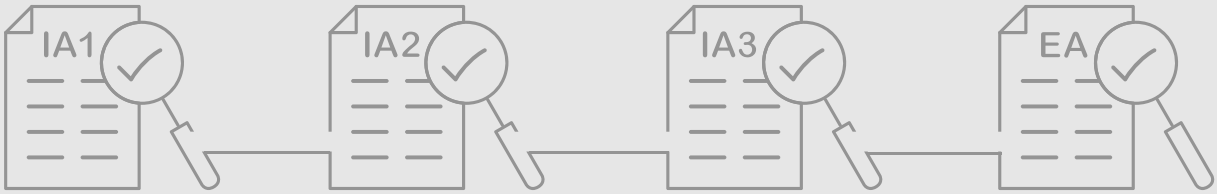
Geography subject report

2023 cohort

January 2024



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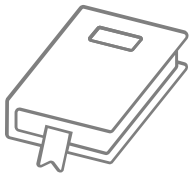
Introduction



Throughout 2023, schools and the Queensland Curriculum and Assessment Authority (QCAA) continued to improve outcomes for students in the Queensland Certificate of Education (QCE) system. These efforts were consolidated by the cumulative experience in teaching, learning and assessment of the current General and General (Extension) senior syllabuses, and school engagement in QCAA endorsement and confirmation processes and external assessment marking. The current evaluation of the QCE system will further enhance understanding of the summative assessment cycle and will inform future QCAA subject reports.

The annual subject reports seek to identify strengths and opportunities for improvement of internal and external assessment processes for all Queensland schools. The 2023 subject report is the culmination of the partnership between schools and the QCAA. It addresses school-based assessment design and judgments, and student responses to external assessment for this subject. In acknowledging effective practices and areas for refinement, it offers schools timely and evidence-based guidance to further develop student learning and assessment experiences for 2024.

The report also includes information about:

- how schools have applied syllabus objectives in the design and marking of internal assessments
- how syllabus objectives have been applied in the marking of external assessments
- patterns of student achievement.

The report promotes continuous improvement by:

- identifying effective practices in the design and marking of valid, accessible and reliable assessments
- recommending where and how to enhance the design and marking of valid, accessible and reliable assessment instruments
- providing examples that demonstrate best practice.

Schools are encouraged to reflect on the effective practices identified for each assessment, consider the recommendations to strengthen assessment design and explore the authentic student work samples provided.

Audience and use

This report should be read by school leaders, subject leaders and teachers to:

- inform teaching and learning and assessment preparation
- assist in assessment design practice
- assist in making assessment decisions
- help prepare students for internal and external assessment.

The report is publicly available to promote transparency and accountability. Students, parents, community members and other education stakeholders can use it to learn about the assessment practices and outcomes for senior subjects.

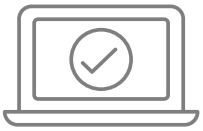
Report preparation

The report includes analyses of data and other information from endorsement, confirmation and external assessment processes. It also includes advice from the chief confirmer, chief endorser and chief marker, developed in consultation with and support from QCAA subject matter experts.

Subject highlights

187
schools offered Geography

87.18%
of students completed 4 units



95.2%
of students received a C or higher

Subject data summary

Subject completion

The following data includes students who completed the General subject or Alternative Sequence (AS).

Note: All data is correct as at January 2024. Where percentages are provided, these are rounded to two decimal places and, therefore, may not add up to 100%.

Number of schools that offered Geography: 187.

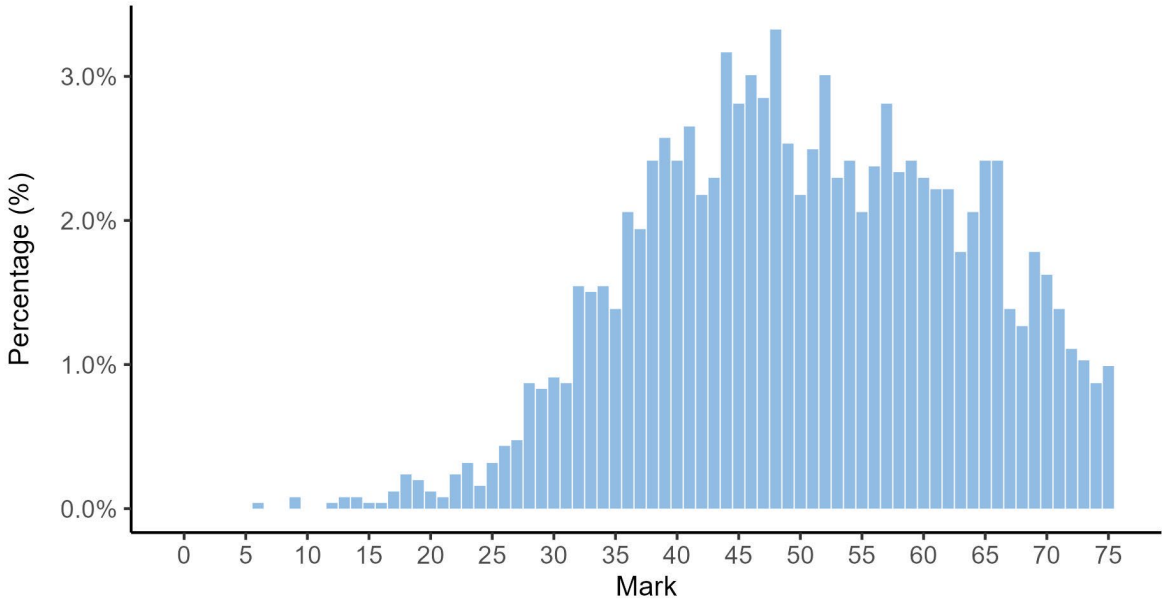
Completion of units	Unit 1	Unit 2	Units 3 and 4
Number of students completed	2,870	2,765	2,502

Units 1 and 2 results

Number of students	Satisfactory	Unsatisfactory
Unit 1	2,574	296
Unit 2	2,602	163

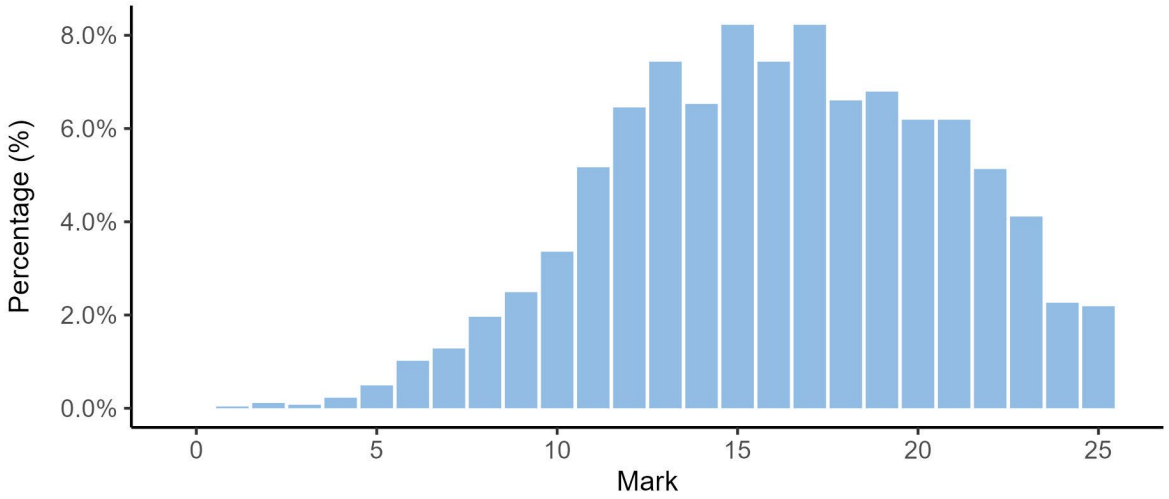
Units 3 and 4 internal assessment (IA) results

Total marks for IA

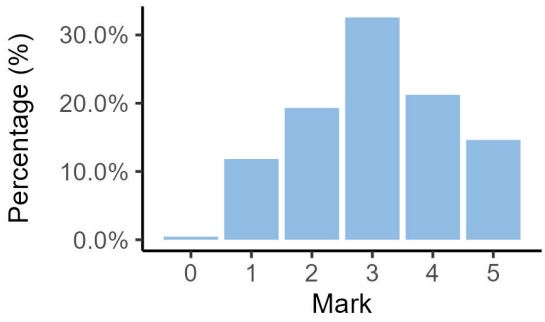


IA1 marks

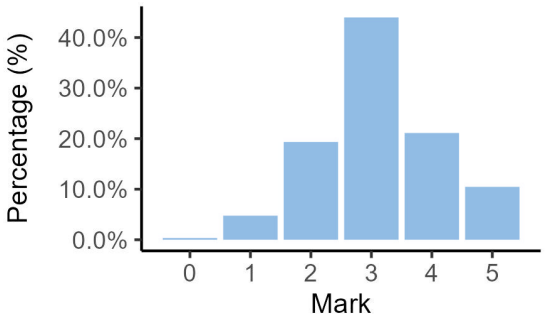
IA1 total



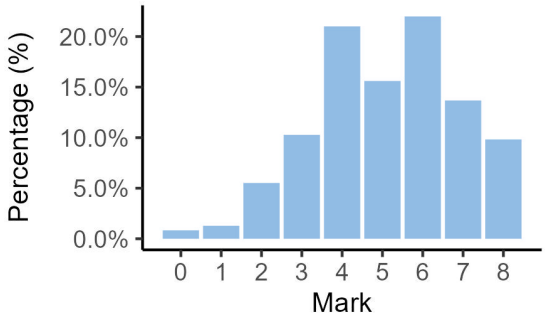
IA1 Criterion: Part A — Explaining



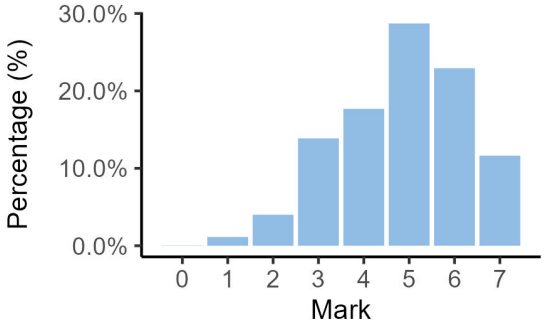
IA1 Criterion: Part A — Comprehending



IA1 Criterion: Part B — Analysing and Applying

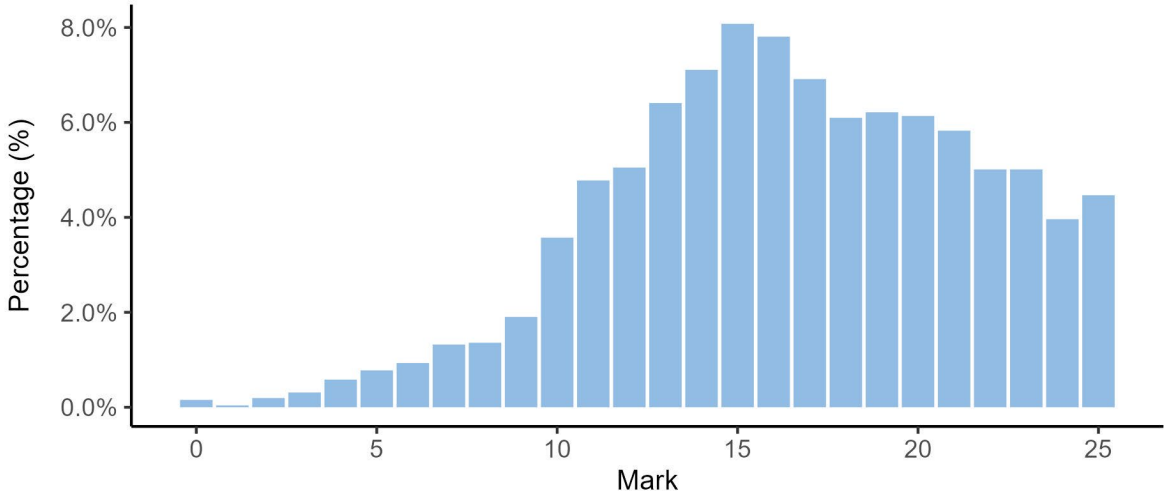


IA1 Criterion: Communicating

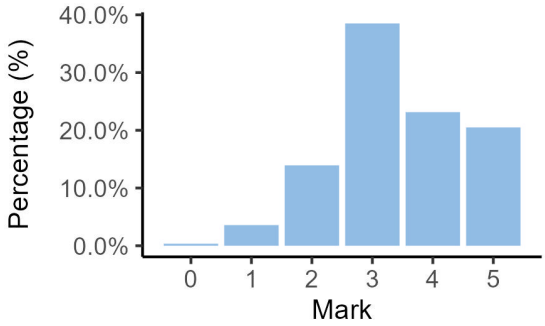


IA2 marks

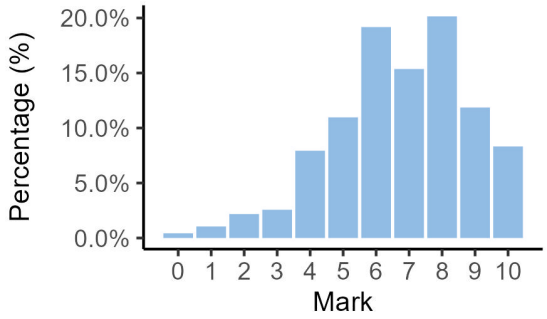
IA2 total



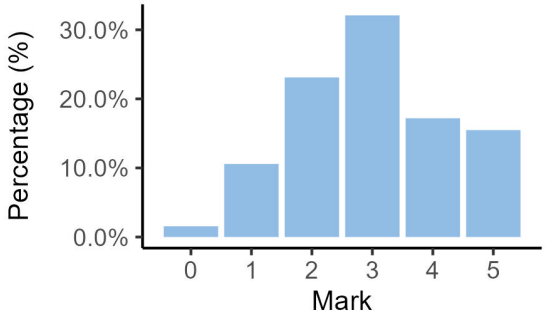
IA2 Criterion: Explaining and Comprehending



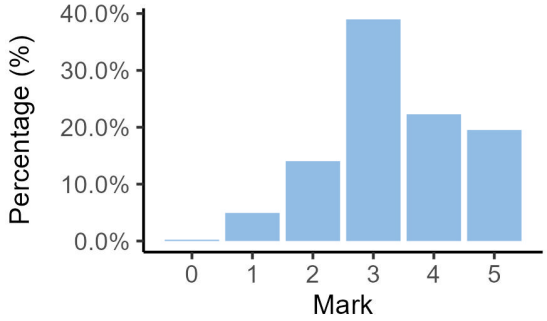
IA2 Criterion: Analysing and Applying



IA2 Criterion: Synthesising

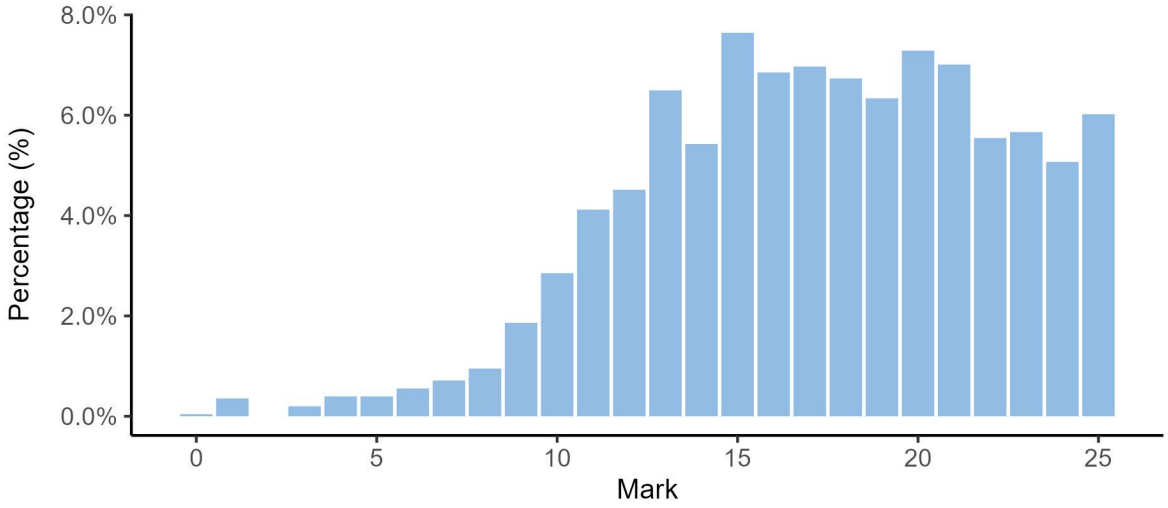


IA2 Criterion: Communicating

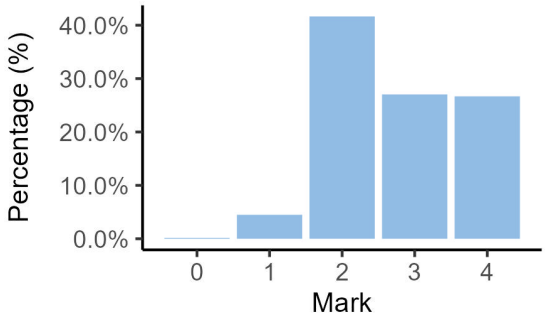


IA3 marks

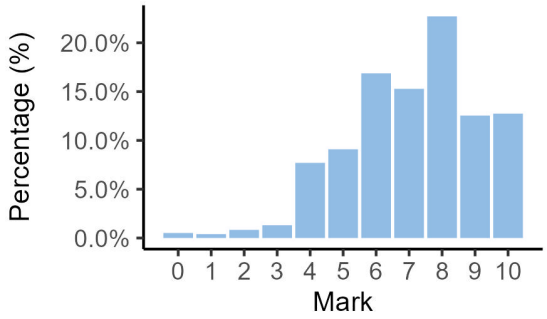
IA3 total



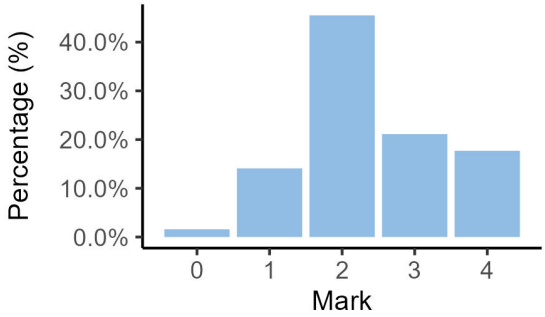
IA3 Criterion: Explaining and Comprehending



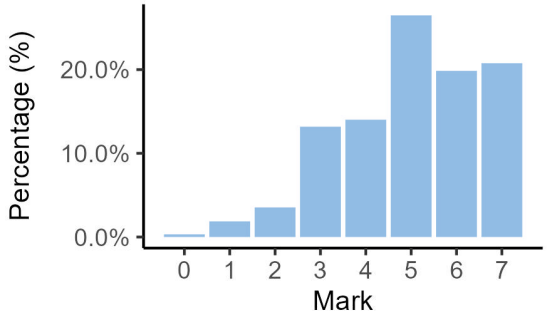
IA3 Criterion: Analysing and Applying



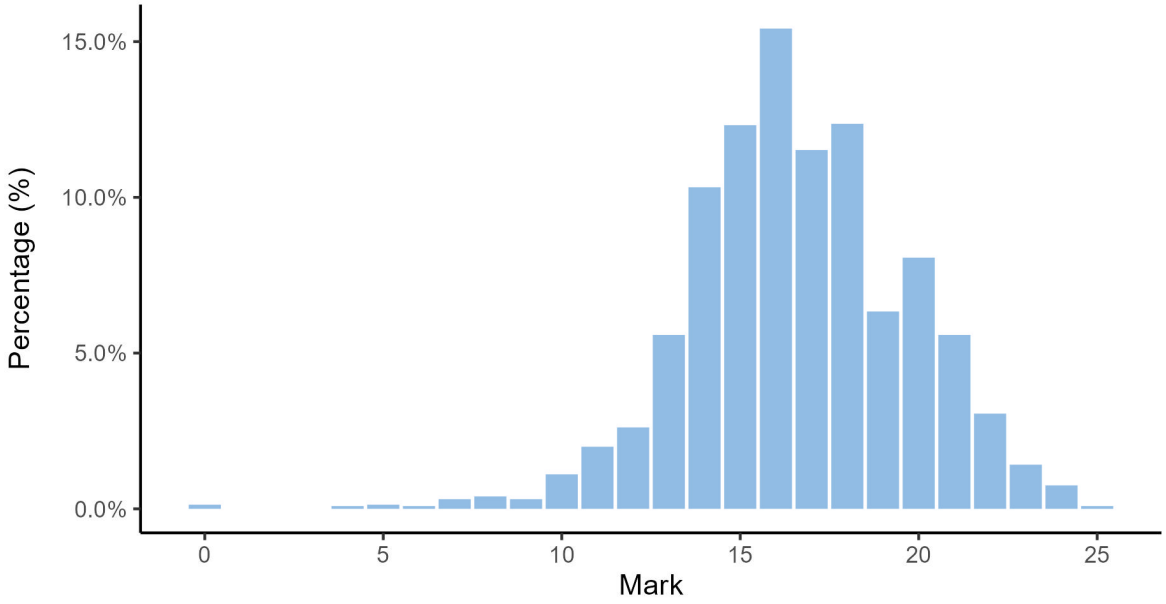
IA3 Criterion: Synthesising



IA3 Criterion: Communicating

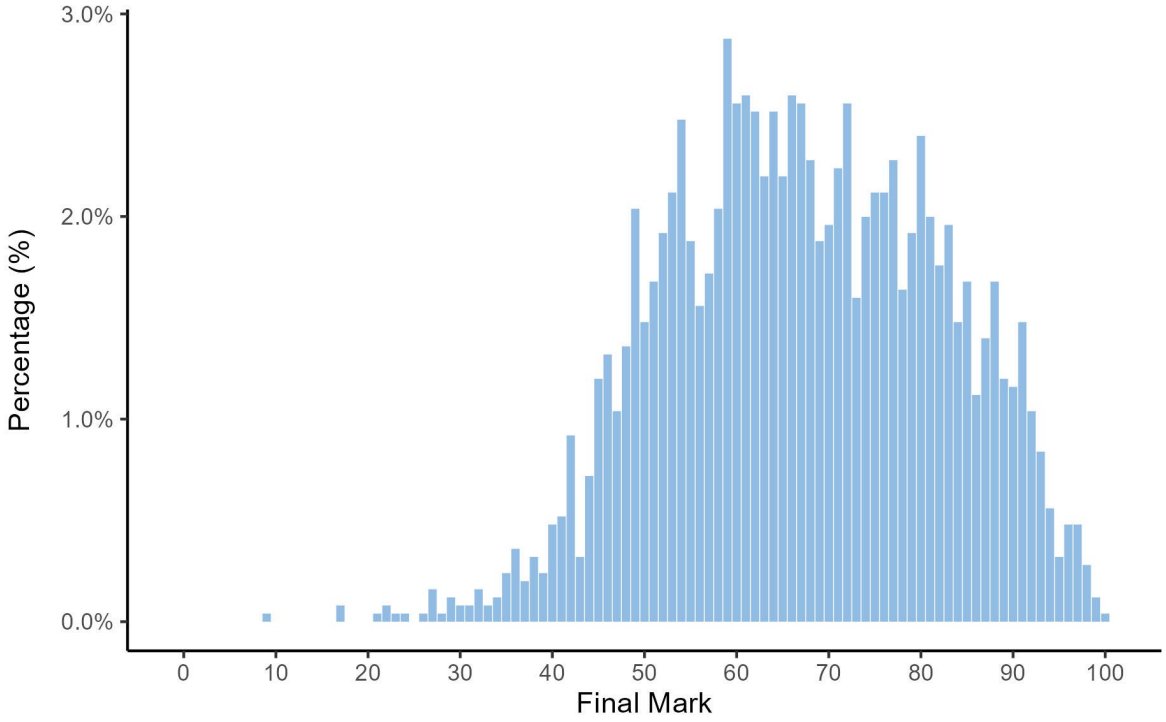


External assessment (EA) marks



Final subject results

Final marks for IA and EA



Grade boundaries

The grade boundaries are determined using a process to compare results on a numeric scale to the reporting standards.

Standard	A	B	C	D	E
Marks achieved	100–83	82–66	65–44	43–18	17–0

Distribution of standards

The number of students who achieved each standard across the state is as follows.

Standard	A	B	C	D	E
Number of students	433	898	1,051	117	3

Internal assessment

The following information and advice relate to the assessment design and assessment decisions for each IA in Units 3 and 4. These instruments have undergone quality assurance processes informed by the attributes of quality assessment (validity, accessibility and reliability).

Endorsement

Endorsement is the quality assurance process based on the attributes of validity and accessibility. These attributes are categorised further as priorities for assessment, and each priority can be further broken down into assessment practices.

Data presented in the Assessment design section identifies the reasons why IA instruments were not endorsed at Application 1, by the priority for assessments. An IA may have been identified more than once for a priority for assessment, e.g. it may have demonstrated a misalignment to both the subject matter and the assessment objective/s.

Refer to *QCE and QCIA policy and procedures handbook v5.0*, Section 9.6.

Percentage of instruments endorsed in Application 1

Number of instruments submitted	IA1	IA2	IA3
Total number of instruments	186	186	185
Percentage endorsed in Application 1	22%	62%	40%

Confirmation

Confirmation is the quality assurance process based on the attribute of reliability. The QCAA uses provisional criterion marks determined by teachers to identify the samples of student responses that schools are required to submit for confirmation.

Confirmation samples are representative of the school's decisions about the quality of student work in relation to the instrument-specific marking guide (ISMG), and are used to make decisions about the cohort's results.

Refer to *QCE and QCIA policy and procedures handbook v5.0*, Section 9.7.

The following table includes the percentage agreement between the provisional marks and confirmed marks by assessment instrument. The Assessment decisions section of this report for each assessment instrument identifies the agreement trends between provisional and confirmed marks by criterion.

Number of samples reviewed and percentage agreement

IA	Number of schools	Number of samples requested	Number of additional samples requested	Percentage agreement with provisional marks
1	182	1,245	65	74.73%
2	183	1,206	72	67.76%
3	183	1,236	23	71.04%

Internal assessment 1 (IA1)

Examination — combination response (25%)

Items are both short response and extended response using evidence from data. Data consists of a collection of information presented as tables and graphs, maps, diagrams and images with minimal text.

Student responses must be completed individually, under supervised conditions, and in a set timeframe.

Assessment design

Validity

Validity in assessment design considers the extent to which an assessment item accurately measures what it is intended to measure and that the evidence of student learning collected from an assessment can be legitimately used for the purpose specified in the syllabus.

Reasons for non-endorsement by priority of assessment

Validity priority	Number of times priority was identified in decisions*
Alignment	97
Authentication	0
Authenticity	13
Item construction	54
Scope and scale	62

*Each priority might contain up to four assessment practices.

Total number of submissions: 186.

Effective practices

Validity priorities were effectively demonstrated in assessment instruments that:

- provided examination questions that explicitly aligned to the assessment objectives and allowed students to provide responses that met the elements of each performance-level descriptor in the ISMG
- allowed students to illustrate the breadth of their understanding by providing multiple opportunities to demonstrate the assessable objectives, either through multiple questions that assessed the same objective or through compound questions that assessed multiple objectives
- included complex stimulus in Part B, which provided students with the opportunity to select from a range of evidence to give unique responses and demonstrate the upper performance-level descriptors for the Analysing and Applying criterion. An example of complex stimulus includes maps with multiple layers of data that allow students to identify relationships
- allowed opportunities for students to create sophisticated cartographic and graphic forms by providing stimulus that contained complex data, e.g. multiple datasets or data that required a calculation to create relevant values

- did not direct students to create a specific type of map or a specific type of graph so students could achieve the top performance level for the Communicating criterion.

Practices to strengthen

It is recommended that assessment instruments:

- include stimulus and data that reflect an appropriate geographical scale. Stimulus and data used in Parts A or B must allow students the opportunity to provide responses that reflect the upper performance levels of the assessment criteria. For instance, questions that require a response at a global scale may be too broad to enable students to provide depth within the prescribed word length
- ensure that stimulus in Part B allows for analysis. If photographs are used as stimulus, students must be able to interpret data to infer how patterns, trends, and relationships represent a geographical challenge. Appropriate photographs could, for example, show land cover change over time with overlaid data
- include a variety of stimulus in Part B with the appropriate scope to allow students to demonstrate the assessable objectives for Analysing and Applying. Patterns, trends and relationships must be evident in the stimulus to identify a geographic challenge in relation to climate change for a selected land cover type, or for the AS, a geographic challenge for a megacity in the developing world
- indicate, explicitly, the expected response length rather than use a word length range for each question, and provide the appropriate response space
- in Part A, provide datasets for creating a map or a graph that
  - allow students to demonstrate their skills of transformation before representing the transformed data as a map or graph, e.g. calculating a percentage change over time
  - are complex to allow students to demonstrate the upper performance level of sophisticated cartographic and graphic forms in the Communicating criterion
  - are explicitly linked to the subject matter, i.e. land cover change data or climate change data.

Accessibility

Accessibility in assessment design ensures that no student or group of students is disadvantaged in their capacity to access an assessment.

Reasons for non-endorsement by priority of assessment

Accessibility priority	Number of times priority was identified in decisions*
Bias avoidance	23
Language	38
Layout	34
Transparency	22

*Each priority might contain up to four assessment practices.

Total number of submissions: 186.

Effective practices

Accessibility priorities were effectively demonstrated in assessment instruments that:

- considered the amount of data presented to students for creating the map and graph, ensuring it was suitable for the syllabus conditions (time) and allowed for the method of transformation, e.g. more data can be transformed when using relevant ICTs or spatial technologies than when maps or graphs are to be hand-drawn
- provided stimulus without distractors for both Parts A and B, e.g. data used to create a map or graph included only the data to be transformed.

Practices to strengthen

It is recommended that assessment instruments:

- include high-quality stimulus that is formatted appropriately and easily fits on one A3 page or equivalent. For instance, ensure maps and graphs and other information are legible and not blurry when printed, include a short caption, and ensure the page has sufficient white space between stimulus items so it is not overcrowded.

Additional advice

- Assessment instruments should be print previewed to ensure all formatting of the task is appropriate and aligned with the quality assessment tool that can be located in the Endorsement application (app) and in the Resources section of the Syllabus app. Teachers should use the page break tool in the Endorsement app to ensure items are not separated across pages, e.g. questions in Part A should be placed alongside stimulus or data, with the response space on the same or facing page.
- When designing the assessment, review the intended length of students responses to each question so the examination's total length aligns to the syllabus conditions.

Assessment decisions

Reliability

Reliability is a judgment about the measurements of assessment. It refers to the extent to which the results of assessments are consistent, replicable and free from error.

Agreement trends between provisional and confirmed marks

Criterion number	Criterion name	Percentage agreement with provisional	Percentage less than provisional	Percentage greater than provisional	Percentage both less and greater than provisional
1	Part A — Explaining	91.76%	4.4%	3.3%	0.55%
2	Part A — Comprehending	90.66%	8.24%	0.55%	0.55%
3	Part B — Analysing and Applying	86.26%	9.34%	2.75%	1.65%
4	Communicating	85.16%	14.29%	0%	0.55%

Effective practices

Accuracy and consistency of the application of the ISMG for this IA was most effective when:

- for the Explaining criterion, student responses demonstrated comprehensive explanations of the complexity of interactions that result in land cover change and a changing climate. A comprehensive explanation includes all or most of the relevant aspects that reflect a complex interaction
- for the Comprehending criterion
  - spatial patterns of land cover change were recognised using relevant geographical terminology, appropriate descriptions aligned with the stimulus, if used, and included all the relevant aspects of the pattern, i.e. comprehensive recognition
  - student responses identified significant relationships and explained implications for people and places as a result of the identified relationships
- in Part B, for the Analysing and Applying criterion, the selection of data and information was discerning (i.e. selected from multiple items of stimulus provided) and enabled students to make astute inferences to identify how patterns, trends, and relationships represented a geographical challenge.

Samples of effective practices

The following excerpts demonstrate evidence to match the top performance-level descriptors for the Explaining criterion and the Comprehending criterion in Part A, and the Analysing and Applying criterion in Part B.

Excerpt 1 demonstrates a comprehensive explanation of the complexity of interactions that result in land cover change and a changing climate.

Excerpt 2 demonstrates comprehensive recognition of spatial patterns and a description using information from the stimulus to identify significant relationships and implications for people and places.

Excerpt 3 demonstrates astute interpretations and inferences enabled by discerning selection of data and information. Multiple pieces of data and information have been used to determine the main causes of a specific geographical challenge in relation to climate change for a land cover type.

Note: The characteristic/s identified may not be the only time the characteristic/s has occurred throughout a response.

Excerpt 1

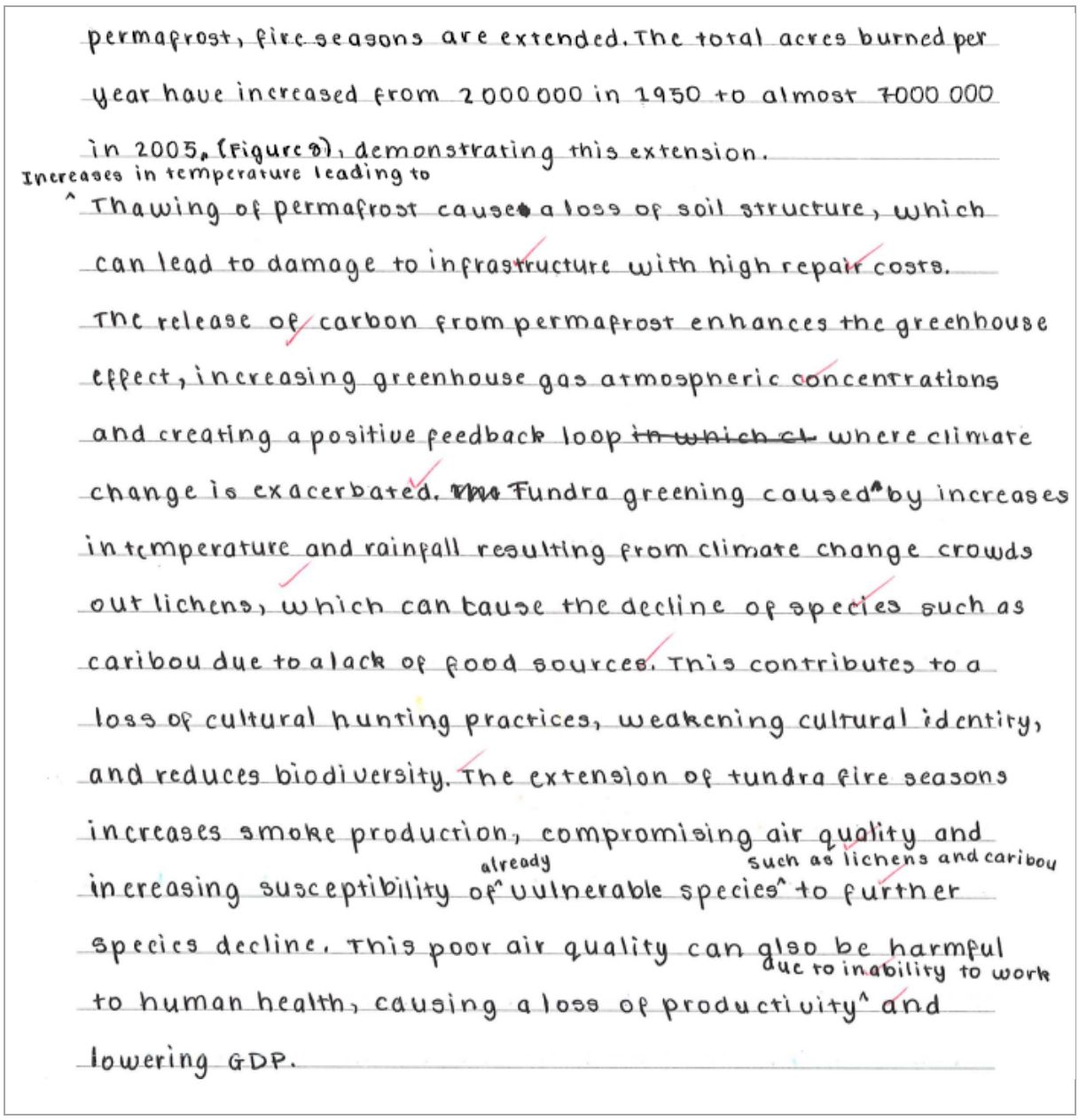
Trees sequester carbon through the process of photosynthesis, forming a carbon sink. Deforestation leads to the release of this stored carbon, which is exacerbated by fires used during forest removal. The transformation of an area from a carbon sink to a non-carbon purpose alters the carbon cycle by increasing ~~concern~~ atmospheric concentrations of greenhouse gases such as CO_2. This ultimately leads to an enhanced greenhouse effect, where greenhouse gases insulate the Earth and cause heat to be retained in the atmosphere. This process leads to global warming, which contributes to the long-term alterations of temperatures and weather patterns caused by climate change.

Excerpt 2

The two bioregions with the highest remaining ecological carrying capacity are located in south-eastern NSW, close to the coastline, with a carrying capacity of ≥58%. Regions with moderate carrying capacities are located either along the eastern coastline of NSW, or in the north-western corner of NSW, with a range of capacities from 34–57%. The areas with low carrying capacity (16–33%) are located inland in the central regions of NSW from the northern to southern border, with the lowest carrying capacity of 15% in the NSS bioregion. Carrying capacity is limited by available resources, so low remaining carrying capacities indicate a lack of shelter, food, water and mates which poses significant challenges for native wildlife and vegetation. As a result, biodiversity could reduce as species significant cannot survive. For people, little water and increased dead vegetation could create hazardous bushfire conditions due to greater dry fuel load, displacing people and burning homes.

Excerpt 3

Climate change has caused temperatures to rise between 2.5°F and 6.2°F between 1970 and 2019 in Alaska (Figure 1). This increase causes a rise in sea temperatures, ~~which~~ shown in Figure 10, where temperatures show a 2°C - 7°C departure from the normal in Alaskan seas. This rise in sea temperatures causes a reduction in sea ice extent, which has decreased by 15.4 ~~millions of squa~~ to approximately 14 millions of square km between 1980 and 2020 (Figure 3). As sea ice melt, sea levels rise, altering the water cycle and causing increases in precipitation of 4.7% - 17.2% in Alaska (Figure 2). Temperature increases also causes permafrost temperatures to rise to thawing points. Figure 7 shows that permafrost temperatures have risen by an average of 10°F in Northern Alaska and 2°F in Interior Alaska. This thawing releases carbon, with permafrost carbon emissions expected to increase from 0 Gt/year to 1.8 Gt/year between 2000 and 2080 (Figure 6). Increases in temperature and precipitation also allow tundra greening, with ~~which~~ vegetation growth shown in Figure 9 to be present (spectrum of 0 - 0.2 greening). This increases biomass, providing a greater fire fuel source, and when combined with increased ~~CO2~~ ~~concentrations from thawed~~ carbon emissions from thawed



permafrost, fire seasons are extended. The total acres burned per year have increased from 2 000 000 in 1950 to almost 7000 000 in 2005, (Figure 8), demonstrating this extension.

Increases in temperature leading to ^Thawing of permafrost causes a loss of soil structure, which can lead to damage to infrastructure with high repair costs. The release of carbon from permafrost enhances the greenhouse effect, increasing greenhouse gas atmospheric concentrations and creating a positive feedback loop ~~in which cl~~ where climate change is exacerbated. ~~The~~ Tundra greening caused^ by increases in temperature and rainfall resulting from climate change crowds out lichens, which can cause the decline of species such as caribou due to a lack of food sources. This contributes to a loss of cultural hunting practices, weakening cultural identity, and reduces biodiversity. The extension of tundra fire seasons increases smoke production, compromising air quality and increasing susceptibility of^ vulnerable species^ to further species decline. This poor air quality can also be harmful to human health, causing a loss of productivity^ and lowering GDP.

already

such as lichens and caribou

due to inability to work

Practices to strengthen

To further ensure accuracy and consistency of the application of the ISMG for this IA, it is recommended that:

- when analysing data in Part B
  - students carefully examine all the stimulus and select specific data and information, from more than one source, that clearly reflects patterns, trends and relationships. They then use this to explain the causes of a specific geographic challenge in relation to climate change for a selected land cover type
  - the analysis needs to demonstrate more than descriptions of each piece of stimulus or examination of the data in isolation from other pieces of data. The analysis must make clear the relationships between the relevant pieces of data and information
- in Part B, generalisations about impacts must be based on the student's analysis and consider possible impacts of climate change on both biophysical and anthropogenic environments.

Additional advice

Teachers should be aware that for the:

- Explaining and Comprehending objectives, evidence is only found in Part A of the response
- Analysing and Applying objectives, evidence is only found in Part B of the response
- Communicating objective, evidence is found in both Part A and Part B of the response.

Internal assessment 2 (IA2)

Investigation — field report (25%)

This assessment requires students to research a land-management or water-management challenge at a local scale through a field investigation. A field investigation assesses a range of cognitions in a particular context including observing, questioning, planning, collecting, recording, representing, analysing and responding to primary data and communicating geographical understanding in a field report.

The assessment occurs over a defined period. Students may use class time and their own time to develop a response.

Assessment design

Validity

Validity in assessment design considers the extent to which an assessment item accurately measures what it is intended to measure and that the evidence of student learning collected from an assessment can be legitimately used for the purpose specified in the syllabus.

Reasons for non-endorsement by priority of assessment

Validity priority	Number of times priority was identified in decisions*
Alignment	30
Authentication	2
Authenticity	22
Item construction	9
Scope and scale	21

*Each priority might contain up to four assessment practices.

Total number of submissions: 186.

Effective practices

Validity priorities were effectively demonstrated in assessment instruments that:

- clearly identified the investigation as a land-management or water-management challenge. Assessment instruments created for the AS clearly identified a sustainability or liveability challenge for a place in Australia
- provided an appropriate scale for investigation, e.g. the investigation focused on a single site for fieldwork activities
- provided the opportunity for substantial data collection that allowed students to demonstrate the upper performance-level descriptors for the Analysing and Applying criterion
- provided scaffolding aligned with the syllabus specifications with clear instructions informing students of the relevant sections for inclusion in the written report.

Practices to strengthen

It is recommended that assessment instruments:

- include a context statement that is clear and concise. It must reflect the focus of the investigation and be aligned to the instrument specifications while not identifying the causes of the challenge or potential responses to the challenge
- provide explicit instructions about the need to collect primary data from the field. This is necessary as students are required to analyse and interpret geographical data collected in the field to demonstrate the upper performance level of the ISMG for Analysing and Applying. Therefore, secondary data and information should be used sparingly
- clearly identify appropriate authentication strategies to allow for unique student responses where data is collected as a group or when using a third-party fieldwork provider.

Accessibility

Accessibility in assessment design ensures that no student or group of students is disadvantaged in their capacity to access an assessment.

Reasons for non-endorsement by priority of assessment

Accessibility priority	Number of times priority was identified in decisions*
Bias avoidance	0
Language	7
Layout	0
Transparency	4

*Each priority might contain up to four assessment practices.

Total number of submissions: 186.

Effective practices

Accessibility priorities were effectively demonstrated in assessment instruments that:

- featured clear and concise instructions aligned to the syllabus and task requirements
- used appropriate geographical terminology and were free of grammatical errors.

Practices to strengthen

It is recommended that assessment instruments:

- ensure any information explaining how to complete the task is only included in the task section
- clearly outline the requirements of the task with clear instructions aligned to the assessment objectives.

Assessment decisions

Reliability

Reliability is a judgment about the measurements of assessment. It refers to the extent to which the results of assessments are consistent, replicable and free from error.

Agreement trends between provisional and confirmed marks

Criterion number	Criterion name	Percentage agreement with provisional	Percentage less than provisional	Percentage greater than provisional	Percentage both less and greater than provisional
1	Explaining and Comprehending	90.71%	7.65%	1.64%	0%
2	Analysing and Applying	75.41%	12.02%	2.19%	10.38%
3	Synthesising	87.98%	10.38%	1.64%	0%
4	Communicating	84.15%	13.66%	2.19%	0%

Effective practices

Accuracy and consistency of the application of the ISMG for this IA was most effective when:

- for the Explaining and Comprehending criterion, responses demonstrated all the upper performance-level descriptors by making links between the explanation of processes that result in land cover change, the spatial patterns of the land cover change, and implications of the relationships and the patterns identified
- for the Synthesising criterion, the proposed action/s addressed the impacts of the geographical challenge identified through the analysis of fieldwork data and information and was clear in how it would improve the sustainability of land use at the fieldwork site (for the General syllabus investigation) or for liveability for the place (for the AS investigation)
- for the Communicating criterion, responses included student-generated maps, graphs and illustrations that represented the fieldwork data in sophisticated forms, e.g. complex maps and graphs that illustrated relationships between different data collected in the field.

Samples of effective practices

The following excerpts demonstrate the upper performance level of the ISMG for Explaining and Comprehending (Excerpt 1), and Synthesising (Excerpt 2 — AS).

Excerpt 1 demonstrates a comprehensive recognition of land cover change at the fieldwork investigation site and identifies relationships between human and environmental factors that caused the transformations.

The proposals made in Excerpt 2 are clearly aligned with managing the identified impacts arising from the challenge identified in the analysis. The proposal/s to manage the impacts of the identified challenge to improve liveability for the place has been justified.

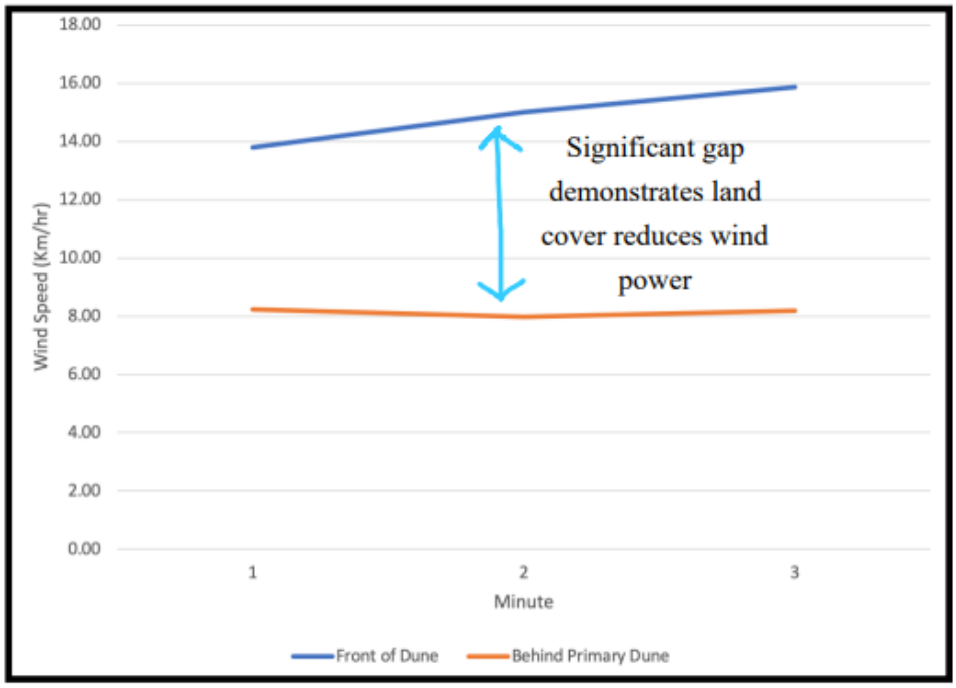
Note: The characteristic/s identified may not be the only time the characteristic/s has occurred throughout a response.

Excerpt 1

Largely anthropogenic processes and partially biophysical processes have degraded the dune's land cover overtime. The dune's characteristics somewhat mirror the conceptual model which was measured along the four transects depicted in Figure 4. Figure 5 illustrates park fencing abruptly ending the vegetation, creating islandisation and shortening the dune. Infrastructure on the primary dune also shortens the land cover and prevents vegetation expansion, interrupting zonation and succession. Zonation is further fragmented because the dune lacks sand-binding shrubs in Figure 6.

The dune partially functions as Figure 7 demonstrates the dune and land cover reduce the wind's power and protects the hind dunes from wind erosion. The wind speed behind the primary dune was significantly lower at 8.20km/hr at the third minute than the littoral zone's wind speed which was 15.87km/hr.

FIGURE 7: WIND SPEED ON LITTORAL ZONE AND HIND DUNE (20/02/23)



Source: Primary Data

The dune's zonation and succession are fragmented due to anthropogenically driven land cover transformation. Zonation should involve grasses spanning 80m-150m from the sea, then small plants and shrubs, and later woodland roughly 250m-400m landward. Embryo dunes exhibit larger trees because vegetation has been condensed from 2,500m to 50m, diminishing zonation. Grasses and particularly shrubs, have insufficient ground coverage, facilitating erosion. Similarly, succession is interrupted because woodland should be 400 years old but is only 30.

Excerpt 2

5.0 Proposals:

The following proposals aim to improve the productivity of Caboolture's Eastern CBD by mitigating the impacts of crime which arise due to the priority challenge of poor aesthetics.

5.1 Urban Redevelopment Plan to Address Aesthetic Challenges

To address the poor aesthetics of Caboolture's Eastern CBD which is contributing to low productivity and thus crime and health impacts (Figures 4,5,6 and 9), it is proposed to implement an urban redevelopment plan. This consists of closing a section of King Street (Figure 11.1), creating an outdoor mall, therefore eliminating several environmental impacts related to car emissions (Figure 6). With greenspace areas such as Figure 11.3 (NC State University outlines that greenspace improves mental health therefore mitigating health impacts on business owners). Modern/attractive shopfronts, playgrounds/attractions (street entertainment), signage, undercover seating, tilled paths, and restrictions on bikes (Figure 11) will also be added. Furthermore, traffic from King Street will be redirected down James Street and Mathew Terrance which will undergo expansion (additional lanes as the current infrastructure wouldn't be able to cope; Figure 11.1). Combined this will enhance the local economy, environment and community creating a place which is comfortable, connected to transport, and provides a range of experiences/services. This is similar to the Queen Street Mall in Queensland Australia which transformed the CBD into a thriving pedestrian mall with over 500 businesses (Brisbane City Council, 2023). Lasty the Moreton Bay Regional Council would fund the urban redevelopment plan because that would allow them to engage with stakeholders.

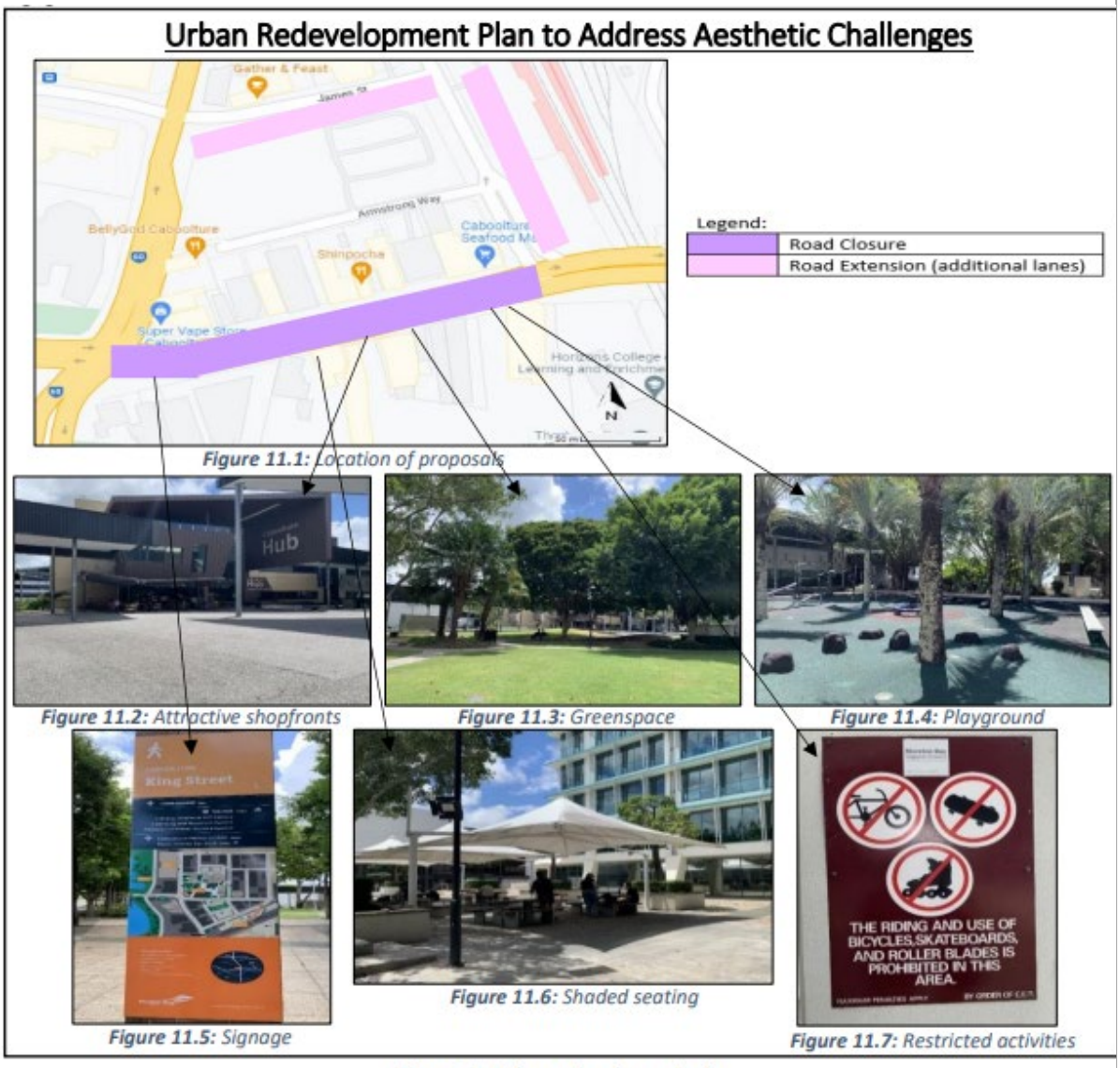


Figure 11.1: Location of proposals

Figure 11.2: Attractive shopfronts

Figure 11.3: Greenspace

Figure 11.4: Playground

Figure 11.5: Signage

Figure 11.6: Shaded seating

Figure 11.7: Restricted activities

Figure 11: Urban redevelopment plan

Practices to strengthen

To further ensure accuracy and consistency of the application of the ISMG for this IA, it is recommended that:

- when matching evidence in responses to descriptors for the Analysing and Applying criterion, attention should be given to ensuring that
  - fieldwork data and information are relevant to the land cover change evident at the fieldwork location and that this is used by students in the analysis to make inferences about the causes of the specific land- or water-management challenge
  - students demonstrate their understanding of the challenge by making valid generalisations (i.e. arising from the analysis) about the impacts of the land cover change for the place being investigated
- for the *comprehend geographic patterns* performance-level descriptor, field report responses should recognise spatial patterns of land cover change at the study site rather than simply describing the location of the study site.

Additional advice

- To demonstrate the upper performance levels across the ISMG, the data and information gathered in the field must form the basis of the analysis and data transformation. Therefore, the land-management or water-management challenge investigated must be of sufficient scope to enable students to collect and use detailed data and information.
- The report must demonstrate the report structure specified in Syllabus section 4.5.2, including the integration of maps and graphs into the relevant section of the report. Maps and graphs included in appendices cannot be used as evidence when making a decision about student performance (*QCE and QCIA policy and procedures handbook v5.0*, Section 8.2.6). The accepted standard is that maps and graphs appear in the report alongside or as close as possible to the relevant text.
- Ensure that, where recordings of electronic reports are submitted for confirmation, the recording is done by the student to demonstrate the interactive data representations — voiceovers are not required.

Internal assessment 3 (IA3)

Investigation — Data report (25%)

This assessment requires students to research a specific challenge or problem (at a local scale of study, for a place in Australia) through collecting, representing, analysing and responding to a range of data that is both teacher-provided and student researched. A geographic inquiry uses research practices to assess a range of cognitions in a particular context. Research practices include locating and using information beyond students' own knowledge and the data they have been given.

This assessment occurs over a defined period. Students may use class time and their own time to develop a response.

Assessment design

Validity

Validity in assessment design considers the extent to which an assessment item accurately measures what it is intended to measure and that the evidence of student learning collected from an assessment can be legitimately used for the purpose specified in the syllabus.

Reasons for non-endorsement by priority of assessment

Validity priority	Number of times priority was identified in decisions*
Alignment	24
Authentication	1
Authenticity	6
Item construction	42
Scope and scale	49

*Each priority might contain up to four assessment practices.

Total number of submissions: 185.

Effective practices

Validity priorities were effectively demonstrated in assessment instruments that:

- supplied students with fundamental raw data at an appropriate geographical scale representing a clear demographic challenge or, for the AS, an ecological hazard
- provided initial datasets for the selected location/s that only included raw data that had not been analysed, summarised or transformed in any way. For instance, removal of the median age from the initial demographic data obtained from the Australian Bureau of Statistics (ABS) for the specified location
- provided the appropriate geographical scale for the initial data, e.g. ABS Statistical Area Level 2 (SA2). A local scale in the context of the AS U 2 IA3 is 'a geographically small, bounded area'. This might constitute a town/city or regional area within a state or country.

Practices to strengthen

It is recommended that assessment instruments:

- designed for the AS reflect the appropriate subject matter for Unit 2 Topic 1. Appropriate topics aligned to the subject matter include ecological hazards such as environmental plant and animal invasions, impacts of pollutants on the lithosphere, atmosphere and biosphere or human health (diseases) such as vector-borne diseases
- select initial data with an appropriate geographical scale that reflects a demographic challenge. Places that have a broad geographical scale (such as ABS SA4) may not allow students to propose authentic strategies to manage a challenge at a local scale
- provide initial datasets with a discernible demographic profile that presents a geographical challenge for the selected location/s such as an ageing population, population decline, youth population, or rapid population growth. Where there is no bulge or dip in the population for any age group, there is no evidence in the initial dataset of a demographic challenge for students to investigate. The challenge must be demographic in nature and not a social challenge.

Accessibility

Accessibility in assessment design ensures that no student or group of students is disadvantaged in their capacity to access an assessment.

Reasons for non-endorsement by priority of assessment

Accessibility priority	Number of times priority was identified in decisions*
Bias avoidance	0
Language	7
Layout	4
Transparency	18

*Each priority might contain up to four assessment practices.

Total number of submissions: 185.

Effective practices

Accessibility priorities were effectively demonstrated in assessment instruments that:

- formatted the initial data (without any distractors) as a table that students were able to easily access and transform using relevant technologies.

Practices to strengthen

It is recommended that assessment instruments:

- ensure the initial dataset/s provided is/are labelled with the appropriate statistical area categorisation. Using only the place name may result in students investigating the wrong place because there are multiple statistical areas for that place (e.g. SA4, SA3, SA2, LGA)
- present datasets, where multiple locations are provided, in a consistent format.

Assessment decisions

Reliability

Reliability is a judgment about the measurements of assessment. It refers to the extent to which the results of assessments are consistent, replicable and free from error.

Agreement trends between provisional and confirmed marks

Criterion number	Criterion name	Percentage agreement with provisional	Percentage less than provisional	Percentage greater than provisional	Percentage both less and greater than provisional
1	Explaining and Comprehending	93.99%	6.01%	0%	0%
2	Analysing and Applying	84.15%	11.48%	0.55%	3.83%
3	Synthesising	91.8%	7.65%	0%	0.55%
4	Communicating	81.97%	15.85%	1.64%	0.55%

Effective practices

Accuracy and consistency of the application of the ISMG for this IA was most effective when:

- for the Explaining and Comprehending criterion, responses matched to the top performance-level descriptors
  - identified a valid demographic challenge from the initial dataset
  - provided in-depth explanations of the geographical processes that contributed to the identified challenge. In-depth explanations are thorough and include a range of processes that result in patterns of population change such as migration or age-specific demographic profiles
  - recognised comprehensive patterns of specific demographic changes over time, e.g. between 2011 and 2021 for the place being investigated, including a comparison of surrounding places (based on cartographic representations of these changes included in the report)
  - recognised significant relationships associated with the demographic change and other relevant data gathered, e.g. the relationship between a young family population and the urban sprawl associated with housing developments. They then used these relationships to determine the implication of the change for people and places
- for the Synthesising criterion, to be matched to the top performance-level descriptors, responses
  - considered the main impacts of the identified challenge to propose relevant action/s to manage the impacts at the place in Australia
  - provided convincing evidence from the analysis to justify the proposed action/s.

Samples of effective practices

The following excerpt demonstrates Analysing and Applying at the upper performance levels of the ISMG (AS) as it demonstrates astute interpretations and inferences that identify how patterns, trends and relationships represent risk for people and environments in hazard zones, as well as sophisticated extrapolation from the analysis to make valid generalisations.

Note: The characteristic/s identified may not be the only time the characteristic/s has occurred throughout a response.

Land use bordering the SGBR coast is comprised primarily of open grazing land with significant regions of farming, spanning 700km along the Mackay-Hervey Bay coastline. Farming in the region is largely sugarcane, which contributes to excessive agricultural runoff, resulting in eutrophication off the coast and providing nutrients for larval COTS (Queensland Government, 2015). Sugarcane undergoes its most intensive care within the first 6 months of being planted (October-March), indicating higher levels of runoff in this season. Coincidently, COTS breed during this period (December-February) supplying juveniles with additional nutrients, ensuring greater survival rates, increasing populations and consequently the hazard.

Supporting this, Mackay, Rockhampton, and Bundaberg depict extreme levels of domestic waste (12,521-42,912 tonnes) comprised of plant/animal wastes and other inorganic substances (Dehghani et al, 2021), which all end up in riverbank side transfer stations in these three regions (Appendix 3). Here, waste has potential to enter waterways, suppling additional nutrients to juvenile COTS, supporting growth.

3.2 Exposure

The SGBR coastline spans 620km, and borders 3 major towns, Mackay, Rockhampton, and Bundaberg (Google Earth, 2023). Within these cities, dwells over 300,000 people, making up a significant portion of coastal populations off the GBR, and consequently exposing a booming economy to COTS damage.

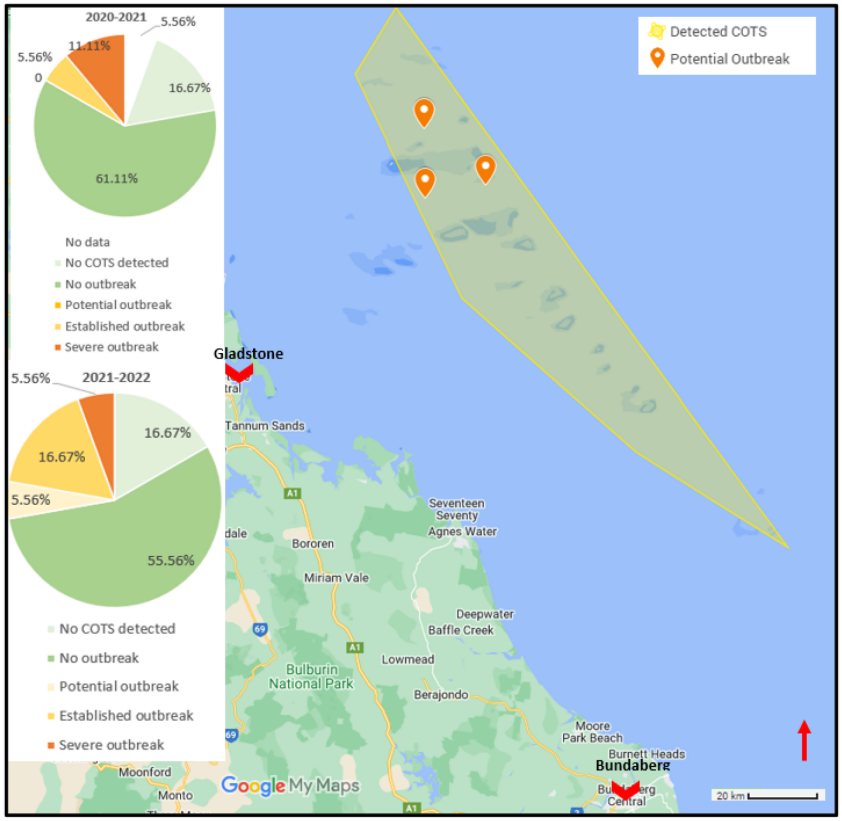


Figure 4: *COTS detection outbreaks and outbreak potential in the Southern reefs (Australian Government, 2023) (Appendix 4)*

Most COTS detected in the SGBR are between Gladstone and Bundaberg, making this region the most exposed to COTS outbreaks. Further, 3 of the 4 potential outbreaks fall in this region, indicating these areas are most at risk in forming severe ecological hazard zones. These areas also show reduced coral cover due to COTS feeding, depicting only 20-30% cover, making these regions more exposed to coastal erosion risk (Australian Government, 2023). Coral cover sits as close as 20km off the coast, significantly closer to residential areas than Mackay and Rockhampton, causing greater exposure of these regions and greater impacts of coastal erosion (Google Earth, 2023).

In 2021-2022, the figure shows approximately 80% COTS exposure in the SGBR and a total of 27.79% classified as outbreak/potential outbreak regions. Both 2020-2021 and 2021-2022 data depict 80% COTS exposure, however, indicating no change in reef exposure to the hazard. However, regions of outbreak/potential outbreak/severe outbreak increase by 11% by 2022, suggesting regions are becoming more vulnerable, causing outbreak numbers to increase.

3.3 Vulnerability

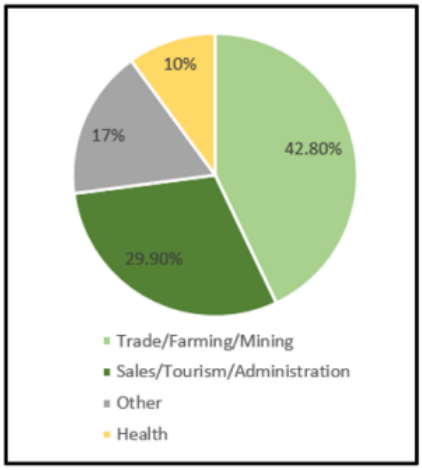


Figure 5: *Main employment industries in Mackay (Appendix 5) (ABS, 2021)*

The primary economy in Mackay consists of trade, farming, and mining (42.8%). Sugarcane is the leading crop grown along this region, contributing up to $3.3 billion to the Queensland economy (Queensland Government, 2018). Sugarcane grows in irrigated, and fertile soils, meaning crops are planted closer to the coast and are therefore more vulnerable to coastal erosion due to COTS induced coral loss, and therefore more likely to impact this major industry.

The second largest industry is sales, tourism, and admin work (29.9%). Tourism is an extremely vulnerable sector because of its reliance on the reef. As the hazard increases and COTS outbreaks worsen, reef quality declines, effecting these sectors

Practices to strengthen

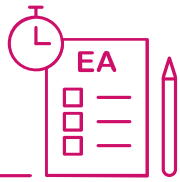
To further ensure accuracy and consistency of the application of the ISMG for this IA, it is recommended that:

- the analysis section should outline the demographic challenge identified in the initial data transformation and the selection of additional data relevant to the demographic challenge. For instance, for an ageing population, suitable data may include healthcare facilities data such as location and accessibility, data concerning housing type and availability, recreational and wellbeing services, and facilities and accessibility
- generalisations about the impacts the demographic challenge will have on the community must be based on the identified factors causing the challenge. Potential impacts can be determined, e.g. using a consequences wheel approach to identify the flow-on effects and more complex impacts that are secondary or even tertiary in nature
- proposal/s aim to sustainably manage the identified impacts.

Additional advice

- The report should be based on the analysis of primary data (statistics) rather than secondary information to successfully meet the Analysing and Applying criterion.
- Maps and graphs must be student-generated using spatial technologies and/or ICT to visually represent data. They must also be fully integrated into the student response.

External assessment



External assessment (EA) is developed and marked by the QCAA. The external assessment for a subject is common to all schools and administered under the same conditions, at the same time, on the same day.

Examination — combination response (25%)

Assessment design

The assessment instrument was designed using the specifications, conditions and assessment objectives described in the summative external assessment section of the syllabus.
The examination consisted of two sections. Part A included five short response questions and Part B included one extended response question (47 marks).

General syllabus examination

The examination assessed subject matter from Unit 4. Questions were derived from the context of Topic 2: Global population change.

The assessment required students to answer questions in response to stimulus for both the short response questions and the extended response question. Students were required to create a graph for the data transformation question.

The stimulus consisted of a range of maps, graphs and data.

Alternative Sequence (AS) examination

The assessment instrument was designed using the specifications, conditions and assessment objectives described in the summative external assessment section of the syllabus.
The examination consisted of two sections. Part A included five short response questions and one extended response question (51 marks).

The AS examination assessed subject matter from AS U2. Questions were derived from the context of Topic 2: Natural hazard zones.

The assessment required students to answer questions in response to stimulus for both the short response questions and the extended response question. Students were required to create a map for the data transformation question.

The stimulus consisted of a range of maps, graphs and data.

Assessment decisions

Assessment decisions are made by markers by matching student responses to the external assessment marking guide (EAMG). The external assessment papers and the EAMG are published in the year after they are administered.

Effective practices

Overall, students responded well when they:

- answered all parts of compound short response questions, using examples from the stimulus when required by the question

- provided detailed analysis, using evidence from the stimulus, for the relevant short response questions, e.g. in Question 3, students clearly analysed the three graphs provided to explain three challenges in relation to natural population change for Japan: declining fertility, increasing life expectancy and declining workforce
- used multiple pieces of stimulus in their analysis for the extended response question to make detailed inferences about a geographical challenge. Students who demonstrated the top mark of the Analysing EAMG used the evidence in the stimulus to identify the geographical challenge as urban sprawl predominantly because of a growing urban population as well as reclassification of land use
- identified complex relationships in the data used in their analysis for the extended response question, e.g. the cause of the growing urban population was a combination of natural population growth within the existing urban footprint, rural–urban migration and the reclassification of land from rural to urban
- made complex generalisations to demonstrate the top mark in the Applying EAMG for the extended response. The generalisations were based on their inferences and the evidence represented in the stimulus, including impacts on the environment (land, water, and air degradation) and people (access to water and deaths from air pollution).

Samples of effective practices

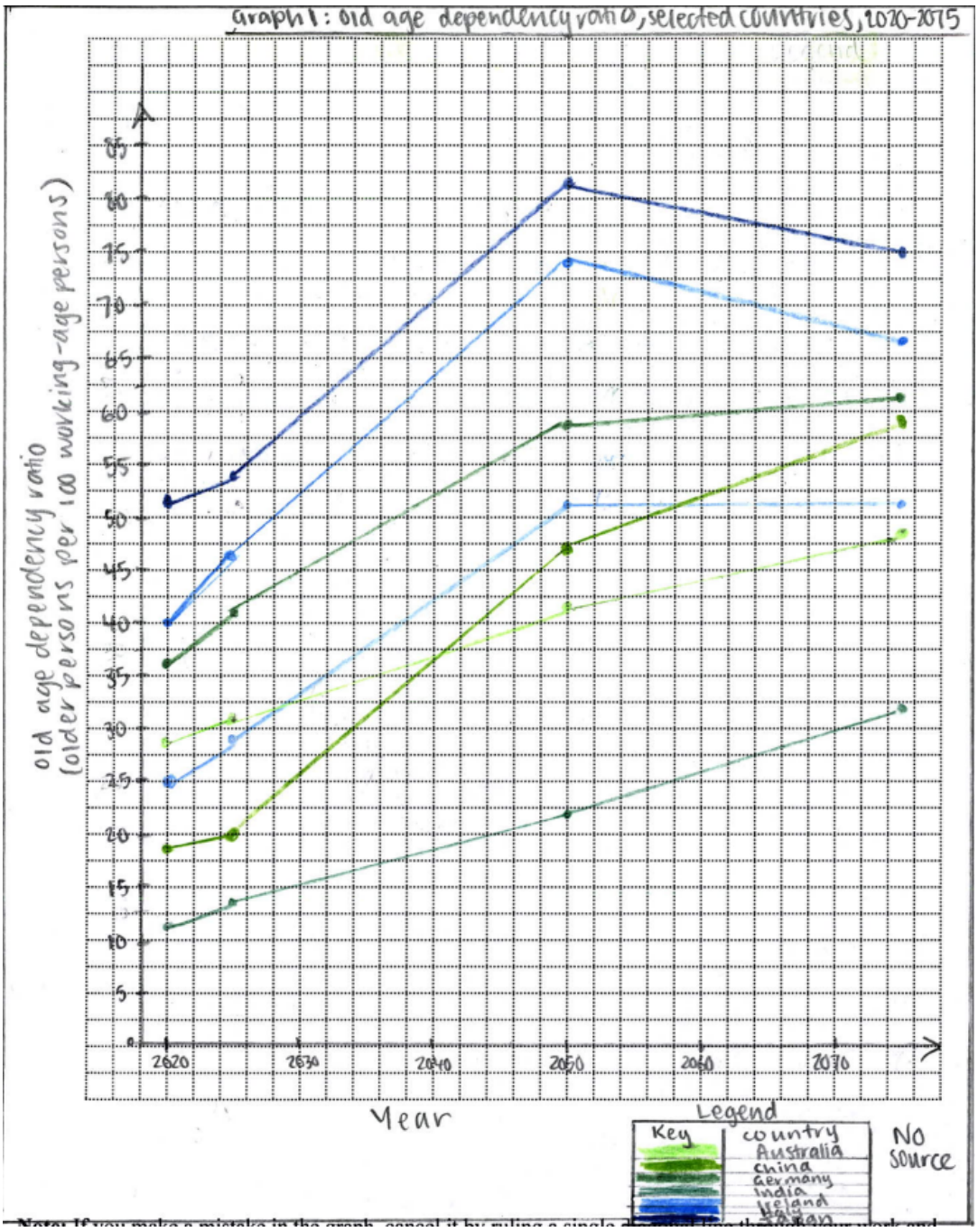
Short response

The following excerpts are in response to Question 4a) (Excerpt 1) and 4b) (Excerpt 2). Question 4a) required students to construct a graph using over-time data for old-age dependency for selected places. Question 4b) required students to analyse the graph they created to describe the trends evident and provide a reason to explain the projected trend for Japan.

Effective student responses:

- included the construction of a suitable graph (i.e. multiple line graph or bar graph) to represent the over-time data and included accurately plotted data, an appropriate scale, and relevant title, key and axis labels
- provided a detailed analysis of the trends, including the overall trend and specific trends, and used appropriate evidence from the graph to support their analysis
- provided a plausible explanation of the projected trend for Italy.

Excerpt 1


Graph 1: old age dependency ratio, selected countries, 2020-2075
old age dependency ratio
(older persons per 100 working-age persons)
A
65
60
55
50
45
40
35
30
25
20
15
10
5
0
2020
2030
2040
2050
2060
2070
Year
Legend
Key
country
Australia
china
Germany
India
Ireland
Italy
No source

Excerpt 2

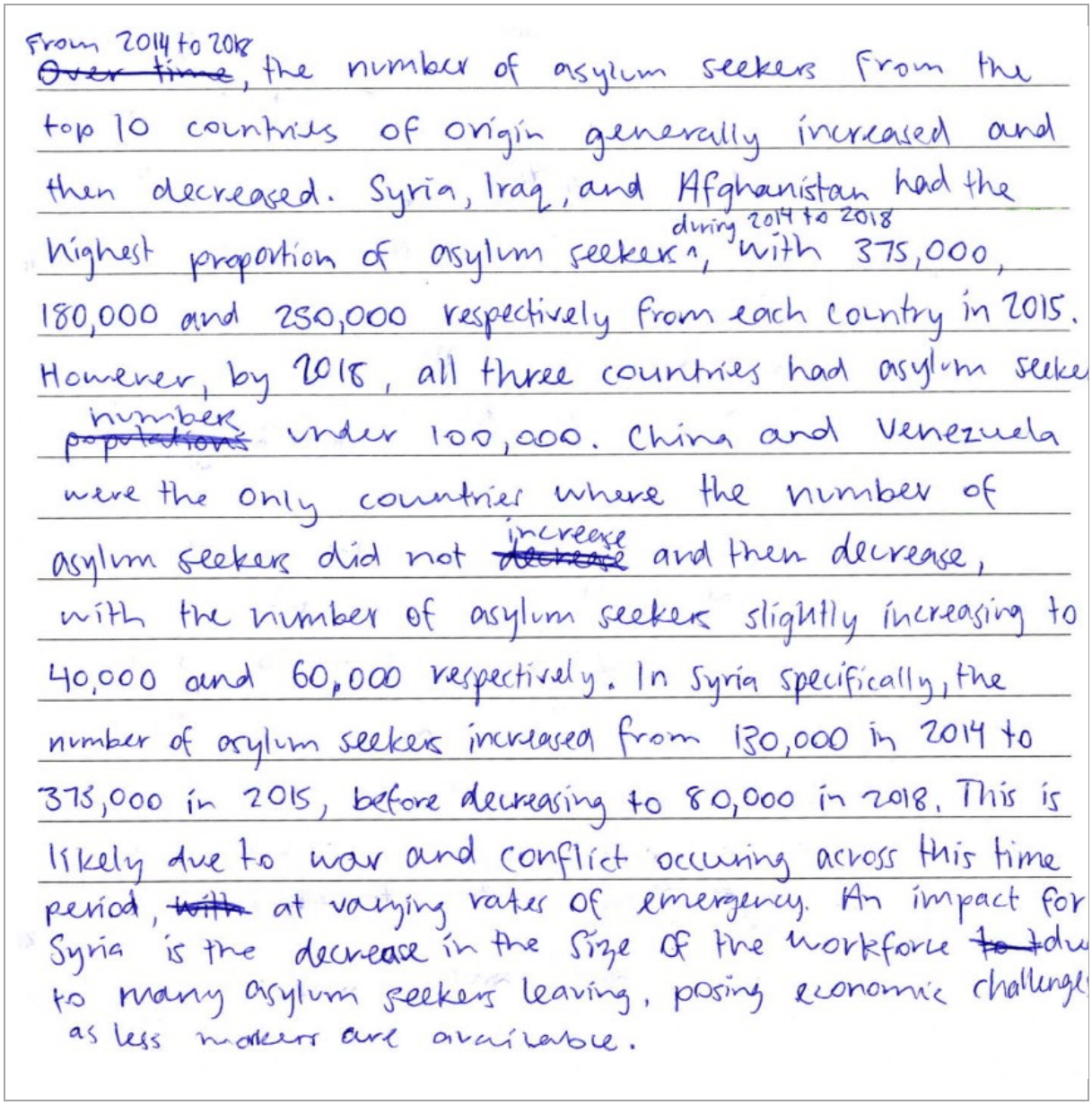
As seen in graph 1, the old age dependency ratio for all selected countries is expected to increase from 2020-2075. Japan, Italy are Ireland all reach their peak in 2050, with 81, 74 and 51 old people per 100 working age people respectively. The country with the greatest increase is China, from 18 to 59 old people per 100 working age between 2020 to 2075. The county with the least increase is Australia, from 28 to 48 old people per 100. Italy increased by 27 old people per 100, from 40 to 67, which is the 2nd high dependency ratio in 2075, after Japan. A possible reason is their low fertility rates and high life expectancy, meaning Italy have an aging population, it slightly decreases from 74 to 67 from 2050 to 2075, as the extremely old people die, reducing the old age dependency ratio.

* Japan has highest ratio at 75 per 100 working age people in 2020 and 2075 respectively. and India has lowest ratio at 32 per 100 in both 2020 and 2075 and 52 and 11 and

The following excerpt is in response to Question 5, which required students to analyse a graph of asylum seeker countries of origin to describe the trends and then suggest a reason to explain a trend in one country.

Effective student responses:

- provided an accurate analysis of the trends evident in the graph, including the overall trends and specific trends using evidence from the graph to support their analysis
- provided a plausible reason to explain a trend in one country and identified a relevant impact for the same country.



From 2014 to 2018 ~~Over time~~, the number of asylum seekers from the top 10 countries of origin generally increased and then decreased. Syria, Iraq, and Afghanistan had the highest proportion of asylum seekers during 2014 to 2018, with 375,000, 180,000 and 250,000 respectively from each country in 2015. However, by 2018, all three countries had asylum seeke ~~populations~~ number under 100,000. China and Venezuela were the only countries where the number of asylum seekers did not ~~decrease~~ increase and then decrease, with the number of asylum seekers slightly increasing to 40,000 and 60,000 respectively. In Syria specifically, the number of asylum seekers increased from 130,000 in 2014 to 375,000 in 2015, before decreasing to 80,000 in 2018. This is likely due to war and conflict occuring across this time period, ~~with~~ at varying rates of emergency. An impact for Syria is the decrease in the size of the workforce ~~to~~ du to many asylum seekers leaving, posing economic challenge as less workers are available.

Extended response

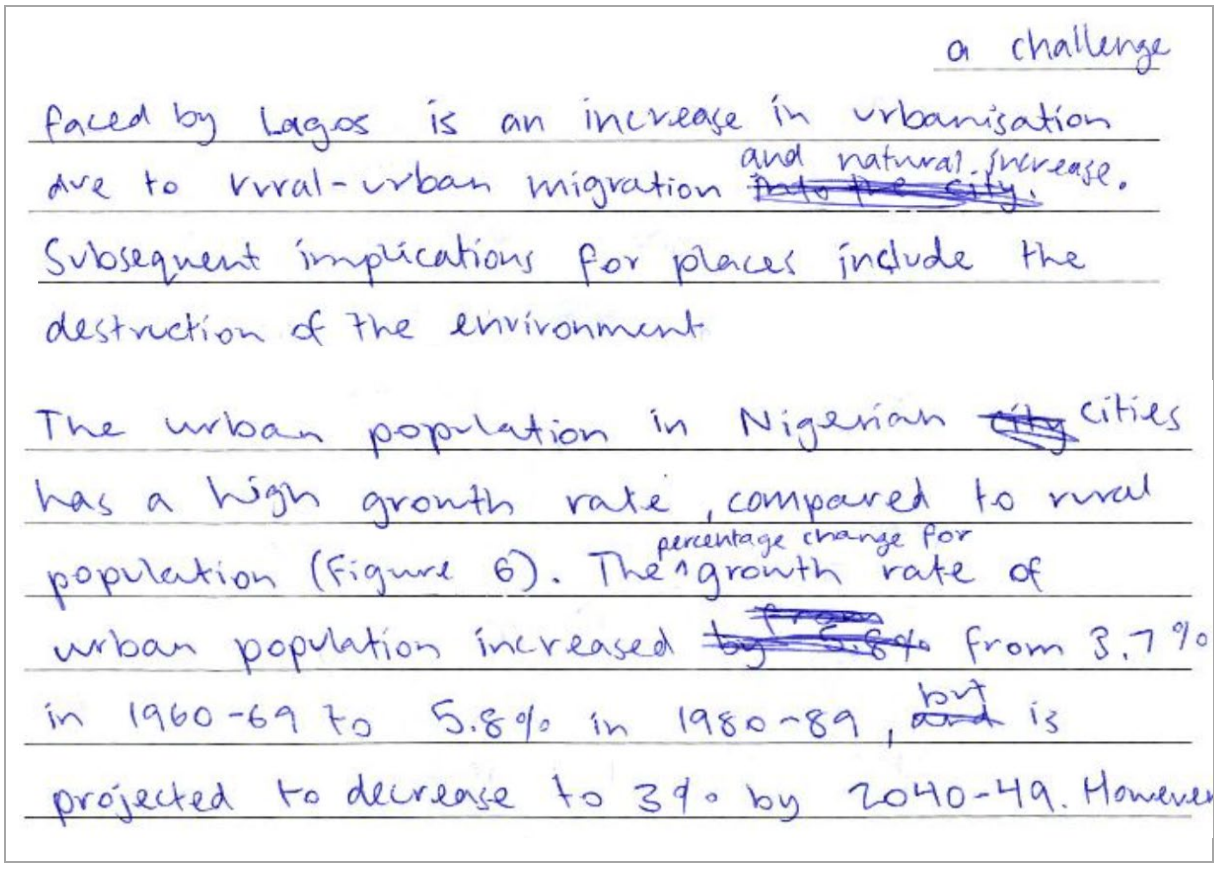
The following excerpt is in response to Question 6, which required students to analyse the stimulus and make inferences about a geographical challenge for Lagos. Students then needed to use their understanding of the challenge (arising from their analysis) to make generalisations about the impacts on people or place.

Effective student responses:

- demonstrated a detailed analysis to make inferences about the challenge of urban sprawl arising from a growing urban population in Lagos (predominantly arising from both rural–urban migration and the natural rate of increase)
- made clear links between multiple pieces of data in their analysis to support their inferences
- made complex generalisations about the impacts of urban sprawl on people or place. A complex generalisation explains more than a primary implication. For instance, a primary implication is increased population growth, which leads to urban sprawl, resulting in the loss of forests and farmland as urban areas are developed. A complex generalisation further explains that increased impervious surfaces due to urban development leads to an increased rate of run-off and therefore greater rates of erosion and flooding, resulting in reduced water quality
- used their analysis to support the generalisations made about the impacts.

This excerpt has been included to demonstrate:

- a detailed analysis using multiple pieces of stimulus with clear links between each to make inferences about urbanisation as a result of increasing urban population (rural–urban migration and natural increase)
- complex generalisations about environmental degradation (impacts) of urbanisation for Lagos.



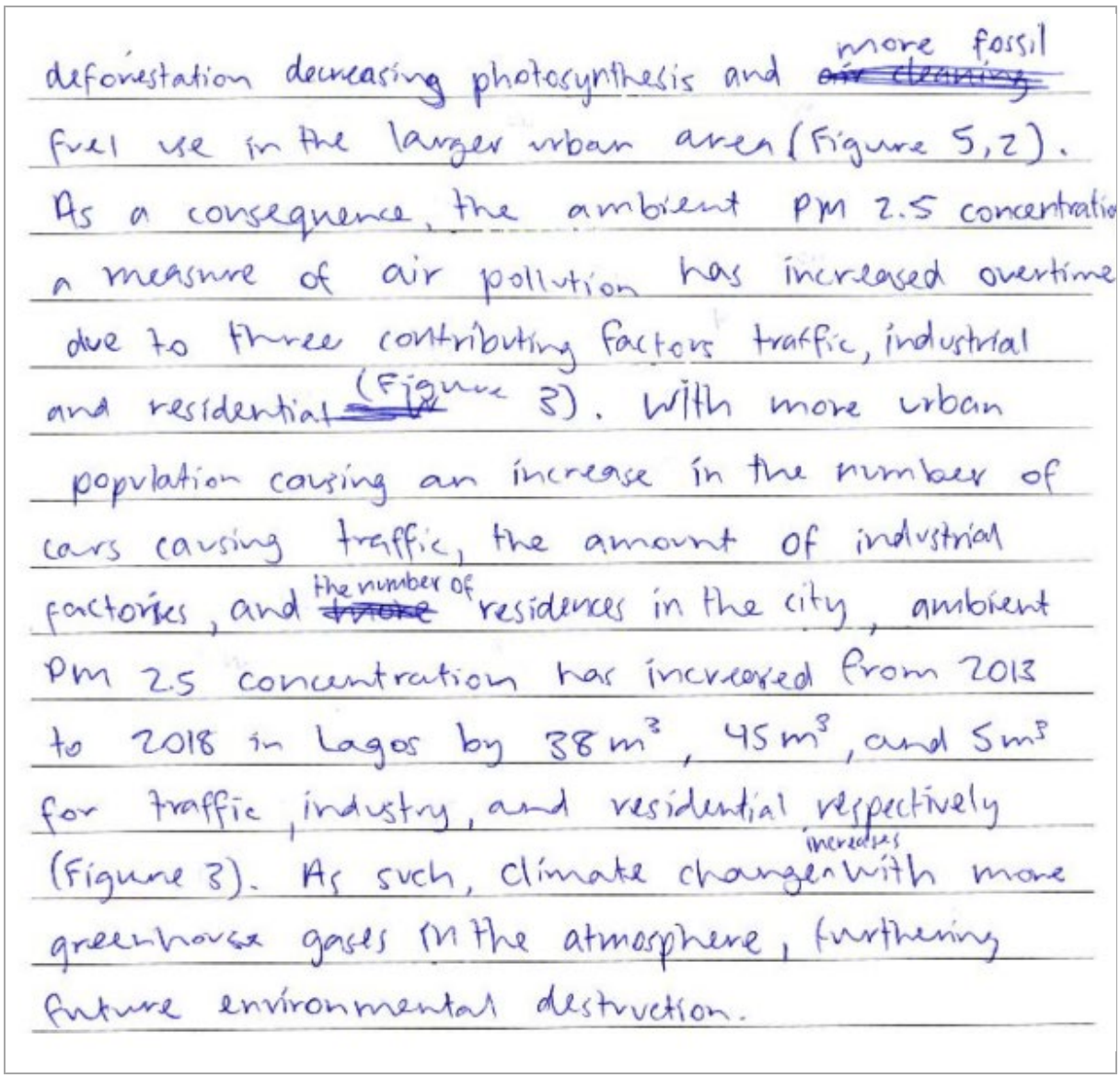
a challenge faced by Lagos is an increase in urbanisation due to rural-urban migration and natural increase. ~~into the city.~~ Subsequent implications for places include the destruction of the environment

The urban population in Nigerian ~~city~~ cities has a high growth rate, compared to rural population (Figure 6). The percentage change for growth rate of urban population increased ~~by 3.8%~~ from 3.7% in 1960-69 to 5.8% in 1980-89, ~~and~~ but is projected to decrease to 3% by 2040-49. However

this value is still significantly higher than the percentage change for rural population, which slightly increased from 1.9% to 2.1%, before decreasing to 1.1% by 2040-49 (Figure 6). Therefore, with a greater percentage change for urban than rural populations projected, Lagos city will experience more population growth and urbanisation. This is largely dive to rural-urban migration, which only contributed to 750,000 of the population in Nigerian cities in 1960-69 but increased to 11.5 million by 2000-09 (Figure 7). Furthermore, the natural population increase in urban areas, caused by more births than deaths, only contributed to 1.5 million of the Nigerian cities' population in 1960-69, but also increased to 13 million by 2000-09 (Figure 9). This therefore evidences the overall population increase in urban areas as a result of not only rural-urban migration, but also natural increase. The increase of urban population resulting in urbanisation of land is displayed through the change in land cover maps (Figure 2) of Lagos from 1986-2019. In 1986, a large

percentage of the land was ~~covered~~ utilised for agricultural purposes, particularly to the north of the city, with forest and bushland contributing to the majority of the land use along the coastline. However, by 2002, the forest cover in Eastern Lagos ~~and the agricultural~~ had significantly decreased, and the agricultural land was completely replaced by urban area. By 2019, urban area also completely surrounded the wetlands to the west of Lagos, in addition to surrounding a large proportion of waterbodies, resulting the ~~the~~ major land cover being urban (Figure 2). Therefore, the increase of urbanisation throughout Lagos is a significant challenge.

Implications of the challenge for places include environmental destruction and ~~pa~~ air pollution. Types of environmental degradation in Lagos include erosion, due to the removal of vital forest ecosystems ~~with~~ where tree root structures supported soil stability ~~for~~ ~~forest~~ to increase urban land, and air pollution, due to the lack of trees ~~existing~~ after


deforestation decreasing photosynthesis and more fossil fuel use in the larger urban area (Figure 5,2). As a consequence, the ambient PM 2.5 concentratio a measure of air pollution has increased overtime due to three contributing factors traffic, industrial and residential (Figure 3). With more urban population causing an increase in the number of cars causing traffic, the amount of industrial factories, and the number of residences in the city, ambient PM 2.5 concentration has increased from 2013 to 2018 in Lagos by 38 m^3, 45 m^3, and 5 m^3 for traffic, industry, and residential respectively (Figure 3). As such, climate change increases with more greenhouse gases in the atmosphere, furthering future environmental destruction.

Practices to strengthen

When preparing students for external assessment, it is recommended that teachers:

- ensure students have detailed exposure to the subject matter from the units being assessed, in particular Unit 4 Topic 2: Global population change. This will enable students to identify a relevant geographical challenge evident in the stimulus for the extended response question. For instance, the challenge evident in the stimulus for the 2023 extended response question was urban sprawl resulting from rural–urban migration and natural population growth in urban areas. The increased urban footprint contributed to flooding due to loss of coastal forests and mangroves and reclamation of wetlands
- provide opportunities for students to develop analytical skills in both short response and extended response questions. In their analysis, students must be able to demonstrate clear links between multiple pieces of data to explain a geographical challenge. Simply analysing separate pieces of data without making links between the data does not allow students to identify complex relationships and make detailed inferences, which are required to achieve the top mark for Analysing.

Additional advice

- Teachers should explore with students which types of graphs they should choose to effectively represent different types of data, e.g.
  - line graphs (including composite line graphs, compound line graphs, multiple axis line graphs) are typically used to show changes over time
  - bar and column graphs (including composite and compound graphs) show values that are independent of each other and are typically used to compare the different values. Bar graphs may be suited to show change over time (usually when the change in time is large)
  - a scatter graph or scatter plot is used to show the relationship between two different variables.