

# Fractions and Decimals in Everyday Problems

**Grade:** 5 **Subject:** Mathematics **Time:** ~45 min core + ~15 min extension **Work mode:** Independent · pencil + packet Math

## Start Here

This is a **paper math packet** about fractions and decimals. Work by yourself with a pencil. **A calculator is not required, but a basic calculator is allowed** if you have one. **Show your work** — write the steps you used, not just a final number. Everything you need is printed right here, including a worked example. If a question is hard, skip it, keep going, and come back. Box your final answers.

## Start Warm-Up 5 min

Bring back what you already know about decimals and fractions.

**1Compare two decimals.** Write  $<$ ,  $>$ , or  $=$  between these two numbers, then tell in one sentence how you knew:  
 $0.7 \square 0.68$ .

**2Name the fraction.** The bar below is cut into equal parts, and some parts are shaded. Write the fraction of the whole bar that is **shaded**.



Figure 1. A bar cut into equal parts, with some parts shaded.

## Build Study the Math 5–10 min

**What you need to know**

**Comparing decimals (to thousandths).** Line up numbers by **place value**, not by how many digits they have. Compare left to right: **tenths**, then **hundredths**, then **thousandths**. It helps to add zeros so both numbers have the same number of decimal places. Example: to compare 0.7 and 0.68, write 0.7 as **0.70**. Now 0.70 vs 0.68 → 7 tenths beats 6 tenths, so **0.70 > 0.68**.

**Adding & subtracting fractions with unlike denominators.** You can only add or subtract fractions when the parts are the **same size** — that means the same denominator (the bottom number). Steps:

1. Find a **common denominator** (a number both bottoms divide into). Multiplying the two bottoms always works.
2. Rename each fraction as an **equal fraction** with that common bottom (multiply the top and bottom by the same number).
3. Add or subtract only the **tops** (numerators). Keep the common bottom.

$$1/2 + 1/4 \rightarrow 2/4 + 1/4 = 3/4$$

**Connecting a fraction to its decimal.** A fraction is a division: the top divided by the bottom. If you can rename a fraction with a bottom of 10, 100, or 1000, you can read the decimal straight off. Examples:  $1/2 = 5/10 = 0.5$ , and  $3/4 = 75/100 = 0.75$ .

Watch out:  $1/2$  is **0.5**, not 0.2. And when comparing decimals, 0.7 is bigger than 0.68 even though 0.68 has more digits.

### Worked Example — adding fractions with unlike denominators

Add  $1/2 + 1/3$ . The bottoms are different (2 and 3), so the parts are different sizes. First find a common bottom.

**Step 1 — common denominator:**  $2 \times 3 = 6$ . Sixths work for both.

**Step 2 — rename each fraction:**  $1/2 = 3/6$  (multiply top and bottom by 3), and  $1/3 = 2/6$  (multiply top and bottom by 2).

**Step 3 — add the tops:**  $3/6 + 2/6 = 5/6$ . The picture below shows why: three sixths plus two sixths fills five of the six equal parts.

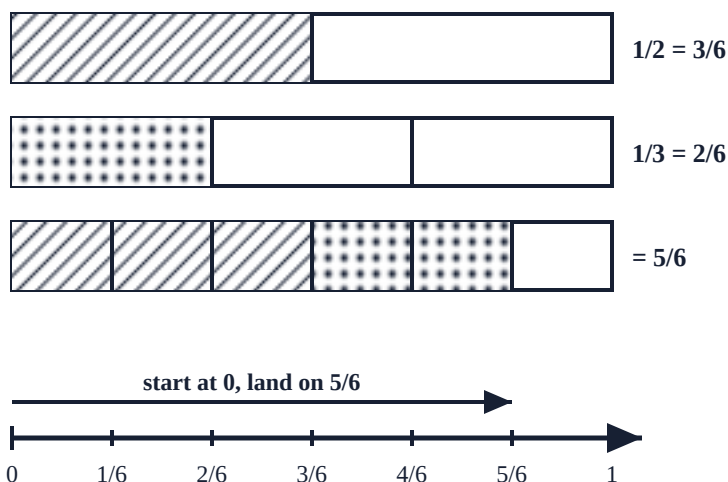


Figure 2. An area model and number line for  $1/2 + 1/3$ . Renaming both fractions into **sixths** ( $3/6$  and  $2/6$ ) makes the parts the same size, so they add to  $5/6$ . The diagonal pattern shows the half; the dotted pattern shows the third. Drawn in black so it reads clearly in grayscale.

3Using the worked example as your guide, add  $\frac{1}{2} + \frac{1}{4}$ . Rename to a common denominator first, then add the tops. Show each step.

## Apply Use What You Know 20–25 min

Show the steps you use in every item. A basic calculator is allowed.

4**Recipe (adding fractions)**. A snack recipe uses  $\frac{1}{2}$  cup of raisins and  $\frac{1}{3}$  cup of almonds. How many cups of raisins and almonds are there **in all**? Find a common denominator, rename, and add. Show your steps.

5**Money (decimals)**. Maya buys a notebook for \$3.45 and a pen for \$1.60.

5a. How much does she spend in all? Line up the decimal points and add.

5b. She pays with a \$10.00 bill. How much change does she get back? Show your subtraction.

6**Find and fix the error**. A student added two fractions this way. **Find the mistake, explain it, and give the correct answer** in the box.

**Student's work:**

$$\frac{1}{4} + \frac{1}{2} = (1 + 1) / (4 + 2) = \frac{2}{6}$$

**What is wrong, and what is the correct sum?**

**7Which operation? (multi-step).** A water bottle holds **2 liters**. José drinks **3/4 liter** in the morning and **1/2 liter** at lunch.

**7a.** How much has José drunk **in all**? Decide the operation, then find a common denominator and add. Show your steps.

**7b.** One tip for choosing the operation: "in all" usually means add; "how much is left" usually means subtract. In one sentence, tell which words in part 7a told you to add.

## Explain Justify Your Thinking 5–10 min

**Question 8.** In problem 6, a student wrote  $\frac{1}{4} + \frac{1}{2} = \frac{2}{6}$ . **Explain why you cannot just add the tops and add the bottoms.** Use the frame below: write your **Answer**, the **Numbers you used**, and **Why** your way is correct.

**Sentence starters you may use:** "The correct sum is \_\_\_\_ because..." · "First I found a common denominator by..." · "I renamed  $\frac{1}{4}$  as \_\_\_\_ and  $\frac{1}{2}$  as \_\_\_\_..." · "You cannot add the bottoms because the parts must be..."

Answer (the correct sum)

Numbers I used

Why my way is correct

## Close ACE Wrap-Up 5 min

Articulate

In your own words, explain what a **common denominator** is and why you need one to add fractions.

Connect

Point to one item in this packet where you found a common denominator. Give its number.

Extend

Write a fraction and its matching decimal that was **not** in this packet (for example, a fraction equal to a number of tenths or hundredths).

## Continue Early Finisher optional · ~15 min

If you finish early (no new materials needed):

**Draw your own model.** On the back of this page, add  $\frac{1}{3} + \frac{1}{6}$ . First find a common denominator, then **draw an area model or a number line** like Figure 2 to show the sum. Label the parts, and write the final answer as a fraction. If you can, also write it as a decimal.

Turn in: Hand in this whole packet with your name, class period, and date filled in. Make sure questions 1–8 and the ACE box are answered **with your work shown**. The early-finisher challenge is optional, but turn it in too if

you did it.