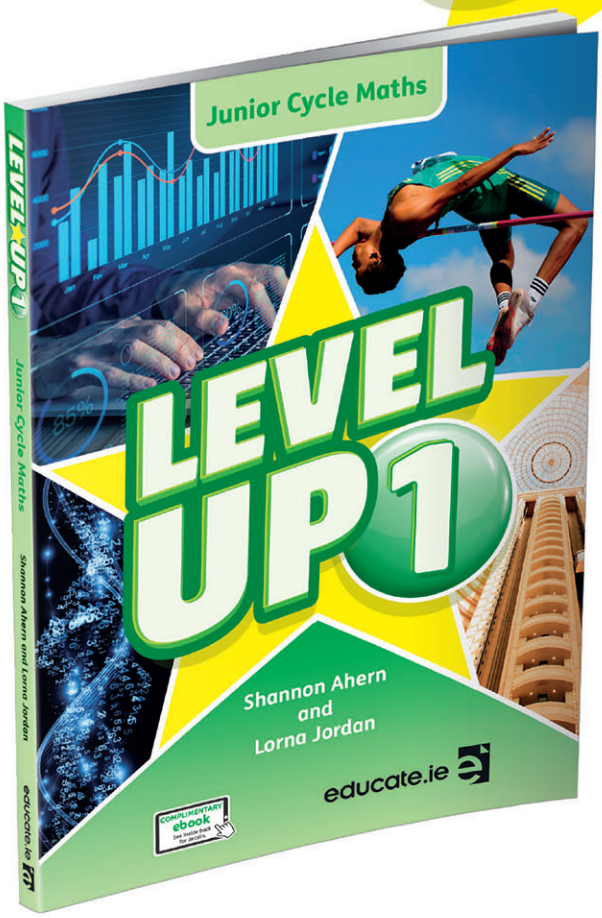
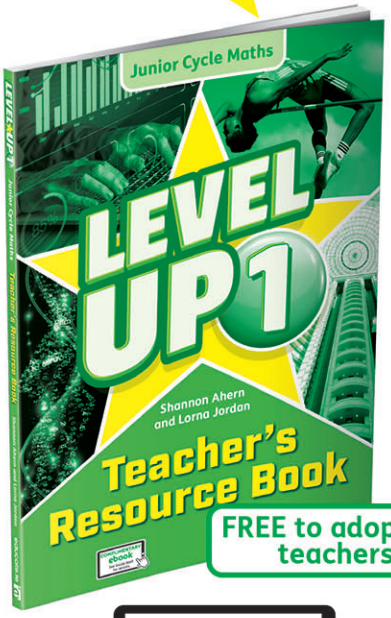
Junior Cycle Maths

LEVEL UP 1





FREE to adopting teachers

A SET OF FOUR CLASSROOM POSTERS

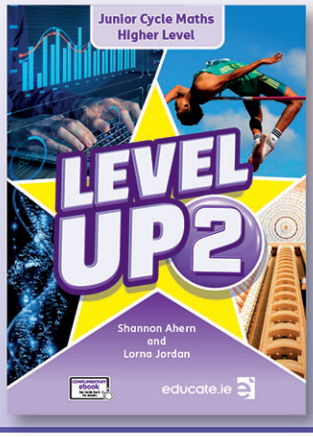
COMPLIMENTARY ebook

- ✓ Packed with differentiated exercises for students of all levels and abilities.
- ✓ Concepts and worked examples explained with accessible language to facilitate all learners.
- ✓ Exam Link sections contain exam-style questions based on insights from three years of SEC final exams and marking schemes.
- ✓ Written by experienced teachers who have examined for Junior Cycle Maths and frequently provide webinars and workshops for Maths teachers.
- ✓ Published after the release of the Early Enactment Review of the Junior Cycle Maths specification and addresses issues that it raised.

Level Up 1 covers the complete Ordinary Level Junior Cycle Maths course and is also the perfect starting book for eventual Higher Level students.

COMING IN 2026

Higher Level students can complete their Higher Level course with *Level Up 2*.



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The Complete Package

Based on issues raised in the Early Enactment Review of the Junior Cycle Maths specification, *Level Up 1* includes:

- comprehensive planning material to ensure all examinable content is covered
- easy-to-navigate algebra chapters to support students
- Let's Discuss pair-work activities that allow students to work collaboratively on maths problems that are relevant to their lives
- units of learning based on Learning Outcomes from across the strands.

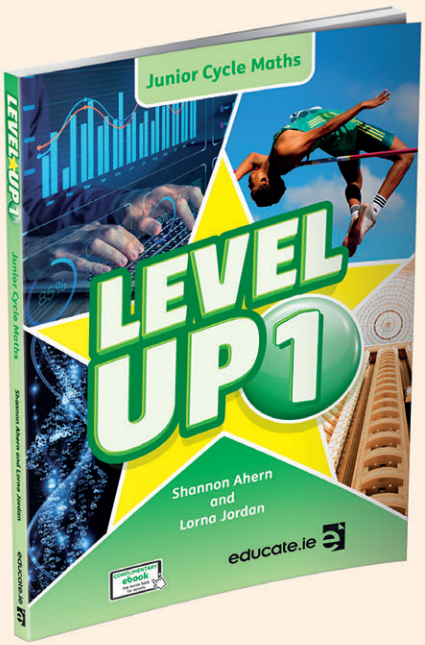
Level Up 1 covers the entire Ordinary Level Junior Cycle Maths course. It is intended that all students start with *Level Up 1* in First Year. Higher Level students will then move on to *Level Up 2* in Second Year after completing part of *Level Up 1*.

Level Up 2 will contain all the Higher Level-only material from the specification while also reminding Higher Level students of the core skills and concepts that they covered in *Level Up 1*.

Students of all levels and abilities will be using *Level Up 1* in First Year, and the exercises have been designed with this in mind. This differentiated approach means that students of all abilities are catered for and challenged appropriate to their needs.

For the Student

- Textbook with **complimentary** ebook
- Digital resources including construction animations and extra exercises

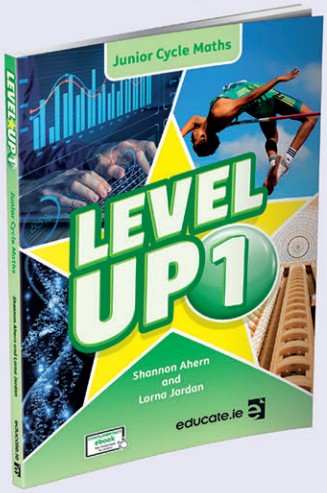


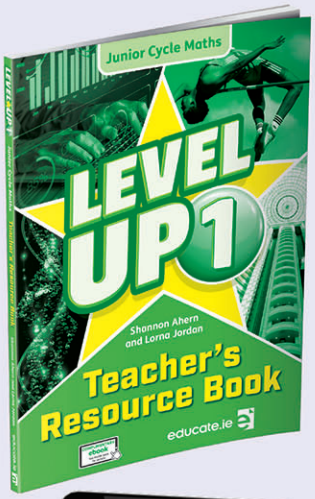
COMPLIMENTARY ebook

For the Teacher

- Textbook with **complimentary** ebook
- Teacher's Resource Book with full solutions
- Digital resources including editable planning documents
- PowerPoints with worked examples and solutions
- Classroom posters

COMPLIMENTARY ebook





Take a Look Inside

Chapters open with clear **learning intentions** to let students know what they will learn in the chapter.

The **Learning Outcomes** addressed in each chapter are listed at the start of each chapter to aid teacher planning.

Entry Level activities introduce students to the chapter topic.

Key terms are listed at the start of the chapter and are clearly **highlighted** and **defined** in the text.

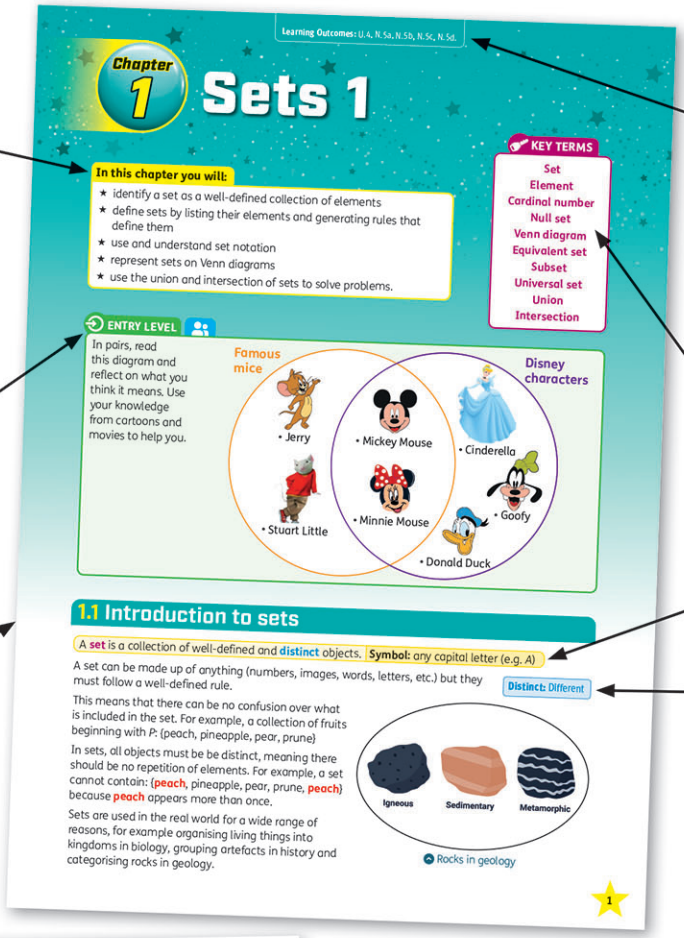
Content is presented using simple language, accurate diagrams and a well-paced structure.

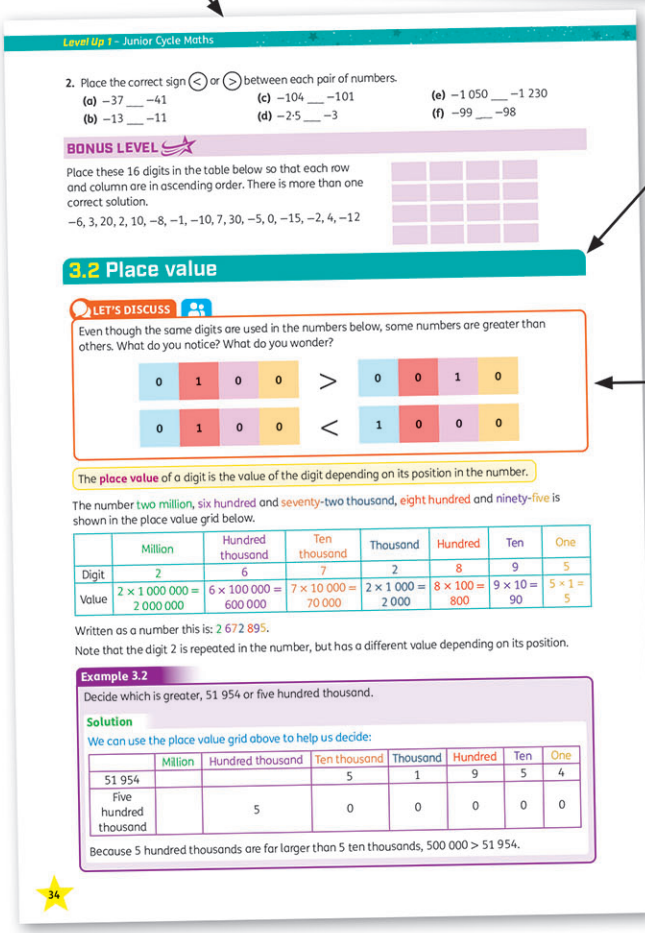
Other unfamiliar terms are **defined** as needed.

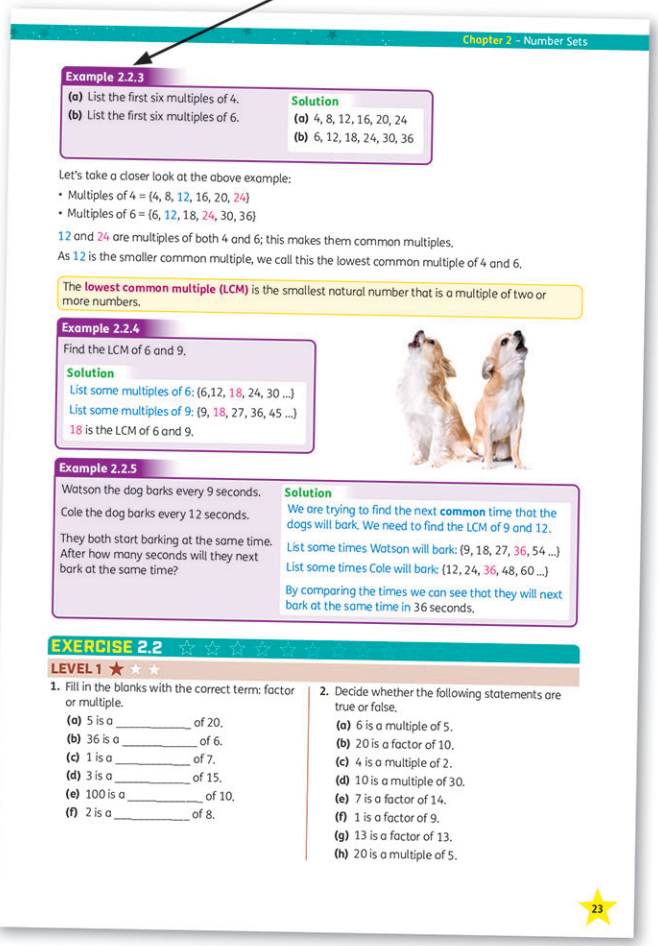
Chapters are split into easy-to-navigate **sections**.

Clear **worked examples** show students how to solve maths problems.

Let's Discuss activities allow students to discuss maths ideas and concepts that are relevant to their lives.







LEVEL 2 ★★

1. Below a student has written some numbers in scientific notation to 3 significant figures that are not quite right. Fix them so that they fit the criteria for scientific notation.
   (a) $81{\cdot}2 \times 10^4$ (b) $54{\cdot}2 \times 10^3$ (c) $12{\cdot}45 \times 10^1$ (d) $1{\cdot}536 \times 10^4$ (e) 745×10^5 (f) $0{\cdot}124 \times 10^6$
2. Arrange the list of numbers from smallest to biggest.
   $4{\cdot}3 \times 10^5$ $1{\cdot}21 \times 10^{35}$ $12{\cdot}1 \times 10^{75}$ $13{\cdot}9 \times 10^{45}$ $19{\cdot}1 \times 10^2$

LEVEL 3 ★★★

1. State whether each of the following statements are true or false.
   (a) $3{\cdot}4 \times 10^5 > 3{\cdot}4 \times 10^3$ (b) $1{\cdot}2 \times 10^2 > 1{\cdot}2 \times 10^6$ (c) $7{\cdot}9 \times 10^4 < 7{\cdot}9 \times 10^6$ (d) $5{\cdot}6 \times 10^3 > 2{\cdot}1 \times 10^3$ (e) $8{\cdot}3 \times 10^4 < 6{\cdot}1 \times 10^4$ (f) $3{\cdot}7 \times 10^7 > 3{\cdot}2 \times 10^7$ (g) $8{\cdot}2 \times 10^4 < 9{\cdot}1 \times 10^3$ (h) $4{\cdot}81 \times 10^5 > 2{\cdot}95 \times 10^4$ (i) $9{\cdot}12 \times 10^4 < 9{\cdot}1 \times 10^4$
2. Write each of the following in scientific notation to 3 significant figures.
   (a) The mass of Jupiter: 1 898 000 000 000 000 000 000 000 000 kilograms.
   (b) The distance from Earth to the Sun: 149 600 000 kilometres.
   (c) The age of the universe: 13 800 000 000 years.
   (d) The views on a popular YouTube video: 3 561 245 782.
   (e) The world population: approximately 8 123 819 741 people.

BONUS LEVEL

Using the skills you have learned so far, write each of the following using scientific notation and evaluate.

(a) How many times bigger is Jupiter than planet Earth?
Volume of Jupiter: 1 431 281 810 739 360 000 cubic kilometres
Volume of Earth: 1 083 210 000 000 cubic kilometres

(b) How many times faster is the speed of light than the speed of sound?
Speed of light: 299 792 458 m/s
Speed of sound: 343 m/s

(c) What percentage of the body is taken up by bacterial cells if:
Number of bacterial cells in the human body: 38 000 000 000 000 cells
Number of human cells in the human body: 37 200 000 000 000 cells

LEVEL COMPLETE

Archimedes developed a method known as the 'Sand Reckoner' to estimate the number of grains of sand that could fit in the universe. This method used a method very similar to the scientific notation we use today. However, as scientific notation was not yet invented, instead of using powers of 10 Archimedes used the words 'myriad' to represent 10 000. This allowed him to work out the number of grains of sand to be:

10 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000

Can you write this in scientific notation? Hint: You just need six symbols!

Sections end with **graded Level 1, Level 2 and Level 3 exercises** that allow students to level up their maths skills and track their progress.

Bonus Level exercises give students a chance to really test themselves and shoot for the stars.

Chapters close with **Level Complete** activities to show students how far they have progressed from the start of the chapter.

Revision Blaster sections contain graded exercises that students can practise their skills on as they blast their way to exam success.

Exam Link sections throughout the book contain exam-style questions that link different topics together.

Revision Blaster

LEVEL 1 ★

1. Match the following expressions to their algebra tile representations.

	Expressions		Algebra tiles
1	$2x$	A	
2	$x + 2$	B	
3	x^2	C	
4	$\frac{x}{2}$	D	

1 = ___ 2 = ___ 3 = ___ 4 = ___

2. Evaluate where $a = 5$.
   (a) $a + 2$ (b) $3a$ (c) $3a + 2$ (d) $a - 4$ (e) $2a$ (f) $2a - 4$
3. Evaluate where $b = 1$, $c = 2$.
   (a) $2b + cy$ (b) $3b + 6c$ (c) $-2b - 4c$ (d) $b^2 - 2c$ (e) $6bc$ (f) $b^2 + c$
4. Simplify each of the following expressions.
   (a) $-5z + 4 - 2z + 9$
   (b) $3 - 7z - 11 - 8z$
   (c) $6w + 9 - 2w - 1{\cdot}8$
   (d) $a + 3b + 6a - 2b$
   (e) $x + 2y - 7x + 8y$
   (f) $-2c + 3d - d + 5c$

LEVEL 2 ★★

1. Fill in the blanks in the table below. The first one has been done for you.

In letters	In words
$3x$	Multiply x by 3
$x - 2$	
	Add 4 to x
$6x$	
	Divide x by 7
	Subtract 5 from x

2. Solve each of the following equations.
   $x = 4$: (a) $x + 1$ (b) $2x$ (c) $2x + 1$ (d) $2x - 1$ (e) x^2 (f) $3x^2$ (g) $3x^2 + 1$ (h) $(x + 1)^2$ (i) $3(x + 1)^2$

Exam Link 1: Chapters 1–6

Now that you have mastered the skills in Chapters 1–6, it is time to challenge yourself with some problem-solving questions. The questions below link different topics together in the same way topics can be linked together in real life and in questions in the final exam.

Question 1

(a) Find the value of the following.
(i) $451 + 982$ (ii) $1\,078 - 325$ (iii) $30 \div (2 + 3)$

(b) The numbers 1, 2, 3 and 5 are written on four cards. The cards can be arranged to make a four-digit number as shown below.

2	5	3	1

(i) Rearrange the cards to make another odd number.
(ii) Rearrange the cards to make an even number.
(iii) Rearrange the cards to make a number that is divisible by 5.

(c) Insert operators to make each calculation below true. Use the operators +, − and ×.
(i) 1 ___ 5 ___ 2 = 7
(ii) 1 ___ 5 ___ 2 = 3
(iii) 1 ___ 5 ___ 2 = 11
(iv) 1 ___ 5 ___ 2 = 4

Hint: Remember the correct order of operations.

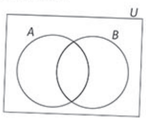
Question 2

$A = \{2, 3, 6, 7, 9, 10\}$ $B = \{1, 3, 5, 7, 9\}$

(a) (i) Write down a subset of A that contains three elements.
(ii) Write down a subset of A that contains only odd numbers.
(iii) Write down a subset of A that contains only prime numbers.

(b) (i) Use sets A and B to fill in this Venn diagram.
(ii) List the elements of $A \cap B$.
(iii) List the elements of $A \cup B$.

Hint: When it comes to Venn diagrams always start by filling in the intersection. This makes sure we don't double up on any elements.



(c) Decide if the following statements are true or false.
(i) $\#A < \#B$ (ii) $\#(A \cap B) > \#(A \cup B)$ (iii) $\#B > \#(A \cap B)$

Question 3

(a) Match the algebraic expression with its description in words.

1	$3x$	A	Divide a number by 5
2	$x + 4$	B	Multiply a number by 3
3	$9 - x$	C	Subtract a number from 9
4	$5x$	D	Multiply a number by 5
5	$x - 9$	E	Add 4 to a number
6	$\frac{x}{5}$	F	Subtract 9 from a number

1 = ___ 2 = ___ 3 = ___ 4 = ___ 5 = ___ 6 = ___

(b) Find the value of each expression from part (a) when $x = 4$.

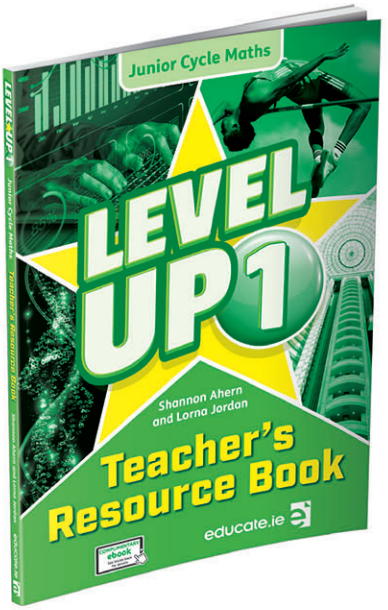
The textbook also contains a **CBA advice chapter** and **answers** to all the exercises.

View the **flipbook**

Teacher's Resource Book

The invaluable *Level Up 1* Teacher's Resource Book provides the ultimate support for planning, teaching and assessing Junior Cycle Maths. It includes:

- information on the Junior Cycle Maths specification
- guidelines on using *Level Up 1* with your class group
- comprehensive schemes of work and departmental units of learning plans
- planning templates
- information on assessment
- worked solutions for all exercises
- information on retrieval practice and Junior Cycle Maths
- teaching strategies and templates.



Digital Resources

- Ebook
- Editable planning documents
- PowerPoints with worked examples and solutions
- Construction animations
- Extra exercises

About the Authors

Shannon Ahern is a Maths teacher at St Declan's College, Cabra, Dublin 7, where she has been teaching since 2019. A graduate of Trinity College Dublin and Hibernia College, Shannon completed her PME with First-Class Honours in Maths and Science education. With more than eight years of experience in STEM education, Shannon has worked as Lead Maths Educator with the Trinity Walton Club and Maths Expert with the Irish STEM Institute and The Tuition Centre. Shannon is also the creator of Craic Matamaitic, an online platform that supports over 3,000 teachers across Ireland. Since 2023, she has delivered numerous webinars, workshops and conference presentations on Maths education. In 2024 Shannon was co-opted onto the IMTA National Council.

Lorna Jordan is a Maths teacher at Ballinrobe Community School, Co. Mayo with over a decade of teaching experience in Ireland and the UK. A graduate of the University of Oxford, Lorna completed her PGCE in Mathematics and a Masters in Education with a particular focus on mixed-ability teaching and formative feedback, areas that continue to inform her teaching and writing. Lorna has extensive experience as a state examiner for Junior Cycle Maths, GCSE and A-Levels, and has facilitated workshops for Maths teachers in Ireland and the UK.

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