

# The New Primary Mathematics Syllabus

## Pupils should

- ↑ have a sense of the size of a number
- ↑ know where a number fits into the number system
- ↑ know by heart number facts
- ↑ use what they know by heart to figure out answers mentally
- ↑ calculate accurately and efficiently
- ↑ make sense of number problems and recognise the operations needed to solve them
- ↑ explain their methods and reasoning using correct mathematical terms
- ↑ judge whether their answers are reasonable and have strategies for checking them where necessary
- ↑ suggest suitable units for measuring and make sensible estimates of measurements
- ↑ explain and make predictions from the numbers in graphs, diagrams, charts and tables

# The New Primary Mathematics Syllabus

Children will use

a number line

0	1	2	3	4	5	6	7	8	9
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a number square

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

# The New Primary Mathematics Syllabus

## The Process to Calculation

Concrete Apparatus



Pictorial Representation



Symbolising



Practising in oral and written forms



# The New Primary Mathematics Syllabus

## Memorisation of Addition Facts

It is sufficient that children memorise the following addition facts:

↑ facts which add by one, and two, rooted in their knowledge of the counting sequence

$$3 + 1, 5 + 2$$

# The New Primary Mathematics Syllabus

## Memorisation of Addition Facts

It is sufficient that children memorise the following addition facts:

↑ facts which add by one, and two, rooted in their knowledge of the counting sequence

↑ facts to 5

$$1 + 4, 2 + 3$$

# The New Primary Mathematics Syllabus

## Memorisation of Addition Facts

It is sufficient that children memorise the following addition facts:

↑ facts which add by one, and two, rooted in their knowledge of the counting sequence

↑ facts to 5

↑ facts with 5

$$5 + 1, 5 + 3$$

# The New Primary Mathematics Syllabus

## Memorisation of Addition Facts

It is sufficient that children memorise the following addition facts:

↑ facts which add by one, and two, rooted in their knowledge of the counting sequence

↑ facts to 5

↑ facts with 5

↑ doubles

$$1 + 1, 3 + 3$$

# The New Primary Mathematics Syllabus

## Memorisation of Addition Facts

It is sufficient that children memorise the following addition facts:

↑ facts which add by one, and two, rooted in their knowledge of the counting sequence

↑ facts to 5

↑ facts with 5

↑ doubles

↑ facts to 10

$$1 + 9, 2 + 8$$

# The New Primary Mathematics Syllabus

## Memorisation of Addition Facts

It is sufficient that children memorise the following addition facts:

- ↑ facts which add by one, and two, rooted in their knowledge of the counting sequence
- ↑ facts to 5
- ↑ facts with 5
- ↑ doubles
- ↑ facts to 10
- ↑ facts with 10

$$10 + 1, 10 + 6$$

# The New Primary Mathematics Syllabus

## Memorisation of Addition Facts

**It is sufficient that children memorise the following addition facts:**

- ↑ facts which add by one, and two, rooted in their knowledge of the counting sequence**
- ↑ facts to 5**
- ↑ facts with 5**
- ↑ doubles**
- ↑ facts to 10**
- ↑ facts with 10**

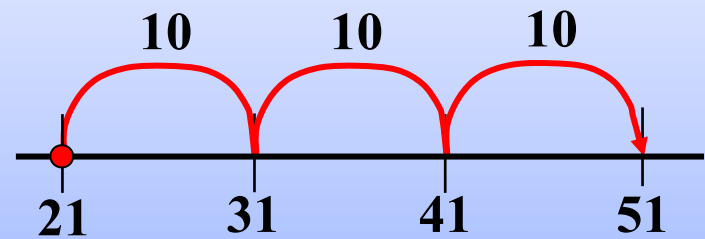
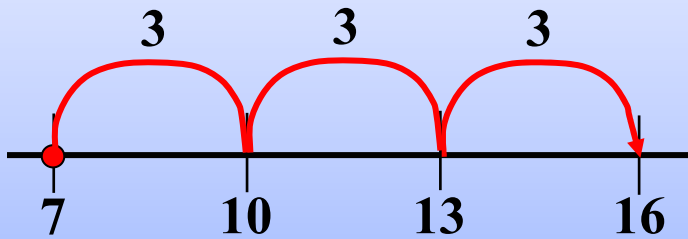
**All other addition facts to 20 can be worked by inference.**

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## Calculation Strategies

### Addition

- Preliminary Stage - count on in 2s, 3s, 4s, ...

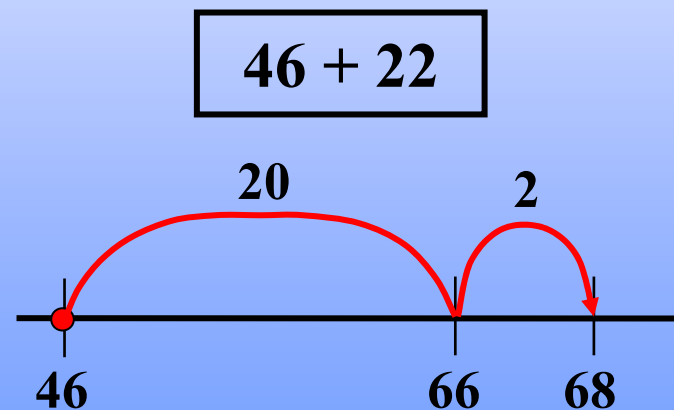
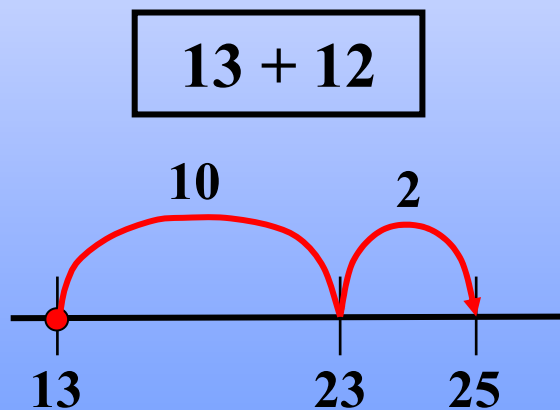


# The New Primary Mathematics Syllabus

## Calculation Strategies

### Addition

- Preliminary Stage - count on in 2s, 3s, 4s, ...
- Adding on 10s then units, with no carry

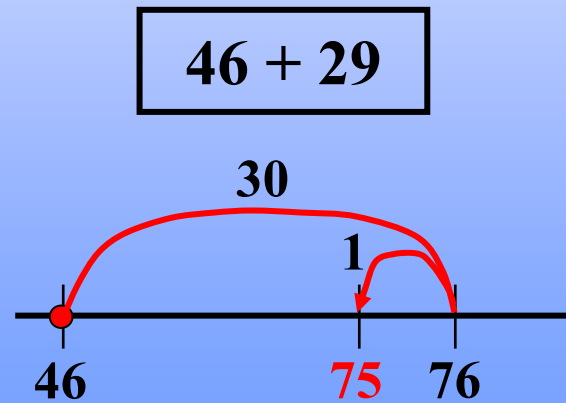
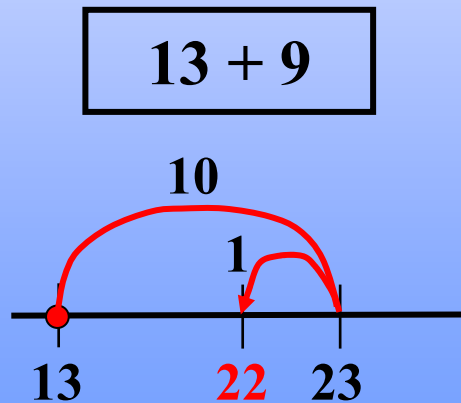


# The New Primary Mathematics Syllabus

## Calculation Strategies

### Addition

- Preliminary Stage - count on in 2s, 3s, 4s, ...
- Adding on 10s then units, with no carry
- Adding 9s by adding 10s and adjusting

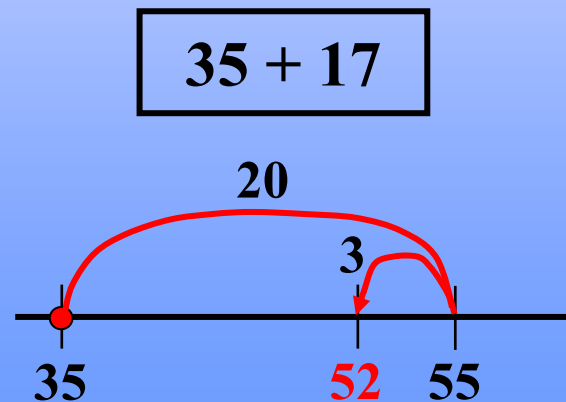
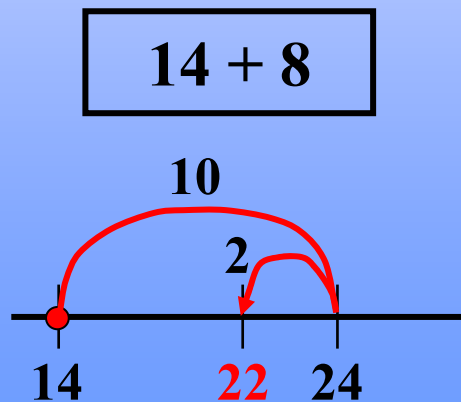


# The New Primary Mathematics Syllabus

## Calculation Strategies

### Addition

- Preliminary Stage - count on in 2s, 3s, 4s, ...
- Adding on 10s then units, with no carry
- Adding 9s by adding 10s and adjusting
- Adding the nearest multiple of 10 then adjusting

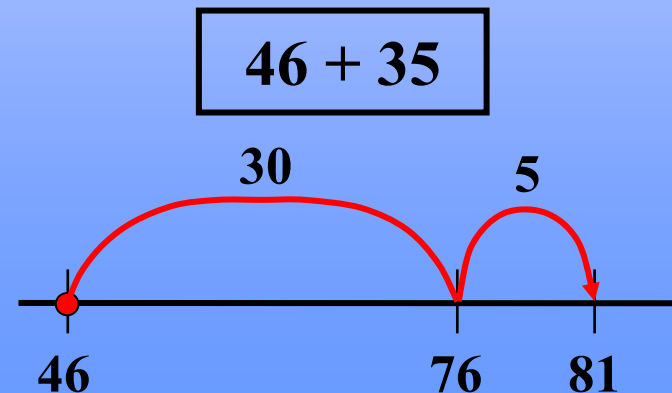
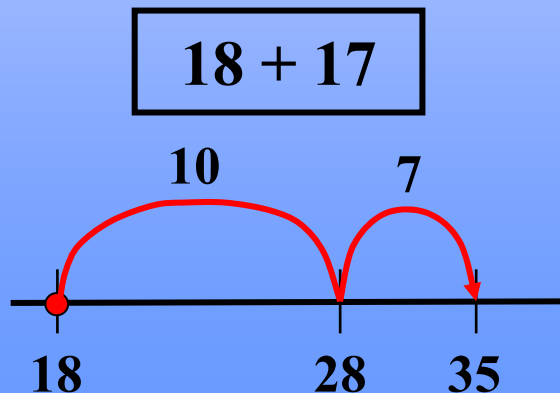


# The New Primary Mathematics Syllabus

## Calculation Strategies

### Addition

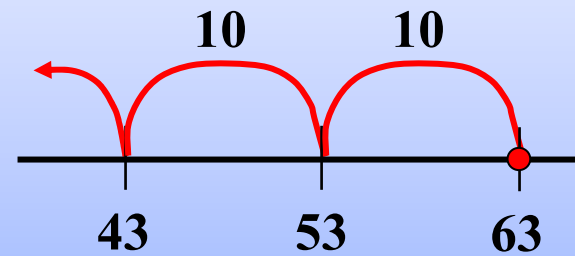
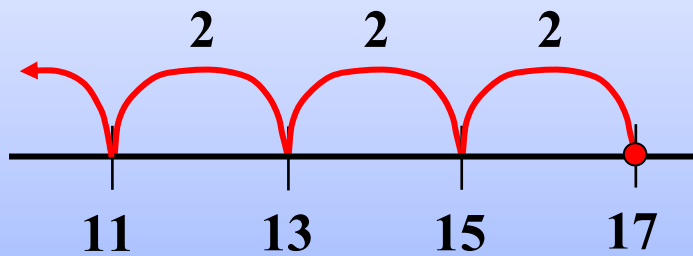
- Preliminary Stage - count on in 2s, 3s, 4s, ...
- Adding on 10s then units, with no carry
- Adding 9s by adding 10s and adjusting
- Adding the nearest multiple of 10 then adjusting
- Adding on 10s then units, with carry



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## Calculation Strategies Subtraction

- Subtracting a single digit number or 10



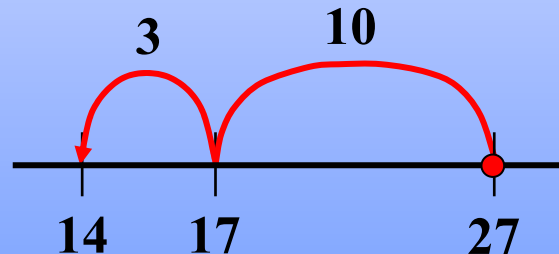
# The New Primary Mathematics Syllabus

## Calculation Strategies

### Subtraction

- Subtracting a single digit number or 10
- Subtracting 10s then units, not crossing a multiple of 10

$$27 - 13$$



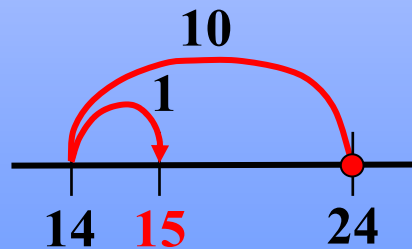
# The New Primary Mathematics Syllabus

## Calculation Strategies

### Subtraction

- Subtracting a single digit number or 10
- Subtracting 10s then units, not crossing a multiple of 10
- Subtracting 9s by subtracting 10s, then adjusting

$$24 - 9$$

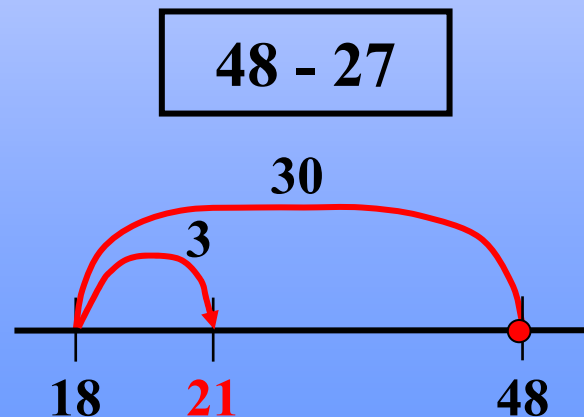


# The New Primary Mathematics Syllabus

## Calculation Strategies

### Subtraction

- Subtracting a single digit number or 10
- Subtracting 10s then units, not crossing a multiple of 10
- Subtracting 9s by subtracting 10s, then adjusting
- Subtracting the nearest multiple of 10, then adjusting

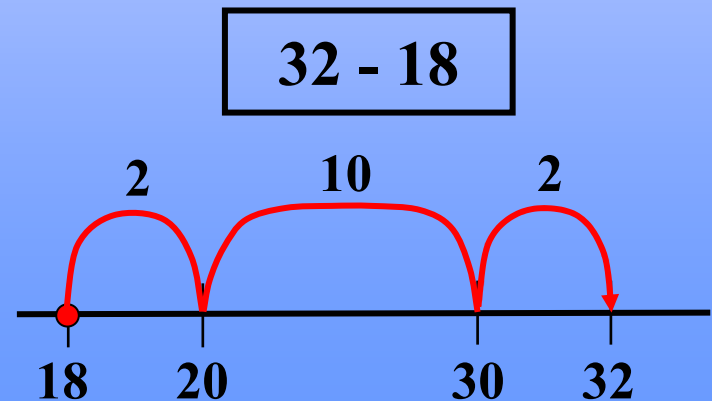
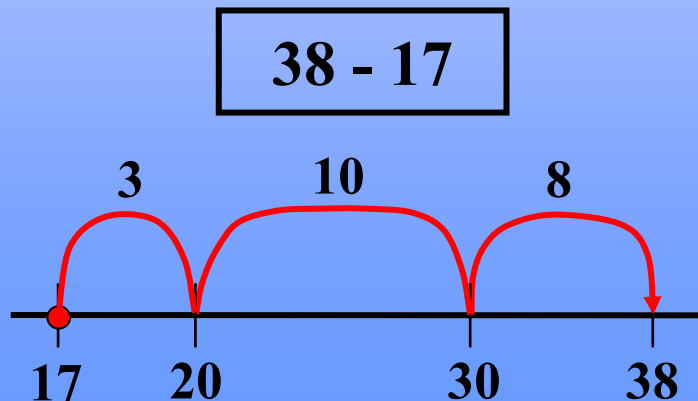


# The New Primary Mathematics Syllabus

## Calculation Strategies

### Subtraction

- Subtracting a single digit number or 10
- Subtracting 10s then units, not crossing a multiple of 10
- Subtracting 9s by subtracting 10s, then adjusting
- Subtracting the nearest multiple of 10, then adjusting
- Adding on to find the difference



# The New Primary Mathematics Syllabus

## Calculation Strategies Towards Formal Addition

- Vertical Layout, expanded working

$$\begin{array}{r} 87 \\ +39 \\ \hline 110 \\ 16 \\ \hline 126 \end{array}$$

$$\begin{array}{r} 87 \\ +39 \\ \hline 16 \\ 110 \\ \hline 126 \end{array}$$

$$\begin{array}{r} 379 \\ +285 \\ \hline 500 \\ 150 \\ 14 \\ \hline 664 \end{array}$$

$$\begin{array}{r} 379 \\ +285 \\ \hline 14 \\ 150 \\ 500 \\ \hline 664 \end{array}$$

# The New Primary Mathematics Syllabus

## Calculation Strategies Towards Formal Addition

- Vertical Layout, condensed working

$$\begin{array}{r} 87 \\ +39 \\ \hline 126 \\ 1 \end{array}$$

$$\begin{array}{r} 379 \\ +285 \\ \hline 664 \\ 11 \end{array}$$

# The New Primary Mathematics Syllabus

## Calculation Strategies Towards Formal Subtraction

$$563 - 241$$

$$\begin{array}{r} 500 \quad 60 \quad 3 \\ 200 \quad 40 \quad 1 \\ \hline 300 \quad 20 \quad 2 \end{array}$$

leading to

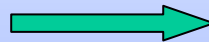
$$\begin{array}{r} 563 \\ - 241 \\ \hline 322 \end{array}$$

# The New Primary Mathematics Syllabus

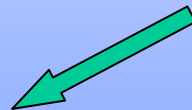
## Calculation Strategies Towards Formal Subtraction

$$563 - 278$$

$$\begin{array}{r} 500 \quad 60 \quad 3 \\ 200 \quad 70 \quad 8 \\ \hline \end{array}$$



$$\begin{array}{r} 500 \quad 50 \quad 13 \\ 200 \quad 70 \quad 8 \\ \hline \end{array}$$



$$\begin{array}{r} 400 \quad 150 \quad 13 \\ 200 \quad 70 \quad 8 \\ \hline 200 \quad 80 \quad 5 \end{array}$$



$$\begin{array}{r} 563 \\ - 278 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ 453 \\ - 278 \\ \hline 285 \end{array}$$

# The New Primary Mathematics Syllabus

## Calculation Strategies

### Long Multiplication

#### Multiplying HTU by U

$$523 \times 8$$

- How many hundreds ... tens ... units?
- Before starting give an estimate for the answer.
- Next, multiply each part by 8, then add the three answers together.

# The New Primary Mathematics Syllabus

## Calculation Strategies

### Long Multiplication

#### Informal Written Method

$$523 \times 8$$

Estimate - 4000

	<b>500</b>	<b>20</b>	<b>3</b>	<b>4000</b>
<b>8</b>	<b>4000</b>	<b>160</b>	<b>24</b>	<b>160</b>
				<b>+ 24</b>
				<hr/> <b>4184</b>


# The New Primary Mathematics Syllabus

## Calculation Strategies

### Long Multiplication

#### Standard Written Method

$$\begin{array}{r} 523 \\ \times 8 \\ \hline 4000 \\ 160 \\ 24 \\ \hline 4184 \end{array}$$



$$\begin{array}{l} 500 \times 8 \\ 20 \times 8 \\ 3 \times 8 \end{array}$$

**Compare the answer with the estimate.**

# **The New Primary Mathematics Syllabus**

## **Calculation Strategies**

### **Long Multiplication**

#### **Multiplying TU by TU**

$$34 \times 17$$

- **Before starting give an estimate for the answer.**
- **To multiply by 17, first multiply each part by 10, then by 7.**

# The New Primary Mathematics Syllabus

## Calculation Strategies

### Long Multiplication

#### Multiplying TU by TU

$$\begin{array}{r} 34 \\ \times 17 \\ \hline 300 \\ 40 \\ 210 \\ 28 \\ \hline 578 \end{array}$$

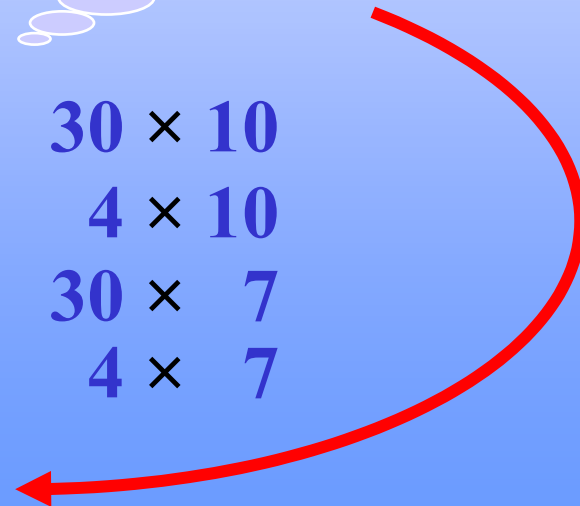
Estimate  
600

$$30 \times 10$$

$$4 \times 10$$

$$30 \times 7$$

$$4 \times 7$$



# The New Primary Mathematics Syllabus

## Calculation Strategies

### Long Multiplication

Multiplying U.t by U by partitioning

e.g. Work out  $\text{Lm}3.84 \times 7$

$$\text{Lm}3.00 \times 7 = \text{Lm } 21.00$$

$$80\text{c} \times 7 = 560\text{c} = \text{Lm } 5.60$$

$$4\text{c} \times 7 = 28\text{c} = \text{Lm } 0.28$$

---

$$\text{Lm } 26.88$$



Estimate  
**Lm28**

# The New Primary Mathematics Syllabus

## Calculation Strategies

### Long Multiplication

To multiplying U.t by U using a standard written method

e.g. Work out  $4.7 \times 9$

$$4.7 \times 9 =$$



Estimate

45

$$4.0 \times 9 = 36.0 \text{ (nine lots of four units)}$$

$$0.7 \times 9 = \underline{6.3} \text{ (nine lots of seven tenths)}$$
$$42.3$$

# The New Primary Mathematics Syllabus

## Calculation Strategies

### Long Multiplication

To multiply U.th by U using a standard written method

e.g. Work out  $4.73 \times 9$

$$4.73 \times 9 =$$

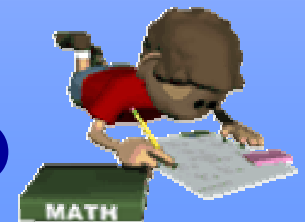
$$4.0 \times 9 = 36.0 \quad (\text{nine lots of four units})$$

$$0.7 \times 9 = 6.3 \quad (\text{nine lots of seven tenths})$$

$$0.03 \times 9 = \underline{0.27} \quad (\text{nine lots of three hundredths})$$
$$42.57$$

Estimate

45



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## Calculation Strategies

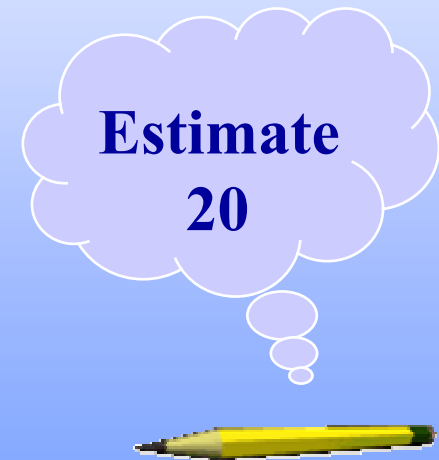
### Long Division

$$\begin{array}{r} 18 \\ 4 \overline{) 75} \\ \underline{40} \\ 35 \\ \underline{20} \\ 15 \\ \underline{12} \\ 3 \end{array}$$

**10** × 4  
**5** × 4  
**3** × 4

→ left over

$$75 \div 4 = 18 \text{ r } 3$$



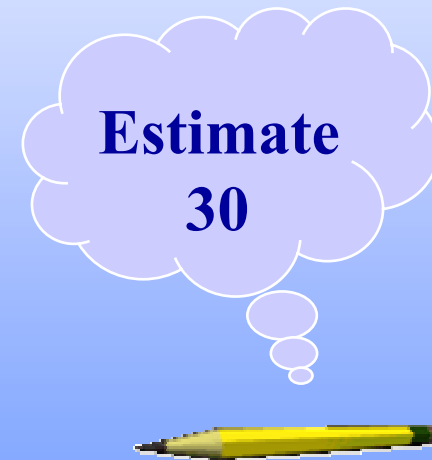
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## Calculation Strategies

### Long Division

$$\begin{array}{r} 31 \\ 32 \overline{) 995} \\ \underline{960} \\ 35 \\ \underline{32} \\ 3 \end{array}$$

**30** × 32  
**1** × 32  
3 → left over



$$995 \div 32 = 31 \text{ r } 3$$

# The New Primary Mathematics Syllabus

## Calculation Strategies

### Long Division

$$\begin{array}{r} 3.2 \\ 9 \overline{) 28.8} \\ \underline{27.0} \\ 1.8 \\ \underline{1.8} \\ 0.0 \end{array}$$

$$\begin{array}{l} 3.0 \times 9 \\ 0.2 \times 9 \end{array}$$

Estimate

3



$$28.8 \div 9 = 3.2$$