ever level, and it is the most popular A-level. But there is significant regional variation and students in some areas are much less likely to progress to A-level mathematics than their peers in other parts of the country. There are significantly more students studying advanced mathematics in London and the South East than other parts of the country⁵⁸.

The review will propose solutions to these imbalances and the wider challenges that reduce progression to A-level and other important maths qualifications. These include both cultural factors and practical barriers, including financial ones, for schools and colleges. Furthermore, the proportion of girls studying A-level mathematics and physics still lags behind that of boys significantly⁵⁹.

Maths free schools such as Exeter and King’s College London, have the potential to drive up standards in the subject and ensure advanced mathematics education is available to pupils who might not otherwise be able to access it. The Government will consider how to enable this model to spread and deliver benefits for mathematics education in their wider community. We will seek partners to open mathematics schools of this kind across the country.

Furthermore, there is also evidence of increasing demand in STEM subjects within higher education, with UCAS acceptances for full-time undergraduates in these subjects growing by 19 per cent between 2010 and 2016⁶⁰. The Government already recognises the importance of support in this area through the subsidy paid to higher education institutions via Higher Education Funding Council for England (HEFCE) to incentivise provision of high-cost, mostly STEM subjects.

Proportion of those who achieved A*-C at age 15 studying level 3 maths at 16 (by local authority).

LAs with highest L3 maths participation local authority		LAs with lowest L3 maths participation local authority	
	% study L3		% study L3
Reading	57%	Wakefield	15%
Sutton	46%	York	15%
Harrow	45%	Blackburn with Darwen	14%
Barnet	45%	Salford	13%
Redbridge	43%	Barnsley	13%
Wokingham	42%	City of Kingston Upon Hull	12%
Brent	42%	Middlesbrough	12%
Enfield	40%	Knowsley	7%

To deliver a world-class industrial strategy we will want to encourage the education sector to increase opportunities in grow STEM subjects even further.

4. Identifying and addressing sector-specific skills gaps

The actions set out above, taken together, will help deliver the long-term surge in skills that this country needs. They will tackle, over time, the legacy of historic underperformance. But we know that there are also acute and urgent skills shortages in key industrial sectors including infrastructure and the nuclear industry. In some sectors – for example digital and rail – action is already being taken through the creation of sector-specific national colleges. The Transport Infrastructure Skills Strategy (published in January 2016) and taskforce are driving jobs and skills in roads and rail across the country.

We recognise that previous efforts by the Government and industry to forecast skills shortages have lacked the accuracy to enable timely and effective action, and that further action could be taken to ensure that we can better identify and address future shortages.

Part of the problem has been the lack of a single authoritative source: the UK Commission for Employment and Skills (UKCES), the Low Pay Commission, the Migration Advisory Committee, and individual sectors have produced assessments focused on their specific remits. But no organisation has been tasked with identifying persistent or emerging sector specific gaps and proposing action. We will now work towards a single, authoritative view of the gaps faced by the UK now and in the future.

5. Higher quality careers information and advice

Our improved education and skills system must be supported by high-quality careers provision. We know that young people who are uncertain

or unrealistic about career ambitions at the age of 16 are three times more likely than their peers to spend significant periods out of education, employment or training⁶¹. And teenagers who have direct experience of the labour market (such as through careers talks at school), earned more in adulthood than those who missed out⁶². Good careers advice is particularly important for young people from disadvantaged backgrounds, who may have less informal information, contacts and support on which to draw⁶³.

We have made a good start by investing £90 million over this Parliament to support young people in accessing the advice they need. The Careers & Enterprise Company's Enterprise Adviser Network is now live – connecting 1,300 schools and colleges with local employers to provide experiences of the workplace for young people. The Government will consider what more we can do to involve businesses in providing experience of different careers.

But we need to go further if everyone is to get the information, advice and guidance they need to succeed. Careers provision continues to be patchy and inconsistent – both in schools and in later life. The amount of time invested by adults in training mid-career is going down, while employers' investment in training has been in decline for two decades despite numerous attempts to reverse the trend.

The Government is reviewing the current careers offer for people of all ages, and will build on the best international evidence to publish a comprehensive strategy later this year for careers information, advice and guidance.

6. Testing new approaches to lifelong learning

For busy people in work with family commitments, the barriers to retraining or gaining higher qualifications can be considerable. A recent review by the Department for Education identified significant declines in training with age, and in work-

based training; and that poorer or less well-educated groups are less likely to undertake it. Perceptions of affordability and attitudinal factors (such as a lack of confidence) are key inhibitors.

However, the increasing pace of technological change means it will be increasingly necessary for people to retrain during their careers. To connect more people to opportunities to retrain, we will test ambitious new approaches to encourage lifelong learning, which could include direct outreach with busy people, particularly where industries are changing or in decline. We will trial the use of ‘contact moments’ people have with the Government to promote opportunities to retrain and we will consider the role of community learning centres as part of this. In addition we will review the option to introduce maintenance loans for higher technical education, of the kind the Government already supports in higher education.

We will also explore how to bring together information on training opportunities, costs, government support and likely employment benefits, in order to increase take-up of skills training. This will include better signposting and promoting online training that be accessed as needed by users.

As part of the Government’s higher education reforms we will look to promote opportunities for students to transfer between courses and institutions. Opportunities to transfer offer more options for students wishing to continue with their studies later in life and will contribute to raising higher level skills among people of all ages.



Developing skills

Actions under way:

- We are moving forward with **schools reforms**, consulting on our plans for a new, fair National Funding Formula for schools.
- We are delivering more, higher-quality **apprenticeships** and introducing the Apprenticeship Levy to bring in investment needed in our young people.
- Through **the Sainsbury Review** and the **Skills Plan**, the Government has set out its plan to radically simplify the thousands of vocational qualifications into a smaller number of high quality new routes.

New commitments:

- We will create a **proper system of technical education**, to benefit the half of young people who do not go to university and provide new, better options for those already in the workforce. This involves creating a small number of high quality new routes, as set out in the Skills Plan, and attracting more industry specialists to work in the sector to raise the quality of higher skills training.
- We are committing **£170m of capital funding to the creation of prestigious new Institutes of Technology** to deliver higher technical education in STEM subjects and meet the skills needs of employers in local areas.
- We will explore how to **support further education colleges to be centres of excellence in teaching maths and English**.
- We will explore how to **give technical education learners clear information**, which could include a way of searching and applying for courses similar to the UCAS process.
- Professor Sir Adrian Smith's independent review of post-16 mathematics will propose measures to improve take up of mathematics and **close large regional imbalances in take up of advanced mathematics**.
- We will consider how to enable the specialist maths school model pioneered by Exeter and King's College London to spread. We will seek partners to open mathematics schools of this kind across the country.
- We will explore further encourage the uptake of STEM subjects to help meet unmet demand and build on the growth of recent years.
- We will work towards a **joined-up, authoritative view of the sector specific skills gaps** that the UK faces now and in the future.

- We will publish a **comprehensive careers strategy** later this year to radically improve the quality and coverage of careers advice in schools and colleges, to make it easier for people to apply for technical education, and to give people the information they need to access training throughout their working lives.
- **We will explore ambitious new approaches to encouraging lifelong learning**, which could include assessing changes to the costs people face to make them less daunting; improving outreach to people where industries are changing; and providing better information.
- We will take further actions to **address differences in skill levels between different areas** to help drive economic growth and opportunity throughout the country (explored in later chapters of this paper).

Questions for consultation

10. What more can we do to improve basic skills? How can we make a success of the new transition year? Should we change the way that those resitting basic qualifications study, to focus more on basic skills excellence?
11. Do you agree with the different elements of the vision for the new technical education system set out here? Are there further lessons from other countries' systems?
12. How can we make the application process for further education colleges and apprenticeships clearer and simpler, drawing lessons from the higher education sector?
13. What skills shortages do we have or expect to have, in particular sectors or local areas, and how can we link the skills needs of industry to skills provision by educational institutions in local areas?
14. How can we enable and encourage people to retrain and upskill throughout their working lives, particularly in places where industries are changing or declining? Are there particular sectors where this could be appropriate?