

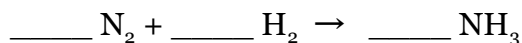
## PHET Balancing Chemical Equations

**Search “phet balancing chemical equations” and click the first link.**

**Start the simulation by clicking the arrow in the middle.**

**Click on Introduction first.**

1. Use the simulation to adjust the coefficients and balance the following equation (Make Ammonia). Select the balance scales and bar charts to help. Fill in the proper coefficients when you are successful (yellow smiley face).



2. Draw the particle view of the balanced equation as shown in the simulation.

3. Use the “Tools” button to try out the scales and the bar charts. Describe what the scales and the bar charts do. Which one do you prefer?

Scales -

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Bar charts -

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I prefer \_\_\_\_\_ because \_\_\_\_\_

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4. In order for a chemical equation to be properly balanced, what must be true?

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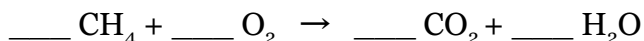
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5. Balance the other two examples.

Separation of water



Combustion of methane



6. The number placed in front of a formula is called a coefficient. The small number within a chemical formula is called a subscript. Why do we adjust coefficients when balancing chemical equations and not subscripts?

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### Now go to the Game.

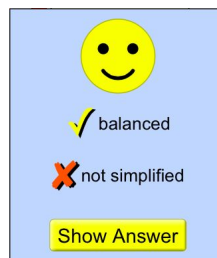
NOTE - Turn the SOUND OFF or use headphones. The timer is up to you.

Record your score for each of the levels in the balancing game:  
(Yes, I know it only gives you 5 equations, but it also gives you a score out of 10.)

Play until you have a score of 8/10 or higher on each level! Then, get a teacher's signature.

	Score	Teacher Signature
Level 1	/ 10	_____
Level 2	/10	_____
Level 3	/ 10	_____

### REDUCING EQUATIONS:



When you were playing the game, did you ever get this ? \_\_\_\_\_

What does it mean for an equation to not be simplified? How can you simplify an equation? (If you don't know the answer, use the hint below.)

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HINT: Go to Level 1 of the game. Balance the first equation, but BEFORE YOU PRESS CHECK, double all of the coefficients. What happens? Why?