Using standards to make judgments about student responses

English, History, Mathematics and Science assessment instruments

March 2010
## Contents

**Assessing and making judgments** ................................................ 4  
**Resources** ........................................................................................................... 4  
**Purpose** .............................................................................................................. 4  
**Aligning teaching, learning and assessment** ...................................................... 4  

**Designing assessment using syllabus dimensions and standards** ............................................................... 5  
*Determining the general objectives and standards to be demonstrated* ................................................................................. 5  
*Sample instrument-specific criteria and standards: Modern History* ................................................................. 6  
*Assessment instruments* ................................................................................................................................. 7  
*Modern History assessment instrument* ............................................................................................................. 7  
*Sample student responses* ............................................................................................................................... 8  
*Sample student response: Standard A* ............................................................................................................... 9  
*Sample student response: Standard C* ............................................................................................................. 11  
*Further sample assessment instruments and responses* ....................................................................................... 12  

**English** ........................................................................................................... 13  
*Instrument-specific criteria and standards* ........................................................................................................... 13  
*Assessment instrument* ................................................................................................................................. 14  
*Student responses* ............................................................................................................................... 15  
*Sample student response: Standard A* ............................................................................................................... 15  
*Sample student response: Standard C* ............................................................................................................. 18  

**Science: Biology** ........................................................................................................... 22  
*Instrument-specific criteria and standards* ........................................................................................................... 22  
*Assessment instrument* ................................................................................................................................. 22  
*Student responses* ............................................................................................................................... 23  
*Sample student response: Standard A* ............................................................................................................... 23  
*Sample student response: Standard C* ............................................................................................................. 27  
*Use of sources* ............................................................................................................................... 29  

**Mathematics B** ........................................................................................................... 30  
*Instrument-specific criteria and standards* ........................................................................................................... 30  

**Assessment instrument** ........................................................................................................... 32  
*Sample student responses* ............................................................................................................................... 33  
*Sample student response: Standard A* ............................................................................................................... 34
Sample student response: Standard C........................................................................ 37

Using standards to make judgments about student achievement............................................. 38
Making decisions about exit levels of achievement................................................................. 38
Assessing and making judgments

This document explains the practices associated with applying the Queensland Studies Authority’s (QSA) syllabus principles, guidelines and standards to make judgments about student responses to assessment instruments and make decisions about levels of achievement in Authority subjects.

Resources

This document should be read in conjunction with the QSA’s P–12 Assessment Policy.

Purpose

Assessment instruments should provide opportunities for students to demonstrate the syllabus:

- general objectives, described in dimensions — the salient characteristic or property of a subject
- standards — a description of the expected qualities of student work which provides a basis for judging how well students have demonstrated what they know, understand and can do.

This document provides information about:

- using syllabus general objectives and standards descriptors to design assessment instruments, tasks and items
- making judgments about student responses using instrument-specific criteria and standards selected from the syllabus dimensions and standards.

Aligning teaching, learning and assessment

Alignment of teaching and student learning experiences with syllabus general objectives and standards descriptors will occur in the design of:

- assessment instruments — tools or devices for gathering information about student achievement
- assessment tasks — a type of assessment instrument that involves students applying and using relevant knowledge and theoretical and practical skills to create a product or a response to a meaningful problem or issue
- items — subsets or parts of an assessment instrument
- instrument-specific criteria and standards or criteria sheets — tools for making judgments about the quality of students’ responses to an assessment instrument and lists of the properties or characteristics used to assess students’ achievements.
Designing assessment using syllabus dimensions and standards

The syllabus general objectives and standards descriptors are used to inform the design of assessment instruments, assessment tasks and items.

Determining the general objectives and standards to be demonstrated

Teachers should use the syllabus and the schoolwork program to determine which dimensions of the general objectives are to be assessed.

Once the dimensions are determined, descriptors are selected from the relevant syllabus standards to inform assessment design and the design of instrument-specific criteria and standards.

The descriptors to be assessed are gathered at Standards A to E on the school’s criteria sheet. All syllabus exit descriptors might not be assessed in a single assessment instrument; however, across the course of study, opportunities to demonstrate all must be provided.
Sample instrument-specific criteria and standards: Modern History

Schools will make judgments about the match of qualities of student responses with the standards descriptors that are specific to the particular assessment instrument. The assessment instrument presented in this section provides opportunities for the demonstration of the following dimensions:

- Forming historical knowledge through critical inquiry
- Communicating historical knowledge.

The qualities of student work to be matched to the syllabus standards are identified and the relevant syllabus descriptors from these two dimensions are selected for use.

In all of the sample student responses in this document, only Standards A and C are presented. However, some aspects of student work may match descriptors in other standards.

<table>
<thead>
<tr>
<th>Standard A</th>
<th>Standard C</th>
</tr>
</thead>
<tbody>
<tr>
<td>In an essay response to an unseen historical question on Gandhi and the Salt Tax Protest under test conditions, the student:</td>
<td></td>
</tr>
<tr>
<td><strong>Criterion 2: Forming historical knowledge through critical inquiry</strong></td>
<td><strong>Generally uses primary and secondary sources to Gandhi’s non-violent civil disobedience campaign of 1930 – 1931, the Salt Tax Protest, and its success or failure to:</strong></td>
</tr>
<tr>
<td>- uses a <strong>diversity</strong> of primary and secondary sources to Gandhi’s non-violent civil disobedience campaign of 1930 – 1931, the Salt Tax Protest, and its success or failure to:</td>
<td>- comprehends and applies <strong>explicit</strong> meanings</td>
</tr>
<tr>
<td>- comprehend and apply explicit and implicit meanings</td>
<td>- identifies <strong>simple and familiar</strong> concepts, values and motives that are explicit</td>
</tr>
<tr>
<td>- analyse to identify implicit and explicit patterns of information and categorise evidence</td>
<td>- analyses to identify <strong>obvious</strong> themes or patterns</td>
</tr>
<tr>
<td>- perceptively interpret values and motives and identify perspectives, while acknowledging the time period and context of a source’s production</td>
<td>- recognises <strong>relevant sources</strong></td>
</tr>
<tr>
<td>- corroborate primary and secondary sources</td>
<td>- detects bias in sources</td>
</tr>
<tr>
<td>- evaluates the relevance, <strong>representativeness</strong>, likely accuracy and likely reliability of sources</td>
<td>- refers to mainly secondary sources to make <strong>obvious decisions</strong></td>
</tr>
<tr>
<td>- synthesises evidence from primary and secondary sources to justify <strong>insightful decisions</strong></td>
<td></td>
</tr>
</tbody>
</table>
Criterion 3: Communicating historical knowledge

- consistently communicates accurately recalled or selected definitions, key historical concepts, terms, events, developments and people, and the relationships among them
- presents a coherent and valid historical argument that:
  - incorporates concepts of change and continuity over time
  - uses extensive vocabulary in a succinct and effective manner
  - accords closely with the style and conventions applicable to the essay genre
  - refers to evaluation processes without disrupting the argument
  - incorporates direct and indirect references to diverse relevant historical evidence
  - accurately uses the conventions of a system of referencing appropriate for an essay test
  - meets stipulated requirements for length and scope of response.

- communicates some recalled or selected definitions and descriptions of key historical concepts, terms, events, developments and people
- presents a coherent response that:
  - uses some historical concepts
  - incorporates some direct reference to appropriate sources of historical evidence
  - expression uses descriptive and explanatory language in which the meaning is discernible despite errors in vocabulary, style and conventions
  - uses some elements of a system of referencing appropriate for an essay test
- usually meets the stipulated requirements of the task.

Assessment instruments

The purpose of this document is to provide information about assessment practices. For this reason, assessment instruments are not presented in a way that would allow immediate application in a school context. In particular, the assessment technique is presented in isolation from other information relevant to the implementation of the assessment. For further information about those aspects of the assessment not explained, please refer to the assessment sections of the relevant syllabuses.

This sample from Modern History requires the demonstration of the instrument-specific criteria and standards through an extended written response to historical evidence in the form of an essay completed under test conditions.

Modern History assessment instrument

The student work presented demonstrates students applying and using relevant knowledge and skills to create a response to a problem or issue.
Task

You are required to respond to the unseen question below in essay form.

“Even the most powerful cannot rule without the cooperation of the ruled.” Gandhi

The non-violent civil disobedience campaign of 1930 – 1931, the Salt Tax Protest, remains a highly contentious event in the history of modern India. The great poet, Tagore, described it as a “great moral defeat for Europe”, while the Indian Nationalist leader, Chandra Bose, accused Gandhi of “acts which have done considerable disservice to the public cause.”

Using the evidence supplied and your knowledge and understanding of Gandhi and the Salt Tax Protest, decide whether the non-violent civil disobedience campaign of 1930 – 1931 was a “triumphant success” for Gandhi or whether it represented a “dismal failure” of his leadership.

In writing your response, you must make reference, in text, to a range of the sources provided, including some of the unseen sources provided. The sources provide different perspectives about the issue and you are required to reflect these different perspectives in your response. Remember, once you have considered the issue from these varied perspectives; you must reach a decision in response to the unseen question.

Sources provided for the test.

<table>
<thead>
<tr>
<th>SEEN SOURCES</th>
<th>UNSEEN SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source 1</td>
<td>Source 2</td>
</tr>
<tr>
<td>Gandhi’s letter to Lord Irwin</td>
<td>David Low’s cartoon, “Goosey, Goosey, Gandhi”</td>
</tr>
<tr>
<td>Source 3</td>
<td>Source 6</td>
</tr>
<tr>
<td>Webb Miller’s description of the raid at Dharasana</td>
<td>Churchill commenting on the Gandhi – Irwin truce</td>
</tr>
<tr>
<td>Source 4</td>
<td>Source 7</td>
</tr>
<tr>
<td>Table of prisoners during the Salt Tax Protest</td>
<td>William Shirer’s memoir of Gandhi and the Salt Tax Protest</td>
</tr>
<tr>
<td>Source 8</td>
<td>Source 10</td>
</tr>
<tr>
<td>Gandhi’s conversation with William Shirer</td>
<td>R.C. Majumdar’s analysis</td>
</tr>
<tr>
<td>Source 5</td>
<td>Source 11</td>
</tr>
<tr>
<td>Lord Irwin commenting on the Gandhi – Irwin truce</td>
<td>Namboodiripad’s comments on Gandhi and Non-violence</td>
</tr>
<tr>
<td>Source 9</td>
<td>Source 12</td>
</tr>
<tr>
<td>Tagore’s comments on the Salt Tax Protest</td>
<td>Ackerman and Du Val’s assessment of Gandhi and the Salt Tax Protest</td>
</tr>
</tbody>
</table>

Sample student responses

In this section, information about how the qualities of student work match the relevant instrument-specific criteria and standards at Standards A and C will be demonstrated. The complete annotated student response can be found on the QSA website: <www.qsa.qld.edu.au> Years 10–12 > Years 11–12 subjects > Humanities and Social Sciences.
Sample student response: Standard A

Note: “[...]” indicates where the text has been abridged.

<table>
<thead>
<tr>
<th>Standards descriptors</th>
<th>Student response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presents a coherent and valid historical argument</td>
<td>Over time there have been many debates as to whether the non-violent civil disobedience campaign of 1930 – 1931 was a “triumphant success” for Gandhi or whether it represented a “dismal failure” of his leadership. Success can be measured or interpreted differently. For Gandhi, who lived in a ‘world of possibility’ achieving independence, the obvious goal was not his only aim. Gandhi hoped to transform the Indian people. However for those who measure success simply and solely through tangible or measurable results they saw Gandhi’s campaign as an utter failure.</td>
</tr>
<tr>
<td>Refers to evaluation processes without disrupting the argument</td>
<td>In many ways Gandhi’s leadership was a success. Those who went through the Salt Tax protest were transformed. Gandhi successfully dispelled the sense of inferiority that British imperialism had created within them. It was proven that Indians had the power to drive events, for instance when the British lost control of Peshwar for 10 days at the end of April. The protest altered the Indian psyche, and although it “did not change the minds of the British, it did change the minds of the Indians about the British” (Source 12). As a secondary source, this source is highly credible, but given that it is a text that passionately promotes non-violent action a certain bias is evident. Yet importantly the authors acknowledged that there was strength in Gandhi’s non-violent resistance. “Non-violent action did not work the way Gandhi had expected – but it worked: (Source 12).</td>
</tr>
<tr>
<td>Evaluates the relevance, representativeness, likely accuracy and likely reliability of sources</td>
<td>The non-violent campaign ironically forced the British into violent action, as shown in Source 3. “The survivors, without breaking ranks, silently and doggedly marched on until struck down … Although everyone knew that within a few minutes he would be beaten down, perhaps killed, I could detect no signs of wavering fear”. This violence demonstrated the ugliness and the ferocity of British rule. This reported first person account of the raid on the Dharasana Saltworks (1930) provides a perspective that sheds light on the values and motives of the British. The legitimacy and supposed altruism of the British was shredded completely, and their specious nature was revealed in Webb Miller’s graphic account.</td>
</tr>
<tr>
<td>Perceptively interprets values and motives and identifies perspective, while acknowledging the time period and the context of the production of the source</td>
<td>In addition, Gandhi succeeded in forcing the British to deal with an Indian leader as an equal and to take congress seriously. It can be seen in Source 1, that it was Gandhi’s ambition to “open a way for real conference between equals…” This was certainly achieved, as reported in William Shirer’s Memoir (Source 7). “For the first time since the British took away India from the Indians they had been faced, as Churchill bitterly complained to deal with an Indian leader as an equal”. It is clear that Gandhi’s campaign had many successful moments and brought significant change.</td>
</tr>
<tr>
<td>Despite what many believed in terms of Gandhi’s success, many believed he failed entirely. It is true that Gandhi gave a lot, and Irwin...</td>
<td></td>
</tr>
</tbody>
</table>
gave only a little in the “Delhi Pact”. Irwin himself was surprised at how easy it was. “Looking over the whole thing, I do regard it as a very astonishing thing that Gandhi should have been so far persuaded to come into line” (Source 5). Even Gandhi’s colleagues such as Nehru and other congress thought that Gandhi surrendered. Reputable Indian historian Majumdar, comments that “It is hard to defend his pact with Irwin on any national ground, unless it were a tacit admission of failure and inability to continue the civil disobedience movement any further”. After the campaign India was no where near receiving dominion status or complete independence and Gandhi had not succeeded in any of the bread and butter issues such as relieving the Salt Tax. Communist, Namboodiripad also supported the perspective that Gandhi’s weaknesses denied India self-rule by “his insistence on a scrupulous adherence to what is called non-violence, which in effect, served to restrain the mass of workers” (Source 11). However as this is a communist point of view, it should be noted that his ideology was of the opinion that it was the birth right of those who are oppressed to act violently to those who ‘exploit’. It is clear that if success is measured by tangible or measured results, then on these terms Gandhi’s leadership may have been considered a failure.

Overall, it is evident that differing interpretations of success impact on the argument of whether Gandhi succeeded or failed. It is undeniable that Gandhi achieved a lack of tangible results from the “Delhi Pact”. However, Gandhi believed the “suffering has its well defined limits. Suffering can be both wise and unwise”. Therefore he believed that things had run their course. His argument was that you cannot get everything in one stroke. You must gather yourself and take the next step. Gandhi achieved overwhelming success in his goal to transform the people of India. He roused the masses, gave Indians a common purpose and truly revealed the falsity in British Imperialism. Therefore, it is evident that although Gandhi failed to an extent, in terms of achieving measured results, Gandhi succeeded in something greater. He altered an entire people, and revealed the Britians true purpose.’ “England can hold India only by consent”, he conceded, “We can’t rule it by the sword” The British lost that consent…” (Source 12)
Sample student response: Standard C

Under the Salt Laws, the British had imposed a monopoly on the salt, controlling the production and distribution of it. As his other attempts of civil disobedience had failed to push the British out of India, Gandhi used the force of the satyagraha as his final attempt to overthrow the Raj. This vision was for Indians to fight for self-rule first by freeing themselves from the unjust salt tax which significantly impacted on a number of Indians. From evaluating a variety of sources which depict Gandhi’s philosophy and aim for India, it is evident that from the courses of action he chose to take and their outcomes, he was considered to be a ‘triumphant success’.

Prior to the Salt March, Gandhi sent a letter to Lord Irwin on March 2, 1930, warning him that he and members of his ashram would begin to disobey the salt tax. With no intention made visible that he would be stopped by Lord Irwin, Gandhi began his march to the seacoast on March 12, 1930 with 78 followers and after making 200 miles, arrived on April 6 with over a thousand followers. Upon reaching there he picked up a pinch of salt from the ocean, immediately disobeying the Salt law. The march was, in all practicality, meaningless, yet created astonishing power. From this simple action made by Gandhi himself, he influenced many Indians from all over the country to do the same. This created frustration amongst the British who then began arresting Indians until their prisons were overflowing. As this made no impact. Lord Irwin ordered the arrest of all Indian leaders, from Nehru to Gandhi. However this failed to deter demonstrations throughout India as followers of Gandhi maintained his philosophy of civil disobedience. Despite this, the British continued to act unjustly towards the Indians as they saw them as an inferior race. Source 3 supports the display of unjustice from the British illustrating how they were brutally bashed. However, it also depicts the brave attitude Indians with held when struck, showing how ‘not one of the marchers even raised an arm to fend off the blows’. From this source, it is clear that Indians all round strongly stuck by Gandhi’s philosophy satyagraha. By doing so and continuing to let the British use a strong force of violence upon them, it can be seen that the Indians were in reality more powerful, showing that they didn’t need any armed weapons, only the force within themselves to stay strong and continue Gandhi’s philosophy.

Whilst projecting his idea of satyagraha and civil disobedience, Gandhi also worked to come to some agreement with Lord Irwin. After meeting twice and forming a quick agreement on constitutional talks based on federation, accounted government and reserved powers, they eventually came to an agreement in 1931, known as the Gandhi – Irwin Pact. At first, it was considered that Gandhi didn’t gain much from this action, however, by evaluating Source 7, it is quite evident that Gandhi did in fact gain something from the pact.
Even though Shirer fails to realise that Gandhi benefits from the pact, he soon realised that he actually achieved a great deal. This included being treated as an equal by the British and the aspirations of Indians for self-government being acknowledged. This clearly presents a turning point in the Salt Tax protest, showing how the British began to respect Gandhi and India’s requests. From this, it is clear that his vision of equality began to come into process.

Sources 11 and 12 corroborate in portraying Gandhi as success throughout his civil disobedience movement. Both evidently show that from Gandhi’s ideas and vision of satyagraha, he worked towards success portraying that despite the failure of overthrowing the raj, there were still various fields he succeeded in. Even though the civil disobedience movement failed to bring about changes between Britain and India, Gandhi’s influence and philosophy of satyagraha during the civil disobedience movement brought about change in Indians themselves. From non-violent action of Indians and brutality by the British, the injustice of Indian’s became harder to hide. Throughout his movement, Gandhi illustrated that by bringing about unity religion and caste systems and effectively displaying non-violent action, they can achieve so much more, not only through their country but within themselves too.

By considering and evaluating a variety of sources, it can be seen that Gandhi was a success in his civil disobedience movement of the Salt Tax Protest. Even if he failed to make significant changes within the government through his various decisions, his philosophy of satyagraha was most effective influencing and changing the minds and actions of Indians therefore weakening the British.

Further sample assessment instruments and responses

This document provides further examples of how syllabus standards descriptors are used to design assessment instruments and inform judgments from the following subjects and courses:

- English 2002
- Science: Biology 2004

Student responses will be provided at Standards A and C. The purpose of this document is to inform standards-based decision making. To achieve this, it is not always necessary to look at complete student responses.

Complete student responses and assessment instruments and the instrument-specific criteria and standards are available for all the assessment instruments in this document on the QSA website at <www.qsa.qld.edu.au>.
## Instrument-specific criteria and standards

<table>
<thead>
<tr>
<th>Knowledge and control of texts in their contexts</th>
<th>Knowledge and control of textual features</th>
<th>Knowledge and application of the constructedness of texts</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student has demonstrated knowledge that meanings in texts are shaped by purpose, cultural context and social situation by:</td>
<td>The student has demonstrated knowledge of appropriateness of textual features for purpose, genre, and register by:</td>
<td>The student has demonstrated knowledge of the ways in which texts are selectively constructed and read by:</td>
</tr>
<tr>
<td>• exploiting the patterns and conventions of the essay to analyse the novel</td>
<td>• exploiting the sequencing and organisation of subject matter in stages</td>
<td>• evaluating how cultural assumptions, values, beliefs and attitudes underpin the novel</td>
</tr>
<tr>
<td>• selecting and synthesising substantial, relevant subject matter</td>
<td>• making discerning use of cohesive ties to emphasise ideas and connect parts of texts</td>
<td>• making subtle and complex distinctions when evaluating representations of the relationships and identities of individuals, groups, times and places</td>
</tr>
<tr>
<td>• interpreting, inferring from, analysing and evaluating aspects of the novel in great depth</td>
<td>• exploiting an extensive range of apt vocabulary</td>
<td>• thoroughly analysing how readers are invited to take up positions in relation to texts</td>
</tr>
<tr>
<td>• substantiating opinions with well balanced and relevant argument and evidence</td>
<td>• combining a wide range of clause and sentence structures for specific effects, while sustaining grammatical accuracy</td>
<td>• identifying and explaining the ways cultural assumptions, values, beliefs and attitudes underpin the novel</td>
</tr>
<tr>
<td>• exploiting the ways the essay writer’s role and their relationship with the reader is affected by power, distance and affect</td>
<td>• sustaining control of paragraphing and a wide range of punctuation</td>
<td>• making broad distinctions when identifying and explaining representations of the relationships and identities of individuals, groups, times and places</td>
</tr>
<tr>
<td></td>
<td>• controlling conventional spelling</td>
<td>• identifying and explaining ways readers have been invited to take up positions in relation to texts</td>
</tr>
</tbody>
</table>

Queensland Studies Authority  March 2010 | 13
Assessment instrument

This sample assessment instrument provides opportunities for students to demonstrate the following dimensions:

- knowledge about texts and their contexts, interpretation of texts, taking account of the way that meanings in texts are shaped by purpose, cultural context and social situation
- knowledge, understanding and control of the appropriate use of particular textual features and their patterns of use in genres to achieve particular purposes for specific cultural contexts and social situations
- knowledge of the ways in which texts are selectively constructed and read.

Context

You are invited to contribute to a Year Twelve book of essays, *Reading Nineteenth Century Fiction: The Individual and Society.*

Option 1 — Persuasion

In her novel *Persuasion*, Jane Austen crafts a subtle critique of Regency notions of social class, rank and status.

In your essay, you should consider:

- the extent to which different character representations serve to support or challenge Regency notions of class, rank and status
- Austen’s use of irony and satire
- how readers are positioned to respond to issues of social class, rank and status.

Option 2 — Wuthering Heights

Many critics have argued that Emily Brontë’s novel, *Wuthering Heights*, marks her as a pioneer ahead of her time. Other commentators, however, have argued that, despite its subversive overtures, *Wuthering Heights* ultimately upholds the traditional values of nineteenth century British culture and society.

In your response to these statements, you must discuss ways attitudes and assumptions about traditional class structures are reinforced or challenged in the novel.

Your article will also need to discuss one of the following:

- the extent to which traditional gender roles are supported or challenged in the novel; or
- the extent to which traditional ideas about race are supported or challenged in the novel.
Student responses

These student responses give a detailed explanation of the match of standards descriptors to student responses. Further examples across the suite of current English Authority syllabuses can be found on the QSA website: <www.qsa.qld.edu.au> Years 10–12 > Years 11–12 subjects > English.

Sample student response: Standard A

<table>
<thead>
<tr>
<th>Standard descriptors</th>
<th>Student response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploiting the patterns and conventions of the essay (opening remarks, thesis statement, plan of development)</td>
<td>In a Class of Her Own. Unconcealing propriety, fervent duty, and a strict sense of class defined the world of Jane Austen. The Regency period of the 19th century was inherently founded upon a rigid social structure, in which respectability and rank could not be garnered through virtue of character but were bestowed through land and family heritage. In her novel Persuasion, Jane Austen has crafted a clever critique of these Regency notions by primarily conforming the traditional class structure, but also subtly endorsing the key role it played in the 19th century. In her characterization of Anne Elliot, the male characters in the novel, and the Musgrove family, Austen challenges Regency beliefs, and positions the audience to see through their superficiality. However, Austen also acknowledges that such beliefs were entrenched in the lives of the upper-middle class, by endorsing social propriety in marriage.</td>
</tr>
<tr>
<td>Interpreting, inferring from, analysing and evaluating aspects of the novel in great depth</td>
<td>Austen wildlife the character of Anne Elliot to very effectively challenge the traditional notions of social class, rank, and status. As the heroine of the novel, Anne’s values and characteristics play a vital role in positioning the audience. Anne’s modesty and indifference to rank set her apart from the rest of her family. Sir Walter Elliot is defined by “family of person and of situation”, and both Elizabeth</td>
</tr>
</tbody>
</table>
Interpreting, inferring from, analysing and evaluating aspects of the novel in great depth

Substantiating opinions with well balanced and relevant argument and evidence

Exploiting the patterns and conventions of the essay (use of direct quotation)

Sustaining control of paragraphing and a wide range of punctuation

Making discerning use of cohesive ties to emphasise ideas and connect parts of texts

Making subtle and complex distinctions when evaluating representations of the identities of individuals and groups

Thoroughly analysing how readers are invited to take up positions in relation to texts

Exploiting an extensive range of apt vocabulary

And many have a great deal of "the Elliot pride" (p. 21). Anne, on the other hand, emits such neurosis on the issue that even the Miss Musgrove's acknowledge that "all the world knows how easy it is to have your pride hurt, if you are about it" (p. 135). Instead, Anne values modesty over status. Her idea of good company is "the company of clever, well-informed people" (p. 146). This directly contrasts traditional Regency beliefs, which Mr. Elliot articulates: "Good company requires only birth, being an *excellent* good-heeded fellow" (p. 18) respectively.

Furthermore, the comparison between Mr. Elliot and Captain Wentworth is a deliberate contrast between traditional Regency values and the "new genre". Mr. Elliot is an extremely negative character that the audience is positioned to dislike. He is "black at heart, hollow and black" (p. 187) and was only able to "purchase independence by uniting himself with a rich woman" (p. 9). In stark contrast, Captain Wentworth is represented in a universally likeable fashion, with his "warm and cordial heart" (p. 26). Unlike Mr. Elliot, Wentworth is able to gain status with "nothing but himself to recommend him" (p. 127). This map in social status and rank is to be admired by the audience, as it is achieved through personal virtue and contrasts the rigid social structure of the Regency period.

The Regency notions of class and rank are further contrasted by Austen's comparison between the Ewells and the Musgroves. The audience is positioned to see through the social pretensions of the Ewells, and identify with the Musgrove family. Austen was satiric in making Sir Walter's inflated sense of self-importance and Mary's exaggerated sense of self-pity, and how certain mere values (what his character displays, Austen refers to the bargain as "market Sir Walter"). Similarly, despite being prone to fancying herself neglected and ill-used (p. 35), Mary is referred to as "poor Mary" (p. 35). Their representation as caricatures of the snobbish upper-middle class undermines their traditional values of rank and class. The Musgroves, on the other hand, who are supposedly 'beneath' the Elliots in rank are portrayed much more positively. Austen describes them as a "very good sort" of people (p. 38) who do everything to bring happiness (p. 204) in their daughters' lives.
The value that Anne has for the Musgroves, despite being one of the Eugens, highlights the author's value for personal worth, as opposed to the traditional notions of rank and respectability.

Despite the numerous ways in which Austen challenged the beliefs of the Regency period, she is unable to dismiss them completely. Thus, Austen subtly endorses the role of Regency class structure in marriage, the role of persuasion in Anne's life. Key to this endorsement is the character of Captain Wentworth. As a young girl of 19, Anne is persuaded by Lady Russell to marry Captain Wentworth, who at that time, had "no hopes of attaining affluence" (p.27). Despite suffering mild unhappiness because of it, at 27, Anne admits that the was right to "yield on the side of safety". Anne could not be guaranteed financial stability if she had entered into this unsuitable marriage. Significantly, when Anne does agree to marry Captain Wentworth, it is no longer an unsuitable match. Captain Wentworth had achieved a small fortune and was "no longer nobody" (p.232).

Even Sir Walter was "very far from thinking it a bad match" (p.232). Their marriage does not challenge any social boundaries. Similarly, the other marriages in the novel are deemed socially suitable matches. Henrietta marries Charles Hayter, a man with "good, freehold property" (p.71), and Louisa marries Captain Benwick, who is also of respectable rank and financial position. Jane Austen achieves this happily-ever-after ending only by coupling the young characters into socially acceptable marriages, thus, confirming the importance of social propriety in marriage, and positioning the audience to accept this expectation as part of life in the Regency period.

To construct a subtle critique of the Regency notions of class, rank, and status. Jane Austen both mocks and honours traditional Regency values. The characterisation of Anne, the construction of male characters, and the representation of the Musgrove family all serve to challenge the traditional class structure. However, the role of marriage in the novel counters this criticism, by affirming social propriety and expectations. In a modern context, such a blend of ideas
## Sample student response: Standard C

<table>
<thead>
<tr>
<th>Standard descriptors</th>
<th>Student response</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the main, employing the patterns and conventions of the essay to analyse the novel (opening remarks, thesis statement)</td>
<td>The novel <em>Wuthering Heights</em>, written by Emily Brontë in the early 19th Century, is a novel about a microsociety in Yorkshire which has a rather tempestuous past that is newly revealed by the new tenant of Thrushcross Grange. Throughout the novel is a strong gothic theme which can be seen throughout the entire novel prefiguring the strange events. This paper is going to assess the underlying themes of class and race within the novel and to determine whether Brontë has chosen to present these in the traditional standard set by the British culture in the 19th Century or whether Bronte's novel was truly ahead of its time.</td>
</tr>
<tr>
<td>Establishing the essay writer's role</td>
<td>(Race in <em>Wuthering Heights</em> can be seen in a rather traditional light by reading how the introduction of the only ethnic character within the novel is greatly discriminated against. When Heathcliff was brought home by Mr Earnshaw, the reactions to the dark-skinned child set the tone for the race relations within the novel. He is constantly described as an &quot;Ilk&quot; (p.36) rather than he, given a name and even when he is named Heathcliff, he is often referred to as an it. The first description of the child immediately portrays him as something evil: &quot;It's as dark almost as if it came from the devil.&quot; (p.36). Through the first description of the child it is prominent that this family shows no tolerance towards people with an ethnic background.</td>
</tr>
<tr>
<td>Using a range of clause and sentence structures with occasional lapses in grammatical accuracy</td>
<td>Fother into the novel it is not only</td>
</tr>
<tr>
<td>Identifying and explaining the ways cultural assumptions, values, beliefs and attitudes underpin the novel</td>
<td></td>
</tr>
<tr>
<td>Making broad distinctions when identifying and explaining representations of the identities of individuals and groups</td>
<td></td>
</tr>
</tbody>
</table>

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18 | Assessing and making judgment  English, History, Mathematics and Science
Identifying and explaining the ways cultural assumptions, values, beliefs and attitudes underpin the novel

Supporting opinions with relevant argument and evidence

Using suitable vocabulary.

Identifying and explaining the ways cultural assumptions, values, beliefs and attitudes underpin the novel

In the main, employing the patterns and conventions of the essay to analyse the novel (use of quotations)

Supporting opinions with relevant argument and evidence

the Earnshaw family, who have taken this child into their home, who constantly emphasise Heathcliff’s non-English origins but he is also discriminated by an upper-class family, the Lintons. Mr Linton assumes that this is the “little Lascar, or an American or Spanish castaway”, which is then followed by Mrs Linton’s remark “a wicked boy, at all events... and quite unfit for a decent house” (p56). From the very start, later compares himself with Edgar, in a discussion with Nelly declaring that he wishes he had dark hair and fair skin” (p57). This shows Heathcliff’s knowledge of his different ancestry. Bronte later in the novel also describes Heathcliff as “an animal,” and his mouth watered to tear you with his teeth; because, he’s only half a man—not so much” p. (13)

This further emphasises the importance of race in the early 19th century because Heathcliff is not referred to as a person anymore, he is now a savage animal.

The values of class in this novel can be argued that there is a rather traditional underlying trend shown by the characters. Catherine’s decision about who she marries is determined primarily on the class of the male. She says to him:

“I’ve no more business to marry Edgar Linton than I have to be in heaven; and if that wicked man in there had not brought Heathcliff so low, I shouldn’t have thought of it. It would degrade me to marry Heathcliff now” (p 81).
Interpreting and explaining aspects of the novel with some analysis and evaluation

Controlling paragraphing and punctuation, such as commas, apostrophes, capitals and full stops

Usually linking ideas with cohesive ties

Selecting sufficient relevant subject matter

Using a range of clause and sentence structures with occasional lapses in grammatical accuracy

Identifying and explaining the ways cultural assumptions, values, beliefs and attitudes underpin the novel

Supporting opinions with relevant argument and evidence

This quotation by Cathy implies that she is aware of the certain standards which she is expected to uphold because of her status. Previously to this statement Cathy says “I shall like to be the greatest woman in the neighbourhood, and I shall be proud of having such a husband” (p 78), this further declares her desires to become a wealthy woman and uphold the traditions expected of women in her time. → Central argument: reader positioning.

Furthermore, when Heathcliff returns from his two year absence he returns with his newly found wealth. Cathy now believes that “Heathcliff was how worthy of anyones regard” (p 79). He has returned with a promoted status and washed away “marks of former degradation” (p 80). Although Heathcliff has returned with the right status, Cathy still doesn’t love him and uses his newly found power to attack those who have mistreated and degraded him. Rather than changing, how class is viewed in society he reinforces the boundaries. He uses upper class ideals of marriage and arranged marriages to obtain power over Edgar by forcing her to marry Linton although this is unnecessary and she says “why should you force me to do what I’d willingly do myself” (p 274). Even though Catherine and Linton may have eventually married Heathcliff wanted to have the authority in the situation to cause harm to Edgar. → Central argument.
Identifying and explaining the ways cultural assumptions, values, beliefs and attitudes underpin the novel.

Interpreting and explaining aspects of the novel with **some** analysis and evaluation.

The novel, *Wuthering Heights*, classically portrays the ideals of race and class of the early 19th Century in Britain. After all the destruction Heathcliff receives, he becomes a totally dehumanised character in the novel who revolves his life around obtaining power and revenge on those responsible for losing Cathy. He does not restore the balance between the classes, he simply becomes the upper class and keeps the cycle going; he does nothing to restore the ‘balance and equality’ amongst all people.
# Science: Biology

## Instrument-specific criteria and standards

<table>
<thead>
<tr>
<th>Standard A</th>
<th>Standard C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Understanding biology</strong></td>
<td><strong>Evaluating biological issues</strong></td>
</tr>
<tr>
<td>The student communicates their understanding by:</td>
<td>The student communicates their understanding by:</td>
</tr>
<tr>
<td>- making links between related ideas, concepts and principles of biotechnology to reveal meaningful interrelationships.</td>
<td>- defining and describing ideas, concepts and principles of biotechnology and identifying interrelationships.</td>
</tr>
<tr>
<td><strong>Evaluating biological issues</strong></td>
<td><strong>Evaluating biological issues</strong></td>
</tr>
<tr>
<td>The student communicates by:</td>
<td>The student communicates by:</td>
</tr>
<tr>
<td>- gathering, critically analysing and evaluating information about biotechnology from a variety of valid and reliable sources.</td>
<td>- gathering information about biotechnology from a variety of sources.</td>
</tr>
<tr>
<td>- integrating the information and data to make justified and responsible decisions about the biotechnology.</td>
<td>- selecting relevant information and data to make plausible decisions and predictions about biotechnology.</td>
</tr>
<tr>
<td>- considering alternatives and predictions relevant to biotechnology.</td>
<td>- recognising concepts that form the basis of biotechnology issues.</td>
</tr>
</tbody>
</table>

## Assessment instrument

This sample assessment instrument provides opportunities for students to demonstrate the following dimensions:

- Understanding biology
- Evaluating biological issues.

The student work presented in this sample is in response to an assessment task.

### Part A

Research one of the following topics.
- Stem cell research
- Cloning
- Genetic engineering
- Genetically modified foods
- Organ transplant
- IVF
- Other (negotiated topic – must be approved by the teacher)

Compile an annotated bibliography of your research.
Part B

Develop an original essay that discusses and evaluates the issues surrounding the topic. The essay must contain:

- Links to science with both scientific and public attitudes considered.
- Evidence of research incorporated into the response.

Student responses

These student responses give a detailed explanation of the match of standards descriptors to student responses. Due to copyright restrictions diagrams presented in the student responses have been omitted. Further examples across the suite of current Science Authority syllabuses can be found on the QSA website: <www.qsa.qld.edu.au> Years 10–12 > Years 11–12 subjects> Sciences.

Sample student response: Standard A

<table>
<thead>
<tr>
<th>Standard descriptors</th>
<th>Student response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrating information and data to make justified and responsible decisions about the technology.</td>
<td>Genetically modified foods are and have been for many decades, a controversial bioethics topic. Genetically modified foods are part of the branch of science known as biotechnology, and are foods which have had their genetic makeup altered (Human Genome Project, 2008). The genetic modification (GM) of food is a bioethics issue because the production of GM foods raises questions regarding its benefits. Genetically modified foods should be sold and available globally, with clear and meticulous labelling. Extensive scientific research over a suggested period of ten or more years should be allowed for developing the process of which genes and foods can be safely modified. Genetically modified crops should also be well contained and isolated from other plant life, both of crops and wild plant life. Genetic engineering and modification can be conducted on animals, however, only genetically modified plant crops will be discussed in this paper. Agriculturalists have used the method of natural selection to improve and to grow bigger crops for decades. Genetic modification is the next and more advanced scientific step in this development of growing better food. The quality of food will increase with genetic modification and GM foods will also be fresher due to more locally and year-long crops being produced. Crops will become more enduring and tolerant with the aid of GM biotechnology. Additionally, environmental benefits from GM food crops are substantial. Not everything is known about GM biotechnology and allergies may be triggered by these foods. GM foods use recombinant DNA technology which is the joining or recombining of genetic material from different sources. This is possible because in nature genetic material is constantly recombining at fertilisation, crossing over and the exchange of material by bacteria. Genetic engineering moves single genes whose functions are known from one organism to another. The risk of producing organisms with unexpected traits is decreased. With selected breeding, genes of unknown function are also transferred. Genetic modification is used to improve the same traits as selective breeding:</td>
</tr>
<tr>
<td>Making links between related ideas, concepts and principles of biotechnology to reveal meaningful interrelationships</td>
<td>increased nutritional content</td>
</tr>
<tr>
<td></td>
<td>disease resistance</td>
</tr>
<tr>
<td></td>
<td>taste</td>
</tr>
<tr>
<td></td>
<td>ability to withstand harsh environmental conditions</td>
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</table>
Genetic modification of food first began in the 1970s and they were first sold in the early 1990s (Green & Watts, 2004). There are three different types of genetic modification. These are the introduction of a foreign gene to DNA, the alteration of an existing gene or the deactivation of an existing gene (VEA, 2005).

GM involving the introduction of a foreign gene creates transgenic organisms which are organisms which have a gene from another organism. This is a relatively complex process involving the breaking apart of bacterial plasmids which are chromosomes found within bacteria. When used in this way they are known as vectors which include foreign DNA into their structure. Restriction enzymes are then used to cut the vectors. Scientists attach a marker to the desired gene which will become part of the existing vector. DNA ligase then combines the joined ends together which are then cloned. This cloned DNA is introduced to the host plant cell and the desired gene integrates into the plant’s chromosomal DNA (VEA, 2005). This delicate and complex process has taken many years of refinement and testing.

Cells share structural and functional features, they contain the same types of molecules, operate by processes that follow the same rules and speak similar genetic languages and this is what makes genetic modification possible. Cells:

- are built to the same basic design using the same molecules
- exhibit the same fundamental properties
- operate using the same processes eg. Cell reproduction requires DNA duplication
- utilise the same principles
- speak basically the same genetic language.

The central dogma for molecular biology is DNA → RNA → protein. As the process from gene to protein is the same in all cells, genes can be transferred to another cell and produce the same protein.

Biotechnologists research the genome of the organisms which they are changing and carefully choose which genes and which strands of DNA to extract.

At present, all GM crops are kept in isolation from other natural plants. This would be continued on into the future to ensure that any native plants and non-transgenic crops do not cross-pollinate with these GM plants. If this were to occur the consequences are unknown but could include loss of biodiversity. Loss of biodiversity could prove to be disastrous as this affects the ecosystem and could provide an imbalance, subsequently resulting in extinction of many species within that particular ecosystem (Shah, 2009). This isolation is deemed necessary while scientists are still discovering more about the properties of genetically modified food crops.

Biodiversity is important, few animals rely on only one food source and therefore if there is greater plant biodiversity, there is greater animal diversity. Biodiversity also helps to maintain genetic diversity. This would increase the chance a species – at least some numbers – will survive environmental change. Selective breeding of crops decrease genetic diversity and therefore prone to pests.

Prior to today’s technological advancements of biotechnology, genetic modification was not possible. However, farmers were still able to modify crops to produce better quality produce. Natural selection was used which involved handpicking the best produce to cross-breed to be used for the next season’s harvest. This was a slow process that could take many seasons before any difference in the quality and size of the produce was noted. Genetic modification is simply a more scientific and calculated method of natural selection that happens to work much faster. This is the most recent development in food modification, a more scientific procedure than that which farmers have been using for decades and indeed centuries.

Most food of better nutrition can be grown which will aid in feeding the people of the world. The quality of food crops will become improved with the aid of GM technology.
Considering alternatives and predictions relevant to biotechnology

Crops will be potentially larger than ever before and have a better flavour and nutritional value. The sugar content of some types of naturally sweet food can be enhanced through the alteration of existing genes (VEA, 2005). Foods can be modified so that they contain more essential vitamins required in the human diet. Considering that the world population is currently approximately 6.8 billion and growing at a fast exponential rate, more and more food is needed worldwide in order to feed this vast population. GM foods will be able to assist in solving these problems. Many farmers are already using genetically modified crops with 13.3 million farmers across 25 different countries recorded to be using these crops (Monsanto company, 2009).

Furthermore, extra nutrients and vitamins are able to be added to foods to produce more vitamin rich food for people who do not have much variety within their diet and are lacking vitamins. For example, in many part of Asia rice is a staple food in many people’s diets. While rice is plentiful in carbohydrates, it is lacking in vitamins such as the essential vitamin A. Vitamin A is essential in the diet as without it, disastrous effects such as blindness may occur. Vitamin A deficiency also currently causes up to two million deaths annually (Monsanto company, 2009). Scientists are presently working on creating genetically modified rice so it will contain vitamin A. They are doing this by obtaining vitamin A DNA from carrots which are a food plentiful in this vitamin (Whitman, 2000). Beta-carotene is introduced from the carrots into the DNA of rice which stimulates the production of vitamin A (Monsanto company, 2009). This rice can then be grown across Asia and hence, the rate of blindness and other problems caused by vitamin A deficiency will be significantly lowered.

Another example illustrating the advantage of GM foods being produced at higher rates is that insulin will be able to be produced at a cheaper cost. Insulin is a critical hormone for people with diabetes and was previously obtained from either humans or pigs. Today, most insulin is produced by bacteria in fermenters but this procedure of obtaining and using the insulin is expensive. As a result of GM technology, insulin can now be grown in modified plants such as Safflower plants (New Scientist, 2009). This provides a cheaper way of creating insulin for those with diabetes. As this sort of technology is so advantageous to so many people, this aspect of GM foods is an advantage to use.

Scientists are able to manipulate DNA of plants so that they become more enduring and tolerant of harsh soil types. This potentially means that GM crops will be able to withstand droughts and salty soil types that are present across much of Australia. Genes are taken from hardy plants such as grasses and wheat and are transplanted into the crops that are in areas affected by drought (VEA, 2005). The same types of scientific principles also apply for growing crops in underdeveloped nations suffering in from long term famines and droughts. In many cases, not enough food is grown in continents such as Africa due to the soil types. With harder crops, these problems can be solved and these famines can be slowly eliminated. Crops will be more enduring and able to adapt to more climates than ever before. In the past, certain plants developed an adaptation to certain areas depending on the climate and soil types. These adaptations could include things such as sunken stomata on the leaves of plants in hot an dry climates to avoid excess water loss or pneumataphoric root systems of trees in areas that are known to receive generous amounts of rain and flood. However, these adaptations take many generations of plant reproduction before they are evident and are able to fully adjust to different climate types. With genetic modification, these types of adaptations can be created for immediate use and different crops can be cultivated across climates that they are not usually grown in. For example, strawberries and blueberries are usually grown in colder climates. With genetic modification by either implanting genes from foods that grow in warm climates or by altering the genes that enable these foods to grow in a colder climate, this crop could be grown and harvested in warmer climates such as in Africa. This technology not only ensures that there is enough food across the world, but also ensures there is a wide variety of this food.

Another benefit that arises from the potential hardiness of GM crops is that food will no longer need to be imported if it is out of season. A lot of the food currently consumed is imported if it is out of season. A lot of the food currently consumed is imported or kept in storage for months at a time. Crops can be genetically modified to withstand the heat or cold and thus, food usually grown in summer will not need to be imported to Australia during winter. Due to this endurance, genetically modified foods will potentially be fresher as they should all hypothetically be locally grown. This cuts down on travelling time as well as all shipment in which crops may become...
damaged. Genetically modified foods would theoretically be fresher as they would not need to be imported or kept in storage. They could continue to be produced all year long. An example of this is strawberries that are frost resistant. Even though strawberries are naturally a winter fruit, they cannot survive the winter frosts of the more southern parts of the nation.

Biotechnologists have extracted a gene from fish breeds which swim and live in icy water such as cod and have transplanted this gene into the DNA of strawberries (Choice, 2009). This enables the strawberries to become resistant to the cold weather and will thus not be affected by the frost and can be cultivated in colder climates. This means that more farmers can grow a larger variety of crops, providing more jobs and more fresh produce for consumers. The quality of the food will also be improved as it will be potentially fresher and will undergo less shipment.

Genetic modification of food not only proves to be beneficial for human consumption, but is also advantageous for the environment. As a society currently growing more and more environmentally aware, the potential advantages that arise from GM crops should be embraced. Pesticides containing dangerous chemicals have been used on crops for decades. These pesticides can sometimes spread, causing many species of insects that are not harmful to crops to die. This could eventually result in a loss of biodiversity which, as mentioned earlier, can affect all species within and ecosystem.

Biotechnologists have been able to manipulate the genes of plants so that the plants themselves have an inbuilt pesticide that is specific for the type of pests that eat the crops. Weevils are pests that consume pea plant crops. Researchers found that these pests do not however eat bean plants. Scientists were able to extract a gene from the bean plant to implant in the pea plants. After this, weevils did not consume the pea plants and farmers were able to stop using pesticide as a means of eradicating the weevils (Monsanto company: 2009). This means that farmers can stop spraying potentially toxic chemicals across their crops without worrying that they will be losing vast amounts of income due to insects eating their harvests. Sprays can also be used to kill any weeds that may grow in a farmer’s crop. If these weedkillers spread into the natural surroundings of the crop fields there is the potential that ‘wild’ plant species other that the intended weeks, will die. This, too, results in a loss of plant biodiversity across the area.

Not only does the reduction of these chemicals on the plants benefit the environment, it can also benefit humans. If humans are consuming these crops that have been heavily sprayed with pesticides and harsh chemicals, these chemicals have the potential to affect the digestive system. Even if the crops sprayed with these harsh pesticides are kept for farmed animals such as cows, humans are still essentially consuming these chemicals when they eat beef due to the principle of biomass. Through food chains, 10% of energy is passed on to the next level in the food chain (Spenceley et.al, 2004). This also means that the nutrition (or chemicals) from food that cattle have eaten will almost certainly be passed onto humans. Since 1996, farmers have decreased pesticide application by 359 000 tonnes (Monsanto, 2009). Not only do GM crops create a better environment due to less pesticide being used, this lack of pesticide sprayed also means that there is less carbon emissions from tractors that are used to spray these pesticides. There is also a lot of water that is required to make these pesticides that will be saved due to the genetically modified crops. As genetically modified foods ensure that there is no need for harsh pesticides, our society will not have to fear that they are consuming these pesticides themselves every time they eat.

While the advantages of genetically modified foods are numerous, some potential negative aspects and concerns have arisen. As GM is still a relatively new technology, all hazards are at this point in time, hypothetical. One of the concerns put forward by both the society and scientists alike is the concern that new allergies may be generated from these foods, as well as existing allergies being ignited by genetically modified foods due to genes from the original allergen being genetically transferred to different crops. There are people who are worried that new ‘super allergies’ will be created by genetically modified foods. There is currently little scientific evidence to support the theory that such allergies will be created. Allergies exist for many natural foods and any allergies that do arise from genetically modified foods should theoretically be subsequent to these original allergies.

In 1996, biotechnologists inserted a gene from Brazil nuts into soybeans (Bender, 2009). People who were allergic to the Brazil nuts who ate the soybeans were also allergic to the soybean. The reason for this unfortunate incident can be partly
attributed to the lack of labelling that GM foods had as this technology was still advancing and being discovered. Scientists have learnt from this mistake which was now many years ago. Of course, the awareness and technology will be more advanced at this present time. However, this gives more reason for a long research time to be allocated to this branch of biotechnology before these GM crops can be used and sold freely to the public. Until then, rigorous labelling should be used on any products that have been genetically modified or that contain any GM ingredients. Scientists are currently working on removing the allergens and toxic components from foods that are known to evoke allergies in many people such as the peanut. Research on this is currently being undertaken in universities across the globe including the University of Arkansas, the University of Georgia and Tulane University (The Institute of Food Science & Technology, 2008). Biotechnologists are careful choosing which foods to genetically modify, taking into consideration which foods cause the most allergic reactions.

Genetic modification of food crops should be permitted and the selling of these crops should also be allowed, given that meticulous labelling is used and a suitable and lengthy timeframe in which to test these crops is provided: Isolation of genetically modified foods should also be enforced to ensure biodiversity of an area is maintained. Genetic modification is simply a more technical and advanced way of enhancing future food crops. There are significant advantages that arise from genetic modification which include the better quality of food and the enhanced freshness due to greater local harvests. Crops will be able to sustain the expanding world population and will be able to be grown in harsher climates. In addition, there are many environmental benefits that arise from GM food crops. There are currently a couple of hypothetical concerns regarding genetically modified foods, one of which is that allergies may be triggered by consuming these foods. The advantages far outweigh the disadvantages regarding genetic modification of food and thus, the researching and promoting of such foods should be encouraged.

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**Sample student response: Standard C**

<table>
<thead>
<tr>
<th>Standard descriptors</th>
<th>Student response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Defining and describing ideas, concepts and principles of biotechnology and identifying interrelationships.</strong></td>
<td>Gene therapy introduces or alters genetic material to compensate for a genetic mistake that causes disease. It is hoped that gene therapy can treat or cure diseases for which no other effective treatment is available. However, many technical and ethical considerations have been raised by this new form of treatment. Based on the following evidence only under certain conditions is Gene therapy ethical, if the hereditary disease can be prevented offering the effect subject a new lease on live (<a href="http://www.encyclopedia.com">www.encyclopedia.com</a>).</td>
</tr>
<tr>
<td></td>
<td>Gene therapy is the insertion of genes into an individual cell or tissue to treat or prevent a hereditary disease in which a mutant gene is replaced with a functional one. As technology develops it is likely that medically unrelated genetic traits become the target of manipulation for families that suffer from hereditary diseases such as cystic fibrosis, hemophilia and some susceptible cancers (nodak.edu/instruct/mmclean). Genes are the blueprint for our bodies, influencing factors such as growth and development. A genetic mutation means that a gene contains a change that disrupts the gene message. This can result in a faulty gene. This mutation can occur spontaneously or may be inherited. However the challenge for nations experimenting with gene therapy is to come up with workable, fair and ethical guidelines for its use. Ethical considerations include deciding in which cells should be used, how gene therapy can be safely tested and evaluated in humans, what components are necessary for informed consent and which diseases or traits are eligible for gene therapy research, the range of complex ethical and moral dilemmas offered, the difference between Gene therapy and genetic engineering and the current issues concerning Gene therapy.</td>
</tr>
<tr>
<td></td>
<td>Many medical conditions result from flaws, or mutations, in one of more of a person’s genes. Mutations cause the protein within that gene to malfunction. When</td>
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</tbody>
</table>
a protein malfunctions, cells that rely on that protein’s function can’t behave normally, causing problems for whole tissues or organs. Medical conditions related to gene mutations are called genetic disorders. (http://learn.genetics.utah.edu/)

Being able to have a normal and healthy childhood for a family that suffers from hereditary cancers but has been prevented through gene therapy, is not only ‘playing god’ but offering a new and eventful life experience for that child. Gene therapy raises the possibility of eliminating some diseases from a particular family, and ultimately from the population, forever. However, the raised controversy towards the role of ‘playing god’, and concerns about the technical aspects; the worry that genetic change spread by gene therapy may actually be deleterious and harmful, with the potential for unforeseen negative effects on the future generations. (www.encyclopedia.com/). The distinction between gene therapy for disease genes and gene therapy to enhance desired traits, such as height or eye colour. No one would argue that diseases that cause suffering, disability and potentially, death are good candidates for gene therapy. However, the line between what is considered a disease (such as dwarfism disorder) and what is considered a trait, in an otherwise healthy individual (such as short stature) is not easily distinguished. Even though gene therapy is used for correction of potential socially unacceptable traits, or the enhancement of desirable ones, it may improve the quality of life for an individual. Nevertheless the trait enhancement could negatively impact what society considers ‘normal’ and thus promote increased discrimination towards those with the ‘undesirable’ traits (www.srpt.org.uk/genthpy).

The use of gene therapy comes with a risk, these may include the immune system responding to the healthy gene coy that has been inserted and rejecting it, causing inflammation. The healthy gene may be slotted in the wrong spot, or produce too much of the missing enzyme or protein; causing other health problems or the deactivated virus might target other cells as well as the intended cells, or the deactivated virus might be contagious. All these risks must be accounted for before undergoing to treatment of gene therapy or a trail. Although the majority of trails focus on treating acquired diseases, such as cancer and AIDS, although an increasing number of inherited conditions are now being targeted for gene manipulation. Although there is a fair amount of risk involved in trails of this kind of therapy and to date only kids who are seriously ill or have illness incurable by conventional means have been involved in clinical trials using gene therapy. Nevertheless for those with serious illnesses that aren’t responsive to conventional therapies, gene therapy may soon offer hope that didn’t exist just a short time ago. (parent/system/medical/gene_therapy). Genes can also be ‘over expressed’, meaning they can drive the production of so much of a protein that they can be harmful. Another risk is that a virus introduced into one person could be transmitted to others or into the same environment.

The most targeted side to gene therapy is research being done in gene therapy for kids has been for genetic disorders such as cystic fibrosis. Other gene therapy trials involve children with severe immunodeficiencies, such as adenosine deaminase deficiency (ADA) deficiency (a rare genetic disorder that makes kids prone to serious infection), and those with familial hypercholesterolemia (extremely high levels of serum cholesterol) (medical/gene_therapy). The first use of somatic cell gene therapy was for the treatment of Adenosine Deaminase Deficiency (ADD) in children commonly known as “bubble babies”. This is a rare immune system disorder that ultimately prohibits the body from defending invaders like the common cold. Because doctors were able to successful insert healthy, normal cells into the child with the blood from its umbilical cord, their immune system was able to fully form. The child did not reject the healthy genes and doctors claim the genes are “expressing” (Gorman 1995).

The other type of gene therapy is germline gene therapy. The altered gene is inserted into the sperm or egg cells (germ cells), and this ultimately leads to a change in not only the individual receiving the treatment, but also future offspring. It is also possible to insert the altered cells into an early stage embryo that would affect both the germline and somatic cells. Yet, most governments have limited all gene therapy experiments to somatic gene therapy because the alteration performed in germ gene therapy would change future generations(nodak.edu/instruct/mmclean).

Currently, genetic engineering is concerned with alterations while gene therapy aims to eliminate disease at its source, not produce a ‘better’ class of human-
beings. Human genetic engineering is the modification of an individual's genotype with the aim of choosing the characterises of a newborn or changing the existing characteristics of an adult or child. It holds the promise of curing genetic diseases like cystic fibrosis and increasing the immunity of people to viruses. It speculated that genetic engineering could be used to change physical appearance and even mental improvement like memory and intelligence; although for now these uses are regulated to science fiction (Human_genetic_engineering). Nevertheless, Gene therapy is used more often to cure diseases within a person or subject, therefore bettering the community.

Gene therapy's potential to revolutionize medicine in the future is exciting, and its expectations for curing and preventing childhood diseases is encouraging. One day it may be possible to treat an unborn child for a genetic disease even before symptoms appear. Scientists are hoping the mapping of the human genome will lead the way toward cures for many diseases and that the success of current clinical trials will create new opportunities and challenges. For now, however, it's a wait-and-see situation, calling for cautious optimism. As Gene therapy technology is made available, and even as they sound like miracle cures for disease, the ultimate expression of health can only be within each patient. This is where, long term, the true revolution in medicine may take place.

Use of sources

Gathering, critically analysing and evaluating information about biotechnology from a variety of valid and reliable sources is a Standard A descriptor. In both the sample responses above, the students’ gathering of sources is not demonstrated.

Below is a student sample of the critical analysis and evaluation of some sources collected as part of a Standard A response.

Annotated Bibliography

Bender, D. B.Sc., Ph.D., 2009, ‘Genetic Modification of Food’, (Online)

This article describes the benefits and environmental downsfalls of genetic modification as well as how genetic modification procedures occur. The information within this article has been obtained from the knowledge of a biochemistry lecturer in London. The headings of the website make it very easy to pick and choose which information can be used and concepts are explained through biological terms. There are no examples specific to Australia. This source can be viewed as reliable as it was written by a lecturer in biochemistry who holds a PhD. Bender is also the author of many books which further increases the credibility of the information in the article. As this article is also one of the most recent ones found it should incorporate any recent discoveries regarding genetically modified foods. I have found this article to be of great use, particularly as I was trying to grasp the topic when I first began researching it. Hence, it will form the basis of my research.

Better Health Channel (Victorian Government), 2007, ‘Genetically modified foods’, (Online),
Accessed 9th August, 2009

This article gives a brief layout of the advantages and disadvantages of genetically modified foods and how they are being marketed and sold. This article has been written to promote a better understanding of genetically modified foods to the public. While this article covers the advantages and disadvantages from an ethical point of view, it does not contain much biology. This website is run by the Victorian government. While this means that information may be more reliable, it also means these issues are not fully covered from a biological perspective. It is a recent website which should contain updated information. This article is not of very much use to my topic and hence will not form the basis of my research.
## Mathematics B

### Instrument-specific criteria and standards

<table>
<thead>
<tr>
<th>Standard A</th>
<th>Standard C</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student’s work has the following characteristics:</td>
<td>The student’s work has the following characteristics:</td>
</tr>
<tr>
<td>• recall, access, selection of mathematical definitions, rules and procedures in <strong>routine and non-routine</strong> simple tasks through to routine complex tasks, in life-related and abstract situations</td>
<td>• recall, access, selection of mathematical definitions, rules and procedures in <strong>routine</strong>, simple life-related or abstract situations</td>
</tr>
<tr>
<td>• application of mathematical definitions, rules and procedures in <strong>routine and non-routine</strong> simple tasks, through to routine complex tasks, in life-related and abstract situations</td>
<td>• application of mathematical definitions, rules and procedures in <strong>routine</strong>, simple life-related or abstract situations</td>
</tr>
<tr>
<td>• numerical calculations, spatial sense and algebraic facility in <strong>routine and non-routine</strong> simple tasks through to routine complex tasks, in life-related and abstract situations</td>
<td>• numerical calculations, spatial sense and algebraic facility in <strong>routine</strong>, simple life-related or abstract situations</td>
</tr>
<tr>
<td>• <strong>appropriate</strong> selection and <strong>accurate</strong> use of technology.</td>
<td>• selection and use of technology.</td>
</tr>
</tbody>
</table>

### Knowledge and procedures

- **The student’s work has the following characteristics:**
  - recall, access, selection of mathematical definitions, rules and procedures in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations
  - application of mathematical definitions, rules and procedures in routine and non-routine simple tasks, through to routine complex tasks, in life-related and abstract situations
  - numerical calculations, spatial sense and algebraic facility in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations
  - appropriate selection and accurate use of technology.

### Modelling and problem solving

- **The student’s work has the following characteristics:**
  - use of problem-solving strategies to interpret, clarify and analyse problems to develop responses from routine simple tasks through to non-routine complex tasks in life-related and abstract situations
  - identification of assumptions and their associated effects, parameters and/or variables
  - use of data to synthesise mathematical models and generation of data from mathematical models in simple through to complex situations
  - investigation and evaluation of the validity of mathematical arguments, including the analysis of results in the context of problems; the strengths and limitations of models, both given and developed.

- **The student’s work has the following characteristics:**
  - use of problem-solving strategies to interpret, clarify and develop responses to routine, simple problems in life-related or abstract situations
  - use of mathematical models to represent routine, simple situations and generate data
  - interpretation of results in the context of routine, simple problems routine, simple problems.
The student’s work has the following characteristics:

- appropriate interpretation and use of mathematical terminology, symbols and conventions from simple through to complex and from routine through to non-routine, in life-related and abstract situations
- organisation and presentation of information in a variety of representations
- analysis and translation of information from one representation to another in life-related and abstract situations from simple through to complex and from routine through to non-routine
- use of mathematical reasoning to develop coherent, concise and logical sequences within a response from simple through to complex and in life-related and abstract situations using everyday and mathematical language
- coherent, concise and logical justification of procedures, decisions and results
- justification of the reasonableness of results.

The student’s work has the following characteristics:

- appropriate interpretation and use of mathematical terminology, symbols and conventions in simple routine situations
- organisation and presentation of information
- translation of information from one representation to another in simple routine situations
- use of mathematical reasoning to develop sequences within a response in simple routine situations using everyday or mathematical language
- justification of procedures, decisions and results.
Assessment instrument

This sample assessment instrument provides opportunities for students to demonstrate the following dimensions:

- Knowledge and procedures
- Modelling and problem solving
- Communication and justification.

Functions

Part A

You have been contacted by an advertising company to develop a distinctive signage on the edge of a building similar to the photo below. You are to use two different types of functions from the following list: cubic, quadratic, trigonometric, exponential or logarithmic as a basis for your signage. NOTE: It is a symbol and does not necessarily represent words or letters.

Task:
1. The wall of the building is 20 metres long and 10 metres high. Decide where to place a set of axes on the building. Use this as a basis for your functions.
2. Provide a list of functions for the wall (at least 4).
3. Your functions must be repeated to create at least four curves on the wall. Decide on a domain and range for each function.
4. Provide a computer-generated graph of all functions and what they look like on the wall.
5. Enclose the design with a border and show this border on your graph.
6. Work out the percentage of the wall that is encompassed by this border.
7. Explain the strengths and limitations of your design in relation to the functions chosen.

Part B

Consider the function \( y = (ax^2 - b)(x + c) \). NOTE: \( a, b \) and \( c \) are not equal, and \( a \) is an integer.

Task
8. Choose values for \( a, b \) and \( c \) such that you can satisfy the above conditions. (Your results need to be different from other students.)
9. Provide an appropriate graph of the function.
10. Find “algebraically” (i.e. using algebra and calculus) all intercepts and turning points (maximum and minimum) including justification.
11. Find the length of the line joining the turning points.
12. Find the intersection of the line joining the turning points and the curve.

The visual stimulus has been deleted from the assessment instrument due to copyright restrictions.

This assessment instrument provides opportunities for students to:

- recall, access, select and apply mathematical definitions, rules and procedures
- select and use mathematical technology
- identify assumptions (and associated effects), parameters and/or variables during problem solving
- develop coherent, concise and logical answers within a response expressed in everyday language, mathematical language or a combination of both, as required, to justify conclusions, solutions and propositions
- develop and use coherent, concise and logical supporting arguments, expressed in everyday language, mathematical language or a combination of both, when appropriate, to justify procedures, decisions and results
- represent situations by using data to synthesise mathematical models and generate data from mathematical models
- apply problem-solving strategies and procedures to identify problems to be solved and interpret, clarify and analyse problems.

**Sample student responses**

These sample student responses are extensive, as demonstrated in the image of the student work below. The student responses give a selected explanation of elements of Standards A and C responses.

The complete responses and samples across the suite of current Mathematics Authority syllabuses can be found on the QSA website: <www.qsa.qld.edu.au> Years 10–12 > Years 11–12 subjects> Mathematics.
Sample student response: Standard A

<table>
<thead>
<tr>
<th>Student response</th>
<th>Standards descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction:</strong></td>
<td><strong>Use of problem-solving strategies to interpret, clarify and analyse problems to develop responses in simple non-routine tasks in a life-related situation</strong></td>
</tr>
</tbody>
</table>

A distinctive signage is required to design on the edge of a building with 20 metres long and 10 metres high by an advertising company. Different types of functions have been given in a list of cubic, quadratic, trigonometric, exponential and logarithmic. Two types of those functions are asked to be used at least 2 times to draw this signage. And other functions or relations are available as well.

For this 20 metres long and 10 metres high wall, I decided to place x-axes start from 0 to 20 and y-axes from -5 to 5 which looks like below:

![Graph](image)

To make an advertisement for this wall, I choose it for a skateboard advertisement. And a graph of skateboarder with letters is chosen as the distinctive signage for skateboard shop or club. For this graph, the head and part of body have been designed with curve by using quadratic, cubic and trigonometric functions and circle relations. And parts of bodies like arms or legs are drawn by using linear equations. For those letters, different types of equations and relations has been chosen due to the shape of letters. Functions that have been chosen for it include: linear, quadratic, cubic, trigonometric functions and circle relation.
<table>
<thead>
<tr>
<th>Standard descriptors</th>
<th>Student response A</th>
</tr>
</thead>
</table>
| Use of problem-solving strategies to interpret, clarify and analyse problems to develop responses to simple non-routine tasks in a life-related situation | **Linear**: \( y = mx + c \)  
**Quadratic**: \( y = a(x - h)^2 + k \)  
**Cubic**: \( y = a(x - h)^3 + k \)  
**Trigonometric**: \( y = a \sin(bx + c) + d \)  
**Circle**: \( r^2 = (x - h)^2 + (y - k)^2 \)  
For each function, the domain has been presented in brackets \( "\{ \}^\text{un} \) and the range is represented as \( \{ y : \} \). **My designed graph is:** [Image of a designed graph]  
**All of the equations that have been used for the logo are:**  
\[(x - 6)^2 + (y - 3)^2 = 0.8^2\]  
\[y = -\sqrt{1^2 - (x - 6)^2} + 3 \quad \{5.4, 6.5\}\]  
\[y = -\frac{x}{8} + 2.875 \quad \{3, 5.4\}\]  
\[y = -0.25x + 2.95 \quad \{3, 5.2\}\]  
\[(x - 3)^2 + (y - 2.35)^2 = 0.15^2\]  
\[y = -1.02x + 8.76 \quad \{6.5, 8\}\]  
\[y = \frac{13x}{15} + \frac{107}{15} \quad \{6.5, 8\}\]  
\[(x - 3)^2 + (y - 2.35)^2 = 0.15^2\]  
\[y = -1.02x + 8.76 \quad \{6.5, 8\}\]  
\[y = \frac{13x}{15} + \frac{107}{15} \quad \{6.5, 8\}\]  
\[(x - 8)^2 + (y - 0.4)^2 = 0.2^2\]  
\[y = 5.75x - 35.875 \quad \{6.3, 6.5\}\]  
\[y = 5.75x - 28.25 \quad \{5, 5.2\}\]  
\[y = \frac{7x}{34} + \frac{28}{17} \quad \{6.3, 8\}\]  
\[y = \frac{4x}{3} + \frac{32}{3} \quad \{8, 9.3\}\]  
\[y = \frac{15x}{13} + \frac{109}{13} \quad \{7.7, 9\}\]  
\[y = \frac{3x}{19} + \frac{136}{19} \quad \{5.6, 7.7\}\]  
\[y = \frac{133x}{70} + \frac{7329}{700} \quad \{5.6, 6.1\}\]  
\[y = \sqrt{0.09 - (x - 4.8)^2} + 0.3 \quad \{4.5, 5.5\}\]  
\[y = -1.5x + 7.05 \quad \{4.5, 5.7\}\]  
\[y = 9.88(x - 9)^2 - 2 \quad \text{with domain from 9 to 9.3}\]  
\[y = 5.9375(x - 5.7)^2 - 1.5 \quad \text{with domain from 5.7 to 6.1}\]
Strengths:
- Clear appearance for people to understand and attractive for people who loves skateboard.
- It could be used as logo or advertisement.
- Good advertisement for skateboard shop/ skateboard club.
- It could be a logo for skateboard brand.
- In this graph, different types of functions and relations are used to make it look good.

Limitations:
- The joining points between arms and body do not match quiet well when it is removed from one computer to another.
- The right hand of skater is better being half circle but is not available in this graphmatica.
- The letters which are designed in graph is for the request of using of certain functions (trigonometric)
- The curve which is used to draw his left foot doesn’t match with leg line very well.
- Because the width and height of the graph are different and cause the graph doesn’t appear as in standard square units.
Sample student response: Standard C

<table>
<thead>
<tr>
<th>Standard descriptors</th>
<th>Student response C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selection and use of technology</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Use of problem strategies to develop responses to a routine, simple life-related</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Justification of procedures or results</strong></td>
<td></td>
</tr>
</tbody>
</table>

Part A

1. The wall proposed for the logo is 20m long x 10m high. It was drawn from -10 to 10 on the x-axis and 0 to 10 on the y-axis to centre the drawing. On the graphing program, Graphmatica, the grid range was set up as

[Left: -15.16 Right: 15.16 Bottom: -2 Top: 18]

to provide a squared off view which is realistic.

2. The logo was chosen to be placed on the wall of a surf shop and was therefore inspired by the beach. Below is a representation of it showing the different functions (and relations) used:

The border is 3.5m up the wall to 10m up the wall. It covers all the length of the wall. Therefore the area is 3.5m x 25m = 90

6. The logo’s area, as a percentage of the wall’s area is:

\[ \frac{35 \times 100}{100} = 17.5\% \]

But this wouldn’t be the area not covered by the logo.

Why didn’t you put a border around the logo like you were instructed in task 5? It is okay as long as you gave an explanation.
Using standards to make judgments about student achievement

Making decisions about exit levels of achievement

The extent to which the student responses match the exit descriptors within and across dimensions determines each student’s level of achievement at the completion of a course of study.

Judgments about individual student work are made by matching the qualities of the student responses with the instrument-specific criteria and standards descriptors. The four subjects selected in this document demonstrated this matching of response and descriptors.

Exit level of achievement and relative achievement decisions are made through an on-balance judgment of the match of the syllabus exit standards with the evidence from the range of responses in a folio of student work. Below is an example of a range of judgments made about student responses from a single folio of summative assessment.

This evidence is collected from a range of assessment instruments, techniques, conditions and modes. This means that the information gathered more validly reflects student knowledge and skills and the judgments provide more reliable information about the achievement of course objectives than that which may be captured through a single, point-in-time assessment.

In this way, the integrity of decisions about student achievement made using instrument-specific criteria and standards descriptors, collected through a program of continuous assessment and substantiated a folio of student responses, may be assured.