

PROGRESSION THROUGH CALCULATIONS FOR DIVISION

MENTAL CALCULATIONS

(Ongoing)

These are a **selection** of mental calculation strategies:

Doubling and halving

Knowing that halving is dividing by 2

Deriving and recalling division facts

Tables should be taught every day, either as part of the mental oral starter or other times as appropriate within the day.

2 times table

5 times table

10 times table

Then

3 times table

4 times table

6 times table

Derive and recall quickly division facts for all tables up to 10×10

Using and applying division facts

Children should be able to utilise their tables knowledge to derive other facts.

e.g. If I know $3 \times 7 = 21$, what else do I know?

$30 \times 7 = 210$, $300 \times 7 = 2100$, $3000 \times 7 = 21\ 000$, $0.3 \times 7 = 2.1$ etc

Dividing by 10 or 100 or 1000

Knowing that the effect of dividing by 10 is a move in the digits one place to the right.

Knowing that the effect of dividing by 100 is a move in the digits two places to the right.

Knowing that the effect of dividing by 1000 is a move in the digits two places to the right

Use of factors

$$378 \div 21$$

$$378 \div 3 = 126$$

$$378 \div 21 = 18$$

$$126 \div 7 = 18$$

Children need to be reminded that the decimal point does not move, it's the digits that move into the different place values.

Use related facts

Given that $1.4 \times 1.1 = 1.54$

What is $1.54 \div 1.4$, or $1.54 \div 1.1$?

MANY MENTAL CALCULATION STRATEGIES WILL CONTINUE TO BE USED. THEY ARE NOT REPLACED BY WRITTEN METHODS.

THE FOLLOWING ARE METHODS THAT WE EXPECT THE MAJORITY OF CHILDREN TO BE ABLE TO ACHIEVE.

Stage 1

Children will understand equal groups and share items out in play and problem solving. They will count in 2s and 10s and later in 5s.

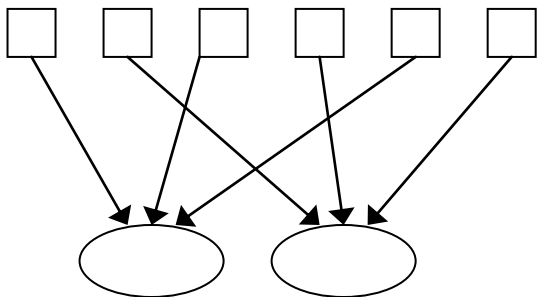


Stage 2

Children will develop their understanding of division and use jottings to support calculation

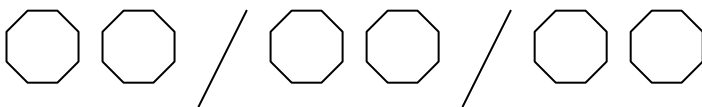
✓ **Sharing equally**

6 sweets shared between 2 people, how many do they each get?



✓ **Grouping or repeated subtraction**

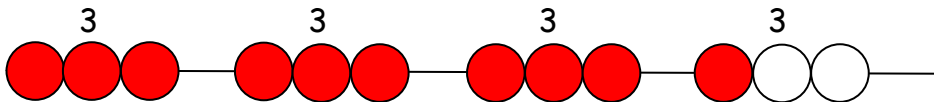
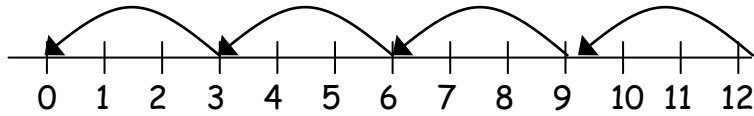
There are 6 sweets, how many people can have 2 sweets each?



Stage 3

- ✓ Repeated subtraction using a number line or bead bar

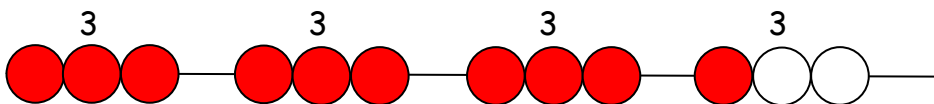
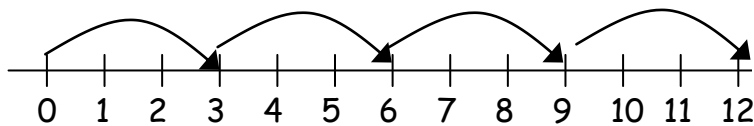
$$12 \div 3 = 4$$



Or

- ✓ Repeated addition using a number line or bead bar

$$12 \div 3 = 4$$



The bead bar will help children with interpreting division calculations such as $10 \div 5$ as 'how many 5s make 10?'

Stage 4

Missing numbers - using the inverse

- ✓ Using symbols to stand for unknown numbers to complete equations using inverse operations

$$\square \div 2 = 4$$

$$20 \div \triangle = 4$$

$$100 \div \triangle = 4$$

Stage 5

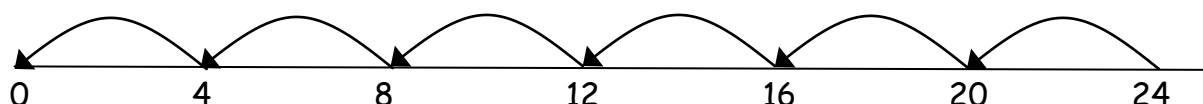
Ensure that the emphasis is on grouping rather than sharing.

Children will continue to use:

- ✓ **Repeated subtraction or addition using a number line**

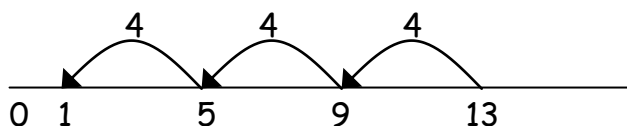
Children will use an empty number line to support their calculation.

$$24 \div 4 = 6$$



Children move onto calculations involving remainders.

$$13 \div 4 = 3 \text{ r } 1$$



Stage 6

Chunking Method

$$\begin{array}{r} 256 \div 7 = \\ 140 \quad (20 \times 7) \\ \underline{70} \quad (10 \times 7) \\ \text{Running Total} \quad 210 \\ \underline{35} \quad (5 \times 7) \\ \text{Running Total} \quad 245 \\ \underline{7} \quad (1 \times 7) \\ \text{Final Total} \quad 252 \quad 36 \end{array}$$

Chunking Table

X 7

$$20 \times 7 = 140$$

$$10 \times 7 = 70$$

$$5 \times 7 = 35$$

$$2 \times 7 = 14$$

$$1 \times 7 = 7$$

By doing a chunking table the children have already got the chunks ready to use.

Answer 36 remainder 4

Check $(36 \times 7) + 4 = 256$

Answer: 36 remainder 4 or $36 \frac{4}{7}$

Stage 7

Short division

$$284 \div 6$$

$$\begin{array}{r} 47 \text{ r}2 \\ 6 \overline{) 2844} \end{array}$$

Answer 47 r 2

Remind children that this is the only time they will start with the highest place value.

Remainder as a fraction

47 r2

$$47 \frac{2}{6} \quad \text{or} \quad 47 \frac{1}{3}$$

**Remainders as Decimals (the question will normal say to how may decimal places)
To One decimal place**

47.3

Stage 8

Extend to decimals with up to two decimal places. Children should know that decimal points line up under each other.

$$87.5 \div 7$$

$$\begin{array}{r} 12.5 \\ 7 \overline{) 87.5} \end{array}$$

Answer : 12.5

+ - + - + - + - + - + - +

By the end of all stages children will have a range of calculation methods, mental and written. Selection will depend upon the numbers involved.

Children should not be made to go onto the next stage if:

- 1) they are not ready i.e. lack of understanding of place value.
- 2) they are not confident with previous stages