Flubber and Topology

Week 3

Flubber (1997) Trailer

TheTrailerGal

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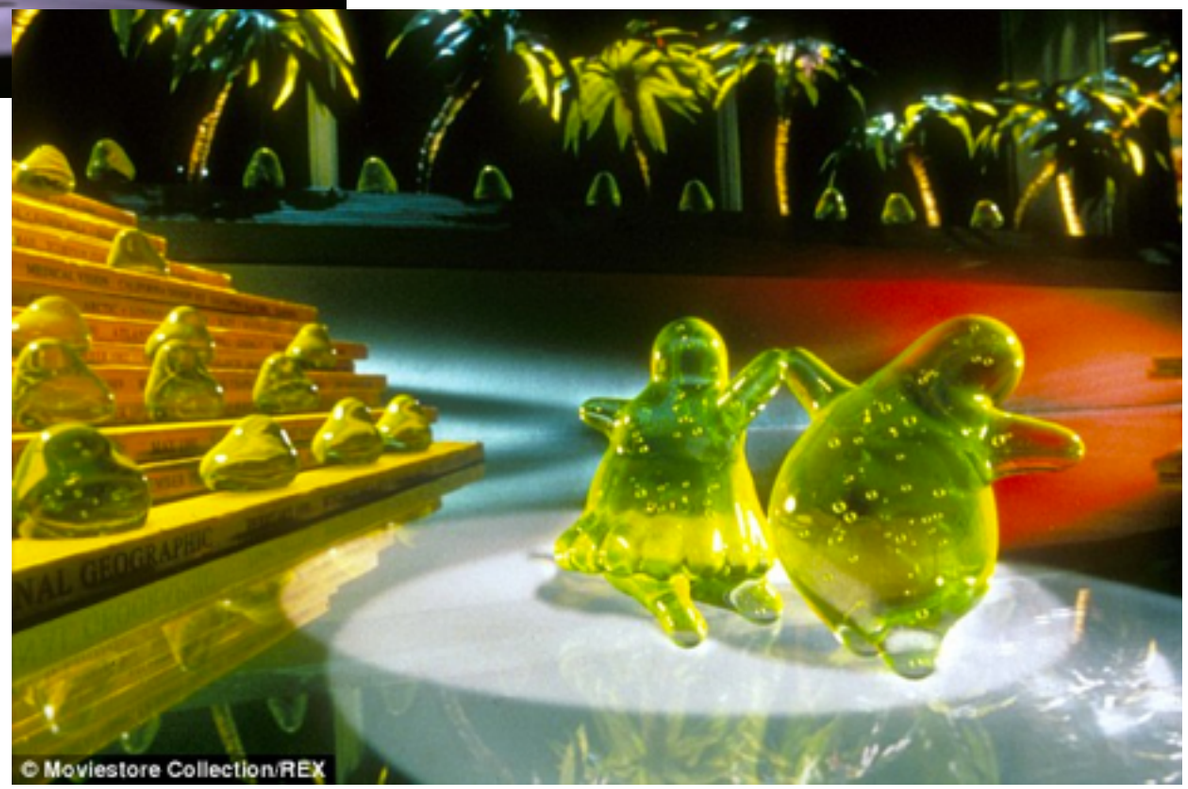
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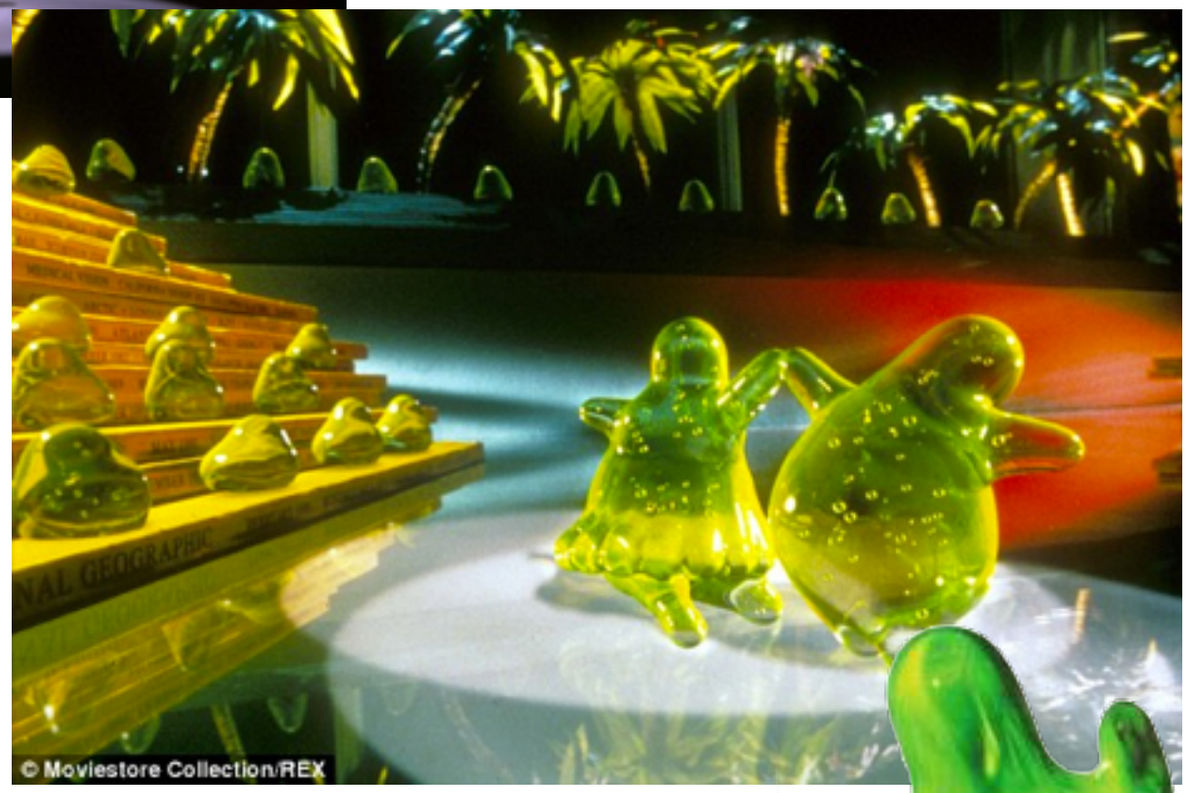
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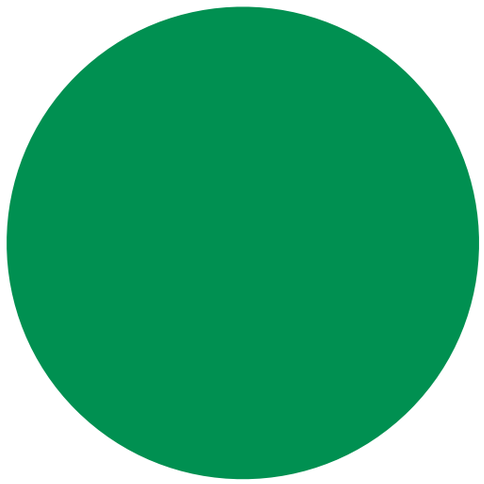
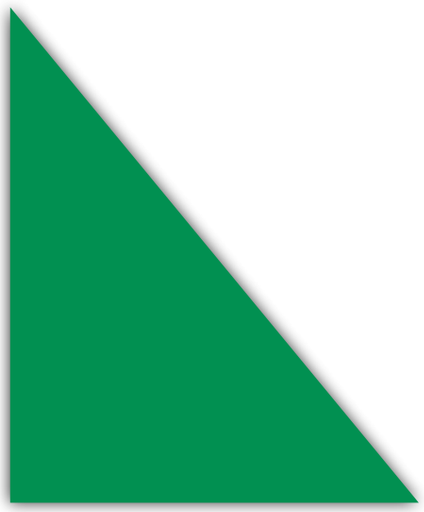
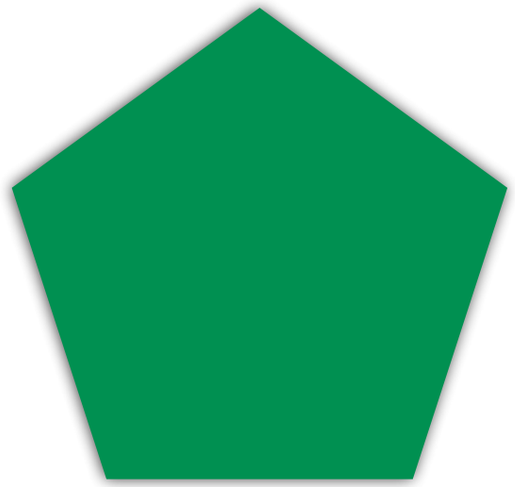
Topology

- "the modern version" of geometry, the study of all different sorts of spaces
- The thing that distinguishes different kinds of geometry from each other is in the kinds of transformations that are allowed before you really consider something changed.

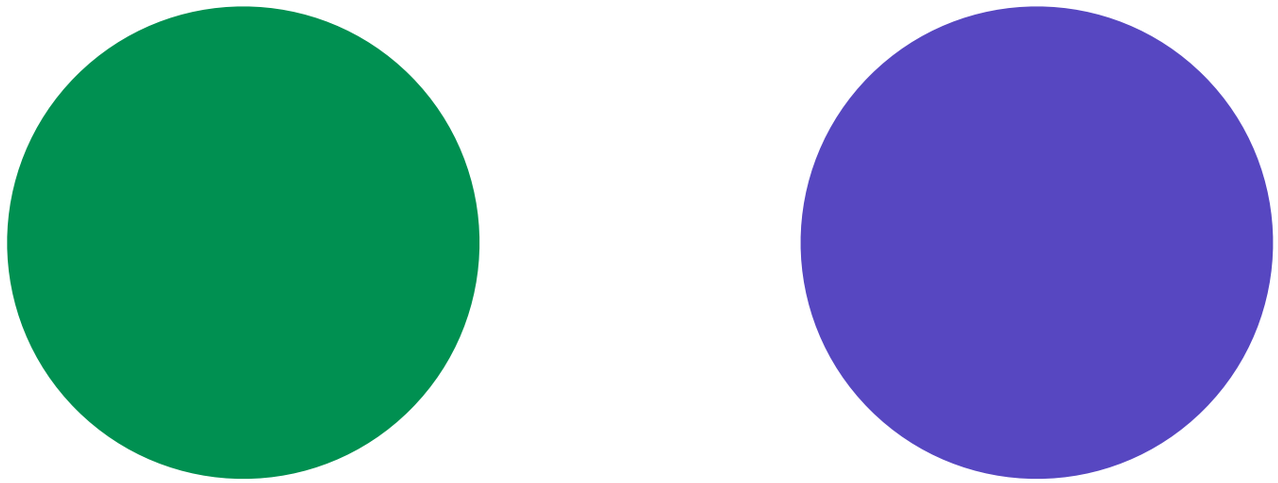






Euclidean Geometry

- Most of us are familiar with Euclidean Geometry
- The idea of congruence here is when they exactly match
  - visually, you can stack them and the edges will all line up



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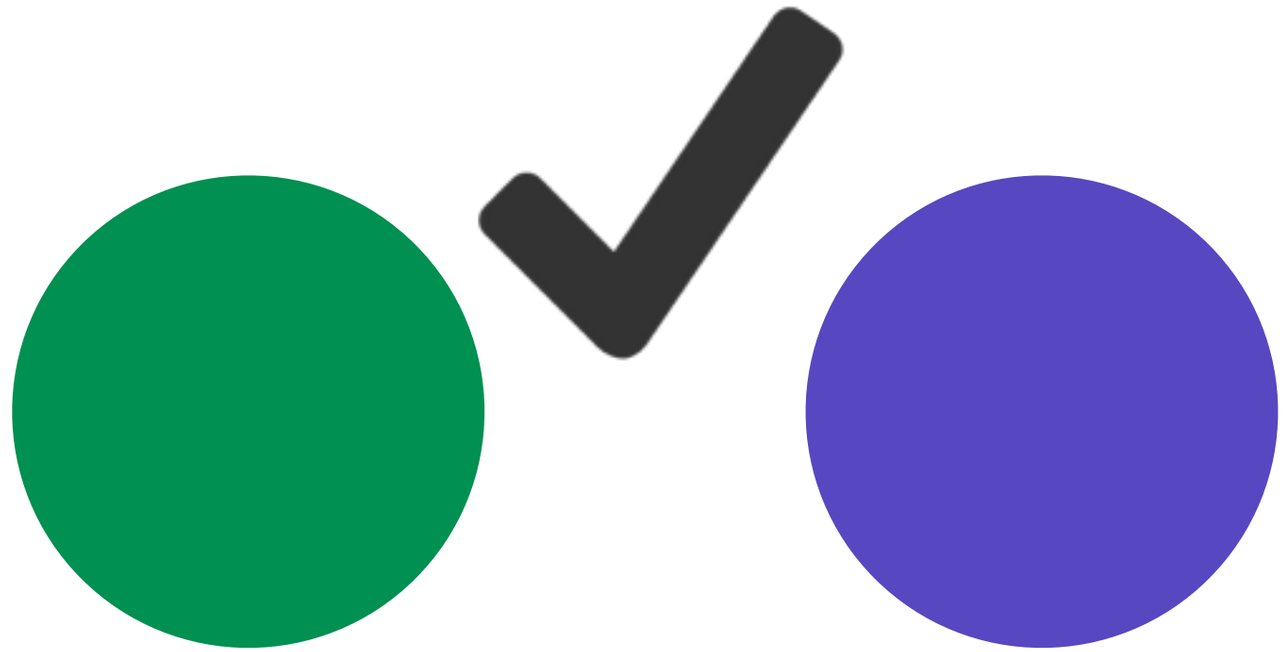


Remember these..

You were doing geometry even when you were a kid!

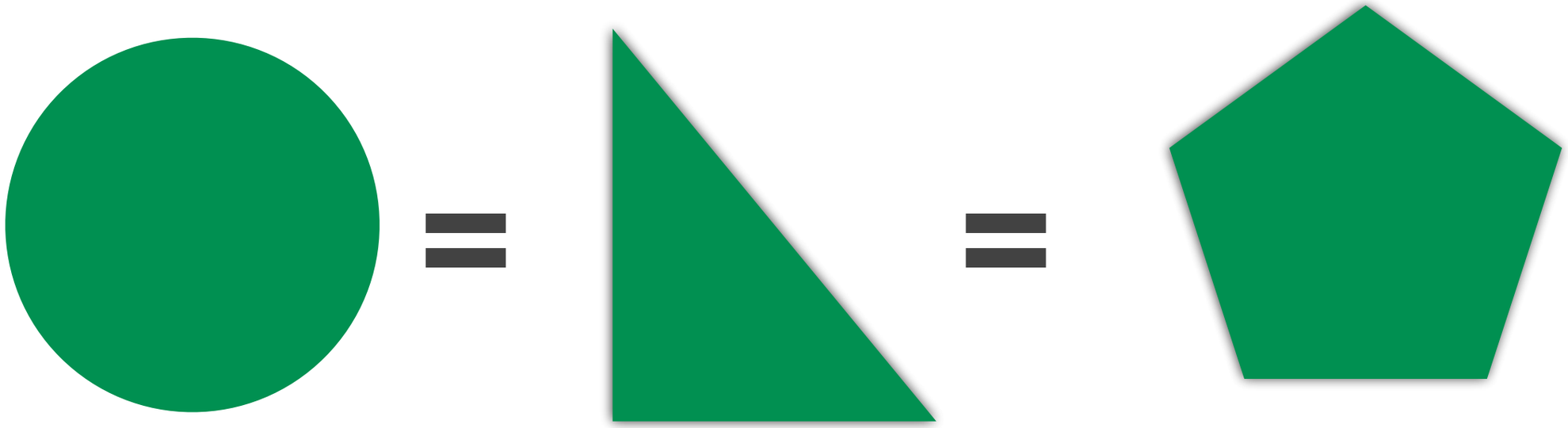
Remember these...

Me as a child…

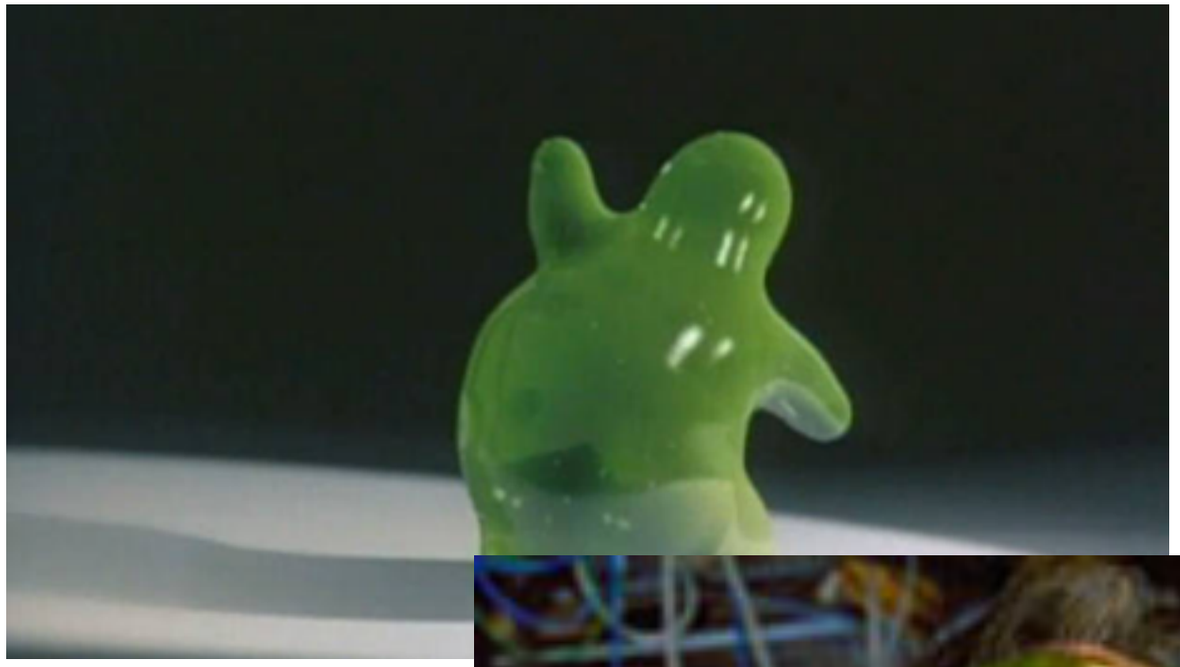
You were doing geometry even when you were a kid!

Topology

- Topology follows a different set of rules
- any continuous change which can be continuously undone is allowed.



So Weird! Flubber, can you help?



Think this way

- If Flubber can morph in a different shape, then they are congruent! If he can't then they are not

Still the same Flubber

Homeomorphic

“In the mathematical field of topology, a homeomorphism or topological isomorphism or bi continuous function is a continuous function between topological spaces that has a continuous inverse function. Homeomorphisms are the isomorphisms in the category of topological spaces—that is, they are the mappings that preserve all the topological properties of a given space. Two spaces with a homeomorphism between them are called homeomorphic, and from a topological viewpoint they are the same.”

Homeomorphic

"In the mathematical field of topology, a homeomorphism or topological isomorphism or bi continuous function is a continuous function between topological spaces

For every shape, there is for sure another shape in another topological space

Every shape is possible! No shapes that CAN'T be made (kinda)

Homeomorphic

"In the mathematical field of topology, a homeomorphism or topological isomorphism or bi continuous function is a continuous function between topological spaces that has a continuous inverse function.

Everything can be undone!

Homeomorphic

Homeomorphisms are the isomorphisms in the category of topological spaces—that is, they are the mappings that preserve all the topological properties of a given space.

When you transform a shape, topologically, no traits are lost

You can squish it or compress it, but it's all the same

Homeomorphic

Two spaces with a homeomorphism between them are called homeomorphic, and from a topological viewpoint they are the same.”

Same topological properties, same shape

Same # of holes = same shape

"A mathematician walks into a coffee shop and asks for a donut. He's given a coffee cup instead. He leaves happily and even tips the cashier"

Remember,

If you can squish/compress it to a different shape, then they are homeomorphic, which means that topologically, they are the same!

Flubber is a topological suface!

Flubber can morph into many other topologically equivalent shapes! He can be stretched, compressed, and he'll be the same. If we have many Flubbers, even in different shapes,they'd all be twins.

Flubber is a topological suface!

Flubber: Dance of 1000 Flubbers

Philip Alexy

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32,610

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Flubber, show us some tricks!

Watch me turn myself inside out!

Flubber, show us some tricks!

Smale's Paradox

We didn't tear or glue any parts of the sphere! Thus, topologically, this is a valid transformation.

Show us another one!

Watch me turn myself into a bottle!

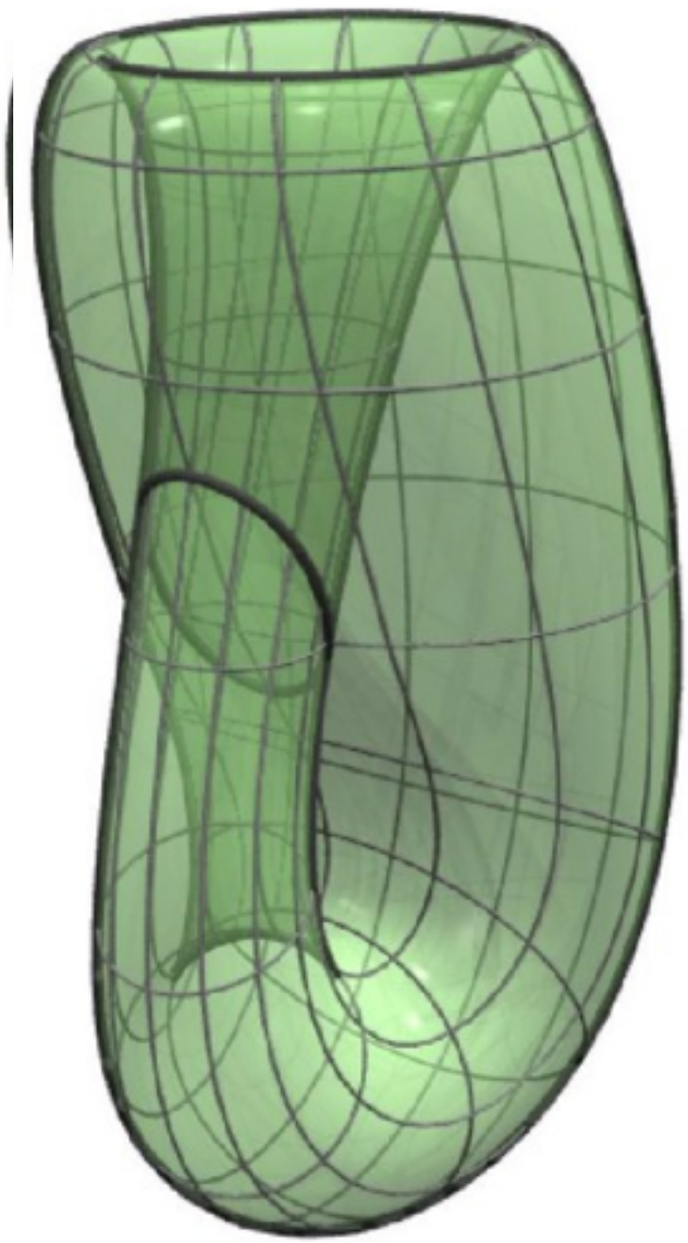
Klein Bottle

- A one sided surface, with no boundary and no volume
- **You can walk around the entire surface and get to any point**

Like a sphere then, right?

Klein Bottle

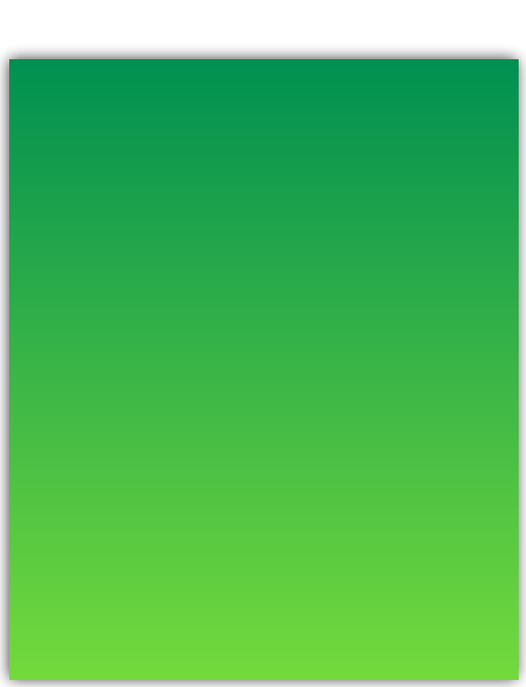
Klein Bottle

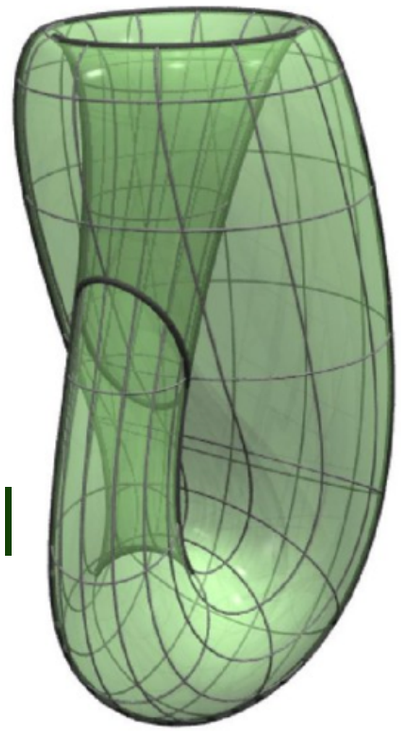


Klein Bottle

Brain hurts

You can walk anywhere on here





After transforming it, we can still do the same!

mathbook

Euclid is currently making the proofs that you studied in 9th grade geometry.

Wall | Info | Photos | Boxes

Basic Information

Sex: Male
Birthday: 330 BC
Hometown: Tyre
Education: Plato’s Academy, Athens, Greece

Write something…

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View photos of Euclid (0)

Send Georg a message

Poke message

Information

Networks:
Greece
Birthday:
330 BC
Hometown:
Tyre

Friends (500)

Pythagoras

Aristotle

is the Father of Geometry

published the book, ‘Elements’

Got a statue of myself #FAMOUS

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