Calculation Mat

Working towards Year 6

Calculating

Identify common factors, common multiples and prime numbers below 30

Find the common factors of 8 and 10 by listing the factors of each: 8: 1, 2, 4, 8 and 10: 1, 2, 5, 10 and identifying the common factors.

Find some common multiples of 2 and 7 by listing some multiples of each: 2: 2, 4, 6, 8, 10, 12, 14, 16, 18 and 7: 7, 14, 21, 28 and identifying the common multiples.

Prime numbers between 0 and 30 are 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29.

Use their knowledge of the order of operations to carry out calculations involving the four operations

6 + 4 × 3 = 6 + 12 = 18 (multiplication first)

(6 + 4) × 3 = 10 × 3 = 30 (brackets first)

'sister' calculations

BODMAS or BIDMAS ( ) ^{2} ÷ × + −

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

Round to the nearest 100 to check the accuracy of 8376 – 2581 = 5795

8400 – 2600 = 5800 so it is correct.

Solve Problems

Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

An archer scores 78 and 67, but is penalized 25 points for a foul shot. What is the archer's total score?

120

Solve problems involving addition, subtraction, multiplication and division

250 ÷ _____ = 2.5

250 must be divided by 100

Pizzas cost £2 and ice cream £3 per tub. At a party, a pizza serves two people and a tub of ice cream serves three people. How much will pizza and ice cream cost for 12 people?

£12 for pizza and £12 for ice cream so £24

Methods

Perform mental calculations, including with mixed operations and large numbers

105 × 3 – 45 = 315 – 45 = 270

(330 – 300) ÷ 3 = 30 ÷ 3 = 10

Methods

Multiply multi-digit numbers up to 2 digits by a two-digit whole number using the formal written method of long multiplication

$$\begin{array}{r} {}^{\cancel{1}}{}^{\cancel{4}}6\ 5 \\ \times\quad 2\ 8 \\ \hline 5\ 2\ 0 \\ 1\ 3\ 0\ 0 \\ \hline \mathbf{1\ 8\ 2\ 0} \end{array}$$

Divide numbers up to 3 digits by a two-digit whole number less than 20 using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

$$\begin{array}{r} \quad\ \mathbf{3\ 2\ r\ 8} \\ 1\ 6 \overline{)\ 5\ 2\ 0} \\ \quad 4\ 8 \\ \hline \quad\ 4\ 0 \\ \quad\ 3\ 2 \\ \hline \quad\quad\ 8 \end{array}$$

Can be written 32 r8, 32 $\frac{1}{2}$

Divide numbers up to 3 digits by a two-digit number less than 20 using the formal written method of short division where appropriate, interpreting remainders according to the context

Calculation Mat

Expected Year 6

Calculating

Identify common factors, common multiples and prime numbers

The common factors of 15 and 24 are 1 and 3.

Use to find an equivalent fraction of $\frac{15}{24} = \frac{5}{8}$

Some common multiples of 4 and 9 are 36, 72, 108...

The prime numbers between 20 and 50 are 23, 29, 31, 37, 41, 43 and 47.

Use their knowledge of the order of operations to carry out calculations involving the four operations

6 + 4 × 3 = 6 + 12 = 18 (multiplication first)

(6 + 4) × 3 = 10 × 3 = 30 (brackets first)

'sister' calculations

BODMAS or BIDMAS ( ) ^{2} ÷ × + −

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

Round to the nearest 1000 to check the accuracy of 378 376 – 182 581 = 195 765

378 000 – 183 000 = 195 000

Explain that this shows the answer is accurate to the nearest 1000, but doesn't find the mistake.

This shows that the answer is reasonable but does not highlight the error in the calculation.

Solve Problems

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

An archer scores 98, 93 and 97. Another archer scores 91, 96, 89. What was the difference between the scores? Explain how you would use addition and subtraction to calculate the answer.

288 - 276 = 12

Solve problems involving addition, subtraction, multiplication and division

Use 6593 ÷ 19 = 347 to solve 18 × 347 =

subtract 347 from 6593

Pizzas cost £2.40 and ice cream £4.25 per tub. At a party, a pizza serves two people and a tub of ice cream serves five people. How much will pizza and ice cream cost for 20 people?

£24 for pizza and £17 for ice cream so £41

Methods

Perform mental calculations, including with mixed operations and large numbers

295 × 3 – 245 = 885 – 245 = 640

(6033 – 3000) ÷ 3 = 3033 ÷ 3 = 1011

Methods

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

$$\begin{array}{r} {}^{2}3\,{}^{1}7\,2\,9 \\ \times \quad\quad 3\,6 \\ \hline 2\,2\,3\,7\,4 \\ 1\,1\,1\,8\,7\,0 \\ \hline \mathbf{1\,3\,4\,2\,4\,4} \\ \mathbf{1\ 1} \end{array}$$

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

$$\begin{array}{r} \mathbf{2\,9\,9\ r\ 8} \\ 24\overline{)7\,1\,9\,4} \\ \underline{4\,8} \\ 2\,3\,9 \\ \underline{2\,1\,6} \\ 2\,3\,4 \\ \underline{2\,1\,6} \\ 1\,8 \end{array}$$

This can be written 299 r18, 299 $\frac{3}{4}$

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

$$\begin{array}{r} \mathbf{2\,9\,9\,.\,7\,5} \\ 24\overline{)7\ {}^{23}1\ {}^{23}9\ {}^{12}4\ .\ {}^{18}0\ {}^{12}0} \end{array}$$

This can be written 299.75

Calculation Mat

Greater Depth Year 6

Calculating

Identify common factors, common multiples and prime numbers

The common factors of 21 and 35 are 1 and 7.

Use to find equivalent fraction of $\frac{21}{35} = \frac{3}{5}$ explaining why.

Some common multiples of 5 and 12 are 60, 120, 180 etc. Explain how to use this when adding fractions.

Know and recognise all the prime numbers between 0 and 100.

Use their knowledge of the order of operations to carry out calculations involving the four operations

Explain why $6 + 4 \times 3 + 2 \neq (6 + 4) \times (3 + 2)$.

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

Explain how to use rounding to check 378 376 – 182 581 = 195 765 and which rounded answer will help find the mistake. For example, rounding to the nearest ten thousand:

380 000 – 180 000 = 200 000 shows the answer 195 765 is not unreasonable, but does not highlight the error in the calculation.

Solve Problems

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Write a word problem where the answer involves at least two addition and two subtraction calculations.

Solve problems involving addition, subtraction, multiplication and division

Use 6593 ÷ 19 = 347 to solve 17 × 347 =

802 ÷ ____ = 0.401

Write a three-step word problem where three different operations must be performed to calculate the answer.

Methods

Perform mental calculations, including with mixed operations and large numbers

395 × 5 – 945 =

(9099 – 3000) ÷ 3 =

Methods

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

Explain how the grid method and the formal long multiplication method provide a different layout for the same calculations in the methods.

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

Explain how the formal written method of short division provides an answer as a decimal.

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

Explain how the formal written method of short division provides an answer as a decimal.

Write two different word problems to explain the two different ways that the remainder can be used.

1. The remainder is not used because it is not a complete set or group.
2. The remainder needs to be used, although the final group or set is incomplete.