

# Clicker Questions for *Balancing Chemical Equations*

**AUTHORS:**

Yuen-ying Carpenter (University of Colorado Boulder)

Robert Parson (University of Colorado Boulder)

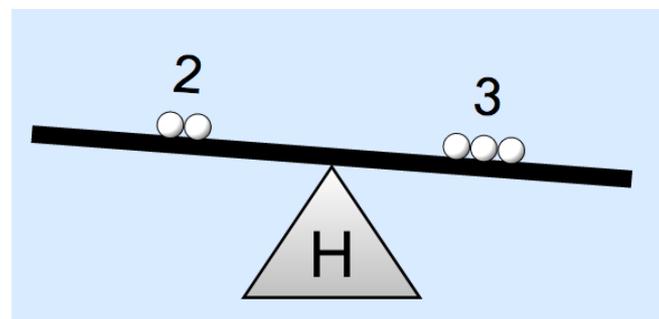
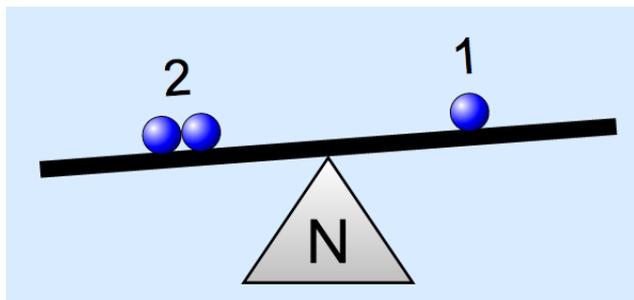
Trish Loeblein (University of Colorado Boulder)

**COURSE:**

Introductory / Preparatory College Chemistry

**COPYRIGHT:** This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

What would you do to balance this equation?



- Double the coefficient of  $\text{N}_2$  ( $2 \text{N}_2$ )
- Multiply coefficient of  $\text{H}_2$  by 3 ( $3 \text{H}_2$ )
- Multiply subscripts of  $\text{H}_2$  by 3 ( $\text{H}_6$ )
- Double the subscripts for  $\text{NH}_3$  ( $\text{N}_2\text{H}_6$ )
- Double the coefficient of  $\text{NH}_3$  ( $2 \text{NH}_3$ )

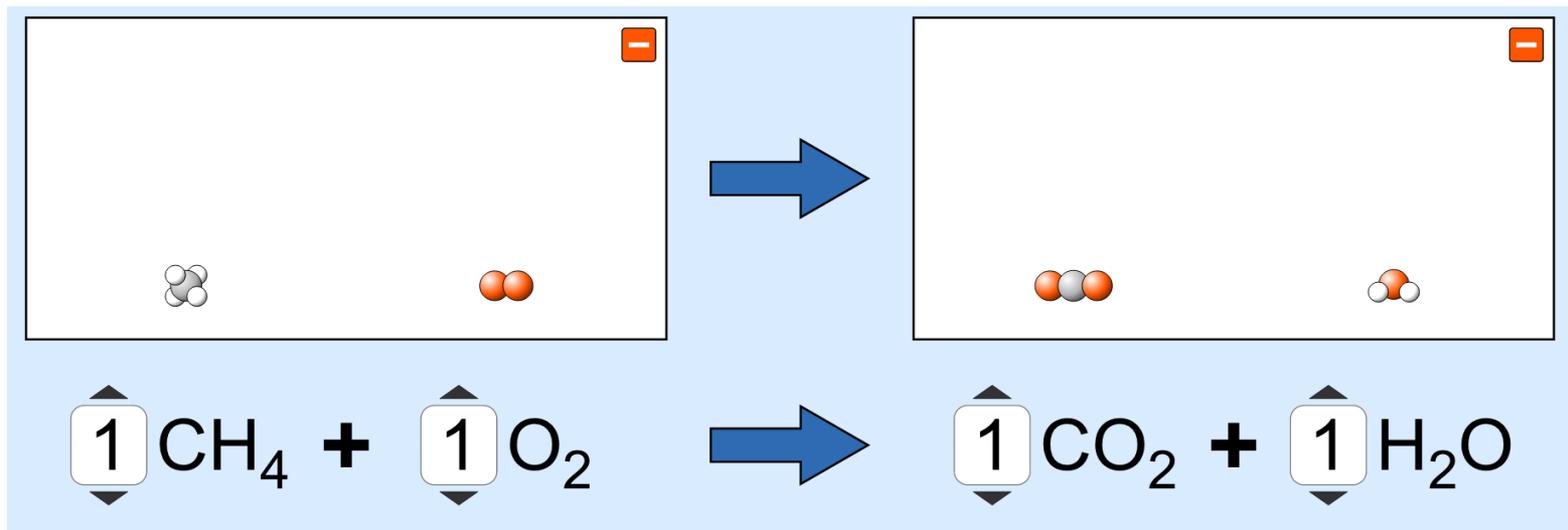
What was your first step in balancing this equation?



- a. Change the coefficient of  $\text{SO}_3$
- b. Change the coefficient of  $\text{SO}_2$
- c. Change the coefficient of  $\text{O}_2$

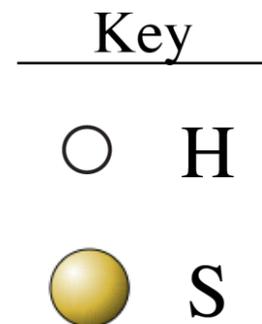
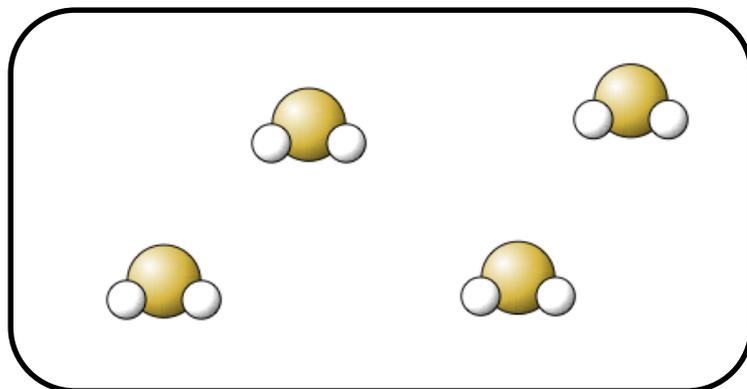
Does not have a  
“correct” answer,  
but A is the most efficient  
way

What was your first step in balancing this equation?



- Change the coefficient of  $\text{CH}_4$
- Change the coefficient of  $\text{O}_2$
- Change the coefficient of  $\text{CO}_2$
- Change the coefficient of  $\text{H}_2\text{O}$

Does not have a  
“correct” answer –  
All choices will work,  
B and D are the most  
efficient



Which of these chemical formulas describes the contents of the box above?

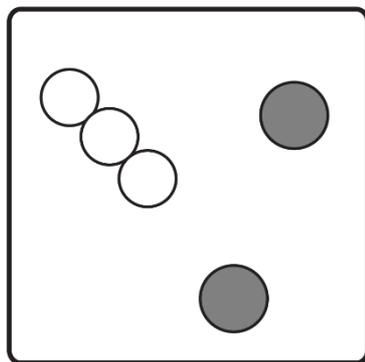


c. Both A and B

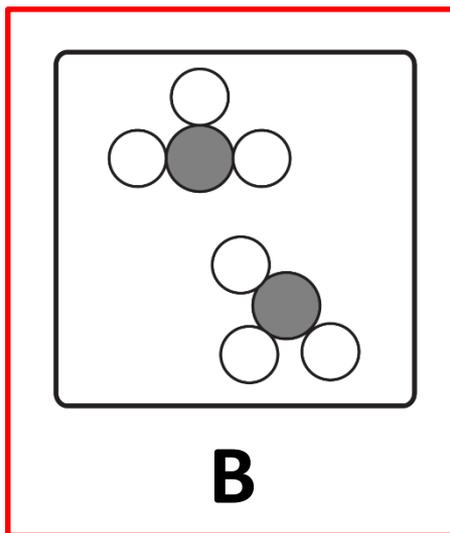
d. Neither A nor B

Which of the boxes below contains a picture representing **2 AsCl<sub>3</sub>**?

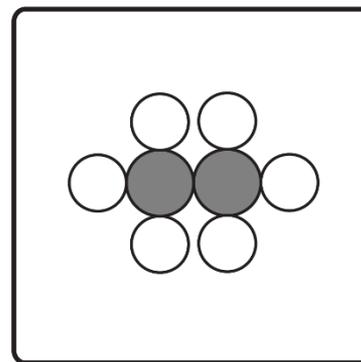
Key



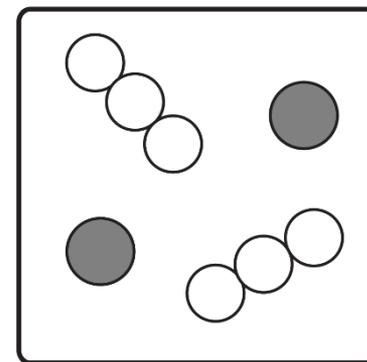
**A**



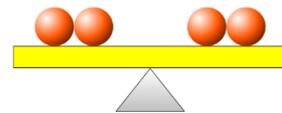
**B**



**C**



**D**



# Balancing Chemical Equations

How many coefficients *need to be changed* to make this chemical equation balanced?



a. None

b. 1

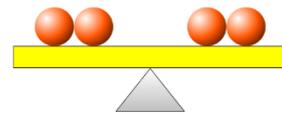
c. 2

d. 3

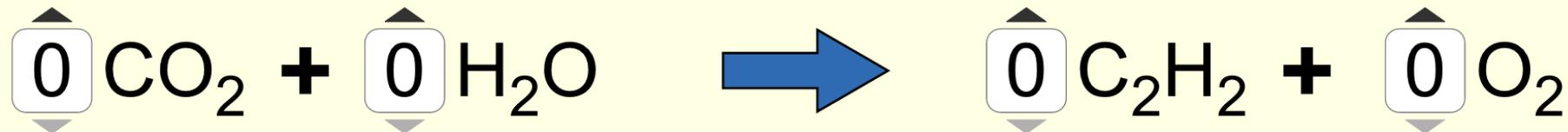
e. 4

Balanced equation:



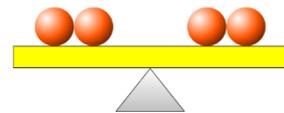


# Balancing Chemical Equations



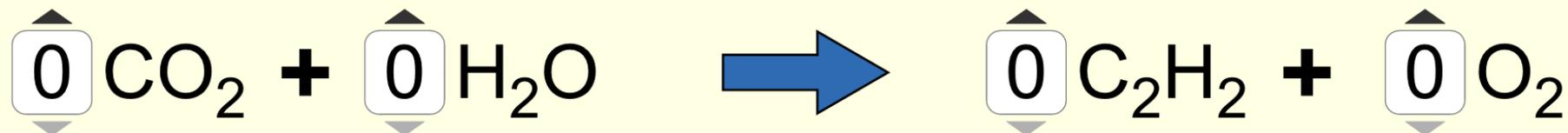
After you balance this equation, what is the final coefficient in front of  $\text{O}_2$ ?

- a. 2
- b. 3
- c. 4
- d. 5



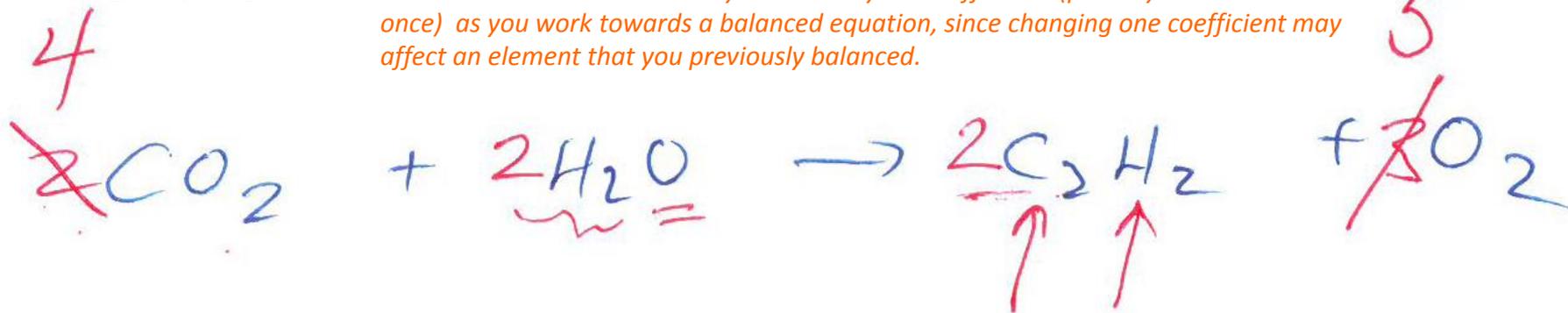
# Balancing Chemical Equations

Unbalanced equation:

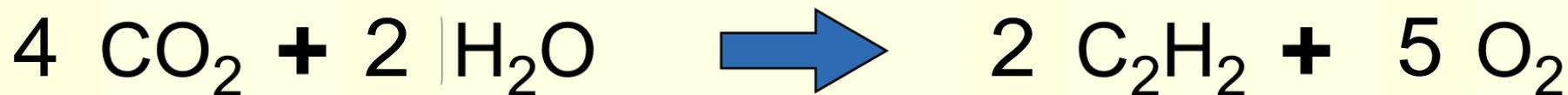


Balancing in progress:

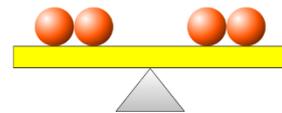
*Notice that it is NORMAL that you'll revise your coefficients (possibly more than once) as you work towards a balanced equation, since changing one coefficient may affect an element that you previously balanced.*



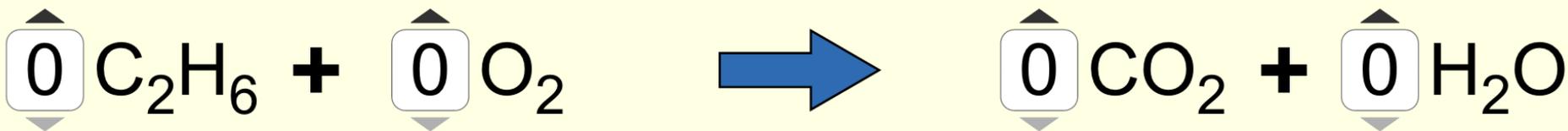
Balanced equation:



# Balancing Chemical Equations

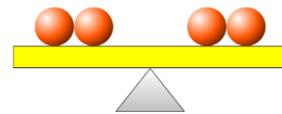


“Level 3” – More challenging

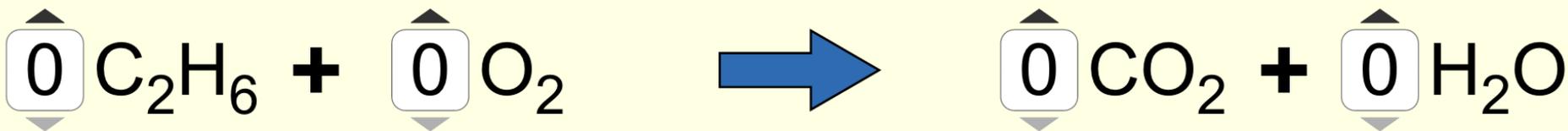


Press ‘A’ on your clicker when you think you have correctly balanced this equation.

# Balancing Chemical Equations



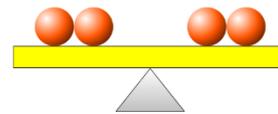
“Level 3” – More challenging



What is the **coefficient of H<sub>2</sub>O** in the balanced equation?

- a. 2
- b. 3
- c. 4
- d. 6

# Balancing Chemical Equations



*Starting from words*

When white phosphorus ( $\text{P}_4$ ) is exposed to oxygen gas ( $\text{O}_2$ ), it begins to burn, producing tetraphosphorus decaoxide.

Is this the correctly balanced chemical equation for this reaction?



a. Yes.

b. No.

c. Impossible to determine.