

The  
**Sir Richard  
Sykes** Review

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# Introduction

The Sir Richard Sykes review group was asked to consider the future of the English qualifications and assessment system in schools, specifically in relation to academic qualifications.

Confidence in the qualifications and assessment system has been diminishing for many years. The usefulness of the system has been eroded by the politicisation of assessment outcomes, by universities' loss of confidence in A levels as a certificate of readiness for university-level study, by employers' loss of confidence in GCSEs and A levels as certification of relevant knowledge and skills, and by the disproportionate burden placed by external assessment on pupils, teachers and schools. The volume of external assessment has also grown enormously. For the great majority of pupils nationally it now encompasses the entire curriculum, at age 16 and again at age 18. For many there is another full assessment at 17; and widespread external assessment at 15 is imminent. This process has undermined the credibility of teacher and school assessment, as well as limiting and undermining teaching.

A country's examination system reflects the wider role of schools in society. The commission considers the pre-eminent role of schools should be to educate. This may seem too obvious to be stated. However many of those who gave evidence commented that a prescriptive assessment-driven curriculum, the examinations framework and the nature of the measures used and targets set by government have forced teachers to abandon education (in its true sense) for easily measurable proxies. There is an obsession with measurement, setting quantitative targets and compiling league tables, as though what cannot be measured numerically has no value and should have no place in education. Yet the best things in education often cannot readily be measured in this way.

This conclusion was also reached by the Select Committee for Children, Schools and Families, whose chairman, Barry Sheerman, commented:

*“In an effort to drive up national standards, too much emphasis has been placed on a single set of tests and this has been to the detriment of some aspects of the curriculum and some students”.*<sup>1</sup>

We hold the optimistic view that an increased emphasis on education in its true sense, with a correspondingly reduced emphasis on testing, is not merely entirely compatible with higher educational standards, but is a precondition for them. We therefore present a discussion and a set of recommendations which if adopted would, we believe, help to redress the balance between education and assessment. They would restore the usefulness of qualifications to universities and employers, and, therefore, to pupils; increase the time available to and the freedom enjoyed by schools and teachers to teach and stretch their pupils, and restore confidence in the assessment skills and judgement of teachers and schools, and the standards achieved by our secondary schools.

## Summary

The commission reviewed the major examinations taken at 16 and 18, with a particular focus on academic qualifications. In each case it considered what the major aims of the examination should be, how well those aims are met, and what reforms might lead to a better experience for the students, teachers, employers and universities involved.

### A levels

A levels have always been the main route to higher education for English students. As University entrance examinations, A levels must primarily do two things – indicate how much candidates know and understand, and provide a means for selective universities to accept one candidate over another.

We concluded that A levels currently fail to achieve those aims. They do not certify clearly in terms of coverage, or develop higher-level skills adequately. They also do not allow universities to rank and select students effectively and fairly, for a variety of reasons.

Problems arising from structures (especially modularisation) have been compounded by the policy of ‘equivalence’, between subjects in a given qualification, and between qualifications. This has meant not only that every A level has the same structure imposed on it, regardless of the needs of the particular subject, but that qualifications are all assigned an arbitrary ‘worth’ on a points scale. This is confusing for students, particularly those without a detailed knowledge and family history of higher education.

**Recommendation 1. All higher and further education institutions should publish clear and specific information on the qualifications they accept and prefer.**

**Recommendation 2. The government should cease to publish ‘average point scores’ achieved by school and college students at A level. However schools and colleges should publish information about qualifications achieved and the destinations of those taking 16-18 qualifications – a more meaningful measure of achievement.**

**Recommendation 3. UCAS and universities should be encouraged to work together to increase the transparency of the relevance and application of any tariff to individual courses and so help 15 and 16 year olds make appropriate choices for 16-18 study.**

The increasing scale of higher education and diversity of post-16 qualifications have made selecting between candidates extremely difficult. Other countries with selective and differentiated universities use standard universal tests that give universities an additional tool to rank and evaluate applicants. We believe that a similar test in the UK, to be used by universities as they see fit, should be considered. Fair methods of ranking candidates on a single scale are highly desirable given the inevitable lack of real comparability among the enormous range of post-16 qualifications.

**Recommendation 4. The Government should consult with universities on the benefits and challenges of developing a standardised University Admissions Test, to supplement A level and other grades and assist with ranking decisions. It should also consult on the benefits and costs of other approaches to ensuring fair consideration of candidates with different combinations of A level subjects or other qualifications, in the context of a move away from the current equivalence-based approach. If commissioned by Government, a University Admissions Test should measure language, mathematics and reasoning skills.**

To encourage swift adoption by universities, and ensure that all schools help students to prepare for the test, a test result could be made a requirement for any applicant for a student loan or grant.

It should also be remembered that A levels are predominantly used for entrance into higher education and must therefore be *of use to universities*. This means that they must not only allow universities to discriminate between candidates, but must also certify that students have sufficient knowledge to begin a degree. What this means will vary from subject to subject, and from university to university.

Since universities are the major users of A levels, they should have considerable input into their content and their structure. The primary determinants of the content and form of A levels should be the requirements of the subject and of the users of the qualification (students and higher education institutions/employers). We therefore recommend a significant deregulation of the current system, and more specifically:

**Recommendation 5. Awarding bodies should, in consultation with universities and employers, be free to develop new qualifications appropriate to the needs of these key user groups. This means that they should be free to offer qualifications at varying levels of difficulty without interference from Ofqual or any other government body unless there is specific cause for concern.**

**Recommendation 6. This freedom should extend to the structure of qualifications and their assessment. For example, syllabuses should no longer automatically be modular or ‘unit-based’ in format; the structure, as well as the nature and content of examinations, should be decided subject by subject through consultation with subject experts in universities and with other qualification users. In particular it should no longer be required or expected that AS levels should be a component of A levels. Alternative paths could be developed for those pursuing A levels through longer-term part-time study, where a modular approach might remain more appropriate.**

**Recommendation 7. Awarding bodies should not be required to have post-16 qualifications accredited, although they may wish to do so. Ofqual should have the power to intervene only where it has been advised (for example by Ofsted or by universities, colleges or employers) that a qualification is failing to provide a minimum standard or is undermining confidence in the examination system.**

**Recommendation 8. Awarding bodies should publish details of whom they have worked with or consulted on their qualification syllabuses and examinations, and universities should publish recommendations on the qualifications which meet their admission requirements and the subjects in which students should be prepared.**

We recognise that the changes recommended here would take time to develop, implement and be fully understood by schools and students. Nevertheless we think it is important that the limitations of current equivalence claims be fully understood, and action taken to reverse their current distorting effects as soon as possible, for example by disseminating information about the relative difficulty of qualifications more widely.

## **GCSEs**

The review group believes that the debate over GCSE examinations has been confused by the conflation of two matters; what should be taught to and learned by the 14-16 age group, and what should be *externally assessed*. As a result of confusion, there is strong pressure on schools to enter pupils for as many external examinations as possible at age 16, although at the same time, there is little indication of what should be examined; whether pupils study history or ICT is a matter of official indifference. While this is not a curriculum review, we believe that the curriculum requirements for 14-16 year olds need to be revisited.

More specifically we do not believe that pupils' entire curriculum requires expensive, time consuming external accredited assessment at this interim stage.

**Recommendation 9. Over time the extent of external assessment at age 16 should be reduced to the minimum needed to maintain the quality of school education, provide information to employers and educational institutions and confirm school-based assessment of pupils.**

Some schools might still choose to enter pupils for multiple qualifications at age 16, but on the basis of their value to the pupil, not because of distorting incentives arising from equivalents, school targets and league tables.

**Recommendation 10. In the core subjects of English and mathematics, external assessment at age 16 should continue to be regulated. The knowledge and understanding required should be applicable to all pupils, clearly specified, published by Ofqual and made available to parents, universities and employers. Achievement at a particular level would become a recognised 'currency' for the pupil.**

The review group considered whether a national examination, administered from the centre, would be advisable in mathematics and English. However we believe that any government would be tempted to use that examination to justify its own performance, and that confidence in its reliability would suffer as a result. We believe a contract with an awarding body, awarded every three years, could be an alternative. At the very least, there must be consistency across awarding bodies on what constitutes the *minimum* satisfactory achievement in mathematics and English.

We recognise that schools must be monitored and held accountable to ensure pupils are receiving an adequate education. We do believe that current accountability systems need improving, but do not consider that this requires or justifies the vast infrastructure of GCSEs and other age 16 qualifications.

**Recommendation 11. Beyond English and mathematics, the form and content of external qualifications should be determined by the users of qualifications rather than by government.**

At the moment schools are required to set targets for and are measured against the number of children achieving 5 A\*-C including English and Maths and against the average number of GCSE or "equivalent" points per pupil. While the current 5+ measure represents a significant improvement on previous measures, this still amounts to measuring schools on quantity, not quality. It creates a number of damaging incentives: to steer pupils towards 'overvalued' qualifications, especially those with multiple GCSE equivalence; to enter pupils for as many qualifications as possible; and to enter pupils for overlapping qualifications, for example GCSE science and BTEC science, or GCSE and another qualification in IT.

**Recommendation 12. Current accountability systems need reform. The current "5+ A\*-C GCSE including English and mathematics" measure should no longer be the main measure for school accountability. Achievement in the core subjects of English and mathematics should be recorded separately and used for accountability in conjunction with a range of other measures.**

Finally, contextual value added (CVA) measures are an attempt to respond, within the league table culture, to a genuine and important issue; namely the greater challenge that some schools face, compared to others, in improving the academic achievement of their pupils. However, the implied precision of these measures is, in fact, spurious, and the measures are therefore unfair to schools and teachers, and to pupils and parents making use of them.

**Recommendation 13. Wide performance measures (value added, CVA, average point score) should not be calculated unless it can be demonstrated that there is real underlying validity to the methodology, including the methodology for valuing different qualifications and different subjects within the same groups of qualifications.**

As with A levels, we recognise that the changes recommended here will take time to develop and implement. It will take time, for example, for new national English and Mathematics testing to be established, and to agree on improved approaches to ensuring school accountability. However, we think it is important that the limitations of current equivalence claims be fully understood, and action taken to reverse the distorting effects of current practices as soon as possible.

## **Vocational qualifications and alternatives to GCSEs and A levels**

Because most vocational qualifications are the shared responsibility of the DCSF and BIS they fall outside the core remit of this review. We note that these qualifications have been subject to particularly intense oversight and regulation in recent decades, and also to direct and repeated design and redesign by government agencies, with consistently poor results. Many vocational qualifications are available to, and taken by, 14-19 year olds and the same basic changes should apply here as to academic qualifications.

**Recommendation 14: Changes in the regulation of qualification structures, and in the use of points scores and equivalences, should be applied to vocational and semi-vocational awards for young people, in parallel with those recommended for GCSEs and A levels. In particular, the imposition of the Qualification and Credit Framework on any qualifications available to young people should cease.**

## **Regulation**

The recommendations made in this report would lead to a major reduction in the examination burden on teachers and pupils, and to far greater freedom for awarding bodies to devise their own qualifications in consultation with users. This implies a corresponding simplification in the regulatory superstructure.

Furthermore, in the field of assessment and qualifications, regulation has proliferated through multiple ‘agencies’, ‘offices’ and ‘authorities’, all used by government to oversee a controlling, centralised, approach. In the 14-19 sector, this has been achieved through many codes of practice, accreditation procedures, rules and regulations, and the use of panels of ‘experts/advisers’ (often anonymous), leading to outcomes which are difficult to challenge.

We believe that the role of a regulator should be redefined to clarify that it is responsible for checking that relevant processes are followed consistently, and not for micro-management and detailed design of individual qualifications. Proven regulatory regimes from other sectors provide good examples of procedures and codes of practice.

**Recommendation 15: The regulatory role should be limited to maintaining confidence in the integrity of the examination system by:**

- **Monitoring the processes by which awarding bodies develop qualifications, and maintain their standard and value.**
- **Ensuring administrative competence and fairness of awarding organisations (examination boards) in the conduct of examinations and in awarding.**
- **Ensuring reliability of the system.**

While it is beyond the scope of this report to provide a detailed blueprint for change, we suggest that the following specific changes follow from these general principles.

**Recommendation 16: Appointments of Chairs and CEOs of the regulatory body should be scrutinised independently of government; and the body should follow the Regulators' Compliance Code, a standard code adopted by comparable regulatory regimes elsewhere.**

**Recommendation 17: The main role of the regulator should be to monitor and accredit awarding organisations, not the individual qualifications they produce. Unless there is a clear contrary indication, it should be assumed that qualifications offered by an accredited awarding organisation are of an acceptable standard. The requirements for awarding body accreditation should not include detailed requirements as to the structure and size of individual qualifications offered.**

**Recommendation 18: The regulator should have the power to respond to concerns about the conduct of awarding organisations, including issues relating to the quality of individual qualifications, accuracy and transparency of information and anti-competitive practices.**

**Recommendation 19. Universities, employers and other relevant bodies should be fully involved in qualification design and implementation. Awarding bodies, which will have considerably more freedom, should be fully transparent as to which bodies they work with in qualification design and implementation.**

## **Curriculum**

The review group was asked to focus on qualifications and assessment. While the curriculum is outside this remit, what is taught and what is assessed are clearly connected.

The National Curriculum, despite recent attempts to increase its flexibility, remains an enormous burden on teachers. The review group commends the excellent recent report of the Children, Schools and Families Select Committee which drew attention to the excessive burden still placed by the curriculum. We believe that the proposals recommended by the Committee have merit, particularly the recommendation that schools should be allowed to opt out of all but core subjects.

Several of those giving evidence to the review group pointed out that pedagogy, rather than content, dominates the national curriculum; teachers are told how to teach, even more than what to teach. Curriculum changes are also made with unnecessary frequency, which is confusing and time-consuming for schools and teachers. We recommend a model of periodic review by an independent expert body, to eliminate the undesirable consequences of endless tinkering by government.

**Recommendation 20. The Government should appoint a fully independent commission to revise the curriculum once every five, or preferably ten years, with no curriculum modification in between reviews save in exceptional circumstances.**

Outside a mandatory core, what should be in the school curriculum is necessarily subjective and best left to local decisions at school level. However we note that the current emphasis on balance in what is offered in schools ("curriculum entitlement") is not leading to balance in individual subject choices, and relatively few pupils are studying history, geography or modern languages after the age of 16.

Many of those giving evidence to the review group, from schools, awarding bodies and other organisations, expressed dissatisfaction over the *type* of prescription in the curriculum. Too much of the curriculum is about how things should be taught or learned, or what types of things to learn, rather than the end product; in other words, what pupils should know.

**Recommendation 21. When next reviewed, the National Curriculum should be shortened and re-balanced to emphasise content over context-free skills. Schools should be given greater discretion over how to teach that content and given the room and freedom to teach beyond the curriculum.**

We believe that the changes outlined above would save money, give schools and teachers crucial freedom and flexibility and ensure that external assessment served pupils, employers and universities well while maintaining accountability.

# What is assessment for?

Assessment has many functions. For school-age students the primary purposes are:

- Certifying achievement
- Ranking students
- Providing feedback and diagnostic information to teachers, pupils and parents.
- Holding teachers, schools and government accountable to their constituencies.

In addition, assessment is used as a lever by governments to control what is taught in schools.

In the last two decades an implicit and damaging assumption has developed that all examinations and tests can and should be used for all these purposes. This has led to a proliferation in examinations and complexity. Last year school examination fees *alone* cost the taxpayer over £265 million – a 70 per cent increase on just 5 years earlier.<sup>2</sup> But the proliferation of examinations is costly in other ways:

**Time.** Educational time is lost to tests and exams themselves, to preparation classes, to study leave, and to ‘dead time’ after summer term examination sessions. This adds up to many months of school time for every student over their school career.

**Educational experience.** Perhaps most importantly, the excessive use of ‘high stakes’ examinations means that taught curricula narrow to that which can be easily measured in an examination.

**The review group believes that by considering these purposes more fully, and using different assessment for different purposes a more sensible balance between testing and teaching will be reached and exams will become better suited to their users.**

## **The major purposes of assessment**

For students and education organisations assessment has three main purposes – certifying achievement, ranking students and providing feedback and diagnostic information. The Government uses it for entirely different and often more questionable purposes. The first is accountability – which is important but can create enormous distortions. The second is as a tool for controlling what teachers teach, how and when.

### ***Certifying achievement***

Exams and tests which lead to a nationally recognised certificate or qualification should measure what a student knows and can do. Examples include whether students know enough mathematics to start a science degree successfully, or to practise as a doctor. Most vocational qualifications focus largely or entirely on certification. Academic examinations often combine certification with other purposes. Examinations for certification need to be wide-ranging, covering all the body of knowledge, understanding and skills being certified.

### ***Ranking students***

Some exams are primarily used to determine entry to an institution or occupation with limited places and many applicants – they therefore rank students. The American SAT is an extreme form of a test used for ranking: students receive a mark from 0-800 in each subject, finely gradating between candidates. In the UK, A-level grades are the main tool used by universities to rank applicants for admission.

### ***Providing motivation, feedback and diagnostic information to teachers and pupils***

Regular assessment is an essential part of good teaching practice; it informs teachers about the effectiveness of their teaching and about the needs of their students; and it informs students about their progress and areas of strength and weakness. Examinations also motivate students to work hard, while encouraging them to focus on the requirements of the examination. While motivation is important, this can discourage broader learning.

### ***Holding teachers, schools and government accountable***

The government uses Key Stage tests and GCSE results as the main accountability mechanism for schools. Schools and teachers are measured, to a considerable extent, on their ability to get children through these tests and exams. The government also uses performance in tests over time, and across the country, to measure its own achievements and claim success.

### ***Controlling what is taught in schools***

If exams are high stakes for schools – because of the government’s use of results to hold them accountable – then they determine what is taught to a very large degree. They are also used as a means of direct control, in that maintained schools may only enter pupils for government-approved qualifications. A main theme in the evidence of most of the people consulted for this review was the **excessive use of examinations as a policy lever**.

## **The process of the review**

For each of the major examinations taken in an English pupil’s school career we have asked:

- What are the aims of the examination?
- How well is the examination performing against those aims?

We have identified several ways in which examinations, especially GCSEs and A levels, are failing, in their current form, to fulfil their purpose. Our recommendations focus on these key problems. While there are other issues associated with examinations and assessment we believe that the changes we recommend, if taken alongside other reforms already planned and announced, will improve examinations’ fitness for purpose, and reduce the ways in which they currently distort the education system.

## **A levels**

A levels are the best known qualifications for post-16 school and college students, as well as the main route into higher education for English students. A levels were introduced in 1951, replacing the Higher School Certificate; they are now taken by 72% of final year students taking a full “level three” qualification.<sup>3</sup> A levels were originally designed for the simple purpose of preparing students for university and professional occupations. Many revisions later, they are trying to serve many purposes: an ‘end of school’ certification of achievement, a general entry to further study in higher education, subject-specific preparation for advanced study, and a ranking mechanism for selective degree courses.

They do not appear to be achieving those aims. For example there is now considerable dissatisfaction in parts of the maintained sector and also in the independent sector with A levels, as a result of which an increasing number of schools are moving to alternatives such as the Pre-U and the International Baccalaureate.

## What should the aims of A levels be?

A levels are still mainly used as a gateway to university entrance, and 76 per cent of students taking A levels go directly to university.<sup>4</sup> Their key purpose is to provide information about students' knowledge and understanding, and to assist universities in making fair selection decisions.

**How much do candidates know?** Whatever a student's destination, a school leaving qualification should be a reliable indicator of what that student has studied, knows and can do. A levels should provide information on students' knowledge at all levels, and encourage students to acquire and extend their knowledge and skills. They should also provide information about the students' understanding of the subject and their ability to integrate their knowledge and understanding and apply them to problem solving and other tasks.

For the majority who will proceed to university, it is important to remember that British universities mainly offer degrees that are both highly specialised and short, just three years for many undergraduate degrees. As a result, strong prior knowledge is an important prerequisite for many courses, particularly in the sciences, mathematics and languages.

**Why should I pick this candidate over another?** Many university courses have more applicants than places and must select from among them. AS levels and predicted A levels are a major source of information on the *relative* performance of candidates.

For some non-graduate occupations A levels may also be used for selection. However employers typically devise wider selection procedures that do not rank applicants by A level grades alone.

**Other purposes.** It is not clear what other purposes A levels currently serve. They are of limited use in holding schools accountable, as many do not have sixth forms, and the examinations taken at 17 or 18 are much more varied than at 16. For the same reason, they are a poor measure of national performance.

## How well do A levels certify and rank?

### **Certification.**

Current A level syllabuses specify content and assessment in considerable detail; the associated examinations are marked carefully and reliably, and teachers and students know what is required. Nevertheless a number of important limitations are apparent.

**Certainty of coverage.** A particular grade does not guarantee that a student will have mastery of a particular area of the syllabus, which can be a problem for university courses requiring prior knowledge. This is also problematic for employers, who may be hiring young people for their mathematics, science or language skills and cannot get clear information about what an A level pass *means*. This is not a new problem, but none of the examination reforms of the last few decades have resolved it.

**No depth of knowledge and understanding.** What A levels currently certify is inadequate for the demands of some university courses. As a recent report by the think tank Reform pointed out, the problem is not the breadth of knowledge and understanding but the depth. Students are less able than preceding cohorts to synthesise knowledge, despite curriculum reforms intended to promote these skills. This is reported by almost all universities, not just the highly selective<sup>5</sup>. This may in part be due to content which would once have been covered by age 16 now having to be covered in A levels.

Modularisation of A levels has contributed to this loss of depth, and encouraged compartmentalisation of

knowledge, reducing the opportunity for students to develop the ability to integrate information.

**Lack of development of higher level thinking skills.** The Reform report also noted students' decreasing ability to think critically and independently, despite curriculum changes intended to promote such skills. One response to this has been the new Pre-U qualification recently launched by Cambridge Assessment, after consultation with schools and academics, to provide a linear qualification which 'challenges students to show not only a keen grasp of their subject, but also lateral, critical and contextual thinking'.<sup>6</sup> It is disappointing that many universities no longer believe that A levels test these skills, and that there was therefore high demand for the Pre-U.

**We conclude that A levels, as currently organised, are not fully meeting the certification requirements of users.**

### **Ranking**

A levels are currently used to rank students in two ways.

- **Within subjects:** for example, they indicate which candidates for French A level are stronger and which weaker.<sup>7</sup>
- **A universal ranking of A level candidates:** UCAS and government league tables treat A level grades in different subjects as equivalent to each other (as they do grades on other 'equivalent level' examinations covering different subject areas, such as Diplomas or, in the past, GNVQs). Grades are given point scores, which are added together in order to compare students who have taken different A levels and different qualifications.

As with certification, a number of important problems are apparent.

**A level grades do not discriminate effectively among high-achieving students.** A levels cannot rank students at the high ability end. This is because the range of attainment covered by an A-grade is extremely wide. In some more academically demanding subjects, it may be unrealistic to expect students achieving in the lower end of this A grade band to succeed in higher level study.

Furthermore, last year more than 26,000 candidates achieved three As at A level or equivalents;<sup>8</sup> enough to fill the entire intake of eight to ten universities. This has led to annual claims of unfairness as many universities are obliged to turn away candidates who are apparently as well qualified as they could possibly be.

An A\* grade is being introduced at A-level to allow discrimination between high-achieving candidates. However the adoption of an A\* grade is likely to have a marginal impact for several reasons. First, given the pressure that universities are under to admit more disadvantaged and state-educated pupils, they are unlikely to make much use of A\* offers (or of underlying module marks) if this would increase the proportion of offers made to pupils from independent schools. Secondly, A level syllabi do not necessarily promote the qualities and knowledge required by some university courses. Because of this, some of the more selective courses are already developing and using their own selection tests, at added expense. There is a real possibility that the number of different tests will increase rapidly. For example, the National Admissions Test for Law is compulsory for an increasing number of Russell Group universities. Several who originally resisted its introduction have felt obliged to reverse their decision.

**Modularisation and re-takes.** A levels have been redesigned as modular qualifications to make it possible for more students to achieve certification and raise their grades through re-takes of individual modules. We recognise that there are some advantages to modularisation: it allows more students to achieve a given level of certification.

However modularisation makes it difficult for A level grades to be used as a proxy for a student's ability to do well in advanced study. This is especially true of a system which permits 'tactical' retakes in a module which has already been passed. For example, the review group heard evidence of students retaking easier AS modules in which they had already achieved an A, in order to gain extra marks, and more leeway in the more difficult modules. Wider certification has been achieved at the expense of effective ranking. **Modularisation also increases the proportion of student time spent on narrow test preparation rather than on wider learning.**

**A levels are an imperfect predictor of future performance.** While A levels are reliable measures of current knowledge, students with high potential who have been poorly taught will be disadvantaged in a ranking based entirely on A level grades, even though they may have the capacity to outperform others.

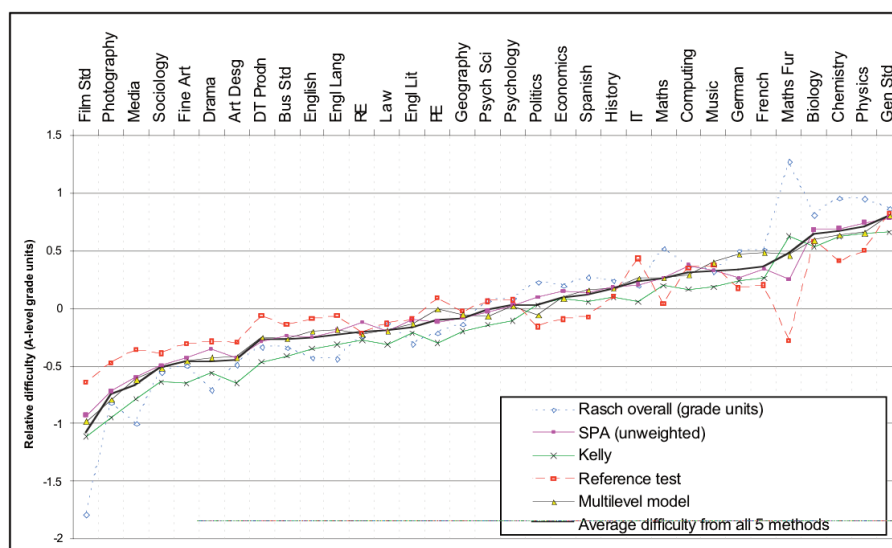
**Ranking through A levels is inefficient and expensive.** A levels are designed to certify reliably and are structured as extensive, in-depth assessments across their entire curricula. Furthermore A levels are not comparable in the nature or extent of their intellectual demands.

**Alternatives are increasingly being preferred.** Led first by independent schools (who are not constrained by government restrictions on qualifications) and subsequently by state schools, and following pressure on QCDA to accredit the qualifications, two alternatives aimed at the upper end of the A level cohort are growing in popularity:

- The International Baccalaureate. The number of entrants has increased by 42 per cent in the last two years in independent schools.<sup>9</sup>
- More recently, the Pre-U, developed by Cambridge Assessment to cater to high ability pupils preparing for university. The QCDA accredited the examination only after it became clear that hundreds of private schools would use it.

**Equivalence judgements distort ranking processes.** The belief in equivalence across qualifications and subjects has many undesirable effects in education. In the context of ranking students at 18, the use of fixed equivalences fails to recognise that most qualifications have different values in different contexts. This applies between different subjects within the same family of qualifications as well as between different families of qualifications. For example, to rank candidates to study medicine, an A level in English literature should be less valuable than an A level in chemistry or biology; similarly a music A level should have high value for any music course, but might reasonably count for less in ranking students to study, for example, ecology.

In addition, there is considerable evidence that all A levels are not equally difficult. Research by the CEM centre at Durham University has demonstrated very clearly that there is a difference of 1-2 grades between the hardest and the easiest academic subjects.<sup>10</sup> Differentials of this size mean that direct grade comparisons even across A-level subjects are of limited value.



*Relative difficulty of examinations in different subjects*

These problems have been compounded by the extension of equivalence ‘judgements’ well beyond A levels themselves. Following the doctrine of equivalence, the government encourages UCAS and others not only to give equal weight to all A level subjects but also to attribute precise values on the same scale to all other qualifications, even music and ballet exams often entered by primary school pupils.

This is not a judgement on particular qualifications, or an assumption that academic is ‘better’. Many vocational qualifications are excellent. They are, however, used for different purposes. One of the unfortunate consequences of rigid equivalence is that vocational qualifications have been ‘academicised’ so that they are less useful for the student, the employer and further and higher education institutions. Rather than how much a qualification is ‘worth’ in general terms, the question should be how good it is for its specific purpose. UCAS (University and Colleges Admissions Service) is the organisation that manages most applications to higher education courses in the United Kingdom. It publishes a tariff attributing points to nearly all recognised post-16 qualifications, illustrated below.

### UCAS points – what can count

Examples comparing the top grade in a range of qualifications are given below. Universities may make offers on the basis of UCAS point scores, although some give specific grade and subject offers instead.

Qualification	AS level	Music Grade 8	A level	Advanced Diploma (progression plus extended project)	GCE (vocational A level) in applied ICT (dual award)	BTEC National Diploma
Grade	A	Distinction	A*	A*	A*	Distinction
UCAS points	60	75	140	420	280	360

This tariff reflects the concept of universal equivalence, with a single point score to be attributed to a given grade in a given qualification for all purposes. It takes no account of known variability between subjects within a qualification.

A level point scores are also ‘capped’ compared with other qualifications. The tariff reflects the political objective of raising the status of vocational qualifications, as shown by the attribution of the same value to a double award vocational A level in applied ICT as to two academic A levels. The new Diplomas developed and launched by the government have been given a value of 3 A levels; and the government has advertised an Extended Diploma as being ‘worth’ 4½ A levels.

For all these reasons the tariff is a defective instrument. Ranking decisions made on the basis of the tariff are unlikely to be fair except in the context of students with a very similar mix of qualifications and subjects, and even then will be affected by the problem of the breadth of the A grade, noted above. For universities which are using ‘total point’ scores, especially at clearing when they are under extreme time pressure, this is highly problematic.

**We conclude that A levels, as currently organised, cannot adequately fulfil the ranking function currently expected of them.**

## **What is going wrong, and why?**

We believe that most of the major problems with A levels (and other 16-19 qualifications) stem from an increasing politicisation of assessments, characteristic of successive governments.

In particular governments have used qualifications as a primary lever to force educational and social change, and as a means of demonstrating their purported success in raising attainment. Many efforts have been made to use vocational qualifications to raise the status of vocational education, as discussed further below. The establishment of the equivalence framework for qualifications was intended to facilitate these objectives, and also to simplify the complex task of allocating funding for post-16 study. Attributing a fixed point score to every given qualification at a given grade appears to solve the problem of measuring across a landscape of large numbers and many types of qualification; but it does not.

More generally, trying to use all examinations for all purposes is, as we argued above, misguided. In this context, it has led to some unfortunate consequences, which are making A levels less useful rather than more useful for some of their purposes.

### ***Distorting qualifications***

The substance, credibility and usefulness of many worthwhile qualifications is damaged by the requirement to assign fixed context-free values, and to make them ‘look’ as similar as possible, and so justify equal weighting in equivalence frameworks.

The structure, assessment and in some cases the content of A levels have been changed for these reasons, without regard to the demands of the relevant subject. So all A levels are now assessed through the same number of modules; and content has been modified or removed to avoid the need to apply knowledge from one module in another module. These changes were not driven by the awarding bodies, but were imposed on them by the QCA. Similarly the requirement was imposed that students be able to retake units many times. Vocational qualifications, as discussed further below, are also being distorted by the ‘equivalence drive’.

### ***Distancing universities from A level content***

Examination boards were originally established, and run, by the Universities. Over time they have been consolidated, often with direct involvement by government, and become awarding bodies with limited links to universities. As part of this process, control of qualification content and assessment has moved away from awarding bodies into successive government agencies, the QCA and now the QCDA and Ofqual.

As a result, even though universities are the main ‘clients’ for A levels, academics, heads of department and universities generally have surprisingly little say in the content and form of A level curricula or the structure of the examinations.

The same is true for those employers who use A levels for selection: little account is taken by the relevant agencies of employer feedback on the usefulness of A levels as general preparation for work or as certification of knowledge, understanding and skills needed in the relevant job.

A comparison between A level and the Pre-U highlights the difference between university and government expectations of post-16 academic study. In the evolution of A levels, academics unhappy with the negative consequences of modularisation were powerless to protect the interests of universities. By contrast, the Pre-U is an independently designed, synoptically assessed qualification created in response to school and university demand. The government and QCA were not formally involved until presented with a finished product for accreditation.

### ***Misdirecting students and schools/colleges***

The wide application of the equivalence framework can actually be deeply unfair to the pupils involved. Those with poor careers advice and less well-informed parents may choose less demanding qualifications of apparently equivalent usefulness that then limit their prospects unnecessarily.

Schools are also affected. League tables are published recording the average point score per student and per examination. Given the defects already noted in the equivalence framework, these tables are virtually meaningless, except as between institutions with very similar student groups and subject offerings. But they give schools an incentive to steer students into the courses in which that pupil is likely to achieve the highest point scores – or at least not to encourage them to take harder courses. Schools recognise that this is a pernicious incentive, and no good school or teacher wants to misadvise a pupil. Yet subject entry data suggests that this may in fact be happening.

### ***Reducing effectiveness of ranking for university selection***

In a competitive university entrance system, which has an enormous impact on students' life-chances, it is imperative that universities be able to discriminate clearly and fairly between candidates on the basis of ability to make best use of advanced study. This has become increasingly difficult.

The way in which the tariff is currently published, used and endorsed increases pressure on universities to admit students who are actually unprepared for their courses, since if they turn away those with qualifications that meet tariff expectations, but actually do not prepare students for advanced study, they are likely to be limiting access by pupils from disadvantaged backgrounds. So far only two universities (Cambridge and London School of Economics) have published explicit guidelines on which A levels they regard as providing inadequate foundation for university study.<sup>11</sup>

**Recommendation 1. All higher and further education institutions should publish clear and specific information on the qualifications they accept and prefer.**

### ***Unhelpful claims of success***

Inevitably, increases in the number of students achieving three As at A level, and in the number of 'points' gained per student, have been used by government to claim success and justify policy. British governments are uniquely obsessed with standards over time; research has shown that other countries do not have this tension.<sup>12</sup>

These increases in fact worsen the apparent unfairness of university admissions, since if the supply of university places does not expand as fast as the supply of students with a given clutch of A level grades, it will appear that younger cohorts are being disadvantaged. This may not actually be the case.

The question of whether overall gains in achievement are real, or the result of changing curricula, standards and assessment, is actually irrelevant at the level of the individual student. The A level is supposed to serve as a ranking examination for University entrance, as well as a certification of knowledge. To achieve this aim, it must differentiate adequately among individual applicants, in a clear and fair manner, without being distorted by other demands made on it.

### ***Inequitable restrictions on state schools***

Maintained schools are currently restricted in the qualifications they can offer their pupils. This is leading to a two-tier system in which some of the most academically demanding qualifications are only available to independent school pupils. This is clearly inequitable and undesirable.

### **What can be done?**

First of all, we believe that the current system of equivalences and of league tables based on point scores is poorly founded and should be abolished. We do however recognise that universities, in particular, but also employers need some way of comparing students who have taken very different school courses, and we therefore make concrete proposals for a new way of achieving this. We also believe that there should be some indication of the relative difficulty of subjects, which is most easily achieved by a single comparison of all candidates.

**Recommendation 2. The government should cease to publish ‘average point scores’ achieved by school and college students at A level. However schools and colleges should publish information about qualifications achieved and the destinations of those taking 16-18 qualifications – a more meaningful measure of achievement.**

UCAS – owned by universities – is free to publish a tariff, and we recognise the potential value of such a tariff if well founded – especially during university clearing. However, as already noted, the current English system makes claims about equivalence for which there is no factual basis. The most disadvantaged pupils are the most likely to be harmed by this process, since they have fewer alternative sources of information on what universities and employers actually value, or on what substantive requirements are made by different degrees.

**Recommendation 3. UCAS and universities should be encouraged to work together to increase the transparency of the relevance and application of any tariff to individual courses and so help 15 and 16 year olds make appropriate choices for 16-18 study.**

Academics and examination boards have, over the years, carried out a great deal of work in the area of test score and examination equating.<sup>13</sup> These have established that there is no satisfactory way of ‘translating’ performance on very different courses and examinations into a simple shared metric. What can be done, however, is to use a test which measures material of relevance to all students, and use student performance on it to obtain an approximate idea of the relative difficulty and demands of other subjects. This is similar to an approach taken by the research programme at Durham, using GCSEs to compare A levels;<sup>14</sup> but universities cannot carry out this sort of research themselves every year for their own applicants. A British UAT, or University Admissions Test, which tested general English and general Mathematics skills, would allow them (through UUK or UCAS) to obtain a profile of different subjects in terms of candidates’ SAT scores, and also to evaluate individual students. This would have the additional advantage that students would carry on with some mathematics and English beyond 16.

A number of countries already use such a test; and we note that they share with the UK a system of differentiated universities, and competitive entry for courses. The American test (the SAT) is the best known, and work has already been carried out in this area by the NFER,<sup>15</sup> using a modified version of American material. It has established that such an examination can indeed add useful information about individuals to that available from A level results. However, the group was particularly impressed by the experience of Sweden and Israel, which have a national curriculum, and national certification systems.<sup>16</sup> Use of such a test as part of the university entrance system has not undermined the importance of subject-based assessments.

We believe that the introduction of a UAT would provide a very helpful way of ranking candidates on a

single scale. This would in no way make subject prerequisites or subject performance irrelevant; both are needed. We would once again underline the experience of other countries in this respect.

**Recommendation 4. The Government should consult with universities on the benefits and challenges of developing a standardised University Admissions Test, to supplement A level and other grades and assist with ranking decisions. It should also consult on the benefits and costs of other approaches to ensuring fair consideration of candidates with different combinations of A level subjects or other qualifications, in the context of a move away from the current equivalence-based approach. If commissioned by Government, a University Admissions Test should measure language, mathematics and reasoning skills.**

This should have the incidental benefit of increasing the proportion of pupils studying mathematics at some level post-16, on one of the pathways recommended in Making Mathematics Count.<sup>17</sup>

To encourage swift adoption by universities, and to ensure that all schools help students to prepare for the test, a test result could be made a requirement for any applicant for a student loan or grant.

We believe this test would best be provided by a single examination board, on a renewable contract.

#### **Recommendations for A levels**

If universities are the major users of current A levels, they should have considerable input into their content and their structure. The primary determinants of the content and form of A levels should be the requirements of the subject and of the users of the qualification (students and higher education institutions/employers). We therefore recommend a **significant deregulation of the current system**, and more specifically:

**Recommendation 5. Awarding bodies should, in consultation with universities and employers, be free to develop new qualifications appropriate to the needs of these key user groups. This means that they should be free to offer qualifications at varying levels of difficulty without interference from Ofqual or any other government body, unless there is specific cause for concern.**

**Recommendation 6. This freedom should extend to the structure of qualifications and their assessment. For example, syllabuses should no longer automatically be modular or ‘unit-based’ in format; the structure, as well as the nature and content of examinations, should be decided subject by subject through consultation with subject experts in universities and with other qualification users. In particular it should no longer be required or expected that AS levels should be a component of A levels. Alternative paths could be developed for those pursuing A levels through longer-term part-time study, where a modular approach might remain more appropriate.**

We would expect, as a result of this, that AS levels would no longer be a standard component of all A levels. Given this increased freedom, it is important that awarding bodies are transparent. We would expect all bodies to publish in full whom they have worked with or consulted and in what context for each qualification.

**Recommendation 7. Awarding bodies should not be required to have post-16 qualifications accredited, although they may wish to do so. Ofqual should have the power to intervene only where it has been advised (for example by Ofsted or by universities, colleges or employers) that a qualification is failing to provide a minimum standard or is undermining confidence in the examination system.**

**Recommendation 8. Awarding bodies should publish details of whom they have worked with or consulted on their qualification syllabuses and examinations, and universities should publish recommendations on the qualifications which meet their admission requirements and the subjects in which students should be prepared.**

The changes recommended in this paper (including those on Regulation: see below) should do a great deal to solve current problems and allow universities to discriminate between students. We do not think that greater freedom for awarding bodies will lead to confusion, and to huge numbers of tiny and ill-understood qualifications. It did not do so in the days before governments directed qualification development.

We do, however, recognise that the changes recommended here will take time to develop and implement, and that schools, and students, will not immediately have access to or develop a familiarity with adequate university and awarding body information. At the same time we think it is important that the limitations of current equivalence claims be fully understood, and action taken to reverse their current distorting effects as soon as possible.

## **GCSEs**

The review group believes that the debate over GCSE examinations has been confused by the conflation of two matters; what should be taught to and learned by the 14-16 age group, and what should be *externally assessed*.

In considering the purpose and value of GCSEs, it is important to recognise that for the many 16 year olds, they are no longer a school leaving certificate: the large majority will achieve some combination of post-16 qualifications. With the exception of GCSEs in English and mathematics, which are of critical importance for both the labour market and university entrance, it is these post-16 qualifications which are of most direct relevance to employers and future educational institutions. In this respect, England is becoming increasingly like other European countries.

The post-16 qualifications of importance to the largest group of students are A levels; for others, diplomas or some other combination of qualifications. It might be argued that GCSEs are particularly valuable for the latter groups in demonstrating the highest level of study they have achieved in important subjects.<sup>18</sup> However, pupils for whom detailed information on academic attainment will be important are also the pupils who are very likely to carry on into the A level cohort, at which point their GCSE subjects and grades will become relatively unimportant.

Across the whole cohort, the dominant preference up to age 16, beyond the core, is currently for an IT qualification (often one with 2-4 GCSE equivalence, offering a strong league table weighting), a semi- or pre-vocational subject such as Business Studies (again often a qualification with multiple GCSE equivalence), together with one or more from the art/design/technology/media/sports groups. Again, in most cases the main post-16 qualification (s), together with English and mathematics qualifications, will be far more important to future employers than the subjects studied to age 16.

That does not mean that other subjects should not be *taught*. The review group believes it is vital that pupils receive a broad education in school which covers the sciences and humanities as well as maths and English. However England is unique in its belief that something cannot be taught or learnt if it is not also externally assessed.

## What should the aims of GCSEs be?

In the current system, GCSEs should be used primarily to:

- Indicate whether the student has sufficient understanding for further study in a particular subject, particularly at age 16-18.
- Demonstrate student achievement across a range of subjects, only some of which will be carried into further study.
- In a small number of subjects, particularly English and mathematics, provide essential information to employers and others, including further and higher education, about individuals' attainment.
- Indicate the success of schools in teaching everyone essential skills.

Only two of these aims, the third and fourth, involve the public demonstration of a clear, consistent and transparent body of knowledge. This is probably why government does not mandate specific subjects for external assessment beyond mathematics, English and a limited science GCSE (which has dramatically changed in content in recent years).

## How well do GCSEs achieve these aims?

The first two aims of GCSEs – indicating to gatekeepers whether a pupil is capable of future study in a particular area post-16, and as an added indicator for universities and employers in selecting applicants – are adequately met by the current structure of GCSE subjects. However the review group believes that this would be true *even with greatly reduced external assessment*.

- Further study. Most students make decisions about their post-16 study before they receive GCSE results, mainly on the basis of school-based assessments and pupil self-selection. Detailed GCSE results add little to the decision, even when students are changing institutions.
- Indication of achievement. For universities, the combination of A/AS level results and the UAT recommended in the previous section would give a good indication of capacity for higher study. For other subjects, teacher assessments could replace external assessment: a high school 'certificate' as exists in many other countries. For employers Mathematics and English are the most important skills, and these are also important to selective sixth form colleges. They should still be externally assessed.

As already noted, the growth of post-16 participation, and acquisition of 'upper secondary' qualifications, has made England more like other European countries. We note that, while it is very common for countries to require some formal testing of core subjects at the end of lower secondary education, nowhere in the world requires formal external assessment to the extent currently practised in England. Furthermore the principal driver for much of this external testing is now the school accountability system, rather than the benefit of pupils, especially in cases when the same pupils will be assessed again in the same subject(s) at age 18. If the accountability system is reformed to align more closely with the interests of pupils, demand for external qualifications at 16 is likely to reduce.

**Recommendation 9. Over time the extent of external assessment at age 16 should be reduced to the minimum needed to maintain the quality of school education, provide information to employers and educational institutions and confirm school-based assessment of pupils.<sup>19</sup>**

We expect that this would reduce the number of external qualifications most pupils are entered for at age 16. However awarding bodies should not be prevented from offering externally assessed and certificated examinations and schools should not be precluded from entering pupils.

If external assessment through pupil qualifications is no longer effectively compulsory across the entire curriculum, the testing burden on pupils, teachers and schools will be greatly reduced in terms of both time and cost.

The review group believes it is vital that pupils receive a broad education in school which includes the sciences and humanities as well as mathematics and English. And clearly there is room for much debate about the necessary minimum of external assessment, both in pupils' own best interests and for the purposes of maintaining school accountability. The committee's view, in the light of practice in other major developed countries, is that there is a range of options that deserves fuller consideration. Obvious possibilities are:

- External assessment in English, mathematics and a specified selection of National Curriculum subjects.
- External assessment in English and mathematics, together with a report of school grades in all other subjects studied. This is common practice in other countries where pupils have a 'grade point average' or GPA in most subjects based on teacher assessment.

We would also expect schools to continue to be inspected on their teaching of a broad curriculum.

### ***How well do GCSEs indicate achievement in the core subjects?***

The third aim of GCSE examinations – providing information to employers and others, including further and higher education, about individuals' attainment in core subjects – is not achieved. Exams where pass marks are very low<sup>20</sup> damage the ability of GCSEs to certificate – if only a small portion of knowledge needs to be demonstrated in the examination, it is difficult to determine exactly which parts students have demonstrated that they know. There is no universal agreement on what constitutes the essential core of English and mathematics; that is, what should be mastered by anyone achieving a C grade at GCSE.

Changes to the syllabus and standards of GCSEs, including the shift to skills-based examination specifications, have also made it very difficult to know what exactly a GCSE at a given C signifies. For example, the QCA publishes a programme of study for Key Stage 4 (ages 14-16) in mathematics which is reproduced at Appendix 2. This shows a strong bias towards skills rather than knowledge. The tone is almost apologetic when the mathematical content is finally made explicit, and the wording makes clear that this content is not a requirement. It is a list from which 'teachers should draw' to teach 'key concepts' (although most of the 'key concepts' listed are skills, not concepts) and 'key processes' such as 'using a range of forms to communicate to different audiences'. It is hard to see how standards could be set which clearly relate such a programme of study to a grading system.

**Recommendation 10. In the core subjects of English and mathematics, external assessment at age 16 should continue to be regulated. The knowledge and understanding required should be applicable to all pupils, clearly specified, published by Ofqual and made available to parents, universities and employers. Achievement at a particular level would become a recognised 'currency' for the pupil.**

In theory it would be desirable to do this through a single all-ability examination. However it should be recognised that, as we know from similar experiments elsewhere, this will exert downward pressure on the required standard, because it will be politically unacceptable to have an examination in which a large number of pupils fail to achieve the required standard.<sup>21</sup>

The review group considered whether a national examination, set and administered from the centre, would be advisable in mathematics and English. However we believe that any government would be tempted to use that examination to justify its own performance, and confidence in its reliability would suffer as a result.

We believe a contract with a particular awarding body, awarded every three years, could be an alternative. At the least, there must be consistency across awarding bodies on what constitutes the *minimum* satisfactory achievement in mathematics and English.

### **What do we lose by not having mandatory external certification for all subjects?**

The view was frequently expressed to us that education has become subservient to assessment.

*The aims for the GCSE listed above are not the primary purposes of being in school until age 16. They only indicate what assessment can achieve. As one of the awarding bodies giving evidence pointed out, examinations should not define what being educated means. Nor should teachers and pupils feel guilty about classroom time not spent on examination preparation. Qualifications are a convenient lever to enforce curriculum change, but they are also a clumsy one – enormous amounts of time in the school year are lost to examination preparation, and what is taught becomes synonymous with what can easily be measured in an examination. The review group heard evidence that science practicals had become both predictable and short in order to meet the demands of coursework without taking away teaching time for the examination.*

There are, of course, some schools – although a small number – which must be monitored and held rigorously accountable in order to ensure pupils are receiving an adequate qualification. The question is whether that justifies the vast infrastructure of GCSEs and other age 16 qualifications.

It is the view of the review group, confirmed by the evidence received, that schools are adequately measured and held accountable by mandatory external tests in core subjects, particularly English and mathematics, by local authority/School Improvement Partner/academy group operator oversight of schools, and by Ofsted inspection. Current arrangements are characterised by all-encompassing qualifications that are themselves subject to very detailed, inflexible and expensive regulation. This environment stifles teaching and innovation and limits pupil opportunities.

### **Recommendation 11. Beyond English and mathematics, the form and content of external qualifications should be determined by the users of qualifications rather than by government.**

This recommendation, if accepted, would free state schools to enter pupils for IGCSEs or other examinations without waiting for a complex accreditation process.

It is key that, as a corollary to these recommendations, the curriculum is revised in order to ensure both flexibility for teachers and a broad education for pupils. This is explored further in the curriculum section.

### **Holding schools accountable: the impact of equivalence**

We entirely recognise that there needs to be a thorough and effective system for holding schools accountable, and that the assessment of pupil attainment is of the utmost importance in any such system. Many secondary schools in England take pupils from ages 11-16, and so some of the main measures of secondary school performance relate to outcomes at age 16. GCSEs and other qualifications are currently used for this purpose.

At this level, as at 18+ a framework of equivalence has been developed in order to make possible all-embracing measures of school performance; of particular importance are contextual value added and average point scores. For these measures, grades in all qualifications (GCSEs and others) are translated into point scores that can be recorded, added and manipulated in various ways. The impact of ‘equivalences’ at GCSE level is different from that at A level but is equally distorting.

This is extremely important because it affects what schools require pupils to take, what they offer them as options, and how they advise pupils on their choices.

The problems arise for several reasons: first because, as noted in the context of A levels, very few qualifications have a society wide, context free value; secondly because the equivalences that have been set reflect politically-motivated pressure to raise the status of vocational and semi-vocational qualifications by awarding them high point scores; and lastly because ill-considered targets create perverse incentives for schools to act against the interest of individual pupils.

For example, the specification for the Edexcel BTEC First Certificate in Applied Science makes clear that virtually any pupil who attends and perseveres should achieve a pass. It is not adequate as a preparation for the study of science at A level, so any pupil who follows this course in preference to GCSE is actually precluded from studying science at a higher level. Yet this qualification is rated as equivalent to two grade C GCSEs in science and additional science; an incontrovertibly more difficult hurdle, which a significant proportion of the cohort is currently unlikely to surmount. The review group heard evidence of schools steering middle and higher achieving pupils towards the BTEC, effectively guaranteeing the school's target outcomes in science, but at the expense of some pupils' interests.

At the moment schools are required to set targets for and are measured against the number of children achieving 5 A\*-C including English and Maths and the average number of GCSE or "equivalent" points per child. This amounts to measuring schools on quantity, not quality. It creates a number of damaging incentives: to steer pupils towards 'overvalued' qualifications, especially those with multiple GCSE equivalence; to enter pupils for as many qualifications as possible; and to enter pupils for overlapping qualifications, for example GCSE science and BTEC science, or GCSE and another qualification in IT. For example, some schools are double-entering groups of higher achieving pupils (for whom the high-scoring BTEC coursework requirements will take up relatively little time) for both GCSE and BTEC science; another has considered putting its entire cohort through the BTEC before embarking on the GCSE course for the higher achievers. It is hard to see such practices as being for the benefit of pupils rather than schools.

In addition, contextual value added (CVA) measures are an attempt to respond, within the league table culture, to a genuine and important issue; namely the greater challenge that some schools face, compared to others, in improving the academic achievement of their pupils. However, the implied precision of these measures is, in fact, spurious, and the measures are therefore unfair to schools and teachers, or to pupils and parents making use of them.<sup>22</sup>

While we recommend removing some unsatisfactory measures (equivalence points, average point scores) it is important that a range of measures be retained. If institutions are held accountable on the basis of a single measure their behaviour is inevitably distorted. For example, in the case of the 5+ measure, the distortion is the loss of the incentive to have any pupil achieve a higher grade than grade C.<sup>23</sup>

**Recommendation 12. Current accountability systems need reform. The current "5+ A\*-C GCSE including English and mathematics" measure should no longer be the main measure for school accountability. Achievement in the core subjects of English and mathematics should be recorded separately and used for accountability in conjunction with a range of other measures.**

**Recommendation 13. Wide performance measures (value added, CVA, average point score) should not be calculated unless it can be demonstrated that there is real underlying validity to the methodology, including the methodology for valuing different qualifications and different subjects within the same groups of qualifications.**

As with A levels, we recognise that the changes we have recommended will take time to develop and implement. It will take time, for example, for new national English and Mathematics testing to be established, and for acceptable ways of demonstrating assessment across the whole curriculum to be agreed. However, we think it is important that the limitations of current equivalence claims be fully understood, and action taken to reverse the distorting effects of current practices as soon as possible.

## **Vocational qualifications and alternatives to A levels and GCSEs**

Because most vocational qualifications are the shared responsibility of the DCSF and BIS they fall outside the core remit of this review. We note that these qualifications have been subject to particularly intense oversight and regulation in recent decades, even by the standards of English education policy, and also to direct and repeated design and redesign by government agencies. The results of this approach strongly support our general conclusions regarding the need for substantial deregulation and a smaller, far more carefully circumscribed role for central government.

Many vocational qualifications are, however, approved for study by young people, as are a number of full-time ‘semi-vocational’ qualifications; typically, these latter qualifications, such as GNVQs, and ‘Vocational A levels’, have been conceived and introduced at the behest of central government, promoted heavily and then summarily abolished.

Government-driven qualifications have generally failed to attract expected levels of enrolment (except where equivalence has made them an attractive way to acquire GCSE points), and it seems likely this will also be the case for the newly introduced Diplomas. At the same time, older awards have survived: BTEC Diplomas for 16-18 year olds, for example, predate any ‘equivalence policy’ and have been the qualification of choice for hundreds of thousands of students, surviving for decades because of sector demand and in spite of government being at best unsupportive and at worst hostile. Their success is evidence for our belief that, in a less centrally-regulated environment, credible and popular qualifications will be developed by awarding bodies. We also note that holders of BTEC awards frequently entered higher education before the current UCAS tariff system was introduced.

Current and recent policy on both equivalence and qualification structure impose rigid requirements on vocational and semi-vocational awards. These are at odds both with actual occupational practices and with the need for these awards to be flexible and easily adaptable to a changing labour market. At present, awards are being forcibly restructured, as part of a major ‘Qualifications and Credit Framework’ initiative conceived and driven by the QCDA (formerly the QCA). This provides for supposed ‘equivalence’ at a micro-level, not only of qualifications but of atomised, credit-bearing units. This will have a direct impact on young people taking these awards, because it will further increase the assessment and record-keeping burden on teachers at the expense of education. It also carries with it claims for equivalence which cannot be supported empirically, and to which all the objections raised earlier in this report also apply.

This review group heard of a number of examples of inappropriate content being introduced into vocational qualifications to make them ‘look’ equivalent to academic ones – detracting from their practical value, and potentially deterring those who do not enjoy academic education from doing them. One example is the addition of written coursework to qualifications for entirely practical qualifications. We were also told of successful qualifications, developed for young people, which had to be entirely and expensively redesigned, with no gain in relevance or validity, because ‘credit framework’ demands tightly constrain the structure and design of all qualifications. The Association of Accounting Technicians told us that ‘The QCF has imposed on us a significant administrative and financial burden with no obvious benefit to our students or employers.’ Overall, the history of vocational and semi-vocational awards for young people indicates that central government agencies are not well suited to the design and direct management of vocational assessment and qualifications.

**Recommendation 14: Changes in the regulation of qualification structures, and in the use of points scores and equivalences, should be applied to vocational and semi-vocational awards for young people, in parallel with those recommended for GCSEs and A levels. In particular, the imposition of the Qualification and Credit Framework on any qualifications available to young people should cease.**

# Regulation

The recommendations made in this report imply a major simplification of and reduction in the examination burden on teachers and pupils; and far greater freedom for awarding bodies to devise qualifications to meet the needs of universities, other educational institutions and employers. This implies a corresponding simplification in and reduction of the regulatory superstructure. The enormous complexity of current arrangements means that a detailed blueprint for such changes is beyond the scope of this report, but we recommend some guiding principles and priorities for reform.

‘Regulation’ and ‘regulatory bodies’ have become a central feature of our education system without any clear and consistent expression of how these terms are defined or the rationale for their existence. A regulation is, at its simplest, an ‘authoritative rule dealing with details or procedure; a rule or order issued by an executive authority or regulatory body, and having the force of law’. In the field of assessment and qualifications, what has developed is an ever-changing cast of ‘agencies’, ‘offices’ and ‘authorities’, all of whom can indeed issue binding orders, and have been used by government to oversee the building of a controlling, centralised, approach to the curriculum, its assessment and ensuing qualifications.

In the 14-19 sector, this has been achieved through a raft of Codes of Practice, Accreditation procedures, Rules and Regulations, and the use of panels of ‘experts/advisers’ (often anonymous), leading to outcomes which are difficult to challenge, and without appeal. For example, at the detailed level of paper-setting, Awarding Bodies are constrained by specifications derived from centrally-set criteria, which in effect determine question characteristics. As the Royal Society of Chemistry has reported to us, one of the most striking features of the current process is that “at each stage there are numerous committees, which draw largely on the ‘secondary educational world’, with little representation from industry, universities or the wider business community.”

This enormous and complex structure, divorced from the actual processes of teaching and examining, helps explain why a succession of initiatives have been imposed on schools, colleges and awarding organisations without any reference to operating effectiveness and efficiency. Moreover this centralised approach puts huge demands on project management capabilities for which the regulatory body (e.g. QCA, NAA) is not skilled or prepared; in consequence the development and introduction of many recent major initiatives (for example, Key Skills, GNVQ, Curriculum 2000, the new Diplomas) have been beset by difficulties and delays. The regulatory bodies have been clearly lacking in the technical and research skills needed if they were to carry out the tasks they have progressively taken upon themselves.<sup>24</sup>

QCA’s role in advising government on curriculum and assessment policy has always sat uneasily with its regulatory role. The rationale for Ofqual as a new regulatory body, as set out in “Confidence in Standards”, had some beneficial pointers but what the legislation establishes is a regulator with enormous powers to oversee every detail of awarding organisations’ activities and which is carrying over, from QCA, requirements for the detailed design of each and every qualification.<sup>25</sup> The regulatory regime is rigid, expensive, and a clear barrier to innovation. Proven regulatory regimes in other areas (eg CAA or Food Standards Authority) may be more valuable models, as may examples from higher education around the world.

A key principle at present is the concept of ‘coherence’, originally expressed as a Governmental general aspiration. However, it has no definition, no clear identity of purpose, no explanation of why it matters or why it should lead to greater value to the system. It is being used to justify a so-called rationalisation of the system, including a reduction in the number of qualifications, and to inform day-to-day accreditation decisions. As discussed above, in our view the development of examinations and qualifications should be in response to the demands and needs of its end-users. Any role for government regulation should follow from, not precede this.

### *A re-definition of the function of regulation*

Because individuals cannot carry out in-depth research on the quality of all organisations and products, governments have traditionally taken on the role of ensuring that producers make truthful information available, and that they operate honestly and fairly. We agree with the Royal Society of Chemistry, who in their submissions to us argued that ‘whatever new systems are introduced, effective regulation is essential’. The Society underlined the extent to which ‘deficiency in regulation has a profound effect on outcomes’ and informed us that, at present, ‘the rigour of regulation weakens the whole system’, which is marked by ‘significant quality assurance issues’ including instructions to markers to accept scientifically incorrect answers.’

We believe that the regulator’s role should be re-defined to clarify that it is responsible for checking that appropriate processes are followed consistently, and not for micro-management and detailed design of individual qualifications. Proven regulatory regimes from other sectors provide good examples of procedures and codes of practice.

**Recommendation 15: The regulatory role should be limited to maintaining confidence in the integrity of the examination system by:**

- **Monitoring the processes by which awarding bodies develop qualifications, and maintain their standard and value.**
- **Ensuring administrative competence and fairness of awarding organisations (examination boards) in the conduct of examinations and in awarding.**
- **Ensuring reliability of the system.**

### *Ensuring reliability of the system*

One regulator of moderate size should be able to carry out these tasks for all non-university awards. Its core role should be to regulate awarding organisations, *not* individual qualifications; it should adopt the core governmental function of discouraging monopolies rather than, as at present, creating a system which militates against innovation or new entries; and it should not be the regulator’s job to determine precisely which qualifications a school, college or other provider may offer.

While, as noted above, it is beyond the scope of this report to provide a detailed blueprint for change, we suggest that the following specific changes are important. They follow from these general principles, and delineate the core activities and structure of a qualifications regulator.

**Recommendation 16: Appointments of Chairs and CEOs of the regulatory body should be scrutinised independently of government; and the body should follow the Regulators’ Compliance Code, a standard code adopted by comparable regulatory regimes elsewhere.**

**Recommendation 17: The main role of the regulator should be to monitor and accredit awarding organisations, not the individual qualifications they produce. Unless there is a clear contrary indication, it should be assumed that qualifications offered by an accredited awarding organisation are of an acceptable standard. The requirements for awarding body accreditation should not include detailed requirements as to the structure and size of individual qualifications offered.**

**Recommendation 18: The regulator should have the power to respond to concerns about the conduct of awarding organisations, including issues relating to the quality of individual qualifications, accuracy and transparency of information and anti-competitive practices.**

**Recommendation 19. Universities, employers and other relevant bodies should be fully involved in qualification design and implementation. Awarding bodies, which will have considerably more freedom, should be fully transparent as to which bodies they work with in qualification design and implementation.**

## The curriculum

The review group was asked to focus on qualifications and assessment. While the curriculum is outside this remit, what is taught and what is assessed is clearly connected and we therefore offer some recommendations of direct relevance to the nature and success of future qualifications and assessment practice.

<b>What is in the National Curriculum?</b>			
<b>Key Stage 1</b>	<b>Key Stage 2</b>	<b>Key Stage 3</b>	<b>Key Stage 4</b>
English	English	English	English
Mathematics	Mathematics	Mathematics	Mathematics
Geography	Geography	Geography	* * *
History	History	History	* * *
RE **	RE **	RE **	RE **
-	Modern foreign languages *	Modern foreign languages	* * *
Science	Science	Science	Science
ICT	ICT	ICT	ICT
Design & technology	Design & technology	Design & technology	* * *
Art & design	Art & design	Art & design	* * *
Music	Music	Music	* * *
PE	PE	PE	PE
Citizenship *	Citizenship *	Citizenship	Citizenship
PSHE *	PSHE *	PSHE *	Sex, relationships, drugs, tobacco, alcohol, careers, work-related learning*

\* Non-statutory programme of study; proposals to make statutory announced  
 \*\* Statutory subject with locally agreed programme of study  
 \* \* \* Beyond the statutory curriculum, KS4 students are entitled to (but not required to take) a course in at least one subject in each of four categories: humanities, MFL, design and technology, arts.

### **Excessive burden**

The National Curriculum, despite recent attempts to increase its flexibility, remains an enormous burden on teachers. New subjects, such as citizenship, cooking, personal, social and health education and modern languages at primary level have added to the amount of prescribed teacher time. While the underlying aspirations are laudable, we do not believe that making them compulsory and dictating how they should be taught is worth the sacrifice of school autonomy and flexibility.

The review commends the excellent recent report of the Children, Schools and Families Select Committee, which drew attention to the excessive burden still placed by the curriculum. We believe that the proposals recommended by the Committee have merit, particularly the recommendation that schools should be allowed to opt out of all but core subjects.

### ***Prescription over pedagogy, not content***

Several of those giving evidence to the commission pointed out that pedagogy, rather than content, dominated the national curriculum; teachers are told how to teach, even more than what to teach. One of the comments made to the Select Committee is particularly relevant:

‘Initially there was a promise to provide guidelines only on *what* children were entitled to be taught, and there was to be no question of eroding the teacher's responsibility for the *how* or the *particularity* of teaching. There can still be no quarrel with that. However, that promise was quickly broken and we now have a totally prescriptive, centrally worked out set of curriculum packages designed for "delivery" by teachers’.<sup>26</sup>

### ***Constant change***

Professor David Hargreaves, speaking to the Children Schools and Families Select Committee pointed out: ‘The mistake we have made in recent years is that there has been a tendency for Ministers, when something comes up, to think that we can impose new regulation through the National Curriculum. [...] This constant changing of the curriculum [...] is politicisation in the negative sense, as opposed to the positive sense that politicians should have a say on what goes on in our schools.’

Curriculum changes are also made with unnecessary frequency, which is confusing and time-consuming for schools and teachers. We recommend a model of periodic review by an independent commission, to eliminate the undesirable consequences of endless tinkering by government.

**Recommendation 20. The Government should appoint a fully independent commission to revise the curriculum once every five, or preferably ten years, with no curriculum modification in between reviews save in exceptional circumstances.**

### ***What should the core consist of?***

*What subjects should be taught?*

Outside a mandatory core, what should be in the school curriculum is necessarily subjective and best left to local decisions at school level. However there is a developing imbalance at Key Stage 4 between the sciences and the humanities. Moreover it is not clear why neither foreign languages nor history are considered essential, but ICT as a separate subject, is; especially now that ICT is embedded in most other curriculum subjects. We note that the current emphasis on balance in what is offered in schools (“curriculum entitlement”) is not leading to balance in individual subject choices, and that relatively few pupils are studying history, geography or modern languages after the age of 16.

*Within those subjects, what should be prescribed?*

Many of those giving evidence to the review, from schools, awarding bodies and other organisations, expressed dissatisfaction over the *type* of prescription in the curriculum. Too much of the curriculum is about how things should be taught or learned, or what types of things to learn, rather than the end product; in other words, what pupils should know.

**Recommendation 21. When next reviewed, the National Curriculum should be shortened and re-balanced to emphasise content over context-free skills. Schools should be given greater discretion over how to teach that content and given the room and freedom to teach beyond the curriculum.**

## List of recommendations

**Recommendation 1.** All higher and further education institutions should publish clear and specific information on the qualifications they accept and prefer.

**Recommendation 2.** The government should cease to publish ‘average point scores’ achieved by school and college students at A level. However schools and colleges should publish information about qualifications achieved and the destinations of those taking 16-18 qualifications – a more meaningful measure of achievement.

**Recommendation 3.** UCAS and universities should be encouraged to work together to increase the transparency of the relevance and application of any tariff to individual courses and so help 15 and 16 year olds make appropriate choices for 16-18 study.

**Recommendation 4.** The Government should consult with universities on the benefits and challenges of developing a standardised University Admissions Test, to supplement A level and other grades and assist with ranking decisions. It should also consult on the benefits and costs of other approaches to ensuring fair consideration of candidates with different combinations of A level subjects or other qualifications, in the context of a move away from the current equivalence-based approach. If commissioned by Government, a University Admissions Test should measure language, mathematics and reasoning skills.

**Recommendation 5.** Awarding bodies should, in consultation with universities and employers, be free to develop new qualifications appropriate to the needs of these key user groups. This means that they should be free to offer qualifications at varying levels of difficulty without interference from Ofqual or any other government body, unless there is specific cause for concern.

**Recommendation 6.** This freedom should extend to the structure of qualifications and their assessment. For example, syllabuses should no longer automatically be modular or ‘unit-based’ in format; the structure, as well as the nature and content of examinations, should be decided subject by subject through consultation with subject experts in universities and with other qualification users. In particular it should no longer be required or expected that AS levels should be a component of A levels. Alternative paths could be developed for those pursuing A levels through longer-term part-time study, where a modular approach might remain more appropriate.

**Recommendation 7.** Awarding bodies should not be required to have post-16 qualifications accredited, although they may wish to do so. Ofqual should have the power to intervene only where it has been advised (for example by Ofsted or by universities, colleges or employers) that a qualification is failing to provide a minimum standard or is undermining confidence in the examination system.

**Recommendation 8.** Awarding bodies should publish details of whom they have worked with or consulted on their qualification syllabuses and examinations, and universities should publish recommendations on the qualifications which meet their admission requirements and the subjects in which students should be prepared.

**Recommendation 9.** Over time the extent of external assessment at age 16 should be reduced to the minimum needed to maintain the quality of school education, provide information to employers and educational institutions and confirm school-based assessment of pupils.

**Recommendation 10.** In the core subjects of English and mathematics, external assessment at age 16 should continue to be regulated. The knowledge and understanding required should be applicable to all pupils, clearly specified, published by Ofqual and made available to parents, universities and employers. Achievement at a particular level would become a recognised ‘currency’ for the pupil.

**Recommendation 11.** Beyond English and mathematics, the form and content of external qualifications should be determined by the users of qualifications rather than by government.

**Recommendation 12.** Current accountability systems need reform. The current “5+ A\*-C GCSE including English and mathematics” measure should no longer be the main measure for school accountability. Achievement in the core subjects of English and mathematics should be recorded separately and used for accountability in conjunction with a range of other measures.

**Recommendation 13.** Wide performance measures (value added, CVA, average point score) should not be calculated unless it can be demonstrated that there is real underlying validity to the methodology, including the methodology for valuing different qualifications and different subjects within the same groups of qualifications.

**Recommendation 14.** Changes in the regulation of qualification structures, and in the use of points scores and equivalences, should be applied to vocational and semi-vocational awards for young people, in parallel with those recommended for GCSEs and A levels. In particular, the imposition of the Qualification and Credit Framework on any qualifications available to young people should cease.

**Recommendation 15.** The regulatory role should be limited to maintaining confidence in the integrity of the examination system by:

- Monitoring the processes by which awarding bodies develop qualifications, and maintain their standard and value.
- Ensuring administrative competence and fairness of awarding organisations (examination boards) in the conduct of examinations and in awarding.
- Ensuring reliability of the system.

**Recommendation 16.** Appointments of Chairs and CEOs of the regulatory body should be scrutinised independently of government; and the body should follow the Regulators’ Compliance Code, a standard code adopted by comparable regulatory regimes elsewhere.

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**Recommendation 19.** Universities, employers and other relevant bodies should be fully involved in qualification design and implementation. Awarding bodies, which will have considerably more freedom, should be fully transparent as to which bodies they work with in qualification design and implementation.

**Recommendation 20.** The Government should appoint a fully independent commission to revise the curriculum once every five, or preferably ten years, with no curriculum modification in between reviews save in exceptional circumstances.

**Recommendation 21.** When next reviewed, the National Curriculum should be shortened and re-balanced to emphasise content over context-free skills. Schools should be given greater discretion over how to teach that content and given the room and freedom to teach beyond the curriculum.

# Appendix:

## GCSE programme of study in mathematics

The paragraphs below reproduce the QCA programme of study for mathematics at Key Stage 4 (GCSE).

### *“The importance of mathematics*

Mathematical thinking is important for all members of a modern society as a habit of mind for its use in the workplace, business and finance, and for personal decision-making. Mathematics is fundamental to national prosperity in providing tools for understanding science, engineering, technology and economics. It is essential in public decision-making and for participation in the knowledge economy.

Mathematics equips students with uniquely powerful ways to describe, analyse and change the world. It can stimulate moments of pleasure and wonder for all pupils when they solve a problem for the first time, discover a more elegant solution, or notice hidden connections. Students who are functional in mathematics and financially capable are able to think independently in applied and abstract ways, and can reason, solve problems and assess risk.

Mathematics is a creative discipline. The language of mathematics is international. The subject transcends cultural boundaries and its importance is universally recognised. Mathematics has developed over time as a means of solving problems and also for its own sake.

### *1. Key concepts*

There are a number of key concepts that underpin the study of mathematics. Pupils need to understand these concepts in order to deepen and broaden their knowledge, skills and understanding.

#### 1.1 Competence

- Applying suitable mathematics accurately within the classroom and beyond.
- Communicating mathematics effectively.
- Selecting appropriate mathematical tools and methods, including ICT.

#### 1.2 Creativity

- Combining understanding, experiences, imagination and reasoning to construct new knowledge.
- Using existing mathematical knowledge to create solutions to unfamiliar problems.
- Posing questions and developing convincing arguments.

#### 1.3 Applications and implications of mathematics

- Knowing that mathematics is a rigorous, coherent discipline.
- Understanding that mathematics is used as a tool in a wide range of contexts.
- Recognising the rich historical and cultural roots of mathematics.
- Engaging in mathematics as an interesting and worthwhile activity.

#### 1.4 Critical understanding

- Knowing that mathematics is essentially abstract and can be used to model, interpret or represent situations.
- Recognising the limitations and scope of a model or representation.

## 2. Key processes

These are the essential skills and processes in mathematics that students need to learn to make progress.

### 2.1 Representing

Students should be able to:

- identify the mathematical aspects of the situation or problem
- compare and evaluate representations of a situation before making a choice
- simplify the situation or problem in order to represent it mathematically using appropriate variables, symbols, diagrams and models
- select mathematical information, methods, tools and models to use.

### 2.2 Analysing

*Use mathematical reasoning*

Students should be able to:

- make connections within mathematics
- use knowledge of related problems
- visualise and work with dynamic images
- identify and classify patterns
- make and justify conjectures and generalisations, considering special cases and counter-examples
- explore the effects of varying values and look for invariance and covariance
- take account of feedback and learn from mistakes
- work logically towards results and solutions, recognising the impact of constraints and assumptions
- identify a range of techniques that could be used to tackle a problem, appreciating that more than one approach may be necessary
- reason inductively, deduce and prove.

*Use appropriate mathematical procedures*

Students should be able to:

- make accurate mathematical diagrams, graphs and constructions on paper and on screen
- calculate accurately, using mental methods or calculating devices as appropriate
- manipulate numbers, algebraic expressions and equations and apply routine algorithms
- use accurate notation, including correct syntax when using ICT
- record methods, solutions and conclusions
- estimate, approximate and check working.

### 2.3 Interpreting and evaluating

Students should be able to:

- form convincing arguments to justify findings and general statements
- consider the assumptions made and the appropriateness and accuracy of results and conclusions
- appreciate the strength of empirical evidence and distinguish between evidence and proof
- look at data to find patterns and exceptions
- relate their findings to the original question or conjecture, and indicate reliability
- make sense of someone else's findings and judge their value in the light of the evidence they present
- critically examine strategies adopted.

### 2.4 Communicating and reflecting

Students should be able to:

- use a range of forms to communicate findings to different audiences
- engage in mathematical discussion of results
- consider the elegance and efficiency of alternative solutions

- look for equivalence in relation to both the different approaches to the problem and different problems with similar structures
- give examples of similar contexts they have previously encountered and identify how these contexts differed from or were similar to the current situation and how and why the same, or different, strategies were used.

### ***3. Range and content***

This section outlines the breadth of the subject on which teachers should draw when teaching the key concepts and key processes.

The study of mathematics should enable students to apply their knowledge, skills and understanding to relevant real-world situations.

The study of mathematics should include:

#### **3.1 Number and algebra**

- real numbers, their properties and their different representations
- rules of arithmetic applied to calculations and manipulations with real numbers, including standard index form and surds
- proportional reasoning, direct and inverse proportion, proportional change and exponential growth
- upper and lower bounds
- linear, quadratic and other expressions and equations
- graphs of exponential and trigonometric functions
- transformation of functions
- graphs of simple loci

#### **3.2 Geometry and measures**

- properties and mensuration of 2D and 3D shapes
- circle theorems
- trigonometrical relationships
- properties and combinations of transformations
- 3D coordinate systems
- vectors in two dimensions
- conversions between measures and compound measures

#### **3.3 Statistics**

- the handling data cycle
- presentation and analysis of large sets of grouped and ungrouped data, including box plots and histograms, lines of best fit and their interpretation
- measures of central tendency and spread
- experimental and theoretical probabilities of single and combined events.

### ***4. Curriculum opportunities***

During the key stage students should be offered the following opportunities that are integral to their learning and enhance their engagement with the concepts, processes and content of the subject.

The curriculum should provide opportunities for students to:

- develop confidence in an increasing range of methods and techniques
- work on sequences of tasks that involve using the same mathematics in increasingly difficult or unfamiliar contexts, or increasingly demanding mathematics in similar contexts

- work on open and closed tasks in a variety of real and abstract contexts that allow them to select the mathematics to use
- work on problems that arise in other subjects and in contexts beyond the school
- work on tasks that bring together different aspects of concepts, processes and mathematical content
- work collaboratively as well as independently in a range of contexts
- become familiar with a range of resources, including ICT, so that they can select appropriately.”

# Footnotes:

<sup>1</sup> BBC, 13 May 2008

<sup>2</sup> *Hansard*, 15 May 2009, col. 1024W

<sup>3</sup> DCSF, *GCE and Equivalent Results in England 2007/8*, January 2009

<sup>4</sup> Reform, *A New Level*, June 2009.

<sup>5</sup> *ibid.*

<sup>6</sup> <http://www.cie.org.uk/qualifications/academic/uppersec/preu/faqs/#answer1>

<sup>7</sup> Although they do not indicate differences between examination boards.

<sup>8</sup> *Hansard*, 23 February 2009, col. 448WA. Excludes general studies, includes VCE and applied A level.

<sup>9</sup> *Hansard*, 19 May 2009, col. 1243WA

<sup>10</sup> Coe, R., Searle, J., Barmby, P., Jones, K. and Higgins, S. (2008) *Relative difficulty of examinations in different subjects*. Report for SCORE (Science Community Supporting Education), July, 2008. Curriculum, Evaluation and Management Centre, Durham University. Available at

<http://www.cemcentre.org/documents/news/SCORE2008report.pdf>

<sup>11</sup> Cambridge has since removed its guidelines from its website.

<sup>12</sup> See for example Wolf, A. (2000) *A Comparative Perspective on Educational Standards*, In Goldstein, H. and Heath, A. *Educational Standards*. Proceedings of the British Academy 102.

<sup>13</sup> See for example Feuer, M J, Holland, P W, Green, B F, Bertenthal, M W and Hemphill, F C eds (1999) *Uncommon Measures. Equivalence and Linkage among Educational Tests*. Report of the Committee on Equivalency and Linkage among Educational Tests (Board on Testing and Assessment, National Research Council) Washington DC: National Academy Press

<sup>14</sup> See work by the Centre for Evaluation and Monitoring, Durham University

<sup>15</sup> NFER, *The use of an aptitude test in university entrance – a validity study*, 2007;2008

<sup>16</sup> Australia also has developed tests of this type. In Queensland, a standardised test is used in conjunction with subject assessments which are entirely carried out by teachers.

<sup>17</sup> Professor Adrian Smith's Inquiry into Post-14 Mathematics Education

<sup>18</sup> However a study of GCSE entries shows that relatively few pupils now study academic subjects outside the English/mathematics/science core after the age of 14. For example, only around 30 per cent of pupils study history or geography to GCSE. It is not clear how far these patterns reflect pressure on schools to achieve maximum '5 A-C' numbers.

<sup>19</sup> Even if external assessment across more of the curriculum is retained for school accountability measurement, this need not take the form of full pupil certification and could be done much more efficiently.

<sup>20</sup> For example Edexcel has awarded C grades in a paper for one of its new science courses to pupils scoring only 20% (*Times*, 24 October 2008).

<sup>21</sup> See for example Shepard, L.A. and Kreitzer, A. (1987) *The Texas teacher test Educational Researcher* 16; Shepard, L.A.(1987) *A case study of the Texas teacher test* US Department of Education; Sturgis, J. (2006) *The English Examining Boards: Their Route from Independence to Government Outsourcing Agencies* PhD thesis, University of London

<sup>22</sup> See e.g. Goldstein, H. and Leckie, G. (2008) *School league tables: what can they really tell us?* *Significance* June 2008 67-69

<sup>23</sup> Goodhart's Law, as proposed by Professor Charles Goodhart, informs us that any quantitative measure which is used for control purposes becomes unreliable (or, more specifically, that 'any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes.'). Studies of British public services operating under the current regime of Public Service Agreements have produced multiple example of this phenomenon, and of the 'gaming' in which institutions engage in order to meet quantitative targets. See in particular publications from the ESRC's recently completed Public Services Programme directed by Professor Christopher Hood

<sup>24</sup> This is particularly evident in the lack of control over educational standards, as much due to its poor understanding of the concepts involved (and low investment in research capability) as its operational involvement. As another example it has been reported to us that 'standards over time' studies have decayed into comparability of specifications rather than sensitive and detailed reporting of essential standards issues leading to an inability to detect any movement of overall standards.

<sup>25</sup> Or, more specifically, every qualification which might be offered in government-supported provision.

<sup>26</sup> Malcolm Ross, Evidence to the Select Committee on Children, Schools and Families