

Chapter 12 — Comparing Rates and Best Buys — Teacher Guide

Chapter at a glance

Lesson duration	4 lessons, 45–65 minutes each (see pacing table below)
Materials	Package cards, price cards, 100 mL and 100 g strips, litre and kilogram conversion cards, double number lines, unit-price grids, decision sentence frames, the three chapter diagrams
Launch question	“Store A: 4 notebooks for \$20. Store B: 6 notebooks for \$24. Which is the better deal?”
Key representation	The comparison table with both unit rates side by side — keep one visible throughout instruction
Anticipated responses	Correct: converts both options to the same unit before comparing. Partial: calculates one unit rate correctly but compares it against a total instead of the other unit rate. Incorrect: picks the option with the lower total price or the larger package without calculating anything.
If the readiness check fails	Reteach unit rates from Chapter 11 before starting the Launch; do not skip the equal-unit-groups step
Talk prompt	“What one unit could both options share?”
Exit ticket	5 items — compare two deals, convert and compare volumes, compare speeds, separate value from practical choice, state the comparison routine (see Section 13)
Reteach / extend	Reteach: same-package-type comparisons only (no unit conversion), with physical strips. Extend: fractional unit rates, minute-to-hour conversions, equal-value cases.

Purpose and pacing

Chapter 12 is the transition from finding rates to using rates as evidence for decisions. The mathematical goal is fairness: no comparison is valid until the unit is shared.

Lesson	Focus	Suggested time
Lesson 1	Readiness, launch, and equal-package best buys	45–60 minutes

Lesson	Focus	Suggested time
Lesson 2	Common units, metric conversions, and comparison tables	50–65 minutes
Lesson 3	Speed, wages, printer rates, and misconception repair	45–60 minutes
Lesson 4	Practical choice, mixed application, Tripwire, and Exit Ticket	50–65 minutes

Materials

Prepare package cards, price cards, 100 mL and 100 g strips, litre and kilogram conversion cards, double number lines, unit-price grids, and decision sentence frames.

Teacher launch guidance

Use the notebook example because it creates an intentional conflict between total price and unit price. Ask students to defend an initial prediction before calculating. The purpose is to make the need for normalization visible.

For volume and mass, insist on the conversion before division. Students should write $1 \text{ L} = 1,000 \text{ mL}$ and choose a common unit such as 100 mL. The choice of common unit is strategic: it should make the comparison understandable and the calculations manageable.

For practical choice, separate the mathematical and personal decisions. The teacher should not present the larger package as automatically preferable or treat the lowest unit price as the only legitimate life decision.

Teacher prompts

Purpose	Prompt
Choose a common unit	“What one unit could both options share?”
Compare package value	“What is the cost for one of the same item?”
Convert measurements	“What conversion equation connects these units?”
Compare speed	“How far does each travel in one hour?”
Compare wages	“How much does each worker earn in one hour?”
Interpret value	“What does ‘better’ mean in this problem?”
Separate practicality	“What might make the mathematical value impractical?”
Check	“Are both unit rates expressed in exactly the same units?”

Differentiation

Students needing concrete support

Use package strips divided into equal unit boxes. Put the price above the strip and physically distribute the price among the boxes. For volume, place 100 mL labels on both bottles before calculating.

Students needing language support

Use the frames:

- “The common comparison unit is _____.”
- “Option A costs/is _____ per _____.”
- “Option B costs/is _____ per _____.”
- “Option _____ is better mathematical value because _____.”
- “A different practical choice might be reasonable because _____.”

Students ready to extend

Use fractional unit rates, unit conversions involving minutes and hours, equal-value cases, and comparisons in which the mathematically better package is not the practical choice.

Formative assessment

Record whether students select a common unit, convert accurately, calculate both unit rates, compare the correct direction, attach units, and distinguish value from practicality. A correct numerical answer with mismatched units should be marked developing.

Revision Support: Expected Ideas and Teacher Moves

Use this compact guide with the new Cumulative Connection and Strategy Studio tasks. Accept equivalent representations when the relationship, units, and reasoning are correct.

Cumulative Connection: Find the unit price of \$6 for 4 ounces. Compare two rates with different units by converting them. Explain why the lowest total price is not always the best buy. Estimate a reasonable unit price before calculating.

Strategy Studio guidance: Expected ideas: A = \$0.40/oz; B = \$0.37/oz, so B is cheaper; the fixed fee can make the low-rate option worse for small quantities but better for large quantities; the final task should mention quality, waste, durability, or another justified non-price factor. Reward assumptions that are stated.

Transfer Bridge Teacher Guidance

Use the four tasks to distinguish imitation from transfer. Ask students to name the relationship, keep units visible, compare representations, and explain or repair an error. Accept equivalent methods when the structure and interpretation are correct.

Expected guidance: Familiar: \$0.40/oz versus \$0.37/oz, so the 20-ounce package is cheaper per ounce. Altered: the fixed fee can make one option worse for small quantities and better for large quantities. Non-routine: a mathematically cheapest option may not be the practical choice if waste or quality differs. Repair: compare like units before comparing prices.

Record whether the difficulty is classification, representation, operation, computation, units, interpretation, or checking. Do not assign more routine practice until the source of the error is identified.

Discussion and evidence note

Ask students to name the relationship before calculating, compare at least two representations when appropriate, and revise an explanation after hearing another strategy. Record whether the difficulty is classification, representation, operation, computation, units, or checking.

Answer Key

Ready-to-Learn Check

1. It makes different packages or situations comparable.
2. \$5/notebook.
3. \$4/item.
4. 1,000 mL.
5. 60 km/h.
6. Package sizes differ, so compare price per kilogram.
7. Express all options in the same unit before deciding.

Worksheet A

1. **3 pens for \$6 at \$2/pen.** Likely wrong answer: 5 pens for \$15, reasoning that the larger package must be the better deal. Misconception: assuming more items automatically means better value. Next move: "what does one pen cost in each deal?"
2. **5 kg for \$15 at \$3/kg.** Likely wrong answer: 2 kg for \$8, reasoning that \$8 is a lower total price than \$15. Misconception: comparing totals instead of unit prices. Next move: "what does one kilogram cost in each package?"
3. **500 mL for \$2.50 at \$0. mL; 1 L for \$6 at \$0. mL, so 500 mL is better.** Likely wrong answer: compares \$2.50 and \$6.00 directly without converting to a common volume unit, or assumes the 1 L bottle must be better because it's

larger. Misconception: comparing incompatible units, or assuming larger is automatically better. Next move: "are both prices measured over the same volume?"

4. **120 km in 2 h is 60 km/h; 210 km in 3 h is 70 km/h, so the second is faster.** Likely wrong answer: picks 120 km as faster, reasoning that a smaller total distance or time must mean faster travel, without computing either rate. Misconception: comparing raw totals instead of unit rates. Next move: "how far does each car travel in exactly one hour?"
5. **Both are \$12/h.** Likely wrong answer: picks \$72 in 6 hours as the higher wage, reasoning that \$72 is a larger total than \$60. Misconception: comparing totals instead of unit rates. Next move: "how much does each worker earn in exactly one hour?"
6. **Different package sizes mean totals do not use a common unit.** Common flaw: says "the prices are different" without explaining that the package sizes differ too, which is what makes total price an unfair comparison. Next move: ask what would happen if both packages had the same size.
7. **Units as named in Questions 1-5.** Common flaw: gives correct numbers but omits the units, or attaches the wrong unit label. Next

move: ask “what does this number actually measure?”

8. **Example: “The 5 kg package is better value because it costs \$3/kg instead of \$4/kg.”** Common flaw: states which option is better without giving the unit rates that justify the claim. Next move: require the sentence to name both unit prices being compared.

Worksheet B

- 4 folders for \$10 is \$2.50/folder; 6 for \$13.50 is \$2.25/folder, so 6 folders.** Likely wrong answer: picks 4 folders for \$10, reasoning that \$10 is a lower total price. Misconception: comparing totals instead of unit prices. Next move: “what does one folder cost in each option?”
- 5 pencils for \$3.75 is \$0.75/pencil; 8 for \$5.60 is \$0.70/pencil, so 8 pencils.** Likely wrong answer: picks 5 pencils for \$3.75 because it’s the lower total price. Misconception: same as #1. Next move: same check.
- 250 g is \$1. g; 500 g is \$1. g, so 500 g.** Likely wrong answer: compares \$3.00 and \$5.50 directly without converting to a common mass unit. Misconception: comparing incompatible units. Next move: “are both prices measured over the same mass?”
- 750 mL is \$0. mL; 1 L is \$0. mL, so 1 L.** Likely wrong answer: compares \$3.75 and \$4.80 directly without converting to a common volume unit. Misconception: same as #3. Next move: same check.
- $360 \div 4 = 90$ km/h; $450 \div 6 = 75$ km/h, so the first is faster.** Likely wrong answer: picks 450 km as faster, reasoning that 450 is a larger

total distance. Misconception: comparing totals instead of unit rates. Next move: “how far does each vehicle travel in exactly one hour?”

- $\$84 \div 7 = \$12/\text{h}$; $\$105 \div 6 = \$17.50/\text{h}$, so the second wage is higher.** Likely wrong answer: picks \$105 as higher pay, reasoning that \$105 is a larger total than \$84, without checking the different hour counts. Misconception: same as #5. Next move: “how much does each worker earn in exactly one hour?”
- Size does not determine unit price or practical usefulness.** Common flaw: says “bigger isn’t always better” without explaining why — that the unit price must be calculated, not assumed. Next move: ask for an example where the smaller package actually has the better unit price.

8–10. **Answers vary but must use common units and justified comparisons.** Common flaw: creates a comparison but never states the unit rate for each option, only a conclusion. Next move: require both unit rates to be shown before the decision.

Worksheet C

- Store A: \$3.50/kg. Store B: \$3.20/kg. Store B is better value.** Likely wrong answer: picks Store A, reasoning that \$10.50 is a lower total price than \$16. Misconception: comparing totals instead of unit prices. Next move: “what does one kilogram cost at each store?”
- 750 mL: $\$2.70 \div 7.5 = \$0.36/\text{mL}$. 1.5 L: $\$5.10 \div 15 = \$0.34/\text{mL}$. The 1.5 L bottle is better.** Likely wrong answer: compares \$2.70 and \$5.10 directly without converting to a common volume unit. Misconception: comparing

incompatible units. Next move: "are both prices measured over the same volume?"

3. **Worker A: \$14/h. Worker B: \$15/h. Worker B earns more.**

Likely wrong answer: picks Worker A, reasoning that \$168 is a larger total than \$135, without checking the different hour counts.

Misconception: comparing totals instead of unit rates. Next move: "how much does each worker earn in exactly one hour?"

4. **Printer A: 35 pages/min. Printer B: 40 pages/min. Printer B is faster.**

Likely wrong answer: picks Printer A, reasoning that 420 pages is a larger total than 360 pages.

Misconception: comparing raw totals instead of unit rates. Next move: "how many pages does each printer make in exactly one minute?"

5. **The 6 kg bag is better value at \$2.75/kg; the 3 kg bag may be the practical choice because the family needs only 3 kg.**

Common flaw: gives only the mathematical value or only the practical choice, not both as separate statements. Next move: require both a "better value" sentence and a "better choice" sentence..

6. **$42 \div 3 = 14$ km/h; $60 \div 4 = 15$ km/h, so the second runner is faster.**

Likely wrong answer: picks the second runner as faster simply because 60 km is a larger total distance, without computing either rate. Misconception: comparing totals instead of unit rates. Next move: "how far does each runner travel in exactly one hour?"

7. **$1,200 \div 8 = 150$ parts/h; $1,050 \div 7 = 150$ parts/h, so equal.**
- Likely wrong answer: picks the first*

machine as faster since 1,200 is a larger total than 1,050, without computing either rate.

Misconception: same as #6. Next move: "how many parts does each machine make in exactly one hour?"

- 8–10. **Answers vary but must identify a common unit and justify the decision.**

Common flaw: creates a comparison but never states the unit rate for each option, only a conclusion. Next move: require both unit rates to be shown before the decision.

11. **Store B, at \$2.80/kg versus Store A's \$3/kg. The shopping time (3 hours) and the number of aisles (4) were not needed to find the price per kilogram.**

Likely wrong answer: works the 3 hours or 4 aisles into the calculation somehow. Misconception: assuming every number in a word problem must be used. Next move: "what does the question actually ask for? Which numbers answer that?"

12. **Answers vary; must describe two package options where one costs \$0.34 per 100 mL and the other \$0.36 per 100 mL, correctly identifying the lower price as the better value.**

Common flaw: creates a context but picks the higher price (\$0.36) as the better value, reversing the comparison. Next move: "is a lower price per 100 mL better or worse value?"

Extend Your Thinking

- 500 mL: \$0. mL. 1.5 L: \$0. mL. The 1.5 L package is better value.
- 250 g: \$0. g. 1 kg: \$0. g. The 1 kg package is better value.
- 60 km in 45 minutes is 80 km/h; the second is 75 km/h, so the first is faster.
- Printer A: 40 pages/min. Printer B: 42 pages/min. Printer B is faster.

5. Answers vary but must have different package sizes and \$2.50/kg.
6. Answers vary; acceptable reasons include waste, storage, freshness, budget today, or actual need.

Tripwire and Exit Ticket

Tripwire: both bottles cost \$0.40 per 100 mL, so equal mathematical value. Exit Ticket:

7 notebooks for \$28 at \$4/notebook versus 4 for \$20 at \$5/notebook, so 7 notebooks; 500 mL is \$0. mL and 1 L is \$0. mL, so 1 L; 240 km in 4 h is 60 km/h and 350 km in 5 h is 70 km/h, so the second;

the 5 kg package is better value but the 2 kg package may fit the need;

choose a common unit, calculate both unit rates, compare, and interpret.

