

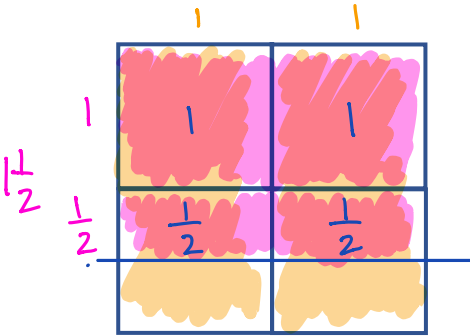
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| Learning Goal 2.2 | I can multiply and divide fractions. |
|--------------------------|--------------------------------------|

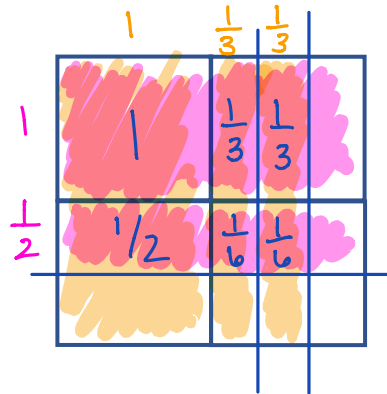
Example Use an **area model** to model the following products.

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



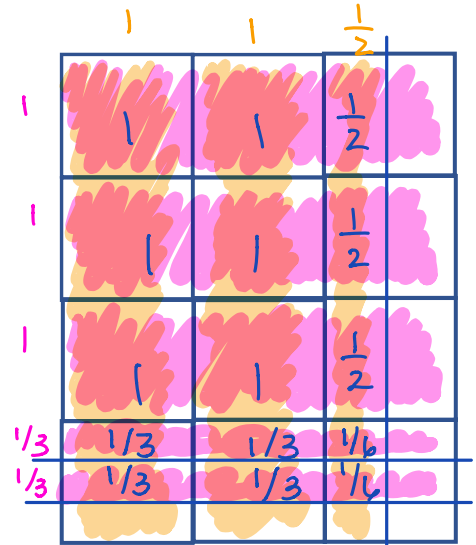
$$1\frac{1}{2} \times 2 = 2\frac{1}{2}$$

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



$$\begin{aligned} &1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{3} + \frac{1}{6} + \frac{1}{6} \\ &= 1 + \frac{1}{2} + \frac{2}{3} + \frac{2}{6} \\ &= 1 + \frac{1}{2} + \frac{3}{3} \\ &= 2 + \frac{1}{2} \\ &= 2\frac{1}{2} \end{aligned}$$

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



$$\begin{aligned} &= 6 + \frac{1}{2} + \frac{1}{3} + \frac{2}{6} \\ &= 6 + \frac{1}{2} + \frac{2}{3} \\ &= 6 + \frac{3}{6} + \frac{4}{6} \\ &= 8\frac{7}{6} \\ &= 9\frac{1}{6} \end{aligned}$$

$$\begin{aligned} &2\frac{1}{2} \times 3\frac{2}{3} \\ &= \frac{5}{2} \times \frac{11}{3} \\ &= \frac{55}{6} \end{aligned}$$

Multiplying Fractions Without using a Model

- change any mixed numbers to improper fractions.
- multiply the numerators together
- multiply the denominators together

Example Evaluate the following products. Write your answers in lowest terms.

a. $4\frac{1}{2} \times 2\frac{1}{3} = \frac{3\cancel{9}}{2} \times \frac{7}{\cancel{3}_1}$
 $= \frac{6\cancel{3} \div 3}{6 \div 3} = \frac{3}{2} \times \frac{7}{1}$
 $= \frac{21}{2}$

b. $1\frac{1}{14} \times 2\frac{1}{3} = \frac{1\cancel{5}}{14} \times \frac{7}{\cancel{3}_1}$
 $= \frac{10\cancel{5} \div 5}{42 \div 3} = \frac{2}{14 \div 7} = \frac{5}{2}$
 $= \frac{5}{2} \times \frac{7}{1}$
 $= \frac{5}{2} \times \frac{1}{1}$
 $= \frac{5}{2}$

c. $3\frac{1}{5} \times 3\frac{1}{8} = \frac{1\cancel{6}}{5} \times \frac{2\cancel{5}}{8}$
 $= \frac{1\cancel{6}^2}{1} \times \frac{5}{\cancel{8}_1}$
 $= \frac{2}{1} \times \frac{5}{1}$
 $= 10$

d. $1\frac{2}{3} \times 2\frac{1}{5} = \frac{1\cancel{8}}{3} \times \frac{1\cancel{5}}{5}$
 $= \frac{1}{3} \times \frac{11}{1}$
 $= \frac{11}{3}$

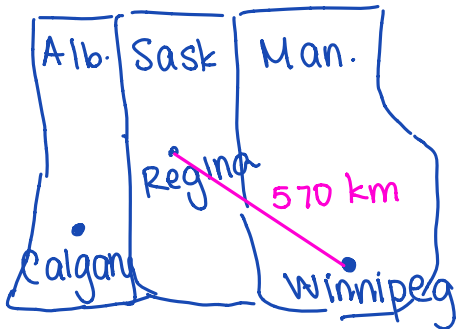
Example Calculate the number of hours in $3\frac{1}{2}$ days.

$3\frac{1}{2} \times 24$
 $= \frac{7}{2} \times \frac{2\cancel{4}^{12}}{1}$
 $= \frac{7}{1} \times \frac{12}{1}$
 $= 84$

OR ~~$24 \times 3\frac{1}{2}$~~

There are 84 hours in $3\frac{1}{2}$ days.

Example The driving distance from Winnipeg to Regina is 570 km. The driving distance from Winnipeg to Calgary is $2\frac{1}{3}$ times the driving distance from Winnipeg to Regina. What is the driving distance from Winnipeg to Calgary?



$2\frac{1}{3} \times 570$
 $= \frac{7}{3} \times \frac{\cancel{570}^{190}}{1}$
 $= \frac{7}{1} \times \frac{190}{1}$
 $= 1330$

~~$570 \times 2\frac{1}{3}$~~

The driving distance from Winnipeg to Calgary is 1330 km.