Westgarth Primary School Parent Night: Years 5 & 6

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There's more than one way to solve a problem: Using traditional and alternate methods for calculations

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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.

The Properties

1. **The commutative property** applies to addition and multiplication. The commutative properties say that no matter what numbers *a* and *b* are used:

$$a + b = b + a \text{ (commutative property for addition)}$$
$$a \times b = b \times a \text{ (commutative property for multiplication)}$$

This means that for addition and multiplication, it doesn't matter which of the two numbers you start off with.

NOTE: Multiplication is commutative but division is NOT
e.g. $2 \times 8 = 16$ and $8 \times 2 = 16$ **but** $16 \div 8 = 2$ and $8 \div 16 = {}^1/_2$

2. Addition and multiplication are **associative**
e.g. $(4 + 2) + 8 = 4 + (2 + 8)$
$3 \times (2 \times 60) = (3 \times 2) \times 60$
In general,
$a + (b + c) = (a + b) + c$
$a \times (b \times c) = (a \times b) \times c$

Can use with commutativity to make calculations easier
e.g. $5 \times 18 \times 2 = 5 \times 2 \times 18 = 10 \times 18 = 180$

Division is NOT associative
e.g. $16 \div (8 \div 4) = 16 \div 2 = 8$
BUT $(16 \div 8) \div 4 = 2 \div 4 = {}^1/_2$

3. **The distributive property** tells how multiplication works with addition.
e.g. For three numbers *a*, *b*, and *c*,
$a \times (b + c) = a \times b + a \times c$
e.g. $10 \times (3 + 2) = 10 \times 3 + 10 \times 2$

- useful for mental computation
- the basis of all formal multiplication algorithms and
- used extensively in algebra for factorisation.

Solve:

a. 196 + 437 =

b. 365 – 189 =

c. 400 – 243 =

d. 75 × 53 =

e. 236 ÷ 17 =

Fractured Subtraction

Here is a subtraction problem that was partially erased.

$$\begin{array}{rcc} & 8 & \_ \\ - & \_ & 7 \\ \hline & 5 & \_ \end{array}$$

1. Can you fill in a possible set of missing digits?
[The missing digits need not be the same as one another]

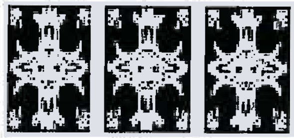
2. How many possible answers are there? What are they?

3. How do you know you found all the possible answers?

Balanced Assessment packages are published by Dale Seymour publications (http://www.nottingham.ac.uk/education/MARS/tasks/

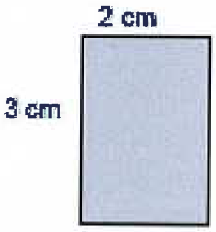
Tiles, Tiles, Tiles (from Scaffolding Numeracy)

www.education.vic.gov.au/studentlearning/teachingresources/maths



TILES, TILES, TILES...

Floor and wall tiles come in difference sizes. The basic tile is shown below.



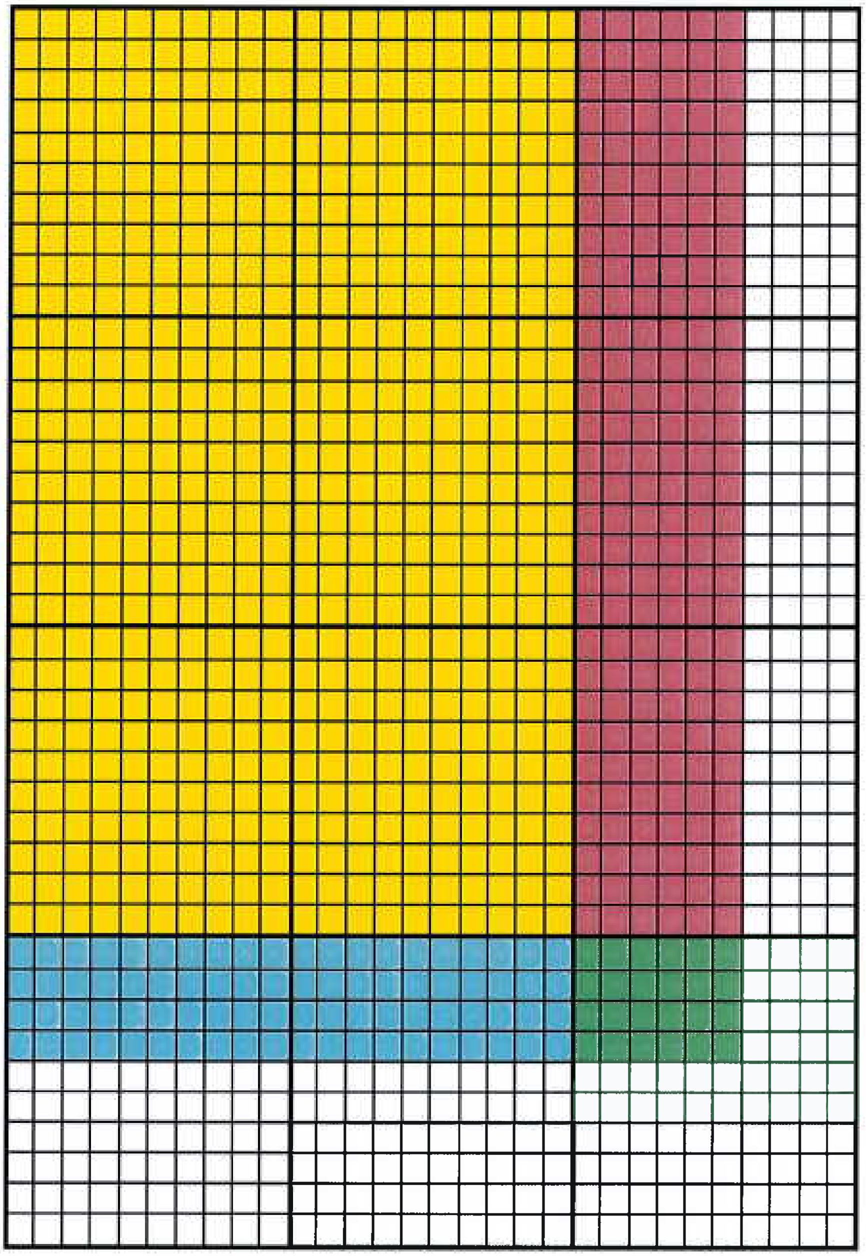
a. How many basic tiles would be needed for an area of 6 cm by 4 cm?

b. How many basic tiles would be needed for an area of 27cm by 18 cm?

c. If the length and width of the basic tile were increased by 2 cm, how many of the larger tiles would be needed to cover 1 square metre (100 cm by 100 cm)?
Show all your working so we can understand your thinking.

www.education.vic.gov.au/studentlearning/teachingresources/maths

TILES, TILES, TILES ...		
TASK:	RESPONSE:	**SCORE**
a.	No response or incorrect with no working and/or explanation	0
	Incorrect (2 tiles), reasoning based on perceived relationship between dimensions eg. "2 goes into 4, 2 times and 3 goes into 6, 2 times" or incorrect drawing, or correct but little/no working or reasoning	1
	Correct (4 tiles), with appropriate diagram and/or explanation	2
b.	No response or incorrect with little/no working and/or explanation	0
	Incorrect (9 or 18 tiles), reasoning based on factors as above, or correct (81 tiles) but little/no working/explanation	1
	Correct (81 tiles), with appropriate diagram and/or evidence of additive strategy, eg. count all or skip count	2
	Correct (81 tiles), with appropriate diagram and/or explanation indicating multiplicative reasoning, eg. factors used appropriately	3
c.	No response or incorrect with little/no working and/or explanation	0
	Some attempt, eg. dimension of larger tile (4cm by 5cm) indicated and /or incomplete solution attempt, eg. attempt to draw all	1
	Incorrect, calculation based on incorrect dimension of larger tile, eg. 4cm by 6cm, but supported by correct reasoning of the area required; or correct (500 tiles), with little/no explanation	2
	Correct (500 tiles), supported by appropriate diagram and/or explanation based on appropriate diagram or computation strategies	3



Partial Product for 34 ×26

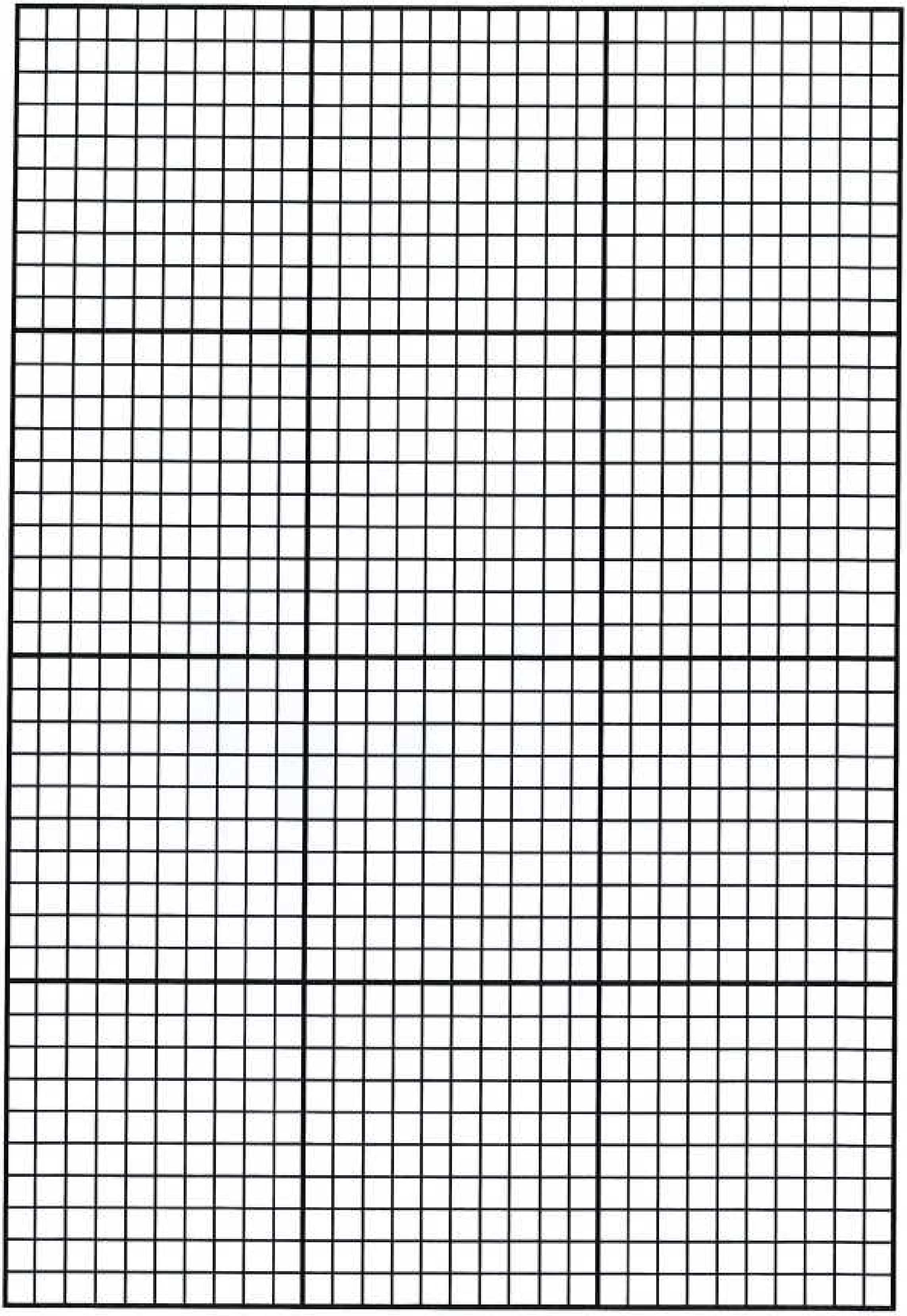
Yellow section is 30 rows of 20 = 600

Blue section is 4 rows of 20 = 80

Pink section is 30 rows of 6 = 180

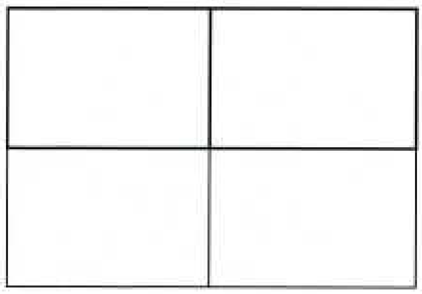
Green section is 4 rows of 6 = 24

Total = 600 + 80 + 180 + 24 = 884

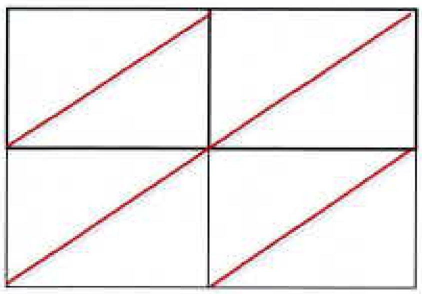


Lattice Multiplication

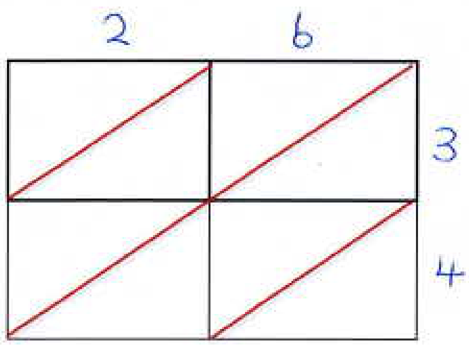
1. Draw 2 x 2 grid



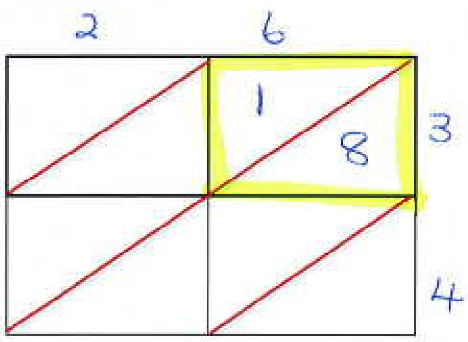
2. Draw diagonals



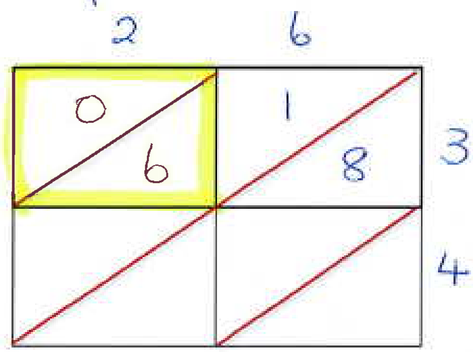
3. 26 × 34 =



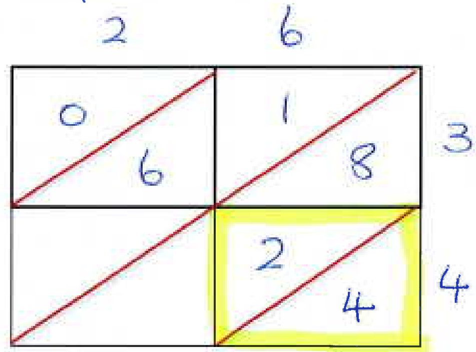
Step 1.



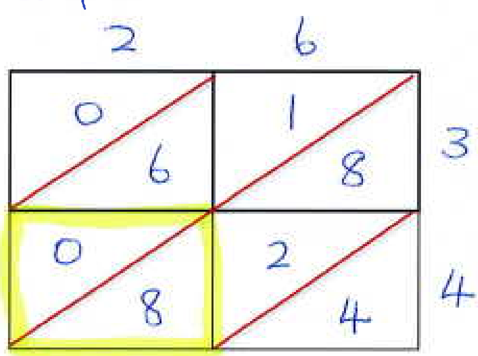
Step 2



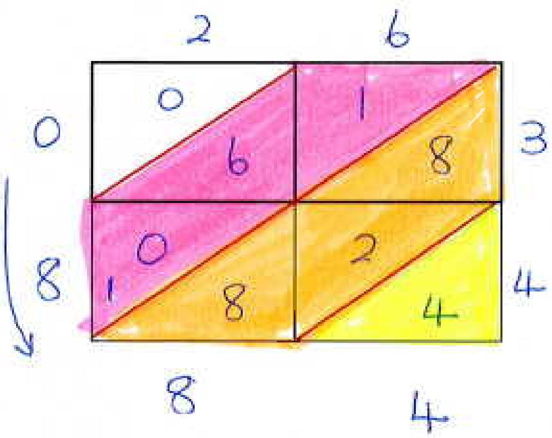
Step 3



Step 4

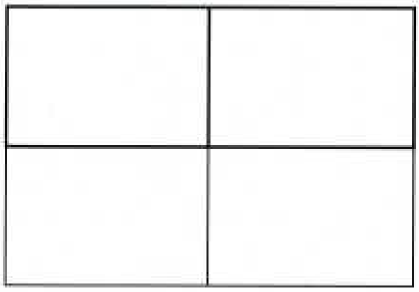


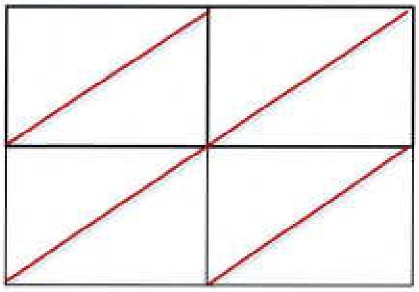
Step 5



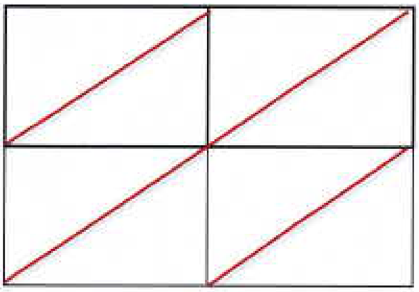
So 26 × 34 = 884

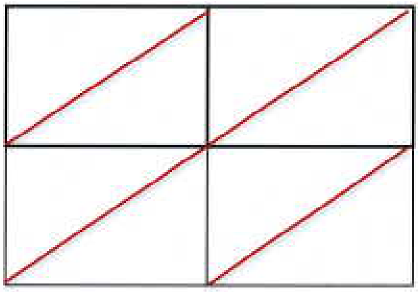
1. **Draw 2 x 2 grid**





2. **Draw diagonals**





3. **26 × 34 =**