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GCSE MATHEMATICS AND NUMERACY DOUBLE AWARD

FOUNDATION

COMPREHENSIVE LESSON NOTEBOOK

UNIT 2: ALGEBRA

Mapped independently to WJEC qualification 3320QD • 10 detailed chapters

concept teaching • worked methods • reasoning • guided practice • independent practice • worked answers

Student: _____

Class: _____ Target grade: _____ Start date: _____

EXAM-BOARD INDEPENDENCE

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COMPREHENSIVE LESSON NOTEBOOK

How to learn from this notebook

Meaning first. Method second. Reasoning throughout.

1 • UNDERSTAND

Read the definition and big idea. Redraw or annotate the representation, then answer the checkpoint without looking back.

2 • BUILD THE METHOD

Cover each next line of the example. Predict it, reveal it and explain why the transformation or calculation is permitted.

3 • CONNECT AND REASON

Use the misconception analysis and guided task to decide which method fits, not merely how to execute it.

4 • PRACTISE INDEPENDENTLY

Show the decisive setup, accurate progress and a supported conclusion. Do not replace mathematical communication with a calculator display.

5 • DIAGNOSE AND REVISIT

Mark from the worked answer. Record whether an error came from interpretation, structure, arithmetic, accuracy, unit or communication.

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COMPREHENSIVE LESSON NOTEBOOK

Algebra unit map

10 chapters mapped to current WJEC content headings.

CH 01	2.1	Algebraic conventions, expressions and formulae: core concepts and metho
CH 02	2.1	Algebraic conventions, expressions and formulae: applications and reason
CH 03	2.2	Equations and inequalities: core concepts and methods
CH 04	2.2	Equations and inequalities: applications and reasoning
CH 05	2.3	Sequences: core concepts and methods
CH 06	2.3	Sequences: applications and reasoning
CH 07	2.4	Coordinates and graphs: core concepts and methods
CH 08	2.4	Coordinates and graphs: applications and reasoning
CH 09	2.5	Real-life graphs: core concepts and methods
CH 10	2.5	Real-life graphs: applications and reasoning

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COMPREHENSIVE LESSON NOTEBOOK

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 1: Algebraic conventions, expressions and formulae: core concepts and methods

Use algebraic notation; manipulate expressions and formulae accurately.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.1. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Use algebraic notation; manipulate expressions and formulae accurately. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this core concepts lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

term; coefficient; expression; identity; formula; substitute; subject; factorise

Three controlling ideas

- Translate words into operations before simplifying.
- Collect only like terms and multiply every term when expanding brackets.
- Substitute with brackets, especially for negative values, and preserve operation order.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “Simplify 7x+4x-3.”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 1: Build the method

Algebraic conventions, expressions and formulae: core concepts and methods

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

Simplify 7x+4x-3.

WORKED REASONING

1. Collect the like x terms; the constant remains.

Conclusion: 11x-3

WORKED EXAMPLE 2

Expand 5(2y-3).

WORKED REASONING

1. Multiply both terms inside the bracket by 5.

Conclusion: 10y-15

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 1: Connect and reason

Algebraic conventions, expressions and formulae: core concepts and methods

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.1, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

Factorise 12a+18. Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding algebraic conventions, expressions and formulae: core concepts and methods.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.1 • Algebraic conventions, expressions and formulae: core concepts and methods

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **Simplify 7x+4x-3.** **[4]**

2. **Expand 5(2y-3).** **[4]**

3. **Factorise 12a+18.** **[4]**

4. **Find 3p^2-2q when p=-2 and q=5.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.1 • Algebraic conventions, expressions and formulae: core concepts and methods

1. WORKED ANSWER

Method: Collect the like x terms; the constant remains. Answer: 11x-3 Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: Multiply both terms inside the bracket by 5. Answer: 10y-15 Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: The highest common factor is 6. Answer: 6(2a+3) Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: 3(-2)^2-2(5)=12-10. Answer: 2 Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 2: Algebraic conventions, expressions and formulae: applications and reasoning

Use algebraic notation; manipulate expressions and formulae accurately.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.1. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Use algebraic notation; manipulate expressions and formulae accurately. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this applications and reasoning lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

term; coefficient; expression; identity; formula; substitute; subject; factorise

Three controlling ideas

- Translate words into operations before simplifying.
- Collect only like terms and multiply every term when expanding brackets.
- Substitute with brackets, especially for negative values, and preserve operation order.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “Write an expression for the cost of n tickets at GBP 7 each plus one GBP 4 fee.”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 2: Build the method

Algebraic conventions, expressions and formulae: applications and reasoning

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

Write an expression for the cost of n tickets at GBP 7 each plus one GBP 4 fee.

WORKED REASONING

1. Variable cost is 7n; add the fixed fee.

Conclusion: 7n+4

WORKED EXAMPLE 2

Make w the subject of P=2l+2w.

WORKED REASONING

1. Subtract 2l, then divide by 2.

Conclusion: w=(P-2l)/2

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 2: Connect and reason

Algebraic conventions, expressions and formulae: applications and reasoning

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.1, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

Simplify 3m x 4m^2. Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding algebraic conventions, expressions and formulae: applications and reasoning.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.1 • Algebraic conventions, expressions and formulae: applications and reasoning

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **Write an expression for the cost of n tickets at GBP 7 each plus one GBP 4 fee.** **[4]**

2. **Make w the subject of P=2l+2w.** **[4]**

3. **Simplify 3m x 4m^2.** **[4]**

4. **A rectangle has sides x and x+5. Write and simplify its perimeter.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.1 • Algebraic conventions, expressions and formulae: applications and reasoning

1. WORKED ANSWER

Method: Variable cost is 7n; add the fixed fee. Answer: 7n+4 Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: Subtract 2l, then divide by 2. Answer: w=(P-2l)/2 Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: Multiply coefficients and add powers of m. Answer: 12m^3 Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: 2x+2(x+5)=4x+10. Answer: 4x+10 Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 3: Equations and inequalities: core concepts and methods

Form and solve equations and inequalities using algebraic methods.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.2. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Form and solve equations and inequalities using algebraic methods. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this core concepts lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

equation; solution; inverse; inequality; interval; root; balance

Three controlling ideas

- Keep an equation balanced by applying the same operation to both sides.
- Reverse the order of operations to isolate the unknown.
- For inequalities, show the solution on a number line and use an open or closed endpoint correctly.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “Solve 5x+7=32.”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 3: Build the method

Equations and inequalities: core concepts and methods

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

Solve $5x+7=32$.

WORKED REASONING

1. Subtract 7, then divide by 5.

Conclusion: $x=5$

WORKED EXAMPLE 2

Solve $4(y-3)=28$.

WORKED REASONING

1. Divide by 4, then add 3.

Conclusion: $y=10$

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 3: Connect and reason

Equations and inequalities: core concepts and methods

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.2, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

Solve $3x+5=x+17$. Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding equations and inequalities: core concepts and methods.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.2 • Equations and inequalities: core concepts and methods

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **Solve $5x+7=32$.** **[4]**

2. **Solve $4(y-3)=28$.** **[4]**

3. **Solve $3x+5=x+17$.** **[4]**

4. **Solve $x/4+3=8$.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.2 • Equations and inequalities: core concepts and methods

1. WORKED ANSWER

Method: Subtract 7, then divide by 5. Answer: x=5 Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: Divide by 4, then add 3. Answer: y=10 Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: Subtract x and 5: 2x=12. Answer: x=6 Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: Subtract 3, then multiply by 4. Answer: x=20 Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 4: Equations and inequalities: applications and reasoning

Form and solve equations and inequalities using algebraic methods.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.2. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Form and solve equations and inequalities using algebraic methods. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this applications and reasoning lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

equation; solution; inverse; inequality; interval; root; balance

Three controlling ideas

- Keep an equation balanced by applying the same operation to both sides.
- Reverse the order of operations to isolate the unknown.
- For inequalities, show the solution on a number line and use an open or closed endpoint correctly.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “Solve 2x-1<9.”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 4: Build the method

Equations and inequalities: applications and reasoning

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

Solve 2x-1<9.

WORKED REASONING

1. Add 1, then divide by 2.

Conclusion: x<5

WORKED EXAMPLE 2

An adult ticket costs GBP 3 more than a child ticket. Two adult and three child tickets cost GBP 36. Find the child price.

WORKED REASONING

1. Let child=x; 2(x+3)+3x=36, so 5x=30.

Conclusion: GBP 6

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 4: Connect and reason

Equations and inequalities: applications and reasoning

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.2, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

Does x=4 satisfy 3x-2=10? Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding equations and inequalities: applications and reasoning.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.2 • Equations and inequalities: applications and reasoning

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **Solve $2x-1<9$.** **[4]**

2. **An adult ticket costs GBP 3 more than a child ticket. Two adult and three child tickets cost GBP 36. Find the child price.** **[4]**

3. **Does $x=4$ satisfy $3x-2=10$?** **[4]**

4. **Solve $-3<=2x+1<9$.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.2 • Equations and inequalities: applications and reasoning

1. WORKED ANSWER

Method: Add 1, then divide by 2. Answer: x<5 Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: Let child=x; 2(x+3)+3x=36, so 5x=30. Answer: GBP 6 Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: 3(4)-2=10. Answer: Yes Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: Subtract 1 throughout, then divide throughout by 2. Answer: -2<=x<4 Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 5: Sequences: core concepts and methods

Recognise, continue, describe and generate numerical sequences.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.3. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Recognise, continue, describe and generate numerical sequences. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this core concepts lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

term; position; common difference; nth term; recursive; quadratic

Three controlling ideas

- Compare consecutive terms to test for a constant difference.
- A linear nth term has the form dn+c, where d is the common difference.
- Check a rule against at least two terms and state the starting value.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “Find the next two terms: 7, 12, 17, 22, ...”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 5: Build the method

Sequences: core concepts and methods

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

Find the next two terms: 7, 12, 17, 22, ...

WORKED REASONING

1. Add 5 each time.

Conclusion: 27, 32

WORKED EXAMPLE 2

Find the nth term of 4, 7, 10, 13, ...

WORKED REASONING

1. Difference is 3; when n=1, 3n needs +1.

Conclusion: 3n+1

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 5: Connect and reason

Sequences: core concepts and methods

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.3, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

Is 58 in the sequence 4n+2? Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding sequences: core concepts and methods.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.3 • Sequences: core concepts and methods

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **Find the next two terms: 7, 12, 17, 22, ...** **[4]**

2. **Find the nth term of 4, 7, 10, 13, ...** **[4]**

3. **Is 58 in the sequence 4n+2?** **[4]**

4. **Find the 20th term of 6n-1.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.3 • Sequences: core concepts and methods

1. WORKED ANSWER

Method: Add 5 each time. Answer: 27, 32 Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: Difference is 3; when n=1, 3n needs +1. Answer: 3n+1 Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: Solve 4n+2=58. Answer: Yes; n=14 Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: 6(20)-1. Answer: 119 Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 6: Sequences: applications and reasoning

Recognise, continue, describe and generate numerical sequences.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.3. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Recognise, continue, describe and generate numerical sequences. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this applications and reasoning lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

term; position; common difference; nth term; recursive; quadratic

Three controlling ideas

- Compare consecutive terms to test for a constant difference.
- A linear nth term has the form dn+c, where d is the common difference.
- Check a rule against at least two terms and state the starting value.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “A sequence starts at 80 and subtracts 7. Write the first five terms.”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 6: Build the method

Sequences: applications and reasoning

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

A sequence starts at 80 and subtracts 7. Write the first five terms.

WORKED REASONING

1. Subtract 7 repeatedly.

Conclusion: 80, 73, 66, 59, 52

WORKED EXAMPLE 2

Find the position of 91 in 5n+1.

WORKED REASONING

1. 5n+1=91 gives 5n=90.

Conclusion: n=18

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 6: Connect and reason

Sequences: applications and reasoning

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.3, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

Explain why 3, 6, 12, 24 is not linear. Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding sequences: applications and reasoning.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.3 • Sequences: applications and reasoning

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **A sequence starts at 80 and subtracts 7. Write the first five terms.** **[4]**

2. **Find the position of 91 in 5n+1.** **[4]**

3. **Explain why 3, 6, 12, 24 is not linear.** **[4]**

4. **A pattern has 5 tiles at stage 1 and gains 4 each stage. Find a rule.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.3 • Sequences: applications and reasoning

1. WORKED ANSWER

Method: Subtract 7 repeatedly. Answer: 80, 73, 66, 59, 52 Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: 5n+1=91 gives 5n=90. Answer: n=18 Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: Differences are 3, 6, 12; the terms double. Answer: The differences are not constant. Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: Common difference 4; 4(1)+1=5. Answer: 4n+1 Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 7: Coordinates and graphs: core concepts and methods

Use coordinates and linear or non-linear graphs to represent relationships.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.4. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Use coordinates and linear or non-linear graphs to represent relationships. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this core concepts lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

coordinate; gradient; intercept; midpoint; linear; quadratic; reciprocal

Three controlling ideas

- Plot coordinates in the order (x,y).
- For y=mx+c, m is the gradient and c is the y-intercept.
- Use a table of values and a sensible scale before joining points appropriately.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “Find the midpoint of (2,5) and (8,11).”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 7: Build the method

Coordinates and graphs: core concepts and methods

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

Find the midpoint of (2,5) and (8,11).

WORKED REASONING

1. Average x coordinates and y coordinates separately.

Conclusion: (5,8)

WORKED EXAMPLE 2

For y=3x-2, find y when x=5.

WORKED REASONING

1. 3(5)-2=13.

Conclusion: 13

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 7: Connect and reason

Coordinates and graphs: core concepts and methods

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.4, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

State the gradient and y-intercept of y=-2x+7. Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding coordinates and graphs: core concepts and methods.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.4 • Coordinates and graphs: core concepts and methods

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **Find the midpoint of (2,5) and (8,11).** **[4]**

2. **For y=3x-2, find y when x=5.** **[4]**

3. **State the gradient and y-intercept of y=-2x+7.** **[4]**

4. **Do the points (1,4) and (3,10) lie on y=3x+1?** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.4 • Coordinates and graphs: core concepts and methods

1. WORKED ANSWER

Method: Average x coordinates and y coordinates separately. Answer: (5,8) Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: 3(5)-2=13. Answer: 13 Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: Compare with y=mx+c. Answer: Gradient -2; intercept 7 Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: Substitute each x; the calculated y matches. Answer: Yes, both Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 8: Coordinates and graphs: applications and reasoning

Use coordinates and linear or non-linear graphs to represent relationships.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.4. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Use coordinates and linear or non-linear graphs to represent relationships. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this applications and reasoning lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

coordinate; gradient; intercept; midpoint; linear; quadratic; reciprocal

Three controlling ideas

- Plot coordinates in the order (x,y).
- For y=mx+c, m is the gradient and c is the y-intercept.
- Use a table of values and a sensible scale before joining points appropriately.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “Find the equation of a line with gradient 4 and y-intercept -3.”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 8: Build the method

Coordinates and graphs: applications and reasoning

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

Find the equation of a line with gradient 4 and y-intercept -3.

WORKED REASONING

1. Use y=mx+c.

Conclusion: y=4x-3

WORKED EXAMPLE 2

Find where y=2x+1 crosses the x-axis.

WORKED REASONING

1. Set y=0: 2x+1=0.

Conclusion: (-0.5,0)

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 8: Connect and reason

Coordinates and graphs: applications and reasoning

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.4, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

Complete y=x^2 for x=-2,-1,0,1,2. Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding coordinates and graphs: applications and reasoning.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.4 • Coordinates and graphs: applications and reasoning

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **Find the equation of a line with gradient 4 and y-intercept -3.** **[4]**

2. **Find where y=2x+1 crosses the x-axis.** **[4]**

3. **Complete y=x^2 for x=-2,-1,0,1,2.** **[4]**

4. **Describe the line x=6.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.4 • Coordinates and graphs: applications and reasoning

1. WORKED ANSWER

Method: Use y=mx+c. Answer: y=4x-3 Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: Set y=0: 2x+1=0. Answer: (-0.5,0) Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: Square each x value. Answer: 4,1,0,1,4 Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: Every point has x-coordinate 6. Answer: A vertical line through x=6 Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 9: Real-life graphs: core concepts and methods

Interpret and construct graphs that model changing quantities in context.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.5. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Interpret and construct graphs that model changing quantities in context. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this core concepts lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

model; variable; rate of change; tangent; interpolation; extrapolation

Three controlling ideas

- Read both axes, units and scale before interpreting a graph.
- Gradient represents a rate of change; a horizontal section means no change.
- Match every answer to the context and avoid extending a model without justification.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “A distance-time graph rises 120 m in 30 s. Find the average speed.”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 9: Build the method

Real-life graphs: core concepts and methods

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

A distance-time graph rises 120 m in 30 s. Find the average speed.

WORKED REASONING

1. Gradient=120/30.

Conclusion: 4 m/s

WORKED EXAMPLE 2

What does a horizontal section on a distance-time graph mean?

WORKED REASONING

1. Distance is not changing with time.

Conclusion: The object is stationary.

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 9: Connect and reason

Real-life graphs: core concepts and methods

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.5, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

A conversion graph shows GBP 45 corresponds to EUR 52.20. Find euros per pound. Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding real-life graphs: core concepts and methods.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.5 • Real-life graphs: core concepts and methods

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **A distance-time graph rises 120 m in 30 s. Find the average speed.** **[4]**

2. **What does a horizontal section on a distance-time graph mean?** **[4]**

3. **A conversion graph shows GBP 45 corresponds to EUR 52.20. Find euros per pound.** **[4]**

4. **A tank graph falls from 900 L to 540 L in 12 minutes. Find the average rate of change.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.5 • Real-life graphs: core concepts and methods

1. WORKED ANSWER

Method: Gradient=120/30. Answer: 4 m/s Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: Distance is not changing with time. Answer: The object is stationary. Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: 52.20/45=1.16. Answer: EUR 1.16 per GBP Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: (540-900)/12=-30. Answer: -30 L/min Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 10: Real-life graphs: applications and reasoning

Interpret and construct graphs that model changing quantities in context.

SPECIFICATION ALIGNMENT

Independent teaching summary for current WJEC content heading 2.5. This lesson develops conceptual understanding, communication using symbols, fluency, logical reasoning and strategic competence.

Understand the mathematical object

Interpret and construct graphs that model changing quantities in context. The central idea is that a representation is useful only when its meaning and conditions are explicit. In this applications and reasoning lesson, first identify the quantities, structures or events involved; then connect the words to notation, a diagram, a table or a graph. A reliable solution preserves that meaning at every step and ends with an answer that fits the original context.

KEY VOCABULARY

model; variable; rate of change; tangent; interpolation; extrapolation

Three controlling ideas

- Read both axes, units and scale before interpreting a graph.
- Gradient represents a rate of change; a horizontal section means no change.
- Match every answer to the context and avoid extending a model without justification.

PRIOR-KNOWLEDGE CHECK

Can you state the meaning of the key terms, identify the operation or relationship in “Why should a straight conversion graph pass through the origin?”, and predict the form or approximate size of the answer? Repair any weakness before continuing.

CHECKPOINT

Explain one method condition in a complete sentence. Give a simple valid example and one non-example that breaks the condition.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 10: Build the method

Real-life graphs: applications and reasoning

Reliable routine

- Interpret: name the target, given information, conditions and units.
- Represent: write an equation, diagram, table, graph or exact numerical structure.
- Execute: show valid transformations or calculations in a readable order.
- Verify: test size, sign, units, domain, accuracy and contextual meaning.

WORKED EXAMPLE 1

Why should a straight conversion graph pass through the origin?

WORKED REASONING

1. Direct proportion has no fixed starting amount.

Conclusion: Zero of one quantity corresponds to zero of the other.

WORKED EXAMPLE 2

A journey travels 18 km in 0.4 h, stops for 0.2 h, then travels 12 km in 0.3 h. Find total average speed.

WORKED REASONING

1. Total distance 30 km; total time 0.9 h; 30/0.9.

Conclusion: 33.3 km/h

SELF-EXPLANATION PROMPT

Which line contains the main mathematical decision? Which line checks interpretation, reasonableness or accuracy? Explain how the method would change if one condition changed.

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COMPREHENSIVE LESSON NOTEBOOK

Chapter 10: Connect and reason

Real-life graphs: applications and reasoning

Why the method works

The method works because each stage preserves the defining relationship in the problem. A calculation is not merely a sequence of button presses: it is a chain in which every symbol, operation and representation has a stated meaning. An independent check uses a different feature - such as an inverse operation, an alternative representation, a bound, a unit or a limiting case - so it can reveal an error rather than repeat it.

COMMON MISCONCEPTION

A common error is to use a familiar rule before checking its conditions. For 2.5, this can produce a plausible-looking answer with the wrong structure, scale, sign, unit or interpretation. State the condition first, then apply the rule.

GUIDED REASONING TASK

A graph is steeper in section B than A. What does this mean on a distance-time graph? Before calculating, write: (a) what is known, (b) what is required, (c) the controlling relationship, and (d) one check. Then complete the solution.

COMMUNICATION STANDARD

Use one mathematical statement per line. Define symbols, label units and diagrams, retain exact values until approximation is requested, and close with a sentence that answers the actual question.

EXTENSION OR REPAIR

Change one value or condition in the guided task. Predict which steps remain valid and which must change. This is the difference between memorising a routine and understanding real-life graphs: applications and reasoning.

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COMPREHENSIVE LESSON NOTEBOOK

Independent practice

2.5 • Real-life graphs: applications and reasoning

Complete without notes. Show the setup, decisive working and final conclusion. Marks are independent teaching allocations, not official WJEC marks.

1. **Why should a straight conversion graph pass through the origin?** **[4]**

2. **A journey travels 18 km in 0.4 h, stops for 0.2 h, then travels 12 km in 0.3 h. Find total average speed.** **[4]**

3. **A graph is steeper in section B than A. What does this mean on a distance-time graph?** **[4]**

4. **State one risk of extrapolating a real-life graph.** **[4]**

REFLECTION

Record the question number of your least secure answer. Name the error type and write the first corrected line that would repair it.

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COMPREHENSIVE LESSON NOTEBOOK

Worked answers and repair notes

2.5 • Real-life graphs: applications and reasoning

1. WORKED ANSWER

Method: Direct proportion has no fixed starting amount. Answer: Zero of one quantity corresponds to zero of the other. Check: confirm the result against the original conditions, units and expected scale.

2. WORKED ANSWER

Method: Total distance 30 km; total time 0.9 h; 30/0.9. Answer: 33.3 km/h Check: confirm the result against the original conditions, units and expected scale.

3. WORKED ANSWER

Method: Greater gradient means more distance per time. Answer: Speed is greater in B. Check: confirm the result against the original conditions, units and expected scale.

4. WORKED ANSWER

Method: Extrapolation goes beyond observed data. Answer: The existing pattern may not continue. Check: confirm the result against the original conditions, units and expected scale.

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COMPREHENSIVE LESSON NOTEBOOK

Algebra mastery review

Explain, demonstrate, connect and revisit.

I can...

- 2.1 Algebraic conventions, expressions and formulae: core concepts and methods: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.1 Algebraic conventions, expressions and formulae: applications and reasoning: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.2 Equations and inequalities: core concepts and methods: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.2 Equations and inequalities: applications and reasoning: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.3 Sequences: core concepts and methods: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.3 Sequences: applications and reasoning: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.4 Coordinates and graphs: core concepts and methods: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.4 Coordinates and graphs: applications and reasoning: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.5 Real-life graphs: core concepts and methods: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.
- 2.5 Real-life graphs: applications and reasoning: explain the idea, reproduce a valid method, solve an unfamiliar problem and check the result.

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