

Thread NSTA Chemical Equation Balancing for 9th Grade

From: physicalscience-request@list.nsta.org [mailto:physicalscience-request@list.nsta.org] **On Behalf Of** William.Braun@winona.k12.mn.us

Sent: Tuesday, December 02, 2008 9:48 PM

To: physicalscience@list.nsta.org

Subject: balancing equations real world applications

I got real tired last week of students whining about balancing equations. I know that most of my 9th grade physical science students will likely not have to balance chemical equations for a living, but I believe it is a skill that students still need to learn and can apply to other areas. I've typed up a worksheet over the weekend where students have to balance numbers- for example as if they are the purchaser at a company making wheels and buy parts in bulk, how many of each part package need to be ordered as to not have extra parts in inventory for long periods which would tie up cash.

My question is does anybody have any other similar worksheets that they are willing to share?

Thanks in advance.

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Balancing Numbers

You will be selling hotdogs as a fundraiser for your club. You decide to have hot dogs with buns (HdBs). Leftovers are not an option. If hot dogs (Hd) come in packages of eight and buns (Bs) come in packages of ten, how many hot dogs with buns will you make? How many packages of hot dogs do you buy? Buns?

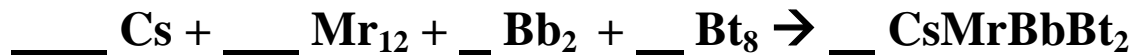


You work at a shop that makes wheels. You discover a supply company that will sell some parts in bulk. Rims (Rm) come in packages of 9. Inner tubes (It) come in packages of 24. Tires (Tr) must be bought in pairs. Axles (Ax) are sold in a box of eight. A gross

(144) spokes (Sp) are found in one container. How many wheels (RmItTrAxSp₃₆) can you make without having anything extra parts?



You are required to build flashlights. You purchase the cases (Cs) individually, but you buy mirrors (Mr) by the dozen, bulbs (Bb) in pairs, and batteries (Bt) in packages of eight.



You buy cupcakes in plastic deli trays with six cupcakes. As a result of the purchase you get cakes (Ck), wrappers (Wr), and a deli tray (Dt). Balance this expression.



For making a variety of pizzas, you need cheese (Ch), sauce (Sc), dough (Do) and pepperoni (Pp).



How many total pizzas could you make? How many of each kind of pizza?

One real world application you could use is the Space Shuttle external fuel tank. You can find cutaway drawings that show the hydrogen tank is approximately twice the size of the oxygen tank. You can stress the high cost per pound of putting an object in space balanced by the bad results of not making orbit.

Sincerely,

Greg

I've used this activity with great results the past two years. I wish I could take credit for it, but I got it off of this listserv myself.

Eric Cecil

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S'more Formulas

In this activity, we will be using s'mores to model the process of ionic bonding and writing formulas for ionic compounds. A s'more is made of graham crackers, chocolate and roasted marshmallows. There are many possible ways to make them, but unfortunately they all go by the same name. We should be able to distinguish between different types of s'mores by writing a "chemical" formula for them.

Instructions:

1. Decide how you would like to make your s'more, and collect the necessary materials.
2. Create a table that lists each ingredient, a chemical symbol for that ingredient, and the number of "units" of that ingredient you used. (each small square of chocolate is one unit, half of a graham cracker is one unit)
3. Write the chemical formula for your s'more in your table.
4. Find someone who made their s'more in a different way, and record the formula for their s'more in your table.
5. Once you have recorded the formula for each type of s'more, show your data table to your instructor. After it is approved, you may use a Bunsen burner to roast your marshmallow and make your s'more.

Questions

1. Is your s'more a model of an element, compound or mixture? The ingredients? All the s'mores from the class? How do you know?
2. The ingredients of our s'mores have a natural attraction for each other, but only in the correct ratios. One marshmallow likes to "bond" with two crackers and three chocolate pieces. Write the formula for this s'more. What properties of the other formula s'mores were different from this one? How were they the same?
3. S'mores can be made from many different ingredients. Suppose we had chocolate graham crackers, cinnamon graham crackers, dark chocolate, white chocolate, chocolate w/ almonds and mini-marshmallows in addition to our other ingredients. Create a "periodic table" of s'more ingredients. Explain your reasons for your organizational scheme.
4. Describe as many ways you can think of that our model is the same as what it represents.
5. Describe as many ways you can think of that our model is different from what it represents.
6. If you handed a s'more to someone who had never studied chemistry and said "This is a model of a compound", what misconceptions might they have about compounds?
7. How could you change our model to prevent these misconceptions?
8. Describe how you could model compounds and writing their formulas using something other than s'mores. Be specific!!!