# Equivalent Fractions and Number Lines

Unit fractions, equivalent fractions, and comparing fractions with models and number lines

**IN THIS PACKET YOU WILL LEARN TO**

- ✓ Place a fraction on a number line between 0 and 1, and beyond 1
- ✓ Find equivalent fractions with models and by multiplying
- ✓ Simplify a fraction to lowest terms
- ✓ Compare two fractions with <, >, or =

Name _____

Teacher _____

Class _____

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Name _____ Date _____

# What a Fraction Means

ANSWER KEY LEARN

Read this page with your teacher or a partner, and look at each model before you read the steps next to it.

EQUAL PARTS OF A WHOLE



**This bar is cut into 4 equal parts, and 3 parts are shaded.**

1. The denominator tells how many equal parts make the whole, so the denominator is 4.
2. The numerator tells how many parts are shaded, so the numerator is 3.
3. The fraction is $\frac{3}{4}$.

**$\frac{3}{4}$ of the bar is shaded**

A POINT ON A NUMBER LINE

**A number line from 0 to 1 can be cut into equal parts too.**

1. Cut the distance from 0 to 1 into 4 equal parts.
2. Each hop is $\frac{1}{4}$.
3. Three hops from 0 land on $\frac{3}{4}$.

**$\frac{3}{4}$ is three hops of $\frac{1}{4}$ from 0**

WORDS TO KNOW

| | |
|---|---|
| **numerator** | The top number of a fraction. It tells how many parts you have. |
| **denominator** | The bottom number of a fraction. It tells how many equal parts make one whole. |
| **unit fraction** | A fraction with a numerator of 1, such as $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$. |
| **equivalent fractions** | Fractions that name the same amount, such as $\frac{1}{2}$ and $\frac{2}{4}$. |

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# Finding Equivalent Fractions

ANSWER KEY LEARN

Each box shows a way to find an equivalent fraction. Read the steps and try the two practice items at the bottom.

MULTIPLY TO FIND AN EQUIVALENT FRACTION

**Find a fraction equivalent to $\frac{1}{2}$ with a denominator of 8.**

1. Ask what you multiply 2 by to get 8, and the answer is 4.
2. Multiply the numerator by the same number: 1 × 4 = 4.
3. So $\frac{1}{2} = \frac{4}{8}$.

$\frac{1}{2} = \frac{4}{8}$

DIVIDE TO SIMPLIFY

**Simplify $\frac{6}{8}$.**

1. Find a number that divides both 6 and 8, and that number is 2.
2. Divide the numerator and the denominator by 2.
3. 6 ÷ 2 = 3 and 8 ÷ 2 = 4, so $\frac{6}{8} = \frac{3}{4}$.

$\frac{6}{8} = \frac{3}{4}$

**Try it**

1. $\frac{1}{3} =$ 3 /9

2. $\frac{8}{12} =$ 2 /3

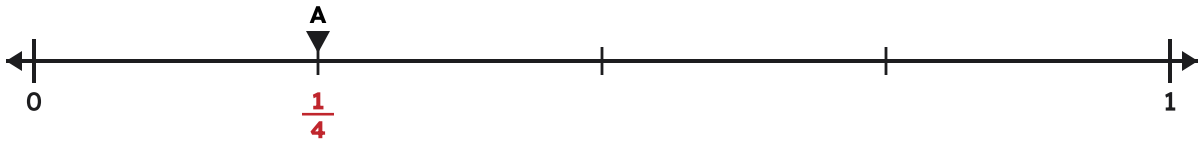
Name _____ Date _____

# Fractions on a Number Line

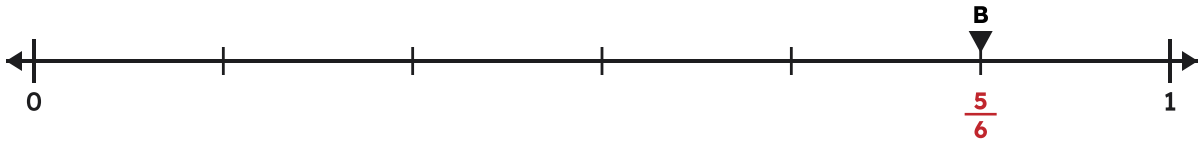
ANSWER KEY GUIDED PRACTICE

Look at each number line. Write the fraction for each marked point, or mark the point named in the question.

**1.** Point A is at which fraction?




**2.** Point B is at which fraction?




**3.** Mark $\frac{2}{3}$ on this number line.




**4.** Point A is $\frac{1}{4}$

**5.** Point B is $\frac{5}{6}$

Name _____ Date _____

# Equivalent Fractions Practice

ANSWER KEY PRACTICE ★

Write the missing number that makes each pair of fractions equivalent. Then simplify each fraction to lowest terms.

1. $\frac{1}{2} = \{\ \underline{2}\ /4\}$
2. $\frac{1}{3} = \{\ \underline{2}\ /6\}$
3. $\frac{2}{5} = \{\ \underline{4}\ /10\}$
4. $\frac{3}{4} = \{6/\ \underline{8}\ \}$
5. $\frac{2}{3} = \{8/\ \underline{12}\ \}$
6. $\frac{1}{4} = \{3/\ \underline{12}\ \}$
7. $\frac{5}{6} = \{\ \underline{10}\ /12\}$
8. $\frac{3}{5} = \{6/\ \underline{10}\ \}$
9. $\frac{1}{5} = \{\ \underline{3}\ /15\}$

**Simplify to lowest terms**

10. $\frac{4}{8} = \frac{1}{2}$
11. $\frac{6}{9} = \frac{2}{3}$
12. $\frac{4}{6} = \frac{2}{3}$
13. $\frac{5}{10} = \frac{1}{2}$
14. $\frac{8}{12} = \frac{2}{3}$
15. $\frac{9}{12} = \frac{3}{4}$

Name _____ Date _____

# Compare Fractions

ANSWER KEY | PRACTICE ★★

Write <, >, or = between each pair. Use a benchmark such as one half, or write both fractions with the same denominator.

1. $\frac{1}{2}$ **>** $\frac{1}{3}$

2. $\frac{3}{4}$ **>** $\frac{2}{3}$

3. $\frac{2}{5}$ **<** $\frac{1}{2}$

4. $\frac{5}{8}$ **>** $\frac{1}{2}$

5. $\frac{3}{6}$ **=** $\frac{1}{2}$

6. $\frac{4}{5}$ **>** $\frac{3}{4}$

7. $\frac{2}{8}$ **=** $\frac{1}{4}$

8. $\frac{5}{6}$ **<** $\frac{7}{8}$

## Fractions greater than one

9. $\frac{5}{4}$ **=** $1\frac{1}{4}$

10. $\frac{7}{3}$ **>** $2$

11. $\frac{11}{6}$ **>** $1\frac{2}{3}$

12. $\frac{9}{4}$ **=** $2\frac{1}{4}$

**REMEMBER**

When two fractions have the same denominator, the one with the greater numerator is greater. When two fractions have the same numerator, the one with the smaller denominator is greater.

Name _____ Date _____

# Sort the Fractions

ANSWER KEY | CUT AND PASTE

Cut out the twelve fraction cards at the bottom of the page. Glue each card in the column that tells how it compares to $\frac{1}{2}$.

| Less than $\frac{1}{2}$ | Equal to $\frac{1}{2}$ | Greater than $\frac{1}{2}$ |
|---|---|---|
| $\frac{1}{3}$ | $\frac{2}{4}$ | $\frac{3}{4}$ |
| $\frac{2}{5}$ | $\frac{3}{6}$ | $\frac{2}{3}$ |
| $\frac{1}{4}$ | $\frac{4}{8}$ | $\frac{5}{8}$ |
| $\frac{3}{8}$ | $\frac{5}{10}$ | $\frac{4}{5}$ |

1. Look at the fractions greater than $\frac{1}{2}$. What do you notice about the numerator and the denominator?

**In each of those fractions the numerator is greater than half of the denominator.**

✂

| | | | |
|---|---|---|---|
| $\frac{2}{3}$ | $\frac{1}{4}$ | $\frac{4}{8}$ | $\frac{5}{10}$ |
| $\frac{3}{6}$ | $\frac{5}{8}$ | $\frac{3}{8}$ | $\frac{2}{5}$ |
| $\frac{3}{4}$ | $\frac{1}{3}$ | $\frac{4}{5}$ | $\frac{2}{4}$ |

Name _____ Date _____

# Match the Model to the Fraction

ANSWER KEY MATCH

Read each description on the left and find the fraction on the right that names it. Write the letter of the fraction on the line.

| MODEL | | FRACTION |
|---|---|---|
| **1.** A bar cut into 4 equal parts with 1 part shaded | **A** | **A** $\frac{1}{4}$ |
| **2.** A bar cut into 4 equal parts with 2 parts shaded | **D** | **B** $2\frac{1}{2}$ |
| **3.** A number line from 0 to 1 with a point 3 hops of $\frac{1}{8}$ from 0 | **H** | **C** 1 |
| **4.** A bar cut into 6 equal parts with 5 parts shaded | **F** | **D** $\frac{2}{4}$ |
| **5.** Two wholes and one more half of a third whole | **B** | **E** $\frac{5}{6}$ |
| **6.** A bar cut into 3 equal parts with every part shaded | **C** | **F** $\frac{5}{6}$ |
| **7.** A number line from 0 to 1 with a point at the fifth of six equal hops | **E** | **G** $\frac{6}{8}$ |
| **8.** A bar cut into 8 equal parts with 6 parts shaded | **G** | **H** $\frac{3}{8}$ |

**9.** Name two equivalent fractions from the list above, and explain how you know they are equivalent.

**Sample answer: $\frac{2}{4}$ and $\frac{6}{8}$ are both equal to $\frac{1}{2}$, so they are equivalent to each other.**

Name _____ Date _____

# Mystery Picture

ANSWER KEY | COLOR BY FRACTION

Find the answer in each square, then color the square with the color from the key that matches that answer. When you finish, a picture will appear.

**Light blue**: The answer is 2 or $\frac{1}{3}$.

**Red**: The answer is 4 or $\frac{2}{3}$.

**Gray**: The answer is 3 or $\frac{1}{2}$.

**Orange**: The answer is 6 or $\frac{3}{4}$.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ | $\frac{1}{3} = \frac{\square}{6}$ | $\frac{4}{12}$ | $\frac{1}{2} = \frac{\square}{8}$ | $\frac{4}{6}$ | $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{3} = \frac{\square}{3}$ | $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ |
| $\frac{1}{3} = \frac{\square}{6}$ | $\frac{4}{12}$ | $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{5} = \frac{\square}{10}$ | $\frac{8}{12}$ | $\frac{2}{3} = \frac{\square}{6}$ | $\frac{1}{3} = \frac{\square}{12}$ | $\frac{2}{3} = \frac{\square}{3}$ | $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ |
| $\frac{1}{3} = \frac{\square}{6}$ | $\frac{4}{12}$ | $\frac{1}{2} = \frac{\square}{8}$ | $\frac{4}{6}$ | $\frac{2}{5} = \frac{\square}{10}$ | $\frac{8}{12}$ | $\frac{2}{3} = \frac{\square}{6}$ | $\frac{1}{3} = \frac{\square}{12}$ | $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{3} = \frac{\square}{3}$ |
| $\frac{1}{2} = \frac{\square}{4}$ | $\frac{1}{2} = \frac{\square}{8}$ | $\frac{4}{6}$ | $\frac{2}{5} = \frac{\square}{10}$ | $\frac{8}{12}$ | $\frac{2}{3} = \frac{\square}{6}$ | $\frac{1}{3} = \frac{\square}{12}$ | $\frac{1}{2} = \frac{\square}{8}$ | $\frac{4}{6}$ | $\frac{2}{6}$ |
| $\frac{1}{3} = \frac{\square}{6}$ | $\frac{4}{12}$ | $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{3} = \frac{\square}{3}$ | $\frac{1}{4} = \frac{\square}{12}$ | $\frac{4}{8}$ | $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ | $\frac{1}{3} = \frac{\square}{6}$ | $\frac{4}{12}$ |
| $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{3} = \frac{\square}{3}$ | $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ | $\frac{3}{6}$ | $\frac{1}{3} = \frac{\square}{9}$ | $\frac{1}{3} = \frac{\square}{6}$ | $\frac{4}{12}$ | $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{3} = \frac{\square}{3}$ |
| $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ | $\frac{1}{3} = \frac{\square}{6}$ | $\frac{2}{4}$ | $\frac{5}{10}$ | $\frac{1}{4} = \frac{\square}{12}$ | $\frac{4}{8}$ | $\frac{4}{12}$ | $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{3} = \frac{\square}{3}$ |
| $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ | $\frac{3}{6}$ | $\frac{1}{3} = \frac{\square}{9}$ | $\frac{2}{4}$ | $\frac{5}{10}$ | $\frac{1}{4} = \frac{\square}{12}$ | $\frac{4}{8}$ | $\frac{1}{3} = \frac{\square}{6}$ | $\frac{4}{12}$ |
| $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{3} = \frac{\square}{3}$ | $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ | $\frac{1}{2} = \frac{\square}{12}$ | $\frac{6}{8}$ | $\frac{1}{3} = \frac{\square}{6}$ | $\frac{4}{12}$ | $\frac{3}{6} = \frac{\square}{4}$ | $\frac{2}{3} = \frac{\square}{3}$ |
| $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ | $\frac{1}{3} = \frac{\square}{6}$ | $\frac{3}{4} = \frac{\square}{8}$ | $\frac{4}{12}$ | $\frac{3}{6} = \frac{\square}{4}$ | $\frac{9}{12}$ | $\frac{2}{3} = \frac{\square}{3}$ | $\frac{1}{2} = \frac{\square}{4}$ | $\frac{2}{6}$ |

Name _____ Date _____

# Fraction Riddle

ANSWER KEY RIDDLE

Find the missing number in each pair. Look it up in the code table and write the letter on the line with the same number to answer the riddle.

**What do you call two fractions that name the same amount?**

| E | Q | U | I | V | A | L | E | N | T |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

CODE TABLE

| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q | A | E | N | U | B | I | L | V | D | T | P |

1. $\frac{1}{2} = \frac{4}{8}$
2. $\frac{1}{3} = \frac{2}{6}$
3. $\frac{1}{2} = \frac{6}{12}$
4. $\frac{2}{3} = \frac{8}{12}$
5. $\frac{5}{6} = \frac{10}{12}$
6. $\frac{1}{4} = \frac{3}{12}$
7. $\frac{3}{4} = \frac{9}{12}$
8. $\frac{2}{5} = \frac{4}{10}$
9. $\frac{1}{2} = \frac{5}{10}$
10. $\frac{3}{4} = \frac{12}{16}$

Name _____ Date _____

# Fraction Word Problems

ANSWER KEY APPLY

Read each problem twice and show your work in the box. Write your answer with the label on the line.

**1.** A pizza is cut into 8 equal slices, and 4 slices are eaten. What fraction of the pizza is eaten, in lowest terms?

SHOW YOUR WORK

$\frac{4}{8} = \frac{1}{2}$

Answer: $\frac{1}{2}$

**2.** Maya walks $\frac{3}{4}$ of a mile and Theo walks $\frac{2}{3}$ of a mile. Who walks farther, and how do you know?

SHOW YOUR WORK

$\frac{3}{4} = \frac{9}{12}$ and $\frac{2}{3} = \frac{8}{12}$, so Maya walks farther

Answer: Maya

**3.** A ribbon is 1 yard long. Kia uses $\frac{2}{6}$ of the ribbon. What fraction of the ribbon is left, in lowest terms?

SHOW YOUR WORK

$1 - \frac{2}{6} = \frac{4}{6} = \frac{2}{3}$

Answer: $\frac{2}{3}$

**4.** A class reads $\frac{5}{8}$ of a chapter on Monday and the rest on Tuesday. What fraction do they read on Tuesday?

SHOW YOUR WORK

$1 - \frac{5}{8} = \frac{3}{8}$

Answer: $\frac{3}{8}$

Name _____ Date _____

# Find the Mistake

ANSWER KEY | ERROR ANALYSIS ★★

Each box shows work from a student who made a mistake. Read the work carefully, explain what went wrong, and then answer the question below it.

Sofia's work

I want a fraction equivalent to $\frac{2}{3}$.

I add 2 to the numerator and 2 to the denominator.

So I think $\frac{2}{3} = \frac{4}{5}$.

1. What mistake did Sofia make? Explain it in a complete sentence.

**Sofia added the same number to both parts, but equivalent fractions come from multiplying both parts by the same number. $\frac{2}{3} = \frac{4}{6}$ if you multiply by 2.**

2. Find a fraction equivalent to $\frac{2}{3}$ with a denominator of 12.

YOUR WORK

$\frac{8}{12}$

Leo's work

I compared $\frac{3}{8}$ and $\frac{1}{2}$.

3 is greater than 1, so $\frac{3}{8}$ is greater than $\frac{1}{2}$.

I wrote $\frac{3}{8} > \frac{1}{2}$.

3. What mistake did Leo make? Explain it in a complete sentence.

**Leo compared the numerators only. Half of 8 is 4, so $\frac{4}{8} = \frac{1}{2}$, and $\frac{3}{8}$ is less than $\frac{1}{2}$.**

4. Compare $\frac{5}{8}$ and $\frac{1}{2}$ using <, >, or =, and show how you know.

YOUR WORK

$\frac{5}{8} > \frac{1}{2}$ because $\frac{4}{8} = \frac{1}{2}$ and 5 > 4

Name _____ Date _____

# Explain Your Strategy

ANSWER KEY

WRITE ABOUT MATH

Answer each question in complete sentences. Use the sentence starters if they help, and use the words numerator and denominator in your writing.

1. How do you find a fraction equivalent to $\frac{3}{4}$ with a denominator of 12, and what is that fraction?

   I multiply the numerator and the denominator by _____, because _____. The equivalent fraction is _____.

   **I multiply the numerator and the denominator by 3, because 4 × 3 = 12. The equivalent fraction is $\frac{9}{12}$.**

DRAW TWO FRACTION BARS OR A NUMBER LINE THAT SHOWS YOUR EQUIVALENT PAIR

2. How can you tell that $\frac{2}{5}$ is less than $\frac{1}{2}$ without finding a common denominator?

   **Half of 5 is 2 and a half, so $\frac{2}{5}$ is less than half of the whole. That means $\frac{2}{5}$ is less than $\frac{1}{2}$.**

Name _____ Date _____

# Mixed Review

ANSWER KEY REVIEW

Solve each problem and check your work when you finish. Use any strategy from this packet that helps you.

1. $\frac{1}{2} = \{ \underline{5} /10\}$

2. $\frac{2}{3} = \{6/ \underline{9} \}$

3. $\frac{3}{5} = \{ \underline{9} /15\}$

**Simplify**

4. $\frac{6}{8} = \frac{3}{4}$

5. $\frac{9}{12} = \frac{3}{4}$

6. $\frac{4}{10} = \frac{2}{5}$

**Compare with <, >, or =**

7. $\frac{5}{8}$ > $\frac{1}{2}$

8. $\frac{3}{4}$ < $\frac{5}{6}$

9. A garden is planted in 6 equal rows, and 4 rows have carrots. What fraction of the garden has carrots, in lowest terms?

SHOW YOUR WORK

$\frac{4}{6} = \frac{2}{3}$

Answer: $\frac{2}{3}$

10. Jon drinks $\frac{3}{8}$ of a bottle of water and Lia drinks $\frac{1}{2}$ of a bottle. Who drinks more, and how do you know?

SHOW YOUR WORK

$\frac{1}{2} = \frac{4}{8}$, and $\frac{4}{8} > \frac{3}{8}$

Answer: Lia

Name _____ Date _____

# Exit Tickets

ANSWER KEY CHECK

Your teacher will cut this page on the dotted line so each student gets one ticket. Solve all four problems on your own and show your work.

## Fractions Exit Ticket

Name _____

1. $\frac{1}{3} = \{ \underline{3} /9\}$

2. $\frac{2}{5} \underline{<} \frac{1}{2}$

3. A pan of brownies is cut into 8 equal pieces, and 6 pieces are eaten. What fraction is eaten, in lowest terms?

SHOW YOUR WORK

$\frac{6}{8} = \frac{3}{4}$

Answer: $\frac{3}{4}$


## Fractions Exit Ticket

Name _____

1. $\frac{1}{3} = \{ \underline{3} /9\}$

2. $\frac{2}{5} \underline{<} \frac{1}{2}$

3. A pan of brownies is cut into 8 equal pieces, and 6 pieces are eaten. What fraction is eaten, in lowest terms?

SHOW YOUR WORK

$\frac{6}{8} = \frac{3}{4}$

Answer: $\frac{3}{4}$

Name _____ Date _____

# How Did I Do?

ANSWER KEY SELF-CHECK

Read each skill and put a check in the box that fits you best. Then answer the two questions at the bottom of the page.

| Skill | I can do this on my own. | I can do this with a little help. | I am still learning this. |
|---|---|---|---|
| I can place a fraction on a number line. | ☐ | ☐ | ☐ |
| I can find an equivalent fraction by multiplying. | ☐ | ☐ | ☐ |
| I can simplify a fraction to lowest terms. | ☐ | ☐ | ☐ |
| I can compare two fractions with <, >, or =. | ☐ | ☐ | ☐ |
| I can use one half as a benchmark when I compare. | ☐ | ☐ | ☐ |
| I can solve word problems that use fractions. | ☐ | ☐ | ☐ |

1. Which skill do you want to practice more, and why?

**Answers will vary. Look for a specific skill and a reason.**

2. Which strategy from this packet helps you the most? Show how it works with one pair of fractions.

**Answers will vary. Look for multiplying both parts, simplifying, or comparing to one half.**