

Consultation on revised assessment arrangements for GCSE computer science



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About this consultation

We have seen evidence that the exam boards' rules for non-exam assessment in GCSE computer science are being broken.

Students who will take their exams in the subject next summer were able to start their non-exam assessment from 1 September 2017. Shortly after that date we became aware that, contrary to the exam boards' rules, the tasks and solutions to them were being discussed in on-line forums.

Our concerns have been heightened because of the degree of malpractice that was found among students who took GCSE computing in summer 2017.

We are also conscious of wider concerns about the burden being placed on teachers by the non-exam assessment, and how the nature of the non-exam assessment may be leading to an approach to problem solving that does not reflect real-world programming practices.

The proposals in this consultation, on which we are seeking views, are intended to address these concerns in the short term by:

- making non-exam assessment no longer count towards a student's 9 to 1 grade in GCSE computer science; their grade would instead be based on their performance in their exams alone¹;
- continuing to require all students to complete one of the non-exam assessment tasks set by the exam boards to meet the curriculum requirements of the course;
- no longer requiring teachers to formally mark² the task, or provide marks for the task to the exam board. But they would be able to use the task – a significant piece of work - to provide formative feedback to students, strengthening their knowledge, skills and understanding, and better preparing them for their exams;
- requiring exam boards to:
 - collect statements from schools and colleges confirming that students have been given reasonable opportunities to complete the programming task and that 20 hours has been set aside for this. This would ensure students covered all of the subject content. The statement would build on existing exam board processes for authenticating students' work.

¹ The exams would remain in the form presented in the published sample assessment materials

² Formal marking of students' work involves the application of the published mark scheme available in each exam board's current specification. Teachers may choose to continue to use these mark schemes, but may also wish to employ a different approach to assessing students' work to support the feedback they give.

- continue monitoring of schools and colleges – through visits and scrutiny of students' work – but with a focus on ensuring that sufficient time is being dedicated to the programming task.

Our proposals would also allow the exam boards to review their restrictions on non-exam assessment, potentially allowing for a more authentic approach to programming, and for students to receive more useful feedback on their work.

Unless changes are made, we believe next summer's results will not provide a true reflection of all students' knowledge, skills and understanding. This will be unfair for some students and unfair for some schools and teachers. Basing the results on students' exam performance alone will allow us to be confident standards will be set appropriately.

We have a duty to consult before taking such an important decision. We recognise this creates some uncertainty for teachers, as they will not know for certain what is expected of them until we announce our decision.

As we are not considering lifting the requirement on students to complete the non-exam assessment task, and exams will still test students' understanding of programming, teachers should continue to set aside time for teaching programming and completing the task. They should also continue to follow their exam board's instructions for the conduct of non-exam assessment between now and when we make our decision.

Teachers and schools/colleges will want to consider their approach to the timing and potential marking of the task. While we cannot pre-empt the outcome of the consultation, we are clear that our preferred approach would mean students have to complete the task but teachers would not have to mark it in the same way. It is also possible that our decisions may lead the exam boards to change some of their restrictions on the conduct of the task.

We are seeking responses to this consultation by 12 noon on Friday 22 December 2017.

We will consider responses to the consultation and announce our decision on whether to make any interim changes during the week commencing **8 January 2018**.

We are working on possible longer-term solutions, and will consult separately on any long-term changes.

Summary of our proposals

We propose to introduce the following interim (for 2018 and 2019) arrangements for reformed GCSEs in computer science:

- students' GCSE grades are based on their performance in their exams alone;³
- as now, all students must complete one of the non-exam assessment tasks set by the exam board;
- teachers are no longer required to formally mark the non-exam assessment task, or provide marks to the exam board, but would be able to use it to provide formative feedback to students;
- exam boards must collect a formal statement from each school/college confirming that students have been given reasonable opportunities to complete the non-exam assessment task and that 20 hours has been set aside for this. This will build on existing forms used to confirm the authenticity of students' work;
- exam boards' monitoring of schools and colleges – through visits and scrutiny of students' work – will ensure that sufficient time is being dedicated to the programming task.

We propose that these interim arrangements should apply for students taking their exams in 2018 and 2019.

We will consider a wider range of options for the longer-term – and consult further before making any changes.

³ The exams would remain in the form presented in the published sample assessment materials

Background

New GCSEs in computer science were first taught in schools in England in September 2016. The first students taking these new qualifications will sit their exams in summer 2018.

As with all other reformed GCSEs, computer science GCSEs are based on [core subject content, developed and defined by the Department for Education \(DfE\)](#).

GCSE computer science now counts towards the science element of the [English Baccalaureate](#) (EBacc). This means that in performance measures, GCSE computer science has the same status as, and can be used interchangeably with GCSEs in biology, chemistry and physics.

Assessment in GCSE computer science

Reformed GCSEs in computer science use a mixture of exams and non-exam assessment.⁴

The exams currently contribute 80% of the marks to the qualification. The exam boards have each chosen to set two papers: broadly, one paper assesses knowledge and understanding of computer science and computer systems and the other assesses computational thinking and programming. The total exam time ranges from 3 hours to 3 hours 45 minutes.

The non-exam assessment currently contributes 20% of the marks to the qualification. The non-exam assessment focuses on the particular aspect of the DfE's subject content that requires students to develop programming skills using high-level programming languages:

GCSE specifications must require students to develop the following skills
[...]
design, write, test and refine programs, using one or more high-level programming language with a textual program definition, either to a specification or to solve a problem

We decided to allow non-exam assessment in this subject, following our consultation in 2014⁵, because we believed this would allow students to demonstrate their subject skills in a context that was more reflective of real-life. But we acknowledged this was a finely-balanced decision, particularly given our wider decision only to permit non-exam assessment in GCSEs where content could not be assessed validly in an exam.

⁴ The only other EBacc GCSEs that use non-exam assessments are in modern foreign languages (MFL). The non-exam assessments in MFL GCSEs are taken in a tightly controlled way; the tasks are not known to students in advance.
www.gov.uk/government/consultations/gcses-as-and-a-levels-reform-of-subjects-for-september-2016

We required the exam boards to determine what controls and support for teachers would be needed to ensure “the non-exam assessment in GCSE computer science [provides] a reliable indication of students’ programming abilities, and students’ marks [are not] distorted by external pressures”.

The exam boards offering reformed GCSEs in computer science have adopted similar approaches and common safeguards to non-exam assessment:

- students must complete an exam board set programming task that is made available to schools at the beginning of the school year in which students take their exams and which must be completed by 31 March of that school year – so students have a shorter time period to complete the task than they did in the legacy qualifications⁶;
- the task requires students to solve a problem, set by their exam board, and evaluate their solutions. Their report – which includes the program they have written in response to the task – must be their own work;
- the task must be completed in 20 hours under tightly-controlled conditions – in particular, the task must be kept confidential, and neither students nor teachers are permitted to discuss the task outside of the 20-hour period in the classroom;
- exam boards visit a sample of schools and colleges to make sure that the assessment requirements are being followed;
- this task is marked by teachers in schools/colleges against a mark scheme specified by the exam board;
- teachers’ marks are moderated by the exam board. A larger sample of students’ work is looked at than for other subjects with non-exam assessment, with moderators applying a smaller tolerance than for other subjects;
- the exam boards use statistical monitoring – comparisons between exam and non-exam assessment marks – to help identify poor quality marking of non-exam assessment and target additional moderation.

⁶ By legacy qualifications we mean GCSEs in computing offered prior to 2017 and graded A* – G.

Emerging issues

Security breaches

All the exam boards have adopted an approach that requires the non-exam assessment task to be kept confidential. The security of some tasks has, however, been compromised⁷.

Extracts from, and complete, tasks have appeared on on-line forums and collaborative programming sites. For example, one non-exam assessment task was briefly made available for sale online.

Potential malpractice

After exam boards released this year's tasks, a number of posts on online discussion forums have appeared which relate to the non-exam assessment tasks. Some sites are well-moderated and have removed the post. Understandably, this has not always happened immediately.

Some posts have directly solicited solutions to the problem. Responses have included full or partial solutions, as well as advice which could be used as part of a student's evaluation of their solution.

Example 1

The NEA task requires students to design a piece of software.

An individual posted on an online forum asking for help with this task. The first response to this question (posted within half an hour) includes a full solution in the requested programming language.

This post currently has over 2,500 views.

Example 2

A simple search for a key requirement of the NEA task on a popular online developer community returns over 40 pages of results. Although many of these are unrelated, at least half of the posts on the first page are clearly directly related to a specific NEA task.

Example 3

⁷ We note that one exam board replaced its non-exam assessment task after it was made available to centres that had not entered students for GCSE computer science. This was caused by a mistake rather than deliberate wrong-doing.

An individual posted that they had “decided to challenge [themselves] with a simple ... task that I found online”, and included a screenshot of the full NEA task.

The post goes on to set out their progress so far, including the code they have written, before seeking advice on particular elements of the task.

Example 4

An individual posted on an online forum seeking specific advice about whether a graphical user interface (GUI) was needed for a specific NEA task.

Responses suggested this was not a requirement, but would help gain higher marks. They also suggested different methods for adding a GUI.

Later posts from other students suggested some teachers were unsure whether a GUI was required.

In some cases, there are direct references to the non-exam assessment task or other information that makes clear a student made the initial post. But other examples are much less clear-cut, and could equally be legitimate requests made by someone seeking a solution to a similar problem in a completely different context.

Students seeking solutions to the tasks are in clear breach of the rules set by the exam boards. It is obvious malpractice.

If the malpractice is not detected and the student receives credit for work that is not their own, then they will receive a mark – and potentially a grade – that does not reflect their true ability. In turn, this means other students who have followed the rules may be unfairly disadvantaged.

We have also seen examples of posts asking for more general advice on how to tackle a particular problem. Some of these posts appear to have been made by teachers, seeking advice on how they might prepare their students for the non-exam assessment task.

Example 5

An individual posted on an online forum used mainly by teachers, seeking assistance with the programming in a particular non-exam assessment task.

One response noted that there are “literally hundreds” of solutions available online, and suggested appropriate web searches which would allow the individual to “see various ways of solving the problems”.

This post currently has over 1,500 views

We understand teachers' desire to ensure they are properly equipped to teach their students. However, discussing the non-exam assessment task outside the classroom is a breach of the exam boards' rules and, therefore, malpractice.

Addressing these potential malpractice cases is not straightforward, for a number of reasons:

- it is not always clear that a particular post has been made by a student or teacher;
- similarly, it is often not possible to determine whether, and if so how many, students might have gained an unfair advantage from a particular online resource (either by soliciting answers, or by using answers provided to others), much less who those students are;
- while exam boards can ask forum operators to remove posts, they can normally only insist posts are removed if they contain copyrighted material (such as the task itself). In any event, it is neither possible nor desirable for exam boards to censor all internet discussion on topics relevant to their non-exam assessment, much of which will be legitimate;
- exam boards can never be certain they have identified every relevant online discussion – particularly since not all discussions take place in public forums; and
- while teachers and exam boards will be taking a number of steps to identify plagiarised solutions during marking and moderation, in practice this type of malpractice is not that simple to detect. Even where a student's solution precisely matches one that has been published online, this is not necessarily conclusive proof of wrongdoing – the student could simply have arrived at the same solution independently.

Nature of the non-exam assessment task

We also have some concerns about the restrictions exam boards, in an attempt to meet our requirements that the assessment is valid and fair for all, have imposed on the non-exam assessment. The Royal Society's report on computing education⁸ illustrates these concerns:

Finally, many teachers in England, Wales and Northern Ireland raised the new Non Examined Assessment arrangements for GCSE computer science

⁸ <https://royalsociety.org/~media/policy/projects/computing-education/computing-education-report.pdf>

qualifications as a cause for concern. These teachers felt that the new rules on GCSE Non-Examined Assessment (NEA) are onerous, and consume a disproportionate amount of teacher time and teaching opportunities in the computer science GCSE.

In addition to the burden of the non-exam assessment arrangements, we are also conscious that the assessment approach taken results in an artificial task that does not align well with real-world approaches to programming. Professional programmers often work collaboratively – seeking and building on existing programs and developing solutions with input from others – and make use of code repositories or other source materials.

Impact on teachers

We have concerns about the way non-exam assessment arrangements are affecting teachers.

It can be difficult for a teacher to be certain a student has breached the rules. Teachers who suspect malpractice must decide whether to attempt to strictly enforce the rules for their students, uncertain of the extent to which equal efforts will be made more generally. In an effort to reduce discussions about the tasks that could lead to malpractice, the exam boards have limited teachers discussing the tasks between themselves. This is intended to strengthen the security around the tasks, but might also stop teachers sharing information that could help them spot malpractice and promote a consistent approach to dealing with it.

Our view

We think the issues we have identified mean that our intention in permitting non-exam assessment – to allow students to demonstrate their skills in a real-life context – has not been achieved.

The ready availability of online solutions to non-exam assessment tasks creates a significant opportunity for malpractice. Despite efforts on the part of the exam boards, we do not think it is possible to mitigate this issue effectively through marking and moderation.

While the exam boards have taken additional steps to mitigate some of the risks, we believe the scale of the problem is potentially significant. In 2017, all the exam boards investigated a number of cases of malpractice in the subject. For one exam board, concerns about possible malpractice involved around 10% of its centres offering its legacy GCSE in computing. While some investigations remain ongoing, malpractice has subsequently been proven in almost two-thirds of resolved cases, meaning many students will have had their marks adjusted or been disqualified from the qualification.

Malpractice on this scale can cause technical difficulties for exam boards when setting grade boundaries. If they are investigating suspected malpractice on a large scale, they might not have sufficient confirmed marks to set the grade boundaries. Results could be delayed, including for students who have fully abided by the rules.

Despite the exam boards' efforts, we think this year's non-exam assessment in GCSE computer science will be compromised. We think there is a real – and significant – risk that, left unchecked, results in next summer's computer science GCSEs will not provide a fair reflection of every student's knowledge, skills and understanding. We also think that the likely extent of malpractice may well compromise exam boards' ability to set grade boundaries and issue results on time. Similar problems are likely to arise in future years.

We know we need to make any changes quickly so that teachers and students are clear what is expected of them. We also wish to make changes that do not increase the burden on teachers or students.

At the same time, we recognise that there are limits to the changes we can make immediately, and we want to explore a broader range of options for the longer-term.

The immediate options

Our proposals for the short term will apply – as a minimum – for students taking their exams in both 2018 and 2019. We think this period of stability is important for a number of reasons:

- students who will take exams in 2018 and 2019 have already started their courses, and both teachers and students need to know what is expected of them as soon as possible;
- exams for summer 2018 have already been written, and exams for summer 2019 will be in an advanced stage of development, so it would be difficult to introduce substantial changes before students take exams in 2020; and
- introducing further changes for 2019 (on top of the introduction of the reformed qualifications in 2016 and the proposed changes for 2018) would place an undue burden on schools, colleges and teachers, and allow limited time to develop the best approach for the longer term.

If needed, all of the possible short-term options could be extended to future years if longer-term solutions are not ready for summer 2020.

We have considered three main short-term options:

- retaining non-exam assessment that contributes to the overall qualification grade. Working with the exam boards, we could take further steps to deter and detect malpractice. The exam boards could also consider reviewing their rules on the assessment;
- basing students' grades on their performance in their exams only, while making it mandatory for schools/colleges to give students the opportunity to complete the task – this is our preferred option-; and
- reporting students' performance in their non-exam assessment separately to the grade for their performance in their exams, either as a pass/fail or using pass/merit/distinction.

Because all of these options retain the non-exam assessment task and the examinations involve computational thinking and programming, the qualification would continue to cover the whole of the DfE's subject content. As all of the options retain the exams, there will be robust assessment of the required knowledge, skills and understanding.

Evaluating the short-term options

The strengths and weaknesses of the short-term options, and of the variations within them, are summarised in the table below. Our aim is to identify the best of the options and, in particular, the one that is the most fair for all students.

Option	Strengths	Weaknesses
Option 1A: retain existing arrangements and take further steps to deter and detect malpractice	<ul style="list-style-type: none"> ■ No immediate changes to assessments. ■ All students complete the non-exam assessment under the same rules. 	<ul style="list-style-type: none"> ■ We know that tasks and solutions are already available and we do not believe it is possible to deter or detect all cases of malpractice. ■ Some students will gain a higher grade because of their malpractice – and results will not fairly reflect students’ knowledge, skills and understanding. ■ Where malpractice is found, students are likely to be given adjusted marks or be disqualified from the qualification. ■ If malpractice is widespread, this may affect exam boards’ ability to set grade boundaries and issue results on time. ■ Teachers are required to detect and deal with student malpractice, when the evidence might not always be clear.
Option 1B: less restrictive assessment conditions	<ul style="list-style-type: none"> ■ A more authentic programming experience for all students in 2019 (and some students in 2018). 	<ul style="list-style-type: none"> ■ Some students taking exams in 2018 will have completed the non-exam assessment under more restrictive conditions. ■ Two different mark schemes would be needed to be

	<ul style="list-style-type: none"> ■ Changes what constitutes malpractice to better reflect real-world practices. 	<p>applied to two different groups of students – the original one for students who have already completed the task and a second one for students taking the task under the revised conditions – making this, practically, very challenging, particularly maintaining standards between groups of students and over time.</p> <ul style="list-style-type: none"> ■ We know that tasks and solutions are already available and will have been used by some students. Those students would gain an advantage if not identified and marked under the scheme applying to the revised conditions.
<p>Option 2: grade based on exam performance alone with centre statements and with less restrictive assessment conditions</p> <p>(preferred option)</p>	<ul style="list-style-type: none"> ■ No need for teachers to formally mark non-exam assessment, or to submit marks to the exam boards. ■ Opportunities for a more authentic programming experience for all students in 2019 (and some students in 2018) – and to use the task to embed learning that students can use in their exams. ■ Teachers empowered to use their professional judgement to identify 	<ul style="list-style-type: none"> ■ Schools that have not completed the task might reduce the time spent preparing students to complete the task (although they would have to set aside 20 hours for completion of the task itself). ■ Some students taking exams in 2018 will have completed the non-exam assessment under more restrictive conditions – and therefore have not benefited from a more real-life experience. ■ No direct reward for students who excel on the programming task, although

	<p>and deal with malpractice as the marks for the task will not contribute to the 9-1 grade.</p> <ul style="list-style-type: none"> ■ Requirement for statement from the school/college that all students have been given the opportunity to complete the task for which 20 hours has been set aside promoting the situation where all students have a similar experience. ■ Exam boards' monitoring visits to continue, to verify school/college statement. 	<p>students will of course have enhanced their skills through the task. In turn, this may help them perform better in their exams which assess computational thinking and programming.</p>
<p>Option 3A: pass/fail endorsement</p>	<ul style="list-style-type: none"> ■ Teachers empowered to use their professional judgement to identify and deal with malpractice as the marks for the task will not contribute to the 9-1 grade ■ Reduced incentive for student malpractice. 	<ul style="list-style-type: none"> ■ Still scope for students to benefit from undetected malpractice. ■ Requires changes to marking of non-exam assessment – including new mark schemes and changes to exam boards' IT systems. We do not believe this can be delivered for consistent application by teachers in time for the 2018 examinations. ■ Teachers may need to remark work students have already completed. ■ Schools/colleges might reduce the time spent preparing students to complete the task (although

		<p>they would have to set aside 20 hours for completion of the task itself).</p> <ul style="list-style-type: none"> ■ No direct reward for students who excel on the programming task, although this may help them perform better in their exams which assess computational thinking and programming.
<p>Option 3B: graded endorsement</p>	<ul style="list-style-type: none"> ■ Students who excel on the programming task receive higher endorsed grade. ■ Teachers empowered to use their professional judgement to identify and deal with malpractice as the marks for the task will not contribute to the 9-1 grade. 	<ul style="list-style-type: none"> ■ Schools/colleges might reduce the time spent preparing students to complete the task (although they would have to set aside 20 hours for completion of the task itself). ■ Still scope for students to benefit from undetected malpractice as this option does not address the issues that arise from solutions being available. ■ Requires changes to marking of non-exam assessment – including new mark schemes and changes to exam boards’ IT systems. We do not believe this can be delivered for consistent application by teachers in time for the 2018 examinations. ■ Teachers may need to remark work students have already completed. ■ May be difficult to set grade boundaries for the endorsement reliably, because students will have

		completed the task at different times and under different conditions.
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Options 1A and 1B – (largely) retaining the status quo

These options retain non-exam assessment that contributes to the overall qualification grade. This would, in principle, ensure that all students taking their exams in 2018 have the same (or at least similar) non-exam assessment experience.

But given the scope for malpractice, we think it is inevitable some malpractice committed by students would remain undetected. We also think it is likely that an enhanced focus on detecting malpractice (option 1A) could inadvertently penalise some students who had arrived at a good solution while complying with the rules, i.e. they will be wrongly thought to have broken the rules.

Similarly, these two options would not address the risk that widespread malpractice (or suspected malpractice) prevents reliable setting of grade boundaries, or timely issuing of results. Nor do they address concerns about burden on teachers or the real-world relevance of the non-exam assessment task. Students who are found to have broken the rules are likely to be given adjusted marks or be disqualified from the qualification.

Some of these issues could be addressed by option 1B – if exam boards relax the rules around non-exam assessment then some of the burden on teachers will be reduced. It also means that some student behaviour, which is currently classed as malpractice, would be acceptable, reducing the risk that investigations into malpractice impact on grading.

However, under option 1B those students who have already completed their non-exam assessment would have done so under different conditions from those who have yet to start. We think this will introduce additional complexity and unfairness.

In principle, mark schemes could be adjusted to compensate for this, although this would be difficult and inevitably create a longer period of uncertainty for teachers. Adjusted mark schemes would also need to reflect the fact that some students will have already completed their work under the more restrictive conditions, and that some of those students may have broken the rules while doing so. In reality it would seem inevitable that there would be a range of mark schemes that have to be applied in different circumstances and then reconciled at marking and awarding. We do not think this can be done fairly and consistently.

In addition, this approach would impose considerable burden on teachers marking the non-exam assessment.

We do not believe either of these options will deliver fair or reliable results next year.

Option 2 – grade based on exam performance alone with centre statements and with less restrictive assessment conditions (our preferred option)

This option eliminates any possible benefit to students who have (or would have) committed malpractice, and any risk of compromising setting of grade boundaries or issuing results in summer 2018.

Exam boards could also review their restrictions on non-exam assessment, allowing for a more authentic approach to programming. There would be no need for teachers to formally mark the task, or submit marks to the exam board. Exam boards would also not need to moderate teachers' marking. This would significantly reduce burden on schools, colleges and exam boards.

There would also be more opportunities for schools and colleges to use the task to enhance students' learning experience. As teachers would now be free to provide feedback on students' performance, this could help strengthen their knowledge, skills and understanding, and better prepare them for their exams.

We also think it could empower teachers to exercise their professional judgement in detecting and acting in cases of malpractice.

In line with the approach we have taken in other GCSE subjects such as geography, we would require exam boards to collect signed statements from schools and colleges confirming that students had been given appropriate opportunities to complete the required programming task. Exam boards already require schools/colleges to formally confirm the authenticity of students' work, so this would build on these existing arrangements.

We would also require exam boards to formally verify these statements. Exam boards are already intending to carry out monitoring visits to schools and colleges, and we think these visits could be repurposed to focus on ensuring schools and colleges are dedicating sufficient time to the programming task.

This is our preferred option. Students who have broken the rules, but whose malpractice goes undetected, will not get a higher mark than they deserve. The exam boards will be able to set the standard for the first award of the qualifications based on all students' exam performance – they will not have to set aside some students' marks while they investigate malpractice. Requiring schools and colleges to confirm that they have set aside 20 hours for students to complete the programming task, and exam boards to verify this is the case, will make sure students can develop and apply their programming skills and that the whole of the subject content is covered. It can be implemented quickly without undue risk and it reduces the burden on teachers.

We acknowledge it has some potential drawbacks:

- students might have less incentive to engage with the programming task, as it would not contribute to their overall grade – and those students who have already excelled in the programming task would not be rewarded above those who do the minimum necessary; and
- students' experience of completing the task is likely to be different depending on when they undertook the work.

However, we are confident the advantages outweigh the disadvantages.

Options 3A and 3B – separate reporting of programming skills.

As with option 2, in both of these options the non-exam assessment would not contribute towards students' 9 to 1 grade. We think this reduces the temptation for students to commit malpractice.

Again, as with option 2, we think these options would also empower teachers to exercise their professional judgement in detecting and acting in cases of malpractice. It would also be possible for the exam boards to review their rules around the non-exam assessment, reducing burden on teachers, schools and colleges, and allowing for a more authentic approach to programming.

Option 3B brings an additional benefit – it rewards students who excel in the programming task with a higher endorsed grade.

These options also share a number of the drawbacks of option 2 – they would result in an inconsistent experience for students taking their exams in summer 2018, and may create some incentive for schools/colleges who have not yet completed the task to reduce the amount of teaching time dedicated to the programming task.

Where these options differ from option 2 is that it would still be possible for students to benefit from undetected malpractice (by receiving a better endorsed grade than they deserve).

There are some significant challenges around implementing these options that would introduce unacceptable risks, particularly in time for summer 2018. Existing mark schemes are unlikely to work well for a separately endorsed grade, and there is little time to change them. Exam boards would also need to make changes to their systems and processes to accommodate a separate grade – again, this would be difficult to deliver in the short time between now and summer 2018. We do not believe the changes could be made in a way that would ensure a consistent approach to teacher marking in 2017/2018.

Teachers would also still need to formally mark the programming task – and exam boards would most likely also need to moderate it, so the burden on schools, colleges and exam boards would be significantly greater than in option 2.

There is also a legitimate question about whether results could be sufficiently reliable to support setting a pass mark (or, in the case of option 3B, multiple grade boundaries) – particularly given our concerns about malpractice.

As with option 1B, we do not think it is possible to design a mark scheme that fairly rewards students who have completed the task under different conditions, without unfairly benefiting students who have already broken the non-exam assessment rules.

Our preferred option – Option 2

We think option 2 is the fairest possible approach for students taking their exams in 2018 and 2019. It eliminates any possible benefit from malpractice, but still ensures that all students need to complete the programming task and can develop their knowledge and understanding to better prepare them for the examinations which include computational thinking and programming.

It is also an approach that reduces the current burden on teachers, schools and colleges, and which we are confident can be delivered in time for next summer's exams.

Our proposals – short-term

We propose to introduce the following interim (for 2018 and 2019) arrangements for reformed GCSEs in computer science:

- students' GCSE grades are based on their performance in their exams alone⁹
- as now, all students must complete one of the non-exam assessment tasks set by the exam board
- teachers are no longer required to formally mark the non-exam assessment task, or provide marks to the exam board
- exam boards must collect a formal statement from each school/college confirming that students have been given reasonable opportunities to complete the non-exam assessment task and that 20 hours has been set aside for this. This will build on existing forms used to confirm authenticity of students' work.

⁹ The exams would remain in the form presented in the published sample assessment materials

- exam boards' monitoring of schools and colleges – through visits and scrutiny of students' work – will ensure that sufficient time is being dedicated to the programming task.

We propose that these interim arrangements should apply for students taking their exams in 2018 and 2019.

The longer-term solution

We think we need to explore a wider range of possible options for the longer-term. We will seek to engage with a range of stakeholders, including the Royal Society and CAS.¹⁰ These options could include any of those listed above that we do not believe are deliverable for summer 2018, as well as further options such as:

- a model similar to the GCSE science subjects, where exams include questions on programming that assume students have programming experience and involve the use of high level programming language rather than pseudo-code; and
- online assessment of practical programming skills.

Our aim with this further work is to deliver a sustainable solution that aligns with the DfE's curriculum intention, but is deliverable in schools and colleges in a meaningful way that avoids unnecessary burden on teachers and students.

This is not a straightforward task; it will need time, thought and careful planning, and the involvement of all key stakeholders to get it right. That is why the short-term arrangements will apply – as a minimum – for all students taking their exams in 2018 and 2019. We will, of course, consult further before we implement any long-term changes.

We would welcome views on any of the long-term options we have identified, as well as any further options we should be considering.

Our proposals – longer-term

We will consider a wider range of options for the longer-term – and consult further before making any changes.

¹⁰ Computing at School, a grass-roots organisation which works in partnership with the British Computing Society to promote the teaching of computer science at school.

Impact of our proposals

Equality impact assessment

We have identified one aspect of our proposals which could have a negative impact on some disabled students – the removal of non-exam assessment that contributes to the overall qualification grade.

As set out in our earlier equality impact assessment for GCSE reform,¹¹ placing greater emphasis on exams rather than non-exam assessment may have some negative impact on students with certain disabilities – including students with visual impairments, and students with disabilities that cause fatigue or difficulty concentrating during an exam. Disabled students are entitled to reasonable adjustments to the way they take their exams.

We have not identified any other impacts on students who share protected characteristics. We would note in particular that we do not consider that our proposals will disadvantage female students: while we have heard of the perception that female students perform better in non-exam assessment (and male students better in exams), the overall body of evidence does not support this conclusion. We discussed this issue in more detail in our GCSE reform equality impact assessment.

We would also note that, if adopted, options 3A and 3B would have similar impacts.

Regulatory impact assessment

Our preferred option would reduce regulatory burden on teachers, schools, colleges and exam boards in a number of ways:

- teachers would no longer need to formally mark the programming task – this may result in a reduced workload;
- exam boards could review some of the restrictions on the conduct of the programming task; and
- exam boards would no longer need to moderate the programming task.

They would also reduce burden on students taking the programming task in the future. This means that those students who have already taken their non-exam assessment will have done so under more onerous conditions than those who are yet to take it, but we think this is necessary to secure the fairest possible outcome for students.

¹¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/529391/2013-11-01_01-equality-analysis-report-on-reforms-to-gcses-from.pdf

There are also some aspects of our proposals that would introduce new or increased burdens:

- exam boards would need to collect an enhanced statement from schools and colleges confirming that they have provided reasonable opportunities for students to complete the programming task – we would expect this to be a relatively small additional burden as it is similar to the existing requirements imposed by the exam boards;
- exam boards may need to retrain staff who will conduct monitoring visits to schools and colleges, reflecting the new focus of these visits on ensuring that they have undertaken the programming task.

On balance, we think our proposals will result in a net reduction in burden, as the reductions in burden from changes to marking and moderation of the programming task will outweigh any additional burden associated with provision of annual statements and retraining of staff conducting monitoring visits.

Responding to this consultation

The closing date for responses is **22 December 2017**.

Please respond to this consultation in one of three ways:

- [complete the online response](#) (click 'Respond online') on our consultation homepage
- [download the response form](#) and either:
 - email your response to consultations@ofqual.gov.uk – please include *GCSE Computer Science Consultation 2017* in the subject line of the email and make clear who you are and in what capacity you are responding
 - post your response to: *GCSE Computer Science Consultation 2017*, Ofqual, Spring Place, Herald Avenue, Coventry, CV5 6UB, making clear who you are and in what capacity you are responding

Evaluating the responses

To evaluate responses properly, we need to know who is responding to the consultation and in what capacity. We will therefore only consider your response if you complete the 'About you' section.

Any personal data (such as your name, address and any other identifying information) will be processed in accordance with the Data Protection Act 1998.

We will publish a summary of the responses received. We will not include your personal details in any published summary of responses, although we may quote from your response anonymously.

Please respond by 12 noon on 22 December 2017

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