



ATTACK

As we begin this battle I would like to point out a few very basic bits of information. These are things we won't dwell on, but I do want to make sure you know what they are.

Good Day, Clash of Scientists!

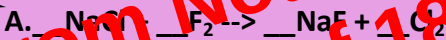
A very important aspect of this lesson is for you to learn how to balance equations. It may come very easily and quickly to you, or it may take an awful lot of hard work. You may have had previous experience with this and only need review. In any case you need to make sure you get sufficient practice. I will show you how to balance some equations and work through several examples and then have you take the time to get a lot of practice. Remember, chemical equations usually do not come already balanced. Making sure they are balanced must be done before the equation can be used in any chemically meaningful way.

Thus, in this chemical war, you should be able to formulate a balanced chemical equation for a given reaction. Boosting your skills and abilities with the innovative techniques in balancing chemical equations will make you fully understand how a certain amount of reac-

Are you ready now? Ahu! Ahu! Let's attack!

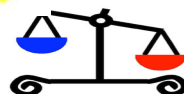
Activity 4: It's Number War - Balancing Act!

Welcome to It's Number War - Balancing Act! The leader of the troop will give you a number of incomplete chemical equations. Balance the chemical equations by selecting coefficients from the candy crush of numbers. Once you think the equation is balanced, release the missile!' button. Have fun and good luck!



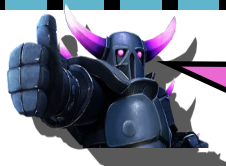
CLICK
HERE

RELEASE



Activity 1

1. to make their mass balance on both sides
2. Their will be an unequal distributions of their mass on both sides
3. In a chemical reaction, the mass cannot be created and destroyed
4. There will be an unequal mass on both sides of the chemical equation.



Clash it! Let's check it!

Activity 2

1. Count the atoms of each element in the reactants and the products. Use coefficients; place them in front of the compounds as needed.
2. to have an equal mass on both sides. Just like we want a seesaw to be balanced on both sides, a chemical equation should also be balanced on both sides. It shows the substances involved in a chemical reaction - the substances that react (reactants) and the substances that are produced (products).
3. A coefficient is a number that we place in front of a chemical formula. In a chemical equation, a subscript cannot be changed.
4. Reactants: Hydrogen (H₂) and Nitrogen (N₂)
Products: Ammonia (NH₃)

Activity 3

Elements	Reactants (Number of atoms)	Products (Number of atoms)
Na	1	2
O	5	5
H	3	2
S	1	1



Activity 4

- A. $2\text{NaCl} + \text{F}_2 \longrightarrow 2\text{NaF} + \text{Cl}_2$
- B. $\text{Zn} + 2\text{HCl} \longrightarrow \text{ZnCl}_2 + \text{H}_2$
- C. $\text{C}_3\text{H}_8 + 5\text{O}_2 \longrightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$

Activity 5

Unbalanced Chemical Equations	Reactants	Products	Balanced Chemical Equation
$\text{P}_4 + \text{O}_2 \longrightarrow \text{P}_4\text{O}_{10}$	P=4; O=2	P=4; O=10	$\text{P}_4 + 5\text{O}_2 \longrightarrow \text{P}_4\text{O}_{10}$
$\text{Fe} + \text{H}_2\text{O} \longrightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$	Fe=1; H=2; O=1	Fe=3; H=2; O=4	$3\text{Fe} + 4\text{H}_2\text{O} \longrightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$
$\text{C} + \text{H}_2 \longrightarrow \text{CH}_4$	C=1; H=2	C=1; H=4	$\text{C} + 2\text{H}_2 \longrightarrow \text{CH}_4$
$\text{Na}_2\text{SO}_4 + \text{CaCl}_2 \longrightarrow$	Na=2; S=1; O=4	Na=1; S=1; O=4	$\text{Na}_2\text{SO}_4 + \text{CaCl}_2 \longrightarrow$

