

Kitchen Kemistry Cookbook



by: Fysical Science Phriday Team



Safety First!

Before we get started here are some safety guidelines to follow as you do the experiments:

- Have adult supervision!
- Wear proper protective gear (Lab coats, gloves, goggles)
- If you have long hair, tie it back
- Some of these experiment deal with possibly hazardous materials when not used correctly so follow the directions carefully and look out for the safety warnings
- Some of these experiments should be done outside, **NOT IN THE KITCHEN**, so follow the directions carefully and look out for location specifications.
- Be careful around glassware; if a cup drops, make sure to ask for an adult to help clean it up.
- Unless told otherwise, **DO NOT EAT** the products!

Choose your adventure: Depending on what materials you have available, you can pick and choose which experiments you want to do from the list! You **DO NOT** need to do every experiment to understand what's happening!



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Questions to think about as you do the experiments!

1. What did you notice about physical changes?
2. What did you notice about chemical changes?
3. What are some indicators that a chemical change occurred?

Spring Salad



Safety Note: If cutting vegetables, be careful with the knife.

Ingredients:

- Lettuce
- Vegetables (Carrots, Beets, etc).
- Fruits (Strawberries, Grapes, etc.)
- Dressing (Ranch, etc.)

Directions:

1. Add each of the ingredients, one by one.
2. Mix each of the ingredients into the salad with a fork.

Is it a **Physical** or **Chemical** change? _____

How do you know?

Baking Soda & Vinegar



Safety Note: Be sure not to get ANY of the final product on your face. Make sure that the bag is away from your face. QUICKLY CLOSE the bag after shaking it. Do not drink the products of this experiment.

Ingredients:

- Small Zip-Loc Bag
- 1 Tbsp. Baking Soda.
- Tissues
- Vinegar

Directions:

1. Grab your small zip-loc bag, or something similar.
2. Put 1 tablespoon of baking soda in a paper towel, and pour this into your bag.
3. Pour some vinegar into the bag quickly, then close it.
4. Shake the bag for 10 seconds and observe what happens.

Is it a **Physical** or **Chemical** change? _____

How do you know?

Sugar & Water



Safety Note: Careful not to spill any of the ingredients.

Ingredients:

- Water
- Sugar

Directions:

1. Grab a cup and fill it with water.
2. Mix 2 TBSP of sugar into the water.
3. Make your observations and record what happens.

Is it a **Physical** or **Chemical** change? _____

How do you know?

Salt & Water

Safety Note: Careful not to spill any of the ingredients.



Ingredients:

- Water
- Salt

Directions:

1. Grab a cup and fill it with water
2. Mix 2 TBSP of salt into the water.
3. Make your observations and record what happens.

Is it a **Physical** or **Chemical** change? _____

How do you know?

Soda Geyser



Safety Note: Please DO NOT drink the soda and mentos together. Also don't do this experiment inside!

Ingredients:

- **Coca-Cola or your preferred bottled soda.**
- Mentos

Directions:

1. Find a nice flat surface outside.
2. Put the bottle soda on the flat surface.
3. Put 3-4 mentos into the bottle and run!

Is it a **Physical** or **Chemical** change? _____

How do you know?

Butter in a Bottle



Safety Note:

Handle the glass container carefully!
Make sure NOT to let the cream spill from the bottle!

Ingredients:

- Heavy Cream
- Bottle or jar with lid

Directions:

1. Fill your bottle or jar about half way with heavy cream.
2. Shake rapidly for 10-20 min.
3. Watch as the liquid becomes a solid.

Is it a **Physical** or **Chemical** change? _____

How do you know?

Instant Freeze



Safety Note: Do not leave in the freezer too long after the 3 hours has passed or the container will break.

Ingredients:

- **Soda** bottle (or water bottle)
- **Ice**
- **Cup**
- **Snow cone syrup** (optional if you used water)

Directions:

1. Grab a room temperature bottle of soda (or bottled water).
2. Shake it violently (DO NOT open bottle after shaking).
3. Place the bottle in the freezer and set a timer for about 3hrs.

You may move on to the other experiments as you wait

4. Once the bottle has sat in the freezer for the 3hrs, remove it and open the cap.
5. Have a cup with one ice cube in it and pour the soda into the cup. Watch as the soda becomes a slushy.

Or if using water, pour your favorite snow cone syrup and enjoy.

Is it a **Physical** or **Chemical** change? _____

How do you know?

Whipped Coffee



Safety Note: Be careful if using an electric mixer! Be careful when handling glass, if it breaks have an adult clean it up, DON'T do it yourself!

Ingredients:

- Water
- Instant Coffee
- Whisk (**electric** saves time)
- Sugar
- Container
- Milk

Directions:

1. Put 2 tablespoons of coffee into a container.
2. Add 2 tablespoons of sugar
3. Pour 2 tablespoons of hot water into the container
4. Whisk the mixture until creamy (It will take a long time by hand mixing so feel free to use an electric mixer as well).
5. Once you obtain stiff peaks of coffee, the experiment is complete
6. Get a glass with a few ice cubes in it and fill it with $\frac{3}{4}$ of the way up with milk
7. Top the glass with the whipped coffee. Serve and Enjoy!

Is it a **Physical** or **Chemical** change? _____

How do you know?

Make Your Own Ice Cream!



Safety Note: DO NOT eat the raw ingredients until AFTER the ice cream is done! They are not dangerous, they just won't taste as good!

Ingredients:

- Ice
- Salt
- Milk or Heavy whipping cream
- Sugar
- Preferred flavor of **syrup**
- Gallon or Quart **zip-lock bag**
- Sandwich **zip-lock bag**
- **Toppings!**

Directions:

1. Grab a gallon zip-lock bag..
2. Fill the zip-lock bag about halfway with ice and 1-2 tablespoon of salt.
3. Grab the sandwich zip-lock bag and pour 1 cup of milk, 1 tablespoon of sugar, and your preferred flavor of syrup (vanilla extract, chocolate, strawberry, or caramel) and zip it tight.
4. Place the smaller zip-lock bag into the gallon zip-lock and shake the bag for about 10 mins while constantly checking on the bag's contents. Once it's a thicker ice cream consistency you're done!
5. Pour on your toppings and eat up!

Is it a **Physical** or **Chemical** change? _____

How do you know?

Get to Know Us!

Meet the teachers:

<p>Brandon Rathke</p> 	<p>Physics & Engineer Camp Facilitator Pre-AP Chemistry Teacher, Dickinson High School</p>	<p>Brandon Rathke is an alumna of the first <i>teachHOUSTON</i> Alternative Certification Program for STEM. He is a chemistry teacher at Dickinson High School in Dickinson, TX.</p> <p>Brandon earned his Physics degree and minor in Mathematics in 2005 (University of Missouri) and joined the US Navy Nuclear Engineering program. In 2007 he qualified as a submarine nuclear engineer officer and served in the submarine service until 2013. That same year, he finished his MBA (Ohio State University) and moved to Houston. He worked in the oil, gas, and chemical refining industry for five years before starting his teaching career.</p> <p>Brandon loves sailing, playing guitar, and learning. He's always been interested in astronomy and enjoying nature. His goal is to make students confident, critical thinkers equipped to take on tomorrow's biggest challenges.</p>
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<p>Tri Duong</p> 	<p>Mathematics Major, Physics Minor, teachHOUSTON Alumnus, University of Houston, College of Natural Sciences and Mathematics</p>	<p>Tri Duong is a teachHOUSTON and University of Houston alumnus. He is currently an AP Physics 1 & 2 teacher at DeBakey HS for Health Professions. He is really passionate about teaching physics and doing cutting-edge research in particle physics and particle accelerator science and technology at US national laboratories around the country during the summer. In his free time, he likes to code and build robots, and play the cello.</p>
<p>Aerielle Rodriguez</p> 	<p>Biology Major, Mathematics and Medicine and Society Minor, teachHOUSTON Preservice Teacher, University of Houston, College of Natural Sciences and Mathematics</p>	<p>Aerielle Rodriguez is a 4th year undergraduate student at the University of Houston majoring in Biology and minoring in Mathematics and Medicine and Society. She is part of the teachHOUSTON Program to become a future high school science teacher. She is equally passionate about education as she is about health and looks forward to bringing that passion to her future students. Growing up as the daughter of two nurses, medicine always felt like a natural fit, but over time a love for teaching developed. In her free time, she explores other passions such as fitness, TV shows, and plays with her dog Ellie.</p>
<p>Alexander Mathen</p> 	<p>Chemical Engineering Major, Chemistry Minor, teachHOUSTON Preservice Teacher, University of Houston, Cullen College of Engineering</p>	<p>Alexander Mathen is a 3rd year undergraduate student working on getting his teaching degree from the teachHOUSTON Program, as well as his bachelor's degree in Chemical Engineering. Alexander is working to become a role model for his future students and is willing to go through great lengths to make sure everyone succeeds! Alexander loves sports, especially basketball and football. He also jogs 3 miles every day.</p>

Amber Ooi



Biology Major,
Data Science Minor,
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Teacher, University of
Houston, College of Natural
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Amber Ooi is a junior at the University of Houston where she is a Biology major and a part of the teachHOUSTON program. She is really passionate about Ecology and new discoveries about Biology! She is currently working on research in the lab and her teaching career.

Paul Womack



Mathematics
Major, TeachHOUSTON
Preservice Teacher,
University of Houston,
College of Natural Sciences
and Mathematics.

Paul Womack is a 4th year Math undergraduate at the University of Houston and a preservice teacher in the teachHouston Program. Paul is excited to be a Math teacher soon, so he can show his students how Math is actually the most awesome subject. Also, he would like to start sleeping again!

Reshmi Joseph



Biochemistry Major,
Chemistry Minor,
teachHOUSTON Preservice
Teacher, University of
Houston, College of Natural
Sciences and Mathematics

Reshmi Joseph is an undergraduate at the University of Houston majoring Biochemistry and minoring in Chemistry. She is a part of the teachHOUSTON Program to learn how to enhance students' learning in STEM. She plans to become a medical doctor in the future and to focus on helping communities around her. In her free time, she likes to snuggle with her dog Daisy and watch Bollywood movies with her family.

Stephen Medel



Physics Major, Math Minor, teachHOUSTON Preservice Teacher, University of Houston, College of Natural Sciences and Mathematics

Stephen Medel is an undergraduate at the University of Houston majoring in Physics major and minoring in Mathematics. He is currently the vice president of the teachHouston Student Society at UH for Fall 2020 and Spring 2021 and is looking forward to being able to teach Physics and/or Mathematics. He likes to spend time with his adorable dog Murphy and studying Math and Physics.