## 6.3 Multiplying/Dividing Fractions (Rational Numbers)

Properties for Rational Numbers with Multiplication

1. Closure

2. Commutativity

3. Associativity

4. Multiplicative Identity

5. Multiplicative Inverse

To multiply fractions: $\frac{a}{b}.\frac{c}{d}=\frac{ac}{bd}$

Multiplication Models

1. Repeated Addition

2. Area model

Division with Fractions

To divide fractions: $\frac{a}{b} \div \frac{c}{d} = \frac{ad}{bc}$ but why?

Use $\frac{3}{4} \div \frac{1}{8}$ as a starting argument.

$4 \div \frac{1}{2}$ means "how many groups of one-half are there in 4?"

$\frac{1}{2} \div \frac{1}{6}$ means:

Examples:

1. $\frac{50}{15} \cdot \frac{39}{55} \cdot \frac{5}{2}$

2. $\frac{3}{4} \cdot \frac{32}{18}$

3. $2\frac{3}{4} \cdot \frac{22}{3}$

4. $\frac{4}{11} \div \frac{7}{22}$

5. $\frac{6}{13} \div \frac{2}{39}$

6. $1\frac{3}{4} \div \frac{9}{8}$

7. $\frac{6}{25} \div \frac{3}{5}$

Students often confuse dividing by 2 with dividing by 1/2.
Write two story problems that show the difference.