Main Learning

- Perform mental calculations, including with mixed operations and large numbers and decimals.
- *Identify, represent and estimate numbers using the number line.*
- *Add and subtract whole numbers and decimals using formal written methods (columnar addition and subtraction).*
- *Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).*
- *Select a mental strategy appropriate for the numbers involved in the calculation.*
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- Solve problems involving addition, subtraction, multiplication and division.
- Use their knowledge of the order of operations to carry out calculations involving the four operations.
- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.
- Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.
- Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Success Criteria

Practice and Consolidation
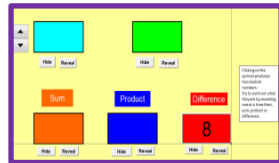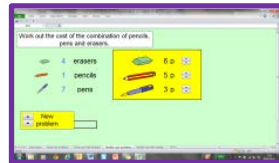
Children need to practice:
- Decision making to determine the most appropriate strategy for a calculation;
- The procedure for each different strategy of mental and written calculation;
- The thinking required when solving problems.

**Sorting and Solving**   **What's The Problem?**   **Make Your Own Problem**

ICT

Vocabulary

add, addition, plus, sum, altogether, how many more to make…? subtract, subtraction, minus, take away, difference between, how many more/less than… ?, inverse, brackets, decrease, how many fewer? calculation, problem, mental, strategy, jotting, method, operation, sign, how did you work it out? multi-step, equation, accuracy, lots of, groups of, sharing, equally, divide, division, divisor, quotient, factor, divisible, remainder, rounding.

Modelling

At this stage, children should not need the calculations to be modelled for them. The modelling should focus on the decision making and problem solving steps.

This website is a useful one to help model the steps required when solving word problems.
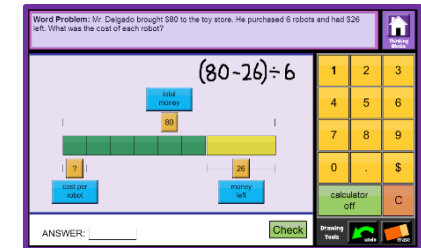
When deciding on calculation strategies, children should work through this:

1. Is the calculation one that I know as a fact?
2. Is the calculation one that is related to a fact that I know?
3. Is the calculation one that I could do in my head?
4. Is the calculation one that I could do in my head with help from a jotting?
5. Is the calculation one that needs a written method?

When deciding on whether a calculation should be carried out mentally (including with the support of a jotting), children should look for clues such as:
- number bonds
- known/related facts
- no exchange between columns
- doubles or near doubles
- a multiple of 10, 100 or 1000 as one of the numbers
- a number close to a multiple of 10, 100 or 100 as one of the numbers
- simple steps e.g. partition then recombine
- numbers with a small difference
- numbers in the calculation that are related to each other.

Using and Applying

True or false?   6.32 + 1.68 = 8   Justify your answer.

Which of these questions are easy and which of them are difficult?
213323 - 70 =
512893 + 37 =
8193.54 - 5.9 =
Explain why you think some are easier than others.

Write the missing signs (+ - x ÷) in this number sentence:

6 ⬜ 12.3 = 61.9 ⬜ 11.9

If you know this fact: 86.7 + 13.3 = 100
what other facts do you know?

What could the missing numbers be to make this correct?
Are there different ways of doing it?

Solve this problem: **The Party**

Use each of the numbers 1, 2, 4, 6, 8, and 12 once. Write one number in each circle. The product of the 3 numbers on each side of the triangle must be 48.
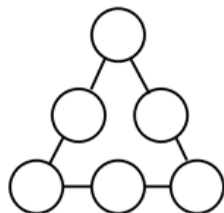
A bit fishy

A goldfish costs £1.80.
An angel fish costs £1.40.

Nasreen paid exactly £20 for some fish.
How many of each kind did she buy?

Challenge 70
A Bit Fishy

Contextual Learning

Problems should be presented in a variety of real life, measures and abstract situations, so children recognise clues that indicate the operation(s) to use. Children should therefore be given examples of mixed problems, rather than problems that are all the same operation. As the children are becoming more confident, problems should become more challenging with regards to their complexity.

Look at this problem for example:
The School Trip – understanding which clues to use and what to do with them is the challenge

Problems should also include number puzzles such as,
"I'm thinking of a number. If I add 24 to it and double it I get 85. What is my number?" or
"I'm thinking of a number. If I add half of it to a quarter of it I get 60. What is my number?"

Assessment

2.4 ÷ 0.3 = ⬜ x 1.25 Which number could be written in the box?

How could you work out: 28 x ⬜ = 14 x 8 ?   Is there another way to work it out? Which way is the best and why?

Use the inverse to check if the following calculations are correct:
2346 x 46 = 332 796   27.74 ÷ 19 = 1.46

Write a number in each box to make this calculation correct. The three numbers must be the same.

⬜ + ⬜ + ⬜ = 4.5

How many boxes of nails can be **filled** with 340 nails?

Work out these calculations using the most efficient method:
671.7 – 60.2   45.8 + 543.65 + 9 - 45.8
73 x 24   6.24 x 8
3199 ÷ 7   109.6 ÷ 8
23.4 x 4   45.89 + 653.11
1040.6 – 89.09   357 ÷ 17

A boy worked out £2.38 + 76p and got the answer £78.38. What did he do wrong?

Three consecutive whole numbers add up to 87. What are they?

Kate buys 24 cans of lemonade. She buys the cans in packs of 4. Each pack costs £1.20.
Steve buys 24 cans of lemonade. He buys the cans in packs of 6. Each pack costs £1.60.
How much more does Kate pay for her 24 cans than Steve?