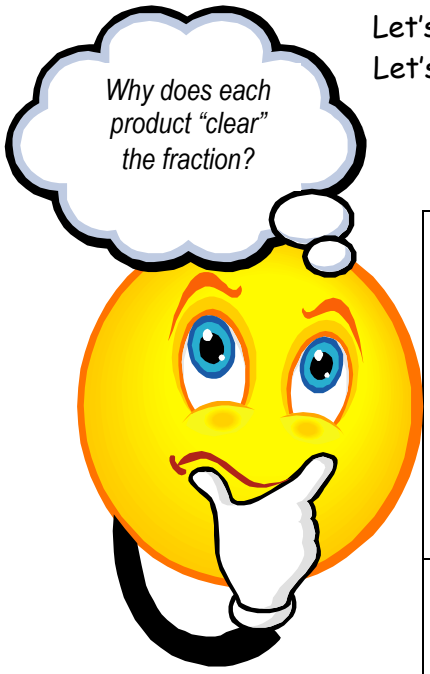
**Essential Question:** How do we solve equations with rational expressions?

**Do Now:** Solve for x. $\frac{4x}{5} - \frac{3x}{4} = \frac{1}{10}$




Let's think about another way to solve the problem from the Do Now. Let's begin by simplifying the expressions below.

| | |
|---|---|
| a. $20\left(\frac{1}{4}\right)$ | b. $15\left(\frac{x}{5}\right)$ |
| c. $16\left(\frac{3x}{8}\right)$ | d. $12\left(\frac{x}{6}+\frac{x}{3}\right)$ |

**Key Concept:**

**Can we solve rational equations using this key concept?**

Consider the following equation from the Do Now… $\frac{4x}{5}-\frac{3x}{4}=\frac{1}{10}$

- What integer value would "eliminate" all denominators?

**Solving Rational Equations using the LCD:**

$\frac{4x}{5}-\frac{3x}{4}=\frac{1}{10}$

- Identify the **least common denominator** (LCD)
- **Multiply each term** of the equation by the LCD and simplify
- **Solve** the equivalent equation (NOTE: the denominator has been eliminated!)
- **Check** your answer!

Let's try solving some more rational equations. Check your answer!

1) $\frac{x}{3}-\frac{2x}{5}=\frac{-7}{15}$

2) $\frac{x}{3}=\frac{x}{2}+2$

3) $\frac{x+5}{5}+\frac{3x}{10}=7$

4) $\frac{2x}{5}-\frac{x}{4}=\frac{3}{2}$

The TAKE AWAY

In a rational equation, multiplying both sides of the equation by the _____ creates an equivalent equation "*without any fractions*".

**Solve each equation. Check the solution with your calculator.**

1. $\frac{x}{3}+\frac{x}{7}=10$

2. $\frac{3x}{4}=20+\frac{x}{4}$

3. $\frac{x+1}{6}+\frac{x+5}{4}=1$

4. $\frac{y-2}{2y}=\frac{3}{8}$

5. $\frac{m-5}{35}=\frac{5}{7}$

6. $\frac{2t}{5}-\frac{t-2}{10}=2$