

# Numeracy 2018 v1.1

IA1A annotated sample response

October 2018

## Extended response — oral mathematical presentation

This sample has been compiled by the QCAA to assist and support teachers to match evidence in student responses to the characteristics described in the instrument-specific standards.

### Assessment objectives

This assessment instrument is used to determine student achievement in the following objectives:

1. select and interpret mathematical information in personal, social and learning situations
2. select from and use a variety of mathematical and problem-solving strategies in personal, social and learning situations
3. use oral and written mathematical language and representation to communicate mathematically in personal, social and learning situations.

**Note:** Objectives 4 and 5 are not assessed in this instrument.

# Instrument-specific standards

Numeracy	
The student work has the following characteristics:	Grade
<ul style="list-style-type: none"> <li>• selection and thoughtful interpretation of mathematical information in personal, social and learning situations</li> <li>• selection and use of a variety of effective practical mathematical and problem-solving strategies when applying mathematics in personal, social and learning situations</li> <li>• controlled use of oral and written mathematical language and representation to communicate mathematically when expressing personal identity, achieving personal goals, understanding and interacting with the wider community, and in learning situations.</li> </ul>	A
<ul style="list-style-type: none"> <li>• appropriate selection and interpretation of mathematical information in personal, social and learning situations</li> <li>• selection and use of a variety of relevant mathematical and problem-solving strategies in personal, social and learning situations</li> <li>• some control in the use of oral and written mathematical language and representation to communicate mathematically in personal, social and learning situations.</li> </ul>	B
<ul style="list-style-type: none"> <li>• selection and interpretation of mathematical information in personal, social and learning situations</li> <li>• selection and use of a variety of mathematical and problem-solving strategies in personal, social and learning situations</li> <li>• use of oral and written mathematical language and representation to communicate mathematically in personal, social and learning situations.</li> </ul>	C
<ul style="list-style-type: none"> <li>• selection and superficial interpretation of basic mathematical information in personal, social and/or learning situations</li> <li>• selection and variable use of some practical mathematical and/or problem-solving strategies in personal, social and/or learning situations in inappropriate or irrelevant ways</li> <li>• fragmented and unclear use of oral and written mathematical language and representation in mathematical communication.</li> </ul>	D
<ul style="list-style-type: none"> <li>• use of rudimentary aspects of mathematical information in personal, social and/or learning situations</li> <li>• inaccurate and sporadic use of mathematical strategies information in personal, social and/or learning situations</li> <li>• infrequent and unclear use of mathematical language information in personal, social and/or learning situations.</li> </ul>	E

# Task

## Context

This topic has focused on using numeracy to achieve personal goals. You have experimented with problem-solving strategies and used mathematics to calculate a range of financial targets according to your interests and whether they are viable. You will use your mathematical knowledge in a variety of personal contexts related to one of the following options:

- the week-long holiday known as ‘Schoolies’
- an alternative holiday with or without your family/friends
- starting part-time work and saving up for your first home or car.

Since the 1970s, what began as a celebration to mark the end of final exams for students on the Gold Coast has grown to become a national tradition. While some young people now see Schoolies as a cultural rite of passage, they can forget the financial implications it can have on them personally and socially. Others see more value in spending that money on a different kind of holiday with family/friends or saving for their first home or car.

## Task

Create and present an informative oral mathematical presentation to your class, using numeracy to solve the problem of funding one of the options given above. Communicate how you calculated the costs and how you devised a personal budget to fund your preferred option.

# Sample response

Criterion	Grade awarded
<b>Numeracy</b> Assessment objectives 1, 2, 3	B

# Transcript of sample video response

This video is available from:

[www.qcaa.qld.edu.au/downloads/portal/media/snr\\_numeracy\\_18\\_ia1a\\_smple\\_asr.mp4](http://www.qcaa.qld.edu.au/downloads/portal/media/snr_numeracy_18_ia1a_smple_asr.mp4).

## Oral mathematical presentation

### *Introduction/background*

Student I know we all want to go to Schoolies together at the end of next year and there are plenty of options for where we go and what we should do. So that we can choose the best location I've put together a presentation that we can show our parents to get them to agree on what we want to do! I think the best option we have is to prove that we can fund the entire week ourselves. We've got over a year to save the money and only a very small deposit of \$150 is required to place a booking this year. I know some of us want to go to Bali and others are happy to go to the Gold Coast. I have calculated the costs for both and also a budget plan for saving the money which we can use to help us make the final decision.

### *Cost considerations for the two locations*

Student First, let's look at the cost for the locations. For Bali: There's a few extra costs when travelling to Bali but I have included these in the total amount. To break it down we have a package covering accommodation, passport, flights and travel insurance, and additional costs for food, drinks and activities, based on \$1000. Which gives us a total of **\$2652**. Now let's look at the costs for the Gold Coast. We have a package for accommodation, bond and insurance, with additional expenses for travel, food, drinks and activities, with a total cost of **\$2284**. The \$200 bond can be refunded after checkout but needs to be paid up front. So we can see that the Gold Coast option is cheaper — but probably not as much as we were expecting!

### *Saving up options and mathematical calculations*

Student Now on to how are we going to save the money to cover this... This is where being a referee is going to help a lot! This table shows the match official fees payable to referees for both Football Brisbane and Football Queensland competitions. At our age, the average weekly earnings for Football Brisbane is \$96 and average weekly earnings for Football Queensland is \$82 because you get less games. There are 20 weeks of competition in the Football Brisbane comp and 26 weeks of competition in the Football Queensland comp. Looking at these figures in the season the potential earnings are:

- \$1920 for Football Brisbane
- \$2132 for Football Queensland.

Of course, that is if every game gets played and we get games each week. So, I have placed a small contingency in place to cover any unexpected events. We all know the biggest reason to call off games — rain!

So the calculation for earnings from this source is:

Football Brisbane: **\$1632** (\$1920 — 288)

Football Queensland: **\$1886** (\$2132 — \$246)

If we say that we equally share Football Brisbane and Football Queensland matches we can calculate a potential yearly earning figure of **\$1759**, which is  $(\$1886 + \$1632) / 2$ .

This will cover the biggest part of the expenses but we do need to find another way to earn the extra money required.

Probably the easiest jobs to negotiate are mowing the lawn and washing and cleaning the car.

The calculations for these jobs:

- mowing lawn — once per week in summer (12 weeks), once per month in winter (3 months)

$$15 \times \$25 = \mathbf{\$375}$$

- washing/cleaning car — once per fortnight for the whole year

$$26 \times \$20 = \mathbf{\$520}.$$

So that would give us a total of **\$2654**.

Which is enough to cover Bali or the Gold Coast. So what do we want to do?

### *Justification based on mathematical reasoning*

Student

Based on mathematical principles, the calculations of **income vs. expenses**, it is apparent that the Gold Coast is the more cost-effective option.

Supporting this decision is that the earning amount can be influenced by external events such as game availability, weather and demand, which can all have a negative impact on earnings.

With our potential earning of \$2654 for the year and the costs for Gold Coast for the week is \$2284, we would have a buffer of **\$384** to cover any additional expenses. For Bali the buffer is only \$2, which doesn't leave much room to move!

### *Conclusion for choice*

Student

We can clearly see that based on the calculations the most viable option to choose is the Gold Coast as our preferred location for Schoolies in 2019! So what are we waiting for — let's go see our parents!

The commentary shows the match to the standard descriptors of the instrument-specific standards.

## Criterion: Numeracy

### **selection and thoughtful interpretation of mathematical information in personal, social and learning situations [A]**

The student has selected and thoughtfully interpreted the mathematical information in his presentation clearly for an audience of peers by:

- identifying relevant mathematical knowledge and drawing meaning for everyday life that embeds a range of familiar, and some less familiar, contexts with regards to the chosen option and personal situation
- presenting facts, rules, definitions and procedures that are authentic for today's youth and making sure that it can be put into effect to obtain their personal goals
- performing calculations with and without the use of technology in a mathematical task, including data located in tables, graphs and charts.

### Summary

When examining the oral presentation, the student:

- selects the option of funding their week-long holiday known as Schoolies week as a critical issue that needs action and support from his peers
- makes thoughtful use of attitudes and values about numeracy and budgeting that reflects his social interest and personal affordability
- uses underpinning factors in statistics and financial literacy to shape his interpretative argument about funding the trip.

### **selection and use of a variety of relevant mathematical and problem-solving strategies in personal, social and learning situations [B]**

The student has selected and used a variety of relevant mathematical and problem-solving strategies relevant to an audience of peers by:

- investigating personal situations using various mathematical methods to find solutions, reflecting on processes used and evaluating outcomes
- selecting and applying mathematical processes and methods, including the use of pen and paper, calculator and technological processes such as spreadsheeting to solve a range of problems embedded in familiar, and some less familiar, contexts
- reflecting on outcomes of mathematical activities and the appropriateness of mathematical processes, including the use of estimation, which was not effectively addressed.

### Summary

The student's selection of subject matter is mostly relevant and fit for a particular purpose, e.g.

- numbers
- budgeting and spreadsheeting tools
- financial literacy
- the lack of working out the average weekly earnings interrupts the flow of mathematical processes and affects cohesion of ideas.

**some control in the use of oral and written mathematical language and representation to communicate mathematically in personal, social and learning situations [B]**

The student has used oral and mathematical language and representation to communicate to an audience of peers by:

- using formal and informal language, including mathematical conventions, symbolism, abbreviations and diagrammatic representations
- conveying mathematical information and problem-solving processes and results in a range of familiar, and some less familiar, contexts, influencing the audience through persuasive arguments.

The student shows an appropriate choice of language by:

- using language that suits the audience of peers and the context, particularly in establishing a formal but relatable position, e.g. 'now let's look at the costs'
- using persuasive language choices to convince the audience that funding a Schoolies trip requires action, with the use of rhetorical questions and hard evidence, e.g. statistics and incomes vs. expenses
- using emotive language to evoke feelings and action, e.g. 'so what are we waiting for — let's go see our parents!'
- demonstrating suitable language choices that are informed by an understanding that the purpose of the task to persuade and articulate action through instructional language, e.g. 'so the calculations for earnings from this source' and 'based on mathematical principles'.

The student mostly uses language features appropriate to the mode, including:

- spoken features
  - use of pronunciation with minimal errors
  - audibility, clarity, volume and pace — though at times some words were hard to understand clearly
  - emphasis was not evident, e.g. stressing key terms would have been more effective
- nonverbal features
  - use of nonverbal features was not apparent, such as facial expressions
  - limited physical movement and stance, with a small screencast based at the bottom right-hand corner
  - reading of the script is apparent throughout the presentation, with inconsistent use of eye contact
- complementary features
  - text font has been used for effect, although alignment of paragraphs was inconsistent
  - appropriate use of images to support the presentation on the chosen option and timed to match the spoken message
  - use of multimodal elements, with pre-recorded video of speech and slideshow presentation using Screencast-O-Matic.

## Summary

The student appropriately integrates modes (visual) and media (slideshow) to form a suitable oral mathematical presentation. They integrate modes by:

- using text (written mode) to highlight main points on the screen to support their arguments
- using images and evidence (e.g. graphs, tables and statistics) to financially support his personal goals of funding the week-long holiday known as Schoolies.