

Summary

Test Identification

Name	2021 MAT SW 3.5
Date Created	16 Sep 2021
Date Modified	05 Nov 2021
Subject	Mathematics
Status	ACCEPTED
Sequence Number	1164869
Total Test Time	59 minutes
Delivery Method	Onscreen

Curriculum Strand

Number Sense & Operations	13	Number Knowledge	13
Statistics	10	Algebra	10

Curriculum Level

4B	1	4P	2	4A	2
5B	10	5P	14	5A	12
6B	3	6P	2	6A	0

Cognitive Processing

Surface	19	Deep	27
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Slider Settings

Strands		Level	
Number Knowledge	Most	Level 4	Few
Number Sense & Operations	Most	Level 5	Most
Algebra	Most	Level 6	Few
Statistics	Most		

Marking Guide : 2021 MAT SW 3.5

Q.No	Marking Key
1	c
2	5
3	d
4	e
5	c
6	a
7	d
8	e
9	b
10	d
11	d
12	c
13	Movies: 0.25, \$10.00 'Both required for 1 mark.'
14	Popcorn: 0.2, \$8.00 'Both required for 1 mark.'
15	Drink: 0.05, \$2.00 'Both required for 1 mark.'
16	a
17	b
18	b
19	b
20	26.915
21	c
22	c
23	d
24	any of: 153,156,159,162,165,168,171,174,177,180,183,186,189,192,195,198 'any of the above for 1 mark'
25	Any of these: 160, 170, 180, 190 'Need only one of these for 1 mark'
26	180 '150 is not acceptable'
27	Not possible. A prime number cannot be divisible by 3 (or similar) 'need equivalent explanation to get 1 mark'

Instructions

Underlined Questions e.g. 10 :Use teacher judgement. Give 1 if answer matches marking guide (unless otherwise instructed). For incorrect answers give 0 (zero).

All other Questions: Enter the response chosen by the student using letters. For example, 'a' for the first option; 'b' for the second option; 'c' for the third option and so on.

Questions Not Answered: Enter a dash (-).

Q.No	Marking Key
28	b
29	a
30	d
31	60
32	b
33	a
34	24.5
35	d
36	a
37	d
38	b
39	71(beats per minute - BPM)
40	d
41	c
42	If you train more, you enjoy your sport; OR if you do little training, you are not likely to play sport next year; OR similar
43	Not true. Does not allow for greater number of cars, or greater mileage covered nowadays, or similar 'Must have clear inference of "not true" and good/suitable explanation for one mark.'
44	1, 3, 6 'all 3 for one mark'
45	0.98265 sq. m suitably rounded
46	Random sample from each class in the school, or increase the sample size or use systematic sampling or similar suitable sample.

Instructions

Underlined Questions e.g. 10 :Use teacher judgement. Give 1 if answer matches marking guide (unless otherwise instructed). For incorrect answers give 0 (zero).

All other Questions: Enter the response chosen by the student using letters. For example, 'a' for the first option; 'b' for the second option; 'c' for the third option and so on.

Questions Not Answered: Enter a dash (-).

Choose a circle to show how much each sentence is like you

Very Unlike Me 1	Unlike Me 2	Like Me 3	Very Like Me 4
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01. I like maths at school.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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02. I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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03. My teacher thinks I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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04. My family/whānau think I am good at maths.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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05. I enjoy doing maths in my own time (not at school).

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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06. I enjoy doing things in maths that I haven't tried before.

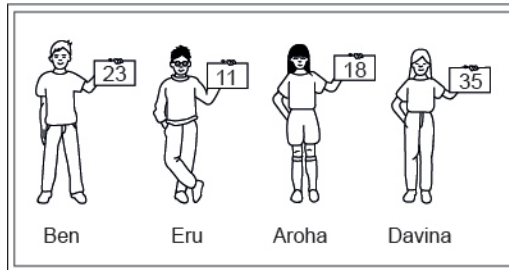
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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ADMINISTER ON SCREEN ONLY

Practice Questions

These practice questions are to help you understand how to show your answer for different types of questions.

P01. Who is holding a card with an even number on it?

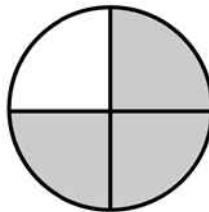


- Ben
- Eru
- Aroha
- Davina

P02. Complete this number pattern.

2, 4, _____, _____, 10

P03. What fraction of this circle is shaded?

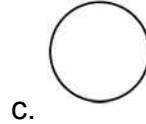
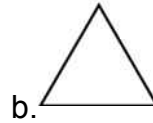




P04. Match the sentence with the correct shape.

1. I have three sides

2. I have 4 sides



P05. Which numbers make this number sentence **TRUE**?

$$2 + \star > 5$$

1

2

3

4

5

P06. Put the numbers 1, 2, 3, and 4 in the boxes to order these numbers from biggest (1) to smallest (4).

3

7

2

0

P07. Select whether the following statements are True or False.

In the number 213, the value of 1 is ten.

TRUE

FALSE

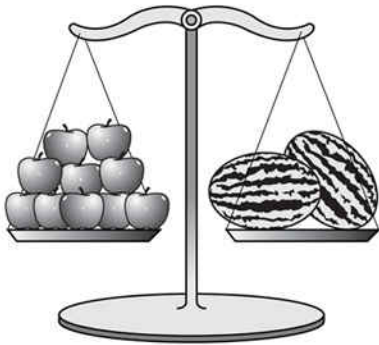
In the number 504, the value of 5 is fifty.

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01. Which is the **BEST** estimate for 11.3×14.6 ?

- 100
- 140
- 150
- 190

02. The 10 apples below weigh the same as 2 melons.



How many melons would weigh the same as 25 apples?

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03. The table shows the annual profit for five companies.
Which statement is valid about the annual profits of these five companies?

2003 Profits

Company	Profit
I	\$300 000
II	\$275 000
III	\$250 000
IV	\$325 000
V	\$300 000

- Companies II and V made the same profit.
- No company made less than \$275 000 profit.
- No company made more than \$300 000 profit
- Company IV made \$75 000 more profit than Company III.

04. Of the following, which is **closest** in value to 0.52?

- $\frac{1}{50}$
- $\frac{1}{5}$
- $\frac{1}{4}$
- $\frac{1}{3}$
- $\frac{1}{2}$

05. Which of the following has a value greater than $\frac{5}{6}$?

- $\frac{5}{9}$
- $\frac{2}{3}$
- $\frac{11}{12}$
- $\frac{10}{12}$

06. Which group of numbers contains *only* prime numbers?

- 2, 3, 13
- 3, 9, 13
- 9, 12, 13
- 2, 3, 4

07. Three brothers, Bob, Dan, and Mark, receive a gift of 45 000 zeds from their father. The money is shared between the brothers in proportion to the number of children each one has. Bob has 2 children, Dan has 3 children, and Mark has 4 children. How many zeds does Mark get?

- 5000
- 10 000
- 15 000
- 20 000

08. A plumber charges customers \$48 for each hour worked plus an additional \$9 for travel.

If h represents the number of hours worked, which of the following expressions could be used to calculate the plumber's total charge in dollars?

- $48 + 9 + h$
- $48 \times 9 \times h$
- $48 + (9 \times h)$
- $(48 \times 9) + h$
- $(48 \times h) + 9$

09. A test on a sample of 492 in-line skate wheels identified 3 defective wheels. Based on this rate of defects, approximately how many defective wheels will be found per 10,000 wheels?

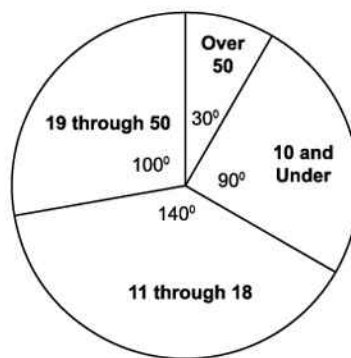
- 20
- 60
- 100
- 300

10. Which of the following is **NOT** a prime number?

- 2
- 5
- 17
- 121

11. The pie graph shown below represents the ages of the students at the Paterson Karate Studio. The degree measures for each sector are given. Which of the following is the closest to the percent of students whose ages are 18 and under?

Ages of Students at the Paterson Karate Studio



- 23%
- 61%
- 39%
- 64%

12. Which table contains only values that satisfy $y = 3x - 5$?



x	y
2	1
0	-2
2	-11



x	y
1	2
3	4
5	10



x	y
-3	-14
0	-5
3	4



x	y
-5	-15
0	-5
5	0

Use the following information to answer questions 13 to 15.

Henri earned \$40 a week on his paper run.

During the week he used his money on savings, movies, popcorn and drinks.

Complete each question to show how Henri used his money, like this example for his Savings Account.

	Fraction	Decimal	\$
Savings Account	$\frac{1}{2}$	0.5	\$20.00

13.

Movies

$\frac{1}{4}$

14.

Popcorn

$\frac{1}{5}$

15.

Drinks

$\frac{1}{20}$

End of Section

16. A light year is approximately 9×10^{12} kilometres.
What is another way to write this number?

- 9 000 000 000 000
- 9 000 000 000
- 900 000 000 000
- 90 000 000 000 000

Use the following information to answer question 17..

Rasela works for the park service. She wanted to estimate the population of fish in a park lake. She obtained samples on which to base her estimate by casting a net in each of seven locations in the lake, counting the fish she caught and then releasing the fish. Her results are shown in the table below:

Results of fish sampling

Location	1	2	3	4	5	6	7
Number of Fish Caught	18	12	18	11	9	13	17

17. What is the mean number of fish caught?

- 13
- 14
- 17
- 18

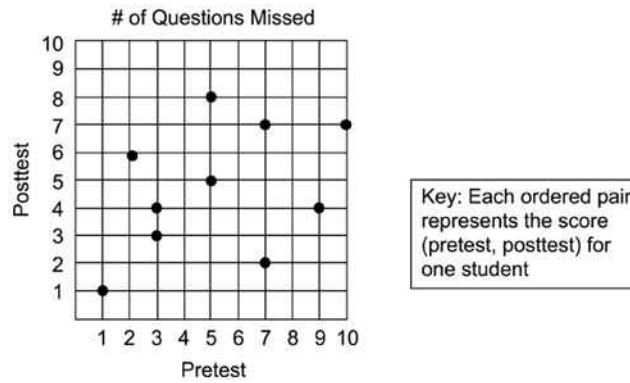
End of Section

18. A 45 000 litre water tank is being filled at the rate of 220 litres per minute. Estimate, to the nearest half an hour, how long it will take to fill the tank.

- 4 hours
- $3\frac{1}{2}$ hours
- 3 hours
- $2\frac{1}{2}$ hours

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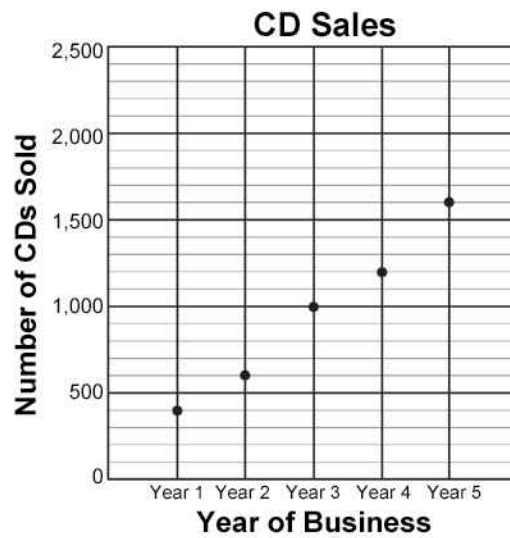
19. Ms Sandy made a scatter plot to compare the number of questions each student missed on the pretest and the posttest, as shown in the graph below. How many of Ms Sandy's 10 students missed the same number of question on both test?



- 2
- 4
- 8
- 10

20. Using the digits 1, 2, 5, 6 and 9 write a number that has a 1 in the hundredths column, a 2 in the tens column, a 5 in the thousandths column, a 6 in the ones column and a 9 in the tenths column.

21. The graph shows the number of CDs sold each year at a small music store. If the number of CDs sold each year continues to increase as shown in the plot, which is the **BEST** prediction of the number of CDs the store will sell during its 8th year of business?



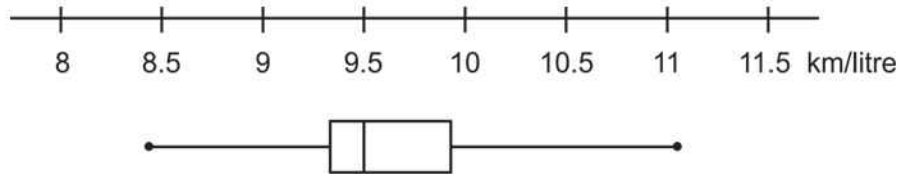
- 3400
- 3000
- 2400
- 2000

22. A certain machine produces 300 nails per minute. At this rate, how long will it take the machine to produce enough nails to fill 5 boxes of nails if each box will contain 250 nails?

- 4 min
- 4 min 6 sec
- 4 min 10 sec
- 4 min 50 sec
- 5 min

23. The box-and-whisker graph shows the results of a survey of the petrol consumption of 100 car models.

Which of the statistics - mean, median, mode, range - could be estimated from this graph?



- Mean only
- Median only
- Range and mean
- Range and median

Use the following information to answer questions 24 to 27

Terri and Nicholas invented a new game called Mix and Match Clues. These are the clues:

Clue A: The number is greater than 150 and less than 200.

Clue B: The number is evenly divisible by 3.

Clue C: The number is evenly divisible by 5.

Clue D: The number is evenly divisible by 2.

Clue E: The number is a prime number.

24. If possible, write a number that fits Clues A and B. If not possible, tell why.

25. If possible, write a number that fits Clues A, C, and D. If it is not possible, tell why.

26. If possible, write a number that fits Clues, A, B, C, and D. If it is not possible, tell why.

27. If possible, write a number that fits Clues, A, B, and E. If it is not possible, tell why.

End of Section

28. Which of the following is the value of $a - 2b^2$ for $a = 19$ and $b = -2$?

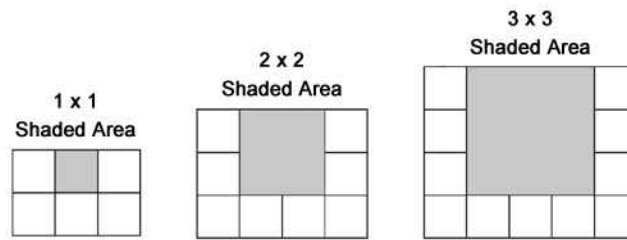
- 3
- 11
- 27
- 35

29. Which one of the following represents 72 written as a product of powers of its prime factors?

- $2^3 \times 3^2$
- $2^1 \times 6^2$
- $2^2 \times 3^3$
- 9×2^3

30. Each figure below shows the number of concrete blocks needed to border 3 sides of a shaded area.

If the pattern continues, which of the following expressions represents the number of concrete blocks needed to border 3 sides of an $n \times n$ shaded area?



- $5n$
- n^3
- $3n$
- $3n + 2$

31. A beaker has 2.5 litres of fluid in it.

If 1.0 litre is taken out of the beaker, what is the percentage of fluid left in the beaker?

_____ %

32. How many integers are there between $\sqrt{15}$ and $\sqrt{63}$?

- Three
- Four
- Five
- Six
- Seven

33. In a coordinate plane, the points (2, 4) and (3, -1) are on a line. Which of the following must be **TRUE**?

- The line crosses the x -axis.
- The line passes through (0, 0).
- The line stays above the x -axis at all times.
- The line rises from the lower left to the upper right.
- The line is parallel to the y -axis.

34. Roger was travelling in a lift when he read the specifications that said it could carry 588kg or a maximum of 8 people. The lift was then checked by the safety inspector and the specifications were changed to read 588kg or a maximum of 6 people.

By how much has the average mass per person increased?

_____ kg

35. Ms Thierry and 3 friends ate dinner at a restaurant. The bill was \$67. In addition, they left a \$13 tip.

Approximately what percent of the total bill did they leave as a tip?

- 10%
- 13%
- 15%
- 20%
- 25%

36. $3y = 7x - 9$

Which **BEST** describes the bold portion of the equation?

- Expression
- Variable
- Term
- Coefficient

37. George is going to sing 4 songs in the school programme.
In how many different orders can George sing each song once?

- 4
- 9
- 12
- 24

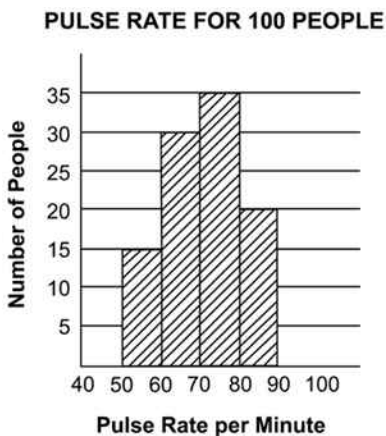
38. The expression below was used to approximate a distance in kilometres.

$$\sqrt{7^2 + 8^2}$$

Based on the expression, which of the following is **closest** to the distance?

- 10 kilometres
- 10.5 kilometres
- 11.5 kilometres
- 15 kilometres

39. The pulse rate for a group of 100 people is shown in the graph below.

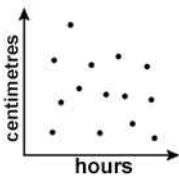
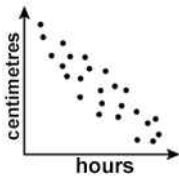
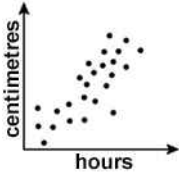
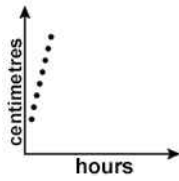


What is the average pulse rate per minute for these 100 people?

(Note: Use the midpoint of each interval to represent the pulse rate for the entire interval.
For example, 55 would be used for the pulse rate of the 15 people in the 50-60 group.)

Average Pulse Rate = _____

40. Which scatter plot **BEST** shows the relationship between a person's height and the time that person spends watching television?



41. $y = 2^x$

As the value of x becomes negative and continues to decrease, what happens to the value of y ?

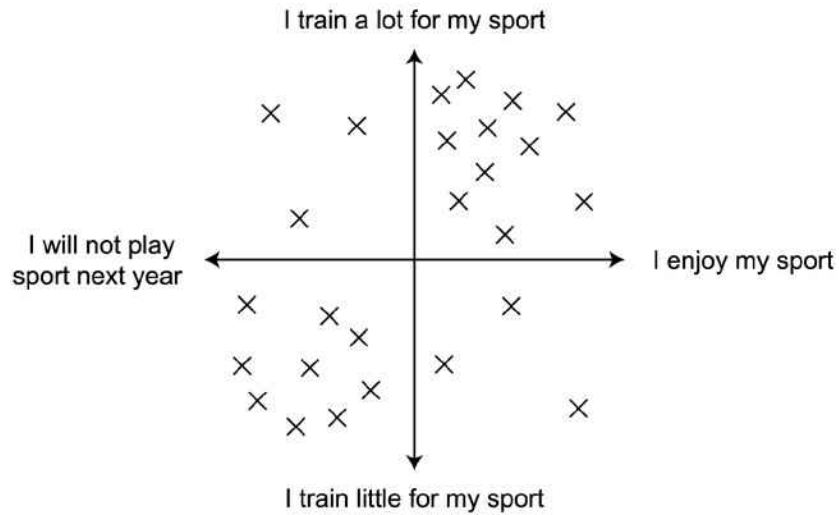
y becomes negative

y gets closer to 1

y gets closer to 0

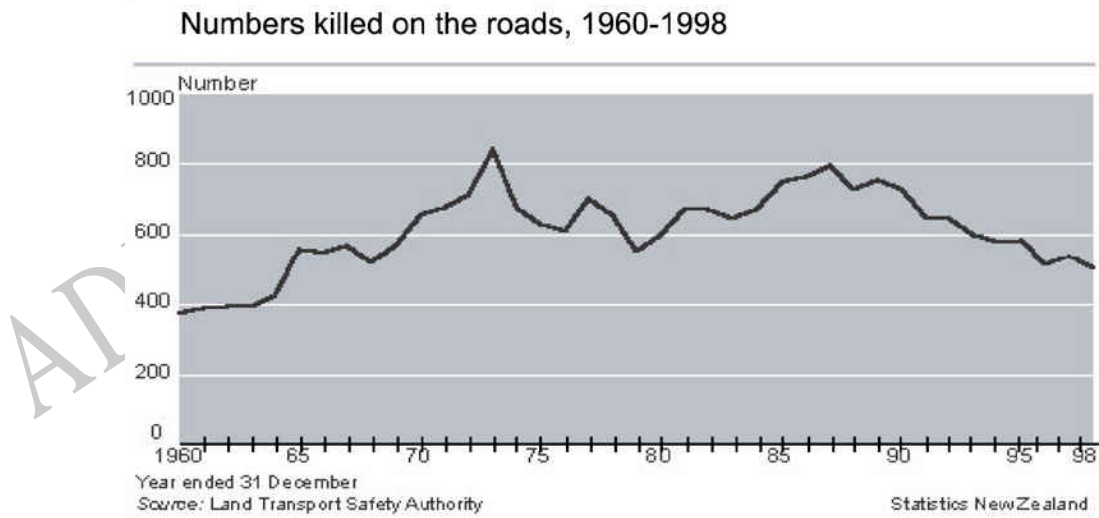
y gets closer to x

42. What conclusion can you make from this 2D scale?



Use the following information to answer question 43..

The graph shows the number of people killed on the roads in New Zealand between 1960 and 1998.



43. Comment on the statement, "The roads are not as safe as they used to be in 1960, as there are still more people killed on our roads."

End of Section

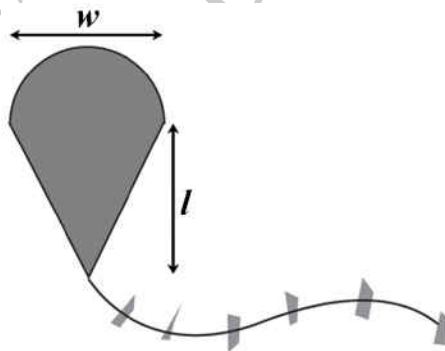
44. The rule for the n th term (t_n) of a sequence is given by $t_n = \frac{1}{2}n(n+1)$ where $n = 1, 2, 3, \dots$

List the first 3 terms in this sequence.

45. The area of this kite can be found by using the formula

$$A = \frac{lw}{2} + \frac{\pi w^2}{4}$$

Julie made a kite with the dimensions $l = 1.2$ metres and $w = 0.8$ metres.



What is the area of her kite?

_____ m²

Use the following information to answer question 46..

A class of 25 students is asked to find out how much time the average student spends on homework during a one-week period. Each student asked one of his/her friends for the information, making sure that no one student was asked more than once. The numbers of hours spent on homework per week are as follows:

8, 0, 25, 9, 4, 19, 25, 9, 9, 8, 0, 8, 25, 9, 8, 7, 8, 3, 7, 8, 5, 3, 25, 8, 10

46. Describe a sampling procedure that would have led to more representative data.

ADMINISTER ON SCREEN ONLY

Please provide these instructions to all staff involved with administering e-asTTle online.

Before the testing session

1. Make sure students have the right devices and browsers installed

Unsupported devices may result in the test not displaying correctly and affect students' scores.

Desktop/Laptop

- Windows, Mac or Chromebook
- Minimum window width: 1280 pixels
- Windows devices need up-to-date Edge, Chrome, Firefox or IE11
- Windows tablets/hybrids e.g., Surface Pro must have a keyboard attached
- Mac devices need recent Chrome or Safari

Large Tablets (9" +)

- iPads: iOS 10+ with Safari
- Androids: Large tablet e.g., Samsung Galaxy Tab 4. Must have Android 5+ and latest Chrome
- Minimum window width: 768 pixels

iPad Minis and small Androids must not be used.

More information on device requirements and the underlying rationale is available on the [help site](#).

2. Sit the Practice Test

[A practice test for each subject](#) is available. These are also available in the Student Portal (no login required). Practice tests are designed to familiarise you and your students with e-asTTle online before sitting a real test. Each practice test contains attitude questions, look-over time and 5-8 questions designed to be relatively simple to answer. [Teacher scripts](#) are available for practice tests.

3. Ensure you have student login information

More information on accessing student logins and resetting passwords is available on the [help site](#).

4. Check if calculators are required (Maths/Pāngarau)

Tests with questions at mostly Level 5 and 6 require the use of calculators. Tests with questions at mostly Levels 2 to 4 do NOT require a calculator.

During the testing session

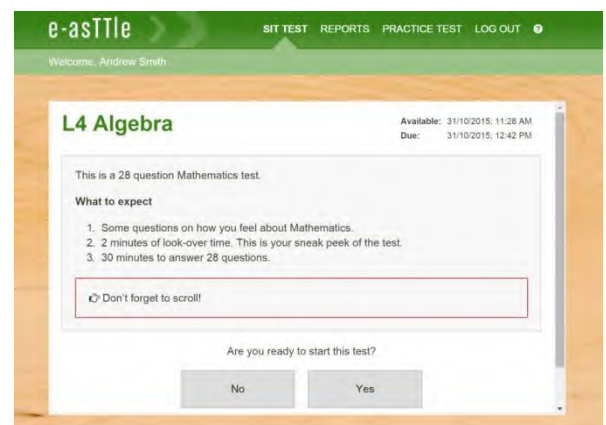
1. Check equipment

- Make sure students' devices are charged.
- Make sure students have scrap paper and a pen/pencil for working, calculators (if needed) and a quiet activity they can continue with if they finish early.

2. Read the Test Details to students

Once students select a test, they will see the test details page (example shown on right).

Read through this page aloud with your students.



Other reminders to discuss with students:

- Once they choose 'Yes', the timer starts. Once the timer is counting down, there is no way to pause the test. If students close the test accidentally, they can re-open it again, provided the timer hasn't finished.
- Ask students to raise their hand if something seems wrong.
- Fullscreen mode is recommended.

For students on iPad or Android tablet devices: remind them to lock their device in portrait mode.

For students on Windows hybrid devices (such as the Surface Pro): remind them to keep the keyboard attached during the test.

3. Supervising the test

Make sure you walk around and monitor students during the test. Students tend to continue with their test even if something has gone wrong – for example, a question does not display correctly. For this reason, check that pages are loading correctly, and students are scrolling to see all the content and options. It's a good idea to have a paper booklet of the test available during the testing session.

Students are generally expected to read the test content without assistance. Information on accommodations (e.g., reader-writers) is available on the [help site](#).

4. Know what to do if things go wrong


Internet disconnected

If student answers aren't saving, e-asTTle will show a yellow banner at the top of the page. The banner will turn red when there has been disconnection for 2 minutes or more. Students can keep answering whatever they can, and e-asTTle will try and save answers. Don't refresh or close the window if a coloured banner is showing.



If the Internet has been down, use your professional judgement to decide if students' results should be [excluded](#).

Images not loading

If an image is missing, students will see an icon they can click to try and reload the image.  **INFO MISSING**
[Click to reload](#)

A question doesn't load fully or looks strange

If something has loaded incorrectly, it can sometimes be corrected by selecting the 'Next' button then the 'Previous' button to reload the question.

Detailed troubleshooting information is available on the [help site](#). To report issues with online testing or for additional assistance, please contact the Education Service Desk: 0800 225 5428.