

ASE 2018

Awarding demystified

Accompanying materials

January 2018

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Presentation slides

Awarding at GCSE and A-level demystified

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January 2018

About this session

- This session will provide an update on the process by which we award GCSE and A-level grades and will include consideration of the arrangements for awarding for the first cohort examined against the new GCSE science specifications.
- Key messages from the A-level and GCSE science exams in 2017 will also be considered.

How we award grades

Marking and awarding

[AQA guide to awarding](#)

How do students get an examination grade?

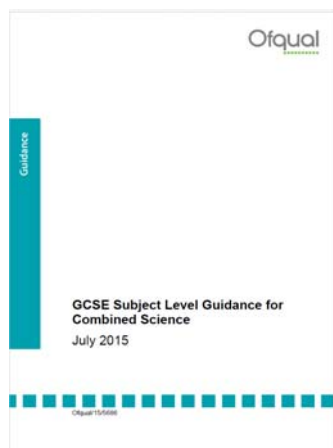
A qualification is a way of demonstrating that someone has achieved a certain level of learning.

- It is based on a specification which sets out the skills, understanding and knowledge that students are expected to have gained by the end of their course.
- Ofqual ensure the specification and assessment materials meet the National criteria; during the development of the specification, we collaborate with teachers and subject associations.
- Question papers **must** test how well a student can demonstrate that they have acquired the knowledge, understanding and skills set out in the specification.

Assessment focusing on skills

- Greater amount of content.
- However, **assessment** generally doesn't focus on knowledge.
- Some exceptions, eg formula recall.
- Limit on knowledge in isolation.
- **Use** the knowledge:
 - knowledge plus understanding
 - applying in context
 - supporting evaluation and analysis.
- Focus on Assessment Objectives and how they're reflected in questions and mark schemes.
- Plus extended response, synopticity, mathematical skills, SPAG...

Assessment Objectives



GCSE Subject Level Guidance for Combined Science

Guidance on assessment objectives for GCSE Qualifications in Combined Science

Condition GCSE(Combined Science) 2 allows us to specify requirements and guidance relating to assessment objectives for GCSE Qualifications in Combined Science.

We published our requirements in relation to assessment objectives in GCSE Subject Level Conditions and Requirements for Combined Science, and reproduce them in the table below.

Assessment Objective	Requirements	Weighting
A01	Demonstrate knowledge and understanding of: <ul style="list-style-type: none"> scientific ideas scientific techniques and procedures. 	40%
A02	Apply knowledge and understanding of: <ul style="list-style-type: none"> scientific ideas scientific enquiry, techniques and procedures. 	40%
A03	Analyse information and ideas to: <ul style="list-style-type: none"> select and evaluate make judgements and draw conclusions develop and improve experimental procedures. 	20%

We set out below our guidance for the purposes of Condition GCSE(Combined Science) 2. This guidance explains how we expect awarding organisations to interpret these assessment objectives in terms of:

- the different strands within each of the assessment objectives,
- the discrete elements within each assessment objective and its strands that candidates and tasks could target either work to create,
- the coverage expectations, such as in relation to the different elements within each assessment objective and how those elements should be sampled over time, and
- the key areas of emphasis in each assessment objective and the particular meaning for the subject of any key terms and phrases used. Defined terms are shown in bold text, followed by their definitions.

In line with the obligations set out in Condition GCSE(Combined Science) 2, we expect awarding organisations to be able to demonstrate how they have had regard to this guidance. For example, an awarding organisation could map how it has regard to the guidance as follows:

- develops its sample assessment materials,
- delivers the qualification,
- develops and applies its approach to sampling the elements into which the assessment objectives are divided, and
- monitors the qualification to make sure it addresses all elements appropriately.

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A01

GCSE Subject Level Guidance for Combined Science

A01: Demonstrate knowledge and understanding of: + scientific ideas + scientific techniques and procedures.			40%
Strands	Elements	Coverage	Interpretations and definitions
1 – Demonstrate knowledge and understanding of scientific ideas.	This strand is a single element.	<ul style="list-style-type: none"> Full coverage in each set of assessments² (but not in every assessment). No more than 15% of the total marks for the qualification should reward demonstrating knowledge in isolation³. 	<ul style="list-style-type: none"> Scientific ideas are aspects of the subject content. They include the subject-specific requirements and the requirements for Working Scientifically as set out in the Content Document – for example, theories, models, methods and how these develop over time, as well as recall of mathematical formulae and units. Scientific techniques and procedures encompasses, but is broader than, knowledge and understanding of the core practical activities. In the context of this assessment objective, it involves the knowledge and understanding of such techniques and procedures. The emphasis in this assessment objective is on Learners recalling and communicating relevant knowledge and understanding from the course of study – for example, facts, definitions, explanations, how to do something and why it should be done in a particular way.
2 – Demonstrate knowledge and understanding of scientific techniques and procedures.	This strand is a single element.		

² For the purposes of this guidance, a 'set of assessments' means the assessments to be taken by a particular Learner for a GCSE Qualification in Combined Science. For clarity, the assessments taken by Learners may vary, depending on any possible routes through the qualification.

³ Marks which 'reward demonstrating knowledge in isolation' means any mark awarded solely for recalling facts or other knowledge that is part of the specification. It does not include marks awarded for selecting appropriate knowledge (for example, to evidence an argument), or for applying knowledge to a particular context.

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A02

GCSE Subject Level Guidance for Combined Science

A02: Apply knowledge and understanding of:			40%
<ul style="list-style-type: none"> scientific ideas scientific enquiry, techniques and procedures. 			
Strands	Elements	Coverage	Interpretations and definitions
1 – Apply knowledge and understanding of scientific ideas.	This strand is a single element.	<ul style="list-style-type: none"> Full coverage in each set of assessments (but not in every assessment). 	<ul style="list-style-type: none"> Scientific ideas are aspects of the subject content. They include the subject-specific requirements and the requirements for Working Scientifically as set out in the Content Document – for example, theories, models and the use of relevant mathematics. Scientific enquiry, techniques and procedures encompasses, but is broader than, knowledge and understanding of the core practical activities. In the context of this assessment objective, it involves applying such knowledge and understanding to a given context. The emphasis in this assessment objective is on Learners applying their knowledge and understanding to provide meaning or explanation – for instance, to connect theory with particular contexts, stimuli or materials. This application should relate principally to: <ul style="list-style-type: none"> novel situations that are not clearly indicated in the specification; developing further material that is covered in the specification; making links between such types of material, which are not signalled in the specification. Application of knowledge should also involve determining how to make sense of connections and linkages within data, information and detail – although not to the extent of drawing conclusions or making judgements.
2 – Apply knowledge and understanding of scientific enquiry, techniques and procedures.	This strand is a single element.		

Ofqual 2015

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A03

GCSE Subject Level Guidance for Combined Science

A03: Analyse information and ideas to:			20%
<ul style="list-style-type: none"> interpret and evaluate make judgements and draw conclusions develop and improve experimental procedures. 			
Strands	Elements	Coverage	Interpretations and definitions
1 – Analyse information and ideas to interpret and evaluate.	1a – Analyse information and ideas to interpret.	<ul style="list-style-type: none"> Full coverage in each set of assessments (but not in every assessment). A reasonable balance between the strands within this assessment objective, and between the elements within each strand. 	<ul style="list-style-type: none"> Develop and improve covers a range of approaches to assessment, including questions related to adapting, modifying and enhancing experimental procedures. Learners should not be expected to develop their own procedures. Experimental procedures encompasses, but is broader than, the core practical activities. In the context of this assessment objective, questions/tasks should take an analytical form such as suggesting the limitations of a particular method. The emphasis here is on the outcome that Learners produce through the analysis of information – for instance, the interpreting, evaluating, judgement, conclusion or modification/improvement of procedures that stems from their reasoning and synthesis of skills. The abilities to interpret and evaluate in this context are both linked and complementary. Questions/tasks should address a range of sources here – for example, written, numerical, theoretical, practical, ethical, social, economic and environmental.
	1b – Analyse information and ideas to evaluate.		
2 – Analyse information and ideas to make judgements and draw conclusions.	2a – Analyse information and ideas to make judgements.		
	2b – Analyse information and ideas to draw conclusions.		
3 – Analyse information and ideas to develop and improve experimental procedures.	3a – Analyse information and ideas to develop experimental procedures.		
	3b – Analyse information and ideas to improve experimental procedures.		

Ofqual 2015

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How do students get an examination grade?

- It is impossible to test the entire specification in one set of exams so we select which areas to focus on in a particular paper, making sure that all areas of the specification are covered over a five year period.
- The question paper, mark scheme and marking guidance are all written at the same time by an exam committee led by a chair of examiners for a subject, under whom chief examiners lead the development of the papers for a specification often with a lead assessment writer – almost all of whom are teachers. There is also an assessment developer, whose role is to check that every aspect of Ofqual's requirements are met.
- All papers are checked, scrutinised and revised many times to remove errors and ensure the right level of challenge and completion in the provided time. They are then proof read before being re-scrutinised before being signed off after 18 months of work.

Writing an exam paper – the 13 steps to success!

1. Review previous exam series papers
2. Develop **blueprint** for new series of papers
3. Write **items** – question and related mark scheme
4. Items checked by Reviser and Senior examiners against blueprint and reviewed by a BATOD representative
5. Collate items into **papers**
6. Paper reviewed by Approval committee – sign off as fit for purpose
7. Paper read by Assessment Production Lead and proof readers
8. 1st Scrutineer sits paper as a student
9. Proof read again
10. 2nd Scrutineer sits paper – check against mark scheme
11. Final fresh pair of eyes check
12. Chair and Assessment Design Manager approves paper
13. Paper sent to printer

The examining process at AQA

- Look at the 16 cards describing the stages in the examining process.
- Some of the cards have been numbered to show their place in the sequence of steps that take place to ensure students are provided with reliable marks?
- Number those cards which do not have a number to create the sequence in which you think the steps take place (work with a neighbour if you wish).

The examining process at AQA

AQA Realising potential
Activity: examiner journey

Examiners are contacted by their Team Leader for a supportive discussion.

What do you think they may discuss?

What do you think this is intended to put the examiner and AQA?

Team Leader makes contact with their examiners beforehand through the marking card.

What do you think they may discuss?

Senior examiners review the mark schemes that all examiners will use.

Examiners are requested to mark the standardising material.

Examiners are given feedback on their overall performance.

Exam day.

Senior examiners, with standardising material and marked Exams that will ensure examiners are motivated throughout their marking.

The standardising material is made up from the standard assessment marking as per student responses.

If a card is required to a standard this is marked as per standard assessment. Examiners must ensure that they use to mark in full of each standard card.

Examiner carries out online training in their computer the principles of the mark scheme.

Examiners are trained about the administrative elements of marking and how to use the online marking systems.

Examiners are given guidance about the standard of their marking and approved to mark their allocated student responses.

Teacher applies to become an examiner through their local authority.

Grade boundaries are established.

All the marking is completed.

Teacher must criteria to become an examiner.

The standard the examiner applies is reviewed every day through marked scripts.

What do you think happens if their marking is not accurate?

Examiners download batches of scripts to mark. These include marked scripts.

This is a randomised list of 16 steps in the examiner recruitment and marking process. Have a go at numbering the steps. Some steps have been labelled for you.

How do students get an examination grade?

Marking

- After the student has sat the paper, it is first marked and then graded.
- We mark more than 7 million scripts each year and provide GCSE and A-level grades to more than 2 million students each year.
- Examiners practice using the mark scheme at standardisation meetings (may be online or less frequently face to face).
- The scripts are marked by the examiner team, with rigorous checking procedures to ensure examiners are consistent, fair and meet the required standard. If the examiner is not marking correctly, the scripts are removed from them and marked by another examiner.
- The rigorous processes involved ensure that all scripts are marked fairly.

How do students get an examination grade?

Awarding

- Whilst boards try to set papers with consistent levels of difficulty, in practice there is variation. To avoid penalising students who sit a more difficult paper in one year compared to another, grade boundaries are set for each paper.
- Awarding is the process by which grade boundaries are identified – it is a lengthy process! Senior examiners look at scripts from last year and compare these with a sample from the current year. They set the boundary so as to maintain the standard of difficulty between papers set in different years. They also use statistics to guide their judgement – how this group of students performed previously and thus what they might be expected to achieve.

How do students get an examination grade?

Awarding

- The grade boundaries (minimum marks required to achieve a given grade) are then applied to the marked scripts.
- Students performing to the same level should get the same grade regardless of the year of their examination.

Grade boundaries: Ofqual update

ofqual.blog.gov.uk/2017/02/03/grade-boundaries-the-problems-with-predictions

“Exam boards are not predicting the boundary marks, and are rightly urging caution. Other organisations, responding to teacher requests, are far less cautious. Some organisations have had their member schools sitting their own mock exams and have provided ‘results’ and ‘grade boundaries’ on the basis of that exercise. That’s really helpful, yes?

Actually, no.”

Grade boundaries: Ofqual update

There are many good reasons to be cautious ahead of 2017. Here are our top three:

1. Even in well-established qualifications, grade boundaries are never set in advance.
2. 2017 sees the first live exams of new GCSEs in English Language, English Literature and Maths.
3. Statistics will play a key role in making sure this year's students are not disadvantaged by being the first to sit these new GCSEs.

Extract from Ofsted School Inspection Update, March 2017

gov.uk/government/publications/school-inspection-newsletter-academic-year-2016-to-2017

- Part of understanding the GCSE reforms is being aware of the volatility of grade boundaries as the new qualifications bed in. Even when qualifications are well established, trying to guess where boundaries lie to predict grades for a particular examination is difficult.
- As inspectors, we can help schools by not asking them during inspections to provide predictions for cohorts about to take tests and examinations. It's impossible to do so with any accuracy until after the tests and examinations have been taken, so we should not put schools under any pressure to do so – it's meaningless.
- Much better to ask schools how they have assessed whether pupils are making the kind of progress they should in their studies and if not, what their teachers have been doing to support them to better achievement.

Grade descriptors and grade boundaries

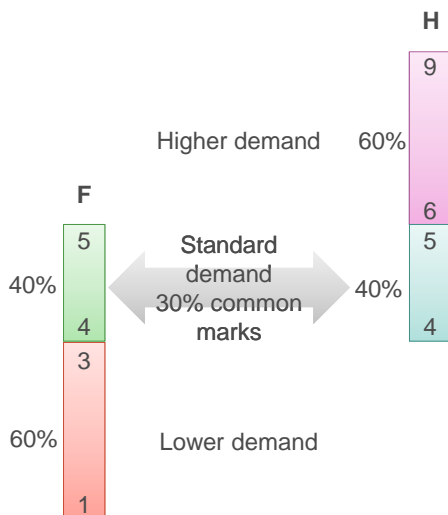
Assessment structure of the summer 2018 series – Trilogy, Synergy and separate sciences

15% of marks assess **practical skills** – all papers.

Combined Science, 20% of marks assess **maths skills**, covering all three levels of demand:

- Biology: 10%
- Chemistry: 20%
- Physics: 30%

No QWC marks.



9-1 tiers and awarding

This table shows how the grades are set in the first year and how that differs from year 2 onwards.

Basis of numerical grade in first year	New grade		Basis of numerical grade from second year
	H	F	
Tailored approach	9		Comparable outcomes
	8		
Comparable outcome – legacy grade A	7		Comparable outcomes
	6		
	5	5	
Comparable outcome – legacy grade C	4	4	Comparable outcomes
	(3)	3	
		2	
Comparable outcome – legacy grade G		1	Comparable outcomes
	U	U	

How is a grade boundary decided?

The 'statistical' element

Our Centre for Education Research and Compliance (CERP) use a range of statistics to make predictions which suggest the most appropriate statistically-recommended grade boundaries. These are based on how comparable students have performed in previous series, KS2 data and matched data.

The 'judgemental' element

The awarding meeting uses a balance of judgemental and statistical evidence to make recommendations. The committee will look at a range of scripts for each 'judgemental grade boundary' (7, 4 and 1 for GCSE).

Making the grades – a guide to awarding

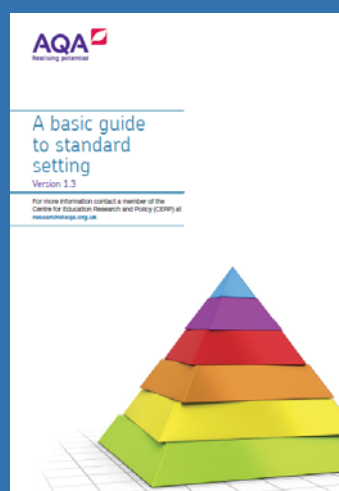
aqa.org.uk/about-us/what-we-do/getting-the-right-result/how-exams-work/making-the-grades-a-guide-to-awarding

What exactly is awarding?

Awarding is the process by which the grade boundary marks are determined at subject level.

We do this in a way that ensures the standard will be comparable with previous series and with that of other awarding organisations.

aqa.org.uk/about-us/what-we-do/getting-the-right-result/how-exams-work/making-the-grades-a-guide-to-awarding



Awarding and the allocation of grade boundaries

- The first award of all new GCSEs will be based primarily on statistical predictions with examiner judgement playing a secondary role. A modified approach, based on a wider range of information, will be used where needed because of the size and nature of the candidature.
- The grade standard established in the first award will be carried forward in the second and subsequent years.
- Where the cohort has the same level of prior attainment, broadly the same proportion of students will achieve a grade 4 and above as currently achieve a grade C and above; grade 7 and above as currently achieve an A and above; grade 1 and above as currently achieve a grade G and above.

Awarding and the allocation of grade boundaries

- All other grade boundaries will be set arithmetically, as previously. For example, the boundaries at grades 5 and 6 will be set based on the difference in marks between grades 4 and 7; grade 5 will be set at one third of the difference in marks, and grade 6 at two thirds the difference in marks.
- The process of comparable outcomes works on the basis that if the cohort hasn't changed much, we wouldn't expect the proportions of each grade to change much either; this ensures that students' outcomes are fair, even if the specification or assessment tools are changed.

Comparable Outcomes

ofqual.blog.gov.uk/wp-content/uploads/sites/137/2017/03/Awarding-and-Comparable-Outcomes-maths-meeting-2017-03-07.pdf

- This is a statistical approach to predict the likely percentage of students achieving each grade.
- Predicted outcome is contextualised by the prior attainment profile of the cohort (either KS2 for GCSE or GCSE for A-level).
- Based on the relationship between the prior attainment of students and their subsequent outcomes in a reference year, against which the performance of the current cohort is compared.

Awarding Grades 8 and 9 in 2018

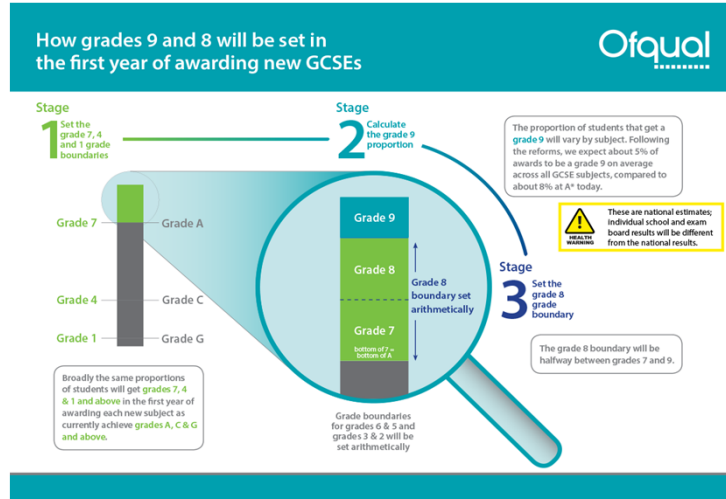
The tailored approach

- The proportion of grade 9s awarded in each subject will vary depending on the overall proportion of grades 7 and above awarded within the subject.
- A formula will be used to achieve these outcomes. Based on data from previous exam series the formula is:

Percentage of those achieving at least a grade 7 who will be awarded a grade 9 = 7% + 0.5 × (percentage of students awarded grade 7 and above)

- Grade 8 will be awarded arithmetically so that the grade boundary is equally spaced in terms of marks from the grade 7 and 9 boundaries.

Awarding Grades 8 and 9 in 2018



This guidance is lifted directly from Ofqual available in full here: ofqual.blog.gov.uk/2017/04/05/setting-grade-9-in-new-gcse. This contains public sector information licensed under the Open Government License v.3.0.

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AQA

Findings from 2017 – GCSE and A-level

Please look at the relevant examiner reports on the AQA website.

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AQA

Provisional GCSE results summer 2017

Provisional GCSE results (All UK Candidates)

The figures in brackets are the final national figures for 2016 Ref: Ofqual/16/6094

	Number sat	C and above	A and above
Core Science	283390 (375654)	47.9 (52.7)	4.5 (6.3)
Additional	376347 (368033)	58.2 (59.7)	9.1 (9.4)
Biology	143340 (144148)	90.4 (90.5)	42.2 (41.4)
Chemistry	141867 (141245)	89.9 (90.3)	42.4 (42.3)
Physics	141977 (139805)	90.8 (90.9)	41.9 (42.8)

Provisional outcomes summer 2017

A comparison of provisional 2017 GCE AS with 2016 AS results in the same subjects for 17 year olds.

The figures in brackets are the equivalent provisional figures for 2016.

	A	C	E
Biology	18 (18.9)	52.1 (57.8)	84.4 87
Chemistry	20.7 (22.4)	53.7 (61.5)	84.2 (87.5)
Physics	22.6 (22.9)	55 (59.5)	83.8 (86.4)

Provisional outcomes summer 2017

A comparison of provisional 2017 GCE A-level results with 2016 GCE results (all UK Candidates).

The figures in brackets are the equivalent provisional figures for 2016.

	A	C	E
Biology	26.2 (27.1)	70.8 (72.6)	96.8 (97.2)
Chemistry	31.7 (31.9)	75.6 (77)	97.0 (97.3)
Physics	29.2 (29.6)	69.7 (71.4)	95.8 (96.4)

Feedback from the summer 2017 end of Year 10 test

Areas of challenge for students:

- revision of material
- basic exam techniques: repeating the information in the question not adding to it
- conversion of units
- not using equations given
- quality of written answers and precise use of language
- application of knowledge to unfamiliar context
- linking information given in a question to what they know and then constructing an answer.

Areas of challenge for students:

- may have carried out the practical work but learning is not embedded
- importance of the apparatus and techniques is being missed
- describing patterns
- lines of best fit can be a curve
- maths skills:
 - not familiar with some of new applications of maths
 - not showing working out clearly.

Some reminders regarding GCSE in 2018

Command words

Knowledge

state, give, name, what, which, identify, define (recall), describe (recall)

Understanding

explain, define (explain), describe (explain), why, suggest, what does ____ mean, give a cause/advantage/disadvantage/reason/problem

Application

how, use, show, demonstrate, illustrate

Analysis

analyse, determine, explain, why, distinguish, appraise, examine

Evaluation

evaluate, assess, justify, compare, discuss, do you agree, contrast, judge

Extended response

- “the assessments for a GCSE...must...include questions or tasks which allow learners to...provide extended responses”.
- “an ‘extended response’ is evidence generated by a Learner which is of sufficient length to allow that Learner to demonstrate the ability to construct and develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured”.
(Ofqual GCSE (9 to 1) Qualification Level Conditions and Requirements)
- Focus on technique.
- Sustained line of reasoning is key.
- Tactics – PEE, brainstorming/essay planning.
- Answer the question – don’t lose focus on AO/command word.
- It should be clear which questions require extended responses.

Tiering: science

- You know your students best.
- Remember new Foundation Tier goes up to grade 5 and Higher Tier starts at grade 4.
- Look at performance on common questions on sample papers.
- Old B/C boundary a better guide than C/D.
- Grade 4/5 candidates may have challenging experience of Higher Tier.
- If it worked for you in Maths, talk to your Maths teachers.
- Change tier of entry for free up to 21 April.

GCSE science

- No more Core and Additional.
- 15% of exam marks drawing on students' practical experiences.
- 20% of marks for assessing mathematical skills.
- 15% limit on knowledge in isolation.
- 40% application in unfamiliar contexts including linking ideas.
- Look at the Ofqual guidance and the mark schemes.
- Make sure you submit your annual statement of practical work.

Key A-level resources

Plan

Option evening flyer – that helps teachers sell the spec to students within school. Schools may start to want them towards Christmas.

Teach

- Practicals page – practical handbook should be the number one resource teachers refer to aside from the spec – plenty of other resources on the page too.
- Schemes of work.
- Transition guides – good to push in the first weeks back, as students are getting started in Year 12.
- Command words – It's clear that plenty of students struggle to answer the questions we're asking – the command words should be a core resource for A-level teachers – students can't get marks if they're not answering the question.

Key A-level resources

Teach

- Maths skills briefings – the level of maths was a surprise to a lot of Biology and Chemistry centres this year.
- Teaching notes – teaching resources produced for areas of the specs that were either new to the spec (Biology and Chemistry) or not traditionally well covered by textbooks (Physics).
- Biology stats guide – every A-level Biology teacher should be familiar with this doc – answers every possible question on how we deal with statistics in A-level Biology.
- Chemistry time of flight guide – came up in the exams this summer.

Assess

- Biology essay resources.

Key GCSE resources

Plan

- Co-teaching ELC and GCSE Combined Science.
- Year 7 transition test.

Teach

- Maths skills in GCSE Science.
- Practical handbook.
- Command words.
- Subject specific vocabulary.

Key GCSE resources

Assess

- Year 10 tests.
- Second set of specimen papers:
 - mirrors the papers of 2018 award – 32 papers
 - simple grid to show metadata – AOs, maths, required practicals, working scientifically, level of demand
 - will be on Secure Key Materials only.

How did we do?

- Please rate this session on the **Sched Conference app**.
- Using the post-its provided, please write:
 - one thing you enjoyed about our session or will take away for your teaching
 - one thing you feel could be improved.
- Stick these on the feedback poster as you leave.

Get in touch

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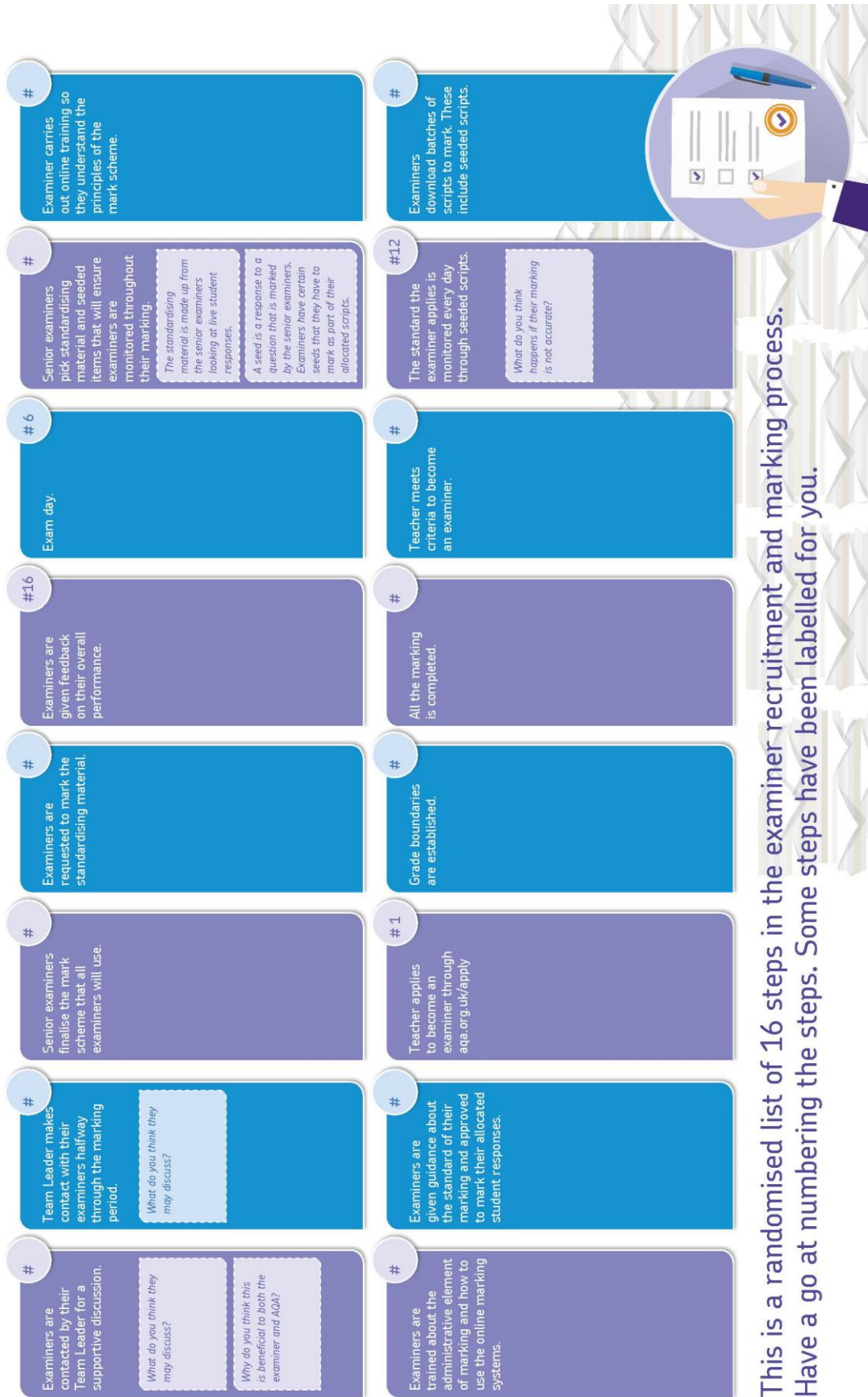
[aqa.org.uk/professional-development](https://www.aqa.org.uk/professional-development)



Thank you

Activity

Activity: examiner journey



This is a randomised list of 16 steps in the examiner recruitment and marking process. Have a go at numbering the steps. Some steps have been labelled for you.

Notes

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Notes

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