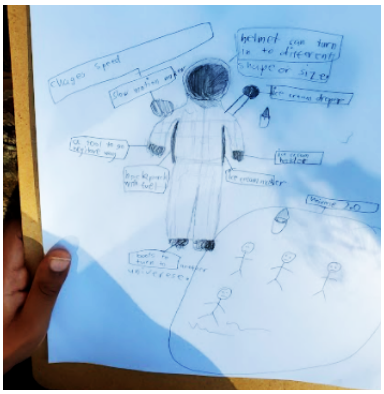
Functions, Functionals, and *Funville Adventures* Math Maker Circle

What are we making? Stories where functions and functionals come to life.



Travel through space faster and faster and faster until you can get across the universe in one minute.

Unicorn gets prettier and prettier, but not prettier than the rainbow. Because nothing is prettier than rainbows!

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Pathways

#26 Real Functions
#68 Computer Science

IS WHAT YOU MAKE IT!

Send your creations, stories, and questions to reach.out@naturalmath.com or text 919-388-1721. We answer every message.

Math Makers Circle is an informal learning space where participants make mathematics accessible to everyone in kind ways. Everyone makes a mathematical object in their own way and helps math friends to make theirs. And then what? Pathways from the international Mathematics Subject Classification: https://msc2020.org/

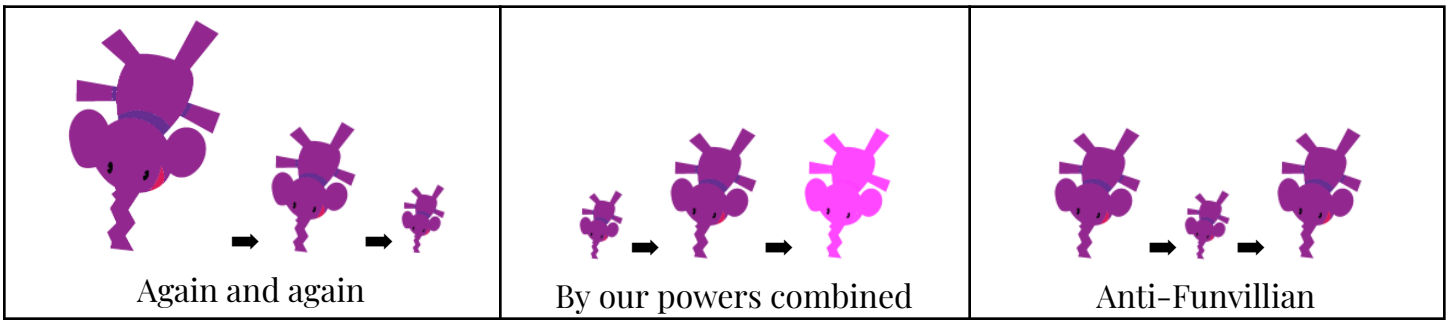
Dreams, Plans, and Guideposts

What will we make? Stories where **functions** and **functionals** come to life as characters with math powers that **transform** objects or other characters' powers. Inspired by https://NaturalMath.com/Funville/

Interesting choices? Choose a **domain** of objects that you like—buildings, toys, plants, magical creatures, robots, or something else. Choose to tell a **realistic or fantastic** story. Pick a **mathematical property** of your object, such as shape, size, pattern, speed, and so on. What if a person had the power to change that property? Choose a **qualitative change**, such as making a building taller or trees grow square leaves, or an **operation,** such as making a spaceship twice as fast. Choose how you can **model** what happens next, for example, write, build, or draw.

What will we explore? Time to check out mathematical implications of your choices!

- **Iterate** your character's power several times. Does it work? If not, what goes wrong? What if your character uses the power **infinitely** many times? Is there a **limit** or **boundary** to the changes?
- **Combine** different powers, one after another. Choose characters to combine, how many, and in what order. Does this always work? Does the order matter, or are the powers **commutative**?
- Create a character whose power is the **inverse** of yours (undo; anti; opposite). Is that always possible? Are your two characters friends, colleagues, or enemies in your story?
- Create a **functional**: a character whose power changes others' powers. Whose powers can your character transform? Does this always work? Can you iterate, invert, or compose your new character's power?



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Math Maker Party

Reflect and celebrate!

💗 Favorites

What felt better and made most sense to you today, so we can do more of that next time?

Making

What did you make? What else could we make?

🧭 Exploring

What came of everyone's choices? How were our creations similar and how were they different?

❓ A question

Ask a question, any question. It's okay to ask more than one. It's okay if you don't yet know how math connects to your question.

Abstracting

What's the big idea? What patterns, structures, or connections did you notice? Where else could you use today's ideas?

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