Classroom copy · 2 November 2026

Equivalent Ratios Teacher Quick Start

Original ratio core | Task edition 0.2.2 | Section 1 of 9

United States Grade 6 mathematics. Teach learners to preserve the relationship by scaling both labeled quantities together.

Fit and limits

Use when learners can name ratio quantities and multiply or divide whole numbers. Teach the fractional-length bridge only when halves and decimal multiplication are accessible. Partial US CCSS 6.RP.A.1 and 6.RP.A.3a connection; no plotting, full-domain or mastery claim.

Prepare and print

Paper and pencil; counters optional. Print readiness alone, then the 4-page lesson, 2-page independent sheet, selected response page, and later check when needed. Teacher guidance and answers stay with you. All formats contain the same tasks.

Sequence and evidence

1 Give readiness before models. 2 Model matched groups, then guide guided practice questions 1 to 3. 3 Teach Worked example 2 and guide guided practice questions 4 and 5 before fractional work. 4 Collect independent questions 1 to 3 independently. 5 Choose one response page using visible reasoning. 6 Reserve later questions 1 to 3 until after another learning opportunity. Use the whole-group extension optionally.

Choose the next move

Same-addend reasoning after labels are clear: Route A. Correct quantities without a reason: Route B. Reversed labels: revisit ratio language. Arithmetic slip with valid setup: support computation. Blank: clarify directions, access and response mode first.

Access and interpretation

Allow a labeled sketch or oral/dictated explanation; record mode. A calculator may follow identification of the factor; record use. Such work does not establish unaided writing or arithmetic. Do not supply a completed table during an independent check.

Planning time and use limits

Plan approximately 4-6 minutes preparation and 40-55 minutes teaching, adjusting for the fractional bridge; these are unmeasured estimates. No teacher-use trial or accessibility conformance claim.

Equivalent Ratios Answer Guidance

Readiness question 1

Prompt: A sticker sheet has 6 stars and 10 circles. Write stars:circles and explain what each number counts. Can you describe the same relationship with two equal groups?

Accepted answer: 6:10. Six counts stars and ten counts circles. The sheet can be seen as two groups of 3 stars and 5 circles, so 3:5 describes the same relationship.

Also accept: A correctly labeled 6:10 description is sufficient readiness evidence even without reducing it to 3:5.

Reasoning to notice: If the order reverses or 'for every' is unclear, teach the prerequisite introduction before treating scaling as the difficulty.

Worked example 1

Prompt: Watch the complete-group model for 3 stars for every 5 circles. Explain why 6:10 keeps the relationship and 6:8 does not.

Accepted answer: 6:10 is two complete 3:5 groups. 6:8 cannot be made from two such groups; 6 stars would need 10 circles.

Also accept: A correctly labeled ratio table, drawing, or multiplication explanation is valid.

Reasoning to notice: The student-facing model may show its solution; it is never used as an independent check.

Worked example 2

Prompt: Read the smaller-length model. Explain why scaling down both lengths preserves the relationship, and why half a sticker would not be allowed in a whole-sticker pattern.

Accepted answer: 6:9 becomes 2:3 by dividing both lengths by 3. 2:3 becomes 1:1.5 by multiplying both lengths by 1/2. Lengths may be divided; a pattern restricted to whole stickers cannot contain half a sticker.

Also accept: A labeled table with the same factor for both lengths plus a whole-object explanation is acceptable.

Reasoning to notice: This is taught work, never independent evidence.

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Guided practice 1

Prompt: A pattern has 3 stars for every 5 circles. If it has 9 stars, how many circles keep the relationship? Show groups or a table.

Accepted answer: 15 circles. Three groups of 3 stars require three groups of 5 circles.

Also accept: 9:15 or a labeled drawing is valid when the quantities are clear.

Reasoning to notice: Ask which factor changed the stars and whether it also changed the circles.

Guided practice 2

Prompt: The same pattern has 20 circles. How many stars keep the relationship? Explain starting with the circles.

Accepted answer: 12 stars. Twenty circles is four groups of five, so four groups of three stars give twelve.

Also accept: A table or 20 ÷ 5 = 4, then 3 × 4 = 12 is valid.

Reasoning to notice: The known quantity is second; do not let a memorized first-column procedure hide its meaning.

Guided practice 3

Prompt: Which pairs keep 3 stars for every 5 circles: 6:10, 6:8, 9:15, 12:20? Explain one pair that works and why 6:8 does not.

Accepted answer: 6:10, 9:15, and 12:20 work; the complete-group factors are 2, 3, and 4. For 6 stars, 6:8 is two circles short of 6:10.

Also accept: Equivalent fraction or ratio-table reasoning is valid if labels and both quantities are handled consistently.

Reasoning to notice: Distinguish adding a complete 3:5 group from adding the same number to both original counts.

Equivalent Ratios Answer Guidance

Guided practice 4

Prompt: A length plan uses 4 centimetres of striped ribbon for every 6 centimetres of plain ribbon. Make a smaller version with 2 centimetres of striped ribbon. Find the plain length, label both lengths, and name the factor used on each.

Accepted answer: 2 centimetres striped and 3 centimetres plain; multiply both by 1/2, or divide both by 2.

Also accept: A correctly labeled 2:3 table row with a shared divide-by-two explanation.

Reasoning to notice: Ask whether the same factor was used in both columns.

Guided practice 5

Prompt: For the same 4:6 ribbon-length plan, a version uses 1 centimetre of striped ribbon. Find the plain length. Then make a 1.5-times version of the original plan and label both lengths. Explain why decimal lengths are possible here.

Accepted answer: 1 centimetre striped needs 1.5 centimetres plain (both originals divided by 4). Multiplying originals by 1.5 gives 6 centimetres striped and 9 centimetres plain. Ribbon can be measured in fractional centimetres.

Also accept: 1 1/2 centimetres and a shared-factor table are acceptable.

Reasoning to notice: Teach this after Worked example 2; do not require unfamiliar fraction operations without support.

Independent question 1

Prompt: A flag display repeats a group of 2 triangle flags and 7 rectangular flags. If it has 8 triangle flags, how many rectangular flags should it have? Show why.

Accepted answer: 28 rectangular flags. Eight triangles make four groups of two; four groups of seven rectangles make twenty-eight.

Also accept: A labeled table or four sketched complete groups is valid.

Reasoning to notice: Look for matching scale in both quantities and an explanation, not only 28.

Equivalent Ratios Answer Guidance

Independent question 2

Prompt: A different banner uses 3 square flags for every 8 round flags. Two proposals are 6 squares with 16 rounds and 6 squares with 11 rounds. Which keeps the relationship? Explain why the other does not.

Accepted answer: 6:16 keeps the relationship because both original counts double. 6:11 adds three to each original count; six squares need sixteen rounds, so eleven is five short.

Also accept: Any clear complete-group or shared-factor comparison that rejects 6:11 and explains the quantity mismatch is valid.

Reasoning to notice: This is a new ratio; it does not supply a useful intermediate pair for Independent question 1. A correct choice without a reason gives limited evidence of the target.

Independent question 3

Prompt: A strip uses 5 centimetres of striped ribbon for every 8 centimetres of plain ribbon. A version has 15 centimetres of striped ribbon. How much plain ribbon does it need? Explain and keep the units.

Accepted answer: 24 centimetres of plain ribbon. Fifteen is three groups of five centimetres striped, so three groups of eight centimetres plain are needed.

Also accept: A ratio table or scaling both lengths by three is valid.

Reasoning to notice: This transfers to lengths; a correct number with reversed labels does not fully interpret the relationship.

Response question 1

Prompt: A model uses 2 triangle counters for every 3 circle counters. Sketch three complete groups. Count both totals. Does 6 triangles with 7 circles meet the rule? Explain.

Accepted answer: Three groups have 6 triangles and 9 circles. The 6-and-7 proposal is short of two circles.

Also accept: A labeled sketch, table, or repeated addition of complete 2:3 groups is valid. Physical counters are optional.

Reasoning to notice: Use when a learner applies a same-addend rule; verify the quantities were understood first.

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Response question 2

Prompt: A pattern uses 4 square tiles for every 7 round tiles. A larger pattern has 21 round tiles. Find the square tiles. Show the factor in both quantities and explain it in words.

Accepted answer: 12 square tiles. Twenty-one round tiles are three groups of seven, so three groups of four square tiles give twelve.

Also accept: A correctly labeled table, sketch, or division-then-multiplication argument is valid.

Reasoning to notice: Use when quantities are correct but the explanation is unclear; do not replace the explanation with a filled sentence alone.

Later question 1

Prompt: A print display uses 4 small prints for every 7 large prints. With 28 large prints, how many small prints keep the relationship? Explain starting with the large prints.

Accepted answer: 16 small prints. Twenty-eight large prints are four groups of seven; four groups of four small prints give sixteen.

Also accept: A labeled table or factor-of-four explanation is valid.

Reasoning to notice: This later task starts with the second quantity; it is fresh but not a calibrated equivalent form.

Later question 2

Prompt: A craft plan uses 15 metres of cord for every 20 metres of ribbon. A smaller version uses 6 metres of cord. How much ribbon keeps the relationship? Explain whether quantities must become larger to remain equivalent.

Accepted answer: 8 metres of ribbon. Multiply both quantities by 2/5, or divide both by 5 then multiply both by 2; equivalent ratios may use smaller quantities.

Also accept: A correctly labeled 6:8 comparison with a shared factor of 2/5 or a valid two-step scaling argument.

Reasoning to notice: This later task uses new quantities and a two-step factor after scaling-down teaching; it is not a calibrated equivalent test form.

Equivalent Ratios Answer Guidance

Later question 3

Prompt: A length plan uses 8 centimetres of blue cord for every 12 centimetres of white cord. A small version uses 3 centimetres of blue cord. How much white cord preserves the relationship? Show how both labeled quantities change and keep the units.

Accepted answer: 4.5 centimetres of white cord. Multiply 8 and 12 by 3/8, or divide both by 8 then multiply both by 3.

Also accept: 4 1/2 centimetres with a labeled ratio table or a valid sequence of common factors.

Reasoning to notice: Use after fractional-length teaching and another learning opportunity. New factors and context prevent treating this as an equivalent test form.

Extension question 1

Prompt: A pattern is built only from complete groups of 3 stars and 5 circles. Can it contain exactly 30 stickers with none left over? What about 32? Explain the whole-group rule.

Accepted answer: Each complete group has eight stickers. Thirty cannot be made from a whole number of these groups. Thirty-two is four groups: twelve stars and twenty circles.

Also accept: A count by eights or a whole-number division argument is valid; fractional stickers do not meet the complete-group rule.

Reasoning to notice: This is a boundary question for discrete complete groups, not another repetitive scaling item.

Equivalent Ratios Supplied Response Lessons

Response A Build complete matched groups

Visible signal: A response uses the same addend on both unequal quantities, after the learner has correctly named the quantities.

Teach: One complete group needs both parts. Sketch the first 2-triangle-and-3-circle group, then a second and third. Count each type. Which part is missing from the proposed 6-and-7 model?

New evidence: Look for a matching number of complete groups and an explanation that both parts change together.

Response B Explain the shared factor

Visible signal: The numerical quantities are correct, but the response does not reveal why they preserve the relationship.

Teach: Start with the quantity we know. How many groups of seven are in twenty-one? What must those same groups mean for the square tiles? Show this in a table, then explain it in your own words.

New evidence: Look for the factor connected to both labeled quantities, not a memorized number pair.

Later check decision

After Route A or B and further teaching, use Later question 1 for a second-quantity unknown and Later question 2 for scaling down. Use Later question 3 only after fractional-length instruction. Record labels, shared factors, arithmetic, units and explanation separately. If a response is still unclear, gather another explanation before assigning a route.

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Equivalent Ratios Boundaries and Access

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Partial connection to US CCSS 6.RP.A.1 and 6.RP.A.3a: labeled ratio language, equivalent-ratio tables and missing whole-number measurements. The fractional-length bridge extends this lesson beyond the whole-number measurements named in 6.RP.A.3a. No coordinate plotting, ratio-table comparison assessment, unit-rate lesson, or full-domain coverage.

These short responses provide narrow classroom evidence, not a diagnosis, calibrated assessment, or broad mastery score. Models and guided tasks are instruction. Later tasks use new demands and are not equivalent test forms. Record support and exposure; a correct immediate answer establishes neither retention nor a causal effect. Human mathematics review, classroom use, measured timing, Word/Google Docs compatibility and assistive-technology testing have not been completed for this edition.

Access options

Holding both quantities in working memory: Keep labels visible and sketch one complete group before making a table. Keep: Both parts must scale together and be explained. Limit: No change to the ratio target when the sketch is learner-created.

Transcribing a written explanation: Permit an oral or dictated explanation with a labeled sketch; record response mode. Keep: The explanation must connect both quantities. Limit: Does not show independent written mathematical communication.

Arithmetic load obscures reasoning: Allow a calculator after the group/factor is identified and record its use. Keep: The learner still chooses the relationship and labels quantities. Limit: The result cannot be used to infer unaided arithmetic accuracy.

Extension answer

Any positive multiple of 8 is possible under the complete-group restriction; a positive nonmultiple is impossible. Example: 40 = 15 stars + 25 circles works; 31 does not.

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Fictional teaching response — sound for the named task

Named task: Guided practice 1

Fictional response — sound for the named task: “9 stars need 15 circles. Nine stars make three groups of 3, so I need three groups of 5 circles.”

Visible evidence: The response labels both quantities and explains the same complete-group count for this whole-object task.

Not established: It does not establish scaling down, fractional lengths, retention or a response to a new independent task.

Clarify: How would you start if the number of circles were given instead?

Next teaching/evidence: Continue with the supplied question that starts with 20 circles; retain its teaching role.

These are invented examples, not learner observations or diagnoses. The same examples also appear in the optional browser preparation companion.

Model and guided practice

Independent check — reserve until after teaching

Later reassessment — save for later

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Fictional teaching response — plausible error

Named task: Guided practice 1

Fictional response — plausible error: “There are 11 circles. I added 6 to 3 to get 9, so I added 6 to 5 too.”

Visible evidence: The stated method uses the same addend on the two unequal starting counts.

Not established: One response does not establish a general difficulty. Quantity labels and task understanding still need clarification.

Clarify: What does one complete group contain? How many of those groups make 9 stars?

Next teaching/evidence: If the quantities are understood and the same-addend reasoning persists, use Response A’s supplied matched-group teaching, then Response question 1 on page 1.

These are invented examples, not learner observations or diagnoses. The same examples also appear in the optional browser preparation companion.

Response pack — choose one of the two response lessons

Independent check — reserve until after teaching

Later reassessment — save for later

Fictional teaching response — partially developed

Named task: Guided practice 1

Fictional response — partially developed: “15.”

Visible evidence: The number matches the requested circle count, but the response does not name the quantity or show a method.

Not established: It does not distinguish shared-factor reasoning, a remembered answer or another route to the number.

Clarify: What does 15 count? Show or explain how both counts change together.

Next teaching/evidence: If quantities are clear but the explanation remains unclear, use Response B’s supplied shared-factor teaching and Response question 2 on page 2. A clear explanation may instead justify continuing.

These are invented examples, not learner observations or diagnoses. The same examples also appear in the optional browser preparation companion.

Response pack — choose one of the two response lessons

Independent check — reserve until after teaching

Later reassessment — save for later