

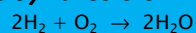
Using Analogies to Learn Stoichiometry

Objectives

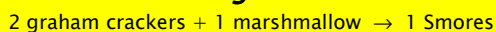
- ▶ Choose a chemical reaction and its balanced equation
- ▶ Choose a non-chemistry process that is analogous to the chosen chemical reaction and has the same ratio of reactants
- ▶ Create a mathematical stoichiometry problem to illustrate the analogy

The "Reactions"

The synthesis of water

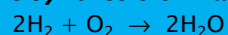


Making smores

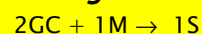


Using symbols...

The synthesis of water

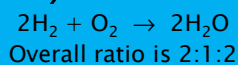


Making smores

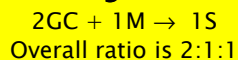


The ratios of reactants in both processes is 2:1

The synthesis of water

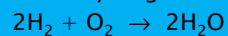


Making smores



Analogous Stoichiometry Problems

How many water molecules can you make if you have 10 hydrogen molecules?



How many smores can you make if you have 10 graham crackers



Use the ratios to solve

$$10\text{H}_2 \times \frac{2\text{H}_2\text{O}}{2\text{H}_2} = 10\text{H}_2\text{O}$$

You could make **10 water molecules**

$$10\text{GC} \times \frac{1\text{S}}{2\text{GC}} = 5\text{S}$$

You could make **5 smores**

Why are the answers different?

$$10\text{H}_2 \times \frac{2\text{H}_2\text{O}}{2\text{H}_2} = 10\text{H}_2\text{O}$$

You could make **10 water molecules**

$$10\text{GC} \times \frac{1\text{S}}{2\text{GC}} = 5\text{S}$$

You could make **5 smores**

Why are the answers different?

$$10\text{H}_2 \times \frac{2\text{H}_2\text{O}}{2\text{H}_2} = 10\text{H}_2\text{O}$$

You could make **10 water molecules**

$$10\text{GC} \times \frac{1\text{S}}{2\text{GC}} = 5\text{S}$$

You could make **5 smores**

The ratio of hydrogen to water is 2:2
The ratio of graham crackers to smores is 2:1