

Comparison

Compare the parts shaded in blue:

$$\frac{1}{2} < \frac{2}{3} < \frac{3}{4} < \frac{4}{5} < \frac{5}{6}$$

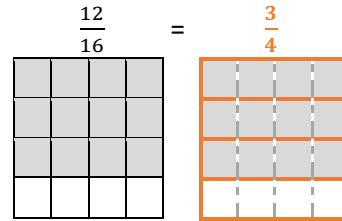


Compare the parts in white:

$$\frac{1}{2} > \frac{1}{3} > \frac{1}{4} > \frac{1}{5} > \frac{1}{6}$$

Why $\frac{3}{4} = \frac{12}{16}$?

Explanation (1): Shade the charts below.



Explanation (2): When the numerator and the denominator are multiplied by the same number, the value remains the same.

$$\frac{3}{4} = \frac{3 \times 4}{4 \times 4} = \frac{12}{16}$$

Basic Operations

Addition/Subtraction:

For fractions with the same denominator, do addition or subtraction on the numerator.

$$\frac{2}{10} + \frac{5}{10} = \frac{7}{10} \quad \frac{5}{9} - \frac{4}{9} = \frac{1}{9}$$

$$\frac{3}{4} + \frac{2}{4} = \frac{5}{4} = \frac{4+1}{4} = 1\frac{1}{4}$$

For fractions with different denominators, first, get them a common denominator.

$$\frac{1}{2} + \frac{1}{4} = \frac{1 \times 2}{2 \times 2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

$$3\frac{2}{3} + 1\frac{1}{9} = 3\frac{2 \times 3}{3 \times 3} + 1\frac{1}{9} = 3\frac{6}{9} + 1\frac{1}{9} = 4\frac{7}{9}$$

Multiplication:

Numerator times numerator, and denominator times denominator.

$$\frac{1}{3} \times \frac{5}{6} = \frac{1 \times 5}{3 \times 6} = \frac{5}{18}$$

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

Reciprocal:

The reciprocal of $\frac{1}{3}$ is 3.

The reciprocal of 5 is $\frac{1}{5}$.

Division = times the reciprocal of the divisor

$$1 \div \frac{1}{6} = 1 \times 6 = 6$$

$$12 \div \frac{1}{3} = 12 \times 3 = 36$$

$$\frac{1}{6} \div 4 = \frac{1}{6} \times \frac{1}{4} = \frac{1 \times 1}{6 \times 4} = \frac{1}{24}$$

$$\frac{5}{8} \div \frac{2}{3} = \frac{5}{8} \times \frac{3}{2} = \frac{5 \times 3}{8 \times 2} = \frac{15}{16}$$

Decimals & Fractions

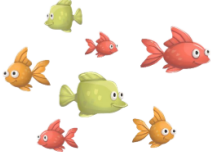

$$0.1 = \frac{1}{10} \quad 0.01 = \frac{1}{100} \quad 0.9 = \frac{9}{10} \quad 0.26 = \frac{26}{100}$$

Exercises

1. Put ">", "<", Or "=".

$$\frac{2}{3} \text{ — } \frac{4}{6} \quad \frac{2}{3} \text{ — } \frac{5}{6} \quad \frac{2}{3} \text{ — } \frac{1}{3} \quad \frac{1}{3} \text{ — } \frac{5}{6} \quad \frac{2}{3} \text{ — } \frac{10}{15} \quad \frac{2}{3} \text{ — } \frac{11}{15} \quad \frac{3}{4} \text{ — } \frac{7}{12}$$

2. The penguin nursery is open two times a day: $\frac{2}{3}$ hour at noon and $\frac{5}{12}$ hour in the afternoon. How much time is the penguin nursery open every day?

<p>3. Two kinds of fish can be found in a small tank that is 5 feet long. The blue fish is $\frac{2}{5}$ feet long and the orange fish is $\frac{7}{10}$ feet long. How much longer is the orange fish?</p> 	<p>4. The biggest zucchini from Joe's farm is $2\frac{5}{8}$ pounds, which is $1\frac{1}{4}$ pound more than the average weight of zucchinis from his farm. What is the average weight of zucchinis from his farm?</p>
<p>5. There was $\frac{5}{8}$ of a pie left in the fridge. Daniel ate $\frac{1}{4}$ of the leftover pie. How much of a pie did he have?</p>	<p>6. A baker is making croissants. He has 18 pounds of dough. Each croissant is made from $\frac{1}{8}$ pounds of dough. How many croissants can he make?</p>
<p>7. Grandma made an apple pie. Josh and his brother Joe finished $\frac{4}{5}$ of it. Then, three friends came over and shared the leftover pie. How much of the pie did each friend eat?</p>	<p>8. Olivia used $\frac{1}{2}$ pound of peppers and $\frac{1}{15}$ pound of cheese to make 3 pizzas. If she uses the same recipe to make 5 pizzas, how much cheese is needed?</p> 

Answer Keys:

- $\frac{2 \times 2}{3 \times 2} = \frac{4}{6}$ $\frac{2}{3} < \frac{5}{6}$ $\frac{2}{3} > \frac{1}{3}$ $\frac{1 \times 2}{3 \times 2} (= \frac{2}{6}) < \frac{5}{6}$ $\frac{2 \times 5}{3 \times 5} = \frac{10}{15}$ $\frac{2}{3} < \frac{11}{15}$ $\frac{3 \times 3}{4 \times 3} (= \frac{9}{12}) > \frac{7}{12}$
- $\frac{2}{3} + \frac{5}{12} = \frac{2 \times 4}{3 \times 4} + \frac{5}{12} = \frac{8}{12} + \frac{5}{12} = \frac{13}{12} = \frac{12+1}{12} = 1\frac{1}{12}$ The penguin nursery opens $1\frac{1}{12}$ hours
- $\frac{7}{10} - \frac{2}{5} = \frac{7}{10} - \frac{2 \times 2}{5 \times 2} = \frac{7}{10} - \frac{4}{10} = \frac{3}{10}$ The orange fish is $\frac{3}{10}$ feet longer than the blue fish.
- $2\frac{5}{8} - 1\frac{1}{4} = 2\frac{5}{8} - 1\frac{1 \times 2}{4 \times 2} = 2\frac{5}{8} - 1\frac{2}{8} = 1\frac{3}{8}$ The average weight of zucchinis from his farm is $1\frac{3}{8}$ pounds.
- $\frac{5}{8} \times \frac{1}{4} = \frac{5}{32}$ Daniel had $\frac{5}{32}$ of the pie.
- $18 \div \frac{1}{8} = 18 \times 8 = 144$ The baker can make 144 croissants.
- $(1 - \frac{4}{5}) \div 3 = (\frac{5}{5} - \frac{4}{5}) \div 3 = \frac{1}{5} \div 3 = \frac{1}{5} \times \frac{1}{3} = \frac{1}{15}$ Each friend ate $\frac{1}{15}$ of the pie.
- $\frac{1}{15} \div 3 \times 5 = \frac{1}{15} \times \frac{1}{3} \times 5 = \frac{1}{45} \times 5 = \frac{5}{45} = \frac{1 \times 5}{9 \times 5} = \frac{1}{9}$ $\frac{1}{9}$ pound of cheese is used to make 5 pizzas. " $\frac{1}{2}$ pound of peppers" is not used to solve this problem.