

Extension Opportunities

PR1ME Scholastic

This resource outlines extension opportunities that are available for teachers using Ministry-funded maths resources from PR1ME Scholastic. This resource is designed to support teachers to focus on deepening the maths knowledge of confident learners within their year level.

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Guidance for teaching to the year level

Extending students is not about accelerating confident learners beyond their year level.

Extension is about stretching and growing confident learners by offering more depth at their year level. Deep learning builds flexible, creative, and independent mathematical thinkers – traits that last well beyond the current year level.

When confident maths learners are extended, they develop the ability to transfer knowledge to new and unfamiliar contexts, tackle problems in multiple ways, communicate reasoning clearly and make meaningful mathematical connections.

Developmental Continuum opportunities for extension

PR1ME's opportunities for extension are available at the front of each Teacher Guide in the 'Developmental Continuum' section. Here is an example of what this looks like in the book. It shows how teachers can Extend or Enable students across mathematical concepts. See next page.

Developmental Continuum

Teachers can use the Developmental Continuum to understand the links between learning objectives within and across strands and grade levels. It provides a useful overview of prior, current and future learning objectives. Teachers will observe how new learning is built on prior learning across the grades and how each topic forms the foundation for future learning.

	Grade 1	Grade 2	Grade 3
NUMBERS AND OPERATIONS			
Whole Numbers / Place Value	Count within 100.	Count within 100.	Count within 1000.
	Read and write a number from 0 to 100—the numeral and the corresponding number word.	Read and write a number within 100—the numeral and the corresponding number word.	Read and write a number within 1000—the numeral and the corresponding number word.
	Recognize conservation of numbers.	Use number notation and place values (tens, ones).	Use number notation and place values (hundreds, tens, ones).
	Use number notation and place values (tens, ones).	Estimate the number of objects in a group of less than 100 objects.	Find the number which is ones, tens or hundreds more than or less than a given number within 1000.
	Estimate the number of objects in a group of less than 40 objects.	Find the number which is 1, 2, 3, 4, 5 or 10 more than or less than a given number within 100.	Count on and backwards by ones, twos, threes, fours, fives, tens or hundreds within 1000.
	Find the number which is 1, 2 or 10 more than or less than a given number within 100.	Count on and backwards by ones, twos, threes, fours, fives or tens within 100.	Describe and complete a number pattern by counting on or backwards by ones, twos, threes, fours, fives, tens or hundreds within 1000.
	Give a number that comes before or after a number or between two numbers within 100.	Describe and complete a number pattern by counting on or backwards by ones, twos, threes, fours, fives or tens within 100.	Compare and order numbers within 1000.
	Count on and backwards by ones, twos or tens within 100.	Read and place numbers within 100 on a number line.	Use '>' and '<' symbols to compare numbers.

Books 1-6 (in physical books and MATH PRO) in each chapter of learning:

- UPAC+ (The 'Plus' in UPAC+ offers an opportunity for extension)
- Mind Stretcher
- Think About It
- Create Your Own
- Explore
- Word Problems
- 2x Mission Possible (per book)

The following are examples of what some of the extension activities listed above look like in PRIME resources:

EXPLORE

Justin and Carrie collected metal cans for a recycling project. Justin collected 2.4 kilograms of metal cans. He collected 0.33 kilogram more metal cans than Carrie. What was the total mass of the metal cans collected?



How can we solve this problem? Discuss in your group and fill in columns 1 and 2.

1. What I already know that will help me solve the problem

2. What I need to find out and learn

3. What I have learned

Mind stretchers are specially crafted problems that require students to apply concepts and skills to unusual or complex problem situations and solve the problems using heuristics and higher order thinking skills. Students learn how to select, innovate and compare their strategies.

Unit 4 Problem Solving

You will learn to...
• solve a non-routine problem on multiplication

4.1 Mind stretcher
Problem
There are 10 sheep and chickens in a barn. The animals have 28 legs altogether. How many sheep are there? How many chickens are there?

1 Understand the problem. How many animals are there? How many legs are there altogether? What do I have to find?

2 Plan what to do. I can draw a picture to show the animals.

3 Work out the Answer. Draw 10 circles to represent 10 animals. Suppose all the animals are chickens. Draw 2 legs for every chicken. 10 chickens have 20 legs.

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Name: _____ Date: _____

4.1A Mind stretcher
Problem
A bakery sells cupcakes in boxes of 3 or 5. Ms. Lee wants to buy 22 cupcakes. How many boxes of 3 cupcakes and boxes of 5 cupcakes does she have to buy?

Strategy: Guess and check.

Guess 1: 1 box of 3 cupcakes and 4 boxes of 5 cupcakes
 $1 \times 3 = 3$
 $4 \times 5 = 20$
 $3 + 20 = 23$
There are 23 cupcakes.
Guess 1 is not correct.

Guess 2: 2 boxes of 3 cupcakes and 3 boxes of 5 cupcakes
 $2 \times 3 = 6$
 $3 \times 5 = 15$
 $6 + 15 = 21$
There are 21 cupcakes.
Guess 2 is not correct.

Guess 3: 4 boxes of 3 cupcakes and 2 boxes of 5 cupcakes
 $4 \times 3 = 12$
 $2 \times 5 = 10$
 $12 + 10 = 22$
There are 22 cupcakes.
Guess 3 is correct.

Ms. Lee has to buy 4 boxes of 3 cupcakes and 2 boxes of 5 cupcakes.

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Teachers will guide students through the worked out examples in the coursebooks. Additional mind stretchers are provided in the Teaching Hub for students to try out such questions on their own.

Continued on the next page...

Mind Stretcher, Create Your Own and Mission Possible immerse students in problem solving tasks at various levels of difficulty.

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4.2 Mind stretcher
Problem

At a party, all the guests are seated around square tables that are joined together side by side to form a long rectangle. Each table can seat 2 guests on each side. There are 100 guests. How many tables are used?

1 Understand the problem. How many guests are there? How many guests can be seated around 1 table? How are the tables placed? What do I have to find?

2 Plan what to do. I can draw a picture.

3 Work out the Answer. 8 guests can be seated around 1 table.
12 guests can be seated around 2 tables.
How many more guests can be seated around more tables?
The first and last tables will have 2 extra guests seated at the sides.
 $100 - 2 - 2 = 96$
 $2 + 2 = 4$
Each table can seat 4 guests on two sides.
 $96 \div 4 = 24$
24 tables are used altogether.

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Students stretch their thinking by working on these challenging tasks.

CREATE YOUR OWN

An oak tree is 18 meters tall.
A maple tree is 5 meters taller than the oak tree.
a) What is the height of the maple tree?
b) What is the total height of the two trees?

Read the word problem. Then, change the numbers in the word problem. How did you decide what numbers to use? Next, solve the word problem. Show your work clearly. What did you learn?

MISSION POSSIBLE

Miguel has the following notes:

Christmas is coming, so he wants to buy two presents for his parents and a book that costs \$12 for his sister.

He is at a gift shop which sells the following presents:

A \$45 B \$27 C \$32 D \$62

He wants to use up as much of his money as possible. Which two presents should he buy so that he has enough money left to buy the book?

Every lesson is designed to develop deep conceptual understanding and procedural fluency in every student.

CREATE YOUR OWN

Kim planted pots of chilli plants. After she gave away pots of chilli plants, there were pots of chilli plants left. How many pots of chilli plants did Kim plant?

Read the word problem. Write the missing numbers.
How did you decide what numbers to use?
Next, solve the word problem. Show your work clearly.
What did you learn?

Books 4-6 (in physical books and MATH PRO):

- 2 x Mathematical Modelling

Books 1-6 (Math PRO only) – found at the end of each chapter of learning:

- Mind Stretcher (extension)
- Mathematical Journalling

Math Journal tasks are designed for students to use the prompts to reflect, express and clarify their mathematical thinking, and to allow teachers to observe students' growth and development in mathematical thinking and reasoning.

There are concept-based and process-based journaling tasks in **PRIME™ Mathematics** Teaching Hub.

The image displays two sample pages from a Math Journal. Each page has a header for 'Name: _____' and 'Date: _____'. The left page is titled 'Math Journal' and contains three tasks: 1. Explain what multiplication means. 2. Draw pictures to show 3×4 . 3. Write two related multiplication facts. A callout box next to it states: 'Concept-based journaling tasks help teachers elicit what the students know about the concept.' The right page is also titled 'Math Journal' and contains three tasks: 1. Write three pairs of hundreds that make 1000. 2. Show how you can subtract ones or tens from a 3-digit number with regrouping. 3. Show how you can find half of a 3-digit even number. A callout box next to it states: 'Process-based tasks help teachers understand students' thinking process through a concept.' Both pages have a red border and a yellow pencil icon at the bottom right. The number '155A' is visible at the bottom right of the right page.