## KS3 Mathematics \& Programming Long Term Plan

- revised for September 2022

| Year 1 |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Term 1a | Term 1b | Term 2a | Term 2b | Term 3a | Term 3b |
| Application themes>>> | All about me | My week | My money | My Leisure activities | My \& my objects | My movement \& visits |
| Core number work | Number system Number Sets +Number $\mathrm{x} /$ Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number $\mathrm{x} /$ Number parts | Number system Number Sets +Number $\mathrm{x} /$ Number parts | Number system Number Sets +Number x/ Number parts |
| Primary focus skill <br> development in addition to number | Sorting <br> Measurement <br> - spatial | Measurementtime | Measurementvalue | Data \& Statistics | Geometryproperties of shapes | Geometryposition \& direction |
| Year 1 <br> Application Themes \& reinforcement opportunities | Me and my class Reinforcement Opportunities: Geometryposition \& direction Data \& Statistics <br> Prog: Instructions for friends, Programming my avatar \& my friends | How long does it take? <br> My day \& week Months \& Seasons Christmas <br> Reinforcement Opportunities: <br> Geometry-position \& direction <br> Geometry- properties of Christmas shapes Prog: instructions for my time, Sequencing time on screen, programming a timer | Food shopping <br> Reinforcement Opportunities: <br> Measurement - spatial <br> Geometry- properties of <br> shapes (stacking and packing) <br> Prog: Shopping list and instructions- if they don't have.... <br> Screen shopping sequence and planning on screen'sum above' function | Music and dance Reinforcement <br> Opportunities: Geometryposition \& direction <br> Prog: <br> dance/music <br> instructions <br> (notation) Making <br> things dance on <br> screen, drum <br> machine, lighting <br> rig <br> Robot dancing <br> Data of music and dance |  <br> cleaning up <br> Reinforcement <br> Opportunities: <br> Measurement - spatial <br> Prog: <br> instructions for <br> tidying/ <br> sequencing <br> tidy-up on <br> screen <br> Robot cleaner | My trip to recreation: playground/hydro \& park <br> Reinforcement Opportunities: <br> Measurement- time <br> Geometry- properties of <br> shapes of the playground <br> Prog: precise instructions, Acted and Virtual visit, beebot/robot visit |


| Year 2 |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Term 1a | Term 1b | Term 2a | Term 2b | Term 3a | Term 3b |
| Application themes>>> | All about me | My week | My money | My Leisure activities | My \& my objects | My movement \& visits |
| Core number work | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts |
| Primary focus skill development in addition to number | Sorting <br> Measurement <br> - spatial | Measurementtime | Measurementvalue |  <br> Statistics | Geometryproperties of shapes | Geometryposition \& direction |
| Year 2 <br> Application <br> Themes \& reinforcement opportunities | Me and my family <br> Reinforcement <br> Opportunities: <br> Measurement- time <br> Data \& Statistics <br> Prog: Instructions for family, Programming my avatar \& my family | How long does it take? <br> My day \& week Months \& Seasons Christmas <br> Reinforcement Opportunities: Geometry- position \& direction <br> Geometry- properties of Christmas shapes <br> Prog: instructions for my time, Sequencing time on screen programming a timer | Clothes shopping <br> Reinforcement Opportunities: <br> Measurement - spatial <br> Geometry- properties of shapes <br> Prog: Instructions for shopping and shopping sequence and planning on screen - 'sum above' function | Table top games <br> Reinforcement <br> Opportunities: <br> Measurement- value <br> Prog: instructions for games, Scoring/ data on screen Making computer games/motivating sequences | Building bridges \& other constructions <br> Reinforcement Opportunities: <br> Measurement - spatial <br> Prog: <br> instructions for construction, sequencing building on screen Robot builder | My trip to food: the canteen \& supermarket <br> Reinforcement <br> Opportunities: <br> Measurement- value <br> Data \& Statistics <br> Prog: precise instructions, Acted and Virtual visit, robot visit, Data of people's trips to supermarket |


| Year 3 |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Term 1a | Term 1b | Term 2a | Term 2b | Term 3a | Term 3b |
| Application themes>>> | All about me | My week | My money | My Leisure activities | My \& my objects | My movement \& visits |
| Core number work | Number system <br> Number Sets +- <br> Number x/ <br> Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts | Number system Number Sets +Number x/ Number parts | Number system <br> Number Sets +- <br> Number x/ <br> Number parts |
| Primary focus skill development in addition to number | Sorting <br> Measurement <br> - spatial | Measurementtime | Measurementvalue |  <br> Statistics | Geometryproperties of shapes | Geometryposition \& direction |
| Year 3 <br> Application <br> Themes \& reinforcement opportunities | Me and my team <br> Reinforcement <br> Opportunities: Geometryposition \& direction Data \& Statistics <br> Prog: Instructions for my team, Programming my avatar \& my team robot teams Data of my team | How long does it take? <br> My day \& week Months \& Seasons <br> Christmas <br> Reinforcement Opportunities: Geometry- position \& direction <br> Geometry- properties of Christmas shapes <br> Prog: instructions for my time, Sequencing time on screen programming a timer | Leisure shopping <br> Reinforcement Opportunities: <br> Measurement- time <br> Geometry- properties of shapes <br> Prog: Instructions for shopping and shopping sequence and planning on screen - 'sum above' function | Athletics <br> Reinforcement <br> Opportunities: <br> Measurement - spatial <br> Prog: Scoring/ data on screen Presenting on screen Robot Olympics | My craft activities <br> Reinforcement <br> Opportunities: <br> Measurement - spatial <br> Prog: <br> instructions for <br> craft, <br> sequencing <br> craft on screen | My trip to school: from entrance to class \& school to home <br> Reinforcement <br> Opportunities: <br> Measurement- time Data \& Statistics <br> Prog: precise instructions, Acted and Virtual visit, robot visit Data of people's trips to school and back home |

## Year 1 National Curriculum* - with developmental core skills

## Programming

Key stage 1
Increasingly precise instructions and sequences - in life and on a computer - predicting and planning for cause, process, effect
$\square$ understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
$\square$ create and debug simple programs
$\square$ use logical reasoning to predict the behaviour of simple programs

## Mathematics

## Number system - number and place value

Number rhymes, anticipation and sequences
1:1 correspondence
Cardinal number
A lot/few
More / less
Number Steps (+/-1)
Ordinal numbers - first, second, last

* AVOID THE NUMERAL TRAP! (numerals are not numbers in themselves) ' -
* AVOID THE NUMBER LINE TRAP! (steps are more accessible)
$\square$ count to and across 100 , forwards and backwards, beginning with 0 or 1 , or from any given number
$\square$ count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
$\square$ given a number, identify one more and one less
$\square$ identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
$\square$ read and write numbers from 1 to 20 in numerals and words.

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Number sets - addition and subtraction
Creation of sets - Sorting, subsets (eg fruit= apples and oranges / boys & girls = children)
Conservation of set - remembering hidden cards/objects etc, pairs, twoness of two etc, numicon,
Sequences - cause and effect - before and after change
Number bonds to 5 and then 10
AVOID THE FALSE ADDITION TRAP! - counting 3 times is not addition - addition is to a conserved set
\square \text { read, write and interpret mathematical statements involving addition (+), subtraction ( } - \text { ) and equals (=) signs}
\square \text { represent and use number bonds and related subtraction facts within 20}
\square \text { add and subtract one-digit and two-digit numbers to 20, including zero}
\square \text { solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number}
problems such as 7 = - 9.
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## Number $\mathbf{x}$ - multiplication and division

Aggregating repeated groups of the same number (eg two eyes per face, 2 wheels per bike....)
Repeated patterns
Sharing fairly
$\square$ solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

## Number parts - fractions

Parts of the whole
Sharing fairly
$\square$ recognise, find and name a half as one of two equal parts of an object, shape or quantity
$\square$ recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

## Measurement - spatial

Opposites and quantitative comparatives - Big/little, Large/small
Objects in combination \& in space (stacking, nesting/fitting, building, rolling) - prepositions
Ordination by size, weight, capacity, time (\& volume, brightness, roughness, smelliness)
Sequencing by cause and effect of one object to another
$\square$ compare, describe and solve practical problems for:

- $\square$ lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
- $\square$ mass/weight [for example, heavy/light, heavier than, lighter than]
- $\square$ capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]


## $\square$ measure and begin to record the following:

-lengths and heights
mass/weight

- $\square$ capacity and volume


## Measurement - time

Opposites and quantitative comparatives - long / short time, quicker, longer
Ordination by, time
Sequencing by cause and effect
Sequencing by time in the day
Days, dates and longer time periods- week, month, season, year
AVOID THE TIME TRAP! - only use numerical time for sets that the pupil can fully and consistently conserve as time is the most abstract context of all
$\square$ compare, describe and solve practical problems for:

- $\quad \square$ time [for example, quicker, slower, earlier, later]
$\square$ measure and begin to record the following:
- $\quad \square$ time (hours, minutes, seconds)
$\square$ sequence events in chronological order using language [for example, before and
after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]
$\square$ recognise and use language relating to dates, including days of the week, weeks, months and years
$\square$ tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.


## Measurement - value

## 'Valuing' - looking after/caring for things

Property- some things are yours and others other peoples- you can't take without consent
Opposites and quantitative comparatives - valuable, worthless
Ordination by big/little value - that value is not related to size
Barter - how many less valuable items for a big value item?
Earn - 'work' for additional access to motivators
Exchange and value,, paying, change (eg looking after things, exchanging, saving (similar to reward chart), 'big money' = pounds, 'little money' $=$ pennies)
Prioritisation - can't have everything- what to have and what to Ieave
AVOID THE MONEY TRAP! - only use money numerically for sets that the pupil can fully and consistently conserve, as money is the most abstract context of all
$\square$ recognise and know the value of different denominations of coins and notes

## Geometry - properties of shapes

objects in combination \& in space (stacking, nesting/fitting, building, rolling) - prepositions
vocab of shape - side, straight, curve, point, corner, angle, height/high, width/wide/narrow, thin, deep,
$\square$ recognise and name common 2-D and 3-D shapes, including:
$\square$ 2-D shapes [for example, rectangles (including squares), circles and triangles]
$\square$ 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].
$\square$ describe position,

## Geometry - position and direction

direction and movement, including whole, half, quarter (sideways)
Repeating patterns
$\square$ direction and movement, including whole, half, quarter and threequarter turns.

## Cultural Capital

## Data \& Statistics

## Sorting

Counting: Number order, anticipation and sequences, 1:1 correspondence, Cardinal number
Scoring and tallying (physical stacking tally)
$\square$ interpret and construct simple pictograms, tally charts, block diagrams and simple tables
$\square$ ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantityask and answer questions about totalling and comparing categorical data.
*Pupils working above Year 1 expectations must have targets appropriate to their National Curriculum year group level

