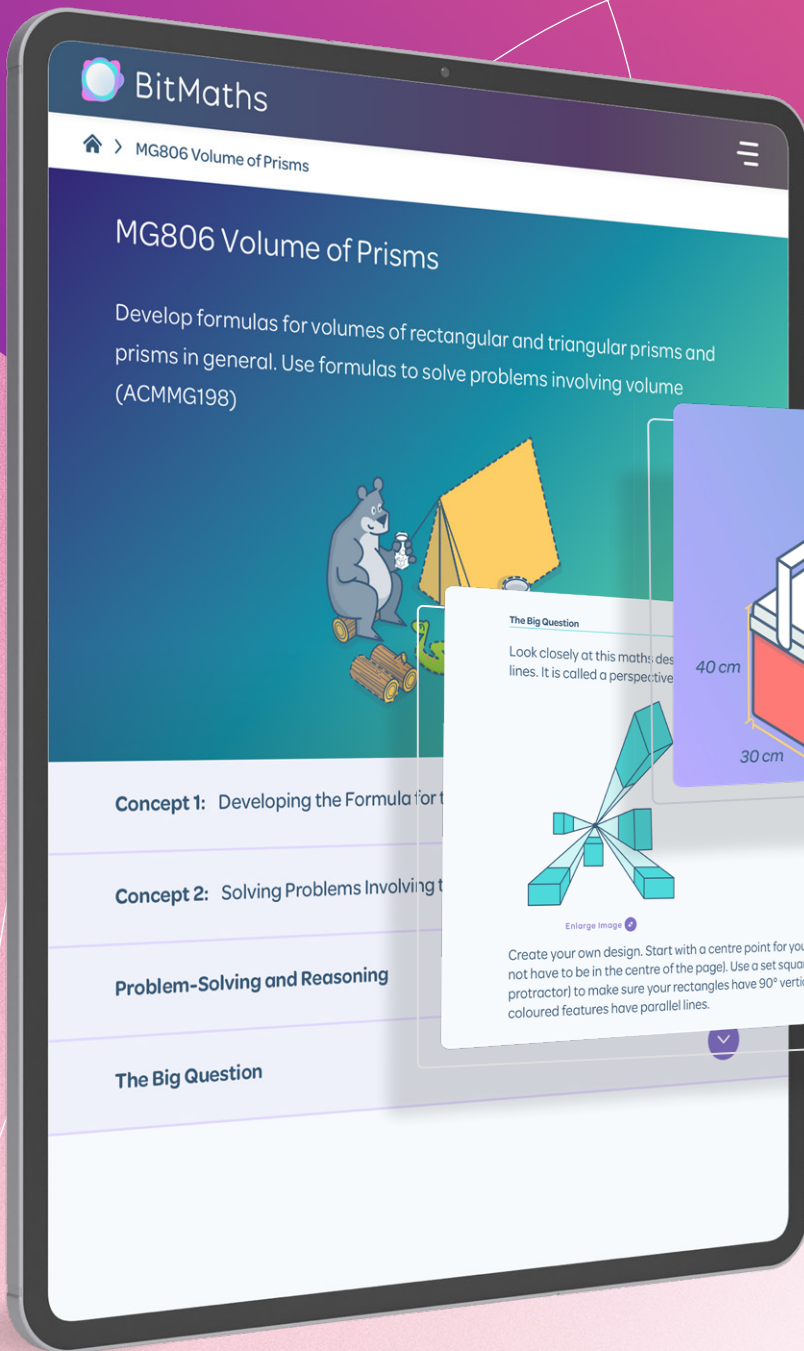





# BitMaths

Digital Maths Resource  
Years 7 & 8



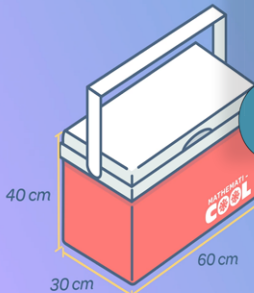
**The Big Question**

Look closely at this maths design. It is called a perspective.



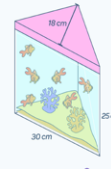
Enlarge Image

Create your own design. Start with a centre point for your design (it does not have to be in the centre of the page). Use a set square (or a ruler and protractor) to make sure your rectangles have 90° vertices and your coloured features have parallel lines.



40 cm  
30 cm  
60 cm

Chelsea's fish tank is in the shape of a triangular prism. It has these internal dimensions.



Enlarge Image

1 Determine the capacity of the tank in litres. Answer to two decimal places.

Complete the working in centimetres, then convert the units. Substitute values in order from left to right.

$V = (\text{Choose...}) \times (\text{Choose...}) \times (\text{Choose...})$

$= (\text{Choose...}) \times (\text{Choose...}) \times (\text{Choose...})$

$= \text{Choose... cm}^3$

$= \text{Choose... mL}$

$= \text{Choose... L}$

Check Answer Correct Answer

## Teacher User Guide



# Welcome to BitMaths

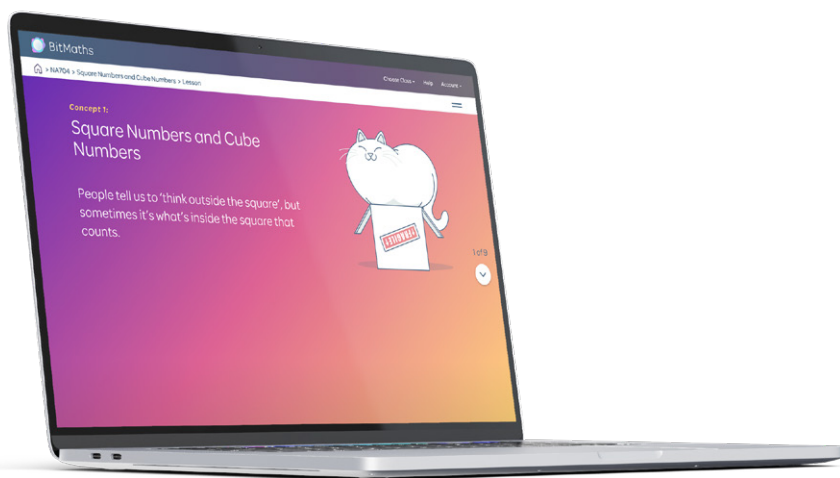
BitMaths is a digital maths resource for teachers and students. With comprehensive content, rigorous pedagogy and intuitive design, BitMaths provides a suite of powerful teaching and learning resources that explicitly target the core concepts of mathematics.

## Teaching

Teachers use the comprehensive suite of resources to deliver effective and engaging lessons. Teachers also have access to activity trackers and portfolios so they can keep track of their students' progress.

## Learning

After lessons are delivered by the teacher, students complete activities online. Students also have access to student texts that mirror the content taught in the lessons, so they can refer back to it at any time.





A digital maths resource  
for junior secondary

## BitMaths Teacher Guide

Learn how to utilise BitMaths resources to deliver powerful, explicit and engaging lessons. With this Teacher Guide you'll discover the rationale and purpose behind every BitMaths feature.

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# Program Structure

BitMaths is available in **Australian Curriculum, New South Wales Syllabus** and **Victorian Curriculum** editions.

## Homepage Overview

Every year of BitMaths content is organised into modules. These modules are listed under their matching curriculum strand and sub-strand.

You have the choice to teach modules in any order, in line with your school's yearly plan, or you can follow our sample yearly plan available in the *Preparation and Planning* section.

The screenshot shows the BitMaths homepage for Australian Curriculum, Year 7 content. The page features a dark blue header with the BitMaths logo and navigation links for 'Choose Class', 'Help', and 'Account'. Below the header, the word 'Home' is displayed on the left, and 'Preparation and Planning' is on the right. The main content area is organized into three columns, each representing a curriculum strand. At the top of this area are three tabs: 'Year 7' (selected), 'Year 8', and 'Year 9 (Coming Soon)'. The 'Number and Algebra' column lists modules such as 'Number and place value' (NA701-NA706), 'Real numbers' (NA707-NA714), 'Money and financial mathematics' (NA715), 'Patterns and algebra' (NA716-NA718), and 'Linear and non-linear relationships' (NA719-NA721). The 'Measurement and Geometry' column lists 'Using units of measurement' (MG701-702), 'Shape' (MG703), 'Location and transformation' (MG704-705), and 'Geometric reasoning' (MG706-709). The 'Statistics and Probability' column lists 'Chance' (SP701-702) and 'Data representation and interpretation' (SP703-706).

Fig 1: BitMaths homepage for Australian Curriculum, Year 7 content

## Module Overview

Each BitMaths module contains one or more **maths concepts**, as well as **problem-solving** and **reasoning** activities, and a *Big Question* to extend students.

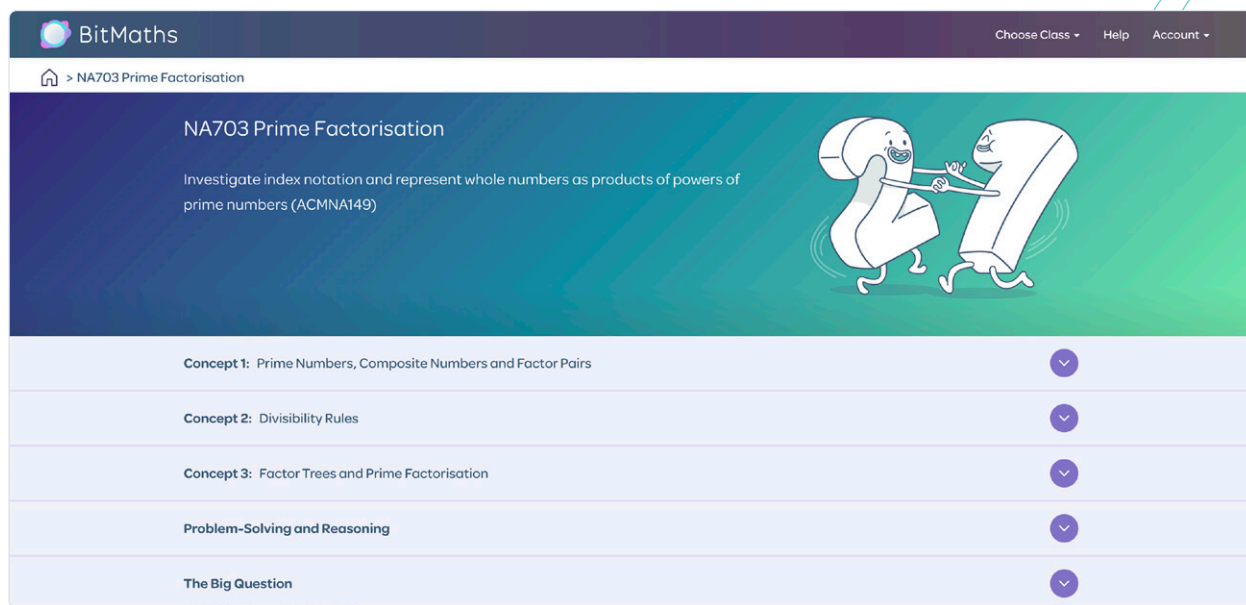


Fig 2: Module NA703 Prime Factorisation

## Maths Concepts

Each concept includes:

- **Teaching and learning resources**

Teaching and learning resources including videos, illustrations, worked examples and more are at the core of every concept. For teachers, content is organised into an interactive slideshow that can be used to deliver engaging and effective lessons at a pace that suits any class. For students, the same content is grouped into a single scrolling page, so they can review the concept independently.

- **Activities**

Every concept includes four sets of differentiated activities that provide students with opportunities to apply the skills they have learned in the lesson.

## Problem-Solving and Reasoning

Every module includes dedicated **problem-solving** and **reasoning** activities related to the concepts taught in the module.

## The Big Question

Included at the end of every module is a challenging maths problem or brainteaser that is perfect for engaging fast finishers, and promoting critical and creative thinking.

# Maths Concepts

Each BitMaths concept is a scaffolded teaching and learning package that facilitates the explicit teaching of mathematical concepts and concludes with targeted practice.

## Teaching Slideshows

The interactive teaching slideshows are designed for classroom projection, with large fonts and clear illustrations. They provide focused stimuli to create engaging maths lessons and deliver information in a stepped-out sequence.

### Gradual Release of Responsibility

The slideshows follow a gradual release of responsibility framework of instruction. This framework typically has four main components:

- **Focused instruction** delivered through introduction slides, learning intentions and success criteria
- **Guided instruction** delivered through explicit teaching slides and worked examples
- **Whole class practice** delivered through *Your Turn* and *Think Bit* questions
- **Independent learning** delivered through concept activities.



## Introduction Slides

Maths can be difficult and stressful for students, so starting each lesson with something lighthearted is important.

That's why each slideshow begins with an engaging introductory slide to break the ice before launching into the lesson. This is a colourful slide with clever, fun artwork and a stimulus, such as a quote, fact, joke or problem.

BitMaths

Choose Class ▾ Help Account ▾

NA703 > Factor Trees and Prime Factorisation > Lesson

**Concept 3:**  
**Factor Trees and Prime Factorisation**

A factor tree is like a family tree (although numbers are easier to get along with than big brothers).

1 of 12

Fig 3: Introduction slide for NA703 Concept 3: Factor Trees and Prime Factorisation

## Learning Intention and Success Criteria Slide

The learning intention succinctly describes the purpose of the lesson. Select the *Show Success Criteria* button to reveal a more detailed breakdown of what students can aim to achieve by the end of the lesson.

BitMaths

Choose Class ▾ Help Account ▾

NA703 > Factor Trees and Prime Factorisation > Lesson

**Learning intention and success criteria**

We are learning to express a given number as a product of its prime factors, using factor trees.

I will be successful when I can:

- construct a factor tree for a given number
- express a number as a product of its prime factors using index notation
- identify the highest common factor of two numbers using prime factors.

Hide Success Criteria

2 of 12

Fig 4: Learning intention and success criteria for NA703 Concept 3: Factor Trees and Prime Factorisation, with success criteria shown

## Explicit Teaching Slides

Most teaching slideshows are **inquiry-driven**. They feature a stimulus question that can initiate discussion and be used as a springboard for your explicit teaching.

Stimulus questions are succinct to help you keep your students focused, however most slides also have a *Show Explanation* button, which reveals more detailed information, to use at your discretion. You may prefer to simply use the stimulus questions, drawing on your own explanations and worked examples, or use the BitMaths explanations and examples to model the concept.

Many teaching slides also include explicit teaching videos and GIFs to provide greater clarity on difficult concepts. You can use the prompts to expand any image to full screen for a more detailed display.

The screenshot shows a BitMaths interface for a lesson titled 'Finding prime factors'. The main question is 'How can we identify all of the prime factors of a composite number, such as 108?'. Below the question is a video player with a play button and a progress bar showing 03:25. To the right of the video player are navigation arrows and the text '3 of 12'. Below the video player is a purple button labeled 'Show Explanation'.

Fig 5: Example teaching slide for NA703 Concept 3: Factor Trees and Prime Factorisation

The screenshot shows a teaching slide titled 'Corresponding angles formed from a transversal'. The question is 'Are these angles congruent?'. Below the question is a diagram showing two horizontal parallel lines intersected by a transversal line. The top-right angle is labeled 'g' and the bottom-left angle is labeled 'd'. Below the diagram is a 'Play Animation' button with a play icon. At the bottom left is a purple button labeled 'Show Answer'.

Fig 6: Example teaching slide for MG708 Concept 3: Angles Created by a Transversal Across Parallel Lines

The screenshot shows a teaching slide titled 'Using a formula to determine probability'. The question is 'What is the probability of rolling a 2 on a fair, six-sided dice?'. Below the question is a video player showing a man speaking, with a play button and a progress bar showing 01:16. Below the video player is a purple button labeled 'Show Explanation'.

Fig 7: Example teaching slide for SP702 Concept 1: Determining Probability



## Worked Example Slides

Worked examples each contain a stimulus question, with the steps and solution hidden by default. This gives you the option to use only the question and model the required processes in your own words. Otherwise, you can select *Show Steps* to talk through the stepped-out solution.

The screenshot shows the BitMaths website interface. At the top, there is a navigation bar with the BitMaths logo, a home icon, and the breadcrumb path: **NA703 > Factor Trees and Prime Factorisation > Lesson**. On the right side of the navigation bar, there are links for "Choose Class", "Help", and "Account". Below the navigation bar, the main content area is titled "Worked example 1" and contains the question: "Write 84 as a product of its prime factors." A purple button labeled "Show Steps" is positioned below the question. On the right side of the content area, there are navigation controls: an upward arrow, the text "4 of 12", and a downward arrow.

Fig 8: Worked solution for NA703 Concept 3: Factor Trees and Prime Factorisation, with solution steps hidden

The screenshot shows the BitMaths website interface with the solution steps revealed. The breadcrumb path is **NA703 > Factor Trees and Prime Factorisation > Lesson**. The question "Write 84 as a product of its prime factors." is followed by the instruction "Draw factor tree for 84". A factor tree diagram is shown, starting with 84 at the top, branching into 7 and 12, then 12 into 6 and 2, and finally 6 into 2 and 3. All prime factors (7, 2, 2, 3) are circled in yellow. Below the diagram is an "Enlarge Image" button. The next instruction is "Write product of prime factors", followed by the equations:  $84 = 2 \times 2 \times 3 \times 7$  and  $= 2^2 \times 3 \times 7$ . A text input field contains the answer: "84 can be written as  $2^2 \times 3 \times 7$ ". Below this is a yellow "Remember" box with the text: "We never break down a prime number to a factor of 1." A purple button labeled "Hide Steps" is at the bottom. On the right side, there are navigation controls: an upward arrow, the text "4 of 12", and a downward arrow.

Fig 9: Worked solution for NA703 Concept 3: Factor Trees and Prime Factorisation, with solution steps shown

## Your Turn Slides

Following the guided teaching and worked examples, *Your Turn* slides provide an opportunity for students to answer questions collaboratively – as a whole class or in groups. They also allow you to check for understanding. Once complete, you can reveal the answer as a focus for discussion.

BitMaths

Choose Class Help Account

NA703 > Factor Trees and Prime Factorisation > Lesson

**Your turn 1**

Draw a factor tree for 100. Use index notation to express 100 as a product of its prime factors.

Show Answer

5 of 12

Fig 10: *Your Turn* question for NA703 Concept 3: Factor Trees and Prime Factorisation

## Think Bit Slides

*Think Bits* provide opportunities to apply higher-order thinking skills. You can use them at your discretion to stretch your fast finishers, or if time permits you may choose to use them for collaborative group work during the lesson.

BitMaths

Choose Cla... Help Account

NA703 > Factor Trees and Prime Factorisation > Lesson

**Think bit**

78 is a composite factor of 156.  
39 and 13 are both factors of 78.  
Is it true, then, that 39 and 13 must also be factors of 156? Why?

Yes. If a number has a composite factor, then the factors of that composite factor, are also factors of the original number.  
So, if 156 has a composite factor of 78, then the factors 39 and 13 must also be factors of 156.

Factor tree for 156:

```

    graph TD
      156 --- 2_1((2))
      156 --- 78
      78 --- 2_2((2))
      78 --- 39
      39 --- 3((3))
      39 --- 13
  
```

Enlarge Image

Hide Answer

7 of 12

Fig 11: *Think Bit* for NA703 Concept 3: Factor Trees and Prime Factorisation, with solution shown

## Student Texts

The student texts include all the same detailed explanations, examples, videos, illustrations and activities as the teaching slideshows to ensure consistency between the teaching and learning resources.

Students can also read the student texts independently, with each concept presented on a single scrolling page with clear headings.

Students can refer to this resource at any time during lessons or review it later. The digital platform allows it to be a truly interactive experience, which makes it far superior to a traditional textbook.

BitMaths Choose Class - Help Account -

NA703 > Factor Trees and Prime Factorisation > Lesson

**Concept 3:**  
**Factor Trees and Prime Factorisation**

A factor tree is like a family tree (although numbers are easier to get along with than big brothers).

**Learning intention and success criteria**

We are learning to express a given number as a product of its prime factors, using factor trees.

I will be successful when I can:

- construct a factor tree for a given number
- express a number as a product of its prime factors using index notation
- identify the highest common factor of two numbers using prime factors.

**Finding prime factors**

How can we identify all of the prime factors of a composite number, such as 108?

We can use factor trees. Factor trees are used to break down a composite number into factor pairs until all of the prime factors have been found.

Enlarge Image

We can rewrite the composite number as a product of its prime factors using index notation.

$$108 = 2 \times 2 \times 3 \times 3 \times 3$$

$$= 2^2 \times 3^3$$

**Tip**  
It doesn't matter which factor pair we start with – all possible factor trees for a composite number will result in the same prime factors.

**Fig 12:** Example section of student text for NA703 Concept 3: Factor Trees and Prime Factorisation, which matches the corresponding teaching slides

## Concept Activities

Students can complete activities online or use printed worksheets.

Online activities include:

- automatic marking
- two attempts to correctly answer each question
- the correct answer for reference if students answer incorrectly on their second attempt.

## Differentiated Activities

Activities include four sets of differentiated questions. Students complete the **understanding** set before continuing to one of the three differentiated sets: **support**, **consolidation** or **extension**.

The **understanding** set is designed to solidify students' knowledge of the concept taught in the teaching slideshow.

Questions in this set graduate in difficulty from C-standard to A-standard questions. For example, the first few questions often call upon a basic knowledge of the mathematical concept, whereas later questions in the set require higher-order application and link to real-world contexts.

The results from the **understanding** set prompt students to complete a follow-up set of differentiated activities, targeted to their understanding level.

| Result     | Recommended activity |
|------------|----------------------|
| <50%       | Support              |
| 50% to 80% | Consolidation        |
| >80%       | Extension            |

### Remind students to record their working out

Even when completing activities online, BitMaths advocates for students to follow good practice by completing all of their working using pen and paper. While online activities provide the benefits of automatic marking and differentiation prompts, no tool can or should replace a pen and paper when it comes to working through problems.

Using paper also allows you to see how students are working and pinpoint where they are making errors.

1 When Jaz drew a factor tree for 180, she wrote two numbers incorrectly.

One incorrect number is . It should be .

The other incorrect number is . It should be .

2 The prime factors of a number are 2, 5, 7, 5, 2, 2, 5.

Which expression shows the product of the prime factors written using index notation, with the base numbers in ascending order?

$7 \times 5^2 \times 2^3$   
  $2^2 \times 5^3 \times 7$   
  $5^2 \times 2^3 \times 7$   
  $2^3 \times 5^3 \times 7$

3 Express 225 as a product of its prime factors using index notation, with the base numbers in ascending order.

225 =  ×

4 Use a factor tree to find the prime factors of 200. Express the product of the prime factors using index notation, with the base numbers in ascending order.

200 =  ×

5 Use a factor tree to find the prime factors of 630. Express the product of the prime factors using index notation, with the base numbers in ascending order.

630 =  ×  ×  ×

6 Use these two factor trees to find the highest common factor of the two numbers.

The highest common factor of 28 and 126 is .

Fig 13: Example understanding activities for NA703 Concept 3: Factor Trees and Prime Factorisation

# Activity Tracking

You can monitor student performance in real time using the *Activity Tracker*, which allows you to provide timely intervention when needed.

The *Activity Tracker* is a table that shows a segmented bar graph for each activity set, indicating the percentage of questions each student has answered correctly or incorrectly. Data can also be viewed numerically.

Click on any cell in the table to see an individual student's answers and whether questions have been answered correctly or incorrectly. Select a student's name to view their entire student portfolio.

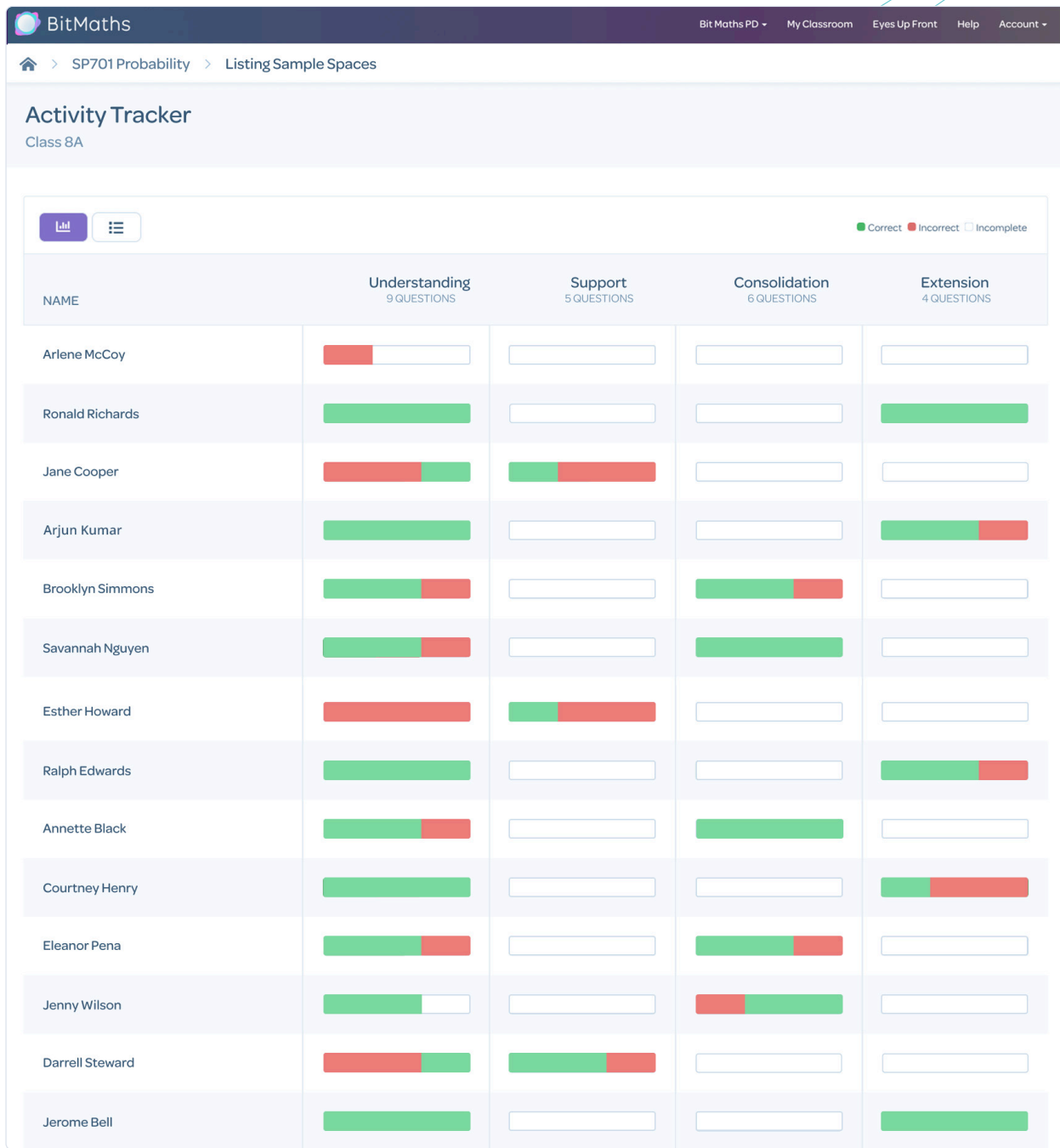


Fig 14: Example *Activity Tracker*

# Problem-Solving and Reasoning

Develop higher-order thinking skills using the dedicated problem-solving and reasoning activities available in every module of BitMaths.

## Problem-Solving

Students may use differing strategies to solve a problem and that's OK! BitMaths provides a framework that allows for student creativity and variance when it comes to the strategies they use to arrive at the correct solution.

This framework includes modelling critical literacy skills and strategic problem-solving using the *Guided Problem* before students apply these skills through independent activities.

## Guided Problems

Display the *Guided Problem* to model good problem-solving practice and facilitate student collaboration and discussion using the following three questions:

### 1. What is the question asking you to do?

Read the question aloud with the class. Ask students to explain, in their own words, what the question is asking them to solve. It is common for students to skim over questions, so this step ensures students read the question properly and understand what is being asked.

### 2. What is the important information?

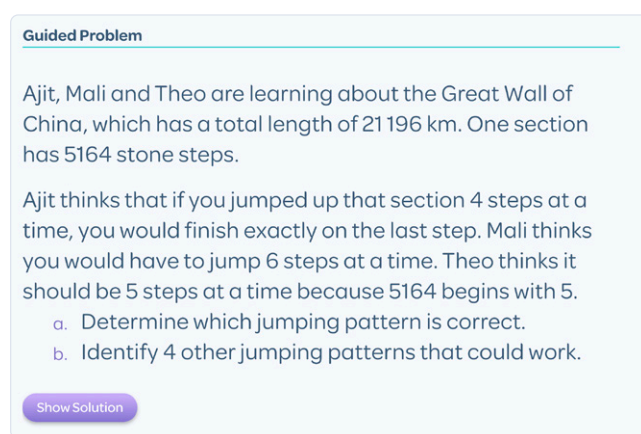
Many questions include irrelevant information. Discuss with the class what essential information is required to solve the problem.

### 3. What should the solution include?

This step is often overlooked, but it helps students understand how their solution should be articulated. Identify and discuss the cognitive verbs in the question. Does the question ask students to provide their answer as a statement? What mathematical working/evidence do they need to show to support their answer?

Once it is clear that students comprehensively understand the question, they are ready to solve the problem.

Ask students to share and discuss the different strategies they used to solve the problem. Explore these strategies and identify those that are most efficient. If required, you can use the provided worked solution to model an efficient strategy that leads to the correct answer.



**Guided Problem**

Ajit, Mali and Theo are learning about the Great Wall of China, which has a total length of 21 196 km. One section has 5164 stone steps.

Ajit thinks that if you jumped up that section 4 steps at a time, you would finish exactly on the last step. Mali thinks you would have to jump 6 steps at a time. Theo thinks it should be 5 steps at a time because 5164 begins with 5.

- Determine which jumping pattern is correct.
- Identify 4 other jumping patterns that could work.

Show Solution

Fig 15: Example *Guided Problem* slide for NA703 Concept 3: Factor Trees and Prime Factorisation, with solution hidden

## Independent Problem-Solving

Opportunities for independent problem-solving are provided at three levels of difficulty: **support**, **consolidation** and **extension**. Direct students to the differentiated problem best suited to their level of competency or allow students to self-select which problems to solve.

Problems can be completed online or on the printed worksheet. Online activities include:

- automatic marking
- two attempts to correctly answer each question
- the correct answer for reference if students answer incorrectly on their second attempt.

There are 32 students in 7M Science and 28 students in 7N Science. Each teacher places their students into equal groups for experiments.

a. Apart from a group size of 1 or 32, how many different ways could the teacher split 7M into equal groups?

b. Apart from a group size of 1 or 28, how many different ways could the teacher split 7N into equal groups?

c. What group sizes do 7M and 7N have in common?

 · 

d. Both classes gather in a large room containing 12 workbenches, each with 14 stools. How many different ways could the teachers split the students into equal groups if the maximum number of groups is 12?

I have completed the working in my workbook ready to show my teacher.

^ v

**Fig 16:** Example independent problem-solving activity (consolidation set) for NA703 Concept 3: Factor Trees and Prime Factorisation, with solution hidden

**Solution**

a. **Make an organised list**

7M = 32 students

1. 2 groups of 16 = 32
2. 4 groups of 8 = 32
3. 8 groups of 4 = 32
4. 16 groups of 2 = 32

7M could be split four different ways.

b. **Make an organised list**

7N = 28 students

1. 2 groups of 14 = 28
2. 4 groups of 7 = 28
3. 7 groups of 4 = 28
4. 14 groups of 2 = 28

7N could be split four different ways.

c. **Compare group sizes**

7M

- 2 groups of 16 = 32
- 4 groups of 8 = 32
- 8 groups of 4 = 32
- 16 groups of 2 = 32

**Fig 17:** Example independent problem-solving solution (consolidation set) for NA703 Concept 3: Factor Trees and Prime Factorisation

### Remind students to record their working out

Students are prompted to confirm they have completed their working in their exercise book before submitting their answer for each online problem-solving activity. This encourages students to follow good practice by completing all of their working using pen and paper.

## Reasoning

BitMaths employs an innovative and comprehensive approach to mathematical reasoning, with a dedicated reasoning task in every module that relates to the concepts taught in that module.

Many students entering secondary school lack the knowledge, confidence or language to clearly articulate mathematical reasoning. To apply mathematical reasoning, students are required to solve problems and articulate their solutions using specific cognitive verbs, such as **prove, justify, determine** and so on. BitMaths reasoning tasks include cognitive verbs to prompt students to articulate their mathematical reasoning.

### Cognitive verbs

Cognitive verbs are important to the explicit teaching of thinking, so students can recognise and verbalise abstract processes. Cognitive verbs include:

**Prove:** To use a sequence of steps to find a conclusive result. Answers should include 'is/is not' or 'does/does not' statements.

**Justify:** To show all evidence that supports a conclusion in a logical way. Answers should include 'because' statements.

**Determine:** To come to a conclusion after considering and/or investigating given information. Answers should include 'is' statements and provide justification.

**Explain:** To make a process clear by giving a detailed account of the given information and/or investigation. Answers should be written in sentences or a paragraph.

**Decide:** To consider options or given information and reach a conclusion. Answers should state the decision clearly and provide justification.

**Evaluate:** To appraise a situation or list of options by considering strengths, limitations and implications, and make judgements based on specific criteria. Answers should be written in sentences and can include calculations, tables, graphs or lists to support findings.

**Compare:** To identify and consider the strengths and limitations of options. Answer statements can include a list.





## Reasoning Tasks

Reasoning tasks can be completed in one of three ways:

- online with the help of the *Reasoning Wizard*
- online independently
- using a printed worksheet.

The screenshot shows the BitMaths website interface. At the top, there is a navigation bar with the BitMaths logo, 'Choose Class', 'Help', and 'Account' options. Below this is a breadcrumb trail: 'Home > MG701 > Problem-Solving and Reasoning > The Task'. A 'Back to module' link is visible. The main content area has a purple-to-orange gradient background. The title 'The Task' is in orange. The text describes Marina's rectangular paddock (90m by 10m) and Luca's square paddock (50m by 50m). The task asks to prove or disprove the statement: 'Marina will need much less turf and much less fencing because she has a much smaller paddock.' Below the text are two buttons: 'I need some help' and 'I can do this myself'.

Fig 18: Example reasoning task for MG701 Formulas for Areas

## Reasoning Wizard

The *Reasoning Wizard* is designed to scaffold and model good practice and articulation for high-level, multi-step, reasoning-based tasks.

Although there are many ways to solve any given problem, the *Reasoning Wizard* provides scaffolding to guide students through each step of the task in an efficient and logical way. It breaks large problems into manageable chunks and allows students to follow a path of deductive reasoning, leading to the correct solution.

By using the *Reasoning Wizard*, students will gain the confidence and skills to not only solve a variety of mathematical problems but also articulate a well-reasoned answer.

To use the *Reasoning Wizard*, students select *I need some help* from the *Reasoning Task* page.

The *Reasoning Wizard* has two main parts:

- *Reasoning Wizard* steps
- Solution

## Reasoning Wizard Steps

The *Reasoning Wizard* includes a scaffolded series of questions that work through the problem-solving and deductive reasoning required to reach the solution. Students get unlimited attempts to answer these questions correctly.

The *Reasoning Wizard* always begins by ensuring students understand the reasoning question. Students are asked to clarify what the question is asking, what maths they will use and what their answers should include.

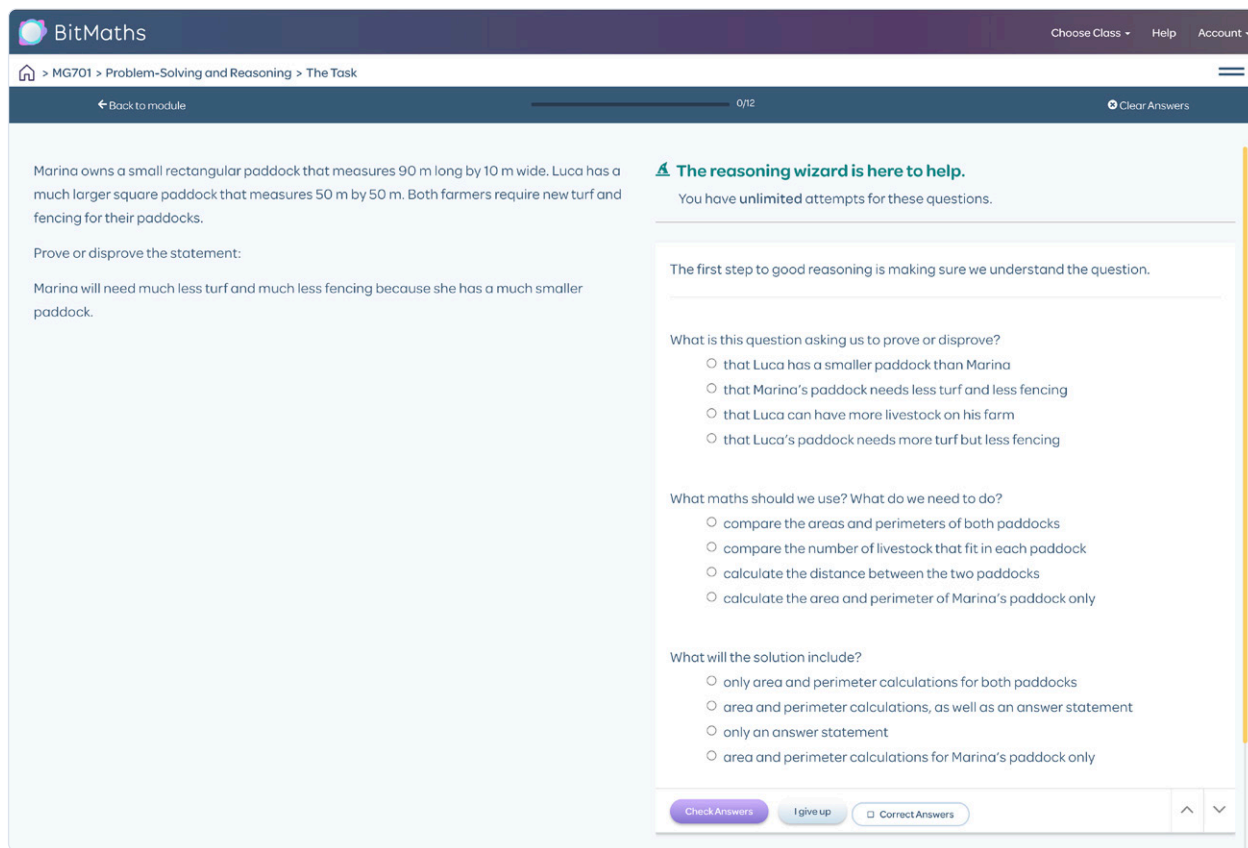


Fig 19.1: Step 1 of Reasoning Wizard for MG701 Formulas for Areas

Students cannot proceed to the next step until they answer correctly. However, students who continually have difficulty answering are given the opportunity to see the correct response and continue.

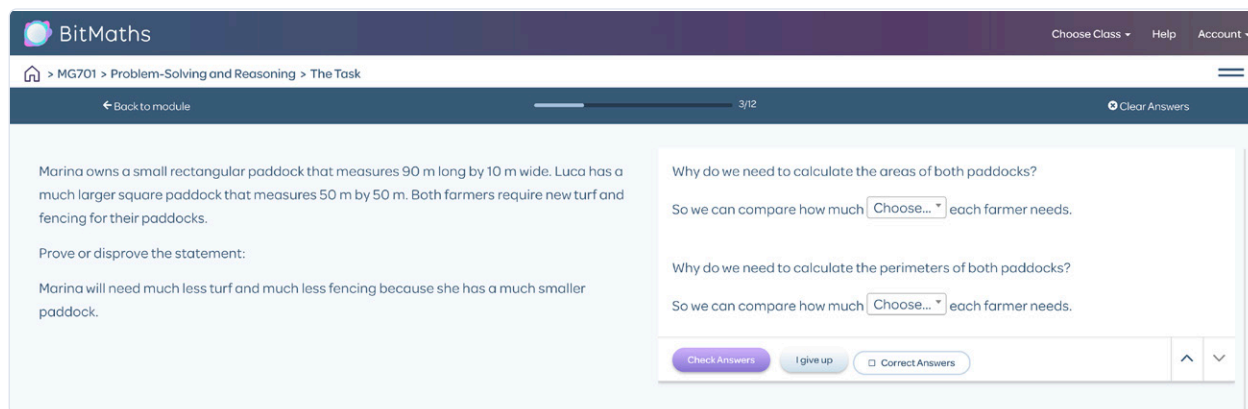


Fig 19.2: Step 2 of Reasoning Wizard for MG701 Formulas for Areas

BitMaths

MG701 > Problem-Solving and Reasoning > The Task

5/12

Clear Answers

Marina owns a small rectangular paddock that measures 90 m long by 10 m wide. Luca has a much larger square paddock that measures 50 m by 50 m. Both farmers require new turf and fencing for their paddocks.

Prove or disprove the statement:

Marina will need much less turf and much less fencing because she has a much smaller paddock.

First, let's find the area of each paddock. To calculate area, we multiply length by width using the formula  $l \times w$ .

Calculate the areas now. Use your workbook to write the formula, substitute the values and calculate.

The area of Marina's paddock is  m<sup>2</sup>

The area of Luca's paddock is  m<sup>2</sup>

Do your calculations about the turf match the statement so far?

Check Answers | I give up | Correct Answers

Fig 19.3: Step 3 of Reasoning Wizard for MG701 Formulas for Areas

BitMaths

MG701 > Problem-Solving and Reasoning > The Task

11/12

Clear Answers

Marina owns a small rectangular paddock that measures 90 m long by 10 m wide. Luca has a much larger square paddock that measures 50 m by 50 m. Both farmers require new turf and fencing for their paddocks.

Prove or disprove the statement:

Marina will need much less turf and much less fencing because she has a much smaller paddock.

Next, let's find the perimeter of each paddock. To calculate perimeter, we add together all the sides using the formula  $(l + w) \times 2$ .

Calculate the perimeters now. Use your workbook to write the formula, substitute the values and calculate.

The perimeter of Marina's paddock is  m .

The perimeter of Luca's paddock is  m .

Do your calculations about the fencing match the statement?

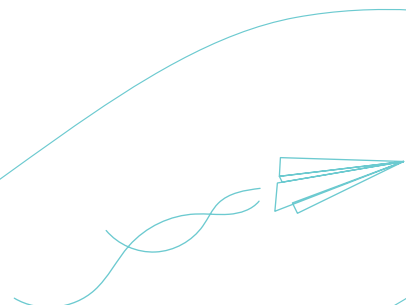
Although the area of Marina's paddock is much smaller, she needs exactly the same length of fencing as Luca.

We're ready to complete a statement to prove or disprove the statement about Marina's paddock.

-R.Wizard

Continue

Fig 19.4: Step 4 of Reasoning Wizard for MG701 Formulas for Areas, including answer elaboration



## Reasoning Solution

Once all the steps required to solve the problem are completed, students are presented with a solution form. Students complete statements with input and multiple choice elements. Each statement provides students with a model for appropriate articulation of the relevant reasoning skill.

Students are given a single attempt to complete the solution in the form of a cloze activity.

BitMaths

Choose Class Help Account

MG701 > Problem-Solving and Reasoning > The Task

Back to module 0/1 Clear Answers

Marina owns a small rectangular paddock that measures 90 m long by 10 m wide. Luca has a much larger square paddock that measures 50 m by 50 m. Both farmers require new turf and fencing for their paddocks.

Prove or disprove the statement:

Marina will need much less turf and much less fencing because she has a much smaller paddock.

Do working in your workbook ready to show your teacher and submit answers online.

Refer to your working to complete this statement:

Marina's paddock has an area of  m<sup>2</sup> and a perimeter of  m. Luca's paddock has an area of  m<sup>2</sup> and a perimeter of  m.

Therefore, the statement  correct. Marina will need  turf and  fencing as Luca.

I have completed the working in my workbook ready to show my teacher.

Check Answer Correct Answer

Fig 20.1: Solution form for MG701 Formulas for Areas reasoning activity

BitMaths

Choose Class Help Account

MG701 > Problem-Solving and Reasoning > The Task

Back to module 0/1 Clear Answers

Marina owns a small rectangular paddock that measures 90 m long by 10 m wide. Luca has a much larger square paddock that measures 50 m by 50 m. Both farmers require new turf and fencing for their paddocks.

Prove or disprove the statement:

Marina will need much less turf and much less fencing because she has a much smaller paddock.

Do working in your workbook ready to show your teacher and submit answers online.

Refer to your working to complete this statement:

Marina's paddock has an area of  m<sup>2</sup> and a perimeter of  m. Luca's paddock has an area of  m<sup>2</sup> and a perimeter of  m.

Therefore, the statement  correct. Marina will need  turf and  fencing as Luca.

I have completed the working in my workbook ready to show my teacher.

Fig 20.2: Solution form for MG701 Formulas for Areas reasoning activity, with solution submitted

**Note:** The same solution cloze activity is used by students who opted to solve the task independently without the use of the *Reasoning Wizard*.

# The Big Question

Another way BitMaths provides higher-order thinking opportunities!

Included at the end of every module is a challenging maths problem or brainteaser. Each question comes with a worked solution that students can view to check against their answer.

**The Big Question**

I entered data into a spreadsheet showing the total votes five candidates received for School Captain. I selected the five cells and created a sector graph. Unfortunately, I deleted the number of votes for AJ and ED.

How many more votes did ED receive than AJ?

**Votes for School Captain candidates**

| Candidate | Number of votes |
|-----------|-----------------|
| AJ        |                 |
| BG        | 65              |
| CS        | 15              |
| ED        |                 |
| GD        | 60              |

Enlarge Image

Show Solution

Fig 21: The Big Question for SP703 Primary and Secondary Data, with solution hidden

Here's one way to find the answer:

We can see that:

ED ( $x$  votes) = 32% of the total votes  
BG (65 votes) = 26% of the total votes  
GD (60 votes) = 24% of the total votes  
AJ ( $y$  votes) = 12% of the total votes  
CS (15 votes) = 6% of the total votes

**Total votes**

65 votes = 26% of votes  
Total votes =  $65 \div 26 \times 100$   
= 250

**AJ votes**

$12\% \times 250$  = 30

**ED votes**

$32\% \times 250$  = 80

Difference =  $80 - 30$   
= 50

ED received 50 more votes than AJ.

Fig 22: The Big Question for SP703 Primary and Secondary Data, with solution shown

# Student Portfolios

When activities are completed online, results are aggregated into student portfolios so you can see a snapshot of student performance at any given time. To access a student's portfolio, select their name on the *My Classroom* page or in any *Activity Tracker*.

## Results Overview

The *Results Overview* section includes graphs that aggregate all activity results for students across concept, problem-solving and reasoning activities.

The overview graphs show:

- how many questions have been answered altogether
- how many questions have been answered correctly, which are broken down into:
  - answered correctly on first attempt
  - answered correctly on second attempt
- how many questions have been answered incorrectly.

Select the *View Details* button to view a more detailed breakdown of activity results.

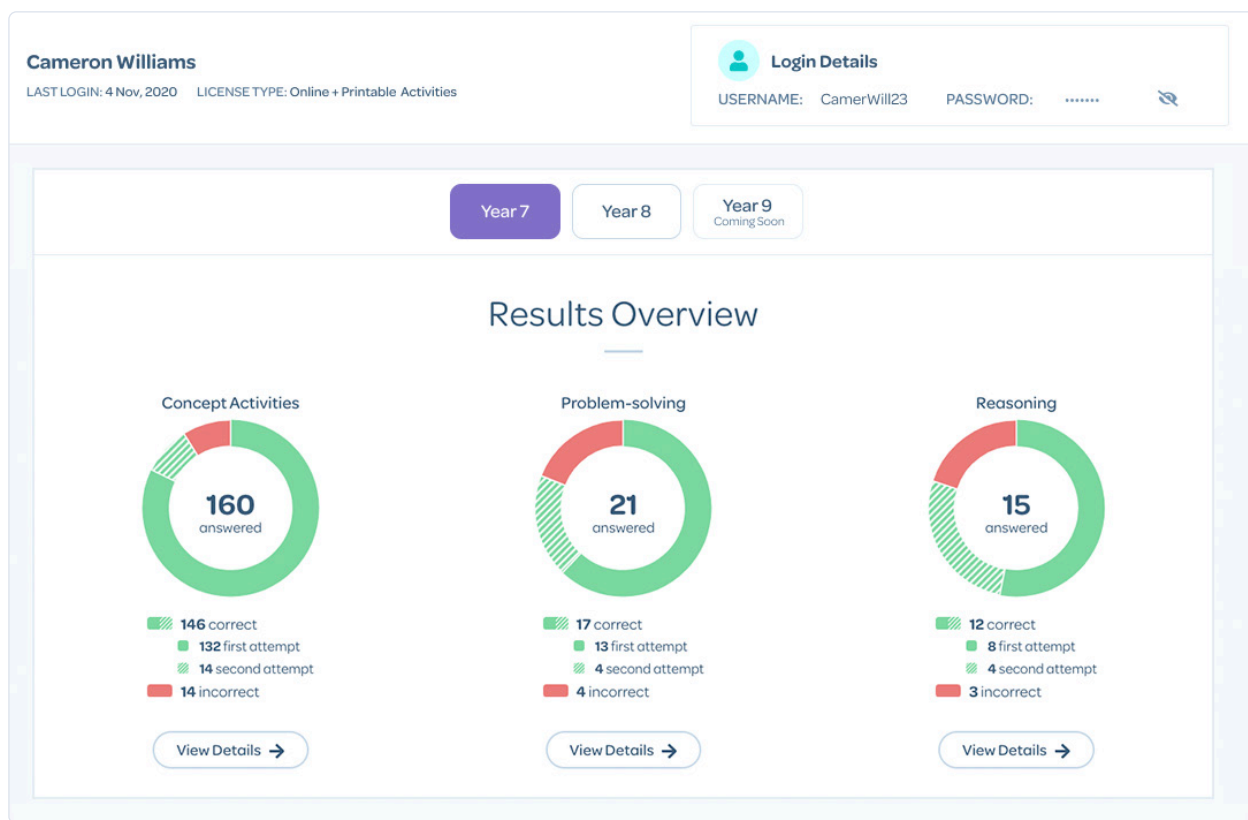


Fig 23: Example student portfolio *Results Overview*

## Detailed Results Pages

These are more detailed pages within a student's portfolio that allow you to see granular data of results across the concept, problem-solving and reasoning activities.

For concept activities, you can view detailed results by:

- activity type (understanding, support, consolidation, extension)
- sub-strand

For problem-solving activities, you can view detailed results by:

- activity type (support, consolidation, extension)
- sub-strand

For reasoning activities, you can view detailed results by:

- use of the *Reasoning Wizard*
- sub-strand

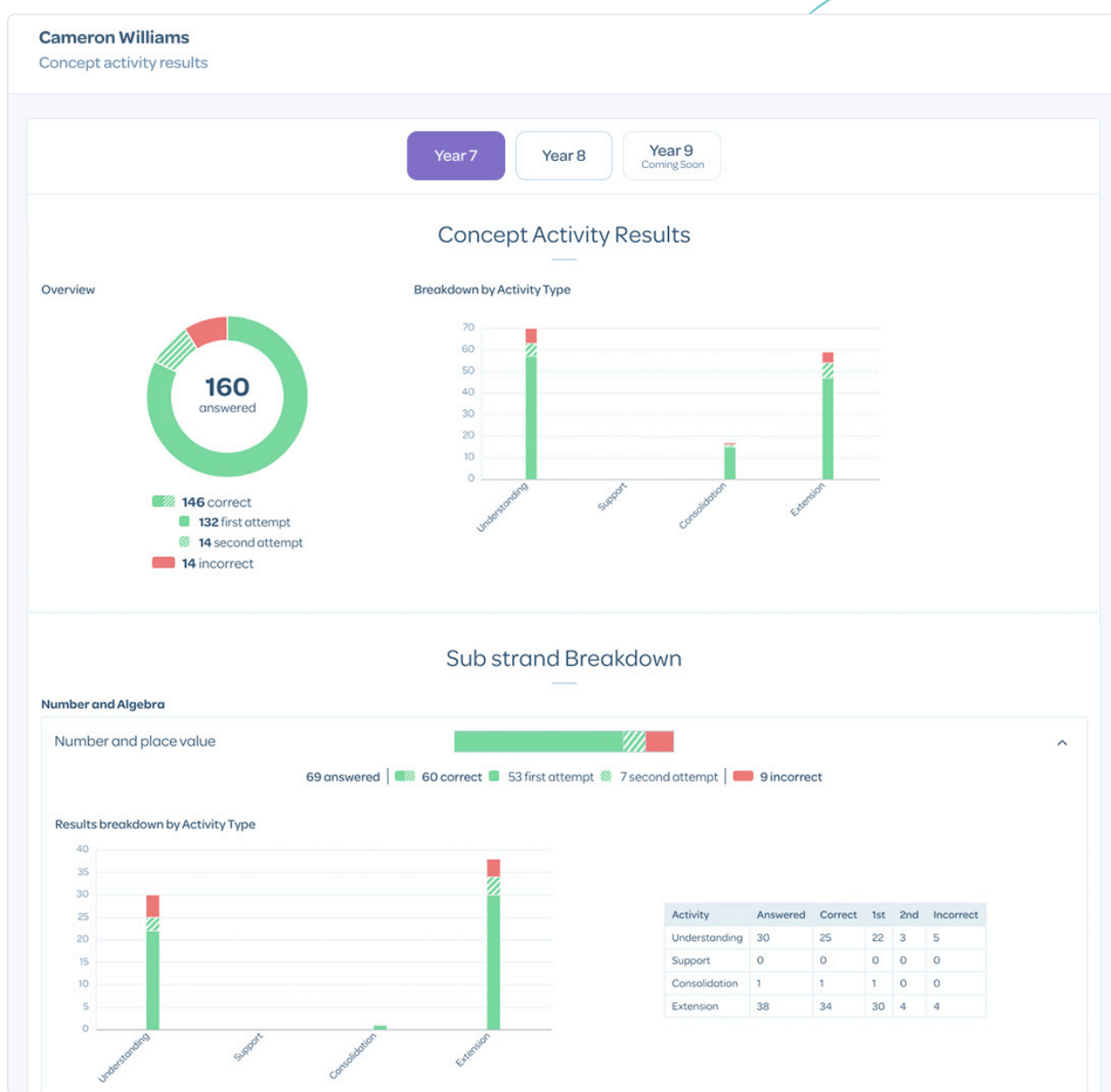


Fig 24: Example student portfolio Concept Activity Results

# Extra Features

With cutting-edge technology embedded throughout the program, here are just a few extra features that make BitMaths the ultimate digital classroom experience.

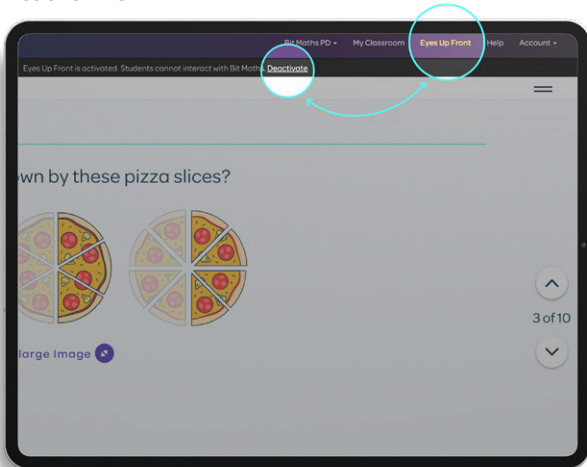
## Classroom Management Tools

BitMaths includes Eyes Up Front and activity locks to help you manage your students' workflow.

### Eyes Up Front

Eyes Up Front allows you to temporarily pause students' access to BitMaths and instructs them to 'pay attention to the teacher'. Find the Eyes Up Front tool in the menu bar of any page within BitMaths. You can deactivate Eyes Up Front when you're ready to let your students continue.

Teacher view



Student view

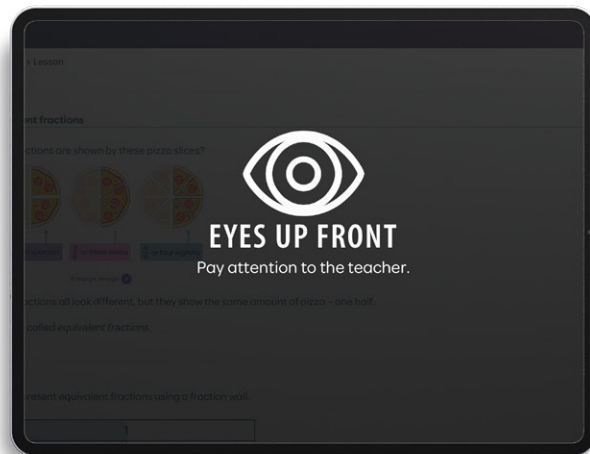


Fig 25: Eyes Up Front screens

### Activity Locks

Activity locks are included in all concept activity sets as well as problem-solving and reasoning activity sets. By default, activity sets are locked to students, so they're not tempted to skip ahead. You can lock and unlock activities from a module homepage.



Fig 26: Activity lock buttons



## Mathematical Input Toolbar

Every activity includes quick access to a mathematical toolbar. Within any answer field, simply select the keyboard icon to open the toolbar.



Students use this toolbar to input more complex solutions where the answer includes a mathematical notation that is not easily accessible via a standard keyboard. For example, fractions, exponents and square roots.

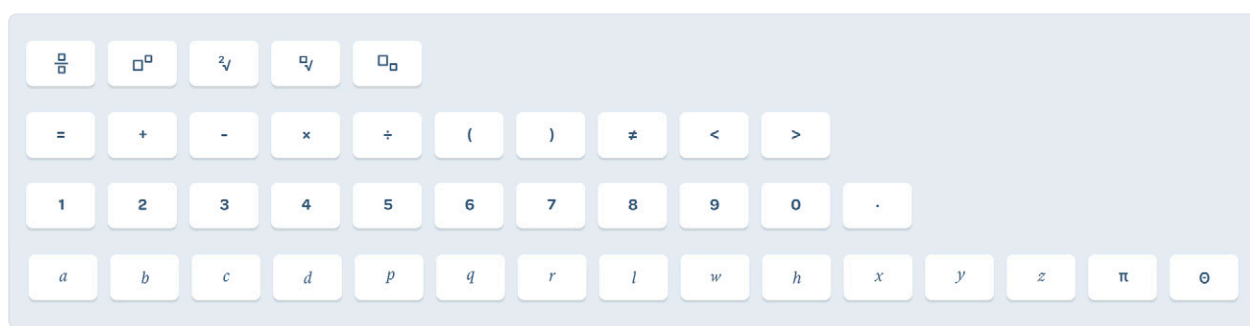


Fig 27: Mathematical input toolbar

### Works on any device

Alongside a range of handy digital features, BitMaths has been created to work on any device connected to the internet. The responsive design means every slideshow, video and activity has been curated for optimal viewing across a range of devices from smartphones to tablets, laptops and desktops.

## Have any questions?

Contact your local education consultant. With teaching experience and in-depth knowledge of the program – we're here to help all year round.



### Try BitMaths for free

Explore what BitMaths has to offer firsthand with a free trial.

We can set up teaching access just for you, or set up access for all teachers and students at your school for the ultimate BitMaths trial experience.

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### Request a demo

You can request a demo just for your executive team or for all your junior mathematics teaching staff.

We provide in-school or virtual demonstrations of BitMaths across Australia.

Visit [bitmaths.com.au](https://bitmaths.com.au)





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