

Measurement Conversion Using Ratio Reasoning

Customary & Metric Stations

Grade 6 | CCSS 6.RP.A.3d

- 5 Station Cards — Customary Length, Capacity & Weight, Metric Length, Metric Mass & Capacity, Mixed
- Student Recording Sheets — structured ratio-table format for every station
- Conversion Reference Sheet — all customary & metric conversion ratios in one place
- Complete Answer Key — fully worked ratio setups and scaling steps
- CCSS Alignment Chart — detailed standard mapping for every station
- 3 Exit Tickets — quick formative assessments for customary, metric & mixed
- Teacher Guide — implementation options, pacing, differentiation & tips

Table of Contents

Teacher Guide

Implementation options, pacing, differentiation strategies, and teaching tips

Vocabulary Cards

7 key terms with detailed definitions for ratio reasoning

Conversion Reference Tables

Customary & metric conversion ratios with known ratios and scaled equivalents

Station 1 — Customary Length

8 problems + challenge: feet, inches, yards, miles

Station 2 — Customary Capacity & Weight

8 problems + challenge: gallons, quarts, pints, cups, ounces, pounds, tons

Station 3 — Metric Length

8 problems + challenge: kilometers, meters, centimeters, millimeters

Station 4 — Metric Mass & Capacity

8 problems + challenge: kilograms, grams, milligrams, liters, milliliters

Station 5 — Mixed Customary-Metric

8 problems + challenge: combined customary & metric conversions

Student Recording Sheets

5 structured recording pages with ratio table columns

Answer Keys

Complete worked solutions with ratio setups, scaling steps, and final answers

CCSS Alignment Chart

Standards mapping for every station and related standards

Exit Tickets

3 quick assessments: Customary, Metric, and Mixed conversions

Review Request

Thank you and TPT review request

Conversion Reference Tables

Each table below shows the **Known Ratio** (the foundational conversion fact) and the **Scaled Equivalents** (examples of equivalent ratios obtained by scaling). Students should use these as a starting point, then scale to match the quantity they need to convert.

Customary Length

Known Ratio	Scaled Equivalents
1 ft = 12 in	2 ft = 24 in, 3 ft = 36 in, 5 ft = 60 in, 10 ft = 120 in
1 yd = 3 ft	2 yd = 6 ft, 5 yd = 15 ft, 9 yd = 27 ft, 100 yd = 300 ft
1 yd = 36 in	2 yd = 72 in, 5 yd = 180 in, 10 yd = 360 in
1 mi = 5,280 ft	2 mi = 10,560 ft, 3 mi = 15,840 ft, 5 mi = 26,400 ft
1 mi = 1,760 yd	2 mi = 3,520 yd, 3 mi = 5,280 yd, 0.5 mi = 880 yd

Customary Capacity

Known Ratio	Scaled Equivalents
1 gal = 4 qt	2 gal = 8 qt, 3 gal = 12 qt, 5 gal = 20 qt
1 qt = 2 pt	2 qt = 4 pt, 5 qt = 10 pt, 10 qt = 20 pt
1 pt = 2 c	2 pt = 4 c, 3 pt = 6 c, 7 pt = 14 c
1 c = 8 fl oz	2 c = 16 fl oz, 3 c = 24 fl oz, 6 c = 48 fl oz
1 gal = 128 fl oz	2 gal = 256 fl oz, 0.5 gal = 64 fl oz

Customary Weight

Known Ratio	Scaled Equivalents
1 lb = 16 oz	2 lb = 32 oz, 3 lb = 48 oz, 5 lb = 80 oz, 10 lb = 160 oz
1 ton = 2,000 lb	2 ton = 4,000 lb, 2.5 ton = 5,000 lb, 0.5 ton = 1,000 lb

Metric Length

Known Ratio	Scaled Equivalents
1 km = 1,000 m	2 km = 2,000 m, 5 km = 5,000 m, 0.05 km = 50 m
1 m = 100 cm	2 m = 200 cm, 3.2 m = 320 cm, 1.8 m = 180 cm
1 m = 1,000 mm	2 m = 2,000 mm, 0.75 m = 750 mm
1 cm = 10 mm	2 cm = 20 mm, 15 cm = 150 mm, 25 mm = 2.5 cm

Metric Mass

Known Ratio	Scaled Equivalents
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Station 1: Customary Length

Convert between inches, feet, yards, and miles using ratio reasoning

CCSS 6.RP.A.3d

Tip

Start with the known ratio (e.g., 1 ft / 12 in). Set up the equivalent ratio with your unknown quantity, then scale by multiplying both terms by the same number. Example: To convert 3 ft to inches, scale 1/12 by 3 $\rightarrow$ 3/36, so 3 ft = 36 in.

Problems

- 1 Convert 5 ft to inches.
- 2 Convert 4 ft to inches.
- 3 Convert 9 yd to feet.
- 4 Convert 100 yd to feet.
- 5 Convert 2 mi to feet.
- 6 Convert 3 mi to yards.
- 7 Convert 72 in to feet.
- 8 Convert 15 ft to yards.

Challenge: Track Laps

A running track has laps that are $\frac{1}{4}$ mile each. If an athlete runs 8 laps, how many feet did they run? Set up your ratio: 1 mi / 5,280 ft. First find total miles: $8 \times \frac{1}{4} = 2$ mi. Then convert: 1 mi / 5,280 ft = 2 mi / x ft. Scale by 2: $x = 2 \times 5,280 = 10,560$ ft.

Student Recording Sheets

Use one recording sheet per station. Fill in each column to show your ratio reasoning.

Station 1: Customary Length

Name: _____

Date: _____

#	Known Ratio	Unknown Ratio	Scale Factor	Answer
1				
2				
3				
4				
5				
6				
7				
8				

Challenge

Ratio Equation: _____

Scaling Step: _____

Answer: _____

Answer Keys

Station 1: Customary Length

Problem 1: Convert 5 ft to inches.

Ratio Setup: $1 \text{ ft} / 12 \text{ in} = 5 \text{ ft} / x \text{ in}$

Scaling Step: Scale by 5: $5 \times 12 = 60$

Answer: 60 in

Problem 2: Convert 4 ft to inches.

Ratio Setup: $1 \text{ ft} / 12 \text{ in} = 4 \text{ ft} / x \text{ in}$

Scaling Step: Scale by 4: $4 \times 12 = 48$

Answer: 48 in

Problem 3: Convert 9 yd to feet.

Ratio Setup: $1 \text{ yd} / 3 \text{ ft} = 9 \text{ yd} / x \text{ ft}$

Scaling Step: Scale by 9: $9 \times 3 = 27$

Answer: 27 ft

Problem 4: Convert 100 yd to feet.

Ratio Setup: $1 \text{ yd} / 3 \text{ ft} = 100 \text{ yd} / x \text{ ft}$

Scaling Step: Scale by 100: $100 \times 3 = 300$

Answer: 300 ft

Problem 5: Convert 2 mi to feet.

Ratio Setup: $1 \text{ mi} / 5,280 \text{ ft} = 2 \text{ mi} / x \text{ ft}$

Scaling Step: Scale by 2: $2 \times 5,280 = 10,560$

Answer: 10,560 ft

Problem 6: Convert 3 mi to yards.

Ratio Setup: $1 \text{ mi} / 1,760 \text{ yd} = 3 \text{ mi} / x \text{ yd}$

Scaling Step: Scale by 3: $3 \times 1,760 = 5,280$

Answer: 5,280 yd

Problem 7: Convert 72 in to feet.

Ratio Setup: $12 \text{ in} / 1 \text{ ft} = 72 \text{ in} / x \text{ ft}$

Scaling Step: Scale by 6: $6 \times 1 = 6$

Answer: 6 ft

Problem 8: Convert 15 ft to yards.

Ratio Setup: $3 \text{ ft} / 1 \text{ yd} = 15 \text{ ft} / x \text{ yd}$

Scaling Step: Scale by 5: $15 \div 3 = 5$, so $5 \times 1 = 5$

Answer: 5 yd

Challenge:

A running track has laps that are $\frac{1}{4}$ mile each. If an athlete runs 8 laps, how many feet did they run? Set up your ratio: $1 \text{ mi} / 5,280 \text{ ft}$. First find total miles: $8 \times \frac{1}{4} = 2 \text{ mi}$. Then convert: $1 \text{ mi} / 5,280 \text{ ft} = 2 \text{ mi} / x \text{ ft}$. Scale by 2: $x = 2 \times 5,280 = 10,560 \text{ ft}$.

Exit Ticket 1: Customary Conversions

Name: _____

Date: _____

1. Convert 7 ft to inches. Show your ratio setup.

Ratio: _____

Answer: _____

2. Convert 3 qt to pints. Show your ratio setup.

Ratio: _____

Answer: _____

3. Convert 2 yd to inches. Show your ratio setup.

Ratio: _____

Answer: _____

Answer Key

1. $1 \text{ ft} / 12 \text{ in} = 7 \text{ ft} / x \text{ in}; x = 84 \text{ in}$

2. $1 \text{ qt} / 2 \text{ pt} = 3 \text{ qt} / x \text{ pt}; x = 6 \text{ pt}$

3. $1 \text{ yd} / 36 \text{ in} = 2 \text{ yd} / x \text{ in}; x = 72 \text{ in}$

CCSS Alignment Chart

This resource primarily targets **CCSS 6.RP.A.3d**: Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. The table below shows how each station aligns with this standard and supporting standards.

Station	Primary Standard	Focus
1 — Customary Length	6.RP.A.3d	Ratio reasoning with customary length units
2 — Capacity & Weight	6.RP.A.3d	Ratio reasoning with customary capacity & weight
3 — Metric Length	6.RP.A.3d	Ratio reasoning with metric length units
4 — Metric Mass & Cap.	6.RP.A.3d	Ratio reasoning with metric mass & capacity
5 — Mixed	6.RP.A.3d	Ratio reasoning across both systems

Related Supporting Standards

Standard	Description	Connection
6.RP.A.1	Understand the concept of a ratio	Students use ratios to express unit conversions
6.RP.A.2	Understand unit rate a/b associated with ratio $a:b$	Conversion factors are unit rates (e.g., 12 in per 1 ft)
6.RP.A.3a	Make tables of equivalent ratios	Ratio tables on recording sheets organize equivalent conversions
6.RP.A.3b	Solve unit rate problems including unit pricing	Finding the scale factor is a unit rate problem

Ratio Table Workshop: Building Understanding Step by Step

Before beginning the stations, use this workshop to introduce or review the ratio-table method with your students. The workshop walks through the process of setting up and using a ratio table for measurement conversion, building from a simple example to a more complex one. Complete this workshop as a whole-class activity before students begin working independently at the stations.

Workshop Example 1: Converting Feet to Inches

Suppose we need to convert 4 feet to inches. We know that 1 foot equals 12 inches. This known relationship is our **conversion ratio**: 12 inches per 1 foot, or written as a ratio, 12 in / 1 ft. To find how many inches are in 4 feet, we set up an equivalent ratio with the unknown value. The ratio equation is: 12 in / 1 ft = x in / 4 ft. Since we scale from 1 foot to 4 feet (a factor of 4), we multiply both terms by 4: $12 \times 4 = 48$. Therefore, 4 feet = 48 inches. Notice that every row in the ratio table represents an equivalent ratio, and the scaling factor tells us how to get from the known ratio to the desired conversion.

Feet	Inches	Scaling
1	12	x 1 (known ratio)
2	24	x 2
3	36	x 3
4	48	x 4 (our answer)

Workshop Example 2: Converting Meters to Centimeters (Metric)

Now let us apply the exact same method to a metric conversion. We need to convert 2.5 meters to centimeters. The conversion ratio is 100 cm / 1 m. We set up the ratio equation: 100 cm / 1 m = x cm / 2.5 m. The scaling factor is 2.5 (we go from 1 meter to 2.5 meters), so we multiply both terms by 2.5: $100 \times 2.5 = 250$. Therefore, 2.5 meters = 250 centimeters. The key insight is that metric conversions use the same ratio-reasoning structure as customary conversions. The only difference is the conversion factor (100 for meters to centimeters, versus 12 for feet to inches). Students who understand this will not need separate rules for customary and metric; one method works for both.

Meters	Centimeters	Scaling
1	100	x 1 (known ratio)
2	200	x 2
2.5	250	x 2.5 (our answer)

Key Insight: The Decimal Shortcut Comes From Ratio Reasoning

Notice that the answer to $100 \times 2.5 = 250$ is the same result you would get by 'moving the decimal two places to the right.' This is NOT a coincidence! The decimal-point shortcut works BECAUSE the ratio equation produces this result every time. Ratio reasoning is the mathematical justification for the shortcut, and understanding the ratio method means you will never forget which direction to move the decimal because the equation tells you what to do.

WHAT'S INSIDE

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CORE STATION PRACTICE

- 5 station cards covering customary length; customary capacity & weight; metric length; metric mass & capacity; and mixed conversions.
- 40 station problems total - 8 problems in each station - plus 5 station challenge problems.
- Ratio-table method throughout: known ratio, equivalent/unknown ratio, scale factor, and answer.

STUDENT-FACING TOOLS

- 5 structured recording sheets, one for each station, with space to show ratio reasoning.
- Conversion reference tables for customary and metric units with known ratios and scaled equivalents.
- 5 exit tickets: Customary, Metric, Mixed, Ratio Table Check, and Real-World Application.

TEACHER SUPPORT

- Teacher Guide with station rotation, homework-packet, and substitute-plan implementation options.
- General teaching tips, differentiation strategies, formative-assessment routines, and Standards for Mathematical Practice connections.
- Vocabulary cards covering 7 key ratio-reasoning terms.

EXPLICIT INSTRUCTION & PRACTICE

- Ratio Table Workshop with worked customary and metric examples.
- Extended worked answer keys and visual ratio-table solutions for the station problems.
- Additional practice, error analysis, number-talk prompts, daily warm-ups, and real-world application practice.

ADDITIONAL ACTIVITIES

- I Have / Who Has game cards and a Conversion Riddle Activity.
- Cooperative-learning structures, anchor-chart examples, and technology-integration ideas.
- Math journal prompts and opportunities to explain ratio reasoning in words as well as equations.

ASSESSMENT & PLANNING MATERIALS

- Student Assessment Checklist for tracking station performance, ratio setup, scale factor, exit-ticket results, and proficiency level.
- Standards-based rubric and student self-assessment materials.
- Project Extension: students design their own real-world measurement-conversion problem and solution.
- Family/parent letter, station-rotation signs, pacing guidance, and teacher preparation checklist.

RESOURCE REFERENCE MATERIALS

- Quick-reference cards - one per station - with the key conversion ratios in ratio-equation format.
- Coverage of customary and metric conversion relationships used throughout the resource.
- Credits, acknowledgments, and general terms of use.

78 PAGES | PRINT-READY | UM PRINTABLES

A complete ratio-reasoning measurement conversion resource for Grade 6