



Maths Progression Ladders

Levels 1-6



POLEGATE
SCHOOL

Children should be able to recall:

- Number pairs with a total of 10, e.g. 3 + 7, or what to add to a single digit number to make 10.

- Addition facts for totals to at least 5, e.g. 2 +3, 4+3

- Addition doubles for all numbers to at least 10, e.g. 8+8

Working mentally, children should be able to:

- Add and subtract a pair of single digit numbers, e.g. 4 +5, 8-3

- Add or subtract a single digit number to or from a teens number, e.g. 13 +5, 17+3
- Add or subtract a single digit to or from 10, and add a multiple of 10, and add a multiple of 10 to a single digit number, e.g. 10+7, 7 +30

- Add near doubles, e.g. 6+7

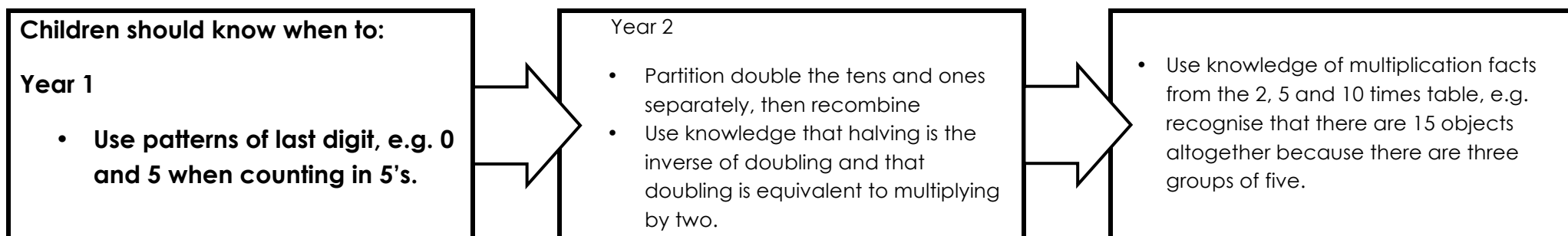
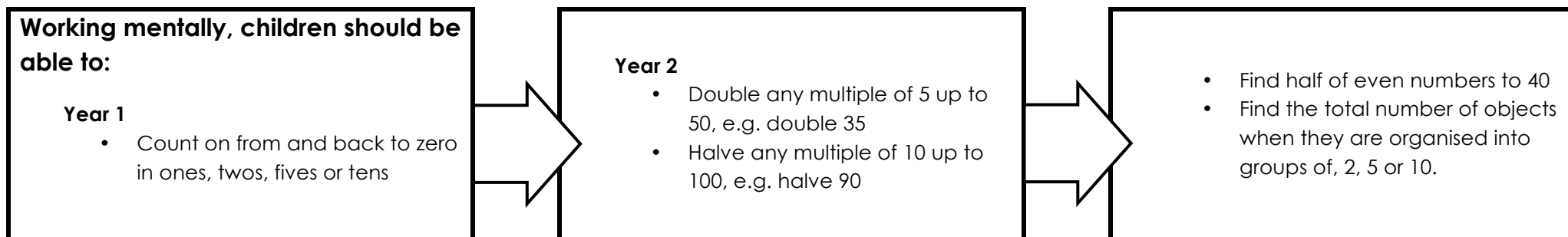
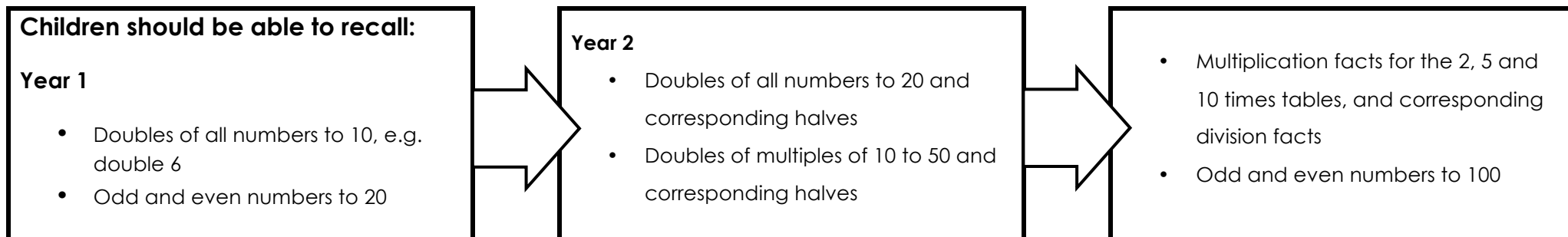
Children should know when to:

- Reorder numbers when adding, e.g. putting the largest number first
- Count on or back in ones, twos or tens

- Partition small numbers, e.g. $8+3 = 8+2+1$
- Partition and combine tens and ones

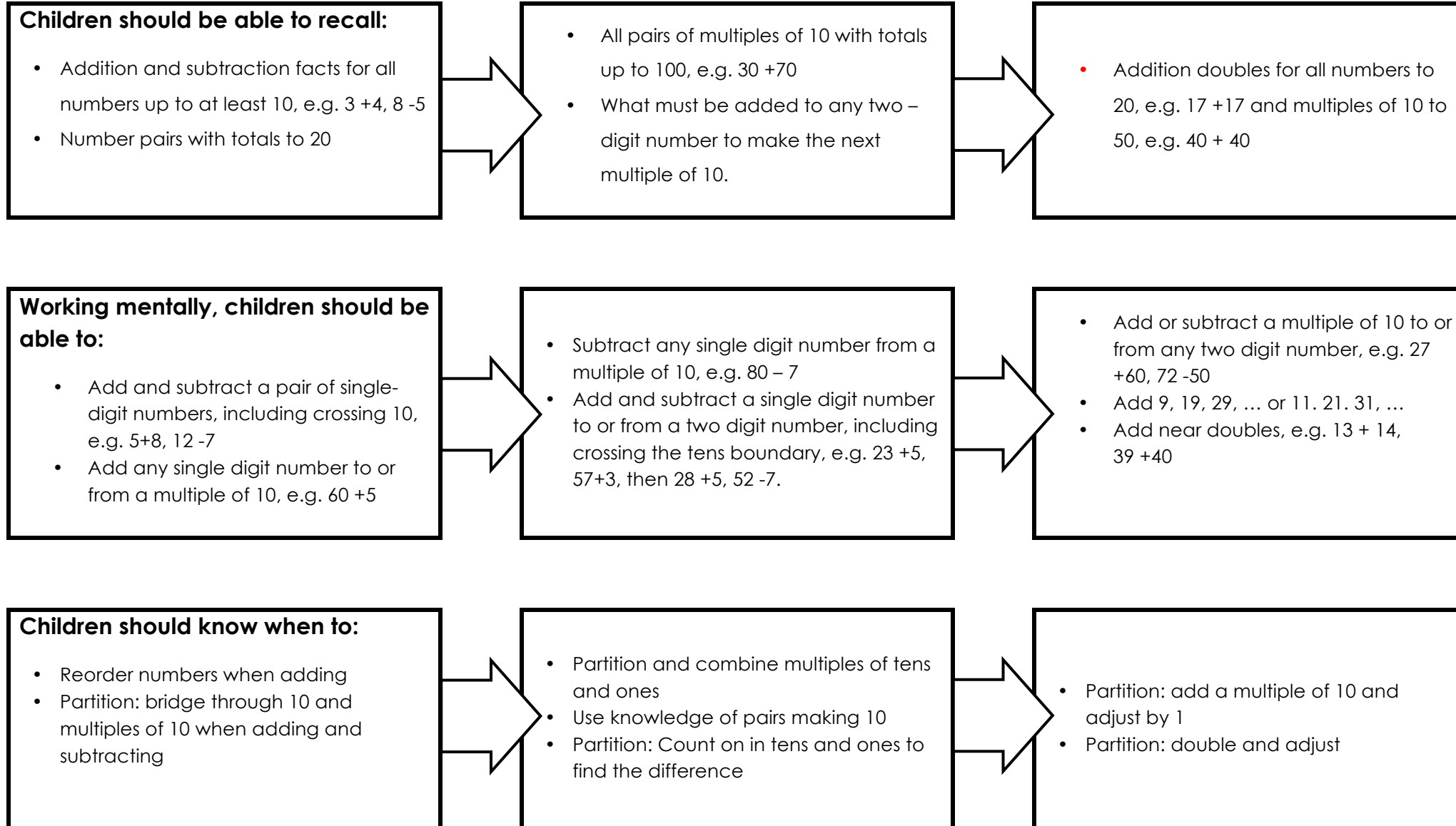
- Partition: Double and adjust, e.g. $5+6 = 5+5+1$

Mental Addition and Subtraction at level 1

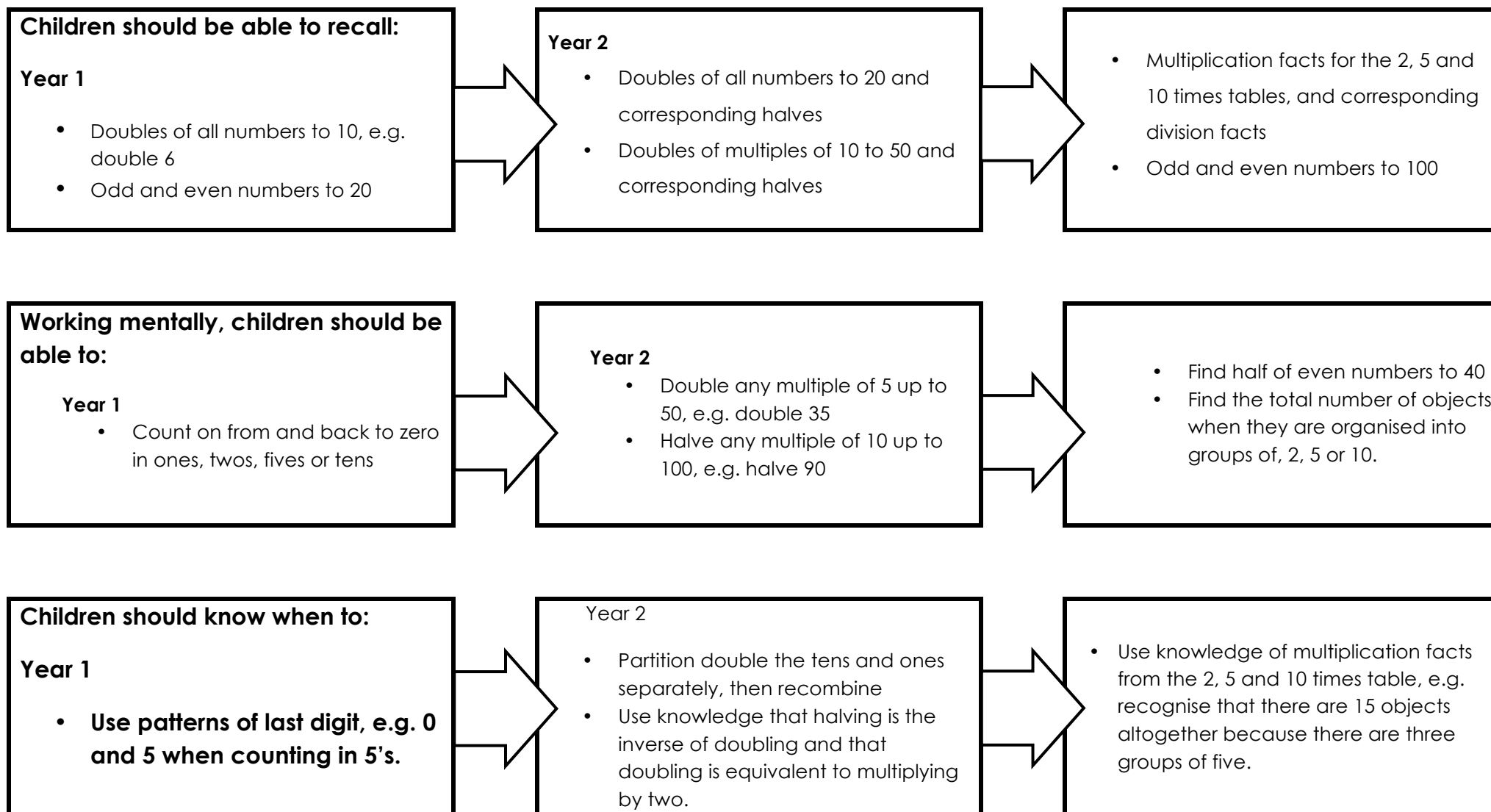


Mental Multiplication and Division at level 1 and level 2

Mental Addition and Subtraction at Level 2



Mental Multiplication and Division at Level 1 and Level 2



Mental Addition at Level 3

Children should be able to recall:

- Addition facts for all numbers to 20 drawing on knowledge of inverse relationship.
E.g. $9 + 8$, $13 + 6$

- Sums of multiples of 10.
E.g. $50 + 80$
- Pairs of two-digit numbers with a total of 100.
E.g. $32 + 68$

- Addition doubles for multiples of 10 to 100.
E.g. $90 + 90$

Working mentally, children should be able to:

- Add and subtract groups of small numbers.
E.g. $6 + 3 - 2$

- Add two-digit numbers.
E.g. $34 + 65$
- Add a two-digit number from a multiple of 10.
E.g. $50 + 38$

- Add near doubles.
E.g. $16 + 18 = 16 + 16 + 2$

Children should know when to:

- Reorder numbers when adding.
- Identify pairs totalling 10 or multiples of 10.

- Partition: Add tens and ones separately then recombine.
- Partition: Count on in tens and ones to find the total.
- Partition: Add 10 or 20 and adjust.

- Partition: Double and adjust when adding near doubles.
- Count on in minutes and hours bridging through 60.

Mental Subtraction at Level 3

Children should be able to recall:

- Subtraction facts for all numbers to 20 drawing on knowledge of inverse relationship.
E.g. $17 - 9$

- Differences of multiples of 10.
E.g. $120 - 90$

- Pairs of two-digit numbers with a total of 100.
E.g. $32 + ? = 100$

Working mentally, children should be able to:

- Add and subtract groups of small numbers.
E.g. $5 - 3 + 2$

- Subtract a two-digit number from a multiple of 10.
E.g. $90 - 27$

- Subtract two-digit numbers.
E.g. $68 - 35$

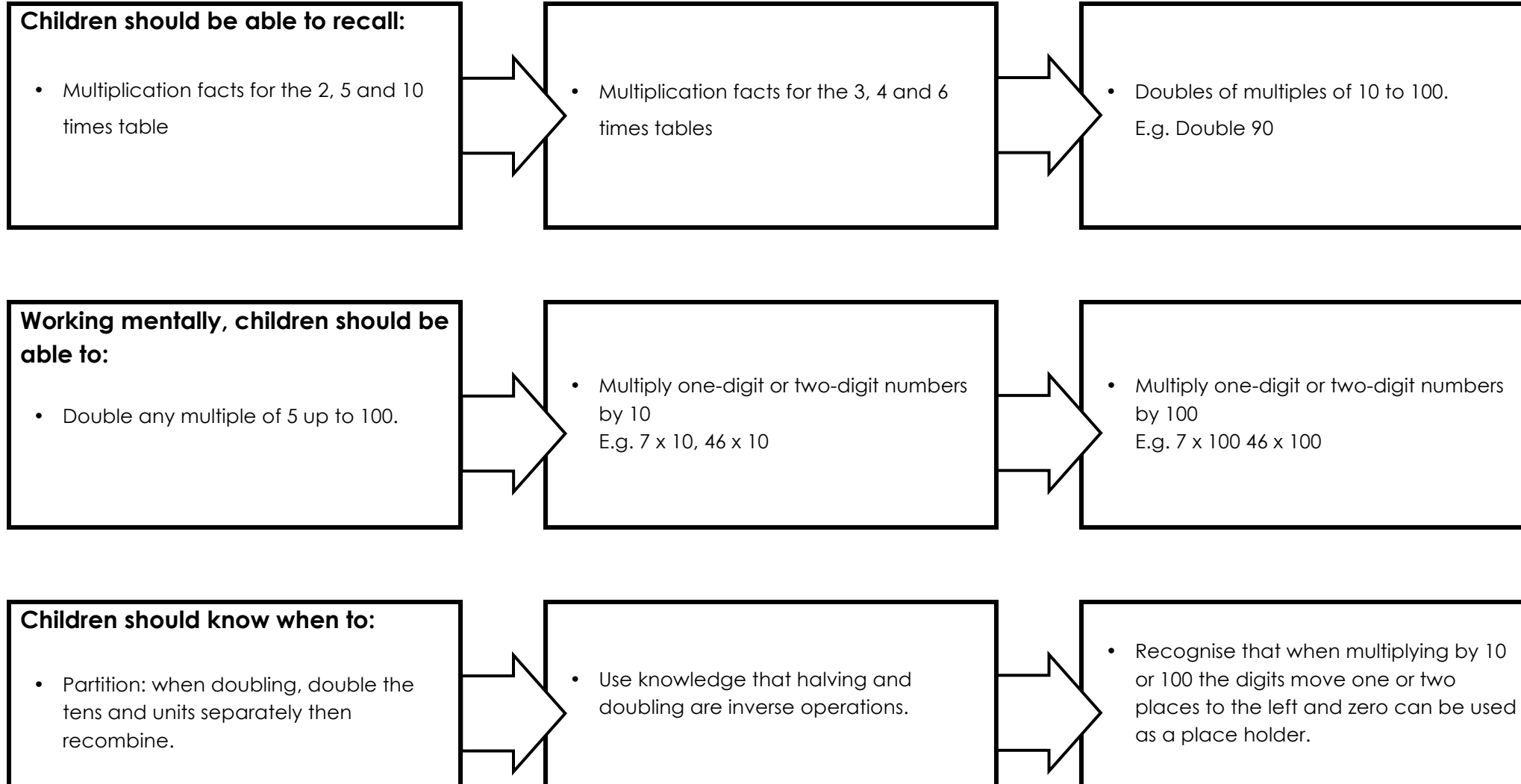
Children should know when to:

- Partition: Count back in tens and ones to find the difference.

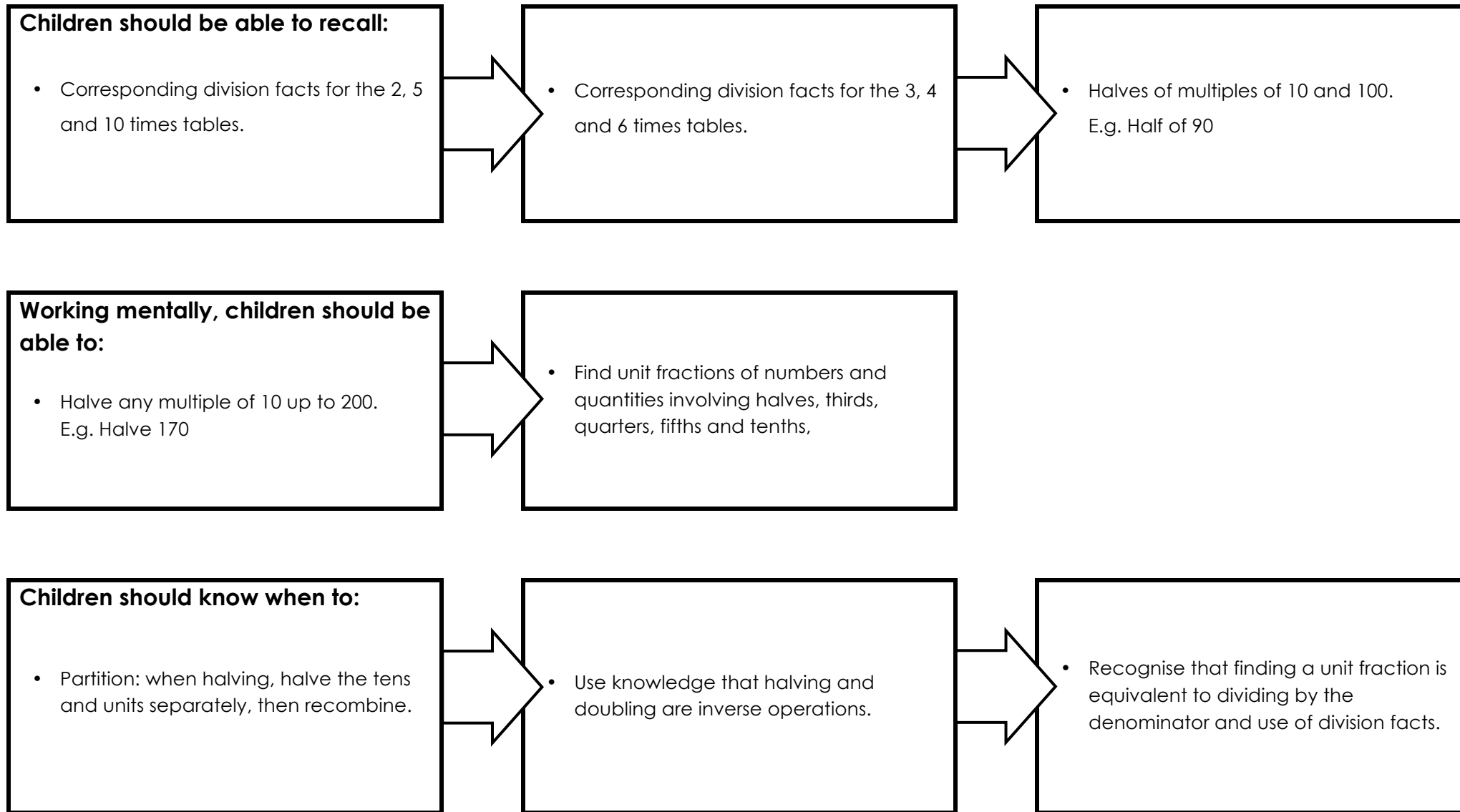
- Partition: Subtract 10 or 20 and adjust.

- Count back in minutes and hours bridging through 60.

Mental Multiplication at Level 3



Mental Division at Level 3



Mental Addition at Level 4

Children should be able to recall:

- Sums of pairs of multiples of 10, 100 or 1000.
- Pairs of fractions that total one.

- Addition doubles of numbers 1 to 100.
E.g. $38 + 38$

- What must be added to any three digit number to make the next multiple of 100.
E.g. $521 + ? = 600$

Working mentally, children should be able to:

- Add any pair of two-digit numbers including crossing the 10 and 100 boundary.
E.g. $47 + 58$

- Add a near multiple of 10.
E.g. $56 + 29 = 56 + 30 - 1$
- Add near doubles of two-digit numbers.
E.g. $38 + 37$

- Add two-digit or three-digit multiples of 10
E.g. $120 + 140$

Children should know when to:

- Count on in hundreds tens or ones.
- Partition: add tens and units separately then recombine.

- Partition: Add a multiple of 10 and adjust.
E.g. $56 + 29 = 56 + 30 - 1$
- Partition: Double and adjust.
E.g. $38 + 37 = 38 + 38 - 1$

- Use knowledge of place value and related calculations.
E.g. Work out $140 + 150$ using $14 + 15 = 29$
- Partition: Count on in minutes and hours, bridging through 60.

Mental Subtraction at Level 4

Children should be able to recall:

- Differences of pairs of multiples of 10, 100 or 1000.

- Halves of numbers 1 to 100.
E.g. Halve 56

- What must be added to any three digit number to make the next multiple of 100.
E.g. $521 + ? = 600$

Working mentally, children should be able to:

- Subtract any pair of two-digit numbers including crossing the 10 and 100 boundary.
E.g. $91 - 35$

- Subtract a near multiple of 10.
E.g. $36 - 19 = 36 - 20 + 1$

- Subtract two-digit or three-digit multiples of 10
E.g. $370 - 180$

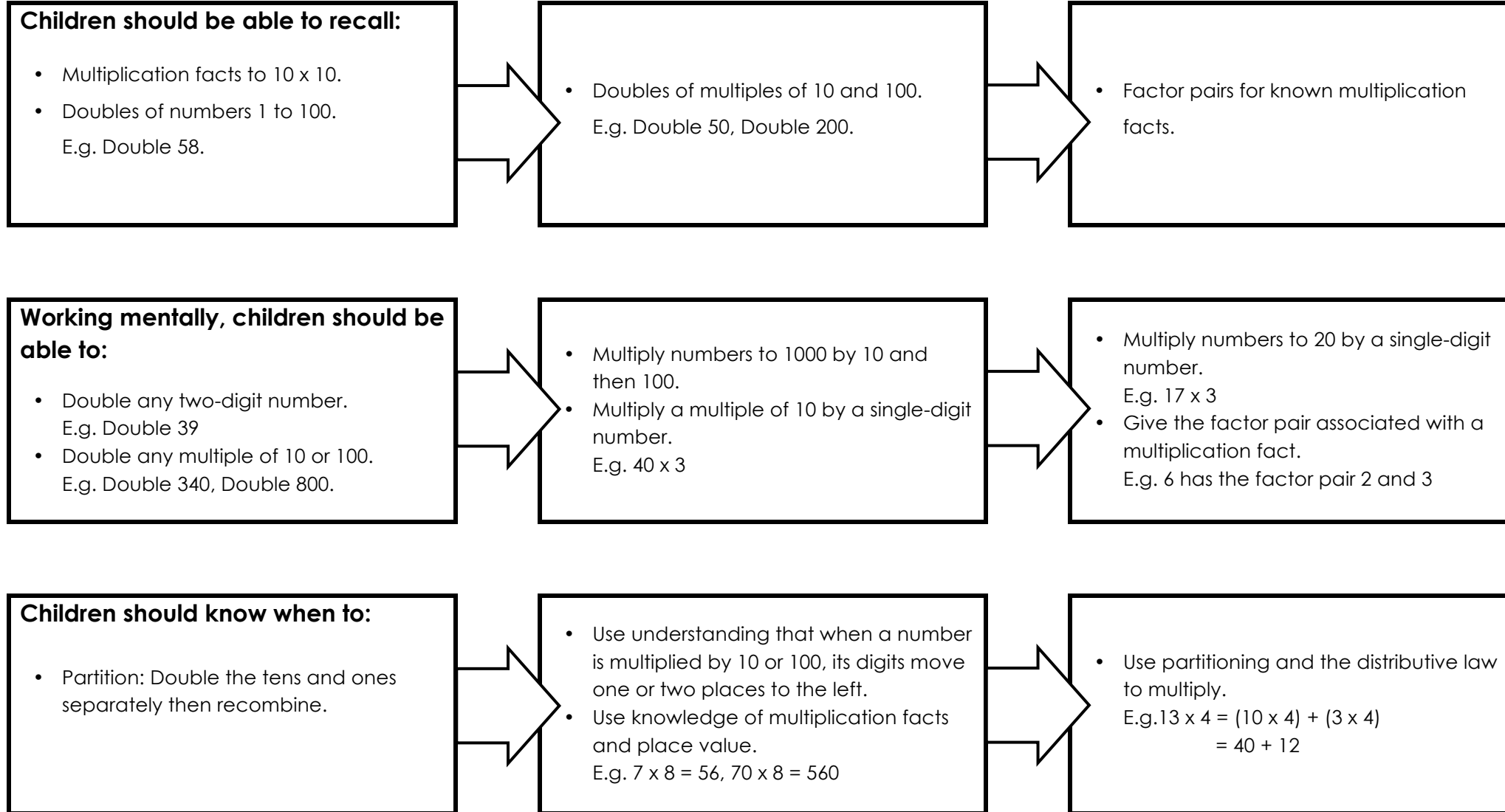
Children should know when to:

- Count back in hundreds tens or ones.
- Subtract by counting up from the smaller number.

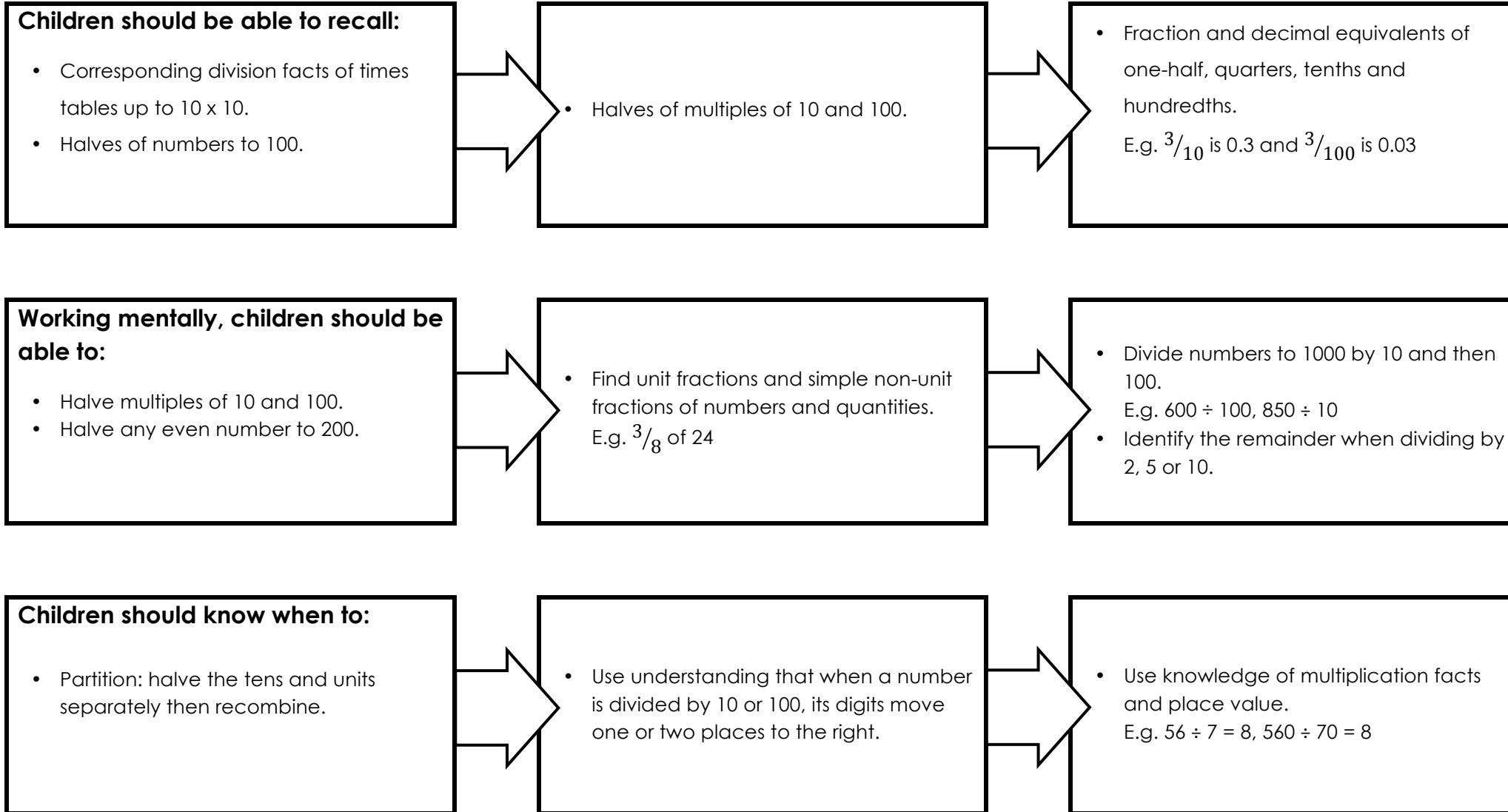
- Partition: subtract tens and units.
E.g. Subtracting 27 by subtracting 20 then 7.
- Partition: Subtract a multiple of ten then adjust.

- Use knowledge of place value and related calculations.
E.g. $290 - 150$ using $29 - 15 = 14$
- Partition: Count back in minutes and hours, bridging through 60.

Mental Multiplication at Level 4



Mental Division at Level 4



Mental Addition at Level 5

Children should be able to recall:

- Sums of decimals.
E.g. $6.5 + 2.7$
- Doubles of decimals.
E.g. Double 3.4

- What must be added to any four digit number to make the next multiple of 1000.
E.g. $4087 + ? = 5000$

- What must be added to a decimal with units and tenths to make the next whole number.
E.g. $7.2 + ? = 8$

Working mentally, children should be able to:

- Add a pair of two digit numbers or three-digit multiples of 10.
E.g. $38 + 86$, $620 + 380$

- Add a near multiple of 10 or 100 to any two-digit or three digit number.
E.g. $235 + 198$

- Add any pair of decimal fractions each with units and tenths.
E.g. $5.7 + 2.5$

Children should know when to:

- Count on in hundreds tens, ones and tenths.
- Partition: Add hundreds, tens or ones separately, then recombine.

- Add a multiple of 10 or 100 and adjust.
E.g. $235 + 198 = 235 + 200 - 2$
- Partition: Double and adjust.

- Use knowledge of place value and related calculations.
E.g. $6.3 + 4.8$ using $63 + 48$
- Partition: Count on in minutes and hours, bridging through 60.

Mental Subtraction at Level 5

Children should be able to recall:

- Differences of decimals.
E.g. $7.8 - 1.3$
- Halves of decimals.
E.g. Half of 5.6

- What must be added to any four digit number to make the next multiple of 1000.
E.g. $5000 - 4087 = ?$

- What must be added to a decimal with units and tenths to make the next whole number.
E.g. $8 - 7.2 = ?$

Working mentally, children should be able to:

- Subtract pair of two digit numbers or three-digit multiples of 10.
E.g. $620 - 380$, $62 - 38$

- Subtract a near multiple of 10 or 100 to any two-digit or three digit number.
E.g. $235 - 198$
- Find the difference between near multiples of 100 or 1000.
E.g. $607 - 588$, $6070 - 4087$

- Subtract any pair of decimal fractions each with units and tenths.
E.g. $5.7 - 2.5$

Children should know when to:

- Count back in hundreds tens, ones and tenths.
- Subtract by counting up from the smaller to the larger number.

- Subtract a multiple of 10 or 100 and adjust.
E.g. $280 - 98 = 280 - 100 + 2$

- Use knowledge of place value and related calculations.
E.g. $6.3 - 4.8$ using $63 - 48$
- Partition: Count back in minutes and hours, bridging through 60.

Mental Multiplication at Level 5

Children should be able to recall:

- Squares to 10×10 .

- Factor Pairs to 100.
E.g. 30 has the factor pairs 1×30 , 2×15 ,
 3×10 and 5×6

Working mentally, children should be able to:

- Multiply two-digit numbers by 4 or 8.
E.g. 26×4
- Multiply two-digit numbers by 5 or 20.
- Multiply by 25 or 50.

- Double three-digit multiples of 10 to 500.
- Multiply whole numbers and decimals by 10, 100 or 1000.
E.g. 4.3×10 , 0.75×100

- Multiply pairs of multiples of 10 and a multiple of 100 by a single-digit number.
E.g. 60×30 , 900×8

Children should know when to:

- Multiply by 4 or 8 by repeated doubling.
- Form an equivalent calculation.
E.g. To multiply by 5, multiply by 10 then halve. To multiply by 20, double and then multiply by 10.

- Use knowledge of doubles and halves and understanding of place value.
E.g. When multiplying by 50, multiply by 100 then divide by 2.
- Use knowledge of multiplication and place value when calculating with multiples of 10.
E.g. 60×7 using 6×7

- Use understanding that when a number is multiplied by 10 or 100 its digits move one or two places relative to the decimal point and zero is used as a place holder.

Mental Division at Level 5

Children should be able to recall:

- Division facts corresponding to tables up to 10×10 and the related unit fractions.
E.g. $7 \times 9 = 63$ so one-ninth of 63 is 7 and one-seventh of 63 is 9.

- Percentage equivalents of one-half, one-quarter, three quarters, tenths and hundredths.

- Factor Pairs to 100 and corresponding division facts.
E.g. $30 \div 5 = 6$, $30 \div 6 = 5$ using $5 \times 6 = 30$

Working mentally, children should be able to:

- Divide two-digit numbers by 4 or 8.
- Halve three-digit multiples of 10 to 1000.
E.g. $760 \div 2$

- Find the remainder after dividing a two-digit number by a single-digit number.
E.g. $27 \div 4 = 6 \text{ r } 3$
- Divide whole numbers and decimals by 10, 100 or 1000.
- Divide a multiple of 10 by a single-digit number (whole number answers)
E.g. $270 \div 3$

- Find fractions of whole numbers or quantities.
E.g. $\frac{2}{3}$ of 27, $\frac{4}{5}$ of 70 kg
- Find 50%, 25% or 10% of whole numbers of quantities.
E.g. 25% of 20 kg, 10% of £10

Children should know when to:

- Divide by 4 or 8 by repeated halving.
- Use knowledge of division facts.
E.g. when carrying out a division to find a remainder.

- Use understanding that when a number is divided by 10 or 100, its digits move one or two places to the right relative to the decimal point and zero is used as a place holder.

- Use knowledge of equivalence between fractions and percentages.
E.g. To find 50%, 25% and 10%
- Use knowledge of division facts and understanding of place value.
E.g. When calculating with multiples of 10.

Mental Addition at Level 6

Children should be able to recall:

- Addition facts for multiples of 10 to 1000.
E.g. $650 + ? = 930$

- Addition facts for decimal numbers with one decimal place.
E.g. $1.4 + ? = 2.5$

- What must be added to a decimal with units, tenths and hundredths to make the next whole number,
E.g. $7.26 + ? = 8$

Working mentally, children should be able to:

- Add pairs of decimals with units, tenths or hundredths.
E.g. $0.7 + 3.38$

- Find doubles of decimals each with units and tenths.
E.g. $1.6 + 1.6$
- Add near doubles of decimals.
E.g. $2.5 + 2.6 = 2.5 + 2.5 + 0.1$

- Add a decimal with units and tenths, that is nearly a whole number.
E.g. $4.3 + 2.9$

Children should know when to:

- Count on in hundreds tens, ones and tenths and hundredths.
- Use knowledge of place value and related calculations.
E.g. $6.8 + 4.3$ using $68 + 43$

- Use knowledge of place value and of doubles of two-digit numbers.
- Partition: Double and adjust.
E.g. $1.6 + 1.7 = 1.6 + 1.6 + 0.1$

- Partition: add a whole number and adjust.
E.g. $4.3 + 2.9 = 4.3 + 3 - 0.1$
- Partition: Count on in minutes and hours, bridging through 60 (analogue and digital times, 12-hour and 24-hour clock)

Mental Subtraction at Level 6

Children should be able to recall:

- Subtraction facts for multiples of 10 to 1000.
E.g. $? - 250 = 540$

- Subtraction facts for decimal numbers with one decimal place.
E.g. $? - 1.4 = 2.5$

- What must be subtracted from a decimal with units, tenths and hundredths to make the previous whole number,
E.g. $7.26 - ? = 7$

Working mentally, children should be able to:

- Subtract pairs of decimals with units, tenths or hundredths.
E.g. $4.54 - 0.84$

- Subtract a decimal with units and tenths, that is nearly a whole number.
E.g. $6.5 - 3.8 = 6.5 - 4 + 0.2$

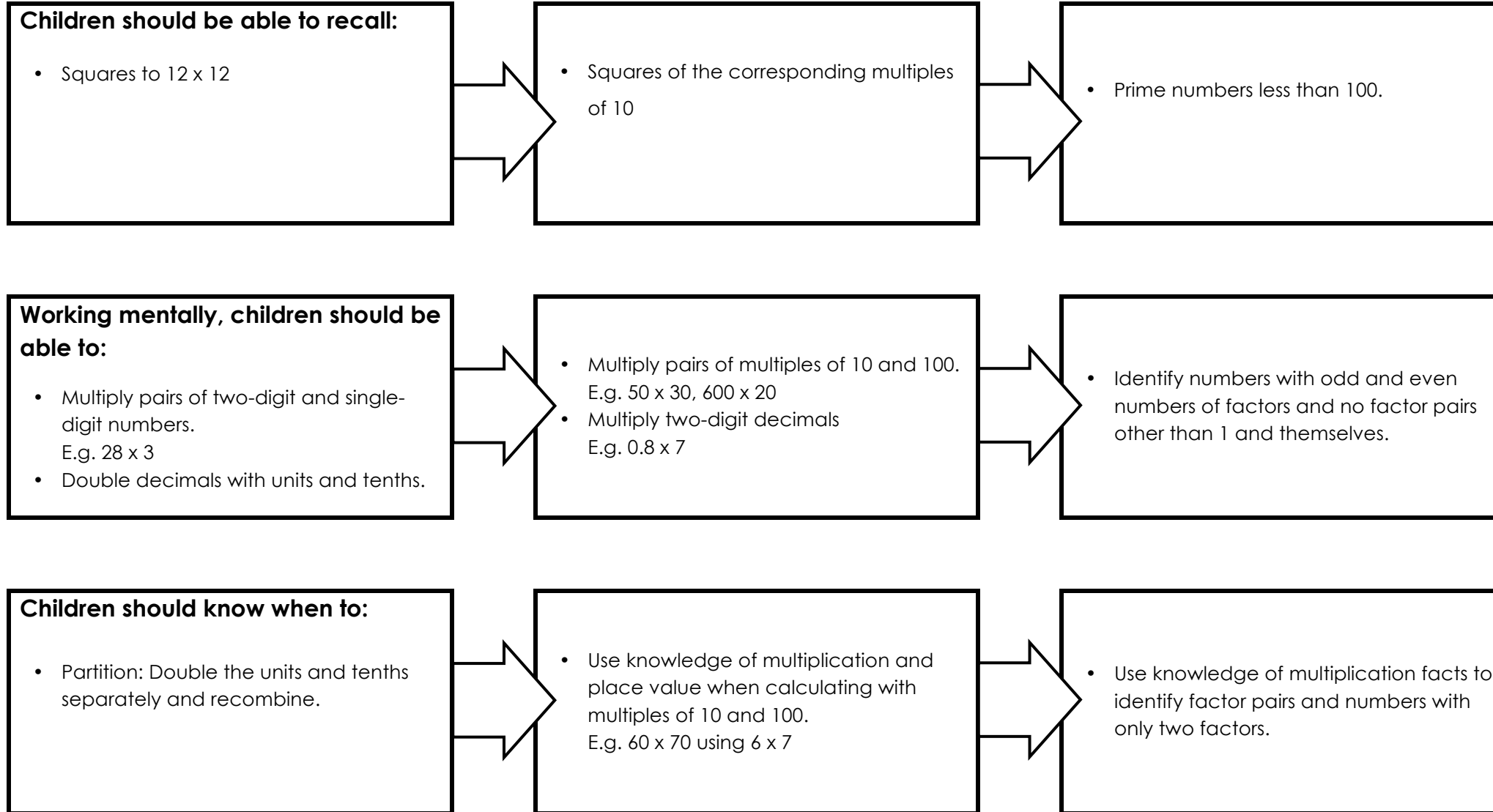
Children should know when to:

- Count back in hundreds tens, ones and tenths and hundredths.
- Use knowledge of place value and related calculations.
E.g. $6.8 - 4.3$ using $68 - 43$

- Partition: subtract a whole number and adjust.
 $6.5 - 3.8 = 6.5 - 4 + 0.2$

- Partition: Count back in minutes and hours, bridging through 60 (analogue and digital times, 12-hour and 24-hour clock)

Mental Multiplication at Level 6



Mental Division at Level 6

Children should be able to recall:

- Prime numbers less than 100.

- Equivalent fractions, decimals and percentages for hundredths.
E.g. 35% is equivalent to 0.35 or $\frac{35}{100}$

Working mentally, children should be able to:

- Divide a two-digit number by a single-digit number.
E.g. $68 \div 4$
- Divide by 25 or 50.
E.g. $480 \div 25$

- Halve decimals with units and tenths.
E.g. Half of 15.2
- Divide multiples of 100 by a multiple of 10 or 100 (Whole number answers).
E.g. $600 \div 20$, $800 \div 400$
- Divide two-digit decimals.
E.g. $4.8 \div 6$

- Find 10% or multiples of 10% of whole numbers and quantities.
E.g. 30% of 50 ml
- Simplify fractions by cancelling.
- Scale up and down using known facts.
E.g. Given that three oranges cost 24p, find the cost of four oranges.

Children should know when to:

- Partition: Use partitioning and the distributive law to divide tens and ones separately.
 $92 \div 4 = (80 + 12) \div 4$
- Form an equivalent calculation.
E.g. To divide by 25 divide by 100 then 4.

- Use knowledge of equivalence between fractions and percentages and the relationship between fractions and division.

- Recognise how to scale up or down using multiplication and division.
E.g. If three oranges cost 24p, one orange costs $24 \div 3 = 8p$

