ISSUE 03

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Dear Readers,

Welcome to the third issue of SWEET!

This time, we're exploring a subject you might already know a little about: math. This part of STEM is commonly seen as just about solving problems with one right answer. But the more I learned, the more I realized how creative, weird, and even beautiful it can be. In fact, math shows up in so many unexpected places, like in designing a cool roller coaster or figuring out how to fairly slice a cake.

In this issue, you'll learn how math connects to real life, and how it can actually be exciting, creative, and fun.

By the end, I hope you'll see math the way I do, and maybe even love it too.

Happy exploring,

Chloe

MATH MAGIC

How numbers, shapes, and patterns create our world

When you hear the word "math," you probably think of numbers, right? Maybe even giant worksheets covered in fractions, multiplication, and long division that never seems to end. But math is actually so much bigger and more fascinating than that.

WHAT IS MATH, REALLY?

Math is the way the universe builds patterns and shapes all around us. It's hidden in the way waves crash on the beach, how trees branch out, and how bees build perfect hexagons in their hives. Every time you notice a pattern, a rhythm, or a shape that feels just right, you're actually noticing math at work.

Think of it like this: imagine you're building a treehouse. Before you hammer a single nail, you need a blueprint, a plan that shows exactly where each wall, window, and step goes. Without it, your treehouse would be a mess!

Math is the universe's blueprint.

Geometry sketches the shapes of everything, from spiderwebs to snowflakes.

Ratios help trees and animals grow in balance.

Patterns let rivers carve their paths and galaxies spin.

Just like a treehouse builder follows a blueprint, the universe follows math to create beauty, order, and wonder all around us.

IS IT FOR ME?

You might be wondering: "Do I have to be a math genius to use math?"
The answer is no! If you love noticing patterns, solving puzzles, creating, building, asking questions, or finding new ways to explain things, you're already thinking like a mathematician.

Math can lead you to amazing careers, like designing roller coasters, studying how animals move, creating video games, exploring outer space and even making new inventions!

Math is so much more than numbers, and no matter what you love to do, there's a little bit of math magic waiting for you.
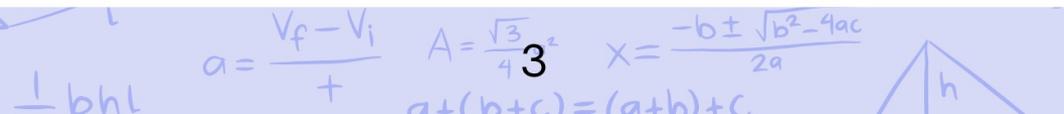
MAKE YOUR OWN Spirograph

By Melody Alduy-Berman

Did you know that math can be turned into something really beautiful? Grab your favorite colorful markers and some other materials, and let your creativity rise as you create amazing geometric designs with your very own DIY Spirograph! Make your own circles, choose the colors you like, and discover how different gears and shapes can create endless possibilities for patterns.

MATERIALS

- Plastic lid
- Cardboard sheet
- Corrugated cardboard
- Paper
- Scissors
- Glue
- Hole punch (or a thumbtack)
- Paper plate, or cup
- Masking tape

1 Trace and cut small circle (about 2–4 inches wide) from a plastic lid or thick cardboard. This is your spinner. From cardboard, cut out one large circle (5–7 inches wide). This is your base. You can use paper plates or cups to help trace the circles.
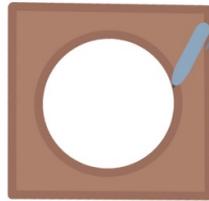
2 Use a hole punch or thumbtack to make several holes near the center of your spinner, but not exactly in the middle.

3 Place your base on a sheet of paper. You can tape it down using masking tape so it doesn't move while you draw. Put your spinner inside the base. Stick a thin marker through one of the holes and start rotating the spinner along the inside edge of the base. Watch the marker draw curves, loops, and spirals!

TIME TO DESIGN!

Punching holes in your circles is a great opportunity to use your STEM creative thinking skills! Where you punch your holes will affect the way your spirograph works and the outcome of your design.

You can also try different materials to see which reduces unwanted movement and provides more stability.

Have fun and don't forget to be creative!

Ada Lovelace

1815 - 1852

By Aleena Wong

Ada Lovelace, an English mathematician and writer, is most well-known for being globally considered the first computer programmer. She is championed for her work on Charles Babbage's proposed mechanical computer, the Analytical Engine. This machine was designed to compute any calculation and even had modern features like memory. Her realization that the computer needed more advanced mathematics than pure calculation led her to create the first computer program, one that could calculate Bernoulli numbers. These are a series of rational numbers (numbers that can be expressed as a fraction where both numbers are digits) used in various mathematical calculations.

HER STORY

Ada Lovelace was born in London as an only child. Weeks after she was born, her parents split and her mother put her through an uncommon and rigorous education.

This mainly consisted of math and science, which was to counteract what her mother saw as the artistic nature of her father. Over time, Ada's studies mirrored her mothers wishes. She even became fascinated with the idea of flying, leading her to write a book called *Flyology* at the age of 12. Her mentors Mary Somerville, a Scottish mathematician and scientist, and Charles Babbage, a British mathematician and inventor known as the "father of computers", both saw her potential and encouraged her studies in math. From then on she collaborated with Babbage to create the Analytical Engine.

"*That brain of mine is something more than merely mortal, as time will show*"

LEGACY

Ada Lovelace's legacy lies in her advanced vision for computing. Not only did she write the first computer program, she predicted that such machines could have various applications to produce music and art, not just carry out calculations. Her ideas of what could come from such machines was way ahead of her time and shifted the understanding of what computers could achieve. To this day she remains a symbol of inspiration and innovation, particularly for women in STEM, with programming languages, awards, and an international day celebrating her and her accomplishments.

Sum Squares

Put numbers in the boxes so each row and column adds up to the number at the end. Don't use the same number twice in a row or column!

			15
			10
			12
9	13	15	

			18
			14
			17
12	18	19	

THE
GOLDEN
RATIO

You might not know the number 1.618 by heart, but your eyes do.
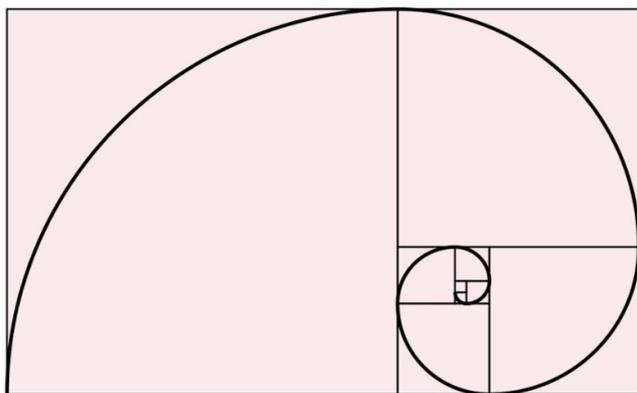
The Golden Ratio

It's called the golden ratio, and it's everywhere. In petals and pinecones. In snail shells and spiral galaxies. In paintings, buildings, and even the way people frame selfies. It's like math is quietly designing the world when we're not looking.

IN NATURE

Have you ever noticed how sunflowers grow in perfect spirals? Or how pinecones and pineapples seem to follow some invisible pattern? That's the golden ratio at work. It helps plants pack in seeds efficiently and grow toward the sun in the right way.

Did You Know?

The Golden Ratio is one of the hardest numbers to turn into a fraction. Most numbers can be written as fractions, like 1/2 or 3/4, but the Golden Ratio is super tricky. Even super-smart mathematicians say it's one of the most "irrational" irrational numbers ever!

IN ART

Artists from the Renaissance to today have used the golden ratio to make things look just right. In the Mona Lisa, her face fits perfectly into a golden rectangle. It can also be found in ancient buildings like the Parthenon in Greece. There's something about this ratio that is pleasing to the eye, almost like harmony in picture form.
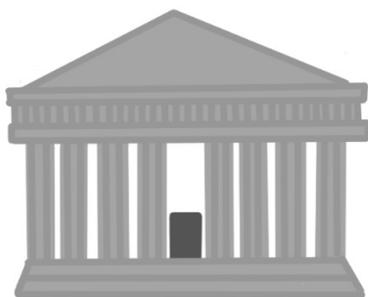
Mona Lisa

The Parthenon

IN EVERYDAY LIFE

You don't have to be an artist or a scientist to find the golden ratio. It's hiding in the way we arrange photos, design logos, or even how a beautiful swirl of whipped cream looks on top of a cupcake.

Once you start looking for it, you'll see golden spirals and patterns popping up everywhere.

The golden ratio isn't magic. It's math. But sometimes, it kind of feels like both.
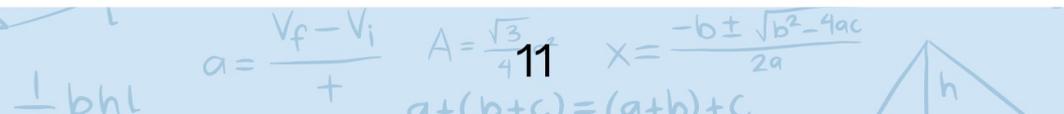
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ABOUT

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

6	1	8	15
2	3	5	10
1	9	2	12
9	13	15	

7	6	5	18
3	5	6	14
2	7	8	17
12	18	19	

OUR TEAM

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