

LESSON  
6.4**Investigating Algebra Activity:  
Solving Systems by Multiplying First***For use before the lesson "Solve Linear Systems by Multiplying First"***Materials:** pencil and paper**QUESTION How can you use the elimination method when coefficients are different?**

In order to use the elimination method with addition you must have the same coefficients with opposite signs. To make coefficients the same, you may need to find the LCM and then change the coefficients to the LCM by multiplying.

**EXPLORE Prepare equations for elimination**

Use the following systems of linear equations in the steps below. The steps will be completed for the first system.

$$3x + 2y = 7$$

$$4x + 3y = 11$$

$$2x - 6y = 20$$

$$7x - 9y = 46$$

**STEP 1 Copy table**

Copy the table below.

Coeff. of $x$	LCM	First factor	Second factor
3, 4			
2, 7			

**STEP 2 Find LCM**

Find the LCM of the coefficients of  $x$ .

Coeff. of $x$	LCM	First factor	Second factor
3, 4	12		
2, 7			

**STEP 3 Determine factor**

Find the factor that is needed to make the first number equal to the LCM.

Coeff. of $x$	LCM	First factor	Second factor
3, 4	12	4	
2, 7			

**STEP 4 Determine second factor**

Find the factor that is needed to make the second number equal to the opposite of the LCM.

Coeff. of $x$	LCM	First factor	Second factor
3, 4	12	4	-3
2, 7			

**STEP 5 Rewrite equations**

Multiply each equation using the factors in your table. Now your system is ready for elimination.

$$3x + 2y = 7 \quad \times (4)$$

$$4x + 3y = 11 \quad \times (-3)$$



$$12x + 8y = 28$$



$$-12x - 9y = -33$$

**DRAW CONCLUSIONS**

**Use your observations to complete these exercises.**

- Repeat Steps 1–5 for the coefficients of  $y$ .
- Explain why you might choose to eliminate one variable over another.