

Numerator and denominator: which is which, and what each means

[] NUMERATOR: the top number. It COUNTS how many parts you have

[] DENOMINATOR: the bottom number. It says how many equal parts make the whole, and so NAMES the part: 2 halves, 3 thirds, 4 quarters, 10 tenths

[] In $\frac{3}{4}$: the whole is cut into 4 equal parts (quarters) and you have 3 of them. Say it aloud: three quarters, numerator then denominator

[] Remember: D is for Down; N is for North (nUmerator Up); de-NOMIN-ator names the part (like nominate)

[] The line is a division sign: $\frac{3}{4} = 3 \div 4 = 0.75$. The denominator can never be 0; the numerator can

Fraction	Numerator	Denominator	Meaning	Size
$\frac{1}{2}$	1	2	one of two equal parts	0.5
$\frac{1}{3}$	1	3	one of three	0.33
$\frac{1}{4}$	1	4	one of four	0.25
$\frac{3}{4}$	3	4	three of four	0.75
$\frac{4}{4}$	4	4	all four: one whole	1
$\frac{5}{4}$	5	4	five quarters: more than a whole	1.25

What changes what

[] Change the numerator, keep the denominator: more or fewer of the same-sized parts. $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$ grows

[] Change the denominator, keep the numerator: the parts change size. $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$ shrinks: a BIGGER denominator means SMALLER pieces

Type	Rule	Examples	Worth
Proper	numerator smaller than denominator	$\frac{3}{4}$, $\frac{5}{8}$, $\frac{2}{9}$	less than 1
Improper	numerator equal to or bigger	$\frac{4}{4}$, $\frac{7}{4}$, $\frac{11}{8}$	1 or more
Mixed number	whole number + proper fraction	$1\frac{3}{4}$, $\frac{23}{8}$	more than 1

[] Improper to mixed: divide; quotient = whole, remainder = new numerator, denominator stays. $\frac{11}{8} = 1 \text{ r } 3 = 1\frac{3}{8}$

[] Mixed to improper: whole x denominator + numerator, over the denominator. $2\frac{3}{8} = \frac{(16 + 3)}{8} = \frac{19}{8}$

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Equivalent fractions, comparing, the mistakes, and a practice set

[] Equivalent fractions: the same amount, different numbers. Multiply OR divide numerator AND denominator by the same number: $\frac{1}{2} = \frac{2}{4} = \frac{5}{10}$; $\frac{6}{8} \div \frac{2}{2} = \frac{3}{4}$ (simplifying). Both numbers, always

[] Same denominator: compare numerators ($\frac{5}{8} > \frac{3}{8}$). Same numerator: the SMALLER denominator is bigger ($\frac{1}{3} > \frac{1}{5}$; $\frac{3}{5} > \frac{3}{8}$). Neither the same: make denominators equal ($\frac{3}{5} = \frac{9}{15}$, $\frac{2}{3} = \frac{10}{15}$) or use $\frac{1}{2}$ as a benchmark

Mistakes

[] The words swapped

[] A bigger denominator taken as a bigger fraction

[] Tops added and bottoms added ($\frac{1}{2} + \frac{1}{2} = \frac{2}{4}$): you add the COUNTS of the same part: 1 half + 1 half = 2 halves = 1

[] An 'equivalent' fraction made by changing one number only

[] A denominator of 0

Curriculum	Where
Australia	Year 2 halves and quarters; Year 3 unit fractions, the two words; Year 4 equivalence; Year 5 compare and order; NAPLAN Years 3 and 5
England	Year 2-3 the terms; Year 4 equivalence; Year 5 improper and mixed; Year 6 simplify and operate
US	Grade 3 3.NF.1 meaning; Grade 4 equivalence, comparison, mixed numbers
CBSE	Class 3-4 introduced; Class 5 equivalent, like and unlike; Class 6 Fractions chapter

Practice

1. In $\frac{5}{9}$, which is the numerator and which the denominator? What does each tell you?
2. Write the fraction for seven tenths, and for two fifths.
3. Which is bigger, $\frac{1}{6}$ or $\frac{1}{8}$? Explain with the denominators.
4. Change $\frac{13}{5}$ to a mixed number, and $\frac{3}{5}$ to an improper fraction.
5. Write two fractions equivalent to $\frac{2}{3}$.
6. A cake is cut into 12 equal pieces and 7 are eaten. Fraction eaten? Fraction left? Why is the denominator the same in both?
7. Shade $\frac{5}{8}$ of a bar divided into 8 parts. How many parts are unshaded, and what fraction is that?
8. Which is bigger: $\frac{4}{7}$ or $\frac{4}{9}$? And $\frac{5}{11}$ or $\frac{7}{11}$?

Answers

1. Numerator 5: how many parts; denominator 9: the whole is in 9 equal parts (ninths). 2. $\frac{7}{10}$; $\frac{2}{5}$. 3. $\frac{1}{6}$: sixths are bigger pieces than eighths. 4. $\frac{23}{5}$; $\frac{11}{3}$. 5. $\frac{4}{6}$, $\frac{6}{9}$, $\frac{20}{30}$ (any two). 6. $\frac{7}{12}$; $\frac{5}{12}$; the same whole cut into 12 parts. 7. 3 parts; $\frac{3}{8}$. 8. $\frac{4}{7}$ (smaller denominator, same numerator); $\frac{7}{11}$ (same denominator, bigger numerator).