Welcome to Year 3 and 4 Maths evening

Interdigitation

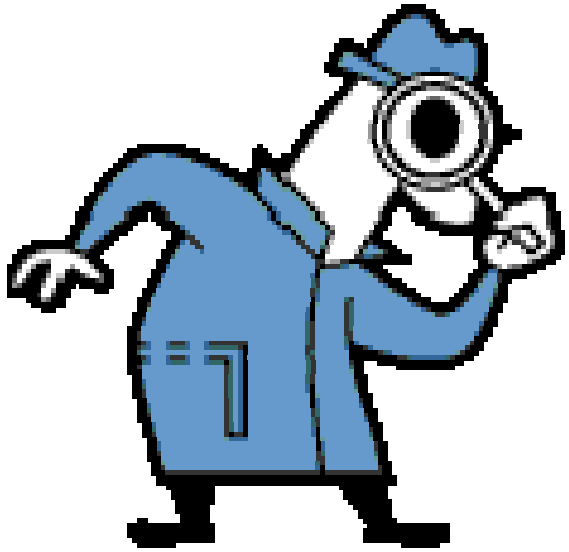
WALT

What **A**re we
Learning **T**oday?

- How we are working together to help our children be good mathematicians

WILF

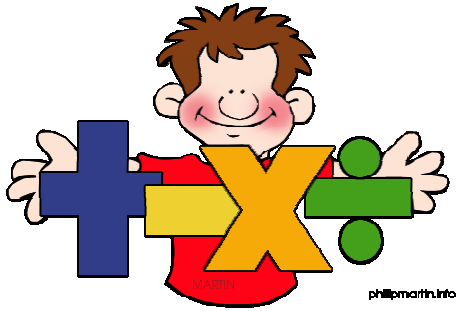
What am **I**
Looking **F**or?



- That the children enjoy mathematics and freely use it in all aspects of their lives.

At all levels learning maths is about solving problems using key processes such as;

- looking for patterns and relationships between numbers
- making sense of and checking information
- communicating and presenting maths using words, symbols, diagrams and graphs



Do it your way!

- 25x19 **475**
- 5% of 86 **4.3**
- 248-99 **149**
- 103-98 **5**
- ½ of 378 **189**
- 1+2+3+4+5+6+7+8+9+10+11= **66**

Progression in maths involves using and applying these processes and skills in mathematics lessons across the whole school curriculum and in *everyday life!*

Using Frank Drake's famous equation, Betty calculates the probability of finding intelligent life on a Saturday night.

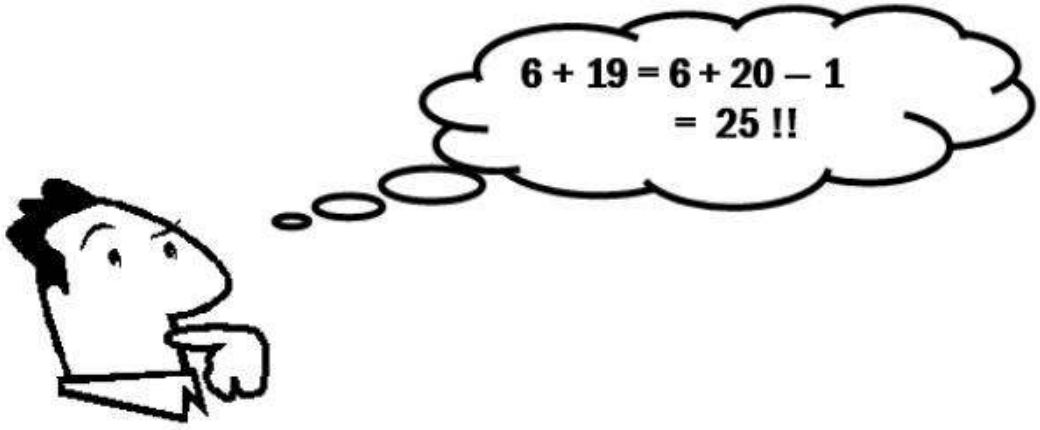
To do this children need to understand key elements such as number, geometry, measures and statistics.
As a mathematical problem-solver, your child should learn and use skills;

- sorting
- ordering
- grouping
- measuring

- calculating
- comparing
- manipulating organising and interpreting information

Key features of the strategy for mathematics

- An emphasis on the development of mental calculation
- A greater focus on the development of number skills and knowledge
- Informal methods of calculation.



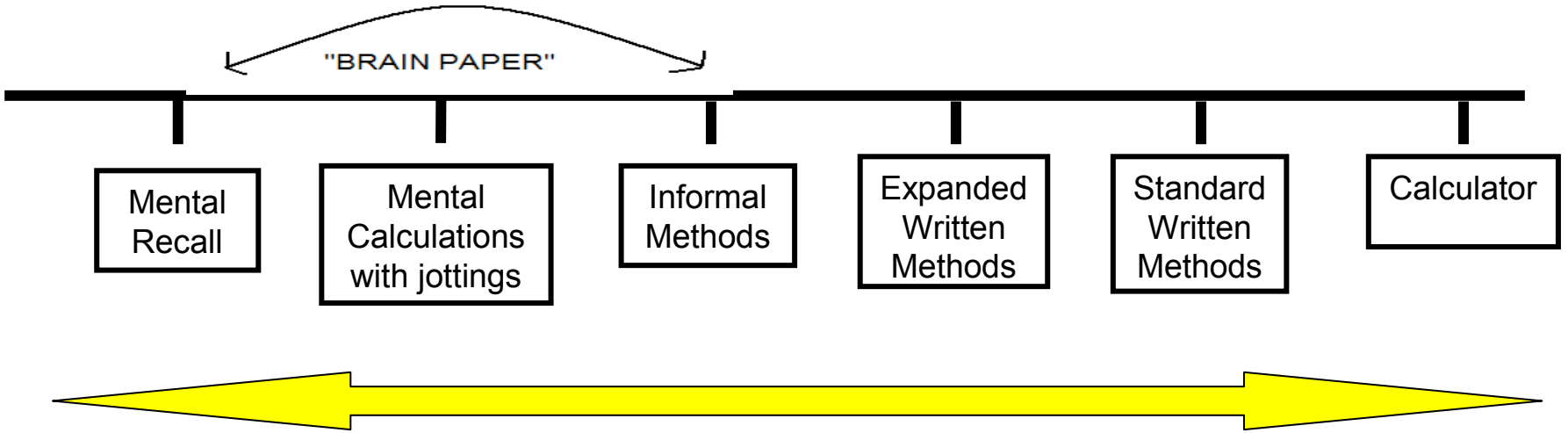
Moving from informal to formal methods

- At every stage, teachers first use examples that children can easily do mentally
- Children then see how the steps in a written procedure link to what they do in their heads
- They then move to using numbers that cannot easily be dealt with mentally, including money and decimal numbers
- Partitioning and place value are crucial concepts and estimation of size of answers is essential.

The calculating repertoire

- Children constantly move up and down the continuum
- Learning a new method of calculating does not mean other ways are no longer relevant
- Children should **always** be looking for calculations they can do wholly or partly mentally

The calculating continuum



A structured approach to calculation

An approach based on the skills of mental calculation:

- Remembering number facts
- Using known facts to derive new ones
- Familiarity with the number system and relationships between numbers
- Having a repertoire of mental calculation strategies
- Understanding of the four operations and how they are related

Addition and subtraction

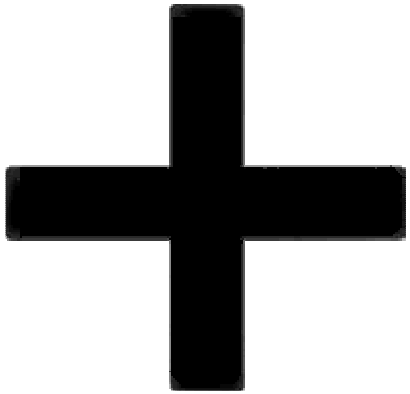
- Partitioning is an important strategy children must learn
- A number line is a method of informal calculation that works for any size of number, for both operations.
- Knowing 33+ 25 = 58 leads to the following:

  25+ 33 = 58, 58-33 = 25, 58-25 = 33

  25+ ? = 58

  ?+? = ?+?

Addition



Summary – This policy for addition is based on the 2 models of combining and augmentation. The numberline is the key model. The landmark use of the numberline leads to the counting on method for subtraction and the partitioning one leads to the expanded and compact methods for addition.

- **Phase 1** Find the total number of items in groups by counting all of them. Say the number which is one more than a given number to 10
- **Phase 2** Derive and recall all number pairs of numbers to 10.Relate addition to counting on. Recognise that addition can be done in any order. Use practical and informal written methods to support addition of a 1 digit number to a multiple of 10 to a 1 or 2 digit number.
- **Phase 3** Add mentally combinations of 1 and 2 digit numbers. Derive and record recall all addition facts to 20 and multiples of 10 that total 100.Use knowledge of addition and place value facts to derive sums of pairs of multiples of 10, 100, 1000. Develop and refine written methods to record, support or explain addition of 2 digit and 3 digit numbers.
- **Phase 4** Use knowledge of addition of 2 digit numbers to derive sums, doubles and halves of decimals. Calculate mentally with integers and decimals U.T + U.T=Use efficient written methods to add whole numbers and decimals with up to 2 places (extend to 3 digit and 2 digit numbers)

Subtraction

The calculation policy for subtraction is built on the difference method and counting on. This does not encompass subtraction using the traditional exchange, borrowing, pay back strategy supported by Diennes apparatus.

Vocabulary:

Take away, more, less, count back,

Take away, subtraction, difference, counting on, less than, more than

Subtract, minus, difference, counting on, estimate, inverse.

Subtract, minus, difference, counting on, decimal, place value

- Phase1: Compare two groups of objects saying which has more and which has less. To find one less from a group of objects. Relate subtraction to taking away. To say the number that is one less than a given number.
- Phase 2: Understand that subtraction is taking away. Find the difference by counting up. (Understand subtraction as the difference model by counting up). Understand that subtraction is the inverse of addition. Subtract a one digit number from a one digit number. Subtract a one digit number from a two digit number.
- Phase 3: Build calculation strategies based on the difference method. Use inverse addition to check calculations. Estimate the answer and compare with accurate calculation. Develop and use the difference method to subtract two digit numbers and three digit numbers. Apply to the context of money
- Phase 4: Refine calculation strategies based on the difference method Estimate and check calculation using a calculator Use efficient written methods to subtract: whole numbers and decimals up to tow decimal places.

Multiplication and division

- Multiplication is repeated addition, division is repeated subtraction
- Doubling, halving, partitioning, and multiplying by 10, 100, 1000 are essential mental strategies
- 3x4=12 leads to 4x3, 12÷3, 12÷4, 6x4, etc, 30x4, 300x4, 120÷4 etc
- Children need to see facts as arrays

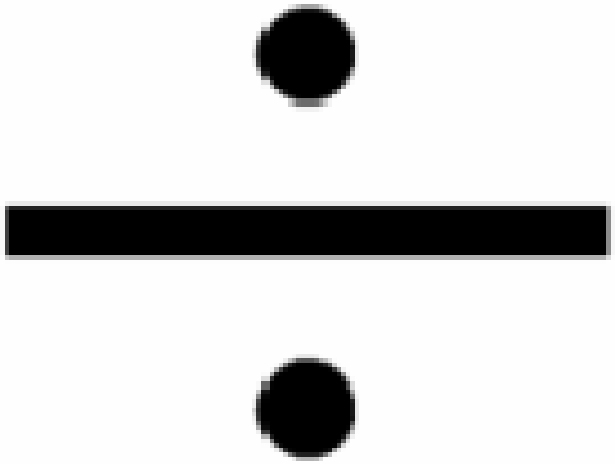
Multiplication

Summary – This policy is based on multiplication as repeated addition and arrays. The blank array is the key model for developing thinking in multiplication and is established in phase three.

Vocabulary – multiply, times, product, groups of, sets of, lots of, arrays.

- Phase 1 Count on in pairs or steps using practical examples. Count repeated groups of the same size.
- Phase 2 Count on or back in 1's, 2's, 5's and 10's to the tenth multiple. Relate multiplication facts to division facts (inverse). Use the multiplication (x) and equals (=) symbol to record and interpret number sequences.
- Phase 3 Derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times tables. Multiply 1 digit and 2 digit numbers by 10 and 100 and describe the effect. Use practical and informal written methods to multiply two digit numbers. Develop and use written methods to record, support and explain multiplication of 2 digit numbers by 1 and 2 digit numbers
- Phase 4 Recall quickly multiplication facts up to 10x10. Use these to multiply pairs of numbers to 10 and 100.Use understanding of place value to multiply whole numbers and decimals by 10,100 and 1000. Relate fractions to multiplication. Refine and use efficient written methods to multiply.

Division



Summary – This policy develops the models of sharing, grouping and fractions to model division. The written methods in phases 3 and 4 build on the grouping model. Written methods build on the policy for addition, subtraction and multiplication.

Vocabulary – The language used to interpret this sign depends on the model e.g. grouping model – 42eggs in boxes of 6. How many boxes do I need? This calculation is 42 ÷ 6 and is read as 42 DIVIDED BY 6 (not 42 shared or divided between 6).

- **Phase 1** To share objects into equal groups and count how many in each group. To use sharing in real life contexts.
- **Phase 2** To solve practical problems that involves sharing amounts into equal groups of 2, 5 or 10.To understand that halving is a form of division and that halving is the inverse of doubling, using numbers to 20. To understand the grouping model for division. To derive and recall division facts within the 2, 5 and 10 times table. To partition 2-digit numbers in a variety of ways.
- **Phase 3** Derive and recall division facts within the 2, 3, 4, 5, 6 and 10 times tables. To understand that division is the inverse of multiplication to help estimate and check calculations. Derive and record division number sentences. Divide number to 1000 by 10 and 100.Develop and use written methods to record, support and explain division of 2-doigit numbers by a 1-digit number, including division with remainders. To round up and down with remainders in context.
- **Phase 4** To refine and use efficient written methods to divide HTU ÷ U, TU ÷ U. Use knowledge of place value and multiplication facts to 10 x 10 to derive division facts involving decimals e.g. 4.8 ÷ 6 = To use approximations, inverse operations and tests of divisibility to estimate and check results. Calculate mentally with integers and decimals e.g. U.T ÷ U

National Curriculum levels typical for their age.

- By the end of Key Stage 1 (Year 2), most children will be working at level 2
- By the end of Key Stage 2 (Year 6), most will be working at level 4

Children are expected to make two levels of progress as they move through each key stage

- High 2 or 2a means that the pupil is working at the top of level 2 and is almost into level 3
- Secure 2 or 2b means that the pupil is working securely in level 2
- Low 2 or 2c means that the pupil's work is just into level 2, but aspects of their knowledge and understanding may not be secure

How can you help?

- For children **playing** and **talking** about games together will really encourage their mathematical development and support their learning in school.
- All activities you do which are seen as a puzzle a game or as a 'finding out' process will enhance your child's confidence to play with numbers and help them be more competent puzzlers and **problem-solvers**
- Encouraging them to **play with numbers** and develop a range of **mental** calculation strategies will also help build their **confidence** and **competence**.

Taught maths – time comparison over a year….