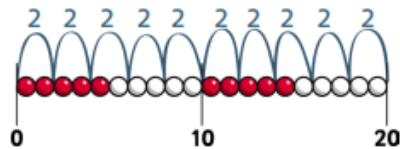


## Overview of Strategies and Methods (Division)

### Stage 1-Mental Division

#### Counting in steps ('clever' counting)

Count in 2s

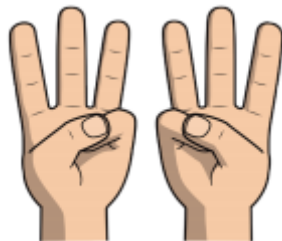


Count in 10s

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	100

#### Doubling and halving

Find half of even numbers up to 12, including realising that it is hard to halve an odd number



### Stage 1-Mental Division

#### Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to questions such as 'How many towers of three can I make with twelve cubes?'

#### Sharing

Begin to find half of a quantity using sharing

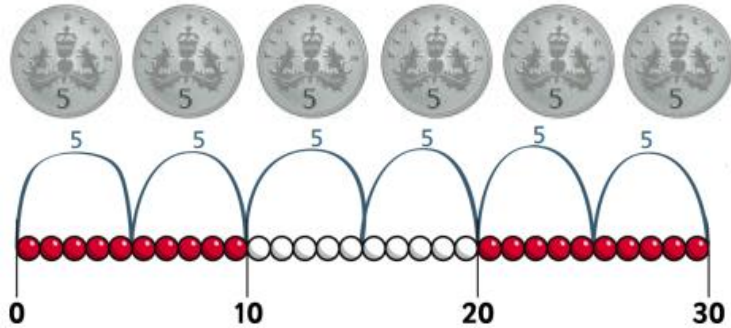
*e.g. find half of 16 cubes by giving one each repeatedly to two children*

## Overview of Strategies and Methods (Division)

### Stage 2-Mental Division

#### Counting in steps ('clever' counting)

Count in 2s, 5s and 10s

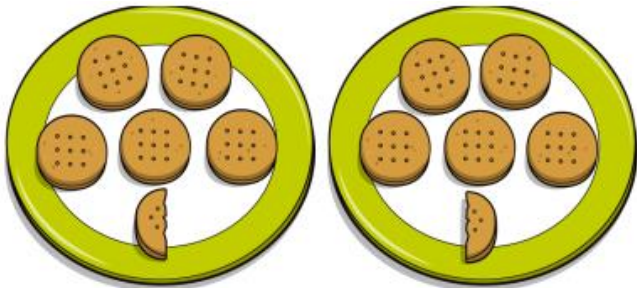


Begin to count in 3s

#### Doubling and halving

Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a  $\frac{1}{2}$

e.g.  $\frac{1}{2}$  of 11 =  $5\frac{1}{2}$



Begin to know half of multiples of 10 to 100

e.g. half of 70 is 35

### Stage 2-Mental Division

#### Grouping

Relate division to multiplication by using arrays or towers of cubes to find answers to division

e.g. 'How many towers of five cubes can I make from twenty cubes?' as  $\_ \times 5 = 20$  and also as  $20 \div 5 = \_$



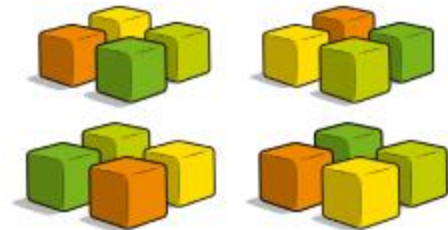
Relate division to 'clever' counting and hence to multiplication

e.g. 'How many fives do I count to get to twenty?'

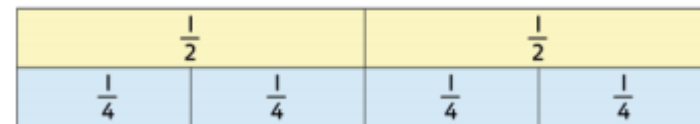
#### Sharing

Begin to find half or a quarter of a quantity using sharing

e.g. find a quarter of 16 cubes by sorting the cubes into four piles



Find  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  of small quantities



#### Using number facts

Know half of even numbers to 24

Know  $\times 2$ ,  $\times 5$  and  $\times 10$  division facts

Begin to know  $\times 3$  division facts

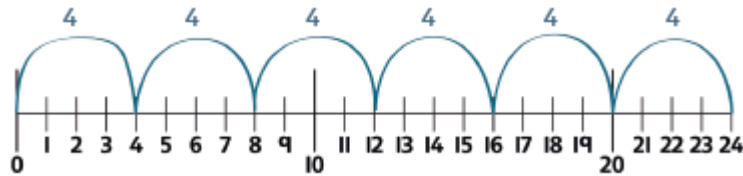
## Overview of Strategies and Methods (Division)

### Stage 3-Mental Division

#### Counting in steps ('clever' counting)

Count in 2s, 3s, 4s, 5s, 8s and 10s

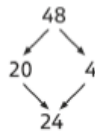
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



#### **Doubling and halving**

Find half of even numbers to 100 using partitioning

e.g. *find half of 48*



### Stage 3-Mental Division

Use halving as a strategy in dividing by 2

e.g.  $36 \div 2$  is half of  $36 = 18$

Find half of odd numbers

#### **Grouping**

Recognise that division is not commutative

e.g.  $16 \div 8$  does not equal  $8 \div 16$

Relate division to multiplications 'with holes in'

e.g.  $\_ \times 5 = 30$  is the same calculation as  $30 \div 5 = \_$  thus we can count in 5s to find the answer



Divide multiples of 10 by 1-digit numbers

e.g.  $240 \div 8 = 30$

Begin to use subtraction of multiples of 10 of the divisor to divide numbers above the 10th multiple

e.g.  $52 \div 4$  is  $10 \times 4$  (40) and  $3 \times 4$  (12) = 13

## Overview of Strategies and Methods (Division)

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### Stage 3-Mental Division

#### **Using number facts**

Know half of even numbers to 40

Know half of multiples of 10 to 200

e.g. *half of 170 is 85*

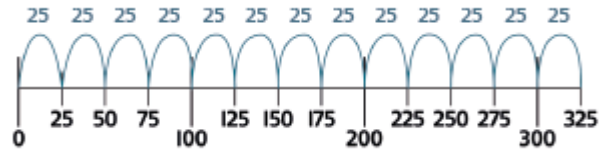
Know  $\times 2$ ,  $\times 3$ ,  $\times 4$ ,  $\times 5$ ,  $\times 8$ ,  $\times 10$  division facts

## Overview of Strategies and Methods (Division)

### Stage 4-Mental Division

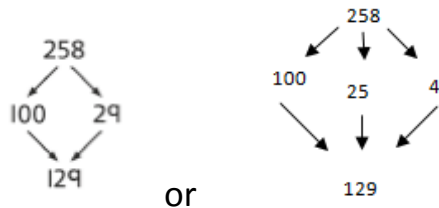
#### Counting in steps (sequences)

Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



#### Doubling and halving

Find half of even numbers to 200 and beyond using partitioning e.g. *find half of 258*



or

Begin to halve amounts of money

e.g. *£9 halved is £4.50*



Use halving as a strategy in dividing by 2, 4 and 8

e.g. *164 ÷ 4 is half of 164 (82) halved again = 41*

### Stage 4-Mental Division

#### Grouping

Use multiples of 10 times the divisor to divide by 1-digit numbers above the tables facts

e.g.  $45 \div 3$  as  $10 \times 3$  (30) and  $5 \times 3$  (15)

Divide multiples of 100 by 1-digit numbers using division facts

e.g.  $3200 \div 8 = 400$

#### Using number facts

Know times-tables up to  $12 \times 12$  and all related division facts

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

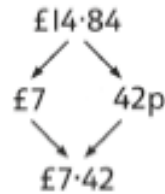
## Overview of Strategies and Methods (Division)

### Stage 5-Mental Division

#### **Doubling and halving**

Halve amounts of money using partitioning

e.g. *half of £14.84 is half of £14 (£7) plus half of 84p (42p)*



Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20 e.g. *115 ÷ 5 as double 115 (230) ÷ 10 = 23*

#### **Grouping**

Divide numbers by 10, 100, 1000 to obtain decimal answers with up

to 3 decimal places e.g. *340 ÷ 100 = 3.4*

Use the 10th, 20th, 30th ... multiple of the divisor to divide 'friendly'

2- and 3-digit numbers by 1-digit numbers

e.g. *186 ÷ 6 as 30 × 6 (180) and 1 × 6 (6)*

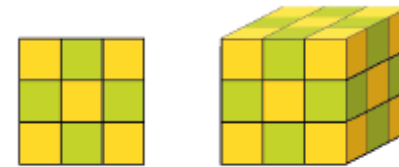
### Stage 5-Mental Division

#### **Using number facts**

Use division facts from the times-tables up to  $12 \times 12$  to divide multiples of powers of 10 of the divisor

e.g. *3600 ÷ 9 using 36 ÷ 9*

Know square numbers and cube numbers

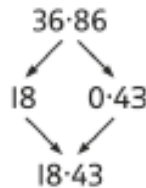


## Overview of Strategies and Methods (Division)

### Stage 6-Mental Division

#### **Doubling and halving**

Halve decimal numbers with up to 2 places using partitioning e.g. *half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)*



Use doubling and halving as strategies in mental division

#### **Grouping**

Use the 10th, 20th, 30th, ... or 100th, 200th, 300th ... multiples of the divisor to divide large numbers e.g. *378 ÷ 9 as 40 × 9 (360) and 2 × 9 (18), remainder 2*

Use tests for divisibility

e.g. *135 divides by 3, as 1 + 3 + 5 = 9 and 9 is in the ×3 table*

### Stage 6-Mental Division

#### **Using number facts**

Use division facts from the times-tables up to 12 × 12 to divide decimal numbers by 1-digit numbers

e.g. *117 ÷ 3 is  $\frac{1}{100}$  of 117 ÷ 3 (39)*

Know tests of divisibility for numbers divisible by 2, 3, 4, 5, 9, 10 and 25

## Overview of Strategies and Methods (Division)

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## Overview of Strategies and Methods (Division)

### Stage 1 – Written Division

Perform divisions just above the 10th multiple using written jottings, understanding how to give a remainder as a whole number

Use division facts to find unit and simple non-unit fractions of amounts within the times-tables

e.g.  $\frac{3}{4}$  of 48 is  $3 \times (48 \div 4) = 36$

### Stage 2 – Written Division

Use a written version of a mental method to divide 2- and 3-digit numbers by 1-digit numbers

e.g.  $86 \div 3$  as  $20 \times 3$  (60) and  $8 \times 3$  (24), remainder 2

$$86 \div 3 = \square$$

$$\begin{array}{r} \square \times 3 = 86 \\ 20 \times 3 = 60 \\ \hline 26 \\ 8 \times 3 = 24 \\ \hline 2 \\ 28 \end{array} \quad \begin{array}{l} 86 \div 3 = 28 \text{ r}2 \\ \uparrow \quad \uparrow \\ \phantom{2} \phantom{8} \phantom{\text{r}2} \end{array}$$

Use division facts to find unit and non-unit fractions of amounts within the times-tables

e.g.  $\frac{7}{8}$  of 56 is  $7 \times (56 \div 8) = 48$

## Overview of Strategies and Methods (Division)

### Stage 3 – Written Division

Short division of 3- and 4-digit numbers by 1-digit numbers  
e.g.  $139 \div 3$

$$\begin{array}{r} 46 \text{ r}1 \\ 3 \overline{) 139} \end{array}$$

### National Curriculum 2014 Examples

$98 \div 7$  becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7 \phantom{0}} \\ 20 \\ \underline{14} \\ 6 \end{array}$$

Answer: 14

$432 \div 5$  becomes

$$\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{) 432} \\ \underline{40} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

Answer: 86 remainder 2

$496 \div 11$  becomes

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \underline{44} \\ 56 \\ \underline{55} \\ 1 \end{array}$$

Answer:  $45 \frac{1}{11}$

### Stage 4 – Written Division

Long division of 3- and 4-digit numbers by 2-digit numbers  
e.g.  $432 \div 15$

### National Curriculum 2014 Examples

$432 \div 15$  becomes

$$\begin{array}{r} 28 \text{ r}12 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{150} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28 remainder 12

$432 \div 15$  becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{150} \\ 120 \\ \underline{120} \\ 0 \end{array} \begin{array}{l} 15 \times 20 \\ 15 \times 8 \end{array}$$

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

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

$432 \div 15$  becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 132 \\ \underline{150} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8

## Overview of Strategies and Methods (Division)

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