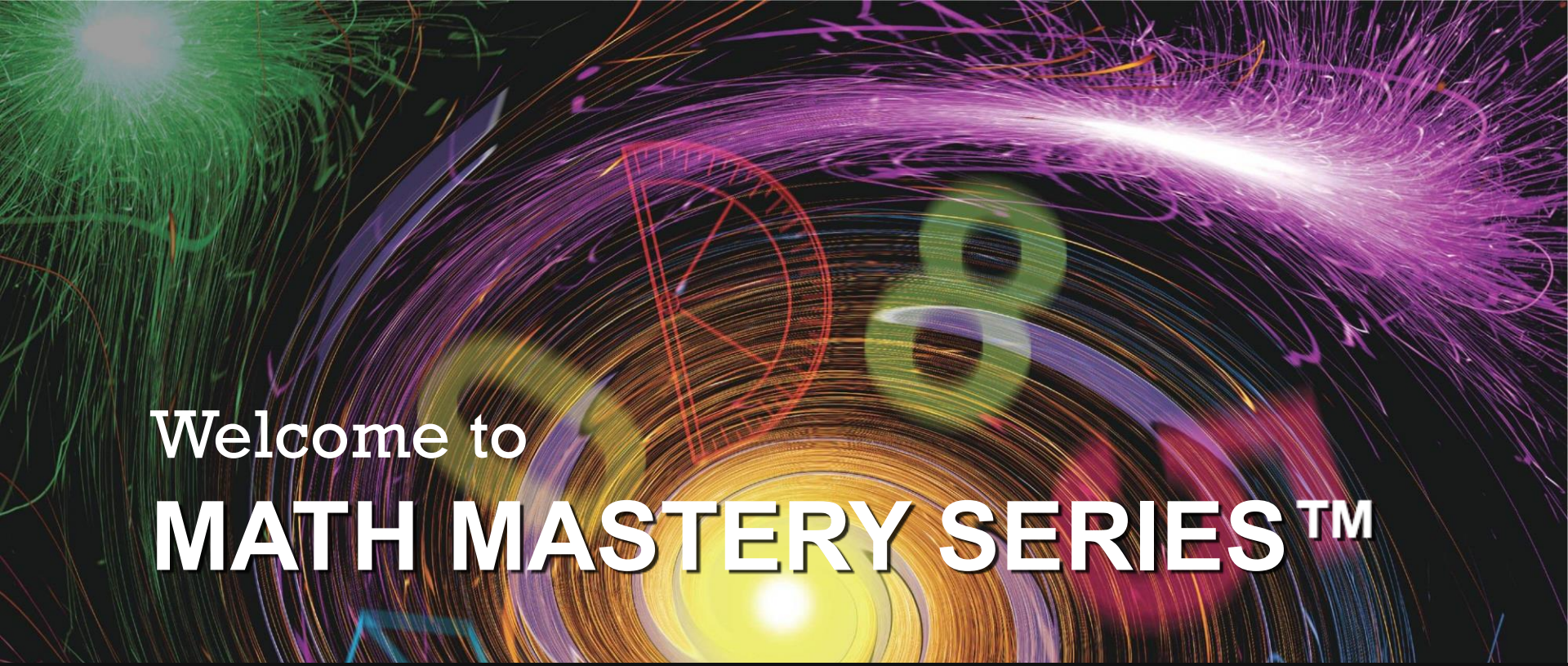


Welcome to

MATH MASTERY SERIES™

Presented by Dr Rhonda Farkota

Direct Instruction (DI)

Little to Chance — Much to Gain
Math Mastery Series

Professor John Hattie

Melbourne University
Director, Melb Ed Research Institute (MERI) and Associate Dean (Research)

Too often, what the critics mean by direct instruction is didactic teacher-led talking from the front; this should *not* be confused with the very successful Direct Instruction method as first outlined by Adams and Engelmann (1996).

… the underlying principles of DI place it among the most successful outcomes.

Visible Learning: A synthesis of over 800 meta-analyses relating to achievement (2009)
pp204–205. Routledge ISBN 10:0-415-47618-6
…the influences on student achievement – what works best for students

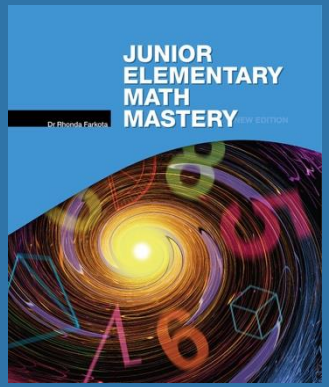
Overview

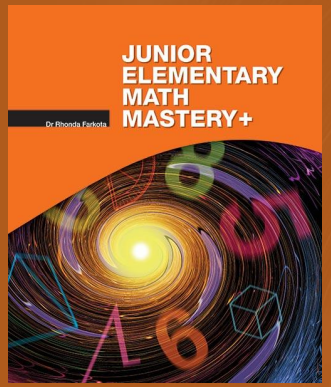
Math Mastery Series

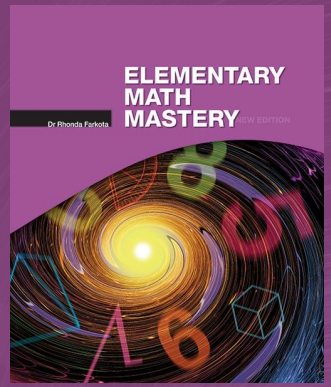
Math Mastery Series

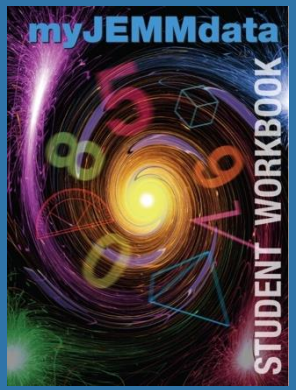
Farkota DI Model for the contemporary Australian classroom

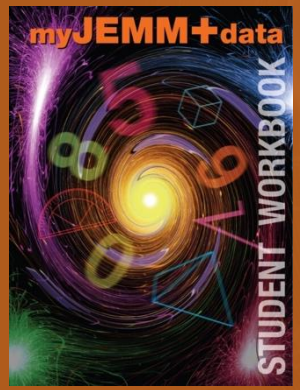
Direct Instruction approach to basic skills fluency and automaticity

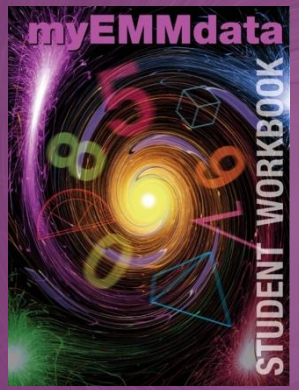












Data driven

Teachers: Deliver Diagnose DeBug
Students : Record Represent Report

Math Mastery Series


DAILY DATA

Date						BugBoard					
Round 5	Lesson 21	Lesson 22	Lesson 23	Lesson 24	Lesson 25	21	22	23	24	25	
Question 1											1
Question 2											2
Question 3											3
Question 4											4
Question 5											5
Question 6											6
Question 7											7
Question 8											8
Question 9											9
Question 10											10
Question 11											11
Question 12											12
Question 13											13
Question 14											14
Question 15											15
My score											
Out of	15	15	15	15	15						

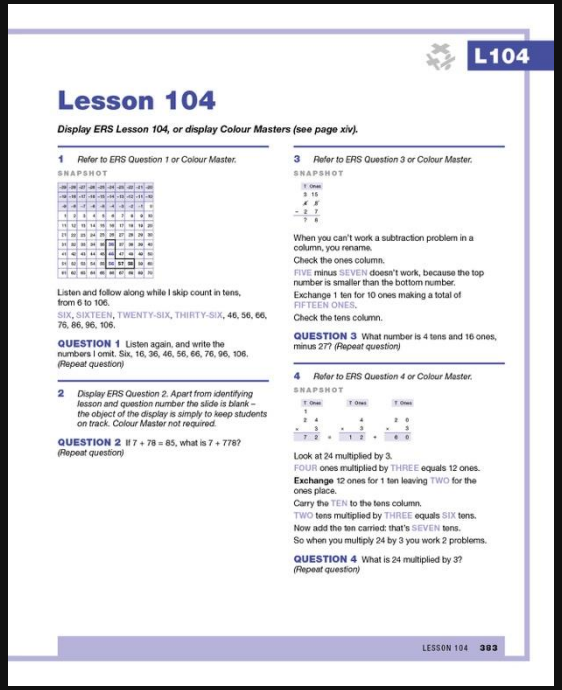
Visual representation

For each Lesson the whole of my data is represented in a column. The scale shows scores 0 to 15. I shade the column upwards stopping at my score.

After recording and summarising my data, I go to **page 24** and complete my Task for this Round.

- Orally delivered
- Imparts skills and knowledge in progressive order
- Enables teachers and students to identify exactly where and when students experience difficulty
- Serves as a daily diagnostic tool

Teacher Script



L104

Lesson 104

Display ERS Lesson 104, or display Colour Masters (see page xiv).

1 *Refer to ERS Question 1 or Colour Master.*

SNAPSHOT

Listen and follow along while I skip count in tens, from 6 to 106.

SIX, SIXTEEN, TWENTY-SIX, THIRTY-SIX, 46, 56, 66, 76, 86, 96, 106.

QUESTION 1 Listen again, and write the numbers I omit. Six, 16, 36, 46, 56, 66, 76, 96, 106. *(Repeat question)*

2 *Display ERS Question 2. Apart from identifying lesson and question number the slide is blank – the object of the display is simply to keep students on track. Colour Master not required.*

QUESTION 2 If 7 + 78 = 85, what is 7 + 778? *(Repeat question)*

3 *Refer to ERS Question 3 or Colour Master.*

SNAPSHOT

When you can't work a subtraction problem in a column, you rename.
Check the ones column.
FIVE minus SEVEN doesn't work, because the top number is smaller than the bottom number.
Exchange 1 ten for 10 ones making a total of FIFTEEN ONES.
Check the tens column.

QUESTION 3 What number is 4 tens and 16 ones, minus 27? *(Repeat question)*

4 *Refer to ERS Question 4 or Colour Master.*

SNAPSHOT

Look at 24 multiplied by 3.
FOUR ones multiplied by THREE equals 12 ones.
Exchange 12 ones for 1 ten leaving TWO for the ones place.
Carry the TEN to the tens column.
TWO tens multiplied by THREE equals SIX tens.
Now add the ten carried: that's SEVEN tens.
So when you multiply 24 by 3 you work 2 problems.

QUESTION 4 What is 24 multiplied by 3? *(Repeat question)*

LESSON 104 383

each sentence deliver in small chunks

- No lesson planning
- Teaching built into scripts
- Scripts indicate what you say, do, and display (ERS)
- Snapshots show what students see (ERS) while teacher delivers script

Electronic Reference Stimuli (ERS)

all visual diagrams, formulas and display material

- Provides effortless visual delivery
- Enhances student engagement
- Aids low-ability students
- Maximises time-efficiency

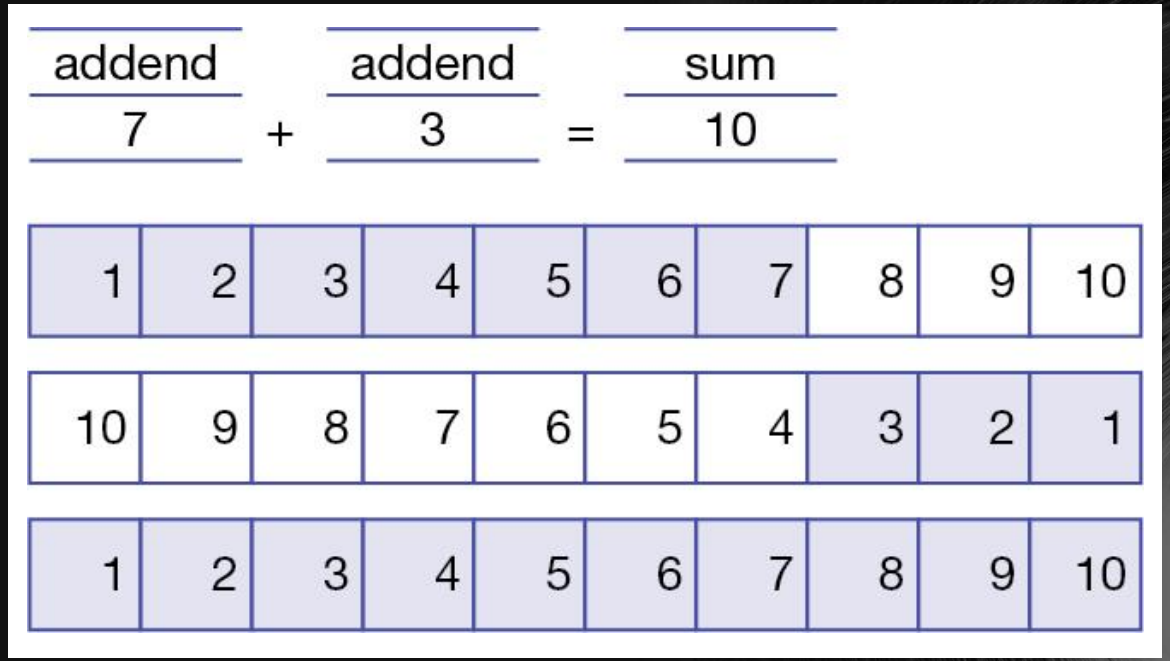
Lesson 1

Question 1

									0
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110

Lesson 1

Question 2



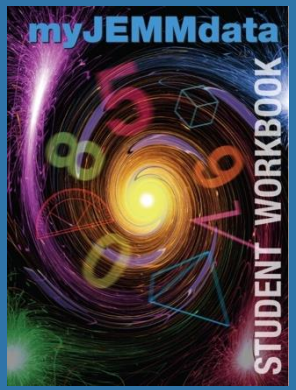
Student Workbook

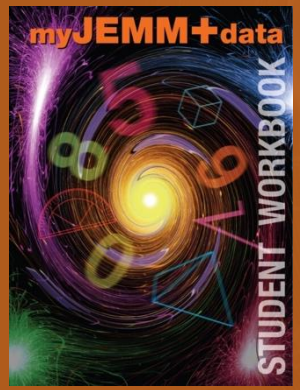
Monitors quality of implementation tracking teacher performance and student achievement

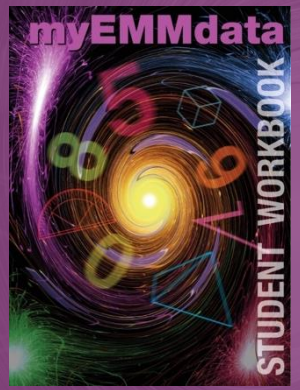
Daily students record, summarise and represent their own data

Data driven

Teachers: Deliver Diagnose DeBug
Students : Record Represent Report







Math Mastery Series

- Lessons presented orally
- Auditory processing capacity

…the ability of the child to hold, sequence and process or understand what they have heard

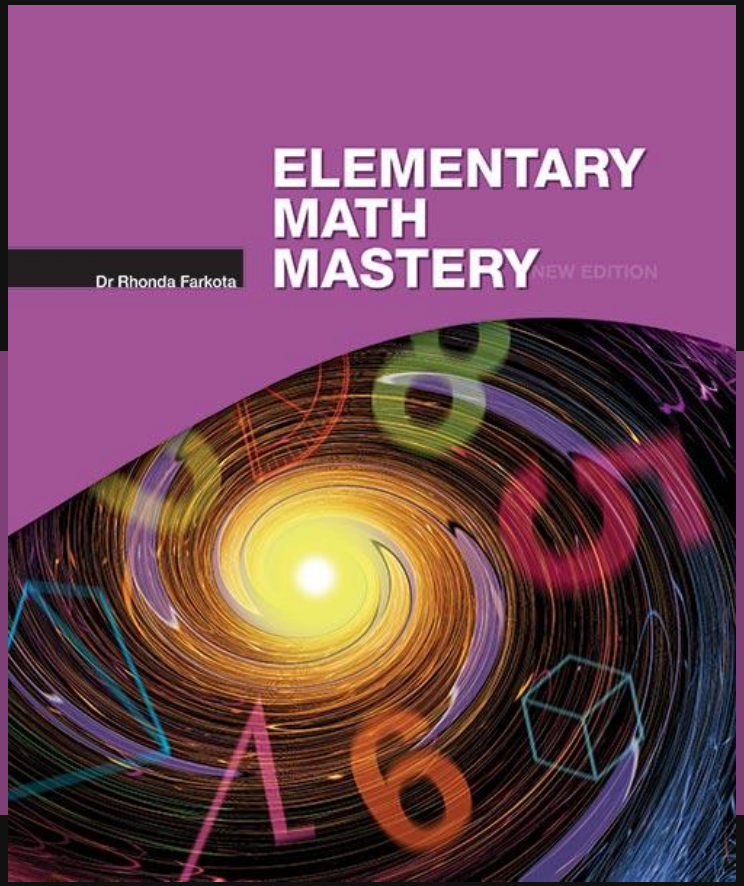
Pollard J., Rowe K. S

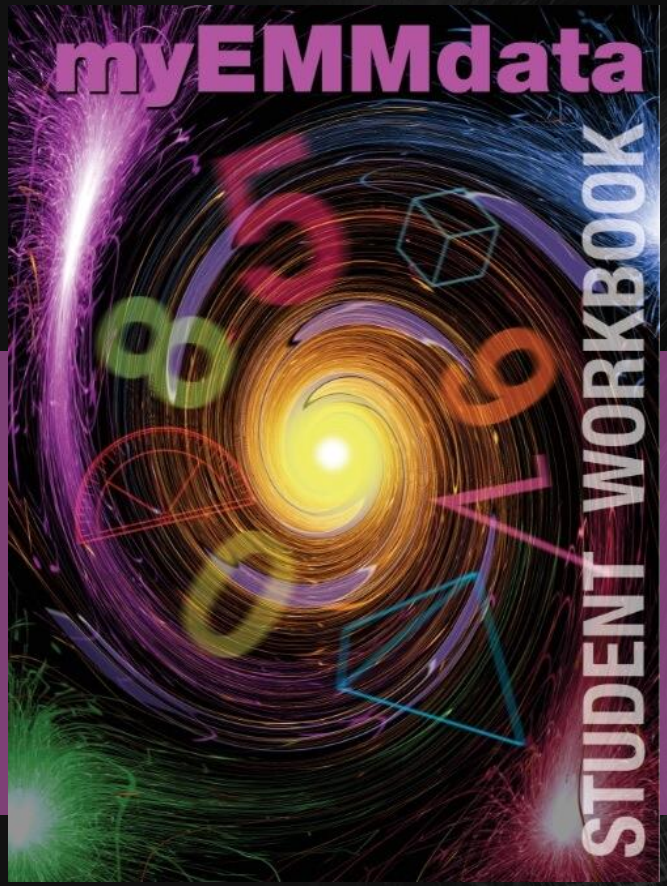
http://auditoryprocessingkit.com/auditory-processing-101.php

Math Mastery Series

	Number of sessions to complete MMS			
	EMM	JEMM+	JEMM	TOTAL
Teacher delivered scripted lessons	160	120	80	360
Student Self-evaluations	8	6	4	18
Marathons	40	30	20	90
EMM/JEMM+/JEMMathon tasks	8	6	4	18
Round tasks	24	18	12	54
Challenges	4	4	4	12
TOTAL number of sessions required	**244**	**184**	**124**	**552**

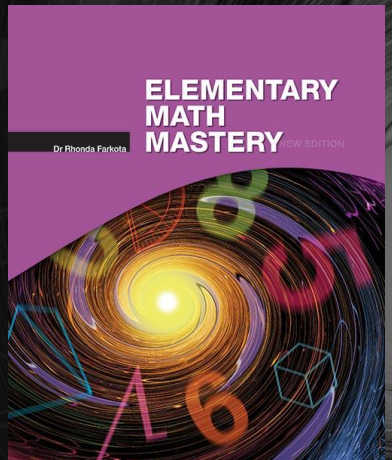
Elementary Math Mastery (EMM)


ELEMENTARY
MATH
MASTERY
Dr Rhonda Farkota


myEMMdata
STUDENT WORKBOOK

EMM

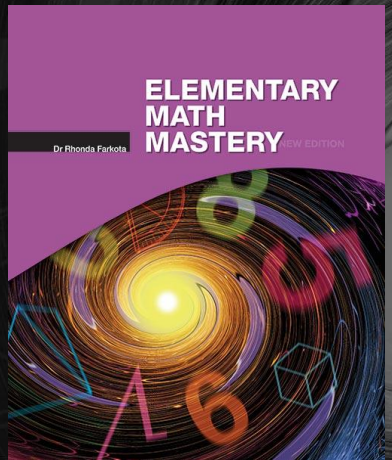
- Ideally suited to upper primary, secondary and remedial students
- Requires 20−25 min daily to implement + 5−10 min for correction and feedback
- 3200 questions
- 160 lessons
- 20 strands each lesson



20 EMM Strands

fluency
automaticity

- ✓ addition
- ✓ subtraction
- ✓ multiplication
- ✓ division
- ✓ number patterns
- ✓ equations and inverse operations
- ✓ whole number properties
- ✓ fractions
- ✓ decimals
- ✓ measurement
- ✓ space
- ✓ geometry
- ✓ average, percentage, ratio, chance
- ✓ math language
- ✓ money
- ✓ time
- ✓ algebra
- ✓ visual perception
- ✓ data analysis
- ✓ problem solving

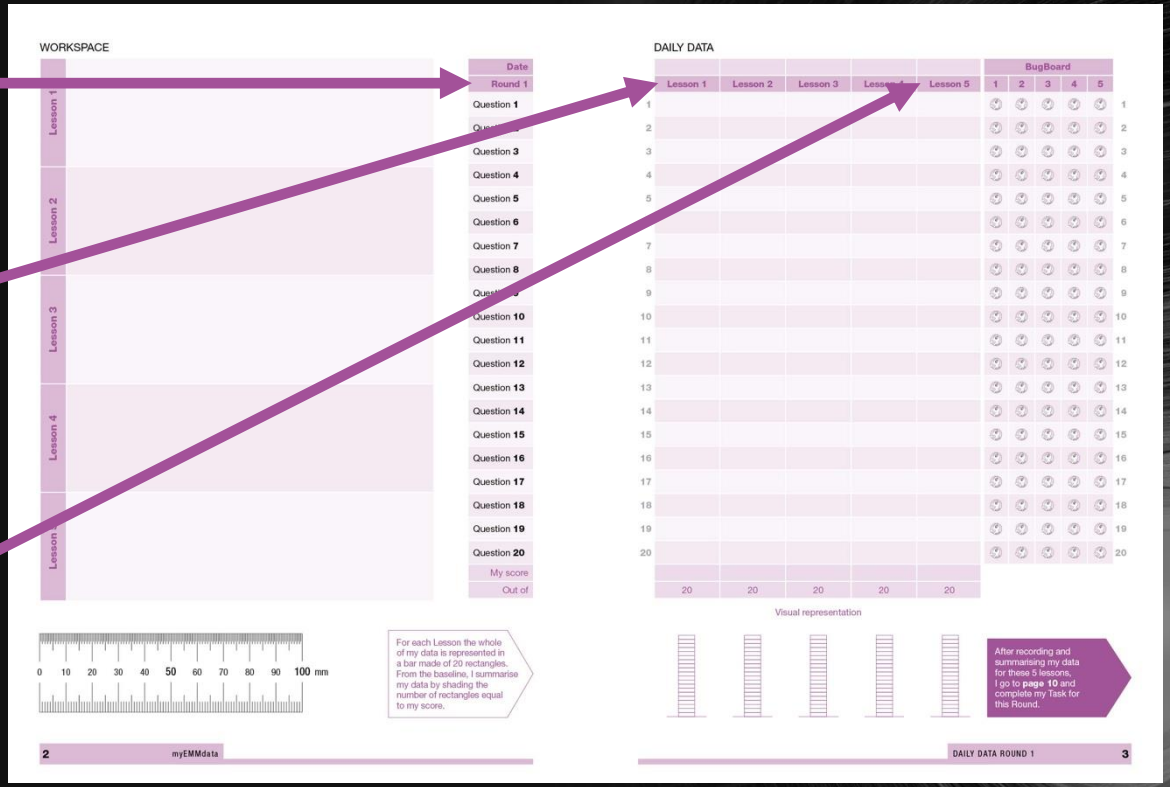


Program Structure – EMM

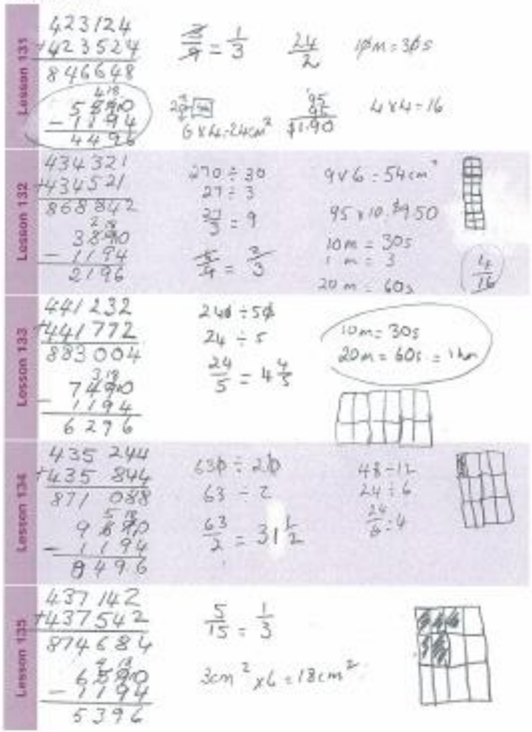
160 lessons starting at base level structured in rounds of five

New concepts introduced in first lesson of round

Last lessons of each round put these concepts to the test



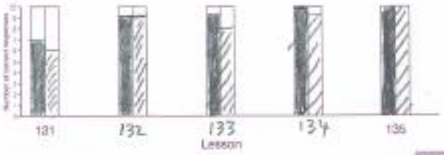
WORKSPACE



DAILY DATA

Date	3-12-12	4-12-12	5-12-12	6-12-12	7-12-12	BugBoard					
Round 27	Lesson 131	Lesson 132	Lesson 133	Lesson 134	Lesson 135	131	132	133	134	135	
Question 1	846648	868842	883004	871088	874684						1
Question 2	4496	2196	6296	8496	5396						2
Question 3	+	−	−	28 +	(9×50)+						3
Question 4	17	9	4 4/5	31 1/2	11						4
Question 5	30	15	9	63	29						5
Question 6	−	−	−	+	÷						6
Question 7	2	3	5	4	10						7
Question 8	1/3	2/3	1/5	1/3	1/3						8
Question 9	12%	14	3/100	5%	9/100						9
Question 10	200	500mL	1g	201g	210g						10
Question 11	b	b	c	a	b						11
Question 12	24cm	54cm²	6cm²	12cm²	18cm²						12
Question 13	Tail	Head	2	3	1h, 1t						13
Question 14	2	10	3	4	5						14
Question 15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						15
Question 16	3	60sec	1	2 min	1·2km						16
Question 17	15	6	30	10	25						17
Question 18	East	North	South	Northeast	SE						18
Question 19	(9, 8)	(8, 6)	Pond	PGarden	Bulb						19
Question 20	16	16	12	1/12	5/12						20
My score	13	18	17	19	20						
Out of	20	20	20	20	20						

Visual representation



KEY
Questions 1–10
Questions 11–20

For each Lesson the whole of my data is represented in 2 columns. The first column represents Question group 1–10. For this group I colour code the KEY. Next I fill in the missing labels. Then I shade the column upwards stopping at the number equal to the number of my correct responses. I repeat the process for Question group 11–20.

After recording and summarising my data, I go to page 98 and complete my Task for this Round.

What bugs you?

- BUG - incorrect response where student is unable to understand why they are wrong
- DEBUG directly after corrections
- Do not debug EMM Question 20, JEMM+ Question 15, JEMM Strategic Thinking Units

What bugs you?

…. brilliant teachers identify problems before they happen. And, the debugging process that is used in the Math Mastery Series (EMM, JEMM, JEMM+) is a great example of a timely correction process (see Boyd, MacNeill, & Sullivan, 2019).

DR RAY BOYD AND DR NEIL MACNEILL

EDUCATION TODAY FEB 10, 2023

https://www.educationtoday.com.au/news-detail/Explicit-Instruction-5836

Lesson 21 – Teacher Script

Scripts indicate what you
say, do, and display

What you stress is in **bold** text.

What you say appears in this type.

What you say and simultaneously point at on the electronic display or whiteboard appears in CAPITAL LETTERS.

13 *Refer to ERS Question 13.*

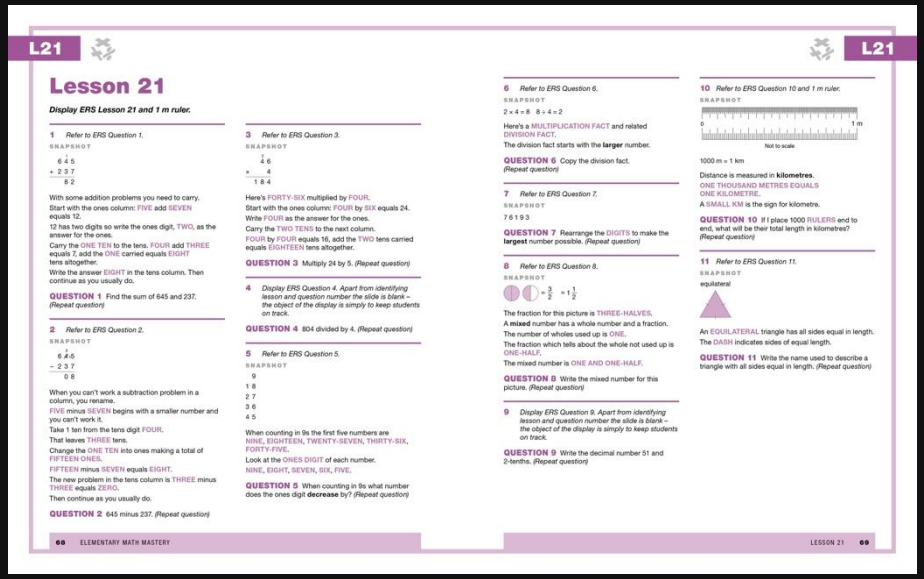
SNAPSHOT

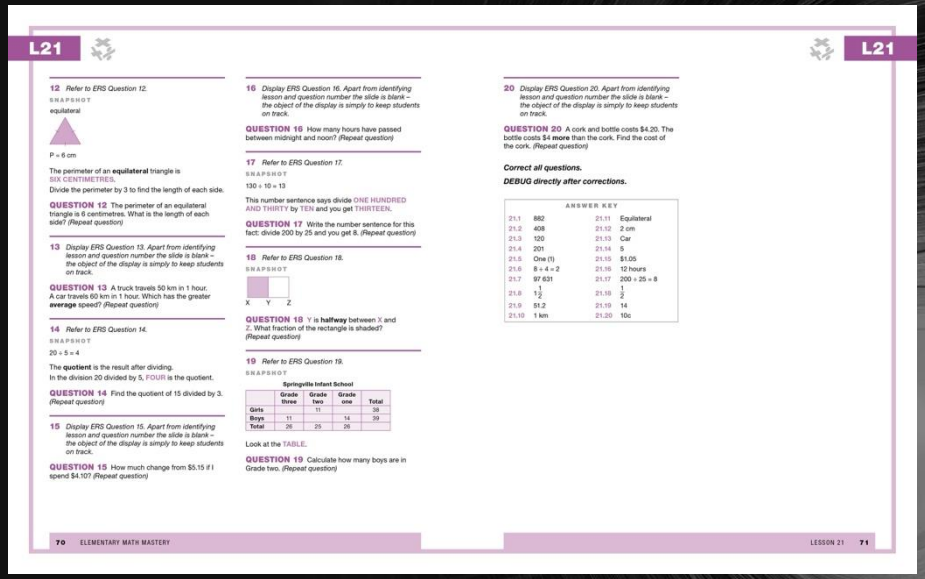
part A 1 square
part B 3 squares

The **average** tells how many there would be in each part if the total sum were evenly shared.
PART A is one part and PART B is the other part.

QUESTION 13 How many parts altogether? *(Repeat question)*

What you do appears in *italics*.





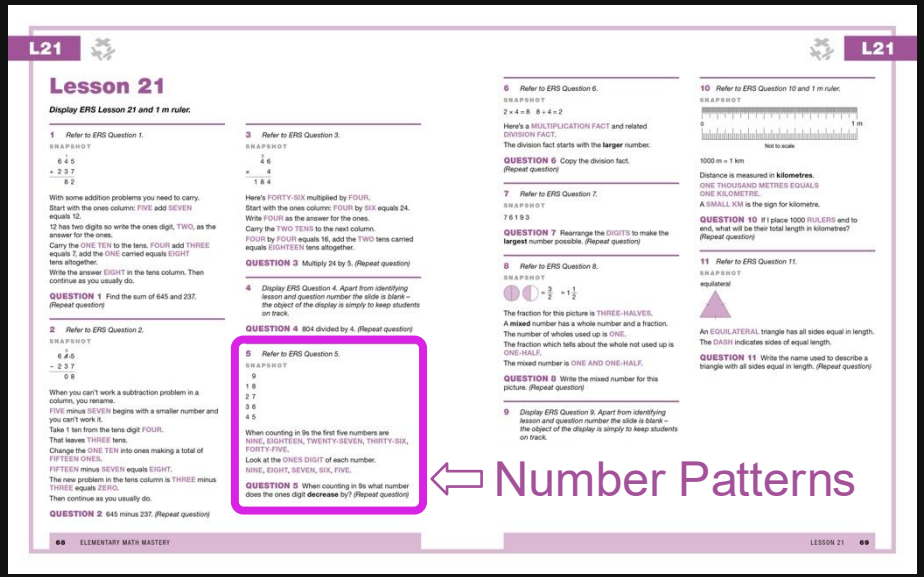
Number Patterns – Question 5

Number Patterns Continuum

- ✓ 2s counting
  Divisibility test Application
- ✓ 5s counting
  Divisibility test Application
- ✓ 9s counting
  Divisibility test Application
- ✓ 3s counting
  Divisibility test Application
- ✓ 10s counting
  Divisibility test Application
- ✓ 4s counting
  Divisibility test Application
- ✓ 8s counting
  Divisibility test Application
- ✓ 25s counting
  Money amounts
- ✓ 6s counting
  Divisibility test Application
- ✓ Missing number within pattern

Lesson 21 – Teacher Script

Scripts indicate what you say, do, and display



L21

Lesson 21

Display ERS Lesson 21 and 1 m ruler.

1 *Refer to ERS Question 1.*

SNAPSHOT

$$\begin{array}{r} 645 \\ +\ 237 \\ \hline 882 \end{array}$$

With some addition problems you need to carry.
Start with the ones column: FIVE add SEVEN equals 12.
12 has two digits so write the ones digit, TWO, as the answer for the ones.
Carry the ONE TEN to the tens. FOUR add THREE equals 7, add the ONE carried equals EIGHT tens altogether.
Write the answer EIGHT in the tens column. Then continue as you usually do.

QUESTION 1 Find the sum of 645 and 237. *(Repeat question)*

2 *Refer to ERS Question 2.*

SNAPSHOT

$$\begin{array}{r} 645 \\ -\ 237 \\ \hline 408 \end{array}$$

When you can't work a subtraction problem in a column, you rename.
FIVE minus SEVEN begins with a smaller number and you can't work it.
Take 1 ten from the tens digit FOUR.
That leaves THREE tens.
Change the ONE TEN into ones making a total of FIFTEEN ONES.
FIFTEEN minus SEVEN equals EIGHT.
The new problem in the tens column is THREE minus THREE equals ZERO.
Then continue as you usually do.

QUESTION 2 645 minus 237. *(Repeat question)*

3 *Refer to ERS Question 3.*

SNAPSHOT

$$\begin{array}{r} 46 \\ \times\ \ 4 \\ \hline 184 \end{array}$$

Here's FORTY-SIX multiplied by FOUR.
Start with the ones column: FOUR by SIX equals 24.
Write FOUR as the answer for the ones.
Carry the TWO TENS to the next column.
FOUR by FOUR equals 16, add the TWO tens carried equals EIGHTEEN tens altogether.

QUESTION 3 Multiply 24 by 5. *(Repeat question)*

4 *Display ERS Question 4. Apart from identifying lesson and question number the slide is blank – the object of the display is simply to keep students on track.*

QUESTION 4 804 divided by 4. *(Repeat question)*

5 *Refer to ERS Question 5.*

SNAPSHOT

9
18
27
36
45

When counting in 9s the first five numbers are NINE, EIGHTEEN, TWENTY-SEVEN, THIRTY-SIX, FORTY-FIVE.
Look at the ONES DIGIT of each number.
NINE, EIGHT, SEVEN, SIX, FIVE.

QUESTION 5 When counting in 9s what number does the ones digit **decrease** by? *(Repeat question)*

6 *Refer to ERS Question 6.*

SNAPSHOT

$2 \times 4 = 8 \quad 8 \div 4 = 2$

Here's a MULTIPLICATION FACT and related DIVISION FACT.
The division fact starts with the **larger** number.

QUESTION 6 Copy the division fact. *(Repeat question)*

7 *Refer to ERS Question 7.*

SNAPSHOT

7 6 1 9 3

QUESTION 7 Rearrange the DIGITS to make the **largest** number possible. *(Repeat question)*

8 *Refer to ERS Question 8.*

SNAPSHOT

$\frac{3}{2} = 1\frac{1}{2}$

The fraction for this picture is THREE-HALVES.
A **mixed** number has a whole number and a fraction.
The number of wholes used up is ONE.
The fraction which tells about the whole not used up is ONE-HALF.
The mixed number is ONE AND ONE-HALF.

QUESTION 8 Write the mixed number for this picture. *(Repeat question)*

9 *Display ERS Question 9. Apart from identifying lesson and question number the slide is blank – the object of the display is simply to keep students on track.*

10 *Refer to ERS Question 10 and 1 m ruler.*

SNAPSHOT

1000 m = 1 km

Distance is measured in **kilometres**.
ONE THOUSAND METRES EQUALS ONE KILOMETRE.
A SMALL KM is the sign for kilometre.

QUESTION 10 If I place 1000 RULERS end to end, what will be their total length in kilometres? *(Repeat question)*

11 *Refer to ERS Question 11.*

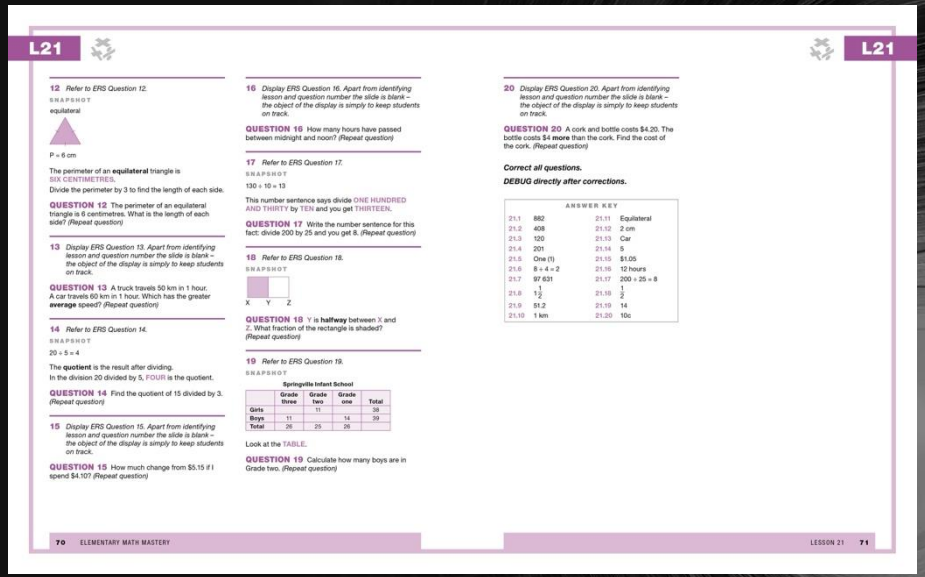
SNAPSHOT

equilateral

An EQUILATERAL triangle has all sides equal in length.
The DASH indicates sides of equal length.

QUESTION 11 Write the name used to describe a triangle with all sides equal in length. *(Repeat question)*

⇦ Number Patterns



L21

12 *Refer to ERS Question 12.*

SNAPSHOT

equilateral

P = 6 cm

The perimeter of an **equilateral** triangle is SIX CENTIMETRES.
Divide the perimeter by 3 to find the length of each side.

QUESTION 12 The perimeter of an equilateral triangle is 6 centimetres. What is the length of each side? *(Repeat question)*

13 *Display ERS Question 13. Apart from identifying lesson and question number the slide is blank – the object of the display is simply to keep students on track.*

QUESTION 13 A truck travels 50 km in 1 hour. A car travels 60 km in 1 hour. Which has the greater **average** speed? *(Repeat question)*

14 *Refer to ERS Question 14.*

SNAPSHOT

$20 \div 5 = 4$

The **quotient** is the result after dividing.
In the division 20 divided by 5, FOUR is the quotient.

QUESTION 14 Find the quotient of 15 divided by 3. *(Repeat question)*

15 *Display ERS Question 15. Apart from identifying lesson and question number the slide is blank – the object of the display is simply to keep students on track.*

QUESTION 15 How much change from $5.15 if I spend $4.10? *(Repeat question)*

16 *Display ERS Question 16. Apart from identifying lesson and question number the slide is blank – the object of the display is simply to keep students on track.*

QUESTION 16 How many hours have passed between midnight and noon? *(Repeat question)*

17 *Refer to ERS Question 17.*

SNAPSHOT

$130 \div 10 = 13$

This number sentence says divide ONE HUNDRED AND THIRTY by TEN and you get THIRTEEN.

QUESTION 17 Write the number sentence for this fact: divide 200 by 25 and you get 8. *(Repeat question)*

18 *Refer to ERS Question 18.*

SNAPSHOT

QUESTION 18 Y is **halfway** between X and Z. What fraction of the rectangle is shaded? *(Repeat question)*

19 *Refer to ERS Question 19.*

SNAPSHOT

Springville Infant School

	Grade three	Grade two	Grade one	Total
Girls		11		38
Boys	11	8	14	39
Total	26	25	28	

Look at the TABLE.

QUESTION 19 Calculate how many boys are in Grade two. *(Repeat question)*

20 *Display ERS Question 20. Apart from identifying lesson and question number the slide is blank – the object of the display is simply to keep students on track.*

QUESTION 20 A cork and bottle costs $4.20. The bottle costs **$4 more** than the cork. Find the cost of the cork. *(Repeat question)*

Correct all questions.

DEBUG directly after corrections.

ANSWER KEY

21.1	882	21.11	Equilateral
21.2	408	21.12	2 cm
21.3	120	21.13	Car
21.4	201	21.14	5
21.5	One (1)	21.15	$1.05
21.6	$8 \div 4 = 2$	21.16	12 hours
21.7	97 631	21.17	$200 \div 25 = 8$
21.8	$1\frac{1}{2}$	21.18	$\frac{1}{2}$
21.9	51.2	21.19	14
21.10	1 km	21.20	10c

Lesson 21

5 *Refer to ERS Question 5.*

SNAPSHOT

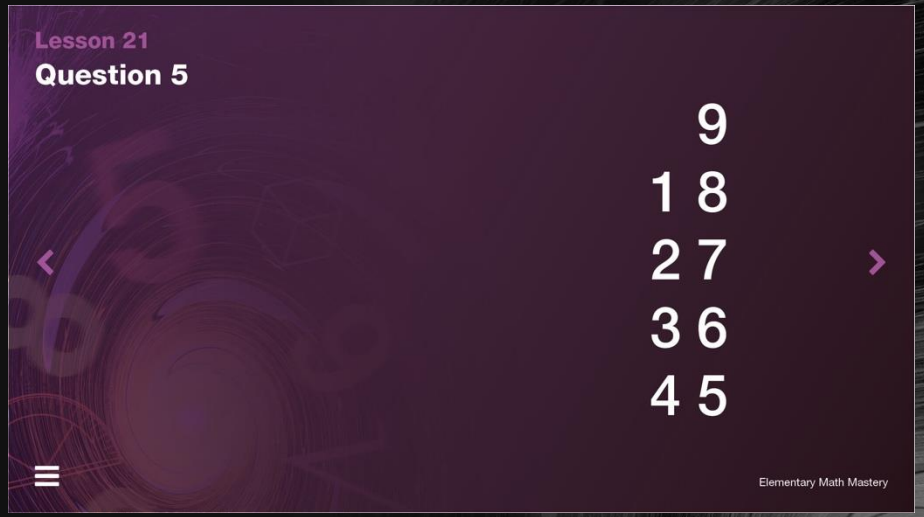
9
1 8
2 7
3 6
4 5

When counting in 9s the first five numbers are **NINE**, **EIGHTEEN**, **TWENTY-SEVEN**, **THIRTY-SIX**, **FORTY-FIVE**.

Look at the **ONES DIGIT** of each number.

NINE, **EIGHT**, **SEVEN**, **SIX**, **FIVE**.

QUESTION 5 When counting in 9s what number does the ones digit **decrease** by? *(Repeat question)*



Strand development – first lesson of Round 5
Section 5: NUMBER PATTERNS
introducing 9s – recognise place value (ones)

Students do not see the teacher's script (shown above). Before reaching this stage of the lesson, the teacher presented sections 1 - 4 (addition, subtraction, multiplication and division).

Lesson 22

5 *Refer to ERS Question 5.*

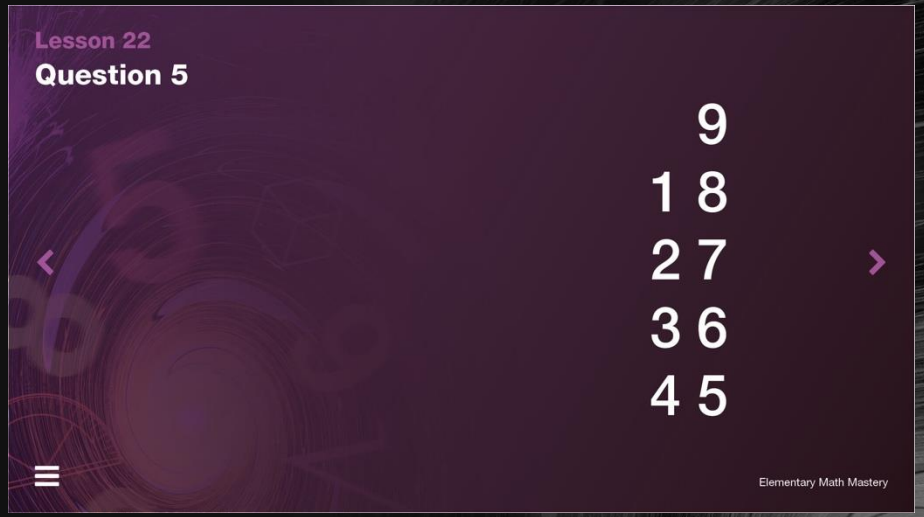
SNAPSHOT

9
1 8
2 7
3 6
4 5

When counting in 9s the first five numbers are **NINE**, **EIGHTEEN**, **TWENTY-SEVEN**, **THIRTY-SIX**, **FORTY-FIVE**.

Look at the **TENS DIGIT** of each number.
ONE, **TWO**, **THREE**, **FOUR**.

QUESTION 5 When counting in 9s what number does the tens digit **increase** by? *(Repeat question)*



Strand development – second lesson of Round 5
Section 5: NUMBER PATTERNS
introducing 9s – recognise place value (tens)

Lesson 23

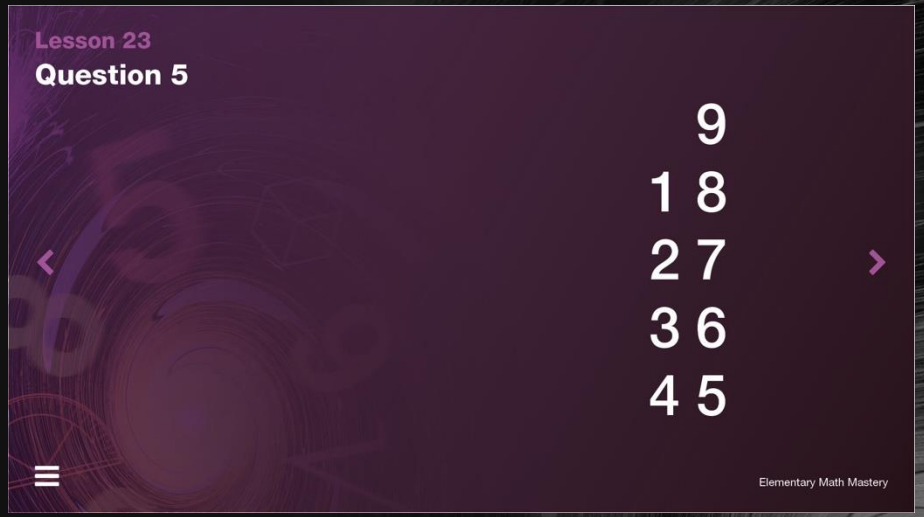
5 *Refer to ERS Question 5.*

SNAPSHOT

9
1 8
2 7
3 6
4 5

When counting in 9s the first five numbers are **NINE**, **EIGHTEEN**, **TWENTY-SEVEN**, **THIRTY-SIX**, **FORTY-FIVE**.

QUESTION 5 When counting in 9s the ones digit decreases by 1 and the tens digit increases by 1. When counting in 9s what number comes just **after** 45? *(Repeat question)*



Strand development – third lesson of Round 5
Section 5: NUMBER PATTERNS
Continue 9s pattern

Lesson 24

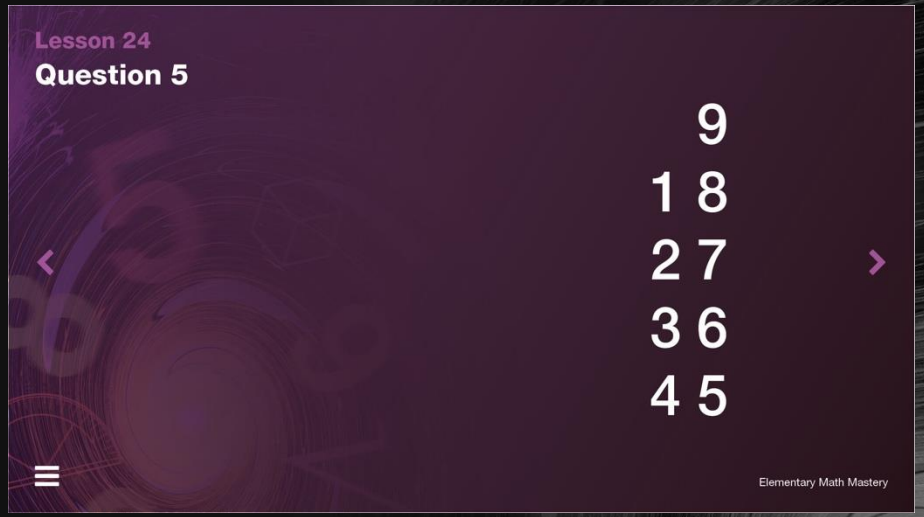
5 *Refer to ERS Question 5.*

SNAPSHOT

9
1 8
2 7
3 6
4 5

When counting in 9s the first five numbers are **NINE**, **EIGHTEEN**, **TWENTY-SEVEN**, **THIRTY-SIX**, **FORTY-FIVE**.

QUESTION 5 When counting in 9s the ones digit decreases by 1 and the tens digit increases by 1. When counting in 9s what number comes just **before** 81? *(Repeat question)*



Strand development – fourth lesson of Round 5
Section 5: NUMBER PATTERNS
Extend 9s pattern

Lesson 25

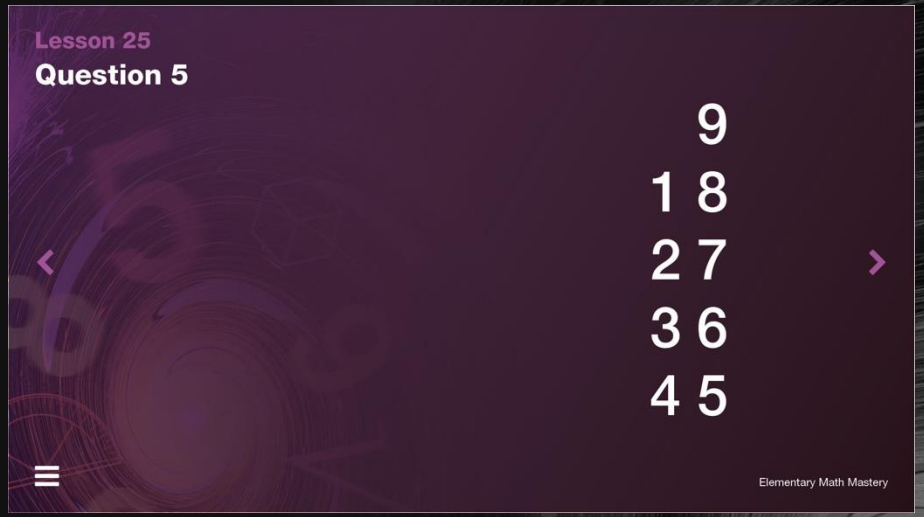
5 *Refer to ERS Question 5.*

SNAPSHOT

9
1 8
2 7
3 6
4 5

When counting in 9s the first five numbers are **NINE**, **EIGHTEEN**, **TWENTY-SEVEN**, **THIRTY-SIX**, **FORTY-FIVE**.

QUESTION 5 When counting in 9s what number comes just **before** 63, and what number comes just **after** 63 when counting in 9s? *(Repeat question)*

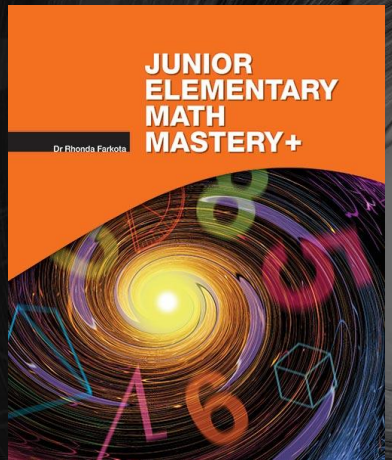


Strand development – last lesson of Round 5
Section 5: NUMBER PATTERNS
understanding 9s – put to the test

15 JEMM+ Strands

fluency
automaticity

- ✓ counting
- ✓ addition
- ✓ subtraction
- ✓ multiplication
- ✓ division
- ✓ number patterns
- ✓ fractions
- ✓ decimals
- ✓ measurement
- ✓ space
- ✓ money
- ✓ time
- ✓ visual perception
- ✓ data and chance
- ✓ problem solving

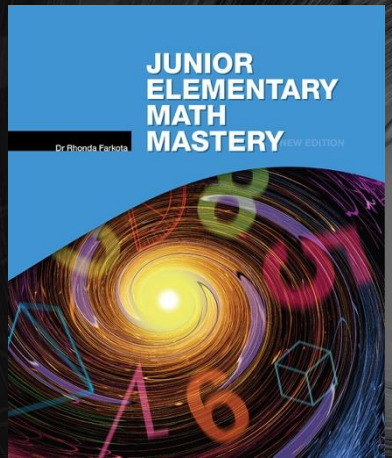


10 JEMM Strands

- ✓ addition
- ✓ subtraction
- ✓ number facts
- ✓ place value
- ✓ number patterns
- ✓ money
- ✓ measurement
- ✓ fractions
- ✓ time
- ✓ data and chance

fluency
automaticity

strategic thinking: a hands-on approach to problem solving



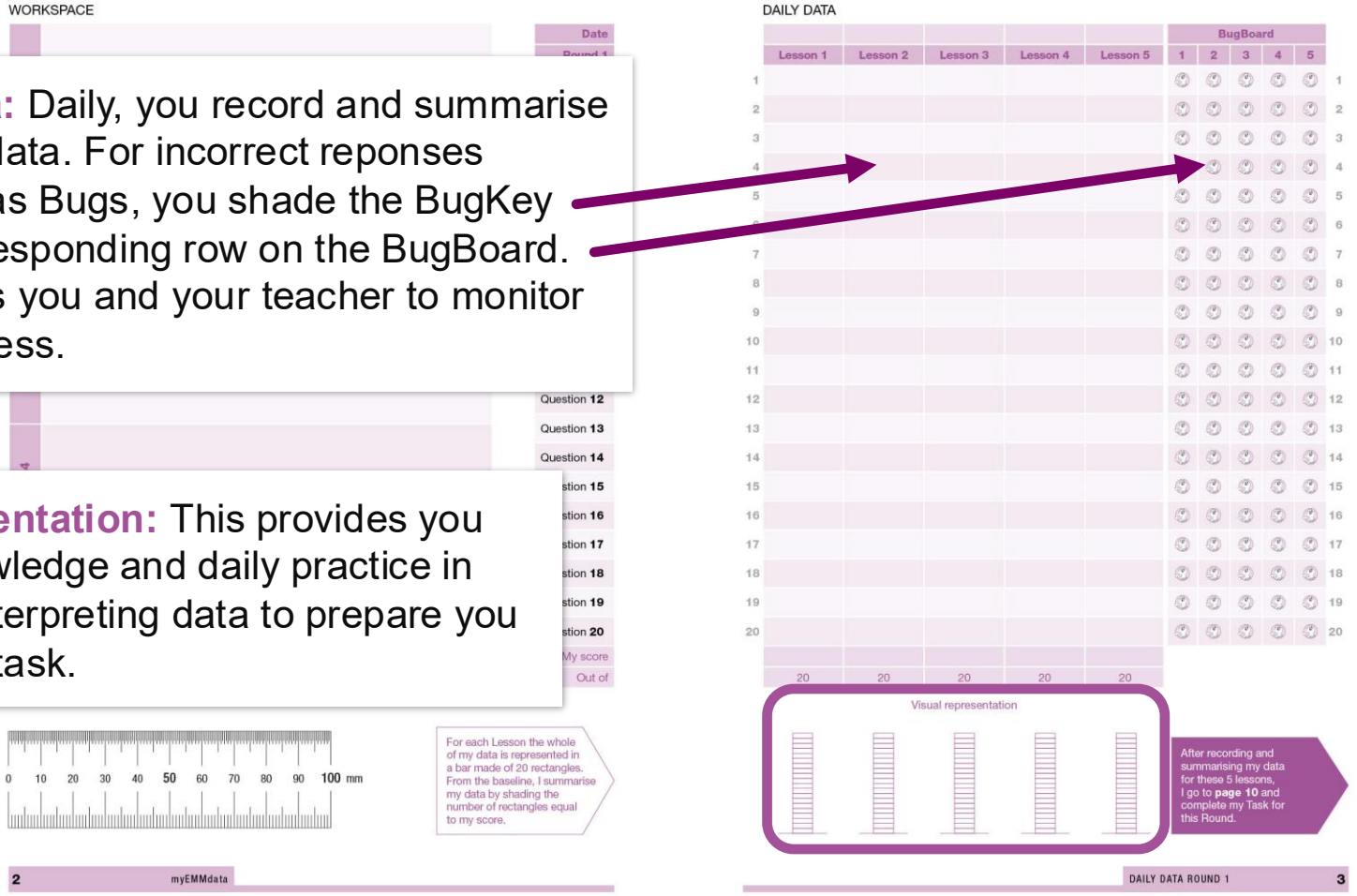
myEMMdata
Student Workbook

https://mathmasteryseries.com.au/student-workbook/

Daily Data: Daily, you record and summarise your own data. For incorrect reponses classified as Bugs, you shade the BugKey in the corresponding row on the BugBoard. This allows you and your teacher to monitor your progress.

Visual representation: This provides you with base knowledge and daily practice in reading and interpreting data to prepare you for the Round task.

myEMMdata
p 2–3



What bugs you?

Feedback originates from the student. When melded with the teachers ‘correctional review’, feedback becomes a new instruction rather than a mere correction (Kulhavy, 1977). Skilled questioning by the teacher will enhance existing knowledge and ‘guide learners to thoughtful and reflective answers’ (Samson, Strykowski, Weinstein, & Walberg, 1987).

See next slide for References and suggested reading on Feedback >

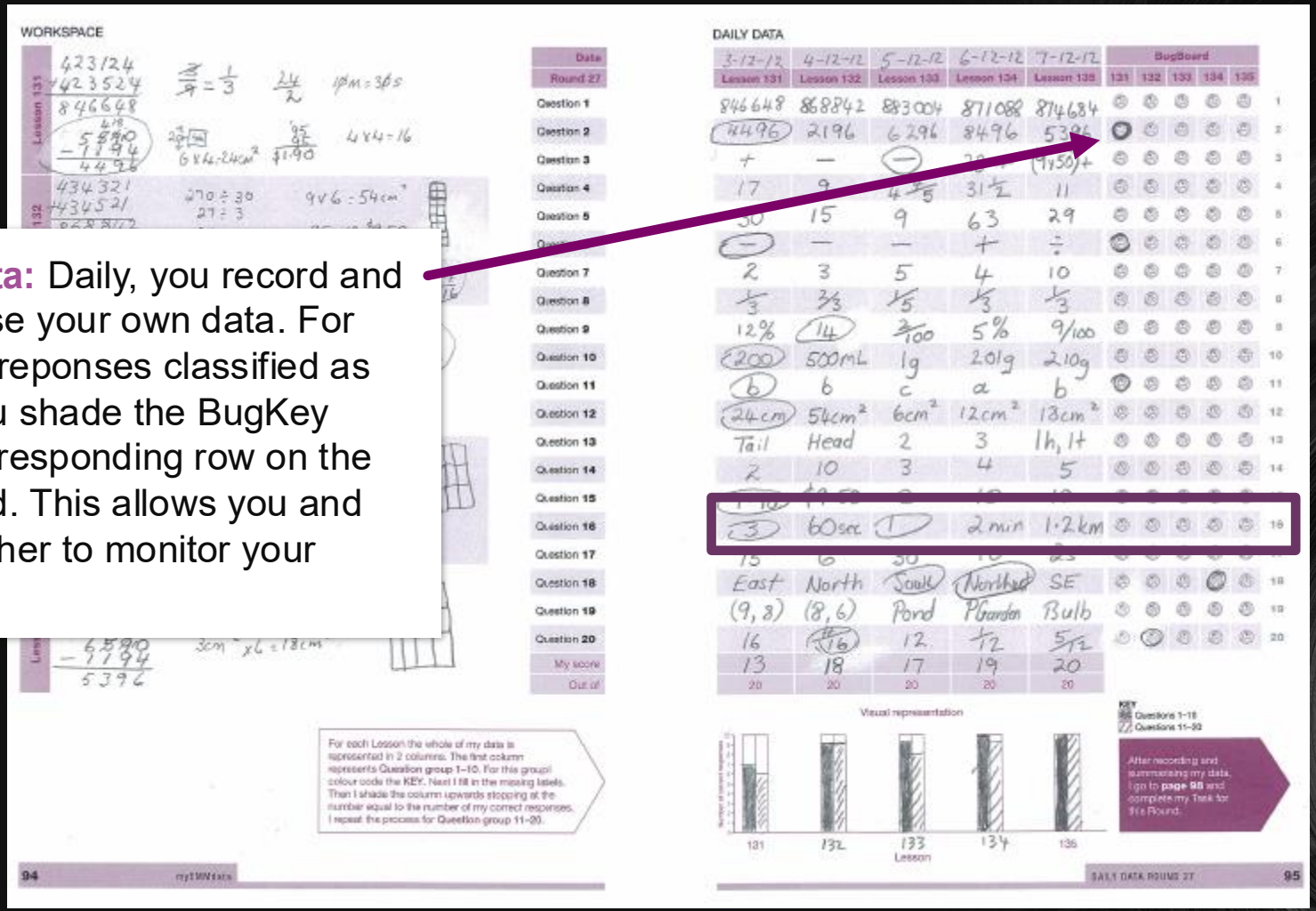
References

Hattie, J. (2008). Visible learning pp 173-184 Routledge.

Kulhavy, R. W. (1977). Feedback in Written Instruction. Review of Educational Research, 47(2), 211-232.

Samson, G. K., Strykowski, B., Weinstein, T., & Walberg, H. J.(1987). The Effects of Teacher Questioning Levels on Student Achievement: A Quantitative Synthesis. The Journal of Educational Research, 80(5), 290–295. https://doi.org/10.1080/00220671.1987.10885769

Daily Data: Daily, you record and summarise your own data. For incorrect reponses classified as Bugs, you shade the BugKey in the corresponding row on the BugBoard. This allows you and your teacher to monitor your progress.



myEMMdata
p 52–53

myJEMM+data
p 38–39

myJEMMdata
p 52–53

ROUND 13 TASK

STEP 1 Look at the Graph titled How Sam scored points Round 13: Questions 1–10. Each space represents one score point. The KEY gives category information about each space. For example, Sam scored 3 for Question 2.

STEP 2 Use the Graph and Record table titled How Sam scored points Round 13: Questions 1–10, to answer these questions:

a. How many points did Sam score for Question 5?
b. How many points did he score for Number patterns?
c. For which question did he score most points?
d. What is the maximum possible Sam can score for Questions 1–10 in one Lesson?
e. What is his total score for Round 13 Questions 1–10?
f. What fraction of the whole represents points he did not score?

END OF TASK

ROUND 14 TASK

STEP 1 In the Record table titled How I scored points Rounds 14 and 15: Questions 1–10, put ticks in each lesson column (66–70) to show how you scored points in Round 14.

STEP 2 Use the Record table to answer these questions:

a. How many points did you score for Question 5?
b. How many points did you score for Number patterns?
c. For which question/s did you score most points?
d. What is the maximum possible you can score for Questions 1–10 in one Lesson?
e. What is your total score for Round 14 Questions 1–10?
f. What fraction of the whole represents points you did not score?

END OF TASK

STEP 1 In the Record table titled How I scored points Rounds 14 and 15: Questions 1–10, put ticks in each lesson column (71–75) to show how you scored points.

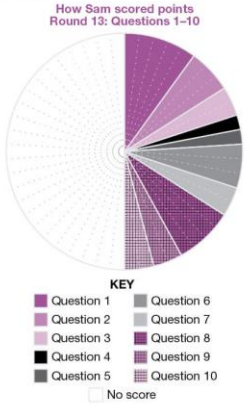
STEP 2 Look at the Graph titled How I scored points Round 15: Questions 1–10. Each space represents one score point. The KEY gives category information about each space. Use a different colour and/or pattern to code

RECORD TABLE

How Sam scored points Round 13: Questions 1–10

Round	13				
Lesson	61	62	63	64	65
Question 1 Addition	✔	✔	✔	✔	✔
Question 2 Subtraction		✔	✔		✔
Question 3 Multiplication	✔	✔			
Question 4 Division				✔	
Question 5 Number patterns			✔		
Question 6 Equation and inverse operations	✔	✔			✔
Question 7 Whole number properties				✔	✔
Question 8 Fractions		✔	✔	✔	✔
Question 9 Decimals				✔	✔
Question 10 Measurement				✔	✔

GRAPH

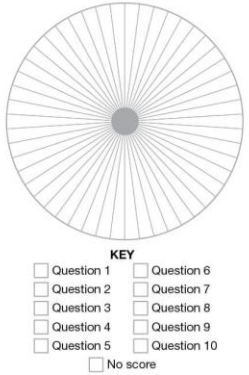


RECORD TABLE

How I scored points Rounds 14 and 15: Questions 1–10

Round	14					15				
Lesson	66	67	68	69	70	71	72	73	74	75
Question 1 Addition										
Question 2 Subtraction										
Question 3 Multiplication										
Question 4 Division										
Question 5 Number patterns										
Question 6 Equation and inverse operations										
Question 7 Whole number properties										
Question 8 Fractions										
Question 9 Decimals										
Question 10 Measurement										

GRAPH



ROUND 13–15 TASKS 53

Round Task: EMM is structured into 32 rounds each consisting of 5 lessons. At the end of each round you read, interpret and complete tables and graphs building on the visual representation knowledge you have acquired.

myEMMdata
p 12–13

myJEMM+data
p 12–13

myJEMMdata
p 12–13

I enter my data in the table on the facing page then complete the Self-evaluation below.

EMM Student Self-evaluation

Lessons **1** to **20**

Name _____ Date ____/____/____

In the last twenty lessons my scores are as follows:

		Score	Out of
1	Addition		20
2	Subtraction		20
3	Multiplication		20
4	Division		20
5	Number patterns		20
6	Equations and inverse operations		20
7	Whole number properties		20
8	Fractions		20
9	Decimals		20
10	Measurement		20
11	Space		20
12	Geometry		20
13	Average, percentage, ratio, chance		20
14	Math language		20
15	Money		20
16	Time		20
17	Algebra		20
18	Visual perception		20
19	Data analysis		20
20	Problem solving		20

From these scores I make the following assessment of my progress:

- My EMM strand of strength is _____ because _____
- The EMM strand I most need to improve is _____
- I can improve my overall EMM scores by _____
- The amount of effort I put into these lessons was _____
- At the moment EMM is making me feel _____

My teacher's comment:

MY TOTAL SCORE

	Round 1	Round 2	Round 3	Round 4	My score	Out of
Question 1 Addition						20
Question 2 Subtraction						20
Question 3 Multiplication						20
Question 4 Division						20
Question 5 Number patterns						20
Question 6 Equations and inverse operations						20
Question 7 Whole number properties						20
Question 8 Fractions						20
Question 9 Decimals						20
Question 10 Measurement						20
Question 11 Space						20
Question 12 Geometry						20
Question 13 Average, percentage, ratio, chance						20
Question 14 Math language						20
Question 15 Money						20
Question 16 Time						20
Question 17 Algebra						20
Question 18 Visual perception						20
Question 19 Data analysis						20
Question 20 Problem solving						20

Self-evaluation: After each group of 20 lessons you self-evaluate and reflect on your growth in knowledge, understanding and achievement.

MMSanimation

Voice-over with animation: animations reflect that critical part of Math Mastery Series lesson script (shown in coloured CAPS) requiring the teacher to point on the electronic display.

Elementary Math Mastery

Lesson 21

Question 5

9

1 8

2 7

3 6

4 5

Lesson 1
Question 2

addend		addend		sum
7	+	3	=	10

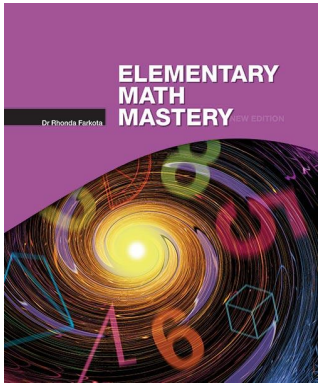
1	2	3	4	5	6	7	8	9	10
10	9	8	7	6	5	4	3	2	1
1	2	3	4	5	6	7	8	9	10

Each program, JEMM, JEMM+ and EMM, comprises:

Teacher Book

Contains presentation lesson scripts with exact instructional wording.

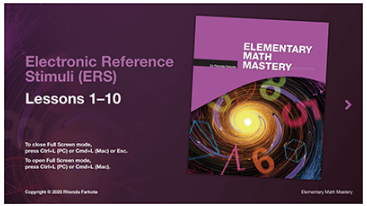
JEMM	80 lessons
JEMM+	120 lessons
EMM	160 lessons



Electronic Reference Stimuli (ERS)

Includes all visual diagrams, formulas and display material (free download provided with the purchase of Teacher Book).

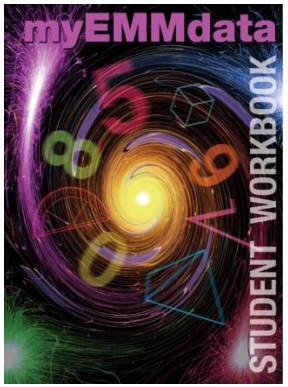
JEMM	680 ERS stims
JEMM+	1800 ERS stims
EMM	3200 ERS stims



Student Workbook

An academic journal where students record, analyse and map performance.

myJEMMdata	92 pages
myJEMM+data	124 pages
myEMMdata	152 pages



MMSanimation

JEMManimation
JEMM+animation
EMManimation

Voice-over with animation: the animations reflect that critical part of the Math Mastery Series lesson script (shown in coloured CAPS) requiring the teacher to point on the electronic display.

JEMM	680 videos
JEMM+	1800 videos
EMM	3200 videos

You can access MMSanimation Lessons 1-10 freely.

Research on Learning

The effectiveness of the Math Mastery Series is dependent on the quality of implementation. Where the quality of implementation is high, and when implemented as prescribed, effective learning is assured.

Teacher Book Introduction and sample lessons: https://mathmasteryseries.com.au/sample-materials/

Implementation Plan: https://mathmasteryseries.com.au/implementation-plan/

Implementation Checklist: https://mathmasteryseries.com.au/implementation-checklist/

Professional Learning Reading Plan:
https://mathmasteryseries.com.au/professional-learning-reading-plan/

Resources to assist the teacher in introducing aspects of Student Workbooks:
https://mathmasteryseries.com.au/student-workbook/

MMSanimation: mathmasteryseries.com.au/mmsanimation/
and select **EMManimation** or JEMM+animation or **JEMManimation**

Dr Rhonda Farkota

Monash University

The effects of DI in the regular math class on student self-efficacy and achievement.

http://www.acer.org/files/FarkotaThesis.pdf

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0448 660 696