

**From:** [Boženka Vondruška](#)  
**To:** [Kevin Hoar](#)  
**Subject:** Re: Student view  
**Date:** Thursday, 21 March 2024 12:16:53 PM  
**Attachments:** [Outlook-iq3wntao.png](#)

---

Thanks [REDACTED]

---

**From:** Kevin Hoar <xxxxx.xxxx@xxxx.xxxx.xx>  
**Date:** Thursday, 21 March 2024 at 12:07 PM  
**To:** [REDACTED] Boženka Vondruška  
<xxxxxxxxxxxxxxxx@xxxx.xxxx.xx>  
**Subject:** Re: Student view

Thanks [REDACTED] for the critiques.

Cheers.  
Kevin

## Kevin Hoar | National Assessment Facilitator

External Assessment Team

Assessment Division | Wāhanga Aromatawai

[New Zealand Qualifications Authority | Mana Tohu Mātauranga o Aotearoa](#)



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[REDACTED]



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**From:** [REDACTED]  
**Sent:** Thursday, 21 March 2024 11:51  
**To:** Boženka Vondruška <Bozenka.Vondruska@nzqa.govt.nz>; Kevin Hoar  
<Kevin.Hoar@nzqa.govt.nz>  
**Subject:** Student view

Hello Kevin and Bozenka

I've been through the CAA on AM as a student. The whole thing is visually appealing so students should find it engaging.

I've added some extra considerations to the Screen Dump doc.

The most important is ensuring that all visuals needed to answer a Q are on the same screen. That may require some alterations in image dimensions.

All the best

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

**From:** [Kevin Hoar](#)  
**To:** [REDACTED]  
**Date:** Re: Friday meeting  
Monday, 6 May 2024 12:02:11 PM  
**Attachments:** [Outlook-rfrsqs0d.png](#)

---

Hi [REDACTED]

Yes, please go ahead with your plans to change some of the Outcome 3 responses from 2023 into multiple choice.

The funding will be part of your examiner contract.

'See' you at 1 pm.

Cheers.

Kevin

**Kevin Hoar** | National Assessment Facilitator

External Assessment Team

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**From:** [REDACTED]

**Sent:** Monday, 6 May 2024 09:03

**To:** Sue Chalmers <xxx.xxxxxxxx@xxxx.xxxx.xx>; Kevin Hoar <Kevin.Hoar@nzqa.govt.nz>

**Subject:** Friday meeting

Hello Sue and Kevin

I've been mulling over our upcoming meeting on Friday to consider electronic marking of all the CAA.

Our writing team has previously attempted to draft Outcome 3 items in a style that might be marked electronically. We ended up abandoning the idea.

I think it would be advantageous to go into the meeting with a couple of examples of how Outcome 3 items from the 2023 CAAs might look in digital-marking format.

Are you happy for me to spend a couple of hours doing that?

I think examples will help clarify the issues.

Regards

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**From:** [REDACTED]  
**To:** [Kevin Hoar](#); [Sue Chalmers](#)  
**Subject:** Examples of digitally markable items  
**Date:** Tuesday, 7 May 2024 2:16:42 PM  
**Attachments:** [Rewritten Outcome 3 items.docx](#)

---

Hello Kevin and Sue

Please see attached an attempt to create digitally markable Outcome 3 items.  
I think that will be very problematic for reasons stated at the end of the examples.

Regards

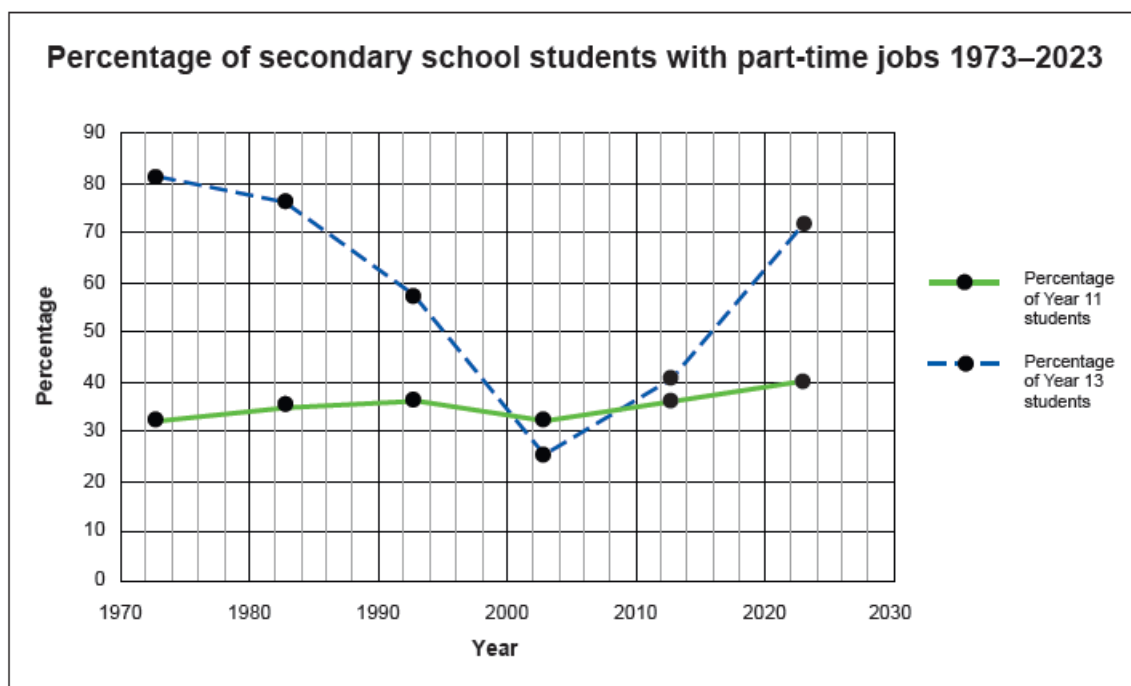
[REDACTED]

# Attempts to rewrite Outcome 3 items in restricted format so they can be marked digitally.

## CAA Term 2 2023 Item 1h

Item as written:

This graph shows the percentage of secondary school students with part-time jobs between 1973 and 2023.



(h) Is the following statement true?

The percentage of Year 13 students with part-time jobs is greater than the percentage of Year 11 students with part-time jobs.

Explain your answer using numbers from the graph.

---

---

## Possible item

(h) Is the following statement true?

The percentage of Year 13 students with part-time jobs is greater than the percentage of Year 11 students with part-time jobs.

Choose **two** answers that are correct:

- a) No. In the year 2001, 25% of Year 13 students had part-time jobs compared to 32% of Year 11 students. (Year incorrect but percentages are correct)
- b) Yes. In every year except 2003, a greater percentage of Year 13 students have part-time jobs than Year 11 students. (Describes overall trend so correct)
- c) Yes. In 2023, 72% of Year 13 students had part-time jobs compared to 40% of Year 11 students. (Correct reading of a specific year)
- d) No. The solid line shows the percentage of Year 11 students, and it does not change much. (Correct observation but does not answer the Q).
- e) Yes. The percentage of Year 13 students is usually 60% or higher but the percentage of Year 11 students is between 30% and 40% (Correct combination of trend and reading percentages from the graph.)

## Item 4c Term 4 2023 CAA

On average, a dairy cow walks about 12,000 steps per day. Each step measures about 1.6 metres.

A farmer claims that each of her dairy cows walks 20 km per day.



(c) Is her claim reasonable? Write a calculation that supports your answer.

B I U     Spell Check 

### Possible item:

In each textbox choose the word or number that makes the answer correct. (Using dropdown menus)

The claim (is, isn't) reasonable. The distance can be found by working out (12,000 x 1.6, 20,000 x 1.6). That answer equals (19,200, 32,000) metres. When metres are changed to kilometres the distance equals (19.2, 1.92) kilometres.

### Even simpler

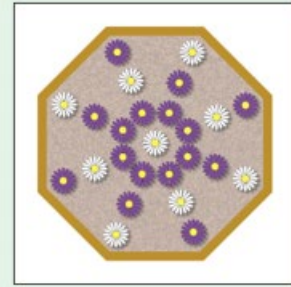
The claim (is, isn't) reasonable, because  $12,000 \times 1.6 =$   km.



## Item 4f Term 2 CAA 2023

Rob plants flowers.

The ratio of white to purple flowers is meant to be 2:3.



Rob's flowers

(f) Has he planted his garden correctly?

Explain your answer using the number of white and purple flowers.

<b>B</b> <i>I</i> <u>U</u>

### Possible Item

Is Rob correct or incorrect? (Drop down Correct/Incorrect)

Choose **one (two?)** correct method/s below that supports your answer:

- 2:3 is the same ratio as 9:16 because  $2 \times 4\frac{1}{2} = 9$  and  $3 \times 4\frac{1}{2} = 16$ .
- 9 and 16 have no common factor, so 9:16 cannot be simplified.
- 2:3 equals 40% to 60% and the garden has 36% white and 64% purple.
- 2:3 has the fraction  $\frac{2}{3}$  and 9 is  $\frac{2}{3}$  of 16.
- 2:3 is the same as 18:27 and 9:16 is the same as 18:32.

## Issues that arise:

1. Validity

Outcome 3 states “Explain mathematical and statistical responses to situations,” and students must “Use evidence to explain the selection of the method and/or calculation.”

Students in digitally marked items are not explaining, they are responding to pre-constructed answers.

2. Intellectual freedom

In current items, students are free to construct an argument that explains their own thinking. A variety of reasonable answers are given credit. In constrained items they must respond to the ideas of others. That tends to be more difficult for students.

3. Readability

The items become very wordy, and students need to be highly literate.

4. Reliability

Multi-choice items are vulnerable to guessing and collusion.

**From:** [Kevin Hoar](#)  
**To:** [REDACTED]  
**Date:** Monday, 13 May 2024 10:58:48 AM  
**Attachments:** [Outlook-mvqqjiyl.png](#)  
[Outlook-jqh1or42.png](#)  
[Outlook-121r35hd.png](#)

---

Thanks [REDACTED]

Cheers.  
Kevin

**Kevin Hoar** | National Assessment Facilitator  
External Assessment Team  
Assessment Division | Wāhanga Aromatawai  
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**From:** [REDACTED]  
**Sent:** Monday, 13 May 2024 10:42  
**To:** Kevin Hoar <[xxxxx.xxxx@xxxx.xxxx.xx](mailto:xxxxx.xxxx@xxxx.xxxx.xx)>  
**Cc:** [REDACTED]  
**Subject:** Re: Possible dates for two-hour Numeracy Workshop.

Hello Kevin and [REDACTED]

Here is an invite:  
[REDACTED] is inviting you to a scheduled Zoom meeting.

Topic: [REDACTED] Zoom Meeting  
Time: May 24, 2024 10:00 AM Auckland, Wellington

Join Zoom Meeting  
<https://us02web.zoom.us/j/86100381180>

Meeting ID: 861 0038 1180

Regards

[REDACTED]

On Mon, May 13, 2024 at 10:11 AM Kevin Hoar <[xx@xx](mailto:xx@xx)> wrote:

Hi [REDACTED].

Do you want to set this meeting up using Zoom, or I can set up a Teams meeting - I will give you the option.

If you want Zoom, send us both an invitation for 10 am to 12 noon on Friday 24 May 2024.

Cheers.

Kevin

**Kevin Hoar** | National Assessment Facilitator

External Assessment Team

Assessment Division | Wāhanga Aromatawai

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---

**From:** Vince Wright <██████████>  
**Sent:** Monday, 13 May 2024 09:45  
**To:** Charles Darr <██████████>  
**Cc:** Kevin Hoar <[xxxxx.xxxx@xxxx.xxxx.xx](mailto:xxxxx.xxxx@xxxx.xxxx.xx)>  
**Subject:** Re: Possible dates for two-hour Numeracy Workshop.

Hi ██████████ and Kevin

Fine by me also.

Regards

██████████

On Mon, May 13, 2024 at 9:43 AM ██████████ > wrote:  
I could do 10-12 on Friday, May 24.

Best,

██████████

---

**From:** Kevin Hoar <[xxxxx.xxxx@xxxx.xxxx.xx](mailto:xxxxx.xxxx@xxxx.xxxx.xx)>  
**Sent:** Friday, May 10, 2024 3:39 PM  
██████████  
██████████  
**Subject:** Possible dates for two-hour Numeracy Workshop.

**CAUTION:** This email originated from outside of NZCER. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Kia ora ██████████

Thank you for attending the Numeracy meeting this afternoon. I thought the meeting was extremely valuable.

I have been speaking with [REDACTED] about a possible date for the workshop to look further into this issue.

[REDACTED] has suggested a two-hour session on one of the following dates:

Wednesday 22 May (10 pm onwards)

Thursday 23 May (anytime)

Friday 24 May (anytime)

Wednesday 29 May (10 pm onwards)

Thursday 30 May. (Before 4 pm)

Please let me know what two-hour slot works with your timetable.

Thanks so much.

Ngā mihi.

Kevin

**Kevin Hoar** | National Assessment Facilitator

External Assessment Team

Assessment Division | Wāhanga Aromatawai

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[REDACTED]

[Redacted]

[Redacted]

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[Redacted]

**From:** [Kevin Hoar](#)  
**To:** [REDACTED]  
**Subject:** Outcome of the Outcome 3 multiple-choice responses from [REDACTED] College.  
**Date:** Tuesday, 27 August 2024 3:11:05 PM  
**Attachments:** [Outlook-ynvdtbaw.png](#)

---

Hi [REDACTED]

[REDACTED]

[REDACTED]

My new manager would love to see the results that you got from the two classes of Taupō-Nui-A-Tia College Year 10 kiddies. I can get the TNAT College results from 2023 for the Outcome 3 questions.

Also, your own take of the exercise, relating it to the marking as well as the intentions of the unit standard.

If you haven't gone through them yet, please let me know an ETA for when you will have the mahi (work) done - I will need to pass that onto my manager, Kate.

Sorry to add more pressure.

Cheers.

Kevin

**Kevin Hoar** | National Assessment Facilitator

Co-Requisite Team

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**From:** [REDACTED]  
**To:** [Kevin Hoar](#)  
**Subject:** Report of trail of closed items  
**Date:** Wednesday, 28 August 2024 2:17:06 PM  
**Attachments:** [Trial of Closed Items for Outcome 3.docx](#)

---

Hi Kevin

Attached is my report on the item trial.  
Happy reading.

Regards

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



**From:** [Kevin Hoar](#)  
**To:** [REDACTED]  
**Subject:** Re: Report of trail of closed items  
**Date:** Wednesday, 28 August 2024 3:16:34 PM  
**Attachments:** [Outlook-ybleozgf.png](#)

---

Thanks [REDACTED]

I will go through the findings and your comments and will discuss these with management. I have a 1 on 1 meeting with Kate, my manager, tomorrow to ask about the trial.

Thanks so much for your time on this. Remember to include the hours it has taken you to prepare / carry out / mark and write up your response.

Cheers.  
Kevin

**Kevin Hoar** | National Assessment Facilitator  
Co-Requisite Team  
Assessment Division | Wāhanga Aromatawai  
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**From:** [REDACTED]  
**Sent:** Wednesday, 28 August 2024 14:16  
**To:** Kevin Hoar <[Kevin.Hoar@nzqa.govt.nz](mailto:Kevin.Hoar@nzqa.govt.nz)>  
**Subject:** Report of trail of closed items

Hi Kevin

Attached is my report on the item trial.  
Happy reading.

Regards

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

## Trial of Closed Items for Outcome 3

18 August 2024

### Research Question:

Do closed answer questions to assess Outcome 3 of the Numeracy Unit Standard perform in a comparable way to open questions?

### Introduction

Unit Standard 32406 Numeracy has three outcomes. Outcomes 1 and 2 are assessed using closed items that include answer entry into text boxes, and multiple choice for a limited number of items. In previous years, 2022-2024, Common Assessment Activities (CAAs) required students to respond to open items for Outcome 3. Usually, the items involved candidates taking a position in respect to a claim or calculation and explaining the reason for supporting that position. The style of these items aligns to the wording of the outcome:

#### ***Explain mathematical and statistical responses to situations.***

Open items create potential issues for candidates attempting the CAA and for markers in assigning “achieved” or “non-achieved” to candidate responses. Candidates answer the items in a digital format so open items demand a higher level of computer skills than closed items. The platform also restricts candidates’ capacity to provide some mathematical symbols, as no equation editor is available. There are also literacy issues for candidates in reading the items and creating a written response, particularly for individuals who find written composition challenging and/or have English as a second language.

Open items elicit a wide range of responses. Assessment schedules are prepared and validated through check markers examining several hundred scripts. Categories of acceptable response are described in the schedule and exemplified by ‘representative’ examples. Nevertheless, the variety of responses poses interpretative challenges for markers, especially in marking partially correct or unexpected responses.

Over the past two years Outcome 3 items proved difficult for candidates, with success rates as low as 14% for one item. The sufficiency requirement for number of items correct in Outcome 3 is a barrier for many candidates.

The writing team previously explored the creation of Outcome 3 items in closed format twice and there was general agreement that these items were difficult to create and most frequently did not assess the “Explain” requirement of Outcome 3. This small study is an attempt to re-address the use of closed items. If such items proved sound, the study would potentially make digital marking possible for the whole CAA and improve the reliability of assessment.

## Method

### Items

A pool of Outcome 3 items from 2023 CAAs were chosen for modification into closed format. Adapting previous items is advantageous as national success rate data are available which allows for comparison of success rate. Knowledge of common candidate responses also supported the creation of strong distractors in the multiple-choice items. Upon advice from ██████████ from NZCER, multiple-choice was chosen as the preferred item type. However, two different response types were also trialled, true/false and multiple selection, to see if these types also held promise. The true/false item is a new item, so no previous success rate is available.

The items are provided in Appendix One at the end of this report, in the form presented to students.

### Students

Students from two classes in a large secondary school anonymously attempted all eight items during one period in the late morning. The school services a large town and draws widely from the community of that town, in both location and socio-economic status. The classes were described a mixed ability and reflective of a typical mid-range class. 38 students provided their work, all those present in that period.

Students were allowed as much time as they needed to respond to the items. Generally, most students were finished in about 20 minutes.

### Data analysis

All student choices were entered into an Excel spreadsheet. The spreadsheet was used to calculate percentages for each response and compare the overall success rate with national data.

## Results

The response patterns for six multiple-choice items adapted from 2023 open items are provided in Table 1. The correct response rate is highlighted in yellow, and the national correct response rate is given in the bottom row. The data show that the distractors perform well, and with Questions 3, 4, and 5 proved more attractive than the correct answers. The success rates for all but Questions 1 and 2 were significantly lower than those achieved by candidates in the open items.

*Table 1: Response rates for adapted multi-choice items*

Answer	Q1	Q2	Q3	Q4	Q5	Q8
A	10.5%	7.9%	15.8%	15.8%	60.5%	23.7%
B	23.7%	13.2%	18.4%	23.7%	10.5%	34.2%
C	36.8%	23.7%	52.6%	36.8%	7.9%	23.7%
D	26.3%	55.3%	13.2%	26.3%	18.4%	5.3%
None	2.6%	0.0%	0.0%	2.6%	2.6%	13.2%
National	27%	56%	27%	61%	63%	57%

Closer examination of the attractiveness of distractors showed that students' choice closely mirrored candidate's incorrect explanations from the 2023 CAAs. For example, Question 3 involves allocating equal playing time in a basketball game to members in a squad of eight players. Option C was selected by 52.6% of students reflecting a common incorrect assumption that the first five players must complete their shift first. That option was chosen despite specific mention in the adapted item that players could be taken off the court at any time. Inclusion of distractors that are reflective of common errors in open questions had the effect of making Questions 3, 4, 5 and 8 considerably more difficult than the matching open items.

In contrast the closed form of Question 1 proved to be marginally easier than the open form with student responses spread relatively evenly among the three distractors. Chance has each answer at 25% so the 36.8% rate is marginally better than that. The way students answered Question 2 may

have influenced the success rate. Observations of students working on the item were that many students used the calculator to check the viability of each possible answer. Providing calculation choices gave affordance to that strategy and meant the item was not a valid assessment of Outcome 3.

Question 6 required students to select two of the five given answers. 20 of the 38 students chose only one option so the instructions did not work. 14 students selected E which most closely reflected the correct answer to the adapted open question. The 36.8% success rate was higher than the 14% rate for the open question but only marginally better than chance. Question 7 was a new item that provided four statements about a strategy for calculating a discounted price for an item of clothing. Students were asked to choose true or false for each statement. Only five students correctly decided that all four statements were true. While making four binary decisions considerably lessens the chances of students being correct by guessing, a four out of four criteria seems too restrictive. If a 'three out of four correct choices' criteria was applied the rate of success increased to 36.8%.

## Discussion

The sample size in this study is small ( $n = 38$ ) and the students came from a single school. Care needs to be taken in generalising the findings to what might occur with testing on a much larger scale. However, the data indicate that creating closed Outcome 3 items may be problematic.

In answer to the research question, closed items did **not** perform in a comparable way to open items posed in the same scenario. The trial items were created with the benefit of knowing common errors candidates showed on the open items. The distractors in the closed items proved to be so strong that success rates on relatively easy open items plummeted on the closed adapted items, to levels equivalent to chance. On the two items where success rates were similar or marginally better, chance played a part in the harder item and ability to trial answers with a calculator impacted on the validity of the easier item.

It is not possible to know the impact that reading volume had on student success with the closed items. Students in the study were asked to indicate if they needed assistance with reading and few did. They seemed to be purposefully engaged in reading the items. It is a natural trade off that

closed multi-choice items require more reading volume than open items that require more writing. The shift from open to closed items constitutes shifting literacy demands from writing to reading. There are often subtleties of meaning between the wording of correct answers and distractors that are likely to challenge candidates.

It is also questionable whether closed items are valid assessments of Outcome 3 that requires candidates to explain. This outcome suggests that candidates need to construct arguments, not just interpret the arguments of others.

## Appendix One

### Question One

Rob plants flowers. The ratio of white to purple flowers is supposed to be 2:3.

This garden has 9 white flowers and 16 purple flowers.

Has Rob planted the garden correctly?



Circle the **best** answer.

- Yes, because there are more purple flowers than white flowers.
- Yes, because  $9 + 16 = 25$ , and 25 is a multiple of five, just like  $2 + 3$ .
- No, because multiplying the ratio 2:3 by five gives 10:15, not 9:16.
- No, because 2:3 means two out of every three flowers should be white.

### Question Two

A cow walks about 12,000 steps per day. Each step is 1.6 metres long.

A farmer claims that the cow walks more than 20 kilometres per day.



Which answer **best** explains whether, or not, the farmer is correct.

- The farmer is correct, because 12,000 steps multiplied by 1.6 meters per step is over 20,000 metres.
- The farmer is **not** correct, because 12,000 steps multiplied by 1.6 meters per step equals 18 kilometres per day.
- The farmer is **not** correct, because the cow would need to take 1.8-metre-long steps to equal 20 kilometres.
- The farmer is correct, because 12,000 steps equal 19,200 metres, which is close to 20 kilometres.



### Question Three

A basketball game lasts 40 minutes.

The coach wants all 8 of her players to get **equal** time on court. But only 5 players can be on at the same time.

The coach **can take players on and off the court anytime she wants**. She thinks that each player should get a total of 30 minutes on court.

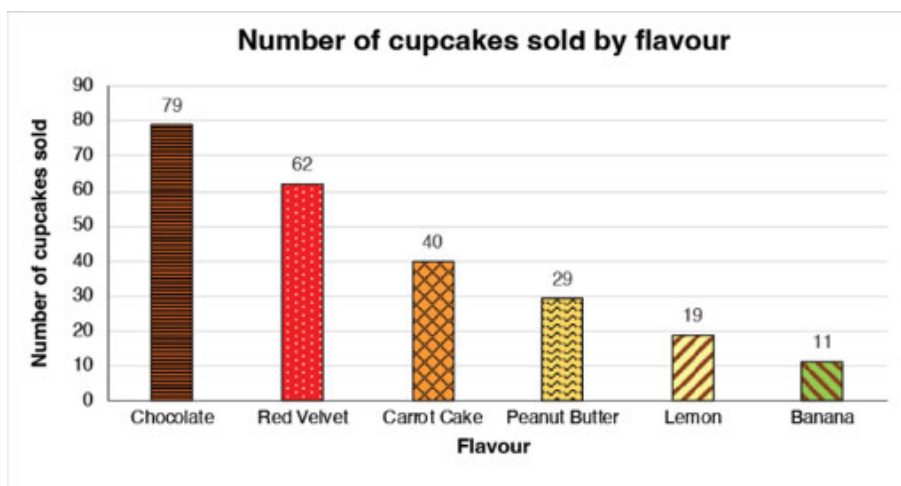


Choose the **best** answer that explains whether, or not, the coach is right.

- No, because there are 200 player minutes in the whole game.  $200 \div 8 = 25$  minutes per player.
- Yes, 30 minutes per player means a total of  $8 \times 30 = 240$  player minutes, which is right.
- No. If the first 5 players get 30 minutes on court that only leaves 10 minutes for the other 3 players.
- No, because  $40 \times 8 = 320$  minutes in total.  $320 \div 5 = 64$  minutes per player.

### Question Four

Here is a graph of cupcake sales at a school during Treat Week 2023. In total, **240 cupcakes** were sold.



Is it true to say, "**About one third of sales were chocolate-flavoured cupcakes**"?

Choose the **best** answer that explains whether, or not, the statement is true.

- Yes, because 79 is very close to one third of 240.
- Yes, because one third of 240 is exactly 79.
- Maybe, it depends on whether people like chocolate.
- No, because one third of 79 is 26.3333, and that doesn't divide evenly into 240.

## Question Five

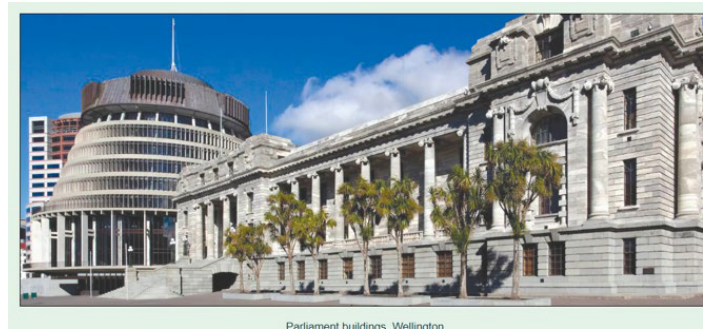
Elections in Aotearoa happen every 3 years.

Last year, in 2023, there was an election.

Was 1987 also an election year?

Choose the **best** answer.

- a. Maybe, perhaps something happened, and people couldn't vote in 1987.
- b. No, because if you count on in threes from 1987, you do not get to 2023.
- c. Yes, because 2023 and 1987 are both odd numbers.
- d. Yes, because 2023 is 36 years on from 1987, and 36 divides evenly by 3.



## Question Six

Julie plays basketball.

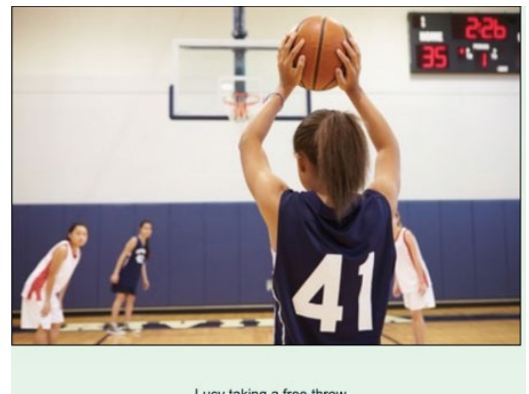
Usually, her success rate for a shot, from the 'free throw' line, is 50%.

She has two shots to take.

Should Julie be confident of getting **at least one** shot in?

Circle **two statements** that are true.

- a. No, shooting is hard to predict so she might miss both shots.
- b. No, it is certain she will miss at least one of her shots.
- c. Maybe, there is zero chance of her getting both shots in.
- d. Yes, her expected chance of getting both shots in is 100%.
- e. Yes, her expected chance of getting at least one shot in is 75%.



## Question Seven

Sue is shopping. The sale discount is 22% off all items. Sue takes the usual price and multiplies it by 0.78 to get the sale price.

For example, a jacket usually costs \$60 so she works out  $0.78 \times 60 = \$46.80$ .



For each statement a-d, choose true or false:

- Sue's way of working out the sale price of the jacket is right.  
(True/False)
- Sue finds the sale price of a \$100 item by working out  $0.78 \times 100 = \$78$   
(True/False)
- 0.78 comes from taking 22% off 100%.  
(True/False)
- If the sale discount was 35%, instead of 22%, Sue would multiply by 0.65.  
(True/False)

## Question Eight

This deck will be 8 metres long and 2 metres wide.

A 1-metre-long strip of wood is called a linear metre.

Each square metre ( $\text{m}^2$ ) of deck takes 11.5 linear metres of wood.



A builder says that about 190 linear metres are needed to build the deck.

Choose the **best** answer that explains whether, or not, the builder is right.

- No, because  $8 \times 11.5 = 92$  linear metres.
- Yes, because the area of the deck is  $10 \text{ m}^2$ , and  $10 \times 11.5 = 115$  linear metres.
- No, because the area of the deck is  $16 \text{ m}^2$ , and  $16 \times 11.5 = 184$  linear metres.
- Yes, because  $190 \div 11.5 = 16.5 \text{ m}^2$ , and that allows for waste.



**From:** [Kevin Hoar](#)  
**To:** [REDACTED]  
**Subject:** Re: Slight revision  
**Date:** Wednesday, 24 July 2024 11:49:29 AM  
**Attachments:** [Outlook-x0g40h2y.png](#)  
[Outlook-efd0tedf.png](#)

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Sounds great!

Cheers.

Kevin

**Kevin Hoar** | National Assessment Facilitator  
External Assessment Team  
Assessment Division | Wāhanga Aromatawai  
**New Zealand Qualifications Authority | Mana Tohu Mātauranga o Aotearoa**



[REDACTED]  
[xxxxx.xxxx@xxxx.xxxx.xx](mailto:xxxxx.xxxx@xxxx.xxxx.xx)  
[www.nzqa.govt.nz](http://www.nzqa.govt.nz)  
125 The Terrace, PO Box 160, Wellington, 6140

*He rerekē tatou katoa – awahi i te oranga ki te katoa*  
*We are all different – embrace life to the fullest*

---

**From:** [REDACTED]  
**Sent:** Wednesday, 24 July 2024 11:47  
**To:** Kevin Hoar <[xxxxx.xxxx@xxxx.xxxx.xx](mailto:xxxxx.xxxx@xxxx.xxxx.xx)>  
**Subject:** Re: Slight revision

Hi Kevin

Typical teacher...shifting the goalposts.  
I think the approach is a good one for the future, not just this round.

Cheers

On Wed, Jul 24, 2024 at 11:43 AM Kevin Hoar <[xx@xx](mailto:xx@xx)> wrote:

What - changing my homework on me?!  
Lucky, I haven't started my homework yet...

Sometimes it is best to leave things to the last minute or three.  
I will have a look over your new material and findings.

Cheers.  
Kevin

**Kevin Hoar** | National Assessment Facilitator  
External Assessment Team



Mana Tohu Mātauranga o Aotearoa  
New Zealand Qualifications Authority



[Redacted]  
[Kevin.hoar@nzqa.govt.nz](mailto:Kevin.hoar@nzqa.govt.nz)  
[www.nzqa.govt.nz](http://www.nzqa.govt.nz)  
125 The Terrace, PO Box 160, Wellington, 6140

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---

**From:** Vince Wright <[vince.wright.3.14@gmail.com](mailto:vince.wright.3.14@gmail.com)>  
**Sent:** Wednesday, 24 July 2024 11:31  
**To:** Kevin Hoar <[Kevin.Hoar@nzqa.govt.nz](mailto:Kevin.Hoar@nzqa.govt.nz)>  
**Subject:** Slight revision

Hi Kevin

I had the brainwave of enlarging the set of 'fringe' items to ten and linking to the Angoff data. The results are interesting.

Regards

Vince

--  
Dr Vince Wright  
Mathematics Education Consultant  
25 Kotare Street, Hilltop, Taupo, New Zealand 3330

Mob: 0064 22 585 1607      email: [vince.wright.3.14@gmail.com](mailto:vince.wright.3.14@gmail.com)

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[Redacted]

[Redacted]

### Item 4f Term 2 CAA 2023 (27%)

Rob plants flowers. The ratio of white to purple flowers is supposed to be 2:3.

This garden has 9 white flowers and 16 purple flowers.

Has Rob planted the garden correctly?



Circle the best answer.

- a. Yes, because there are more purple flowers than white flowers.
- b. Yes, because  $9 + 16 = 25$ , and 25 is a multiple of five, just like 2:3.
- c. No, because multiplying the ratio 2:3 by five gives 10:15, not 9:16
- d. No, because 2:3 is 66% white flowers, and 9:16 is 56% white flowers.
- e. No, because 9:16 has 7 more purple flowers than white flowers. The numbers should be one different.

### Item 4c Term 4 2023 CAA (56%)

A cow walks about 12,000 steps per day.  
Each step is 1.6 meters long.

A farmer claims that the cow walks more than  
20 kilometres per day.



Which answer **best** explains whether, or not, the farmer is correct.

- a. The farmer is correct, because 12,000 steps multiplied by 1.6 meters per step is over 20,000 metres.
- b. The farmer is **not** correct, because 12,000 steps multiplied by 1.6 meters per step equals 18 kilometres per day.
- c. The farmer is **not** correct, because the cow would need to take 1.8 metre steps to equal 20 kilometres.
- d. The farmer is correct because 12,000 steps equal 19,200 metres, which is close to 20 kilometres.

## Item 2c Term 4 2023 CAA (27%)

A basketball game lasts 40 minutes.

The coach wants all 8 players to get equal time on court, but only 5 players can be on at one time.



The coach thinks that each player should get 30 minutes on the court.

Choose the best answer that explains whether, or not, the coach is right.

- No, because there are 200 player minutes in the whole game.  $200 \div 8 = 25$  minutes per player.
- Yes, 30 minutes per player means a total of  $8 \times 30 = 240$  player minutes which is right.
- Yes, because  $\frac{5}{8}$  of 40 equals 30 minutes per player. Each player gets 30 minutes on court.
- No, because  $40 \times 8 = 320$  minutes.  $320 \div 5 = 64$  minutes each per player, not 30 minutes.

## Item 1f Term 2 2023 CAA (57%)

This deck will be 8 metres long and 2 metres wide.

A 1-metre-long strip of wood is called a linear metre.

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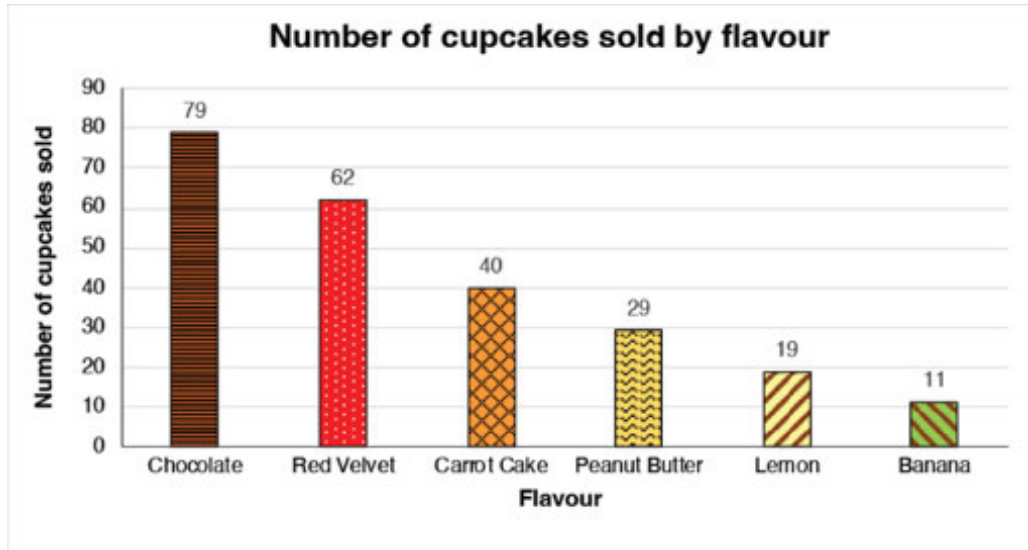
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### Item 5c Term 2 2023 CAA (61%)

Here is a graph of cupcake sales at a school during Treat Week 2023.

In total 240 cupcakes were sold.



Is it true to say that about one third of sales were chocolate-flavoured cupcakes?

Choose the **best** answer that explains whether, or not, the statement is true.

- a. Yes, because 79 is very close to one third of 240.
- b. Yes, because one third of 240 is exactly 79.
- c. No, because 79 is one quarter of 240, not one third.
- d. No, because one third of 79 is 26.3333, and that doesn't divide evenly into 240.

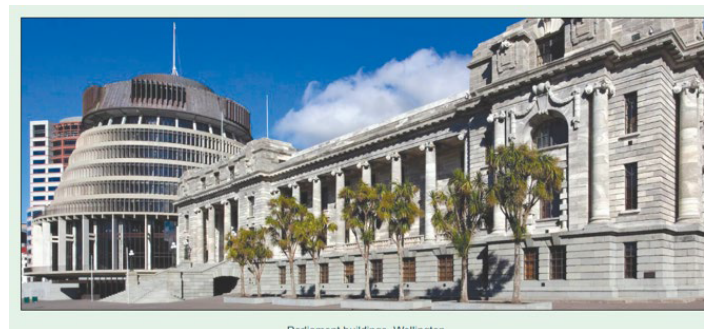
### Item 5A Term 4 2023 CAA (63%)

Elections in Aotearoa happen every 3 years.

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Choose the best answer.



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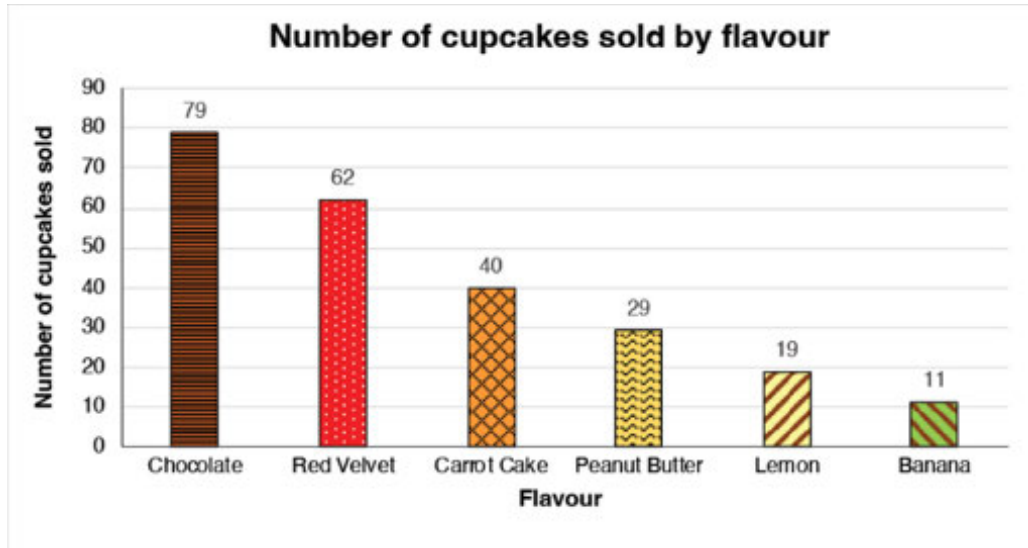
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