

Fractions and Decimals: Compare and Combine

Grade: 4 **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.

1. **A calculator is not required.** A basic calculator is allowed if you have one.
2. **Show your work.** Write the steps you used, not just a final number.
3. Everything you need is printed here, including a worked example.
4. If a question is hard, skip it, keep going, and come back.
5. **Box your final answers.**

Start Warm-Up 5 min

Bring back what you already know about fractions.

1**Name 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.

2**Which is bigger?** Circle the larger fraction, then finish the sentence: $\frac{3}{4}$ or $\frac{1}{4}$. (Both are cut into fourths — the same size parts.)

The bigger fraction is ____ because _____.

Build Study the Math 5–10 min

What you need to know

Equivalent fractions (equal fractions). Two fractions can name the same amount even when the numbers look different. If you cut each part into the same number of smaller pieces, the fraction stays equal. Multiply the **top and bottom by the same number**. Example: $\frac{1}{2} = \frac{2}{4}$ (multiply top and bottom by 2).

Comparing fractions with the same bottom. When two fractions have the **same denominator** (the same size parts), the one with the **bigger top number** is bigger. Example: $\frac{3}{4} > \frac{1}{4}$ because 3 shaded parts is more than 1 shaded part.

Adding and subtracting fractions with the same bottom. When the bottom numbers are the same, the parts are already the same size. So you **add or subtract only the tops** (numerators) and **keep the bottom the same**. Example: $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$, and $\frac{4}{6} - \frac{1}{6} = \frac{3}{6}$.

Fractions and decimals (tenths and hundredths). A fraction with a bottom of **10** is written as a decimal in the **tenths** place. A fraction with a bottom of **100** is written in the **hundredths** place. Examples: $\frac{3}{10} = 0.3$ and $\frac{3}{100} = 0.03$.

Watch out: to add fractions you add only the tops — you never add the bottoms. And **0.3** (three tenths) is much bigger than **0.03** (three hundredths).

Worked Example — adding fractions with the same bottom

1. Add $\frac{2}{6} + \frac{3}{6}$. The bottoms are the **same** (both sixths), so the parts are already the same size.
2. **Add the tops:** $2 + 3 = 5$.
3. **Keep the bottom the same:** the bottom stays 6. So $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$.

The picture below shows why: two sixths plus three sixths fills five of the six equal parts.

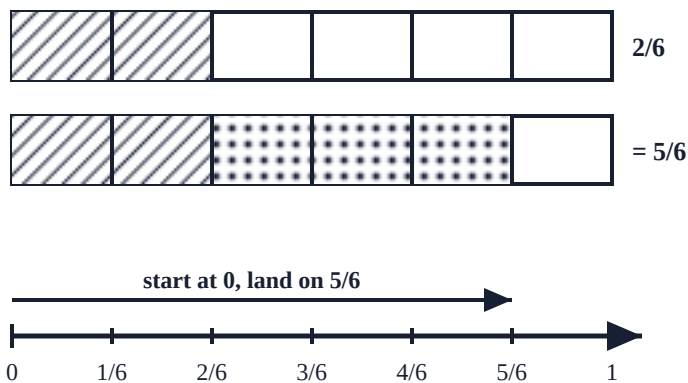


Figure 2. An area model and number line for $\frac{2}{6} + \frac{3}{6}$. The bottoms are the same, so you add only the tops ($2 + 3 = 5$) and keep the bottom (6), which gives $\frac{5}{6}$. The diagonal pattern shows the first fraction; the dotted pattern shows the second. Drawn in black so it reads clearly in grayscale.

3Using the worked example as your guide, add $\frac{1}{5} + \frac{3}{5}$. Add the tops and keep the bottom the same. Show each step.

4 Fill in the missing number to make an **equal fraction**: $\frac{1}{2} = \frac{?}{4}$. Explain how you knew.

Apply Use What You Know 20–25 min

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

5 **Compare two fractions.** Write $<$, $>$, or $=$ between these two numbers, then tell in one sentence how you knew: $\frac{2}{8} \square \frac{5}{8}$. (Both are eighths — the same size parts.)

6 **Ribbon (story problem).** Ana has a ribbon that is $\frac{7}{8}$ of a meter long. She cuts off $\frac{3}{8}$ of a meter to tie a gift. How much ribbon is **left**? The bottoms are the same, so subtract the tops and keep the bottom. Show your steps.

7 **Match the fraction to its decimal.** Draw a line from each fraction to the decimal that names the same amount.

Fraction Decimal

$\frac{3}{10}$ 0.7

$\frac{7}{10}$ 0.03

$\frac{3}{100}$ 0.3

On the lines, write each fraction next to the decimal that equals it.

8 **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:

$$\frac{2}{5} + \frac{1}{5} = (2 + 1) / (5 + 5) = \frac{3}{10}$$

What is wrong, and what is the correct sum?

Explain Justify Your Thinking 5–10 min

Question 9. In problem 8, a student wrote $\frac{2}{5} + \frac{1}{5} = \frac{3}{10}$. **Explain why you keep the bottom the same when the bottoms are equal.** Use the frame below: write your **Answer**, the **Model or numbers** you used, and **Why** your way is correct.

Sentence starters you may use: "The correct sum is ____ because..." · "The bottoms are both ____, so the parts are the same..." · "I add only the tops: ____ + ____ = ____..." · "You cannot add the bottoms because that would change..."

Answer (the correct sum)

Model or numbers I used

Why my way is correct

Close ACE Wrap-Up 5 min

Articulate

In your own words, explain what happens to the **bottom number** when you add two fractions that already have the same bottom.

Connect

Point to one item in this packet where you **added or subtracted** fractions with the same bottom. Give its number.

Extend

Write a fraction and its matching decimal that was **not** in this packet (a number of tenths or hundredths, like $\frac{6}{10} = 0.6$).

Continue Early Finisher optional · ~15 min

If you finish early (no new materials needed):

Draw your own model. On the back of this page, show the fraction $\frac{4}{6}$. **Draw an area model or a number line** like Figure 2 to show it. Split your bar into 6 equal parts and shade 4 of them. Label the parts, and write the fraction under your picture.

Turn in: Hand in this whole packet with your name, class period, and date filled in. Make sure questions 1–9 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.

G04_MATH_FractionsDecimals_01 — Fractions and Decimals: Compare and Combine Student Packet