



FLAVOR SCIENCE PROJECTS

ATTENTION! Do you—or any of the friends you'll be doing these activities with—have food allergies? Make sure you **don't use any foods that may cause problems. If you're not sure, check with your mom, dad or a responsible adult.**

Flavor Lab

Imagine creating your own flavors, just like a flavor chemist does! By mixing different flavor extracts into a frosting base, you can make a delicious vanilla frosting, a fruit punch frosting, or even a cola frosting!

Make sure you check with an adult first, and don't use any ingredient that you or others around may have an allergy to!

What you'll need for the frosting base:

*1 stick of **butter**
3 cups of powdered **sugar**
1 teaspoon of **vanilla extract**
3 tablespoons of **milk***

Extracts for the flavoring:

Note: Extracts are available at your grocery store. They can be expensive, so don't feel as if you need to buy all of these. If you can find even a few of them, you'll still be able to experiment with flavors.

*Vanilla • Lemon • Almond • Banana
Cinnamon • Mint • Raspberry*

Instructions:

To make the frosting base, blend 1 stick of softened butter with 3 cups of powdered sugar. Add 1 teaspoon of vanilla extract and 3 tablespoons of milk. Then blend until smooth.

When scientists create new flavors, they start with a base. Examples of these are a chewing gum base or candy base. The frosting you've just whipped up is **your** base. Now, it's time to mix some flavors into it!

- Divide the frosting into several bowls, so that you can try flavoring more than one sample.
- Add the extracts. Only mix in **one or two drops** at a time!

And just like they do in a flavor lab, make sure you **write down how many drops you used** of each flavor in each batch. That way, you'll be able to use this **formula** to mix up another batch and create that same flavor again!

Cola-flavored frosting! Tropical punch! Yummy fruity mint!

Here are some directions to get those flavors going. You'll have to experiment with different amounts of each extract to get it just the way you like it.

- ❑ To make a cola flavor, try using vanilla, lemon, and cinnamon
- ❑ For tropical punch, use almond, banana, vanilla, and raspberry extracts
- ❑ Want to whip up some fruity mint? Start out with lemon, vanilla, and mint extracts. Then add any other fruit flavors you think might be tasty.

Now try coming up with some other flavors on your own! **Have fun!**

The Nose Knows

Have you ever noticed that when your nose is stuffed up, it's hard to taste things? Why is that?

While your tongue alone can detect **taste** (sweet, bitter, sour, salty, meaty) all by itself, **flavor** (pizza, blueberries, orange juice, chocolate, buttered popcorn, and so on) depends on a **combination of senses**. Your sense of smell is an extremely important part of knowing tastes and enjoying food. That means you need your nose!

If you want to discover just how much we need our nose to enjoy foods, try one of these experiments!

Take the jelly bean challenge

Here's a quick way to see how important your nose is for tasting different flavors.

What you'll need: *Jelly beans in a jar*

Instructions:

- ❑ Close your eyes and pinch your nose closed.
- ❑ Pull a jelly bean from your jar and eat it.

Could you tell what flavor it was? You could probably tell that it was sweet because your tongue does that on its own. But could you detect a specific flavor? Was it strawberry? Watermelon? Lemon? Licorice?

Why was closing your eyes part of this experiment? Just as your sense of smell helps you to perceive flavors, your sense of sight is also a big help! If you had seen that the jelly bean was red, you might have thought it was cherry or strawberry flavored.

Apple or ... onion?

What you'll need: *A small piece of apple*
 A small piece of onion
 A Blindfold

ATTENTION: Please don't attempt to cut the apple and onion pieces yourself. Ask your mom, dad or another adult to do it for you.

- Find a willing friend and blindfold him. Then tell him to hold his nose closed.
- Place a piece of onion or apple on your friend's tongue, but tell him not to chew it.
- Can he figure out what kind of food it is?
- Now have your friend unplug his nose.
- Can he figure out what kind of food it is now?

Secret soda

This experiment doesn't have to do with your nose, but it shows how important your eyes are to the experience of taste. See if you can trick your friend with this cool experiment!

What you'll need: *Seltzer or club soda*
 Food coloring

Instructions:

- Add a few drops of food coloring to the seltzer or club soda.
- Ask a friend to taste your "fruit soda" and tell you what flavor it is.

Club soda has no flavor, but by adding the coloring, you may have tricked your friend into saying it's "orange soda" (if you colored it orange), or "cherry soda" (if you colored it red).

Question:

Why do you think food companies add artificial colors to their products?

Tongue Test!

Have you ever noticed all those tiny bumps on the surface of your tongue? They're called papillae, and they contain your taste buds. Taste buds detect sweetness, sourness, bitterness, saltiness, and "meatiness" (which is also called umami).

The human tongue has about 10,000 taste buds. But some people only have about 500 taste buds! The number of taste buds we have determines how well we can taste our food. Have you ever wondered why some people love spicy food, and others can't stand it? And why does coffee taste bitter to some people, while others love it? A lot of this is determined by how many taste buds we have.

What about you? Are you a "taster?" A "supertaster?" Or maybe you have very few taste buds, and you're a "non-taster." Take the "tongue test" to find out!

Here's what you need: *Food coloring (blue works well)*
 Magnifying glass
 Paper with a hole punched in it

- ❑ Place a few drops of food coloring on the tip of your tongue (you can also try this with friends and family).
- ❑ Place the hole of the paper over the dyed section of your tongue and count the number of pink dots you can see inside the hole. You can use the magnifying glass to help you see them better.

Those pink dots are papillae! The more you have, the more sensitive you are to tasting foods. On average, “nontasters” have less than 15 inside the area of that paper ring, while “supertasters” have more than 30.



Questions:

If you tested the tongues of a few different people, how did the number of taste buds affect how each person tastes his or her food? For example, if you are a “supertaster,” and your friend is a “non-taster,” are there foods that you and your friend disagree about? Maybe your friend loves broccoli, but you can’t stand it. What other foods might a non-taster enjoy and a supertaster not like? Do you like spicy foods? Does your friend?



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