# Calculations Policy

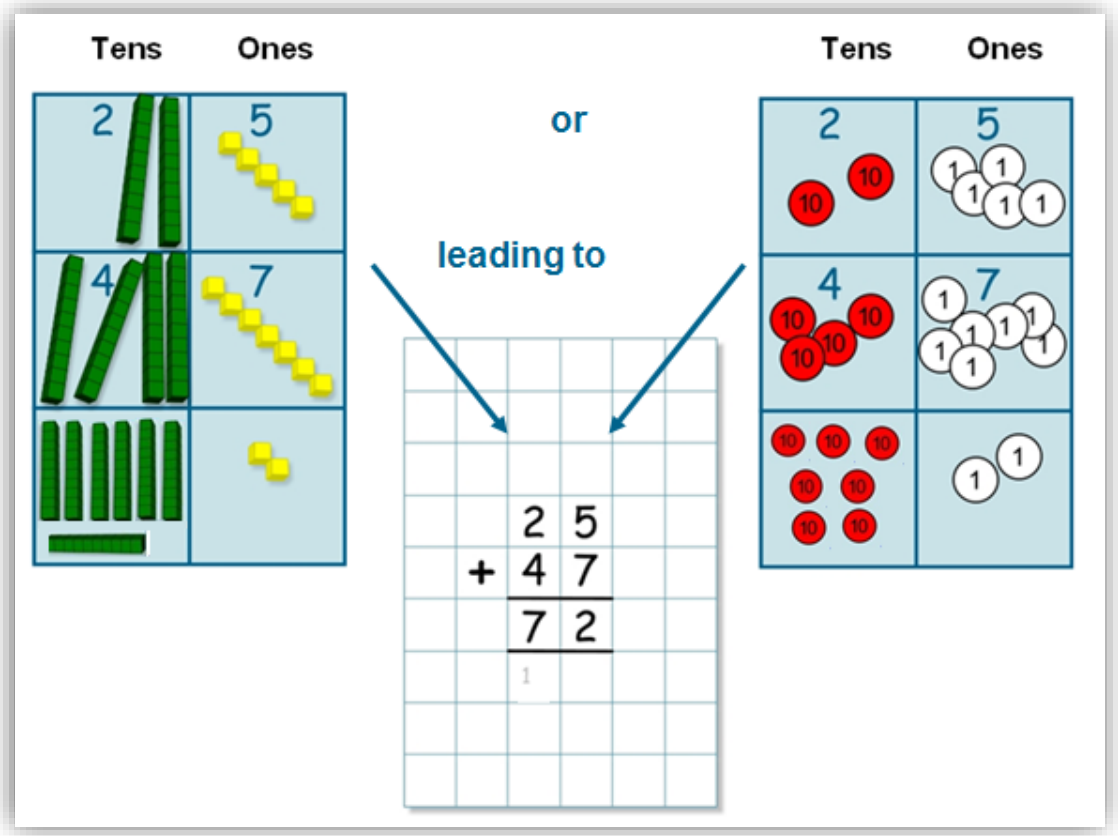
Year 6

# Addition

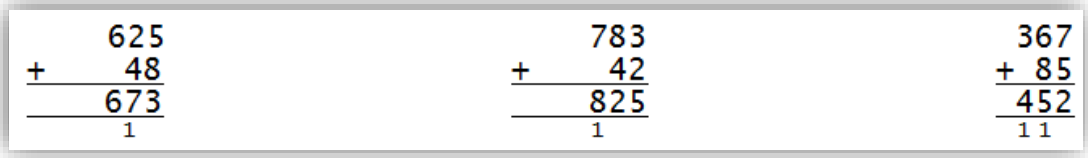
## A. 6. INCREASED EFFICIENCY - COLUMN ADDITION (3-4)

They will then learn to add up the bits of the number, without partitioning first. We call this *column addition.*

25 + 47 = 72




From this, children will begin to carry 'spare' digits below the line.




**End of year expectations**:

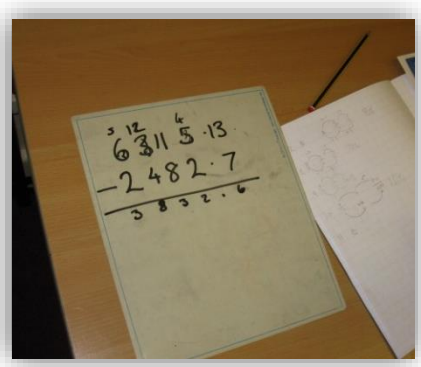
- Add numbers with up to three digits, using formal written method of columnar addition

## A. 7. LARGER NUMBERS (3-4)

When a mental method in not appropriate, this method is the most efficient method of adding numbers, of any size, including decimals.

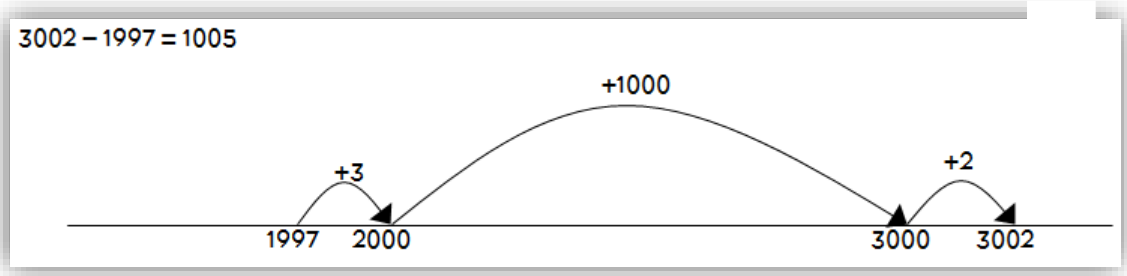
# SUBTRACTION

## S.6 LARGER NUMBERS AND DECIMALS (4-5)




The method of decomposition can be extended to numbers of any size, including decimals.

Note: Where the numbers are involved in the calculation are close together or near to multiples of 10, 100 etc. counting on using a number line should be used:

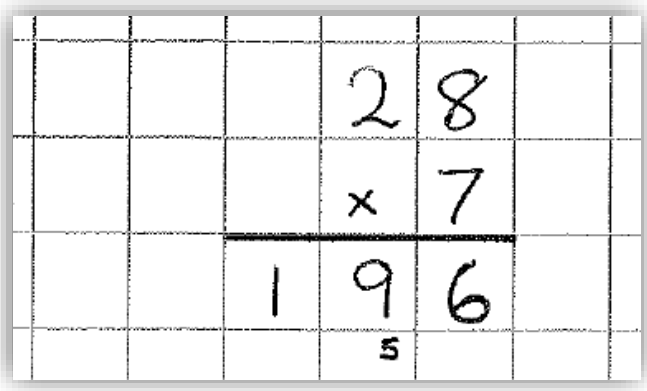



**Remark: Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.**

# MULTIPLICATION

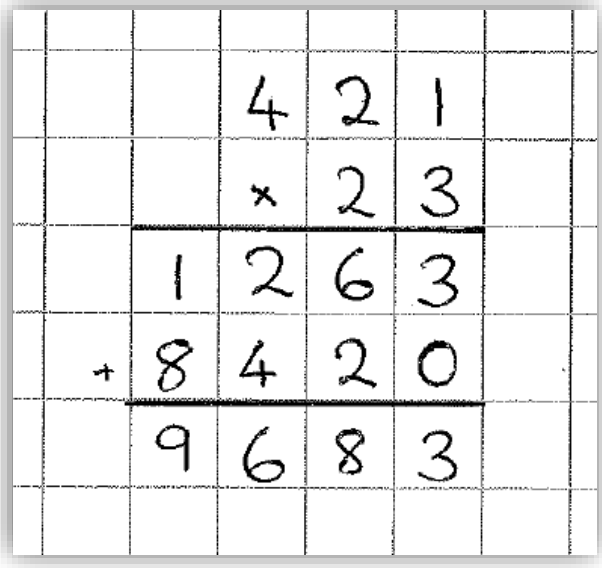
## M. 7. SHORT MULTIPLICATION (5-6)

Short multiplication is the most efficient method for multiplication by a single digit number. It should be taught with reference to the grid method for multiplication, using appropriate place value vocabulary, e.g. we multiply the eight units by seven, then the two tens.

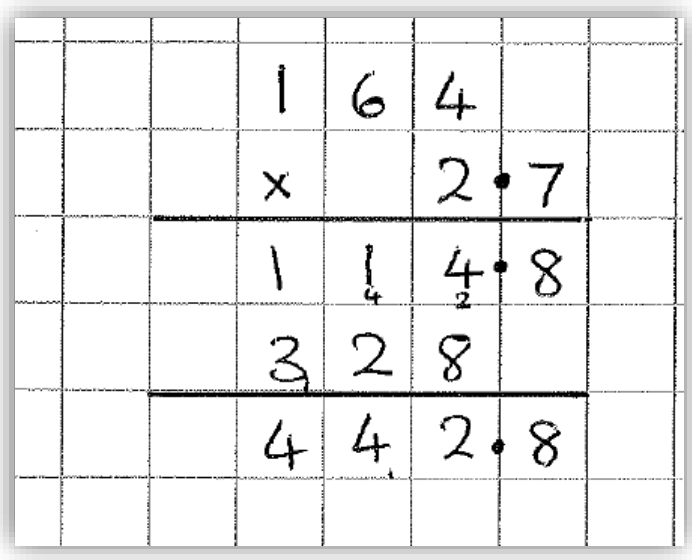



## M. 8. LONG MULTIPLICATION (5-6)

The next step from short multiplication is long multiplication. Again, reference to the grid method should be used to ensure conceptual understanding, *e.g. because we are multiplying by two tens, the answer will be ten times bigger than if we divided by two.*



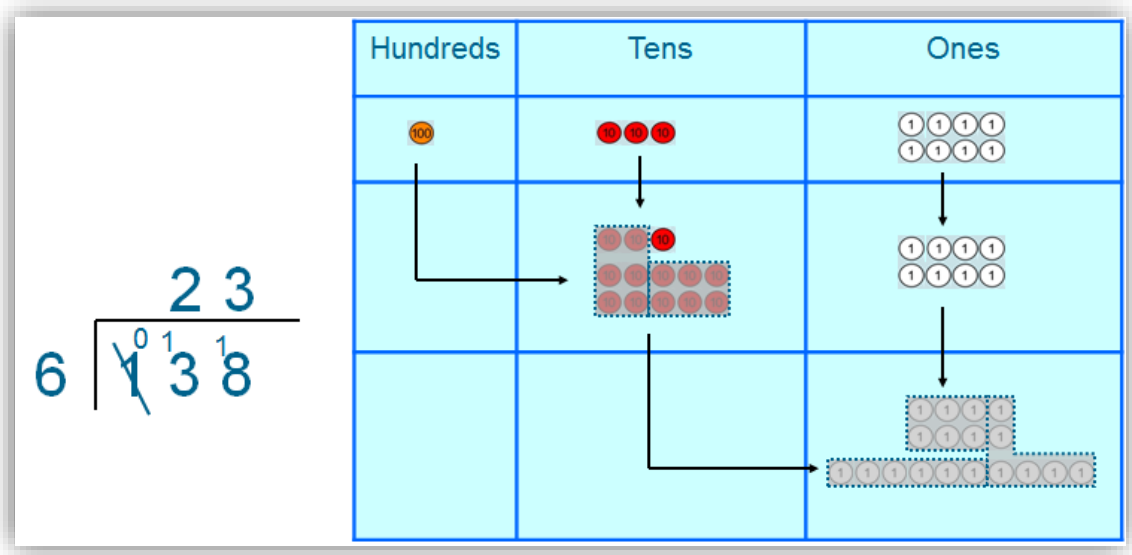

The methods of short and long multiplication extend to decimals.



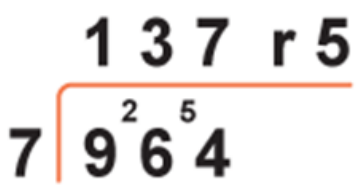

# DIVISION

## D. 7. SHORT DIVISION (5-6)

Dienes apparatus and place-value counters are used to introduce division by grouping after partitioning (see video for a clearer explanation of this method).



964 ÷ 7 = 137 r5



## D. 7. LONG DIVISION (5-6)

Standard short division does not help with the following calculation. However, it can be solved using long division (by repeated subtraction using multiples of the divisor):

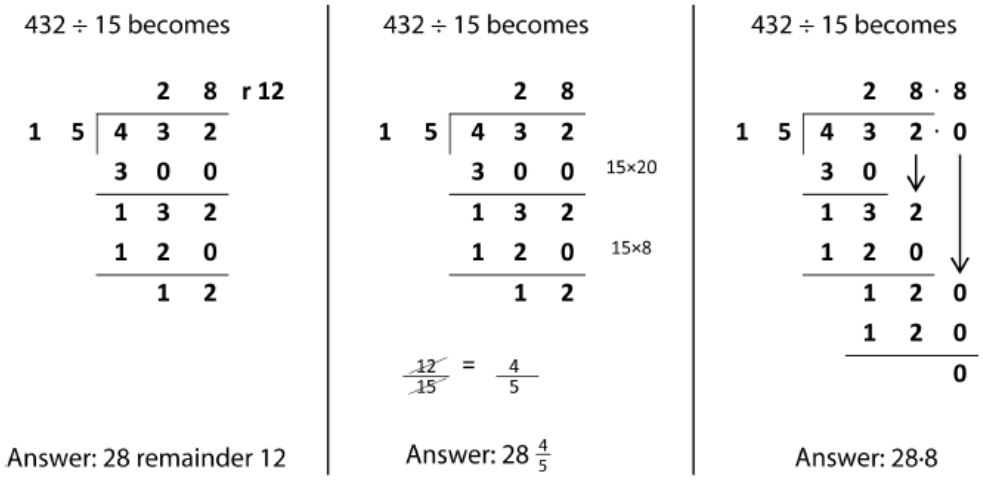
144÷ 16 = 9

```
        9
16 ) 1 4 4
     - 6 4  (4 x 16)
       8 0
     - 6 4  (4 x 16)
       1 6
     - 1 6  (1 x 16)
         0
```

Multiples of the divisor (16) have been subtracted from the dividend (144)

'4 (lots of 16) + 4 (lots of 16) + 1 (lot of 16) = 9 (lots of 16)

There is no remainder'



432 ÷ 15 becomes

```
        2 8  r 12
1 5 ) 4 3 2
      3 0 0
      1 3 2
      1 2 0
        1 2
```

Answer: 28 remainder 12

432 ÷ 15 becomes

```
        2 8
1 5 ) 4 3 2
      3 0 0   15×20
      1 3 2
      1 2 0   15×8
        1 2
```

$\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$

Answer: $28\frac{4}{5}$

432 ÷ 15 becomes

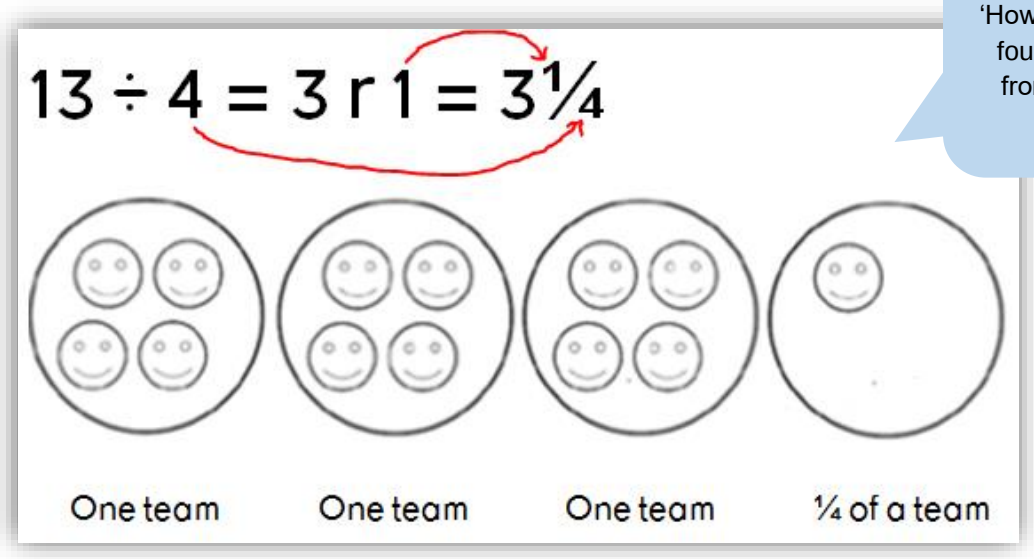
```
        2 8 · 8
1 5 ) 4 3 2 · 0
      3 0
      1 3 2
      1 2 0
        1 2 0
        1 2 0
            0
```

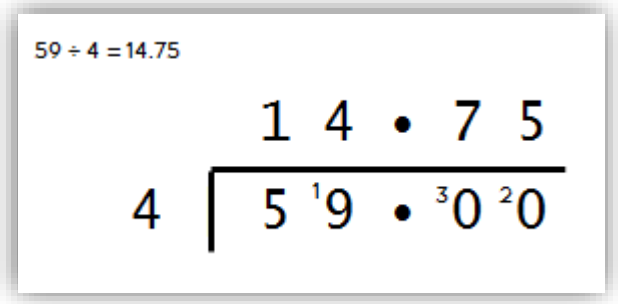
Answer: 28·8

## D. 9. ALTERNATIVE PRESENTATIONS OF THE REMAINDER (6)

Once children have a firm understanding of fractions and decimals, children learn to present the remainder to a division question as a fraction or a decimal.

To present the remainder as a fraction, groupings of objects can be used.




Presentation of the remainder as a decimal can be done either by converting the fraction form above to a decimal, or using the extended short method for division. Place value counters (available down to 0.01) are particularly useful here.