A-level Computer Science

Teacher Standardisation - NEA

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Schedule for the day

Session One:	Welcome and introductions
Session Two:	The NEA
Session Three:	Blind Mark Project - Snakes and Ladders
Session Four:	Discussion of Blind Mark Project
Session Five:	Mark project against log sheet - Project Icarus
Session Six:	Discussion of project marks
Session Seven:	Mark project against log sheet - Graph Tutor
Session Eight:	Discussion of project marks
Session Nine:	Further Resources / Questions

Resources for standardisation

This day is making use of projects from 2017 that were used to standardise the moderators.

Projects used for moderator standardisation:

Day 1
Stressage 2 Dressage - marked blind
Project Icarus - moderated against a completed log sheet
Project Disease Simulator - moderated against a completed log sheet
Day 2
Anti-Virus Software - marked blind
Graph Teacher - moderated against a completed log sheet
Snakes and Ladders - moderated against a completed log sheet

Admin process
Statements for centre feedback forms

The NEA

The non-examined assessment (NEA) is the opportunity for a student to take on a project over a long period of time.

The student is asked to perform either a problem-based or investigatory-based project.

They will complete the following documentation:

Analysis, Documented Design, Technical Solution, Testing, Evaluation

It is important that the marker has had first-hand experience of the solution working so that they can use this when marking the various sections.

Moderators are asked to look at the project coding and consider what features it actually has…
...this is considered more important when a project lacks a good design and/or full testing

The NEA - what has changed from COMP4

A reduction in the amount of documentation required - no system maintenance, user manual

Significant increase in the technical solution marks (20 → 42)

A requirement, therefore, for an appreciation as to the complexity of the technical solution and this should be evidenced across:

Analysis	→ objectives set that clearly indicate algorithmic challenge
Documented Design	→ sections of design clearly set out how algorithms work and are processed
Technical Solution	→ signposting to the ‘complex’ parts of the code
Testing	→ it can clearly be seen that the complex parts of the system work

Purpose of standardisation meetings

To consider the marking of the NEA project against the current standard.

To ‘standardise’ on a selection of projects.

- Even though you may have disagreements with the ‘standard’ - this is what shall be applied during the moderation process

To allow discussion about projects and marking.

To look at the moderation process.

Awarding marks - NEA

Analysis	9
Documented design	12
Technical solution	
Completeness	15
Technical skills	27
Testing	8
Evaluation	4
Total available	**75**

Teachers are asked to...

Draw the moderator's attention to where candidates have achieved criteria.

- This can be done by writing comments and linking to pages using the project log
- This can be done by annotating the documentation to highlight certain parts (this could be especially useful for the technical skills section)
- Encouraging candidates to also help by setting out documentation carefully and providing an 'overview guide' for the technical solution to highlight where technical skills can be evidenced

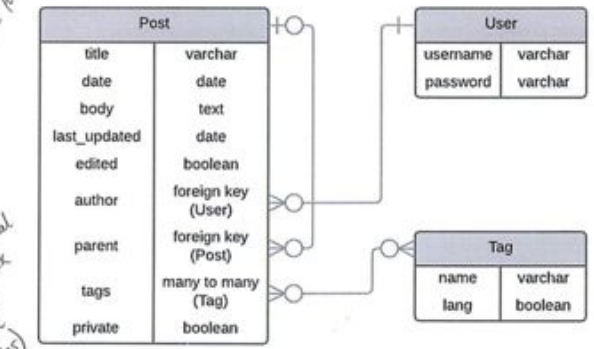
A well completed project log / centre assessment really helps the moderator when looking at centre work.

Providing evidence for the moderator

Project: Hearthstone Card Game

Section	Commentary	Level	Grade
Analysis	There is a clear understanding of the problem to be solved – a computer based card game with an AI option to allow players to play against the machine. There is also research about the Monte Carlo tree search and its possible use. The candidate has interviewed a fellow games developer as well as collected feedback by setting up an online forum. The actual usefulness of this as presented is questionable although there is evidence that it has informed the objectives. The objectives are clear. There is a set of extension objectives that goes beyond the requirements of A level. The student has presented material of the Monte Carlo Tree search. EBI current areas of use of example card game approaches would be discussed. An interview with a games developer is present page X. The candidate is clearly competent and has set himself an ambitious complex project with attainable objectives. Objectives - p6 Table of objects - p7 Analysis class diagram - p9 Interview p10 Monte Carlo Tree Search research - p12	Level 3	8
Documented Design	The design is fully documented. The candidate has a complete understanding of what they were trying to and have achieved. Fully comprehensive with all aspects of the code fully presented. The AI algorithm has been discussed in great detail. Other algorithms presented in class definitions would benefit from annotation IPSO - p17 UML - p18 Flowchart and game process p 23 - 27 Monte Carlo Tree Search algorithm - p28 34 Class definition and algorithms - p34 GUI rationale - p61	Level 4	12

Appropriate and well labelled diagram to illustrate the data model for the database



Group A Technical Skills - Complex data model in database (several tables) interlinked

Figure 6 – final data model

Interface Design

In this section there will be some discussions of the intended user experience as well as some drafts of front end interfaces. The interface designs below incorporate many aspects of the client requirements, so the requirements will not be quoted here. Instead, the relevant requirement numbers will be listed, and the full requirements can be found in the above section Final Client Requirements.

Moderators seek to agree

The moderator is looking to agree with your marking and will use the

- Documentation provided
- The completed project log
- Any annotation of the documentation

as evidence when moderating the work.

A-level standard

Project tasks that are not of A-level standard

If the task (problem or investigation) selected for a project is **not of A-level standard**, mark the project against the criteria given, but adjust, the mark awarded **downwards by two marking levels** (two marks in the case of evaluation) in each section for all but the technical solution

Why might a project not be A-level standard?

- Check against objectives
- Check against data model / algorithms

If you are not sure whether a project is A-level standard please contact your NEA advisor.

WHEN MARKING:

Read just the analysis (as a whole) and consider the objectives:

Is this an A-level project? **YES / NO / could be?**

If could be - look at ***TESTING*** section and consider again

Contact your NEA adviser to discuss

What is A-level standard and the 15 complete test...

Stock-Control System

Village Hall Booking System

Noughts and Crosses

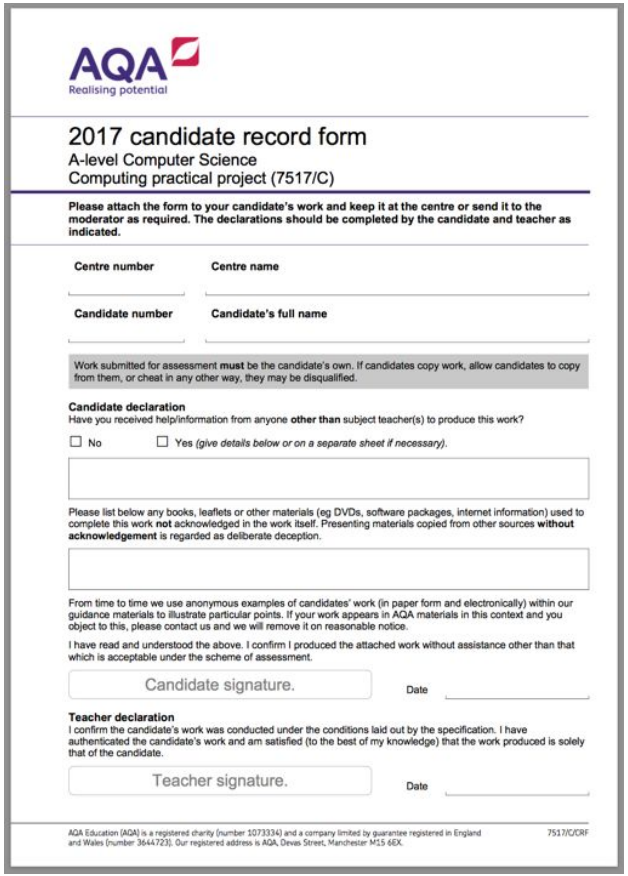
It should be clear from the ANALYSIS stage that the student is attempting a project that is of an A-level standard….

What is A-level standard and the 15 complete test...

Stock-Control System	one file? (No supplier or tracking of sales) doesn't detect if selling too much stock? A-level standard? 15 complete?
Village Hall Booking System	no display of calendar of events ability to over book events events can run past closing time A-level standard? 15 complete?
Noughts and Crosses	just plays nought and crosses does have GUI A-level standard? 15 complete?

It should be clear from the ANALYSIS stage that the student is attempting a project that is of an A-level standard….

The candidate record form



AQA
Realising potential

2017 candidate record form

A-level Computer Science
Computing practical project (7517/C)

Please attach the form to your candidate's work and keep it at the centre or send it to the moderator as required. The declarations should be completed by the candidate and teacher as indicated.

Centre number **Centre name**

Candidate number **Candidate's full name**

Work submitted for assessment **must** be the candidate's own. If candidates copy work, allow candidates to copy from them, or cheat in any other way, they may be disqualified.

Candidate declaration
Have you received help/information from anyone **other than** subject teacher(s) to produce this work?

☐ No ☐ Yes *(give details below or on a separate sheet if necessary).*

Please list below any books, leaflets or other materials (eg DVDs, software packages, internet information) used to complete this work **not** acknowledged in the work itself. Presenting materials copied from other sources **without acknowledgement** is regarded as deliberate deception.

From time to time we use anonymous examples of candidates' work (in paper form and electronically) within our guidance materials to illustrate particular points. If your work appears in AQA materials in this context and you object to this, please contact us and we will remove it on reasonable notice.

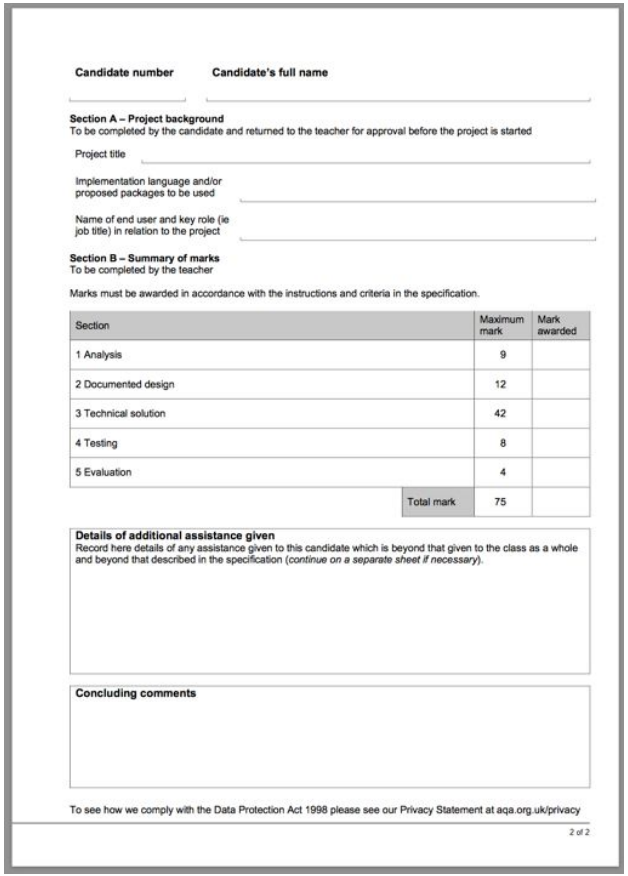
I have read and understood the above. I confirm I produced the attached work without assistance other than that which is acceptable under the scheme of assessment.

Candidate signature. Date

Teacher declaration
I confirm the candidate's work was conducted under the conditions laid out by the specification. I have authenticated the candidate's work and am satisfied (to the best of my knowledge) that the work produced is solely that of the candidate.

Teacher signature. Date

AQA Education (AQA) is a registered charity (number 1073334) and a company limited by guarantee registered in England and Wales (number 3644723). Our registered address is AQA, Devas Street, Manchester M15 6EX. 7517/C/CRF



Candidate number **Candidate's full name**

Section A – Project background
To be completed by the candidate and returned to the teacher for approval before the project is started

Project title

Implementation language and/or proposed packages to be used

Name of end user and key role (ie job title) in relation to the project

Section B – Summary of marks
To be completed by the teacher

Marks must be awarded in accordance with the instructions and criteria in the specification.

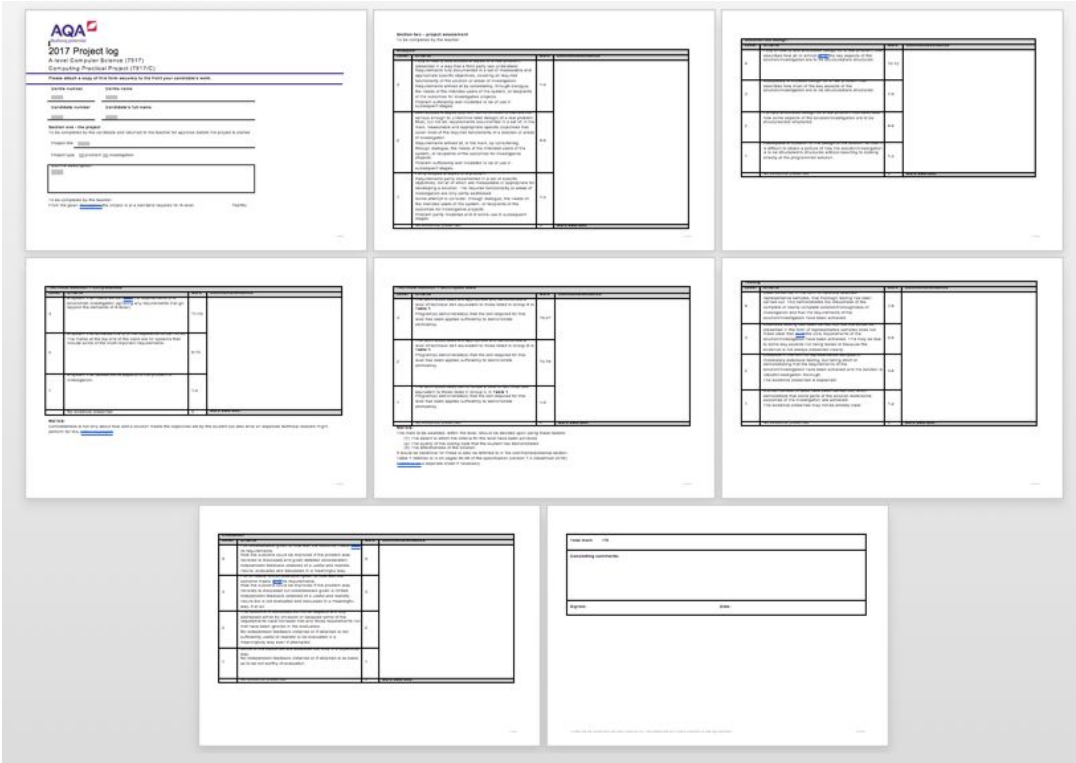
Section	Maximum mark	Mark awarded
1 Analysis	9	
2 Documented design	12	
3 Technical solution	42	
4 Testing	8	
5 Evaluation	4	
Total mark	75	

Details of additional assistance given
Record here details of any assistance given to this candidate which is beyond that given to the class as a whole and beyond that described in the specification (*continue on a separate sheet if necessary*).

Concluding comments

To see how we comply with the Data Protection Act 1998 please see our Privacy Statement at aqa.org.uk/privacy

The project log



Analysis

In the analysis section we are looking for:

- A detailed description of the problem / investigation
- Clear evidence that research has been performed (dialogue)
- A clear set of objectives that will be useful across the later sections of the project
- Modelling of the proposed solution that will be of use to later design work

? Having read the analysis stage:
Do you understand what the project is going to do?
Has the student set clear objectives that are detailed enough?

Documented Design

In the documented design section we are looking for:

- An overview to the whole system design (module breakdown / objects / units / web pages …)
- Clear design & detail for some of the complex algorithms
- Detail for the data to be used (database design / data structure design)

? Having read the documented design:
Do you understand how the project is going to work as a whole?
Do you have a clear understanding as to how some of the complex algorithms will work?
Do you understand how data will be processed / structured?

Technical Skills - Completeness

In the completeness section we are looking for a consideration as to:

- Has the project met the objectives set by the student in the analysis stage
- How well have these objectives been met (consideration to HCI / features)
- Does the technical solution match the original project background description

Completeness should also be measured against the suitability of the project for A-level

A slide used with the moderators about completeness

Completeness

LOOK LEFT:

Analysis/Requirements/Objectives

LOOK RIGHT:

Testing/Evaluation

CROSS THE ROAD:

Any ‘pot holes’ in the code (key missing features)

Abbey Road by Miquel C (CC BY)

Technical Skills - Technical Skills

In the technical skills section we are looking for a marker to:

- Identify parts of the code where complexity is clearly evident and map to Group A/B/C
  [This can be helped by a student producing an overview guide]

- Place consideration into the coding style and comment upon this

- Consider the overall effectiveness of the final solution (does it work how it should…)
  Have algorithms been used for the 'correct' reasons

  For example: Merge sort not just used to sort a list of ten values
  Login system appropriate for solution developed

Testing

In the testing section we are looking for:

- Clear evidence that the core requirements have been tested against
- Clear evidence that the system works as a whole (run through of the whole process/system)
- Robustness - does it work with a reasonable amount of data / amount of activity / ….
- Video evidence can work very well (we have one example of this today)

Evaluation

In the evaluation section we are looking for:

- Clear reflection upon the objectives set in the analysis stage.
  More than a YES / NO but consideration as to how well the objectives has been met and, possibly, how on reflection it could have been improved / done differently

- Feedback from a variety of users and then a reflection upon this

- Consideration of the above two activities into how the solution could be extended / improved in the future and what that might mean in terms of implementation

The NEA

Any questions?

Blind marking of a project

We are going to spend an hour looking at a project.

I would like you to mark it as a teacher (but without access to the student)....

So only going on the evidence in the documentation

This is an exercise to allow us to consider how a teacher might see a project and also think about our role as a marker -- what are we looking for? -- how do we provide evidence of our marking?

Having marked the project this exercise will then allow us to consider the 'standard' from 2017 and then discuss and differences / concerns

Feedback from Snakes and Ladders

	A-level standard?	Analysis	D Design	Completeness	T Skills	Testing	Evaluation	Total
Standard								

Feedback from Snakes and Ladders

ANALYSIS

Is snakes and ladders an appropriate game to consider for an A-level project?
Some research but not much dialogue
Aims and objectives are weak (nothing to indicate algorithmic complexity)

Moderated at 4

Project decided as 'not A-level standard' - so mark reduced to 1

DOCUMENTED DESIGN:

Design leaps into algorithm design with no real 'introduction / breakdown'
Perhaps should start with 'the board' and how this will be displayed / stored
Is it clear that the 'snake' and 'ladder' will only take up one space?
No consideration into the 'problems' that the game could face (a snake above a ladder…) ← but in code
HCI needs some annotation and discussion to raise the quality of this section.
Moderated at 5 (reduced to 1)

Feedback from Snakes and Ladders

COMPLETENESS

Due to the issues with what complexity to solution provides the project is placed into the middle band. (Basically considered skills of a good/top GCSE student)

Not always effective in implementation.

Moderated at 8

TECHNICAL SKILLS

Shows a variety of group B skills - so placed into the middle band.
Can Load/Save games to a file
Does make some attempt at OOP (mainly through use of a framework)

Moderated at 14

Feedback from Snakes and Ladders

TESTING

A reasonable attempt made at the testing.
Might be improved by submitting video evidence as well.
Is it clear that the 'whole system' has been tested?

Moderated at 6 (reduced to 2)

EVALUATION

Feedback from users is present
Student consideration of objectives could be improved.
No 'in depth' consideration of any improvements.

Moderated at 2 (reduced to 1)

Project Icarus

We are going to spend an hour looking at a project.

I would like you to mark it as a moderator.

You have a copy of the 'teacher comments'.

This is an exercise to allow us to consider how a moderator might see a project and also think about our role as a marker

-- what are we looking for?

-- have the teacher comments helped when moderating the project?

-- how could the teacher / student have set the project out better?

Feedback from Project Icarus

	A-level standard?	Analysis	D Design	Completeness	T Skills	Testing	Evaluation	Total
CENTRE	Y	8	12	15	26	8	4	73
Standard								

Feedback from Project Icarus

ANALYSIS

A detailed analysis (lots of nice technical detail providing clear signposts to complexity)
Good evidence of user involvement through dialogue.
Excellent list of objectives - clearly separated, signposting techniques, SMART
Perhaps lacks some modelling at the end of the analysis stage.

Can agree with centre mark of 8 (but why not 9…)

DOCUMENTED DESIGN:

Effective design
Nice breakdowns and overview of the parts of the implementation
Sketched UI with good information about how it will operate
Example data included (p41)
Pseudocode / flowcharts / nice whole system diagram (p49)

Can agree with centre mark of 12

Feedback from Project Icarus

COMPLETENESS

Clearly meets all objectives
Clearly an A-level project (with some interesting ideas)

Happy with centre mark of 15

TECHNICAL SKILLS

Wide variety of technical skills
Byte manipulation / Communications / Classes / Interfacing with sensors / Image manipulation

Can agree with centre mark of 26 (why not 27?)

Feedback from Project Icarus

TESTING

Testing of comms
Testing of image taking Nice modular testing
Test of client
Working through tests and attempting to 'prove' that sections work
Video demonstrates system working
Whole system test (the balloon went up and did 2 flights)

Happy to agree with centre mark of 8

EVALUATION

Evaluation against objectives (with critical comments / suggestions)
Feedback from users (which is relevant) - commentary against this feedback
Suggestions for future (with discussion as to implementation)

Happy to agree with centre mark of 4

Graph Tutor

We are going to spend an hour looking at a project.

I would like you to mark it as a moderator.

You have a copy of the 'teacher comments'.

This is an exercise to allow us to consider how a moderator might see a project and also think about our role as a marker

-- what are we looking for?

-- have the teacher comments helped when moderating the project?

-- how could the teacher / student have set the project out better?

Feedback from Graph Tutor

	A-level standard?	Analysis	D Design	Completeness	T Skills	Testing	Evaluation	Total
CENTRE	**Y**	**9**	**12**	**15**	**24**	**5**	**4**	**69**
Standard								

Feedback from Graph Tutor

ANALYSIS

Good initial discussion over BFS, DFS and A*
Not much dialogue with the user to inform decisions
Objectives are broken down well
Not much modelling at the end of the analysis section (however some work on classes)

Not much detail in the analysis about how the key points made in the 'introduction' section are to be considered

Moderated at 7 marks (clearly A-level standard)

DOCUMENTED DESIGN:

Good overview as to how the system will work (through talking about the UI p16-18)
Would be nice to have some 'sketches' to demonstrate a run through for one of the searches
How is the grid going to be displayed / organised? Detail about data structures…?

Moderated at 9 marks

Feedback from Graph Tutor

COMPLETENESS

Objectives - clearly met
System objective - is this met? - does it 'tutor' students…
- Was decided that it did not really provide any tutoring
- Whilst it draws a DFS,BFS,A* this is 'very fast' and it is not clear why and how it works...

Moderated at 10 marks(key system objective not met)

TECHNICAL SKILLS

Good demonstration of skills - easy to find some group A algorithms
Happy to accept centre mark

Moderated at 24 marks

Feedback from Graph Tutor

TESTING

Video helps to show how the system works
Centre identifies a few problems with the testing

Moderated at 5 marks (happy to agree with centre)

EVALUATION

Reasonable attempt at all tasks.
Would be nice to see an attempt to provide 'detail' for one of the potential improvements.
No real consideration against the system objective (from introduction of analysis)

Moderated at 3 marks

Centre awarded 69 marks (A* territory - is this an A* project)
Moderated at 58 marks (top B grade)

Other Resources

Other resources available to help with marking the NEA:

Standardised projects from 2017

Disease Simulator : Centre marked at 46
Moderated at 35

Stressage 2 Dressage : Another 'not A-level standard' project

Other moderated projects

CodeLine	(70)
Card Game	(69)
Julia Set	(65)
Simulating Charges	(52)
Subject Booking	(32)
Battleships	(14)

Your NEA adviser

The NEA

Any questions?

Thank you