Grade 6 Math · Lesson 4 — How Many Scoops?

Dividing fractions and mixed numbers · 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 4 (The Recipe Developer), by Dr. Gene A Constant.
- **Free tool:** Fraction Action (visual fractions, including dividing fractions), free, no login, plays in the browser: globalsovereignuniversity.org/fraction-action.
- **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 4. Set out a measuring jug, a ¼ cup, a ⅓ cup and some rice or water.

Why this lesson

"Keep, change, flip" is easy to memorize and easy to forget, because it seems like magic. Children who scoop ¼ cups into ¾ cup and count three scoops know what fraction division means: how many of these fit into that? Once they can see it, the rule is just a shortcut for counting scoops.

What the learner will be able to do

- Explain fraction division as "how many fit" or "how much in each share."
- Divide a fraction by a whole number.
- Divide a fraction by a fraction using the reciprocal.
- Divide mixed numbers and decide what a remainder means.

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)

"How many quarter-cup scoops of rice fill this jug to the three-quarter line? Guess first, then scoop."

Say it like this: Scoop together and count: 3. Write it as ¾ ÷ ¼ = 3. You just divided fractions.

2 · Work It Together (15 min)

Open the workbook to How Many Batches? and read it aloud: 5/6 ÷ 2/3 = 5/6 × 3/2 = 15/12 = 1¼. Then read Cutting a Roast: 3½ = 7/2, and 7/2 × 4/3 = 14/3 = 4⅔, so four full portions and part of another.

Ask after each one: is the answer a number of scoops, or an amount in each share? Then play one round of Fraction Action.

3 · The Talk (8 min)

1. Why does dividing by ¼ make an answer bigger than you started with? 2. What does the ⅔ in 4⅔ portions mean in the kitchen? 3. Why change 3½ to 7/2 before dividing?

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

- Q1: Because quarter cups are small, so many of them fit. Three of them fit into ¾ cup.
- Q2: You get four full portions and two-thirds of another one, which may not be enough to serve.
- Q3: The flip-and-multiply rule only works on single fractions, so mixed numbers have to be rewritten first.

4 · Solo Climb (12 min)

Five problems on your own, with your work shown.
1. Find: ½ ÷ 4
2. A recipe uses 2/3 cup of honey for 4 servings. How much honey per serving?
3. A recipe needs ¾ cup of oil. Each batch of dressing uses 1/8 cup. How many batches can you make?
4. A recipe uses 2¼ cups of flour in all. Each batch uses ¾ cup. How many batches is that?
5. A chef has 5½ pounds of potatoes. Each dish uses ¾ pound. How many full dishes can she make?

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. Find the volume: 2.5 m × 4 m × 3 m.
2. Solve: 4/7 = x/35

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)

“Dividing fractions asks how many fit. Flip the second fraction and multiply, and check that the answer makes sense in the kitchen.” · Homework: Cook or bake one recipe at home at half size or double size. Write the new amount of every ingredient first.

The badge moment: finishing all five steps earns the Bronze ring of this lesson’s badge, The Test Kitchen Chef. 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 first fraction instead of the second.
- Dividing mixed numbers without changing them to improper fractions.

- Reporting 7⅓ dishes when the question asks for full dishes.

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 did ¾ ÷ ¼ and got 3/16. Help them find the mistake with measuring cups, without giving the answer."

Adapt It and Measure It

Differentiation

- Struggling: scoop every problem with real cups before writing it down.
- Ahead: write a word problem whose answer is exactly 2½ batches.
- Large co-op: teams race to scale one recipe for the whole group, with the math shown.
- Reluctant: let the child choose a favorite recipe to scale.

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 4 BADGE — The Test Kitchen Chef · 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. 1/8
2. 1/6 cup
3. 6 batches
4. 3 batches
5. 7 full dishes (5½ ÷ ¾ = 7⅓)

Keep It Fresh: 1. 30 cubic meters · 2. x = 20

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 4 (The Recipe Developer).

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