algebraGraph

2. **scaffold to** draw the line e.g. y = 3x + 2 or y = 16 - 2x or x + y = 12 **scaffold is** easy scale, given 3 points plotted, and an almost complete table of values

3. **scaffold to** complete table of values and draw the line e.g. y = 3x + 2 **scaffold is** easy scale, given half complete table and hints about which points are easier to plot first

4. **scaffold to** complete table of values and draw e.g. x = 3 or y = 2 or x + y = 5 or y = x **scaffold is** easy scale, given half complete table and hints about which points are easier to plot first

5. **scaffold to** complete table of values and draw e.g. y = 3x + 2 **scaffold is** given x = 0 and x = 1 values in the table

6. **scaffold to** work out y, when x = 0 and x = 1 for e.g. y = 3x + 2 **scaffold is** an example of the cover up method

7. **scaffold to** complete the table of values for e.g. x = 3 or y = 2 or y = ±x or x + y = 5 **scaffold is** choice of two incomplete table of values

8. draw eg y = 3x + 2 {no table of values}

9. draw e.g. x = 3 or y = 2 or y = ±x or x + y = 5 {no table of values}

expandLinear

1. **scaffold to** expand e.g. $5(y + 3)$ **scaffold is** claw and arrow to invisible × sign and hints $5 \times y = \ldots$ and $5 \times 3 = \ldots$ and incomplete answer line $\ldots + \ldots$

2. **scaffold to** expand e.g. 5(y - 3) **scaffold is** claw and arrow to invisible × sign and hints $5 \times y = \ldots$ and $5 \times 3 = \ldots$ and incomplete answer line $\ldots$ - $\ldots$

3. **scaffold to** expand e.g. $5(x + 3)$ or $5(x - 3)$**scaffold is** claw and arrow to invisible $\ldots$ sign

4. expand e.g. $5(x + 3)$ or $5(x - 3)$

5. expand e.g. $4(2x - 3)$

6. expand $4(3 - 2x)${order may surprise some learners}

7. expand and simplify e.g. $4(2x - 3) + 2(3x - 1)$

8. expand and simplify e.g. $4(2x - 3) + (3x - 1)$

9. expand e.g. $3(4x - 3y)$

10. expand e.g. $-3(4x - 3y)$ or $-(4x - 3y)$

11. expand and simplify e.g. $4(3 - 2x) - (3x - 1)$

expandQuadratic

1. **scaffold to** expand e.g. $y(y + 4)$ or $x(x - 3)$ **scaffold is** claw and arrow to invisible ... sign

2. **scaffold to** expand and simplify e.g. $(x + 4)(x + 3)$ {only plus} **scaffolds for** claw and boxes method

3. **scaffold to** expand and simplify e.g. $(x + 4)(x - 3)$ {exactly one subtract sign} **scaffolds for** claw and boxes method

4. expand e.g. $x(x - 4)$

5. expand and simplify e.g. $(x - 3)(x + 4)$ {never negative $\times$ negative}

6. expand and simplify e.g. $(x - 3)(x - 4)$ {always negative $\times$ negative}

7. expand and simplify e.g. $(x + 4)(x - 4)$ {always difference of two squares}

8. expand e.g. $x(2x - 3)$

9. expand e.g. $4x(2x - 3)$

10. expand and simplify e.g. $(2x - 3)(3x - 1)$

11. expand and simplify e.g. $(4x - 3y)(2x - y)$

factorise

2. factorise e.g. $5x + 10$

4. factorise e.g. $p^2 + 5p$

5. factorise e.g. $6xy - 9y^2$

6. factorise e.g. $y^2 - 49$

7. factorise quadratics of the form $x^2 \pm bx + c$ {only a few ways to factorise c}

8. factorise quadratics of the form $x^2 \pm bx - c$ {only a few ways to factorise c}

inequality

1. from diagram write down all possible values of the integer x for e.g. $-2 \leq x \leq 3$ {only $\leq$}

2. from diagram write down all possible values of the integer x for e.g. $-2 \leq x < 3$ {some $<$}

3. from algebraic inequality e.g. $-2 \leq x < 3$ write down all possible values of the integer x

4. from diagram write the algebraic inequality e.g. $-2 \leq x < 3$

5. from diagram write the algebraic inequality e.g. $x < 3$ or v.v.

6. **scaffold to** write range of values e.g. $L = 18$cm to nearest cm **scaffold is** to complete $\ldots \leq L < \ldots$

7. write the error interval for e.g. $x = 7.2$ to 1 d.p. {NOT 7.0}

sequenceArithmetic

1. **scaffold to** complete the next 2 terms of sequence given e.g. term to term rule is $+3$ **scaffold is** terms in speech bubbles and examples counting on using {in this case} 3 fingers

2. **scaffold to** complete the next (i) 1 and (ii) 2 terms of sequence given term to term rule **scaffold is** terms in speech bubbles and fingers hint

3. **scaffold to** find term to term rule **scaffold is** e.g. Is rule $+2$ correct? Explain

4. **scaffold to** find the term to term rule and next term of e.g. the sequence 1, 5, 9, 13 **scaffold is** hint rule is $+$?.

5. find the term to term rule and next term of e.g. the sequence 1, 5, 9, 13

6. draw next "matchstick" diagram and complete 2 more values in table

7. write down the nth term of e.g. the sequence 4, 8, 12, 16

8. **scaffold to** find nth term of e.g. the sequence 1, 5, 9, 13 **scaffold is** given $4n$ is the nth term of 4, 8, 12, 16

9. find nth term of e.g. the sequence 1, 5, 9, 13

10. find e.g. the 10th term of the sequence 1, 5, 9, 13

11. find the term to term rule and next term or e.g. 8th term of the sequence e.g. 16, 13, 10, 7

12. given 3 "matchstick" diagrams how many "matchsticks" in e.g. pattern number 6

13. explain how you know if {a given number} is a term of e.g. the sequence 1, 5, 9, 13

14. write down e.g. the 20th odd number or write down the nth term of the sequence 1, 3, 5, 7

15. write down the first 3 terms of the sequence where the nth term is given by e.g. $3n+1$

16. is {a given number} a term of the sequence with nth term e.g. $4n-6$? explain

sequenceOther

4. **scaffold to** continue sequence of triangle numbers **scaffold is** shown method to generate sequence

6. **scaffold to** continue sequence of Fibonacci numbers **scaffold is** shown method to generate sequence

8. **scaffold to** find nth term of e.g. 4 12 24 40 **scaffold is** told nth term of 2 6 12 20 is n^2+n {adjustment may be e.g. $\times 2$ or $\div 2$ or - 3 etc}

simplifyPQ

1. simplify e.g. $2 \times a$ or $3 \times a \times b$ or $a \times b$ {easier because always written in correct algebraic order so just miss out $\times$ signs}

2. **scaffold to** simplify e.g. $a \times 2$ and $a \times a$ and $1a$ **scaffold is** given less mathematical way e.g. $a2$ and aa and $5a - 4a$ asked to complete more mathematical way

3. e.g. Name wrote $f + f + f + f = f^4$ is Name correct?

4. simplify e.g. $a \times a \times a \times a \times a$

5. **scaffold to** simplify e.g. $f^3 \times f^2$ {or $f^3 \times f$} **scaffold is** asked to complete writing out question in long winded way first

6. simplify e.g $2a \times 3$ or $2 \times a \times 3$ or $2 \times 3a$ {harder because must do more than miss out $\times$ signs}

7. simplify e.g. $f^3 \times f^2$ {or $f^3 \times f$}

8. simplify e.g. $3a \times b$ or $3a \times 2b$ {but not $3a \times a$}

9. simplify e.g $a \times 3a$ or $3a \times 2a$

10. simplify e.g. $q^5 \div q^3$ or $\dfrac{q^5}{q^3}$ or $q^5 \div q$

11. simplify e.g.$3a^2b \times 4a^3b^4$

12. simplify e.g. $\dfrac{18a^5b^2}{3a^2b}$

13. simplify e.g. $(a^4)^3$

14. simplify e.g.$(2a^2)^3$

simplifySD

1. simplify e.g. $3a + 5a$

2. **scaffold to** simplify e.g. $5a - 3a$ or $2x - 6x$ or $-3y + 7y$ **scaffold is** diagram {never $\pm a$}

3. simplify e.g. $a + a + a + a + a$

4. simplify e.g. $-3a - 5a$

5. simplify e.g. $5a - 3a$ or $3a - 5a$ or $-3a + 5a$ or $-3a - 5a$ {never $\pm a$}

6. simplify e.g. $5a - a$ or $5a + a + a + 2a$ or $5a - 2a - 2a$ {always $\pm a$}

7. simplify e.g $3a + 5b + 5a - 2b$

8. simplify e.g. $3a + 5 + 5a - 2$

9. simplify e.g. $5a + 3b + 7 + 5a - 2b - 4$

10. simplify e.g. $3xy - 5xy$ or $-3y^2 + y^2$

solve

1. solve e.g. $a + 9 = 17$ or $a - 9 = 17$

2. solve e.g. $3b = 36$ or $\dfrac{b}{3} = 9$

3. solve e.g. $3c + 5 = 17$ or $3(c - 5) = 21$

4. solve e.g. $d + d + d = 54$ or $7d - 2d = 35$

5. solve e.g. $4g + 7 = 6g + 1$ {x on both sides, never negatives, solution is integer}

solvingReady

1. **scaffold to** solve e.g. $\star + 7 = 15$ **scaffold is** given block diagram and asked to complete the 3 solve equations NOT actually solve

2. **scaffold to** solve e.g. $\star + 7 = 15$ **scaffold is** given empty block diagram

3. solve e.g. $\star + 7 = 15$ {maximum $8 + 9 = 17$}

4. **scaffold to** use function diagram **scaffold is** use partially complete function diagram to solve e.g $\star + 7 = 22$ {total to 25}

5. **scaffold to** solve an e.g. $\div 5$ thinking of a number problem **scaffold is** empty block and function diagrams

6. **scaffold to** solve an e.g. $\times 4$ thinking of a number problem **scaffold is** empty block and function diagrams

7. solve a {1 operation either $\times$ or $\div$} thinking of a number problem

8. **scaffold to** solve a {2 operations} thinking of a number problem **scaffold is** empty function diagram

9. solve a {2 operations} thinking of a number problem

10. **scaffold to** solve e.g. $3 \star + 5 = 17$ or $\dfrac{\star}{5} - 2 = 4$ **scaffold is** some clues in 2 operation function diagram and reminder of invisible $\times$ sign or fraction $\div$ sign

11. **scaffold to** solve e.g. $3 \star + 5 = 17$ or $\dfrac{\star}{5} - 2 = 4$ **scaffold is** empty 2 operation function diagram

12. **scaffold to** solve e.g. $3(\star + 5) = 21$ or $\dfrac{\star - 2}{5} = 2$ **scaffold is** clues re order of operation and empty 2 operation function diagram

13. **scaffold to** solve e.g. $3(\star + 5) = 21$ or $\dfrac{\star - 2}{5} = 2$ **scaffold is** empty 2 operation function diagram

14. solve {2 operation} e.g $3 \star + 5 = 17$ or $\dfrac{\star}{5} - 2 = 4$ or $3(\star + 5) = 21$ or $\dfrac{\star - 2}{5} = 2$

valueAlgebra

3. **scaffold to** work out the value of e.g. $5b$ when $b = 20$, **scaffold is** given picture context and example such as $3b = 60$

4. **scaffold to** write down weight in terms of b and in kg {given $b = 5$ kg} **scaffold is** given picture context e.g. b is weight (sic) of one box

5. write down the value of e.g. C when $C = 2a$ and $a = 5$ {only positive}

6. write down the value of e.g. C when $C = 2a + 3b$ and $a = 5$ and $b = 2$ {both positive}

7. write down the value of e.g. C when $C = 2a + 3b$ and $a = 5$ and $b = -2$ {never negative times negative}

9. find e.g. cost from word formula {1 or 2 stage }

writeAlgebra

2. **scaffold to** know meanings of calculation, expression and formula **scaffold is** match or complete given e.g. $T = a + b + c$ and values of a and b and c

3. write an expression e.g. $a + b + c$

5. **scaffold to** write an expression or a formula e.g. $5a$ or $T = 5a$ **scaffold is** write a calculation first {given value of a}

6. **scaffold to** write an expression or a formula e.g. $5a$ or $T = 5a$ **scaffold is** standard multiply word formula {to help learners to recognise contexts which require multiply}

7. write an expression or a formula e.g. $5a$ or $T = 5a$

9. **scaffold to** write an expression or a formula e.g. $5a + 3$ or $T = 5a + 3$ **scaffold is** given context which leads from $5a$ to $5a + 3$

10. write an expression or a formula e.g. $5a + 3$ or $T = 5a + 3$