# Grade 6 Math · Lesson 1 — The Balanced Plate

*Ratios, unit rates and proportions · ages 10 to 13 · 45 minutes · the workbook, one screen, this page, a pencil and paper*

## At a Glance

- **The book:** 6th Grade Math Workbook: Real-World Problem Solving, Chapter 1 (The Nutritionist), by Dr. Gene A Constant.
- **Free tool:** Math Jeopardy (a quiz game show with a Grade 6 board), free, no login, plays in the browser: globalsovereignuniversity.org/math-jeopardy.
- **Ages and time:** Grade 6 · ages 10 to 13 · 45 minutes.
- **Prep (5 min):** read the Teaching Creed and have the workbook open to Chapter 1. Set out a measuring cup, a bowl and two kinds of dry food, such as oats and raisins.

## Why this lesson

A ratio is a rule that stays true as things grow or shrink. Children who learn ratios as two numbers with a colon forget them by Friday. Children who mix 2 cups of oats with 3 cups of milk, then double the batch and see that the taste does not change, keep the idea for life. Everything in Chapter 1, from unit prices to medicine doses, grows from that one rule.

## What the learner will be able to do

- Write a ratio three ways and simplify it.
- Find a unit rate and use it to pick the better buy.
- Solve a proportion by scaling or by cross-multiplying.
- Scale a recipe up or down.

# The 45-Minute Climb

*How to read this: the gold box in each step is your lesson, word for word. Run it as written. The notes beneath are optional support. "The group" means your family; "host" means you.*

## 1 · The Hook (5 min)

**"I mixed 2 scoops of oats with 3 scoops of raisins. Now I want a bowl four times as big that tastes exactly the same. How many scoops of each?"**

*Say it like this: Let your child measure it with real scoops if you can. When they say 8 and 12, ask why 2 to 3 and 8 to 12 are the same mix.*

## 2 · Work It Together (15 min)

**Open the workbook to the worked example A Three-Part Ratio and read it aloud: 40:60:20 shares a factor of 20, so it simplifies to 2:3:1. Then read Which Vitamins Cost Less? together: $15 ÷ 20 = $0.75 and $35 ÷ 50 = $0.70, so the bigger bottle is the better buy.**

*Bring a real receipt or grocery flyer if you have one, and find one unit price together. Then play one round of Math Jeopardy on the Grade 6 board.*

## 3 · The Talk (8 min)

**1. Why can you divide both numbers in a ratio by the same number? 2. Is the bigger package always the better buy? 3. What does the word per tell you?**

*You are not fishing for one right answer. You are listening for understanding:*

- Q1: Because the mix stays the same. 40:60 and 2:3 describe the same balance, just in smaller pieces.
- Q2: No. Compare the price for one unit. And it is only a better buy if you will use it all before it spoils.
- Q3: That it is a rate: how much for one of something, such as dollars per pound or miles per hour.

## 4 · Solo Climb (12 min)

**Five problems on your own, with your work shown.**
**1. A protein shake has 25 g protein and 35 g carbohydrates. Write the ratio of protein to carbohydrates in simplest form.**
**2. A box of 12 protein bars costs $36. What is the cost per bar?**
**3. 3 cups of flour make 24 cookies. How many cups of flour make 40 cookies?**
**4. Which is the better buy: 6 ounces of almonds for $4.50 or 10 ounces for $7.00?**
**5. A recipe feeds 6 people with 1.5 pounds of meat. How much meat feeds 10 people?**

*Why solo: a test, a job and real life ask you to work alone. Five problems rehearse exactly that. The answers are at the end of this plan.*

## Keep It Fresh (5 min, the next day)

**Two review problems from earlier chapters.**
**1. Simplify the ratio 48:64.**
**2. 3 apples cost $2.25. How much do 8 apples cost?**

*Ready to move on? Four of the five Solo Climb problems right, with work shown, means this skill is solid. If not, reread the worked examples together and try two more problems from the chapter before the next lesson. Short review of old skills keeps them from fading.*

### 5 · The Takeaway (5 min)

**"A ratio is a rule that stays true when the batch gets bigger. To compare prices, find the price for one." · Homework: At the store or in a flyer, find two sizes of the same product. Work out the unit price of each and decide which is the better buy.**

*The badge moment: finishing all five steps earns the Bronze ring of this lesson's badge, The Smart Shopper. Mark it on the Climber's Passport now; the homework is how Silver and Gold are earned during the week.*

### Common Mistakes to Watch For

- Flipping the order: protein to carbs is 2:3, not 3:2.
- Comparing total prices instead of unit prices.
- Setting up a proportion with the units in different places, such as cups/servings = servings/cups.

### The Teaching Creed

**You are not the expert; the book and the method are. Your job is to ask "how do you know?" one more time than feels natural, and to celebrate wrong answers out loud. In here, a wrong answer is where the lesson lives.**

GENO, GSU's free tutor, can explain any step a second way, any hour, in 83 languages, with no login: globalsovereignuniversity.org/free-tutor. A prompt for the host: Ask GENO: "My child thinks 6 ounces for $4.50 is cheaper than 10 ounces for $7.00 because $4.50 is less. Help them see unit price without giving the answer."

## Adapt It and Measure It

### Differentiation

- Struggling: use real scoops and cups for every problem before writing anything.
- Ahead: find three ratios on food labels at home and simplify each one.
- Large co-op: each team gets a recipe card and must scale it for the whole group.
- Reluctant: let the child plan and price one real family snack.

### Evidence of learning (no exam)

Look for three things. **Tried**: finished all five Solo Climb problems with work shown. **Noticed**: can name the mistake in Common Mistakes that they almost made. **Changed**: the next day, solves one new problem from the same chapter without help. Those three words are the whole rubric, and they match the badge tiers below.

## Gamify It — The Campus Climb

Every GSU lesson is one badge on the Climber's Passport, earned at four depths: Bronze, Silver, Gold and Platinum.

**LESSON 1 BADGE — The Smart Shopper · Bronze — The Climb: finished the 45-minute lesson, all five steps. · Silver — The Try: did the homework and explained it to the host. · Gold — The Proof: completed the chapter's Action Report in the workbook with every answer checked against the Answer Key. · Platinum — The Teacher: ran this lesson as host for someone else. The harvest of a teacher is teachers.**

## Answers for the Host

1. 5:7
2. $3 per bar
3. 5 cups
4. 10 ounces for $7.00 ($0.70 per ounce versus $0.75)
5. 2.5 pounds

**Keep It Fresh:** 1. 3:4 · 2. $6.00

Every answer above comes from the workbook's own Answer Key. The book behind this lesson: 6th Grade Math Workbook: Real-World Problem Solving, Chapter 1 (The Nutritionist).

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