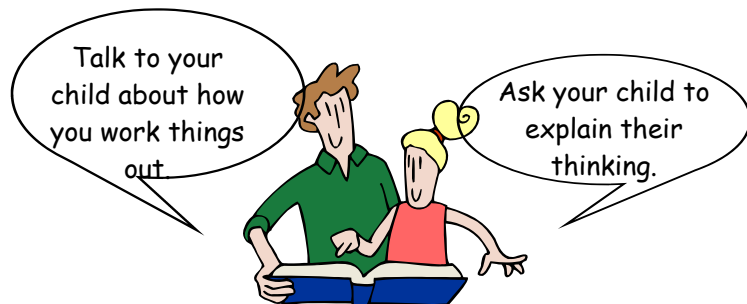




## CALCULATION

A lot of emphasis in Numeracy teaching is placed on using mental calculations where possible. As children progress through the school and are taught more formal methods, they are still encouraged to think about mental strategies they could use first and only use written methods for calculations they cannot solve in their heads. It is important that children are secure in their number bonds (adding numbers together and subtracting them e.g  $10-6=4$ ,  $13+7=20$ ) and have a good understanding of place value (tens and units etc).



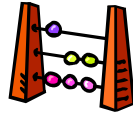
## SHAPES AND MEASURES



- Hunt for right angles around your home. Can your child spot angles bigger or smaller than a right angle?
- Look for symmetrical objects. Help your child to draw or paint symmetrical pictures/patterns.
- Practise measuring the lengths or heights of objects in metres or centimetres. Help your child to use different rulers and tape measure correctly. Encourage them to estimate before measuring.
- Let your child help with cooking at home. Help them to measure ingredients accurately using a weighing scales or measuring jugs. Talk about what each division on the scales stands for.
- Choose some food items in your kitchen. Try to put these objects in order of weight by feel alone. Check by looking at the weight as printed on the packet.
- Practise telling the time with your child. Use both the digital and analogue clock.
- Use a stop watch to time how long it takes to do everyday tasks e.g. how long does it take to get dressed. Encourage your child to estimate first.



## PRACTISING NUMBER FACTS



- Find out which number facts your child is learning at school (addition facts to 10, times tables, doubles etc). Try to practise for a few minutes each day using a range of vocabulary.
- Have a 'fact of the day'. Pin this fact up around the house. Practise reading it in a quiet, loud, squeaky voice. Ask your child over the day if they can recall the fact.
- Play 'ping pong' to practise complements with your child. You say a number. They reply with how much more is needed to make 10. You can also play this game with numbers totalling 20, 100 or 1000. Encourage your child to answer quickly, without counting or using fingers.
- Throw 2 dice. Ask your child to find the total of the numbers (+), the difference between them (-) or the product (x). Can they do this without counting?
- Use a set of playing cards (no pictures). Turn over two cards and ask your child to add or multiply the numbers. If they answer correctly, they keep the cards. How many cards can they collect in 2 minutes?
- Play Bingo. Each player chooses five answers (e.g. numbers to 10 to practise simple addition, multiples of 5 to practise the five times tables). Ask a question and if a player has the answer, they can cross it off. The winner is the first player to cross off all their answers.
- Give your child an answer. Ask them to write as many addition sentences as they can with this answer (e.g.  $10 = \square + \square$ ). Try with multiplication or subtraction.
- Give your child a number fact (e.g.  $5+3=8$ ). Ask them what else they can find out from this fact (e.g.  $3+5=8$ ,  $8-5=3$ ,  $8-3=5$ ,  $50+30=80$ ,  $500+300=800$ ,  $5+4=9$ ,  $15+3=18$ ). Add to the list over the next few days. Try starting with a x fact as well.



When faced with a calculation problem, encourage your child to ask...



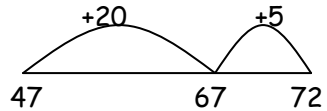
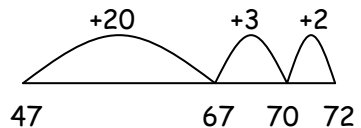
- ★ Can I do this in my head?
- ★ Could I do this in my head using drawings or jottings to help me?
- ★ Do I need to use a written method?
- ★ Should I use a calculator?



Also help your child to estimate and then check the answer. Encourage them to ask...

Is the answer sensible?

**ADDITION** Children are taught to understand addition as combining two sets and counting on. Calculations are put into practical contexts so the child sees the relevance of the method they are learning. The methods below are a progression from junior infants to 6th class. When reciting addition tables use **plus/add** rather than **and**.

<p><b>2+3=</b> At a party, I eat 2 cakes and my friend eats 3. How many cakes did we eat altogether?</p> 	<p>Children could draw a picture to help them work out the answer.</p>
<p><b>7+4=</b> 7 people are on the bus. 4 more get on at the next stop. How many people are on the bus now?</p> 	<p>Children could use dots or tally marks to represent objects (quicker than drawing a picture)</p>
<p><b>47+25=</b> My sunflower is 47cm tall. It grows another 25cm. How tall is it now?</p>  <p>or</p> 	<p>Drawing an empty number line helps children to record the steps they have taken in a calculation (start on 47, +20, then +5). This is much more efficient than counting on in ones.</p>

## REAL LIFE PROBLEMS

- ★ Go shopping with your child to buy two or three items. Ask them to work out the total amount spent and how much change you will get.
- ★ Buy some items with a percentage extra free. Help your child to calculate how much of the product is free.
- ★ Plan an outing during the holidays. Ask your child to think about what time you will need to set off and how much money you will need to take.
- ★ Use a TV guide. Ask your child to work out the length of their favourite programmes. Can they calculate how long they spend watching TV each day / each week?
- ★ Use a bus or train timetable. Ask your child to work out how long a journey between two places should take? Go on the journey. Do you arrive earlier or later than expected? How much earlier/later?
- ★ Help your child to scale a recipe up or down to feed the right amount of people.
- ★ Work together to plan a party or meal on a budget.



These are just a few ideas to give you a starting point. Try to involve your child in as many problem-solving activities as possible. The more 'real' a problem is, the more motivated they will be when trying to solve it.

## Tables

When learning tables start with the variable followed by the constant .e.g.

$1 \times 7 = 7$

$1 \times 7 = 14$

$3 \times 7 = 21$

$4 \times 7 = 28$

$5 \times 7 = 35$

$6 \times 7 = 42$

$7 \times 7 = 49$

$8 \times 7 = 56$

$9 \times 7 = 63$

$10 \times 7 = 70$

$11 \times 7 = 77$

$12 \times 7 = 84$



## ADDITION

Children are taught to start from the **bottom**

$487 + 546 =$

There are 487 boys and 546 girls in a school. How many children are there altogether?

Children will be taught written methods for those calculations they cannot do 'in their heads'.

Expanded methods build on mental methods and make the value of the digits clear to children. The language used is very important.

\* 7 plus 6 = 13, put down your 3 and carry your 1. The number must be placed on the bottom line left of the 7. Keep the numbers carried over smaller than the original digit.

\* 1 plus 8 = 9 plus 4 = 13 put down your 3 and carry your 1

\* 1 plus 4 = 5 plus 5 = 10, write down my 10




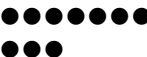
The children are taught the importance of placing digits with the same value underneath each other in clear column.

$$\begin{array}{r} 546 \\ + 487 \\ \hline \end{array}$$

$$1033$$

## SUBTRACTION

**Children are taught to understand subtraction as taking away (counting back) and finding the difference (counting up)**

<p><b>5-2=</b> I had five balloons. Two burst. How many did I have left?</p> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <span>Take away</span> </div> <p>A teddy bear costs €5 and a doll costs €2. How much more does the bear cost?</p> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <span>Find the difference</span> </div>	<p>Drawing a picture helps children to visualise the problem.</p>
<p><b>7-3=</b> Mum baked 7 biscuits. I ate 3. How many were left?</p> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <span>Take away</span> </div> <p>Lisa has 7 felt tip pens and Tim has 3. How many more does Lisa have?</p> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <span>Find the difference</span> </div>	<p>Using dots or tally marks is quicker than drawing a detailed picture.</p>

**Division:** Children are introduced to different ways of writing division. 6

$$\begin{array}{r} 18 \quad 6 \quad 18 \quad 18 - 6 \\ \underline{\phantom{00}6} \phantom{00} \phantom{00} \phantom{00} \\ \phantom{00} \phantom{00} \phantom{00} \phantom{00} \end{array}$$

**84÷6=**  
I need 6 drawing pins to put up a picture. How many pictures can I put up with 84 pins?

**Short Division:**  
We say 8 divided by 6=1 remainder 2. The 2 is placed beside the 4.  
Now we say 24 divided by 6=4

**Tina has 473 daffodil bulbs to plant. She must plant the bulbs in 11 different rows.  
How many bulbs will be in each row?**

**Long division method:**

1. Estimate first 437 divided by 11. Round each number to the nearest 10. 470 divided by 10.=47
2. Divide 11 (the divisor) into the first number 47.
3. It won't go so divide the divisor into the first two numbers 47. How many times will 11 go into 47? 11 x 4=44so 11 will divide into 47 4 times.write the 44 under the 47.
4. Now subtract 44 from 47=3
5. Bring down the 3 beside the 3 that was left over.
6. How many times will 11 divide into 33? 11 x3=33. So write the 33 under the 33 and subtract. There is no remainder.

$$\begin{array}{r} 11 \quad \underline{043} \\ 473 \\ \underline{44} \phantom{0} \\ 33 \\ \underline{33} \\ 00 \end{array}$$

## DIVISION

Children are taught to understand division as sharing and grouping.

$6 \div 2 =$

6 Easter eggs are shared between 2 children. How many eggs do they get each?



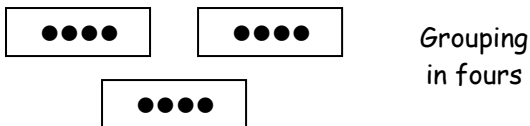
There are 6 Easter eggs. How many children can have two each?



More pictures!  
Drawing often gives children a way into solving the problem.

$12 \div 4 =$

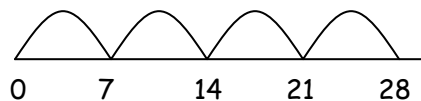
4 apples are packed in a basket. How many baskets can you fill with 12 apples?



Dots or tally marks can either be shared out one at a time or split up into groups.

$28 \div 7 =$

A chew bar costs 7p. How many can I buy with 28p?



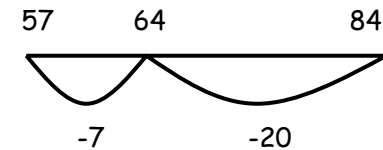
Repeated subtraction method:  
In this example you makes jumps of 7 backwards until you get to zero.  
4 jumps of 7 until you get to zero.

## SUBTRACTION

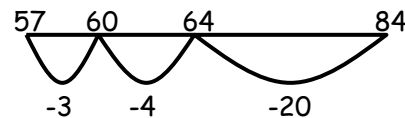
Start from the **bottom**

$84\text{cm} - 27\text{cm} =$

I cut 27cm off a ribbon measuring 84cm. How much is left?



or



Children could count back using an empty number line. This is a really good way for them to record the steps they have taken (start on 84, -20, then -7).

$834 - 378 =$

The library owns 834 books. 378 are out on loan. How many are on the shelves?

$$\begin{array}{r} 7 \ 2 \\ 8 \ 3 \ 14 \\ - 3 \ 7 \ 8 \\ \hline 4 \ 6 \ 6 \end{array}$$

Children progress onto subtraction using decomposition - where there are fewer units, tens, hundreds etc in the larger number. To do this we use the **decomposition method**.

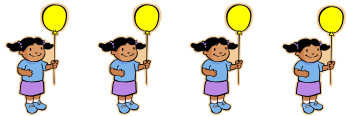
Starting with the units, 8 from 4 we can't take, so we carry over a ten to make 14 units leaving 2 tens. 8 from 14 equals 6 units. Moving onto the tens column, 7 tens from 2 tens we can't do, so we carry over a hundred to make 13 tens leaving 7 hundreds. Now 7 from 13 tens equals 6 tens. Write down your 6. finally in the hundreds column 3 from 7 equals 4 hundreds.

## MULTIPLICATION

Children are taught to understand multiplication as repeated addition and scaling. It can also describe an array.

**2x4=**

Each child has two eyes. How many eyes do four children have?

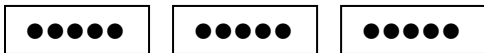


$$2 + 2 + 2 + 2$$

Again a picture can be useful.

**5x3=**

There are 5 cakes in a pack. How many cakes in 3 packs?

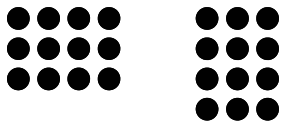


$$5 + 5 + 5$$

Dots or tally marks are often drawn in groups. This shows 3 groups of 5.

**4x3=**

A chew costs 4p. How much do 3 chews cost?



or

Drawing an array (3 rows of 4 or 3 columns of 4) gives children an image of the answer. It also helps develop the understanding that  $4 \times 3$  is the same as  $3 \times 4$ .

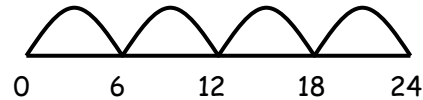
7

## MULTIPLICATION

8

**6x4=**

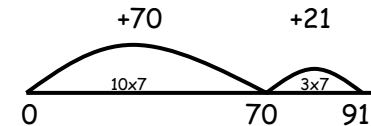
There are 4 cats. Each cat has 6 kittens. How many kittens are there altogether?



Children could count on in equal steps, recording each jump on an empty number line. This shows 4 jumps of 6.

**13x7=**

There are 13 biscuits in a packet. How many biscuits in 7 packets?



When numbers get bigger, it is inefficient to do lots of small jumps. Split 13 into parts (10 and 3). This gives you two jumps ( $10 \times 7$  and  $3 \times 7$ ).

**6x124=**

124 books were sold. Each book cost £6. How much money was taken?

$$\begin{array}{r|rrr} & 100 & 20 & 4 \\ 6 & 600 & 120 & 24 \\ \hline & 744 & & \end{array} = 744$$

This is called the grid method. 124 is split into parts (100, 20 and 4) and each of these is multiplied by 6. The three answers are then added together.

**72x34=**

A cat is 72cm long. A tiger is 34 times longer. How long is the tiger?

$$\begin{array}{r|rr} & 70 & 2 \\ 30 & 2100 & 60 \\ 4 & 280 & 8 \\ \hline & 2448 & \end{array} = 2448$$

This method also works for 'long multiplication'. Again split up the numbers and multiply each part. Add across the rows, then add those two answers together.





## Copies

Children are taught how to rule their copies with a margin and to date their work. Sums should be neatly laid out with one figure in each box.

There is a new emphasis in maths on process rather than product. To this end all calculations are seen as important in a sum and are not known as rough work as in the past. All calculations therefore are done on the page neatly with the sum.



## Equipment:

Each child needs to have their **own** maths equipment as listed on their booklist for that year.

### *Suggested equipment:*

Pencil,  
eraser,  
clear ruler,  
paper,  
two (small squared) copies  
A protractor for 5th and 6th class  
A calculator for 4th, 5th and 6th classes.



## Maths Problem Solving Strategies



## How can you help your child with maths?

- Make sure your child understands mathematical concepts.
- Help them to master the basic maths facts.
- Teach them to write their numbers neatly.
- Provide help immediately when your child needs it.
- Show them how to handle their maths homework.
- Explain how to solve word problems.
- Help your child learn the vocabulary of maths.
- Teach them how to do maths "in thier head".
- Make maths part of your child's daily life.

\* recipes to practise fractions, litres, kilogrammes and grammes, temperature and cooking time, cost of ingredients

\* catalogues for money activities, addition, percentages, saving, value for money, cheap, expensive,



\* travel timetables, travel time, cost of travel, duration of journies.

\* money- saving and spending, change, percentages,

\* sports scores.

\* weather maps, minimum and maximum temperatures.

Time	Flight	Destination	Gate
12:00	00 1961	NEW YORK	06
12:15	PN 0034	CHICAGO	19
12:20	T3 0529	LAS VEGAS	32
12:30	PH 2418	HONOLULU	14
12:50	ST 1972	SAN FRANCISCO	09
12:55	T3 0944	WASHINGTON	27
13:20	SF 2778	HOUSTON	20
13:45	00 0061	HAIRI	31
13:50	BK 1632	BOSTON	04
14:00	00 2487	NEW YORK	12
14:30	PN 0194	ATLANTA	03
14:35	SF 0028	CHICAGO	08

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## How the teacher helps your child with maths.

Your child's teacher will support and develop your child's mathematical thinking by:

- \* **eliciting** as many solutions as possible from the class.
- \* **supporting** your child's thinking,
- \* **extending**, encouraging them to find alternative solution methods.

Between 3rd and 6th class your child will explore mathematical concepts related to the following topics at a class appropriate level:

- \* Numbers, (to a million).
- \* Algebra
- \* Shape and space
- \* Measures
- \* Data

