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

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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

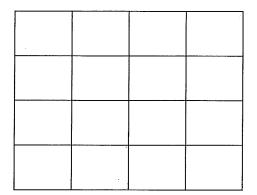
7. Deal with remaining facts

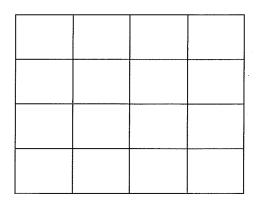
Tracking multiplication and division fact knowledge

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

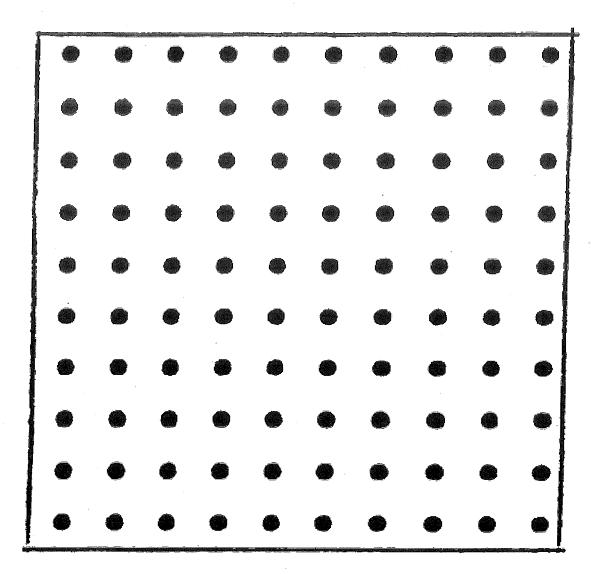
×	1	2	3	4	5	6	7	8	9	10
,	1	1	1	1	1	1	1	1	1	1
1	one	two	three	four	five	six	seven	eight	nine	ten
	1	2	3	4	5	6	7	8	9	10
	2	2	2	2	2	2	2	2	2	2
2	ones	twos	threes	fours	fives	sixes	sevens	eights	nines	tens
	2	4	6	8	10	12	14	16	18	20
	3	3	3	3	3	3	3	3	3	3
3	ones	twos	threes	fours	fives	sixes	sevens	eights	nines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

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6	6	12	18	24	30	36	





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