

Molecular Gastronomy

Molecular gastronomy combines physics, chemistry, and cooking to create food with interesting tastes and textures. Chefs even bring tools from the science lab into the kitchen—talk about a hungry nerd’s dream!

Ready to experiment and eat the results? Here are two easy recipes you can make along with a parent. Both are adapted from an article by Anita George in the June 13, 2013 edition of Paste Magazine.



Rockin’ Chocolate-Covered Strawberries

Ingredients:

Strawberries (any number)
Chocolate (milk, white, or dark)
Popping sugar (like Pop Rocks candy)

The Science:

Effervescence is a chemical reaction that results in the release of gas and the formation of foam, fizz, and bubbles. Like soda, popping sugar creates an effervescent effect because it contains carbon dioxide. When popping sugar comes in contact with moisture, it begins to melt, and the carbon dioxide gas is released, resulting in a popping sensation that you feel in your mouth as you eat it.

Fortunately, mixing popping sugar with melted chocolate (like in this recipe) doesn’t melt the sugar, as the oils and fats normally found in chocolate don’t trigger the melting process. That saves the effervescence for your tongue—pretty cool, huh?

How to make it:

1. Melt the chocolate in the microwave, or by placing it in a non-plastic bowl on top of a pot of lightly steaming water. Stir often, and make sure to have a parent help remove it from the microwave or stove.
2. Dip each strawberry in the melted chocolate, then into a bowl of popping sugar.
3. Place the dipped strawberries onto a sheet with parchment paper and let cool.
4. Eat the strawberries while the chocolate is still warm, or place the sheet in the refrigerator and enjoy after the chocolate has hardened.

Rainbow Foam

Ingredients:

6 boxes of Jell-o (3 oz.), each a different color
2 tall glasses
Whipped cream

For each package of Jell-o:
1 cups boiling water
3/4 cup cold water

How to Make It:

1. Mix each flavor of Jell-o in its own bowl, following the instructions on the box, but using $\frac{1}{4}$ cup less water than is called for on the package. (Follow the ingredient list above when it comes to the water.)
2. Refrigerate the bowls of Jell-o for about 2 or 3 hours, until they're Jello-y but not completely firm. Don't let them completely set.
3. Pour one of the colored mixtures into a large bowl. Using an electric whisk (have a parent help with this), whisk until frothy.
4. Spoon some of the frothy foam into each tall glass and refrigerate for 30 minutes, or until it sets.
5. Repeat step 3 with the next color Jell-o, then spoon that mixture on top of the first color in the glass. Refrigerate again to let it set. Keep repeating with each color until they're all layered on top of one another.
6. Allow the entire Rainbow Foam to set in the fridge overnight. (I know, the waiting is painful!)
7. Top with whipped cream and enjoy!



The Science:

Jell-o contains gelatin, which is used to thicken foods and turn liquids into a solid gummy gel. On a molecular level, powdered gelatin is made up of proteins called amino acids. When amino acids like the ones found in gelatin (glycine, proline and hydroxyproline) come together, they form polypeptide chains, which are normally bound together by weak molecular bonds. But when these bonds are subjected to boiling water (as they when you make Jello or the Rainbow Foam), those bonds break, and polypeptide chains separate from each other. When the gelatin cools again with the addition of cold water, the molecular bonds re-form, and the polypeptide chains come back together.

Agitating the partially-set gelatin with a whisk incorporates air into the mixture. The air gets trapped inside as the gelatin cools, making for a light and airy texture. Voila—edible foam!