Cake Lab

Summary

Students will bake a cake, brownies, cookies etc. This will be used to introduce chemical reactions and writing balanced equations.

Time Frame

1 class periods of 60 minutes each

Group Size

Small Groups

Materials

Put the students in groups the previous class and have them divvy up the materials they will need to bring.
Have some

- sugar
- cornstarch
- and other baking ingredients

ready the next class period for those that do not bring ingredients.
They can cook their "cake" in a crucible on the Bunsen burner. Almost everyone brings their materials because others in their group are counting on them.

Background for Teachers

Time Needed:

This requires about two twenty minute increments of time with a ten minute introduction during one class period (my students did an activity to study for their final between this lab). Take fifteen minutes the previous class to give the students planning time.

Safety Considerations:

Have some hot pads to get the pans out of the oven.

Student Prior Knowledge

This is meant to be an introductory lab so no prior knowledge is required.

Instructional Procedures

Ask the students the day before the lab what they need to make a cake. They will begin to list the ingredients and after time start mentioning the pan and other baking utensils. Split the class in groups of four and have them decide who will bring what. Make sure they bring a spatula to get the cake out, bowl, mixer, frosting, butter knife etc. Students usually bring the ingredients but sometimes leave out the small but necessary details.

Talk to a foods teacher ahead of time to see if your classes can use the ovens. If this is not possible, students can make the cakes on a waffle iron (brownies do not work as well).

Go over the lab write up part with the students. They should know how to do the title, materials, and procedure. Explain that the data is to be taken on the cake mixture (the smell, texture, etc.) and again for the finished product. For the conclusion, have the students answer these questions:

#1. List your reactants. What was your product? Write your chemical reaction. Explain that this will look something like 2C flour + 2 tsp water Double fudge cake.

#2. If there are the same number of atoms before and after a chemical reaction (the heat of the oven), then why does the cake weigh less than the mixture of all the ingredients? The next day after the lab, explain that some of the atoms leave the cake as they are heated (evaporation etc.). But if the reaction took place inside a closed container the mass would be the same before and after.
#3. Name the catalyst(s) of the experiment. Talk about catalysts and have the students write the definition of a catalyst: something that speeds up a reaction but is not consumed in the reaction.
#4. List all the signs you can think of that showed that a chemical reaction took place.
Give the students twenty minutes to make their cakes (most of the students bring a dry mix that you just add eggs and water) and begin their lab write up. Make sure to preheat the oven right away.
After the twenty minutes, do a separate activity while the cakes finish cooking and cooling. Just let one "oven" person per group go to the foods room to check on the cakes and bring them back.
Give the students another twenty minute period to frost and eat their "products" and to finish their lab write up.

Assessment Plan

Scoring Guide:

Give the students points for making a "product" and for finishing the lab write up.

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

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