

**Westgarth Primary School Parent Night:
Years 3 & 4
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Strategies matter: Building on what students know
Developing strategies for understanding the
multiplication and division facts

Cath Pearn

Melbourne Graduate School of Education
The University of Melbourne
cpearn@unimelb.edu.au

Australian Council *for*
Educational Research
catherine.pearn@acer.edu.au

Victorian Curriculum: Mathematics

Rationale and Aims

<http://victoriancurriculum.vcaa.vic.edu.au/mathematics/introduction/rationale-and-aims>

The Mathematics curriculum aims to ensure that students:

- develop useful mathematical and numeracy skills for everyday life, work and as active and critical citizens in a technological world
- see connections and apply mathematical concepts, skills and processes to pose and solve problems in mathematics and in other disciplines and contexts
- acquire specialist knowledge and skills in mathematics that provide for further study in the discipline
- appreciate mathematics as a discipline – its history, ideas, problems and applications, aesthetics and philosophy

Learning in Mathematics

<http://www.vcaa.vic.edu.au/Pages/foundation10/f10index.aspx>

The proficiencies of Understanding, Fluency, Problem Solving and Reasoning are fundamental to learning mathematics and working mathematically, and are applied across all three strands Number and Algebra, Measurement and Geometry, and Statistics and Probability.

Students build understanding when they:

- connect related ideas
- represent concepts in different ways
- identify commonalities and differences between aspects of content
- describe their thinking mathematically
- interpret mathematical information.

Students are fluent when they:

- make reasonable estimates
- calculate answers efficiently
- recognise robust ways of answering questions
- choose appropriate methods and approximations
- recall definitions and regularly use facts,
- can manipulate expressions and equations to find solutions.

Students pose and solve problems when they:

- use mathematics to represent unfamiliar or meaningful situations
- design investigations and plan their approaches
- apply their existing strategies to seek solutions
- verify that their answers are reasonable.

Students are reasoning mathematically when they:

- explain their thinking
- deduce and justify strategies used and conclusions reached
- adapt the known to the unknown
- transfer learning from one context to another
- prove that something is true or false
- make inferences about data or the likelihood of events
- compare and contrast related ideas and explain their choices.

Framework of Mathematical Learning

Retrieved from

<http://www.education.vic.gov.au/school/teachers/teachingresources/discipline/maths/Pages/enrpframe.aspx>

D. Strategies for multiplication and division

0. Not apparent.

Not yet able to create and count the total of several small groups.

1. Counting group items as ones

To find the total in a multiple group situation, refers to individual items only.

2. Modelling multiplication and division (all objects perceived)

Models all objects to solve multiplicative and sharing situations.

3. Abstracting multiplication and division

Solves multiplication and division problems where objects are not all modelled or perceived.

4. Basic derived and intuitive strategies for multiplication

Can solve a range of multiplication problems using strategies such as commutativity, skip counting and building up from known facts.

5. Basic, derived and intuitive strategies for division

Can solve a range of division problems using strategies such as fact families and building up from known facts.

Extending and applying multiplication and division

Can solve a range of multiplication and division problems (including multi-digit numbers) in practical contexts

From Di Siemon (2007) Retrieved from
<https://www.eduweb.vic.gov.au/edulibrary/public/teachlearn/student/devbigideas.pdf>

1. The 2s facts

e.g. 2 ones, 2 twos, 2 threes, 2 fours, ... 2 eights ...

DOUBLES e.g. "2 sevens ... double 7, 14"

Establish RELATED facts, e.g. 7 twos, think 2 sevens

2. The 3s facts

e.g. 3 ones, 3 twos, 3 threes, 3 fours ... 3 eights, 3 nines ...

DOUBLES AND 1 MORE GROUP e.g. "3 eights ... double 8, 16 and 8 more, 20 ... 24"

Establish RELATED facts, e.g. 8 threes, think 3 eights

3. The 4s facts

e.g. 4 ones, 4 twos, 4 threes, 4 fours ... 4 eights, 4 nines ...

DOUBLE DOUBLES e.g. "4 sixes ... double 6, 12, double 12, 24"

Establish RELATED facts e.g. 6 fours think 4 sixes

4. The 5s facts

e.g. ... 5 threes, 5 fours, 5 fives, 5 sixes ... 5 eights, 5 nines ...

RELATE TO TENS e.g. "5 eights is half of 10 eights, 40

Establish RELATED facts e.g. 8 fives, think 5 eights or 4 tens

5. The 9s facts

e.g. ... 9 sixes, 9 sevens, 9 eights, 9 nines

TEN GROUPS LESS 1 GROUP e.g. 9 eights is less than 10 eights, it is 8 less, 72"

Establish RELATED facts using the same strategy e.g. 8 nines is less than 8 tens it is 8 less, 72

6. The 1s and 0s facts

e.g. 1 one, 1 two, 1 three, 1 four ... 1 of anything is anything

Establish RELATED facts e.g. 8 ones, think 1 eight

e.g. 0 ones, 0 twos, 0 threes, 0 fours ... 0 'anythings' is zero

Establish RELATED facts e.g. 9 zeros, think 0 nines

7. Deal with remaining facts

Tracking multiplication and division fact knowledge

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

×	1	2	3	4	5	6	7	8	9	10
1	1 one 1	1 two 2	1 three 3	1 four 4	1 five 5	1 six 6	1 seven 7	1 eight 8	1 nine 9	1 ten 10
2	2 ones 2	2 twos 4	2 threes 6	2 fours 8	2 fives 10	2 sixes 12	2 sevens 14	2 eights 16	2 nines 18	2 tens 20
3	3 ones 3	3 twos 6	3 threes 9	3 fours 12	3 fives 15	3 sixes 18	3 sevens 21	3 eights 24	3 nines 27	3 tens 30
4	4 ones 4	4 twos 8	4 threes 12	4 fours 16	4 fives 20	4 sixes 24	4 sevens 28	4 eights 32	4 nines 36	4 tens 40
5	5 ones 5	5 twos 10	5 threes 15	5 fours 20	5 fives 25	5 sixes 30	5 sevens 35	5 eights 40	5 nines 45	5 tens 50
6	6 ones 6	6 twos 12	6 threes 18	6 fours 24	6 fives 30	6 sixes 36	6 sevens 42	6 eights 48	6 nines 54	6 tens 60
7	7 ones 7	7 twos 14	7 threes 21	7 fours 28	7 fives 35	7 sixes 42	7 sevens 49	7 eights 56	7 nines 63	7 tens 70
8	8 ones 8	8 twos 16	8 threes 24	8 fours 32	8 fives 40	8 sixes 48	8 sevens 56	8 eights 64	8 nines 72	8 tens 80
9	9 ones 9	9 twos 18	9 threes 27	9 fours 36	9 fives 45	9 sixes 54	9 sevens 63	9 eights 72	9 nines 81	9 tens 90
10	10 ones 10	10 twos 20	10 threes 30	10 fours 40	10 fives 50	10 sixes 60	10 sevens 70	10 eights 80	10 nines 90	10 tens 100

(Donald Eddington, 2014; adapted from Dianne Siemon, 2011)



