

PRIMARY MATHEMATICS · FOR TEACHERS

Maths

5th Class · Teacher Resource Book



FOR TEACHERS

NCCA Primary Mathematics Curriculum

A teacher's reference to the 2025 specification this course delivers — strands and elements, the five pedagogical practices, the assessment continuum, the on-IWB interactive activities that drive every lesson, and how this 120-lesson course threads the Stage 4 outcomes across the school year.

How to use this book

This Teacher Resource Book pairs with the printed Student Activity Book for 5th class. Each lesson here gives you a one-page reference: the whole-class teaching arc, the moves to make at each step, the misconceptions to watch for, and three-band differentiation cues. The Student Activity Book answers sit on the same page so you can mark while a pupil's still at your desk.

The lesson pages are numbered to match the Student Activity Book and the on-screen lessons. The front matter that follows is for in-service reference — read it once, dip back when you need a refresher.

Anatomy of a lesson

Every 5th class maths lesson plays out across four surfaces — the IWB, the printed Student Activity Book, an optional printed Extension Sheet, and a digital homework panel pupils can use at home. The diagram shows how they connect.

IN CLASS · ~30 MIN

1 Whole-class teaching

Front of class · teacher-led on the IWB

Steps run in sequence: Getting Started → What You'll Learn → Try It Yourself → Think About It → Student Activity Book hand-off. The lesson's interactive activity drives the explanation in explore, guided, or display mode.



2 Student Activity Book

Pupils · paper · seat work

One A5 page per lesson. Three-tier pyramid: 4★ access, 3★★ stretch, 2★★★ challenge. Pupils work alone; teacher marks against this book's answer key.

↓ fast finishers only

3 Extension Sheet

Pupils · paper · printed on demand

One A4 page per lesson with five stretch problems and an optional Investigate panel. Print for in-class fast finishers, or send home as a paper backup.

AT HOME · DIGITAL

4 Homework panel

Pupil alone · digital

Pupils log in on a home device. The lesson page shows the same interactive used in class, loaded with a **homework challenge bank** of problems pitched at consolidation. Problems are self-contained — designed for a 10-year-old to do alone without a teacher reading them aloud.

↓ fast finishers only

5 Extension at home

Pupil alone · digital · same interactive

The lesson's **extension challenge bank** is also visible at home. A pupil who flies through homework can choose to attempt extension on their own — same interactive, harder problems.

Interactive activities – the spine of every lesson

NCCA primary maths is **manipulative-first**: children handle a model of the idea before they meet the abstract notation. For this course the IWB version of that is the **interactive activity** — place-value blocks you drag into columns, fraction strips you slice, balance scales that tip in real time, a number line you jump along, a hundred square you light up. These are manipulatives, just on a screen, set up for you, and configurable on the fly.

Every lesson is built around one or two of them. They are not bolt-ons; they are the spine of the lesson, and the lesson page tells you which interactive each lesson hinges on and how to drive it.

- **Pre-loaded per lesson.** Numbers, columns, and target values are already configured for the lesson's content. No prep before class — open the lesson and the interactive is ready.
- **Three modes per interactive.** Explore lets pupils play freely. Guided walks the class through a worked example step by step. Challenge poses a target (e.g. "build 4,073") and only accepts correct answers.
- **Display mode for IWB narration.** Want to show a worked example without the class touching the interactive? Drop it into display mode — same activity, no chrome, locked configuration. The interactive becomes your visual explainer.
- **In-lesson configuration.** Mid-lesson, change a number, swap a column, switch from sevenths to ninths, pick a different target. Updates without leaving the lesson.

The Maths Activity Bank. Beyond the per-lesson set-up, every interactive is also available standalone in the platform's Maths Activity Bank. Spin one up on demand, configure on the spot, put it on the IWB in seconds — fraction strips for the topic you're hitting, a balance-scales puzzle for an algebra group, a coordinate grid for a quick geometry warm-up. Nothing extra to install. The Bank is your spin-up shelf between lessons.

Physical kit (Dienes blocks, fraction tiles, real coins) still has its place — the Physical kit list page lists what to keep on the shelf. The interactives sit alongside that kit: a screen-based model for whole-class IWB teaching, with live feedback, error-catching, and on-the-fly reconfiguration when you want to push a number, a denominator, or a column in a different direction mid-lesson.

Student Activity Book – how to mark

Each lesson's Student Activity Book page uses a three-tier pyramid. Aim for every pupil to do the 4★ row; the rest is optional, designed to stretch faster finishers.

- 4★ — access tier. Every pupil does these. Mark for accuracy; flag any pupil who doesn't reach the end of the row for follow-up.
- 3★★ — stretch tier. Stronger pupils. Look for method, not just answer.
- 2★★★ — challenge tier. The top end. Open-ended; valid alternative answers welcome.

The 4★/3★★/2★★★ counts mean: 4 questions in the access tier, 3 in stretch, 2 in challenge — a deliberate inverted pyramid so the weakest pupil sees more practice and the strongest sees more depth.

FOR TEACHERS

Lesson Notes & Answers

Lesson 1: What we already know – place value to millions

CURRICULUM ALIGNMENT

NUM.PVT.4 investigate how decimals and percentages (and fractions) can be compared, ordered and expressed in related terms.

ALG.PRR.4a identify, explain and apply generalisations, including properties of operations, mathematical models and patterns.

INTERACTIVES **Place Value Blocks (Dienes)** · challenge, display, explore

WHAT THIS LESSON TEACHES

Each digit in a whole number sits in a **place**. Reading from the right: **Units, Tens, Hundreds, Thousands**. Each place is **ten times** the one to its right.

→ **3 482** → 3 thousands, 4 hundreds, 8 tens, 2 units.

→ **70 050** → 7 ten-thousands, 0 thousands, 0 hundreds, 5 tens, 0 units.

LESSON ARC

Open by taking three hands-up 'biggest number you've seen' answers and dropping each into a six-column place-value frame on the IWB. Build 4,073 then 9,999 with the place-value-blocks interactive, pivoting on what the zero holds and what rolls over at 9,999. Pupils build 3,072 through 800,070 together at the board, reading each aloud, then sketch the same four numbers into labelled columns in their copy. The Class Challenge bank pushes zero-heavy numbers like 700,005.

TEACHING MOVES

- Getting Started.** Take exactly three hands-up numbers, not open call-outs, and slot each into a quick place-value frame so the columns spread out beneath it. If a pupil offers a millions number, name the column and promise they'll see it lives in the same frame today.
- Watch and Notice.** Build from the smaller numbers up so the columns grow leftward. On 4,073 point straight at the zero in the hundreds column and ask what's holding that place. On 9,999 ask 'what comes next?', pause at the empty TTh column, then reveal the whole row rolling over into 10,000.
- Try It Together.** Call one number at a time — 3,072, 70,309, 105,008, 800,070 — and have the whole class read it aloud before the builder finishes. Watch for pupils who drop a zero and slide the other digits over; revoice 'the zero holds the column open and keeps every other digit in its place.'
- Sketch the Columns in Your Copy.** Walk the room glancing only at column labels and digit alignment — no marking. The thing to spot is a zero written in the wrong column or skipped entirely, which slides everything one place out.
- Class Challenge.** Keep it brisk — one quick 'what's tricky about this one?' per target, then a pupil builds and the class confirms. Don't re-teach each number; the zeros in 200,109 and 700,005 do the work. Let stronger pupils predict the column count before the build starts.
- What Did We Notice?.** Run the 'what if it was five times?' prompt as open thinking, not a one-answer question. Listen for pupils naming the ten-times jump as the engine; revoice 'because each column is ten times the last, ten of one always rolls into one of the next.'

COMMON MISCONCEPTIONS

⚠ Reading 70,309 aloud, a pupil says 'seven thousand, three hundred and nine' — they skip over the empty thousands column the zero is holding open.

Rebuild 70,309 in the columns and point to each filled column in turn: seven ten-thousands, no thousands, three hundreds. Then build 7,309 beside it so the class sees how dropping the zero shrinks the whole number.

⚠ Building 105,008, a pupil places the digits 1, 5, 8 in adjacent columns and ignores the zeros, ending up with 158.

Stop and read the number aloud as a class first, then build it digit by digit against the called-out places. Put an empty block-space in each zero column so pupils see the gap is doing a job, not nothing.

DIFFERENTIATION

EMERGING

- Pre-label the six columns on the IWB and in copies so pupils only place digits, not invent the HTh-U structure.
- Keep these pupils on the four-digit numbers (3,072) while the class moves up to six digits; they build in the same blocks with you at the board.

DEVELOPING

- After the copybook four, ask which of their numbers is the largest and how they can tell from the columns alone, before reading any of them.
- Hand a missing-digit variant: 'I built a number with a 6 in TTh and a 4 in units and zeros everywhere else — what is it?'

PROFICIENT

- During the Class Challenge, have them predict the exact column count and which columns hold zeros before anyone builds, then justify the prediction aloud to the class.
- Pose: build the smallest and the largest six-digit number you can using the digits 7, 0, 0, 5 and two more zeros — explain why your largest is largest.

• **Cross-curricular:** Tie to Geography — look up the populations of a few Irish counties or cities (e.g. Cork, Galway) and slot each into the six-column frame.

ANSWER KEY

a)

Row 1 (3,072): Th = 3, H = 0, T = 7, U = 2 — HTh and TTh stay blank.

b) Row 2 (70,309): TTh = 7, Th = 0, H = 3, T = 0, U = 9 — HTh stays blank.

c)

Row 3 (105,008): HTh = 1, TTh = 0, Th = 5, H = 0, T = 0, U = 8.

d) Row 4 (800,070): HTh = 8, TTh = 0, Th = 0, H = 0, T = 7, U = 0.

Q1: $485,708 = 400,000 + 80,000 + 5,000 + 700 + 8$

Q2: $377,265 = 300,000 + 70,000 + 7,000 + 200 + 60 + 5$

Q3: 200,000 (2 hundred thousands)

Q4: $-4.1 < 0.1 < 2.9 < 4.8$

Lesson 2: One whole, ten parts – introducing tenths

CURRICULUM ALIGNMENT

NUM.FRC.4a explore (model, compare and convert) the relationships between fractions, decimals and percentages.

NUM.PVT.4 investigate how decimals and percentages (and fractions) can be compared, ordered and expressed in related terms.

INTERACTIVES [Fraction Strips · challenge, display, explore](#)

WHAT THIS LESSON TEACHES

If you split **one whole** into **ten equal parts**, each part is one **tenth**. Written as a fraction: **1/10**.
Written as a decimal: **0.1**.

→ **3/10 = 0.3** (three tenths).

→ **7/10 = 0.7** (seven tenths).

→ Ten tenths make one whole: **10/10 = 1.0**.

LESSON ARC

Open with the shared-pizza question, then bring up the fraction-strips interactive — one whole strip above a strip cut into ten, with a halves strip beside it for contrast. Count the ten parts aloud and draw out that more parts means smaller parts. Pupils take turns shading named tenths at the board, then sketch and label $3/10$ and $7/10$ in their copies. The Class Challenge ends on the 'more than half but less than seven tenths' reasoning round.

TEACHING MOVES

- Getting Started.** Give quiet think-time, then take three hands-up answers — not call-outs. When a pupil says 'a tenth' or 'one out of ten', re-voice it as 'one tenth'. Then plant the seed: 'and if everyone put their slice back?'
- Watch and Notice.** Point along the ten-tenths strip while the class counts in unison — 'one tenth, two tenths...' to ten. On the halves contrast, slow right down and ask: which are bigger, the halves or the tenths? Land the line 'more parts means smaller parts' explicitly — this heads off pupils thinking ten always means bigger.
- Try It Together.** Call a tenths fraction, a pupil shades it at the board, the class names it aloud as $4/10$. Then turn to the watching rows: 'how many more tenths would reach one whole?' Take two answers and re-voice the reasoning. Keep glancing back up at the lined-up whole strip so pupils see how far each amount sits from full.
- Sketch the Tenths in Your Copy.** Walk the room as pupils draw and divide their strip. Glance for two things only: are the ten parts roughly equal, and does the shaded count match the label? This is practice, not marking — fix shaky strips on the spot rather than grading.
- Class Challenge.** Keep the board work brisk — pupils take turns, the class confirms each answer, then move on. Shade $5/10$ as the agreed reference point before the final round. For 'more than half but less than seven tenths', let the class reason out loud why six tenths is the only fit before anyone checks it.
- What Did We Notice?.** Listen for everyday tens — ten 10c coins in a euro, ten centimetres along a ruler, ten years in a decade. Re-voice a strong one: 'so ten of those equal parts rebuild one whole, just like our ten tenths.' This is the bridge into decimals next.

COMMON MISCONCEPTIONS

⚠ A pupil reasons that tenths must be bigger than halves because ten is bigger than two.

Hold the halves strip directly above the tenths strip on the IWB so one half visibly covers five of the little parts. Ask the pupil to point to a single half, then a single tenth — 'cutting one whole into more pieces makes each piece smaller'.

⚠ When shading four tenths, a pupil writes $\frac{4}{6}$ — they count the four shaded parts over the six unshaded ones instead of the ten total.

Stop and have the class re-count all the parts of the whole strip together — ten, every time. The bottom number is always how many equal parts the whole was split into, shaded or not; the top is just how many we've shaded.

DIFFERENTIATION

EMERGING

- Pre-divide the IWB strip into its ten parts and have these pupils only count and shade, not judge whether the parts are equal.
- For the copybook, let pupils trace over a strip you've already divided into ten so they focus on shading and labelling $\frac{3}{10}$ and $\frac{7}{10}$.

DEVELOPING

- After $\frac{7}{10}$, ask them to write how many more tenths reach one whole and prove it by shading on their copy strip.
- Pose a missing-shade puzzle: 'I shaded some tenths and there are exactly four parts left white — what fraction did I shade?'

PROFICIENT

- During the Class Challenge, narrate a harder variant aloud: 'shade an amount between five tenths and six tenths' — let them argue why no whole tenth fits, and what they'd need (smaller parts) to land between.
- Ask them to explain to the class, in their own words, why ten tenths and one whole are the same number written two ways.

• **Cross-curricular:** Link to measures — pupils find the ten 1 cm marks between two whole-centimetre lines on their ruler and name one of them as a tenth of the way along.

ANSWER KEY

a) $\frac{3}{10} = 0.3$

b) $\frac{7}{10} = 0.7$

c) Any of $\frac{6}{10}$ ($= 0.6$) — only one tenths option between $\frac{1}{2} = \frac{5}{10}$ and $\frac{7}{10}$.

d) $\frac{10}{10} = 1 = 1.0$

Q1: $2.52 = 2 + 0.5 + 0.02$

Q2: $6.96 = 6 + 0.9 + 0.06$

Q3: between 4 and 5, closer to 4

Q4: between 3 and 4, closer to 3

EXTENSION SHEET · STRETCH ANSWERS

S1: between 3 and 4, closer to 3

S2: $5.71 = 5 + 0.7 + 0.01$

S3: $8.32 = 8 + 0.3 + 0.02$

Lesson 3: Reading decimals to tenths and hundredths

CURRICULUM ALIGNMENT

NUM.PVT.4

investigate how decimals and percentages (and fractions) can be compared, ordered and expressed in related terms.

INTERACTIVES [Place Value Blocks \(Dienes\)](#) · challenge, display, explore

WHAT THIS LESSON TEACHES

Each digit in a decimal sits in a place. Reading from the decimal point: tens, units, **then tenths, hundredths, thousandths.**

→ **12.45** → 1 ten, 2 units, 4 tenths, 5 hundredths.

→ **0.07** → 0 units, 0 tenths, 7 hundredths.

ANSWER KEY

a) Row 1: 0 . 2 7

b) Row 2: 1 . 0 5

c) Row 3: 2 . 3 0

d) Row 4: 0 . 0 6

e) Row 5: 0 . 4 3

Q1: $5.71 = 5 + 0.7 + 0.01$

Q2: $8.32 = 8 + 0.3 + 0.02$

Q3: between 3 and 4, closer to 3

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EXTENSION SHEET · STRETCH ANSWERS

S1: between 4 and 5, closer to 4

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Glossary

MEASURES **24-hour time** A way of writing the time using a single number from **00:00 to 23:59** instead of am/pm. 17:30 means half-five in the afternoon.

SHAPE & SPACE **angle** The **opening between two arms** that meet at a vertex. Measured in degrees.

MEASURES **area** How much **surface a 2-D shape covers**. Measured in square units (cm^2 , m^2).

DATA & CHANCE **average** Another word for the **mean** — add the values together and divide by how many there are.

DATA & CHANCE **axis** A **number line** along the edge of a chart or coordinate plane. The horizontal one is the ***x*-axis**; the vertical one is the ***y*-axis**.

DATA & CHANCE **bar chart** A chart that shows **how often each category occurs** using rectangular bars whose heights match the frequencies.

ALGEBRA **BIDMAS** The order to do operations: **B**rackets, **I**ndices, **D**ivision and **M**ultiplication, **A**ddition and **S**ubtraction.

MEASURES **budget** A plan for **how much money** you can spend on each thing.

MEASURES **capacity** How much liquid a container can **hold**. Measured in millilitres (ml) and litres (l). $1\text{ l} = 1\text{ 000 ml}$.

MEASURES **centimetre** A unit of **length**, written **cm**. $100\text{ cm} = 1\text{ m}$. A fingernail is about 1 cm wide.

MEASURES **change** The money you get back when you pay **more than the price**.

SHAPE & SPACE **cone** A 3-D shape with a **circular base** and a single point (apex) at the top. An ice-cream cone is one.

DATA & CHANCE **coordinate** A **pair of numbers (x, y)** that pinpoints a place on the coordinate plane. ***x*** moves across, ***y*** moves up or down.

SHAPE & SPACE **cube** A 3-D shape with **6 square faces**, all the same size. Every face meets the next at a right angle.

MEASURES **cubic centimetre** A cube that is **1 cm × 1 cm × 1 cm**. Used to measure volume — written cm^3 .

SHAPE & SPACE **cuboid** A 3-D shape with **6 rectangular faces** — a box. Opposite faces are always equal.

DATA & CHANCE **data** The **information collected** by counting, measuring, or asking — written as numbers, words, or marks ready to be summarised or charted.

NUMBER **decimal** A number with a **decimal point** separating whole units from parts of a unit (tenths, hundredths, thousandths).

NUMBER **decimal point** The dot that separates whole units from parts of a unit. In 4.75 the decimal point sits between the **4** and the **7**.

NUMBER **denominator** The **bottom number** of a fraction. It says how many equal parts make up one whole.

NUMBER **digit** Any of the symbols **0, 1, 2, 3, 4, 5, 6, 7, 8, 9** used to write numbers.

MEASURES **discount** An amount taken **off the original price**. A 20 % discount on €30 means €6 off, paying €24.

SHAPE & SPACE **edge** A **line where two faces meet** on a 3-D shape. A cube has 12 edges.

MEASURES **elapsed time** The **time that has passed** between a start and an end. From 9:15 to 11:50 is 2 h 35 min elapsed.

ALGEBRA **equation** A statement that **two expressions are equal**, with an = sign in the middle. Both sides must always balance.

NUMBER **equivalent** Worth the **same value** even though they look different — e.g. $\frac{1}{2}$, 0.5, and 50 % are all equivalent.

MEASURES **estimation** A **sensible guess** about a measurement before checking — e.g. 'I think this jug holds about 500 ml.'

ALGEBRA **expression** A **piece of maths** with numbers and/or letters but no equals sign — e.g. $3x + 4$.

SHAPE & SPACE **face** A **flat surface** of a 3-D shape. A cube has 6 faces.

NUMBER **factor** A whole number that **divides exactly** into another. Factors of 12: 1, 2, 3, 4, 6, 12.

NUMBER **fraction** A number that names **part of a whole**, written as numerator over denominator (e.g. $\frac{3}{4}$).

DATA & CHANCE **frequency** **How many times** a value appears in a data set.

MEASURES **gram** A unit of **mass**, written **g**. $1\text{ 000 g} = 1\text{ kg}$. A €1 coin weighs about 7.5 g.

SHAPE & SPACE **hexagon** A polygon with **6 straight sides**. Honeycomb cells are hexagons.

NUMBER **hundredth** **One part in 100**. Two places after the decimal point: 0.07 means 7 hundredths.