Ratios and Percents: Weekly Planning for Teachers (Online)

Chapter 6, Ratios and Percents · November 2026 · draft for review · all five weeks written

How the chapter runs

This plan covers Chapter 6, Ratios and Percents, taught online after Chapters 3 and 5: 13-year-olds with five maths lessons a week of about 55 minutes, each student working on a device in the course pages. It takes 5 weeks (25 lessons): 20 teaching lessons, 3 mixed practice and review days, the chapter check and a buffer lesson at the end.

The chapter is about comparing amounts. A ratio says how two or more amounts compare, not how big they are; from it students share a total, rebuild the whole from one part, and turn ratio facts into equations (Chapter 3's one-letter equations, Chapter 5's substitution). Conversion factors and percents are ratios too. Week 1 is what a ratio says; week 2 ratios with algebra, then units; week 3 units, then percent; week 4 percentage problems; week 5 mixtures, review and the chapter check. All units are metric.

Every day is a normal lesson. Monday to Friday, each lesson teaches one skill (or half of a harder one) with the same 55-minute plan. When a skill is finished, its mastery check is the last part of that lesson. The page marks the check straight away.

Below the pass mark is "not yet", never a fail. The student practises that skill again, then retakes the check with new questions at the end of a later lesson. The mixed days and the buffer lesson have time for retakes built in.

Two routes. The mandatory route is 19 skills for every student; the chapter is mastered when all of them are. The advanced route has six optional skills (clock-hand problems, shares taken in steps, profit as a percent of cost, the part that doesn't change, clocks that run slow, and percents with letters), still to be written.

Week	Focus	Lessons
1	What a ratio says	RP01, RP02, RP03, RP04, RP05
2	Ratios with algebra, then units	RP06, RP07, RP08, MX12, RP09
3	Units, then percent	RP10, RP11, RP12, RP13, RP14
4	Percentage problems	RP14, RP15, RP16, RP17, RP18
5	Mixtures, review and the chapter check	RP19, MX13, MX14, CH6, BUF6

Numbering. Skills are numbered RP01 to RP25 (ratios and percents); LE stays Chapter 3 and SY Chapter 5. Mixed practice and review days are numbered MX12, MX13 and MX14, after Chapter 5's MX09 to MX11: they practise several skills at once and have no mastery check of their own, so they are not skills. CH6 is the chapter check and BUF6 the buffer lesson.

Answers that are ratios. A ratio is typed one number per box, in the order the question names the parts: boys : girls = 3 : 4. Typing "3:4" in the first box also works. The same ratio not yet in simplest form (6 : 8) is not marked right but told to divide both numbers by 2; the right numbers the wrong way round are diagnosed as the wrong order. Other answers are numbers: fractions such as 4/7 and decimals such as 2.5 are both fine.

Metric units only. Lengths in metres, centimetres and millimetres, masses in kilograms and grams, volumes in litres and millilitres. Where the book uses inches, feet, pounds or gallons, the lessons use metric units instead; a ratio of two lengths or masses is written after changing both to one unit.

What you do

- In each lesson: lead the Learn part with the class, then walk round while students practise. There is nothing to prepare, print or mark.

- After each lesson, five minutes in the class view: who is “not yet” on today’s check, and the mistakes each student makes most often (see The class view after each lesson).
- Use what you see there in the next lesson’s warm-up.

A normal lesson

Every lesson, Monday to Friday, follows the same four parts, so students know what to expect and you never plan from scratch.

Minutes	Part	Students	You
0 to 8	Warm-up	Answer one or two quick questions on earlier skills, in the page	Read the answers out in a minute. Add the mistake the class view showed most often yesterday, if there was one
8 to 20	Learn	Open the day’s lesson and follow it together: the narrated video (a minute or so), the explanation, and the activity (step-by-step ratio problems: which part, how many in a group, how many groups)	Lead it from the front on your own screen. Ask “which part is this number?” and “part to part, or part to whole?” more than “what is the answer?”
20 to 45	Practise	Work through the practice, easiest first. Each answer gets instant feedback that names the mistake. Hints are there when stuck. Students who finish early do the two extra exercises	Walk round. Look for the mistakes listed in the day’s plan and stop the class if you see one several times
45 to 55	Exit	If the skill finishes today: its mastery check (about 10 minutes), plus any retakes. Otherwise: redo, without hints, the hardest practice question they got right	Make sure everyone submits before the bell. The page marks the checks and gives every student different questions

A student who finishes the practice early may take the mastery check before the Exit.

Mastery checks and retakes

1. **Check at the end of the skill.** On the day a skill finishes, its mastery check takes the last 10 minutes of the lesson. The page builds a new set of questions for every student and every attempt, so there is nothing to copy.
2. **The page marks it.** Students see their score, which rows they missed and why, straight away. A row counts only when it is exactly right and finished. The result appears in the class view at the same moment.
3. **Below the pass mark: “not yet”.** The student practises that skill again (the lesson’s practice and its extra exercises), then retakes the check at the end of a later lesson, with new questions. The mixed practice and review days (Thursday of week 2, Tuesday and Wednesday of week 5) end with retakes, and in week 5 every check of the chapter can be retaken on the week 5 page.
4. **The chapter check has no pass mark.** On Thursday of week 5 it shows, skill by skill, what each student still knows. Every skill a student misses goes on their review list for Friday’s buffer lesson.

Some students cannot get online at home. Let them practise and retake in a lunchtime or after-school session on the school’s devices.

The five weeks

Week 1: What a ratio says

Monday students read and write ratios: the order follows the words, and a ratio is simplified like a fraction (lengths and masses in one unit first). Tuesday they switch between part to part and part to whole: add the parts to get the whole. Wednesday they share a total in a ratio three ways (groups, a fraction of the whole, equations); Thursday they rebuild the whole from one part, choosing the ratio that links what they know with what they want. Friday extends all of it to ratios of three quantities. Ratios are typed one number per box, in the order the question names them.

Day	Lesson	Warm-up	Exit	Watch for
Mon	RP01 Read and write ratios “What a Ratio Says”	fractions, decimals & reciprocals (PRE02, earlier work)	RP01 check (5 of 6)	Writing the ratio in the wrong order (girls : boys for “boys to girls”). Reading a ratio as the actual numbers (2 : 3 means there are 2 dogs and 3 cats)
Tue	RP02 Part to part, part to whole “Parts and the Whole”	RP01; fractions, decimals & reciprocals (PRE02, earlier work)	RP02 check (5 of 6)	Reading a part-to-part ratio as a fraction of the whole (boys : girls = 3 : 4 read as “3/4 of the class are boys”). Forgetting to add the parts to get the whole (the whole taken as 4 instead of 3 + 4 = 7)
Wed	RP03 Share a total in a ratio “Share It Out”	RP02; solve by substitution (SY03, Chapter 5)	RP03 check (4 of 5)	Dividing the total by one number of the ratio instead of the sum (84 ÷ 4 = 21 girls). Giving the number of groups as the answer (12)
Thu	RP04 From one part to the whole “From One Part to the Whole”	RP03; solve any linear equation (LE13, Chapter 3)	RP04 check (4 of 5)	Matching the number given to the wrong part (the 18 who say yes used as if they said no). Applying the fraction to the part instead of the whole (18 × 9/11)
Fri	RP05 Ratios of three quantities “Three-Way Ratios”	RP04; RP02	RP05 check (4 of 5)	Using only two of the three numbers for the whole (2 + 3 = 5). Matching the number given to the wrong term of the ratio

Week 2: Ratios with algebra, then units

Ratios that change when something is added or taken away, the ratio of two letters from an equation, and chains of ratios. Thursday is mixed practice: which ratio does the question need? Friday starts conversion factors: multiply by a fraction worth 1.

Day	Lesson	Warm-up	Exit	Watch for
Mon	RP06 Ratios that change “Ratios That Change”	RP05; clear fractions with the LCD (LE12, Chapter 3)	RP06 check (3 of 4)	Writing a part-to-whole ratio as part to part (g/r = 2/5: the book’s bogus solution). Applying the change to the ratio numbers instead of the amounts ((2 + 4) : (5 − 10))
Tue	RP07 Find a ratio from an equation “A Ratio From an Equation”	RP06; clear fractions with the LCD (LE12, Chapter 3)	RP07 check (4 of 5)	Turning the ratio upside down (11x = 9y read as x/y = 11/9). Trying to find x and y separately

Day	Lesson	Warm-up	Exit	Watch for
Wed	RP08 Chain ratios “Chains of Ratios”	RP07; fractions, decimals & reciprocals (PRE02, earlier work)	RP08 check (4 of 5)	Multiplying two ratios whose shared letter doesn’t cancel (x/y · z/y). Adding the ratios (2/3 + 7/5)
Thu	MX12 Which ratio? Mixed practice (RP01 to RP08: every ratio skill). Mixed practice on weeks 1 and 2: parts and wholes, sharing, changes, equations and chains, all mixed “Which Ratio?”	RP02; RP07; RP08	Hardest practice question; retakes	Using the ratio as it is given, even when it compares a part with the whole and the question needs part to part (or the other way round)
Fri	RP09 Convert with a conversion factor “Conversion Factors”	RP08; divide monomials with several letters (MV05, Chapter 4)	RP09 check (4 of 5)	Multiplying when you should divide (64 cm = 64 × 100 = 6400 m: the book’s bogus solution). Using the factor upside down, so the units don’t cancel (cm²/m)

Week 3: Units, then percent

Conversion factors for squared and cubed units, units in the denominator (rates) and chains of factors, all metric. Thursday moves between percents, fractions and decimals; Friday starts the percent equation (part 1 of 2).

Day	Lesson	Warm-up	Exit	Watch for
Mon	RP10 Squared and cubed units “Square the Factor”	RP09; multiply monomials & powers of products (EX05, Chapter 2)	RP10 check (4 of 5)	Using the length factor only once (1 m² = 100 cm²). Squaring the unit but not the number ((100 cm)² = 100 cm²)
Tue	RP11 Units in the denominator “Change What’s Underneath”	RP10; RP09	RP11 check (4 of 5)	Multiplying by a factor that has the unit in the same place, so it doesn’t cancel (km/h × 60 min/1 h). Converting only the unit on top
Wed	RP12 Chains of conversion factors “Plan the Route”	RP11; RP09	RP12 check (3 of 4)	One factor in the chain upside down, so a unit doesn’t cancel. Rounding in the middle of the chain
Thu	RP13 Percent, fraction, decimal “Per Hundred”	fractions, decimals & reciprocals (PRE02, earlier work); RP01	RP13 check (5 of 6)	Moving the decimal point the wrong way or only one place (25% = 2.5 or 0.025). Thinking a percent can’t be more than 100
Fri	RP14 The percent equation (part 1 of 2) “The Percent Equation”	RP13	Hardest practice question (check on Monday, week 4)	Using the wrong number as the whole (48 is what percent of 240 worked out as 240/48 = 500%). Multiplying when the whole is unknown (36 is 120% of what? 1.2 × 36)

Week 4: Percentage problems

The percent equation, part 2 (with its mastery check), increasing and decreasing by a percent, finding the original before a change, changes one after another, and combined groups with convenient numbers.

Day	Lesson	Warm-up	Exit	Watch for
Mon	RP14 The percent equation (part 2 of 2) “The Percent Equation”	RP14	RP14 check (5 of 6)	Using the wrong number as the whole (48 is what percent of 240 worked out as 240/48 = 500%). Multiplying when the whole is unknown (36 is 120% of what? 1.2 × 36)
Tue	RP15 Increase or decrease by a percent “Up or Down by a Percent”	RP14; RP13	RP15 check (4 of 5)	Giving only the change (75% of 24 = 18) instead of the new amount. Using the wrong multiplier (1.2 for a 120% rise, or 0.4 for a 40% cut)
Wed	RP16 Find the original “Find the Original”	RP15; solve any linear equation (LE13, Chapter 3)	RP16 check (4 of 5)	Taking the percent of the new amount (450 + 25% of 450). Multiplying by the multiplier instead of dividing
Thu	RP17 Successive percent changes “One Change After Another”	RP16; RP15	RP17 check (4 of 5)	Adding successive percents (20% + 25% = 45%). Undoing a 50% rise with a 50% cut
Fri	RP18 Combined groups; convenient numbers “Two Groups Together”	RP17; RP14	RP18 check (3 of 4)	Averaging the two percents ((6% + 3%)/2 = 4.5%). Adding the two percents (9%)

Week 5: Mixtures, review and the chapter check

Mixtures and concentration on Monday, mixed practice on percent on Tuesday, a review of the whole chapter on Wednesday, the chapter check on Thursday and the buffer lesson on Friday.

Day	Lesson	Warm-up	Exit	Watch for
Mon	RP19 Mixtures and concentration “Mixtures”	RP14; value and weight problems (SY09, Chapter 5)	RP19 check (3 of 4)	Averaging the two concentrations ((36% + 4%)/2 = 20%). Adding the substance without keeping the total volume (the book’s bogus solution: 18 mL of acid added, not replaced)
Tue	MX13 Mixed practice: percent (RP13 to RP19: every percent skill). Mixed practice on percent: parts, wholes, changes, originals, groups and mixtures, all mixed “Which Percent?”	RP13; RP14; RP15	Hardest practice question; retakes	Taking the percent of whichever number is given, without asking which number is the whole
Wed	MX14 Chapter review (RP01 to RP19: every skill of the chapter). A review of the whole chapter in no particular order, like tomorrow’s chapter check “Which Skill? Chapter Review”	RP01; RP09; RP14	Hardest practice question; retakes	Doing well when the skill is announced, but stalling or guessing when it is not

Day	Lesson	Warm-up	Exit	Watch for
Thu	CH6 Chapter check: one or two questions from every mandatory skill, mixed (whole lesson)	None	None: the check is the whole lesson	Shows what each student still knows weeks later, skill by skill; it makes each student's review list for Friday
Fri	BUF6 Buffer lesson: warm-up, your review list from the chapter check, retakes	RP04; RP11; RP16	Retakes	Teach again any skill where many students missed the chapter check; then review lists and retakes

The lesson videos

Each teaching lesson opens its Learn part with a short narrated video; 20 videos in all. Every video has captions, a storyboard (one picture for each step, to print for students) and a teacher script (what to say and write on the board), so a class without screens can follow the same lesson. All of them are in Lesson videos on the course home.

Video	Title	Lesson	Length
RP01-V1	What a Ratio Says	Monday, week 1: What a Ratio Says	1:31
RP02-V1	Parts and the Whole	Tuesday, week 1: Parts and the Whole	1:26
RP03-V1	Share It Out	Wednesday, week 1: Share It Out	1:32
RP04-V1	From One Part to the Whole	Thursday, week 1: From One Part to the Whole	1:37
RP05-V1	Three-Way Ratios	Friday, week 1: Three-Way Ratios	1:36
RP06-V1	Ratios That Change	Monday, week 2: Ratios That Change	1:50
RP07-V1	A Ratio From an Equation	Tuesday, week 2: A Ratio From an Equation	1:19
RP08-V1	Chains of Ratios	Wednesday, week 2: Chains of Ratios	1:24
RP09-V1	Conversion Factors	Friday, week 2: Conversion Factors	1:27
RP10-V1	Square the Factor	Monday, week 3: Square the Factor	1:27
RP11-V1	Change What's Underneath	Tuesday, week 3: Change What's Underneath	1:21
RP12-V1	Plan the Route	Wednesday, week 3: Plan the Route	1:42
RP13-V1	Per Hundred	Thursday, week 3: Per Hundred	1:32
RP14-V1	The Percent Equation, Part 1	Friday, week 3: The Percent Equation	1:07
RP14-V2	The Percent Equation, Part 2	Monday, week 4: The Percent Equation	1:23
RP15-V1	Up or Down by a Percent	Tuesday, week 4: Up or Down by a Percent	1:34
RP16-V1	Find the Original	Wednesday, week 4: Find the Original	1:28
RP17-V1	One Change After Another	Thursday, week 4: One Change After Another	1:28
RP18-V1	Two Groups Together	Friday, week 4: Two Groups Together	1:27
RP19-V1	Mixtures	Monday, week 5: Mixtures	1:47

The class view after each lesson

This replaces marking. Five minutes after each lesson, open the class view at the bottom of the week's page. It is shown to teachers who can edit the course, and lists every student's progress, lesson by lesson, live.

Look at	What it tells you	What to do
Who is “not yet” on today’s check	Who needs to practise that skill again and retake	Next lesson, check that their retake happened
How many are “not yet”	Whether the skill landed	Half the class or more: teach it again the next day (see If the class is behind or ahead)
“Watch for”: each student’s most frequent mistakes	What the class misunderstood, by the mistake behind it	Put one question on it in the next warm-up
Last active, and students two or more lessons behind	Who is falling away from the class	Pair them with a classmate during practice

If the class is behind or ahead

Let the check results decide, not the calendar.

Behind. If half the class or more is “not yet” on a skill, teach it again the next day before moving on, and shift the plan by a day. The buffer lesson in week 5 absorbs one day of delay; beyond that, shorten the chapter review (MX14) to half a lesson and keep the chapter check. Two things never get cut: the two days of the percent equation (RP14), and the mastery checks. A student stuck on sharing a total (RP03) usually needs part to whole again (RP02): add the parts to get the whole.

Ahead. If most students pass first time, use the buffer lesson for the advanced skills. A class that is clearly fast can run a mixed practice day as half a lesson.

Individual students. Nobody waits for the class and nobody is dragged along with it. A student who is behind practises and retakes with new questions; one who is ahead does the extra exercises and, when they are written, the advanced skills. If a student is two or more lessons behind, pair them with a classmate during practice.

Materials status for the pilot

This plan describes the full chapter online. All content is a draft waiting for review by the maths expert.

Material	Status
Skill graph for the chapter, with the mandatory and advanced routes	Ready
Week 1 to week 5 pages: 25 lessons (RP01, RP02, RP03, RP04, RP05, RP06, RP07, RP08, MX12, RP09, RP10, RP11, RP12, RP13, RP14P1, RP14P2, RP15, RP16, RP17, RP18, RP19, MX13, MX14, CH6, BUF6), each with warm-up, lesson, practice and its mastery check or exit question, and a class view	Ready (prototype)
20 lesson videos, one for each teaching lesson (the mixed practice and review days have none; RP14 has two, one for each part), each with captions, a storyboard and a teacher script	Ready (draft)
Practice sets: 32 more exercises for the four hardest skills (ratios that change, chains of conversion factors, finding the original, mixtures), and four exercise exemplars	Ready (draft)
Advanced skills RP20 to RP25	Not written yet
Catch-up practice set automatically as homework, with the retake opening once it is done	Designed, not built yet
Sign-in for a whole class through the school	Part of the production platform