

Year 3 Curriculum Workshops



Garden Suburb Junior School
2018

Aims of session

- Brief overview of the Year 3 curriculum
- Expectations
- Building Learning Powers
- Supporting your child
- English in Year 3
- Mathematics in Year 3

Year 3 curriculum

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
SCIENCE	Animals including humans	Rocks and Soil	Forces and Magnets	Plants		Light and Shadow
HISTORY	Black History		World Study - Ancient Egypt		Changes in Britain from the Stone Age to the Iron Age	
GEOGRAPHY	Weather around the world	Volcanoes and Earthquakes				
COMPUTING	Online safety We are meteorologists	Touch Typing (Nessy Fingers)	Emails	We are programmers Espresso Coding	We are bug fixers Espresso Coding	Online Surveys
ART	Investigating pattern William Morris		Portraying relationships		Sculpture	
DESIGN TECHNOLOGY		Photo Frames		Moving Egyptian Sarcophagus		Healthy Muffins
PHYSICAL EDUCATION	Gymnastics - Stretching/curling Invasion Games - Basketball	Dance - Volcanoes Creative games- Creating own games	Dance- Egyptians Invasion games - passing and catching skills	Gymnastics- Balancing techniques Adventure/ co-operation games	Sports Day preparation	Athletics - Running jumping and throwing techniques Striking and fielding games - Rounders/ Cricket
MUSIC	Echoes, Onomatopoeia. Beat, Rhythm & Melody.	Basic music theory Note values	Reading/listening Rhythms in 4/4	Understanding all basic music theory Rhythms in 3/4	Composition using tuned percussion Ensemble playing	Singing - tone, expression, clarity, diction
PSHE	New beginnings/ Say no to bullying	RSE - Changes and Families	Getting on and falling out	Relationships/ Say no to bullying	Going for goals	Drug and Alcohol Education- Smoking
SPANISH	Greetings + farewells Introduction to language/cognates Class instructions How are you?	Colours What's Your Name? Numbers 1-12 How old are you?	Months Numbers 13-31	Famous Spaniards When is your birthday Days of the week Date	Pets Family Gender	Body parts Revise and consolidate by storytelling
RELIGIOUS EDUCATION	What makes a time special? Why are some places considered to be special?	What makes a time special? (Diwali, Advent, Christmas)	What makes a time special? (Chinese New Year)	What makes a time special? (Hajj)	What is life? Creation stories What makes a time special? (Wesak)	How do I care and how am I cared for?

Weekly Timetable

	Monday	Tuesday	Wednesday	Thursday	Friday
Soft Start 8.45 - 9.05					
9:05 - 10:10	Maths	Maths	Maths	Library RE	Science 2
10:10 - 10:25					
10:25 - 11:20	English	Computing	English	English	English
11:20-12:20		PPA Games/Spanish/Music	Science 1		Maths
12.20-1.20	LUNCH				
1:20-1:45	Guided Reading	PPA Games/Spanish/Music	Guided Reading	PSHE	Assembly (LB) 1.30-2.00
1:45 - 2:40	History/Geography		Indoor PE	Maths	Art/DT
2:40 - 3:05	Assembly (EB)	PPA Games/Spanish/Music	Assembly (AH)	Assembly (NG)	Golden Time
3.10-3.25	Class reader, homework, letters				

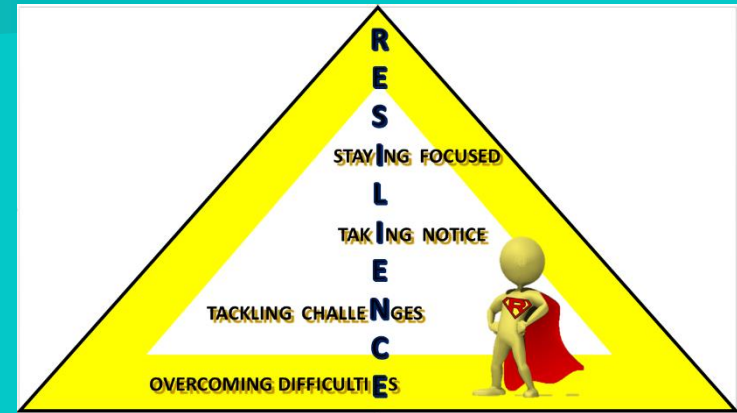
High Expectations

- Behaviour for learning
- Attendance and punctuality
- Uniform
- PE kit
- Homework
- Snack and water bottles

What is Building Learning Powers based on?

- The pioneering work of Professor Guy Claxton, who is programme consultant and chief inspiration for the programme
- An extensive body of research into learning and the brain
- Recent research into the key dimensions of learning power
- Practical trials in schools across the country

Learning Powers



Why use Building Learning Powers?

- Helping children become better learners
- Developing transferable learning power
- Preparing children for a lifetime of learning

Benefits of BLP

- Improved behaviour for learning
- Increased motivation
- Increased enjoyment in learning
- Established habits of lifelong learning
- Enhanced creativity
- Supple learning minds
- Raised achievement at all levels

BLP in school

- Posters- around the school and hanging in each classroom
- LPs incorporated into all lessons
- Regular school assemblies with a focus on a LP
- Comments on certificates for behaviour/work to reflect LPs
- Comments in books to reflect LPs with stars and wishes

BLP at home

- Encourage children to do same at home- getting things ready for school, planning free time, managing resources, collaborative play with siblings
- Talk- about events at school, what they learnt rather than did
- Feed curiosity- develop enquiring minds- in Waitrose etc
- Build empathy- encourage kindness/ sharing- outside world/ news
- Be a good role model- not being rude, minimise mobile phone-use etc
- Encourage collaboration- share roles at meal times
- High expectations- hobbies/interests
- Demonstrate- ability to practise, persevere and be resilient
- Support the school as a valued place of learning - unequivocal research to prove:

“ If you support the learning your child is doing at school, it positively affects how well they do.”

Supporting your child in their learning

- Homework
- Building Learning Powers
- School website

<http://www.gardensuburbjunior.co.uk/>

- Online safety

Homework

- Spellings
- Times tables
- Sentence/word level tasks
- Mathematics task
- Reading
- Reading record
- Topic based research project
- Learning Logs

Supporting your child in their learning

'If parents want to give their children a gift, the best thing they can do is to teach their children to love challenges, be intrigued by mistakes, enjoy effort, and keep on learning. That way, their children don't have to be slaves of praise. They will have a lifelong way to build and repair their own confidence.'

Carol S. Dweck

English in Year 3

'There is a brilliant child locked
inside every student.'

- Marva Collins

English in Year 3

- National Curriculum Expectations
- Autumn Term Curriculum Map
- Reading
- The Sequence of English lessons
- Marking/Feedback
- Handwriting
- Spelling
- How to Support your Child in English

English National Curriculum

Our English curriculum aims to ensure all pupils:

- Read easily and fluently
- Develop the habit of reading
- Develop a wide vocabulary and understanding of grammar
- Write clearly and accurately
- Use discussion in order to learn
- Are competent in the arts of speaking and listening

English

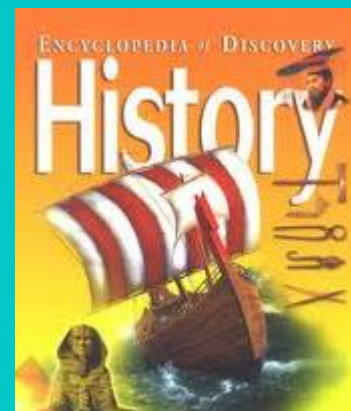
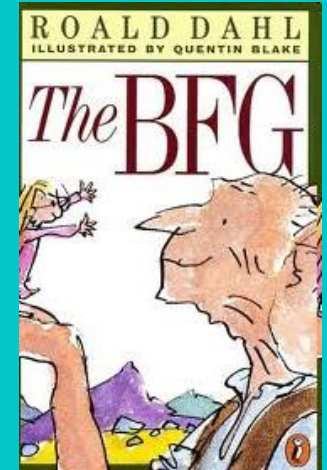
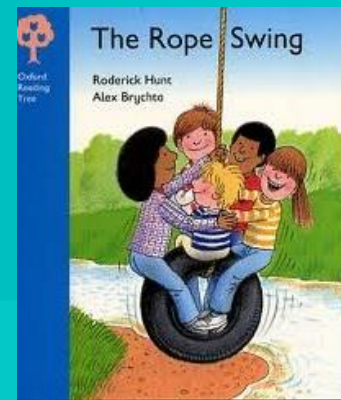
	Autumn 1		Autumn 2	
Genre / Text Type	Narrative (3 weeks)	Letters (3 weeks) Recounts (1 week)	Narrative	Reports (volcanoes and earthquakes)
Possible Novels / Extracts	'Adventure in a Spooky school' – Pie Corbett	Black History – Desmond Tutu Letter from head teacher Postcards	The Enormous Crocodile	Reports on volcanoes and earthquakes
Reading	<ul style="list-style-type: none"> To find information in a narrative text To infer meaning To understand how texts are structured 		<ul style="list-style-type: none"> To find information in a narrative text To infer meaning To comment on the author's use of language To understand how texts are structured 	
Punctuation and Grammar	<ul style="list-style-type: none"> To use capital letters and full stops To use verbs and adjectives To write in the past tense To use conjunctions 		<ul style="list-style-type: none"> To use paragraphs To write in the past tense To use conjunctions To use different sentence structures 	
Spelling	<ul style="list-style-type: none"> To learn keywords Adding suffixes to words with more than one syllable To add the prefix <u>dis</u> to a root word. To add the prefix <u>-mis</u> to a root word. To <u>recognise</u> specific sounds in words 		<ul style="list-style-type: none"> To explore prefixes - <u>il</u>, <u>im</u>, <u>ir</u>, re, sub, inter super, anti and auto To add the suffix - <u>ation</u> and <u>-ly</u> 	

Year 3 Reading Targets

- Apply phonic knowledge to read aloud and understand meanings of new words
- Read and discuss a range of genres
- Use dictionaries to check the meaning of words
- Discuss words and phrases that capture the reader's interest and imagination
- Check the text makes sense
- Ask questions to improve their understanding of a text
- Draw inferences from the text e.g. character feelings, motives
- Make and justify story predictions
- Identify how language and structure contribute to meaning

Reading

- Guided reading
- Library
- Book corner
- Weekly comprehension
- Class reader
- Reading records
- First News



English Week

Session 1 - Comprehension

Session 2 - Grammar Skills

Session 3 - Planning and writing

Session 4 - Edit and redraft

Spelling

Handwriting

Comprehension

- Depending on the genre being studied, a high quality text is chosen to be read
- This may be sent home the week before so that children can identify unfamiliar vocabulary
- After discussion, children are expected to answer questions about the text
- Literal questions (retrieval)
- Inference questions

Comprehension

With his heart racing inside his chest, Jake reached the office. It was unlocked! The phone was on the desk by the window. He knew what to do. All he had to do was phone 999. But would they believe him? And what was that sound – was that the burglars coming towards him? Out of the window Jake could see something – Mr Mack! The caretaker was walking back from the hedge carrying a bag of litter and grumbling to himself.

1. What does the phrase 'with his heart racing' tell you about how Jake felt?
2. What kind of mood do you think Mr Mack is in?
3. How does the author make the text exciting for the reader?

Grammar

- Skills are initially taught discretely
- Phrases and sentences are formed for use in writing later that week
- When writing, it is expected that children will use the grammar skill accurately



Writing



Newspaper Articles

Linked to History

Letters

To Year 2

Leaflets

About the Chiltern Open Air
Museum

Poetry

Autumn poems

Book

Reviews

Instructions

Science methods and growing
plants

Recounts

From summer holidays

Stories

Based on key texts

Recipes

For muffins in DT

Note Taking

Whilst watching video
clips

Writing Targets - Year 3

- Sentences with capitals and full stops
- Use a range of punctuation , ? ! () " "
- Use commas to separate items in a list
- Use varied sentence structures
- Adjectives and powerful verbs
- Write sentences in the correct tense
- Use fronted adverbials (next, later)
- Use conjunctions (if, so, but) to vary sentence length

Writing Process

- Comprehension texts and grammar lessons feed into writing
- Planning - organising ideas
- Teacher modelled writing - author's thoughts and choices, reading good examples
- Shared writing- class or small groups
- Providing structure - writing frames, sentence openers, vocabulary
- Editing and redrafting

Marking Code

○ = missing punctuation

SP = spelling mistake in margin

P = punctuation mistake in margin

^ = missed word

~~~~~ = this sentence does not make sense

[ ] = this section does not make sense

\* = add some extra information

NP = new paragraph

NL = new line

○ = better word choice

WO = word order for effect

# Marking Writing

- There is regular dialogue between pupils and adults (both written and verbal)
- Written marking refers to the skill and success criteria
- Pupils have time to evaluate their own work and are able to reflect on their learning
- Pupils have time to respond to the marking

# Edit Lesson

- Children are given time to address spelling, grammar and punctuation issues
- The teacher will teach children how to improve their work based on the common misconceptions
- Children then respond to their wish by rewriting a section of their work

# Edit Lesson

## PRIMARY SCHOOL TEACHER FINDS STONE AGE BONES

Last weekend, a science coordinator from London named Miss Childs discovered Stone Age remains in the Nature Garden whilst digging up weeds.

Sources have revealed that the young teacher was in the nature garden to rid the flowerbeds from weeds. 'I was doing my usual gardening when my spade hid something hard. Initially, I thought it was a large stone and dug deeper. Soon, I could see the tip of a bone. As I dug deeper I uncovered an adult skeleton.'

After the discovery was made, Miss Childs phoned experienced scientists to examine the Neanderthal bones at the Natural History Museum. Straight away, the scientist, called Professor T. Rex. 'I could not believe that this Year 6 teacher did not find the bones on purpose so I rushed over to see them for myself.' After the bones were sent away to the museum, I called Mrs Bhavsar who was

\* Journalistic tone used.

\* Well done for using quotes and fronted adverbials.

↳ Reunite the underlined sentence so it makes sense.

# Edit Lesson

Miss Childs has informed us that she went straight to the museum, with the bones, after she had called the head. ✓

After <sup>the bones</sup> ~~the~~ were sent away to the museum, I called Mrs Bhavsar who was shocked and stunned to find out that her school's nature garden might become a historic site. ✓ said Miss Childs, the science coordinator of Garden Suburb Junior. ✓

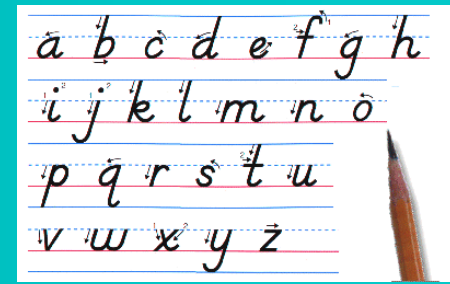
We have been informed that professors used carbon dating to find <sup>out</sup> the age of these prehistoric bones. Other strategies are also going to be used to detect features of these bones. ✓

After examination, hopefully the bones will be displayed at the Natural History Museum with a plaque in Miss Childs's name. ✓

\*You have made improvements to your article.

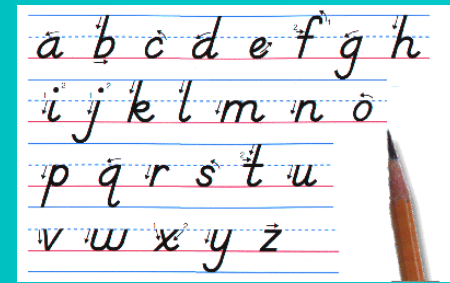


# Handwriting



- The children have weekly handwriting lessons
- Handwriting is explicitly taught using the Oxford Owl Nelson Handwriting scheme
- Children are required to write in a fully cursive (joined) style to meet the national standard in Writing
- In Year 3, children write in pencil

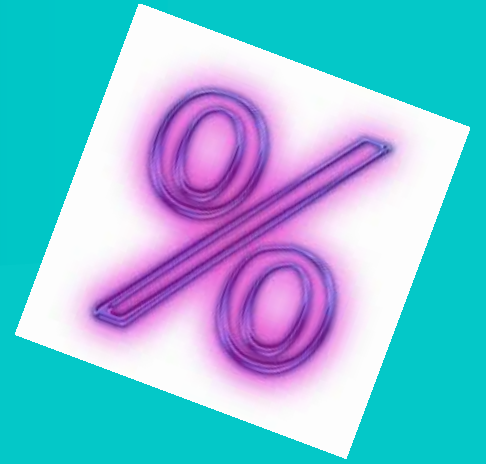
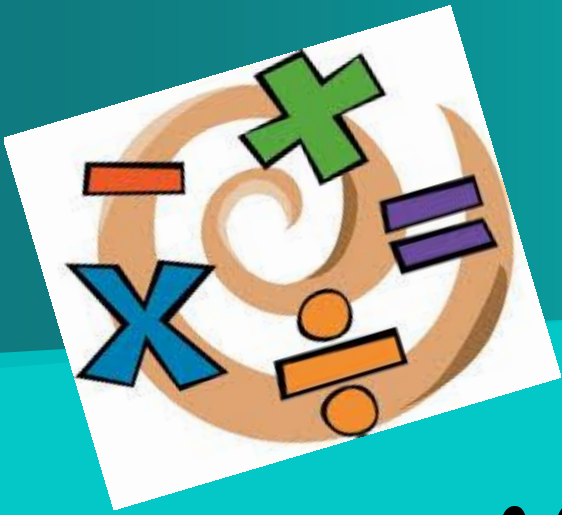
# Spelling



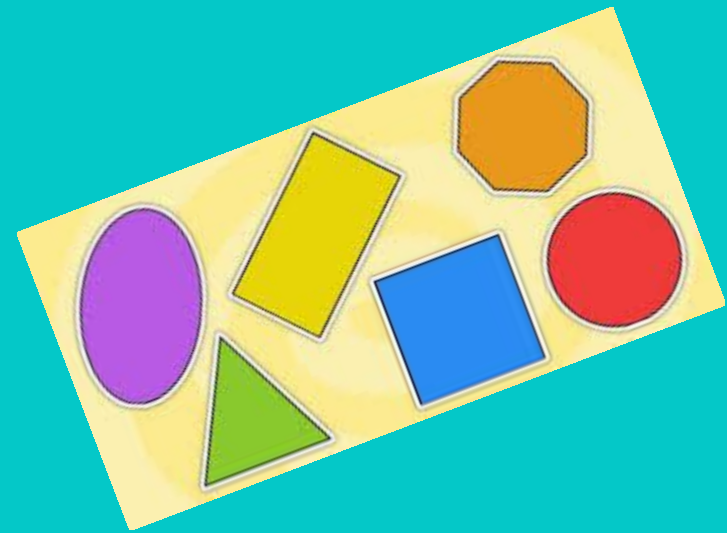
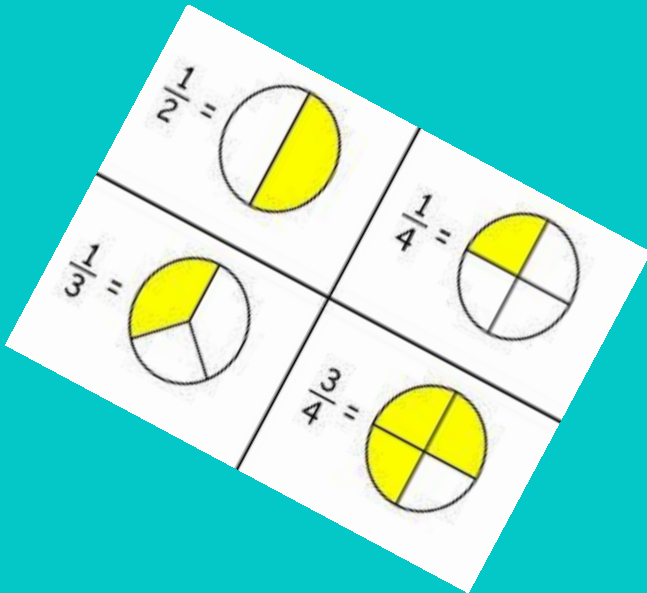
- The children have weekly spelling lessons and tests are on a Friday
- Each week a new spelling rule is learnt e.g. plurals, adding ing and ed, suffixes er, ful and ly
- Words are sent home on a Friday to learn for homework
- Please support your children in learning the rule at home

# How to help your child at home

- Reading at least 5 times per week with questions about what they have read
- Enjoy books with your child - visit the library
- Support with completing reading records
- Learning spellings
- Finding opportunities to write
- Playing games with your child will develop their speaking and listening skills



# Mathematics



# Mathematics National Curriculum

## Core Elements

Number and Place Value

Addition and Subtraction

Multiplication and Division

Fractions, Decimals, Percentages

Measurement

Geometry

Statistics (interpreting and analysing data)

# A mastery approach

I Can  
MASTER

Maths!



By explaining it.



By drawing it.



By showing it in  
different ways.



By teaching it.

"I know the answer,  
can I do something  
harder?"

NOT

"My son is finding  
adding easy - can he  
be moved onto some of  
the Year 4 maths  
objectives?"

"Why do I need to  
explain it or use  
resources? I already  
know the answer!"

# Times Tables - Each Year Group

## Year 1

Year 1 children are taught counting up in 2s, 5s and 10s (the simplest form of multiplication).

## Year 2

Year 2 children are introduced to multiplication, division facts and repeated addition for numbers 2, 5 and 10.

## Year 3

*Year 3 is a crucial year for times tables learning.* Children learn multiplication facts for the 3, 4 and 8 times tables.

## Year 4

Year 4 is a 'completing' year for all multiplication facts up to  $12 \times 12$ .

# Times Tables

Times Tables Check will now be administered for children in Year 4, starting in the 2019-20 academic year.

## The basics:

Primary school children were expected to know all their times tables up to 12x12 by the end of Year 4.

## Why a new test?

The Department for Education says that the check is part of a new focus on mastering numeracy, giving children the skills and knowledge they need for secondary school and beyond.

## Which children will sit the times tables check?

It will be taken by children in Year 4, in the summer term (in June). In June 2019 the multiplication check will be voluntary (schools will be able to decide whether to administer it or not). In June 2020 it will become compulsory for all English schools.



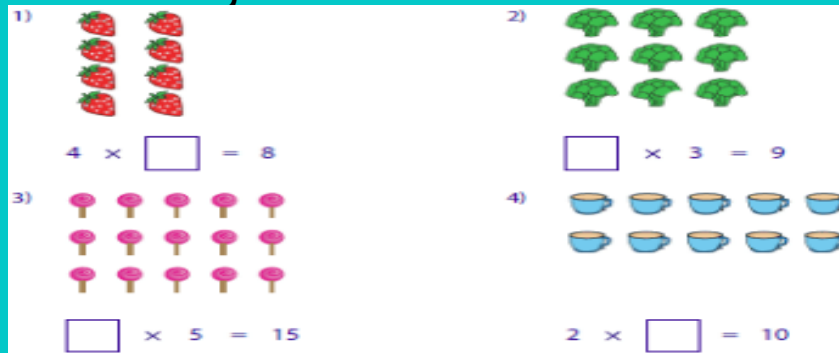
# Times Tables

## How can you help your child practise their times tables?

An extensive curriculum means there is an expectation that parents will help their children learn their times tables at home and not rely on schools to bring them up to speed.

### Some of the techniques you can use include:

- 1) Practising times tables by rote.
- 2) Asking your child multiplication questions out of order - such as 'What's 11x12? What's 5x6?' rather than 1x12? 2x12? 3x12?
- 3) Asking your child the related division facts:  
What's 4x2? So what is 8/4? And what is 8/2?
- 4) Using arrays to help your child memorise times tables - you can use fun objects like Smarties or Lego bricks to make it more entertaining.



- 5) Giving your child word problems to test their skills, like 'If Peter has 800ml of orange juice and needs to share it between four friends, how much can they each have?'
- 6) Using apps and games like TT Rock Stars to build speed.
- 7) Singing times tables using songs like Percy Parker.
- 8) Focus on a times tables of the week - stick it on the fridge - regularly re-visit it.

# Maths in the Autumn term: Autumn Term 1

|                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit 1                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Week 1: Number -<br>Number and place value                                                        | <ul style="list-style-type: none"> <li>• Read and write numbers to 1000</li> <li>• Partition three-digit numbers into hundreds, tens, ones</li> <li>• Explain how the digits change when counting in tens or hundreds</li> <li>• Order a set of numbers to 1000</li> <li>• Solve number problems and reason mathematically</li> </ul>                                                                                 |
| Week 2: Number -<br>Addition                                                                      | <ul style="list-style-type: none"> <li>• Add a pair of two-digit numbers</li> <li>• Add a three-digit number and ones</li> <li>• Add a three-digit number and tens</li> </ul>                                                                                                                                                                                                                                         |
| Week 3: Number-<br>Subtraction                                                                    | <ul style="list-style-type: none"> <li>• Subtract a pair of two-digit numbers</li> <li>• Subtract a three-digit number and ones</li> <li>• Subtract a three-digit number and tens</li> </ul>                                                                                                                                                                                                                          |
| Unit 2<br>Week 4: Number -<br>Multiplication and<br>division, including<br>Number and place value | <ul style="list-style-type: none"> <li>• Find 10 more or less than a given number</li> <li>• Identify two multiplication and two division facts from a given set of three numbers</li> <li>• Describe the relationship between multiplication and division</li> <li>• Recall the multiplication and division facts for the 3 multiplication table</li> <li>• Solve word problems and reason mathematically</li> </ul> |
| Week 5: Geometry -<br>Properties of shape                                                         | <ul style="list-style-type: none"> <li>• To name and describe 2D shapes</li> <li>• Recognise, name and describe prisms</li> <li>• Visualise the skeletal outline of a 3-D shape</li> </ul>                                                                                                                                                                                                                            |
| Week 6: Number -<br>Fractions                                                                     | <ul style="list-style-type: none"> <li>• Find a unitary amount of a set of objects</li> <li>• Recognise a unit fraction as one item in a set of objects, e.g. <math>1/10</math></li> <li>• Recognise a non-unit fraction as more than one item in a set of objects, e.g. <math>3/10</math></li> <li>• Add fractions with the same denominator that total one whole</li> </ul>                                         |
| Week 7: Collins<br>assessment tests                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                       |

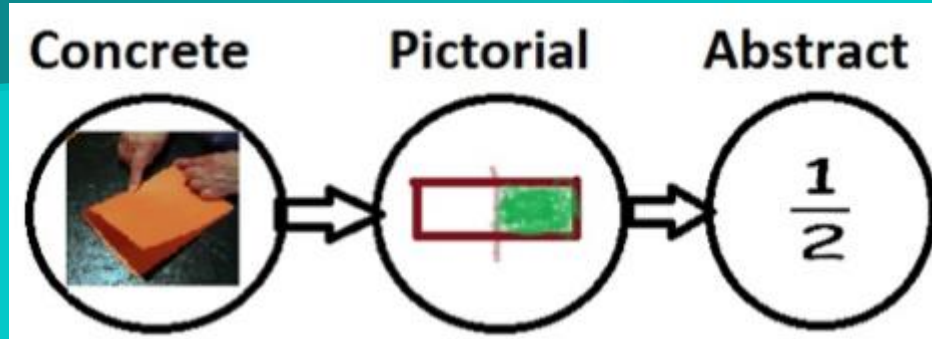
# Maths in the Autumn term:

## Autumn Term 2

|                                                                                |                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit 2                                                                         |                                                                                                                                                                                                                                                                                                                                                                              |
| Week 1: Measurement (mass)                                                     | Measure mass in kilograms and grams <ul style="list-style-type: none"> <li>• Compare mass in kilograms and grams</li> <li>• Add and subtract mass in kilograms and grams</li> </ul>                                                                                                                                                                                          |
| Unit 3                                                                         |                                                                                                                                                                                                                                                                                                                                                                              |
| Week 2: Number - Addition and subtraction                                      | <ul style="list-style-type: none"> <li>• Add a three-digit number and ones</li> <li>• Add a three-digit number and tens</li> <li>• Add a three-digit number and hundreds</li> <li>• Solve word problems and reason mathematically</li> </ul>                                                                                                                                 |
| Week 3: Number - Addition and subtraction                                      | <ul style="list-style-type: none"> <li>• Subtract a three-digit number and ones</li> <li>• Subtract a three-digit number and tens</li> <li>• Subtract a three-digit number and hundreds</li> <li>• Solve word problems and reason mathematically</li> </ul>                                                                                                                  |
| Week 4: Geometry - Properties of shape                                         | <ul style="list-style-type: none"> <li>• Identify right angles in 2-D shapes</li> <li>• Make and describe right-angled turns</li> <li>• Give and follow directions to make turns</li> <li>• Recognise whether angles are equal to, greater than or less than a right angle</li> </ul>                                                                                        |
| Unit 4                                                                         |                                                                                                                                                                                                                                                                                                                                                                              |
| Week 5: Number - Multiplication and division, including Number and place value | <ul style="list-style-type: none"> <li>• Count on and back in steps of 4</li> <li>• Recognise the multiples of 4</li> <li>• Recall the multiplication facts for the 4 multiplication table</li> <li>• Recall the division facts for the 4 multiplication table</li> <li>• Multiply a multiple of 10 by 4</li> </ul>                                                          |
| Week 6: Number - Multiplication and division, including Number and place value | <ul style="list-style-type: none"> <li>• Count on and back in steps of 8</li> <li>• Recognise the multiples of 8</li> <li>• Recall the multiplication facts for the 8 multiplication table</li> <li>• Recall the division facts for the 8 multiplication table</li> <li>• Multiply a multiple of 10 by 8</li> <li>• Solve word problems and reason mathematically</li> </ul> |
| Week 7: Assessment tests Week                                                  |                                                                                                                                                                                                                                                                                                                                                                              |
| Week 8: 7/8- Carry 'Time' to Spring 1 Measurement (time)                       | Times tables revision<br>Tell and write the time on a 12-hour clock with hands <ul style="list-style-type: none"> <li>• Tell and write the time on a 24-hour clock with hands</li> <li>• Use a time line and read words related to time</li> <li>• Estimate and measure time to the nearest minute</li> </ul>                                                                |

# Maths Week

Session 1 - Introduction to a mathematical concept and its rules using concrete resources, pictorial and abstract representations.



## Session 2, 3 and 4

Fluency and reasoning/problem solving

Session 5- Using and applying their understanding to a range of mathematical contexts.

Times tables practice.

# Year 3 Maths Targets

## Number and place value:

Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less

Recognise the place value of each digit in a three-digit number.

Compare and order numbers up to 1000.

Identify, represent and estimate numbers using different representations.

Read and write numbers up to **1000** in numerals and in words.

Solve number problems and practical problems involving these ideas.

## Addition and Subtraction:

Add and subtract numbers mentally

Add and subtract numbers with up to **three digits**, using formal written methods of addition and subtraction.

Estimate the answer to a calculation and use inverse operations to check answers.

Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

## Year 3 Maths Targets

### Multiplication and Division:

Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.

Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know.

Use formal written methods to multiply and divide **2 digit numbers by a 1 digit** number.

Solve problems, including missing number problems, involving multiplication and division.

### Fractions:

Count up and down in tenths.

Recognise, find, write and use fractions (unit fractions and non unit).

Recognise and show, using diagrams, equivalent fractions.

Add and subtract fractions with the same denominator.

Compare and order unit fractions.

Solve problems that involve all of the above.

## Year 3 Maths Targets

### Measurement:

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

Measure the perimeter of simple 2-D shapes.

Add and subtract amounts of money to give change, using both £ and p.

Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks.

Estimate and read and discuss time with increasing accuracy.

Know the number of seconds in a minute and the number of days in each month, year and leap year.

Compare durations of events.

## **Geometry:**

Draw 2-D shapes and make/recognise 3-D shapes.

Recognise angles as a property of shape or a description of a turn.

Identify right angles and recognise their relationship with turning.

Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

## **Statistics:**

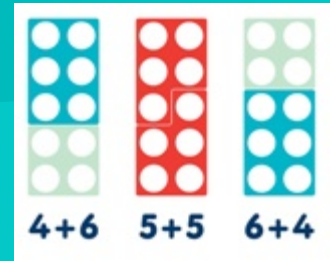
Interpret and present data using bar charts, pictograms and tables.

Solve one-step and two-step questions using information presented in scaled bar charts, pictograms and tables.



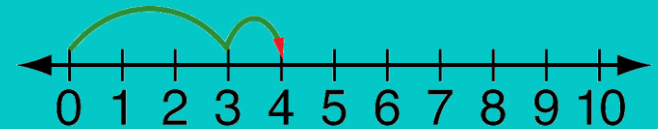
# Progression in addition

Pictorial or concrete aids



Number lines

$$3 + 1 = 4$$



Partitioning (breaking it up into easier parts)

$$46 + 27$$

$$40 + 20 = 60$$

$$6 + 7 = 13$$

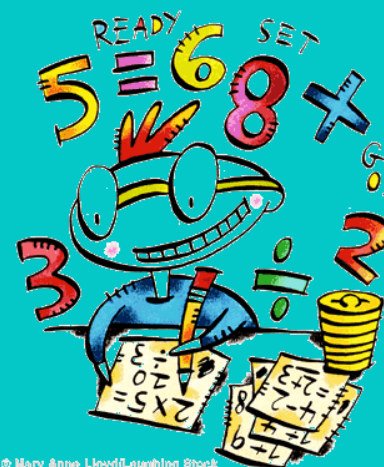
$$60 + 13 = 73$$

# Expanded column method

$$\begin{array}{r} 46 \\ +27 \\ \hline 13 \text{ (6 + 7)} \\ + 60 \text{ (40 + 20)} \\ \hline 73 \end{array}$$

$$\begin{array}{r} 1 \\ 46 \\ +27 \\ \hline 73 \end{array}$$

# Formal column method



# Addition

## Reasoning and problem solving

Kourtney, Scott and Mason are working out  $374 + 37 =$

Kourtney



I started at 374 on a number line

I used column method

Scott



Mason



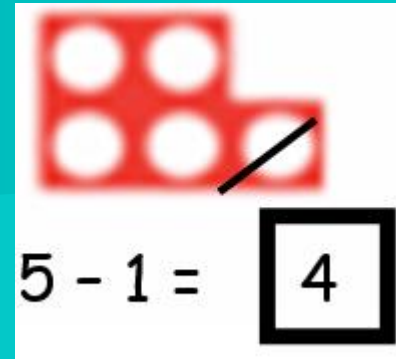
I added 40 and subtracted 3

Which method do you prefer?  
Are there any other ways to work this out?

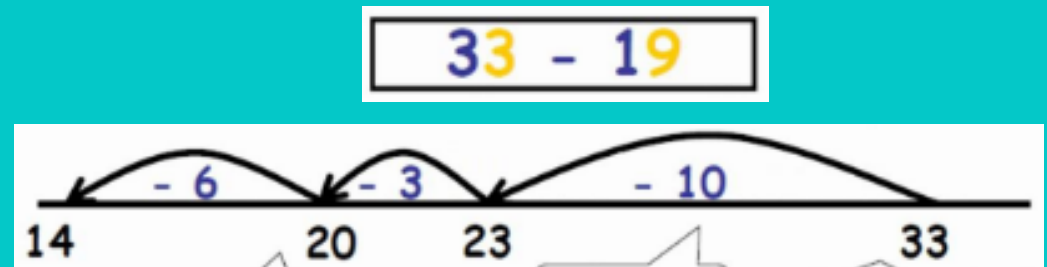
Children choose their preferred method and explain why.

# Progress in subtraction

Pictorial or concrete aids



Number lines



Partitioning (breaking it up into easier parts)

$$49 - 27$$

$$40 - 20 = 20$$

$$9 - 7 = 2$$

$$20 + 2 = 22$$

# The formal column method

*Without exchanging:*

|   | H | T | U |
|---|---|---|---|
|   |   |   |   |
|   | 3 | 4 | 6 |
| - | 2 | 1 | 2 |
|   |   |   |   |
|   |   |   |   |
|   | 1 | 3 | 4 |

$$\begin{array}{r} 5 \phantom{0} \phantom{0} \\ 5 \phantom{0} \phantom{0} \\ - 278 \\ \hline \end{array}$$

*With exchanging:*

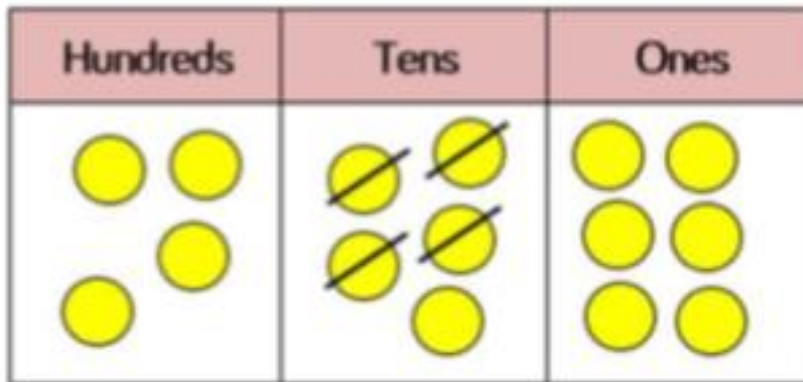
I cannot subtract 8 from 6 so I need to exchange 1 ten for 10 ones.

Use of appropriate decomposition language.

# Subtraction

## Reasoning and problem solving

Sara thinks the chart shows  $456 - 4$   
Do you agree?

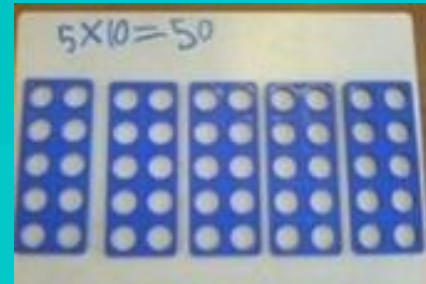


Explain why.

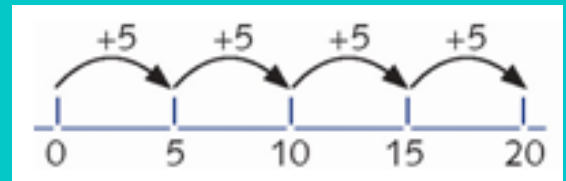
No, I disagree.  
Sara has  
subtracted 4 tens  
not 4 ones.

# Progress in multiplication

Pictorial and concrete aids



Multiplication is initially taught as repeated addition.



Partitioning is used for some larger numbers

$$24 \times 3$$

$$20 \times 3 = 60$$

$$4 \times 3 = 12$$

$$60 + 12 = 72$$

Children must learn times tables to have a range of known facts to use in other calculations.

The 'grid method' also uses partitioning and is a way of ensuring no part of the calculation is left out when both numbers have more than one digit.

|       |    |     |            |     |
|-------|----|-----|------------|-----|
| 21x32 | x  | 30  | 2          | 600 |
|       | 20 | 600 | 40         | 40  |
|       | 1  | 30  | 2          | 30  |
|       |    |     | <u>+ 2</u> | 672 |

This relies on a good knowledge of place value and times table facts. It gives the children a good understanding of how the numbers are generated in the formal method.



## Formal expanded written method

$$\begin{array}{r} \text{Expanded} \\ 36 \\ \times 4 \\ \hline 24 \\ 120 \\ \hline 144 \end{array}$$

(6x4)  
(30x4)

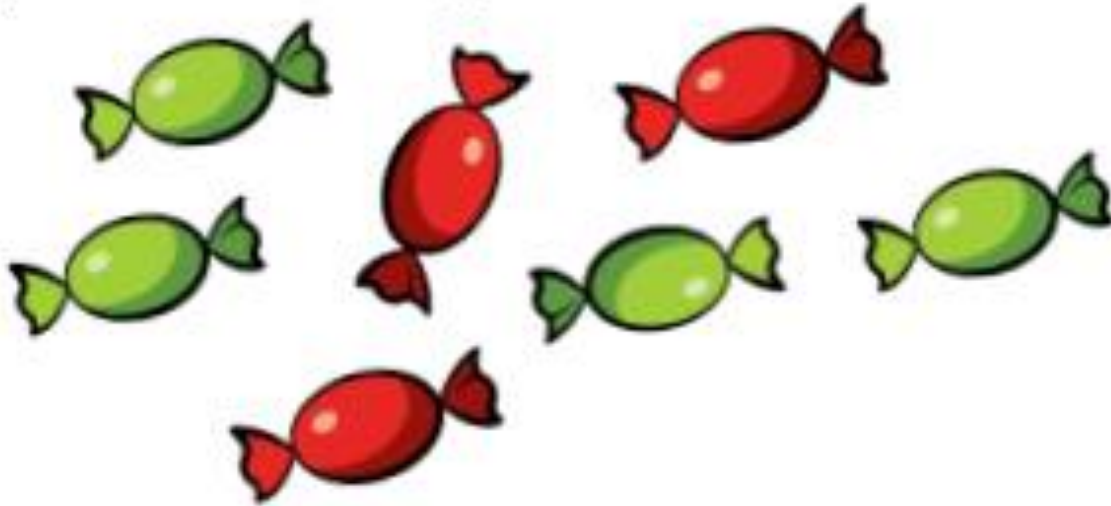
## Formal short written method

$$\begin{array}{r} \text{Standard} \\ 2 \\ 36 \\ \times 4 \\ \hline 144 \end{array}$$

# Multiplication

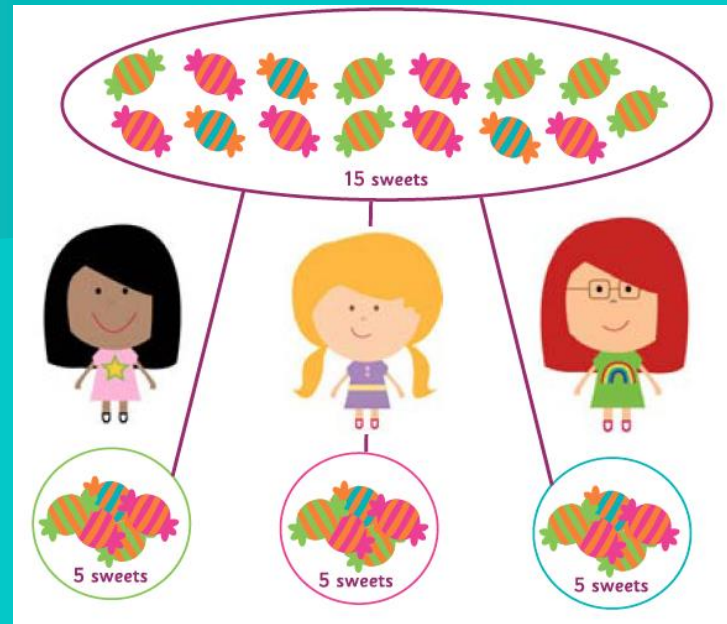
## Reasoning and problem solving

Billy has 56 sweets. There are 7 sweets in a pack. How many packets does he have?

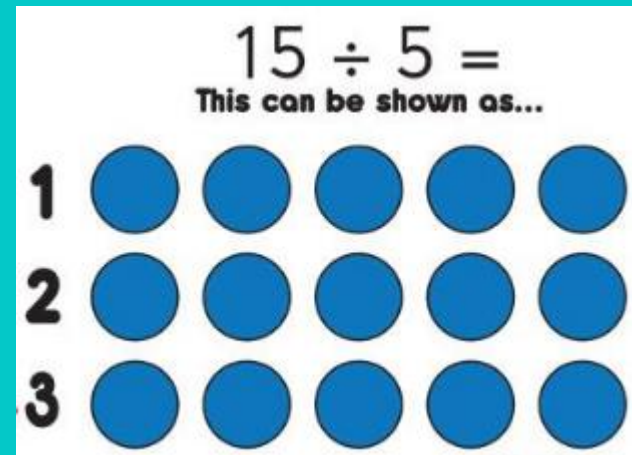


# Progress in division

Pictorial or concrete aids



Arrays



We move on to using partitioning to solve mentally

$$92 \div 4 = (80 \div 4) + (12 \div 4)$$

$$80 \div 4 = 20$$

$$12 \div 4 = 3$$

$$20 + 3 = 23$$

Expanded long division

$$\begin{array}{r} 4 \overline{) 92} \\ - 80 \quad (20 \times 4) \\ \hline 12 \\ - 12 \quad (3 \times 4) \\ \hline 0 \end{array}$$

$$20 + 3 = 23$$

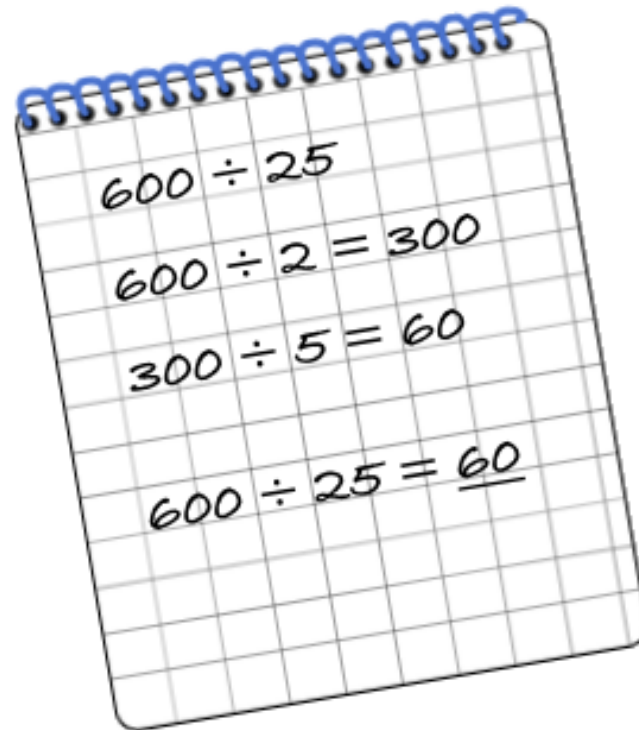
Short division

|   |   |   |
|---|---|---|
|   | 1 | 3 |
| 3 | 3 | 9 |

# Division

## Reasoning and problem solving

Tim has answered a question. Here is his working out.



600 ÷ 25  
600 ÷ 2 = 300  
300 ÷ 5 = 60  
600 ÷ 25 = 60

Is he correct?

Explain your answer.

Tim is not correct as he has partitioned 25 incorrectly.

He could have divided by 5 twice.

The correct answer should be 24

# How to help your child at home

- Play games that involve numbers or logic
- Notice and discuss numbers in real life situations
- Allow children to handle money
- Discuss the time and how long things take
- Count in different steps forwards and back
- Use and discuss measurements together
- Play times tables games
- Look on the website 'medium term plans' to find out what your child is learning in class.
- Have a look at our school website for useful resources to use at home
- Complete homework set