

Chapter 5: Multiplying and Dividing Fractions

CH 5.5 - Dividing proper and mixed fractions

Dividing proper fractions

Example

Method 1 - multiply by reciprocal

**** (STAY - CHANGE - FLIP) ****

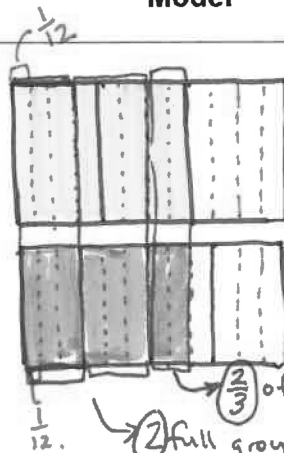
$$\frac{2}{3} \div \frac{1}{4}$$

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

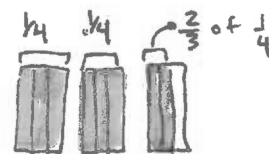
$$= \frac{8}{3}$$

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

Model



How many groups of $\frac{1}{4}$ can fit into $\frac{2}{3}$?



2 full groups of $\frac{1}{4}$ can fit

$$2\frac{2}{3}$$

Method 2 - divide using common denominator

$$\frac{1}{10} \div \frac{1}{5}$$

① Common denominator.

$$\frac{1}{10} \div \frac{2}{10}$$

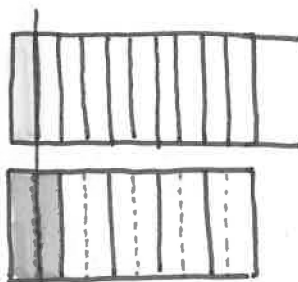
$$\frac{1}{10} \div \frac{2}{10} = \frac{1}{10} \div \frac{2}{10}$$

② Divide the numerators.

$$\frac{1}{10} \div \frac{2}{10} \rightarrow 1 \div 2 \rightarrow \boxed{\frac{1}{2}}$$

Why the "shortcut" works

$$\frac{1}{10} \div \frac{2}{10} \rightarrow \frac{1}{10} \times \frac{10}{2} = \frac{10 \div 10}{20 \div 10} = \frac{1}{2}$$



only $\frac{1}{2}$ of $\frac{1}{5}$ or $\frac{2}{10}$ can fit into $\frac{1}{10}$.

Dividing mixed numbers

Example

$$3\frac{1}{6} \div 1\frac{2}{3}$$

① Change to improper fractions.

$$3\frac{1}{6} = \frac{19}{6} \quad 1\frac{2}{3} = \frac{5}{3}$$

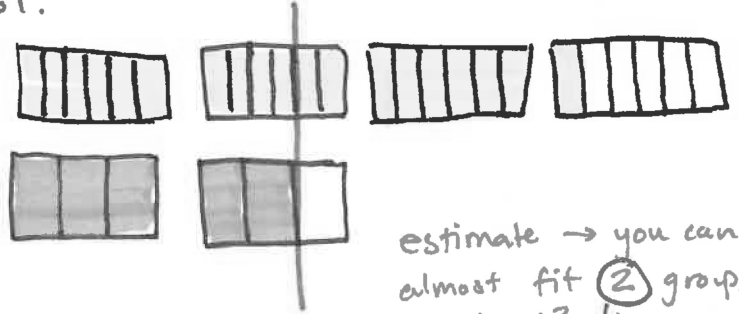
$$\frac{19}{6} \div \frac{5}{3}$$

② STAY, CHANGE, FLIP

$$\frac{19}{6} \times \frac{3}{5} = \frac{57}{30} \rightarrow 1\frac{27}{30} \rightarrow 1\frac{9}{10} \sim 2$$

Model

Models work best as an estimation tool.



estimate $\rightarrow$ you can almost fit 2 groups of $1\frac{2}{3}$ into $3\frac{1}{6}$.

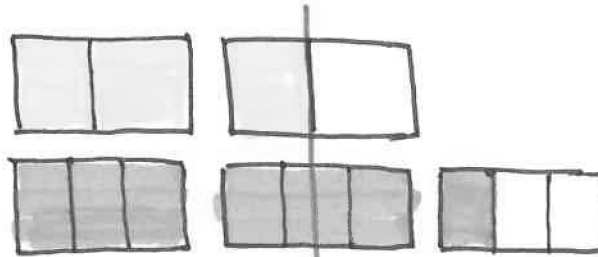
$$1\frac{1}{2} \div 2\frac{1}{3}$$

$\downarrow$

$$= \frac{3}{2} \div \frac{7}{3}$$

$$= \frac{3}{2} \times \frac{3}{7}$$

$$= \frac{9}{14} \sim \frac{1}{2}$$



$\hookrightarrow$ about $\frac{1}{2}$ of $2\frac{1}{3}$ can fit into $1\frac{1}{2}$.