Interesting Maths Problems
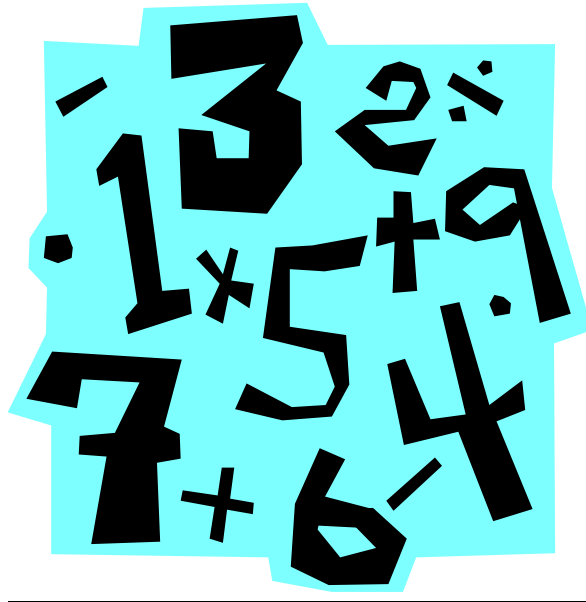
Multiplying by 11

We discovered an easy way to multiply by 11. With a 2 digit number, this is what you do:

23 x 11 = 253

First write 23 in the space for the answer and leave a gap between the 2 and the 3.

Add 2 and 3 together and put the answer between the 2 and the 3. The answer to the problem is 253.

With a 3 digit number:

231 x 11 = 541

First put the 1 from 231 in the ones column in the answer space. Then add 3 and 1 together and put that answer in the tens column. Last add 2 and 3 and put the answer in the hundreds column.

With a 3 digit number where the numbers added come to more than nine, we needed to carry digits.

483 x 11 = 5313

Put the 3 in the ones column. Add 8 and 3. The answer is 11, so put a 1 in the tens column and carry 1 above the 8. Add 8 and 4 and the 1 that was carried. The answer to this is 13. Put the 3 in the hundreds column and carry 1 and put it above the 4. Then add the 1 carried to the four. The answer of 5 is put in the thousands column.

We found after doing a few of these problems we were able to multiply really big numbers by 11 using the methods we have told you about. We checked our answers on a calculator.
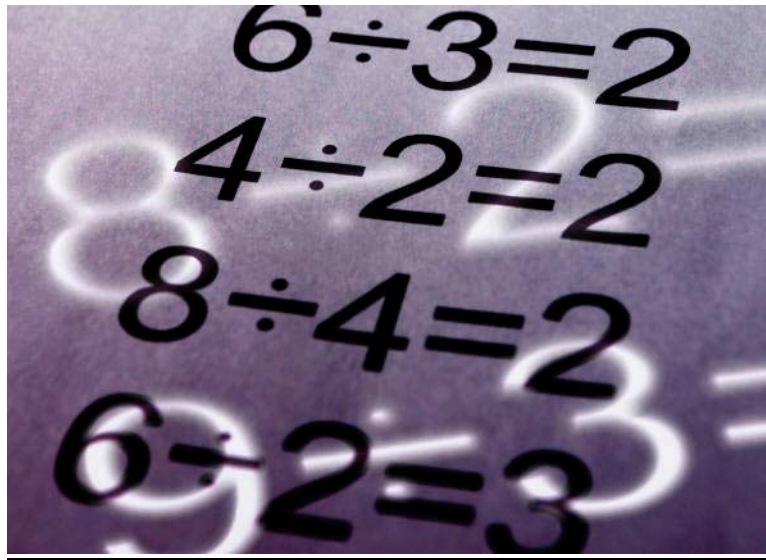
Magic Squares

Another interesting activity was the work we did on magic squares. We discovered that the totals of all the columns, rows and diagonals were always equal to each other. We worked on a 3 x 3 square and used the numbers 1 to 9. We played around with these numbers for a while and tried to discover the magic number. It was really hard. Then one of us suggested we add up all the numbers:

1+2+3+4+5+6+7+8+9=45

Because there were nine numbers we then divided 45 by 9:

The answer was 5.

 We thought the five might be an important number. After playing around some more we looked at the magic square and thought we have 3 rows of 3. Maybe the "magic" number was the answer to 5 x 3. We then decided to put the 5 in the middle square. If we were

right then all the columns, rows and diagonals should add up to 15. We moved the other numbers around and then because 5 is an odd number and was in the middle we decided to put the odd numbers in the outside middle squares. The even numbers were then placed in the corner squares. It was really easy once we had worked out one row. Our magic square looked like this when we had finished, with each column, row and diagonal totalling 15. We had solved the problem.

4	3	8
9	5	1
2	7	6

Factorial Notation

We learnt about factorial notation. We learnt that 7! means factorial 7. It sounded a bit confusing at first.

Factorial 7 or 7! = 7 x 6 x 5 x 4 3 x 2 x 1

Factorial 4 or 4! = 4 x 3 x 2 x 1

We can show a division problem by putting the divisor under the dividend like:

3 divided by 2 = $\underline{3}$

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We tried to solve this problem:

Factorial 4 or 4! divided by factorial 3 or 3!

We simplified the problem $\underline{4!}$ = $\underline{4 \times 3 \times 2 \times 1}$

                             3!   3 x 2 x 1

The 3's, 2's and 1's cancel each other out so the answer is 4.

$\underline{8!}$ = $\underline{8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}$ =8

7!   7 x 6 x 5 x 4 x 3 x 2 x 1

We love doing maths with Mrs Lansdell and we have learnt heaps! We have done lots of other interesting work and we have enjoyed solving problems. We have worked out how to win the game of Thirty-One. At first

we could not beat Mrs Lansdell, but we thought about what we needed to do to win and at last came up with the way to win this game.   It was a bit tricky if the first person turned over 3 then the other turned over 4 and then they kept repeating this. In the end the person who started with 3 found that they could not get to 31 as there were no more 3's, so they could only turn over a 2 or 1 and the other person would then win. You can't always win if you start on 3! It was fun.

Luke Swan

Braedyn James

Naleea Fewkes-Broadby

Moonah Primary School

Tasmania

 2006

ITAS Teacher: Ruth Lansdell