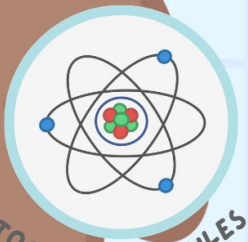
ISSUE 01

SWEET CHEMISTRY

EXPERIMENT

MARIE CURIE



ATOMS & MOLECULES

INCLUDES GAMES INSIDE!

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Dear Readers,

Thank you so much for picking up the very first issue of Sweet! I'm beyond thrilled to share this space with you, where we'll dive into the extraordinary world of STEM–Science, Technology, Engineering, and Math.

Sweet is all about inspiring and empowering young girls to explore and excel in these exciting fields. Whether you're curious about the cosmos, fascinated by robots, or eager to invent the next big thing, we're here to fuel your passion and help you shine.

In this debut issue, we delve into the world of chemistry, uncovering how it impacts our everyday lives and how you can conduct your own experiments at home!

I hope you're as excited for this journey as I am! Let's dive in and uncover the wonders of science together.

Happy exploring,

Chloe

STEM Exploration

THE MAGIC OF CHEMISTRY

How Do Everyday Reactions Shape Our World?

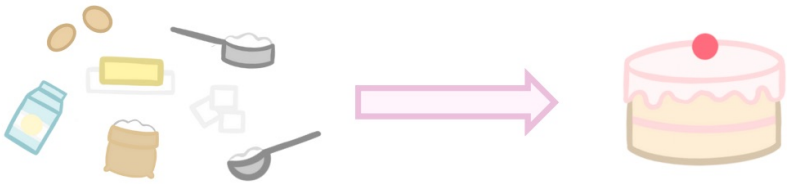
Have you ever wondered why highlighters are fluorescent or why your soap cleans so well? Chemistry is the secret behind these everyday wonders, turning ordinary moments into extraordinary science!

WHAT IS CHEMISTRY?

Chemistry is the study of **matter**, which is anything that takes up space and has weight, and how it changes through **chemical reactions**. These reactions happen everywhere—from how your ice cream melts on a hot day to how a fizzy soda bubbles up.

Imagine chemistry as a recipe book. Just like you follow a recipe to bake a cake, chemists mix different substances (called **chemicals**) to create new things.

In chemistry, the substances you start with in a reaction are called **reactants**. These are the ingredients that mix together to make something new. After the reaction takes place, the substances you end up with are called **products**.



In this case, the butter, milk, flour, salt, sugar, eggs, and baking soda are the reactants, which mix and transform into the product: a delicious cake!

IS IT FOR ME?

Chemistry is at the root of countless amazing discoveries. It helps us discover new materials, create brand new products, and even solve worldwide problems like pollution. If this sounds exciting to you, there's a wide range of career paths to explore!

You could become a **chemist** working in a lab, a **pharmaceutical scientist** developing new medicines, or an **environmental chemist** helping to keep our planet clean.

So, if you have a passion for experimenting, solving puzzles, and learning new things, chemistry might be the perfect match for you. Who knows? It could be ***you*** who invents the next big thing or makes groundbreaking discoveries that change the world.

Experiment

MAKE YOUR OWN

Chemical Reaction

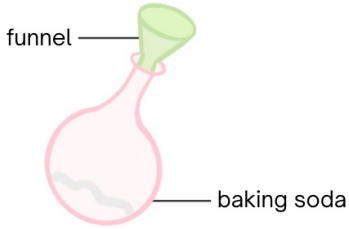
MATERIALS

- Balloon
- Empty bottle
- Funnel
- White vinegar
- Baking soda
- Measuring cup
- Measuring spoons

In this experiment, you'll learn how to inflate a balloon using a simple chemical reaction. Get your gloves, goggles, and let's begin!

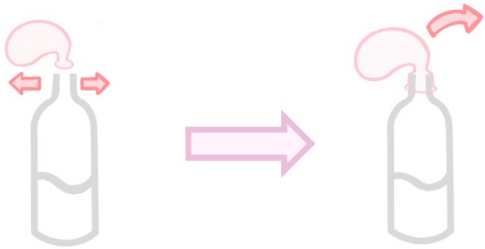
INSTRUCTIONS

1. Pour ¼ cup of white vinegar into the empty bottle and add ½ teaspoon of baking soda into the balloon.

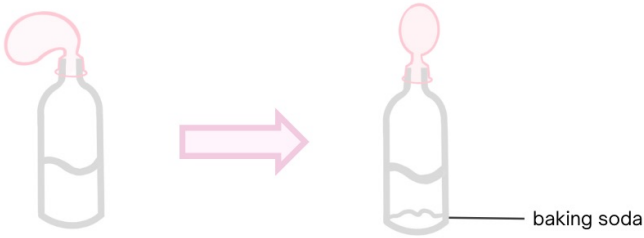


Note: Make sure to do this in a place where it's okay to make a little mess, like the kitchen or outdoors.

2 Stretch the balloon's opening over the bottle's neck.



3 Gently lift the balloon so the baking soda falls into the vinegar.



4 Draw what you see happening here!

EXPLANATION

In this experiment, we see how an acid and a base react with each other. An **acid** is a substance that tastes sour and can change colors, like vinegar. A **base** is a substance that feels slippery, like baking soda. When vinegar and baking soda mix, they create a chemical reaction that produces a gas called **carbon dioxide**. This gas is what you see filling the balloon and making it inflate!

Women in STEM

Marie Curie

1867 - 1934

Marie Curie, born Maria Salomea Skłodowska, was a widely-renowned French-Polish physicist and chemist. She is best known for her pioneering research on radioactivity, during which she discovered two elements: polonium and radium! This work established the foundation for modern radiology and advanced the development of more effective medical treatments.

HER STORY

From a young age, Marie Curie demonstrated remarkable intellectual talent and curiosity, which made her a prodigy in her studies. Recognizing her potential in 1891 she moved to pursue higher education at the University of Paris. There, she studied physics and math, quickly establishing herself as a leading mind in these fields.

In 1895, Marie met Pierre Curie, a fellow physicist, and they married the same year. The couple collaborated closely on their scientific research and had two daughters, Irène and Ève. After Pierre's untimely death in 1906, Marie continued her groundbreaking work independently.

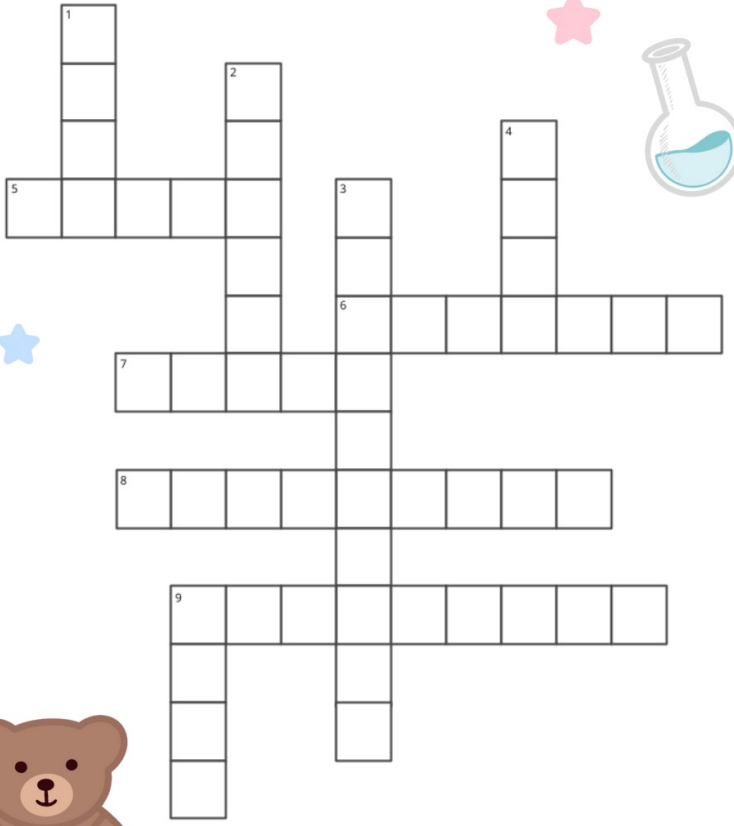
"I am among those who think that science has great beauty."

In recognition of her great contributions to science, Marie Curie became the first woman to win a Nobel Prize and remains the only person to have won Nobel Prizes in two different scientific fields: Physics in 1903 and Chemistry in 1911 for her work on radium. She also founded the Radium Institute in Paris, where she conducted most of her research.

LEGACY

Marie Curie's work undoubtedly revolutionized the world of science and medicine, especially in cancer treatment through radiation therapy. Her legacy endures in a number of institutions and research centers named in her honor, inspiring generations of young scientists like you.

chemical crossword



DOWN

1. A substance that's usually slippery
2. Anything that takes up space and has mass
3. A test used to discover something unknown or to test a hypothesis
4. A substance with a sour taste.
9. Acronym for subjects that help us understand and build things

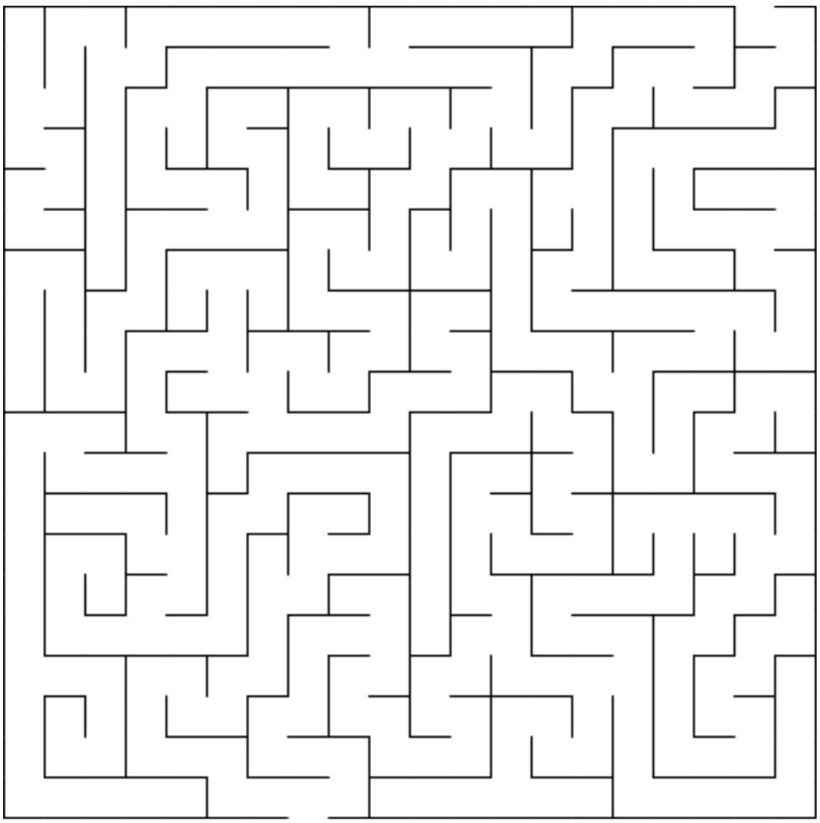
solutions p. 13

ACROSS

5. To undergo a chemical change, often when substances interact with each other
6. The result of combining two or more substances in a chemical reaction
7. Surname of a scientist known for her work on radioactivity
8. Substances that can be combined or changed
9. You!

MOLECULE MAZE

Help us find the water molecule (H_2O)!



(see p. 10-11 for the lesson)

Lesson

Atoms & Molecules 101

How Small Things Make Big Differences

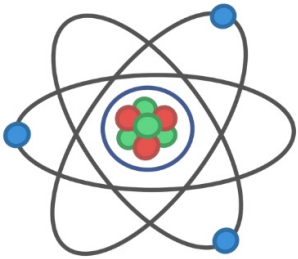
WHAT'S AN ATOM?

Atoms are the building blocks of all matter. They make all the things you see, touch, and feel. Everything around you, like the air, water, or even this magazine, is made up of these tiny atoms!

An atom is has three main parts:

- **Protons**: These are positively charged and are found in the center of the atom, called the **nucleus**.
- **Neutrons**: These are neutral–meaning they have no charge–and are also found in the **nucleus**.
- **Electrons**: These are tiny, negatively charged particles that orbit the nucleus like planets around the Sun.

Schema of an atom



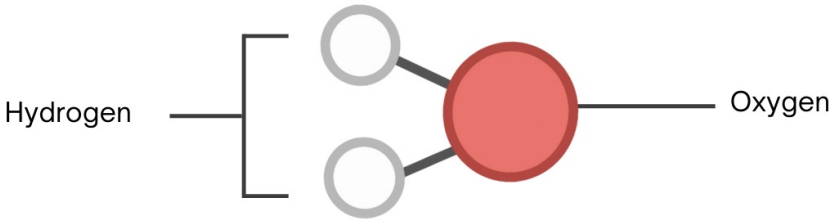
Did You Know?

The number of atoms in just one grain of sand is more than the stars in the Milky Way!

WHAT'S A MOLECULE?

Similarly to how each individual puzzle piece can form a bigger picture, when atoms join together, they form **molecules**.

For example, a water molecule (H_2O) is composed of two hydrogen atoms and one oxygen atom:



Scientists are continuing to explore the fascinating world of atoms and molecules. They are discovering new ways to use them to solve problems, create new materials, and even improve the future of medicine and technology. Maybe one day, you'll help make the next big discovery!

THANK YOU!

CONTACT US!

@sweetsciencezine

sweetsciencezine@gmail.com

sites.google.com/view/sweetsciencezine

ABOUT

SWEET (Science with Exciting Experiments & Tips) is a zine that aims to spark curiosity and empower the next generation of girls in STEM through hands-on experiments, fun lessons, and games.

SOLUTIONS