

What are HEADS UP *maths workouts*?

The **HEADS UP *maths workouts*** programme is an in-class or homework system that provides a **comprehensive review of mathematical skills and concepts**. It is constructed to build **mathematical knowledge** through regular, organised, cyclical practice and review. It reflects the new **National Standards** and aims to raise student achievement.

DAY 1

Basic Facts: **Addition**

1. **Numeracy** (Whole Numbers)
2. **Numeracy** (Place Value)
3. **Numeracy** (Number Sense)
4. **Numeracy** (Basic Operations)
5. **Numeracy** (Fractions)

DAY 2

Basic Facts: **Subtraction**

6. **Numeracy** (Fractions)
7. **Decimals**
8. **Patterns**
9. **Vocabulary**

DAY 3

Basic Facts: **Multiplication**

10. **Algebra**
11. **Geometry**
12. **Geometry**
13. **Measurement**
14. **Measurement**

DAY 4

Basic Facts: **Division**

15. **Position**
16. **Statistics**
17. **Probability**

DAY 5

Problem-solving

Fig. 1

HEADS UP *maths workouts* are daily review in individual student workbooks. Components of the programme include:

- **Student Workbooks.** – Each student receives two 64-page workbooks that cover the school year. Each workbook covers 15 CYCLES, a total of 30 for the year (one CYCLE = 5 pages or a week of work). Over one CYCLE, five workout pages, the workbook covers 14 concepts (see *Fig 1*), basic facts, and one problem-solving question.
- **Student Tracking.** The inside cover of the workbook has a Tracking Sheet on which students record their results.
- **Teacher Resource.** The Teacher's Manual includes information about the **HEADS UP** programme, photocopiable Tracking Sheets, grids of Sample Problems.
- **Grids of Learning Intentions, National Standards and Sample Problems.** Grids of concepts and skills with associated Learning Intentions, National Standards and Numeracy Stages are found in the Teacher Manual

How and when do I use HEADS UP?

The features of **HEADS UP *maths workouts*** allow for many teaching and management preferences. **HEADS UP** does not prescribe how to teach; teachers are inventive and have their own styles. However, we offer some suggestions and ideas from other teachers:

- **Beginning of school as the first activity of the day or as maintenance at the beginning of the daily math session.**

A **HEADS UP maths workout** is an excellent start and routine for the beginning of the school day or maths class. When the students enter the classroom they do the next **workout** in the CYCLE.

- **One day a week in maths class as weekly review.**

Set aside one day a week as a **HEADS UP** review time. The students work through all five pages for that CYCLE. The teacher is available to help individual students with problem areas.

- **Daily maths homework.**

A page from the **HEADS UP maths workouts** can be used as daily homework or as a combination of in-class and homework.

Whatever strategy is used, the students will be maintaining their memory through regular, cyclic review of skills and concepts from the NZ Curriculum.

Features of HEADS UP maths workouts

ORGANISATION OF DAILY PAGES

	3	9	2	4	5	10	6	7
+ 4								

1 Write a COMPACT NUMBER for: $3\ 000 + 500 + 10 + 4$

2 What is the TOTAL VALUE of the underlined DIGIT?

a) 2 694 b) 7 382 c) 9 650

a) _____
 b) _____
 c) _____

3 Circle the ODD numbers. 77 144 44 123 64

4 Use a strategy to find the SUM. Show your thinking.

$403 + 398 =$

5 Write a FRACTION for the part of the CIRCLE that is shaded.

CYCLE 1

Whole Numbers	1
Place Value	2
Number Sense	3
Basic Operations	4
Fractions	5

In the upper corner of each page is the CYCLE number with the problem types for that day. These concepts are identified on the Student Tracking sheet as well.

Every number covers the same concept. Example: all question 2's are Numeracy (Place Value) and Question 5 always relates to Fractions.

Within each concept, the geometric shape identifies a CYCLE group. For example, all triangular shapes for #5 will have similar wording. This provides the repetition that builds memory. The specific component of the concept is repeated for three CYCLES and reviewed twice more several CYCLES later.

NAME _____

Orange 1 TRACKING

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Addition Facts
 Subtraction Facts
 Multiplication Facts
 Division Facts

DAY 1

1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Whole Numbers
Place Value

STUDENT TRACKING

A Student Tracking Sheet is found on the inside front cover of each workbook.

Tracking encourages **self-management**; it is a visual presentation of successes, weaknesses and improvements.

Again, teachers have their own styles and methods for marking work. We suggest, however, giving students responsibility for tracking so that they can watch their progress. See Fig. 2 for an example of a completed Tracking Sheet.

Features of Tracking:

- CYCLE number
- Number of correct basic facts out of 8.
- Correct answers tracked
- Area of weakness – needs attention
- Total correct problems for the CYCLE.

NAME _____															Orange 1 TRACKING																																																																																																	
V															1 2 3 4 5 6 7 8 9 10 11 12 13 14 15																																																																																																	
6	8	8	7	8	8	8	8	8	8	8	8	8	8	8	6	8	8	Addition Facts	8	7	8	7	8	8	8	8	6	8	8	8	8	8	7	8	Subtraction Facts	6	5	7	7	8	8	7	8	7	8	8	8	8	8	6	5	7	Multiplication Facts	5	8	7	5	8	7	6	8	7	8	8	5	6	8	Division Facts																																												
DAY 1															DAY 2																																																																																																	
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DAY 3															DAY 4																																																																																																	
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Fractions	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Decimals	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	Patterns	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	Vocabulary	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
DAY 5															DAY 5																																																																																																	
P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Position	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Statistics	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	Probability	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17		18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18																				
TOTAL CORRECT															TOTAL CORRECT																																																																																																	

Topics from the NZ Curriculum

Fig. 2

SAMPLE PROBLEMS

For quick reference use the Sample Problem grids in the Teacher Manual. These provide:

- NZ Curriculum Standards
- Sample problem types for each geometric shape

HEADS UP! NZ Curriculum - Sample Problems - ORANGE 1 Day 3													
NZ Curriculum Standards	#10 Algebra	#11 Geometry	#12 Geometry	#13 Measurement	#14 Measurement								
A.3-3 State the general rule for a set of similar practical problems. A.3-5 Solve problems of the type $\square + 15 = 39$. N.3-1 Explain the meaning of the digits in any whole number.	Find the value of a in $14 - a = 6$	I have _____ SIDES and _____ VERTICES. I am a _____ pentagon rectangle parallelogram	Circle the word that best describes these LINES. • perpendicular • parallel • intersecting	Circle the best ESTIMATE for the length of a shoe. 25 metres 25 centimetres 25 millilitres	The time it takes to say your phone number is best measured in seconds, minutes, hours, months, or years?								
Write a NUMBER SENTENCE for: There are 24 bottles of fizzy drink in a case. How many bottles are there in 3 cases? (Hint box given in Week 4 only)		A square has _____ sides. A square has _____ angles. Draw a SQUARE.	Circle the angle GREATER THAN A RIGHT ANGLE.	2 metres is the same as : a) _____ centimetres b) _____ millimetres.	How much money does Rawiri have if he has two \$1 coins, three 50c pieces and four 10c pieces?								
Choose the rule to get from R to S.	<table border="1"> <tr><td>R</td><td>S</td></tr> <tr><td>3</td><td>6</td></tr> <tr><td>5</td><td>10</td></tr> <tr><td>15</td><td>30</td></tr> </table> A. $\times 3$ B. $+ 3$ C. $+ 5$ D. $\times 2$	R	S	3	6	5	10	15	30	I have _____ VERTICES, _____ SIDES and _____ DIAGONALS. I am a _____	Mark all the RIGHT ANGLES in this figure.	Calculate the PERIMETER of this shape. (Hint: A perimeter is the distance around the edge of a figure.)	How many hours are there in four days?
R	S												
3	6												
5	10												
15	30												

GLOSSARY




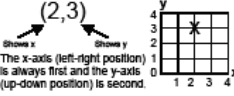




Each book of **HEADS UP maths workouts** includes a GLOSSARY of mathematical terms in case students forget the meaning of one of the maths' words in the exercises. Words in capital letters throughout the book will be found in the Glossary.







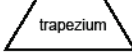
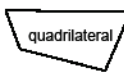







RATIONALE

It is widely known in educational circles, and supported by brain-based learning theory, that for the brain to retain some forms of information, skills, and concepts, regular review and practice are necessary.

Students may demonstrate proficiency immediately after learning a strategy, skill or concept, however, unless the learning is revisited regularly the learning can be lost.

HEADS UP is a tool to help students retain memory through regular, cyclic review.

GLOSSARY		
angle  Two rays with a common end point.	area  Area = 12 square units Number of square units on the surface of a figure.	compact number A number written in the following way: 362
congruent  Two shapes that are the same shape AND the same size.	coordinates A pair of numbers to show a point on a graph or grid.  The x-axis (left-right position) is always first and the y-axis (up-down position) is second.	denominator  The bottom of a fraction.
diagonal  A straight line between the vertices of a figure.	difference $14 - 8 = 6$ Answer to a subtraction problem.	digit 492  2, 4 and 9 are the digits. Any one of the ten (1, 2, 3, 4, 5, 6, 7, 8, 9, 0) used to write numbers.
edge  The line where faces of a solid figure meet.	estimate $23 + 41 \approx 60$ An answer that is close to the exact amount. Often rounding is used.	even number A number that can be divided by 2 without a remainder. Even numbers are 0, 2, 4, 6, 8, 10, etc.

GLOSSARY		
sum $4 + 5 = 9$ The answer to numbers that are added together.	turn (rotation) 	vertex (vertices)  Points where line segments meet in a polygon.
2-D SHAPES		
 circle	 triangle	 square
 parallelogram	 trapezium	
 quadrilateral	 pentagon	 hexagon
3-D SHAPES		
 sphere	 cube	 cylinder
 cone	 pyramid	
METRIC UNITS ___ millimetres = 1 centimetre ___ centimetres = 1 metre ___ metres = 1 kilometre ___ millilitres = 1 litre ___ grams = 1 kilogram ___ kilograms = 1 tonne		
TIME ___ seconds = 1 minute ___ minutes = 1 hour ___ hours = 1 day ___ days = 1 week ___ days = 1 month ___ weeks = 1 year ___ months = 1 year ___ days = 1 year ___ days = 1 leap year ___ years = 1 century		

Ideas and suggestions

- *Meet with parents at the beginning of the year to explain the HEADS UP system.*
- *All problems have been created to be solved without the use of calculators.*
- *Create an end-of-term certificate for recognition of accomplishment.*