

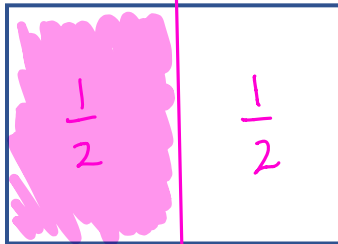
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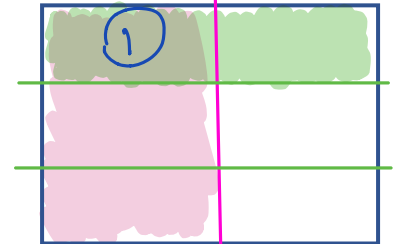
**Learning Goal 2.2** I can multiply and divide fractions.



1



$\frac{1}{2}$

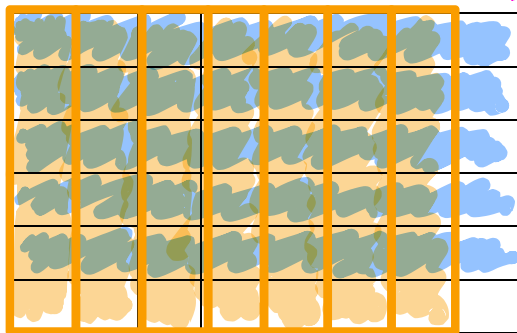


$$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

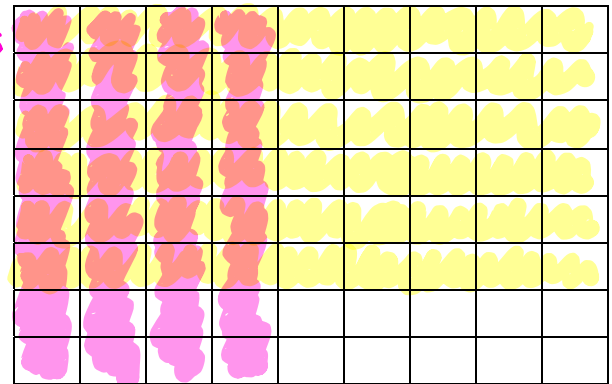
**Example** Model the following products.

$$\frac{7}{8} \times \frac{5}{6} = \frac{35}{48}$$

coloured both orange and blue  
total squares



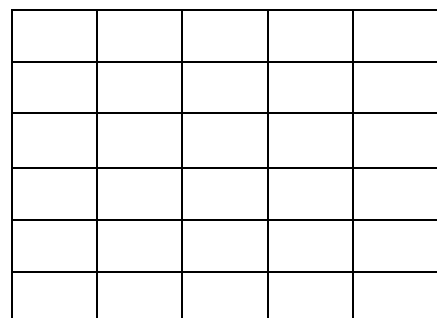
$$\frac{4}{9} \times \frac{6}{8} = \frac{24}{72} = \frac{1}{3}$$



$$\frac{4}{5} \times \frac{3}{4} = \frac{12}{20} = \frac{3}{5}$$



$$\frac{3}{5} \times \frac{5}{6} = \frac{15}{30} = \frac{1}{2}$$



**Multiplying Proper Fractions Without using a Model**

\* multiply the numerators together  
 \* multiply the denominators together

**Example** Find the product of the following fractions in lowest terms.

a.  $\frac{8}{15} \times \frac{5}{6} = \frac{40}{90} = \frac{4}{9}$

b.  $\frac{3}{5} \times \frac{2}{9} = \frac{6}{45} = \frac{2}{15}$

c.  $\frac{5}{6} \times \frac{4}{5} = \frac{1}{1} \times \frac{4}{3} = \frac{4}{3}$

d.  $\frac{4}{21} \times \frac{7}{12} = \frac{28}{252} = \frac{14}{126} = \frac{7}{63} = \frac{1}{9}$

e.  $\frac{27}{49} \times \frac{35}{36} = \frac{27}{7} \times \frac{5}{36} = \frac{3}{7} \times \frac{5}{4} = \frac{15}{28}$

f.  $\frac{144}{256} \times \frac{128}{81}$

**Example** Three fifths of a school class is made up of girls. One third of the girls walk to school. What fraction of the class is made up of girls who walk to school?

$\frac{1}{3}$  of  $\left(\frac{3}{5}$  of the class)  
 $\frac{1}{3} \times \frac{3}{5} = \frac{1}{5}$

$\frac{1}{5}$  of the girls walk to school.

**Example** Estimate the value of the product to the nearest half. Show your thinking.

a.  $\frac{3}{5} \times \frac{1}{9} = \frac{1}{15}$   
 $\approx \frac{1}{2} \times 0$   
 $\approx 0$

b.  $\frac{4}{9} \times \frac{3}{7} = \frac{4}{21}$   
 $\approx \frac{1}{2} \times \frac{1}{2}$   
 $\approx 0$

c.  $\frac{9}{11} \times \frac{7}{13}$   
 $\approx 1 \times \frac{1}{2}$   
 $\approx \frac{1}{2}$

$$\begin{aligned}
 \text{f. } \frac{144}{256} \times \frac{128}{81} &= \frac{\overset{48}{\cancel{144}}}{\underset{128}{\cancel{256}}} \times \frac{\cancel{64}}{\underset{27}{\cancel{81}}} \\
 &= \frac{\overset{24}{\cancel{48}}}{\underset{64}{\cancel{128}}} \times \frac{64}{27} \\
 &= \frac{24}{\cancel{64}} \times \frac{\cancel{64}}{27} \\
 &= \frac{\cancel{24}^8}{1} \times \frac{1}{\cancel{27}_9} \\
 &= \frac{8}{9}
 \end{aligned}$$