

Science Emoji Proposal for Unicode v2

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To: ESC, UTC

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Disclaimer

This document is a proposal whose contents are subject to UTC review, and any and all details are therefore subject to change. Any characters that are contained in this proposal, along with their attributes, including, but not limited to, their names, code points, and representative glyphs, should not be construed as final. There is also no guarantee that the characters will be added to the Unicode standard.

Summary

Science is global, and conversations about the method-driven enterprise are hardly confined to classrooms and laboratories.

The Facebook page for science fan site “I Fucking Love Science” has more than 25 million followers.¹ A search of the hashtag #science on Instagram returns nearly 4 million posts.² Meanwhile, at nearly 4 PM Eastern on a Thursday, one week after the U.S. presidential election, some 100,000 people were talking about climate change on Facebook, according to the company’s search results. *Science Magazine*, *Scientific American*, *WIRED Science*, and other popular and professional scientific publications have many tens of millions of followers combined on Facebook.

In [a Nov. 14 blog post](#) for *Scientific American*, journalist Dan Rather called for scientists to assert themselves in the public discourse in light of growing anti-science sentiment.³ They have responded by organizing a March for Science on Earth Day in Washington, DC, and more than 400 satellite marches around the world. The March for Science group on Facebook counts more than 840,000 members.⁴

As science garners mainstream attention, we propose the series of science-related items in the tables below for encoding in Unicode.

The items listed below are specifically requested of Unicode by the authors listed above, the American Chemical Society, which is a professional society for more than 157,000 chemists, and General Electric⁺, which created *Emoji Science*, an emoji-based science outreach campaign.

We reached out to more than a dozen science organizations representing scientists and science enthusiasts worldwide to gather science emoji suggestions. The International

Council for Science (ICSU) and the American Geophysical Union (AGU) responded by our deadline.

ICSU is an international organization of national scientific membership bodies, representing 142 countries, and international scientific unions. Its mission includes facilitating “interaction amongst scientists across all disciplines and from all countries.”

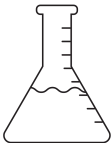
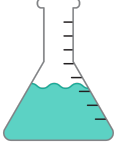
A U.S.-based scientific professional society with some 60,000 members in the geosciences, AGU estimates the geoscience community to be about 500,000 people worldwide. The organization began a Twitter campaign in December 2016 using the hashtag #geomoji, and it generated responses from all over the world. The top request during the #geomoji campaign was for plant emoji, which have been submitted as a separate proposal (Swetz et al, April 2017).

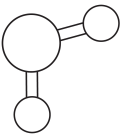
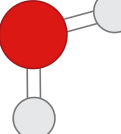


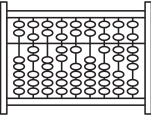
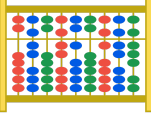

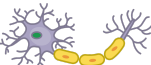




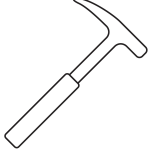

Based on these responses and those from ICSU, we’ve created tiers that represent requested emoji in the general sciences and sub-disciplines like geology, chemistry, and biology.

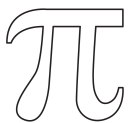
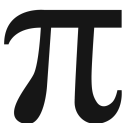




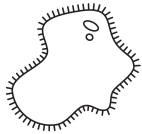
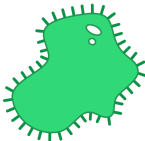


Among the tiered items proposed below are goggles, a lab coat, and a fire extinguisher—each of which is a mainstay in representing laboratory science. We’re also requesting sub-discipline specific emoji like a rock, an Erlenmeyer flask, a petri dish, and a compass.

PROPOSED CHARACTERS



Tier 1: General science emoji are interdisciplinary, can be used for non-science purposes, and are recognizable worldwide.

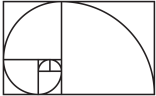

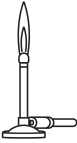



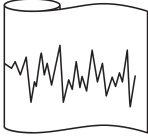
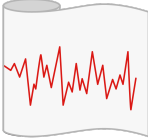




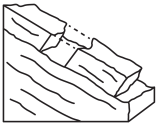

Name	B&W Image*	Color Image*	Other Key Selection Factors (for inclusion)
ERLENMEYER FLASK			ERLENMEYER FLASK could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D).

MOLECULE			MOLECULE could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D).
FOSSIL FISH			FOSSIL FISH could be located with fish (U+1F41F).
ABACUS			ABACUS could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D).
NEURON			NEURON could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D).
PETRI DISH			PETRI DISH could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D).
DNA			DNA could be located with microscope (U+1F52C), pill (U+1F48A), and syringe (U+1F489).
ROCK HAMMER			ROCK HAMMER could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D) or with hammer (U+1F528) and pick (U+26CF)

PI			PI could be located with the atom symbol (U+269B).
GOGGLES			GOGGLES could be located with glasses (U+1F453) and sunglasses (U+1F576). GOGGLES is ripe for combination by zwj sequence with many of the approved smiley face emojis.
FIRE EXTINGUISHER			FIRE EXTINGUISHER could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D).
MICROBE ESC on April 8, 2017, received a proposal for bacteria which notes the importance of microbes. (Proposal for BACTERIA by Dawid Kubicki)			MICROBE could be located with microscope (U+1F52C), pill (U+1F48A), and syringe (U+1F489) or in the Animals & Nature section.
ROCK			ROCK could be located in the Animals & Nature section.

Tier 2: Sub-discipline science emoji are more specific to fields like geology, chemistry, and biology. Many of these can be used for non-science purposes and are recognizable worldwide.

Name	B&W Image*	Color Image*	Other Key Selection Factors (for inclusion)
LAB COAT			LAB COAT could be located with necktie (U+1F454), t-shirt (U+1F455), jeans (U+1F456), dress (U+1F457), kimono (U+1F458), etc.

FIBONACCI SERIES			FIBONACCI SERIES could be located with the atom symbol (U+269B).
BUNSEN BURNER			BUNSEN BURNER could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D).
COMPASS			COMPASS could be located with world map (U+1F5FA).
SEISMOGRAM			SEISMOGRAM could be located with alembic (U+2697), microscope (U+1F52C), and telescope (U+1F52D).
IMPACT CRATER			IMPACT CRATER could be located with mountain (U+26F0) and volcano (U+1F30B).
WARMING EARTH			WARMING EARTH could be located with Earth globe Europe-Africa (U+1F30D) and other globes.
LANDSLIDE			LANDSLIDE could be located with mountain (U+26F0) and volcano (U+1F30B).

SELECTION FACTORS FOR INCLUSION

A) Compatibility

N/A

B) Expected Usage Level

a) Frequency

There is strong existing demand for science-themed emojis. The “Chemoji” keyboard app created by the American Chemical Society in August 2015 has been downloaded more than 13,000 times. It includes chemistry-themed images, such as the grinning face ([U+1F600](#)) with goggles, beakers, and lab-coated scientists in familiar laboratory scenes.

General Electric’s Emoji Science campaign, which began in late 2014, generated a series of videos hosted by popular science personality Bill Nye that explain science using emoji. This series was referenced as a clue in the New York Times crossword puzzle on Sept. 9, 2016.⁵

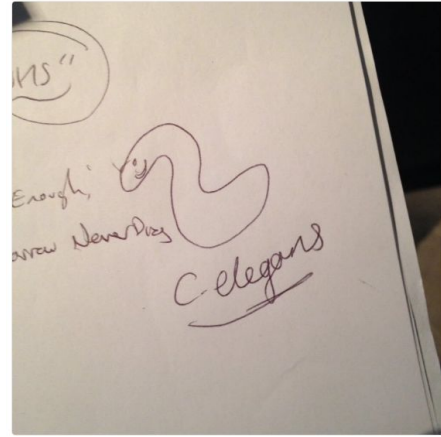
The following are examples of interest in science emoji at events, on social media, and in popular culture:

- In Nov. 2016, science journal and newsmagazine Nature asked readers to submit their science emoji ideas using the hashtag #sciemoji. Responses included replication crisis emoji, *C. elegans* emoji, Jacques Cousteau hat emoji, and lab coat emoji (shown below).

Andreas Brandmaier @brandmaier · 23 Nov 2016
Indispensable: The replication crisis emoji #SciEmoji @NatureNews
🌐 Translate from Spanish



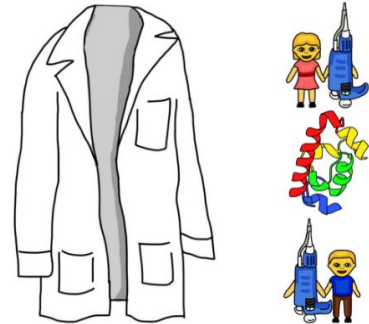
Hanne Stawarz @Moruseon
@NatureNews my friend @bianca_bana needs this to happen:



Jamie Hudson @Jamie_Bio
Late to the party with #SciEmoji. May I present from the man who inspired numerous marine scientists... Cousteau's hat



Sketching Science @sketchscience · 13 Nov 2016
#SciEmoji @NatureNews



- A Twitter account run by the Canadian Society for Ecology & Evolution said, “We heartily endorse #sciemoji as #scicomm exercise: Reduce research jargon, focus on fundamental message, have fun.”
- In a blog post from The American Association of Chemistry Teachers, an Indiana chemistry teacher says, Chemoji stickers are “a fun and easy way to include my love of chemistry in my digital communication.”
- Chemists and scientists have had an overwhelmingly positive response to the Chemoji stickers:



Carmen Drahl @carmendrahl · Aug 13

OMG. ROFL. Chemistry emoji are a thing you can have. ow.ly/QR6e9 Via @ihearttheroad #acschemoji



← ↻ 36 ❤️ 29 ⋮



RealTimeChem @RealTimeChem · Aug 18

Currently downloading #ACSchemoji I warn you I may get carried away with these. #RealTimeChem

← ↻ 1 ❤️ 4 ⋮



Chemjobber @Chemjobber · Oct 11

I cannot overestimate how much people loved the #chemoji. #DIYscizone #ggc15



← ↻ 4 ❤️ 10 ⋮



Jeff Ting @J_Ting1 · Aug 13

@krummc Stole your idea :)

Grad School: ACSChemoji

1st Year 2nd Year 3rd Year



4th Year 5th Year



- Host of the web series “Emoji Science” was a clue on the Sept. 9, 2016, New York Times crossword puzzle. Emoji Science is a campaign created by General Electric to explain science concepts using emoji.



b) Multiple use

Many of the emojis in this proposal have multiple uses.

Goggles: While scientists frequently wear safety goggles, they don't have an exclusive claim to their use. Skiers, swimmers, mechanics and others can use GOGGLES as well. More informal uses of GOGGLES in language, like the phrase "beer goggles," can now also be represented.

Fire extinguisher: FIRE EXTINGUISHER can be used for laboratory and other safety. But it can also be used as a response to or in combination with FIRE (U+1F525).

DNA: Outside of science and medicine, DNA is often used to mean the essence of a person or thing. The phrase “it’s in our DNA” has been used by everyone from car companies

(<https://www.youtube.com/watch?v=cez6Muw5-7A>) to churches (http://www.ucc.org/daily_devotional_its_in_our_dna).

Molecule: As one of the most recognizable molecules, H₂O can stand for molecules in general. But while drops and waves are already represented among emoji, H₂O itself is not. H₂O can be used in conversations about thirst.

Compass: It’s a critical tool used by geologist, biologists and others who do fieldwork, and COMPASS is also popularly understood as a symbol of finding one’s way, as in the phrase “moral compass.”

Pi: Often used humorously as a stand-in for its homonym, pie. PI has its own holiday in the U.S., as well, March 14.

Rock: Rock music continues to be one of the world’s most popular genres, making ROCK likely to be frequently paired with musical note (U+1F3B5). ROCK will also be useful for expressing excitement, as in “This rocks!”

C) Image Distinctiveness

All of the items proposed to be emoji have very distinct images.

D) Completeness

While several approved emojis already fall under the umbrella of science, technology, engineering and mathematics, such as MICROSCOPE (U+1F52C), TELESCOPE (U+1F52D), and SYRINGE (U+1F489), the proposed items add unrepresented disciplines like chemistry, physics, geology, mathematics and molecular biology to the emoji keyboard.

SELECTION FACTORS FOR EXCLUSION

E) Overly Specific

N/A

F) Open ended

There are many possible items that could represent the various scientific disciplines and their activities. We chose the items we thought would best stand for science as a whole, but it is possible others may propose additional scientific items in the future.

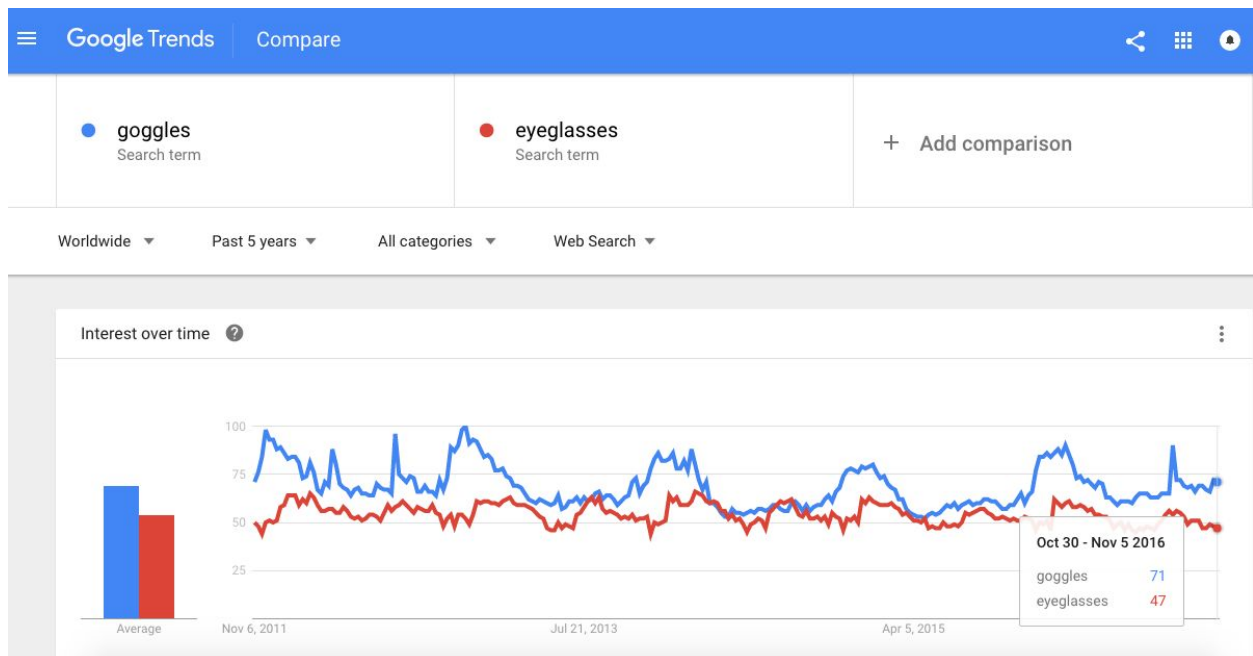
G) Already represented

None of these objects are represented already.

EVIDENCE OF FREQUENCY

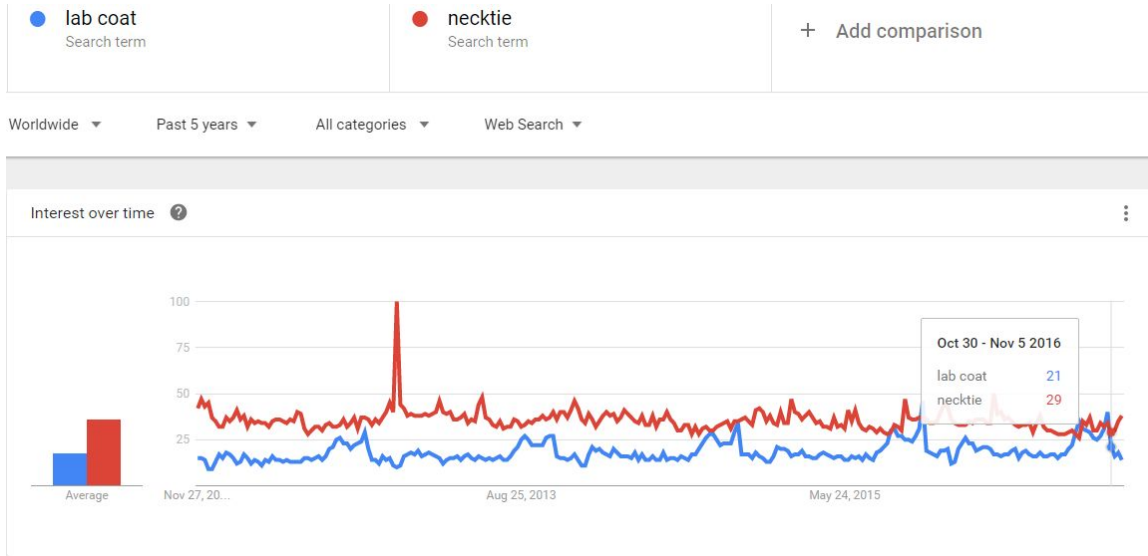
Popularity estimation of proposed characters based on comparison to existing characters using Google Trends

GOGGLES - 151% popularity: Goggles 71 vs Eyeglasses 47



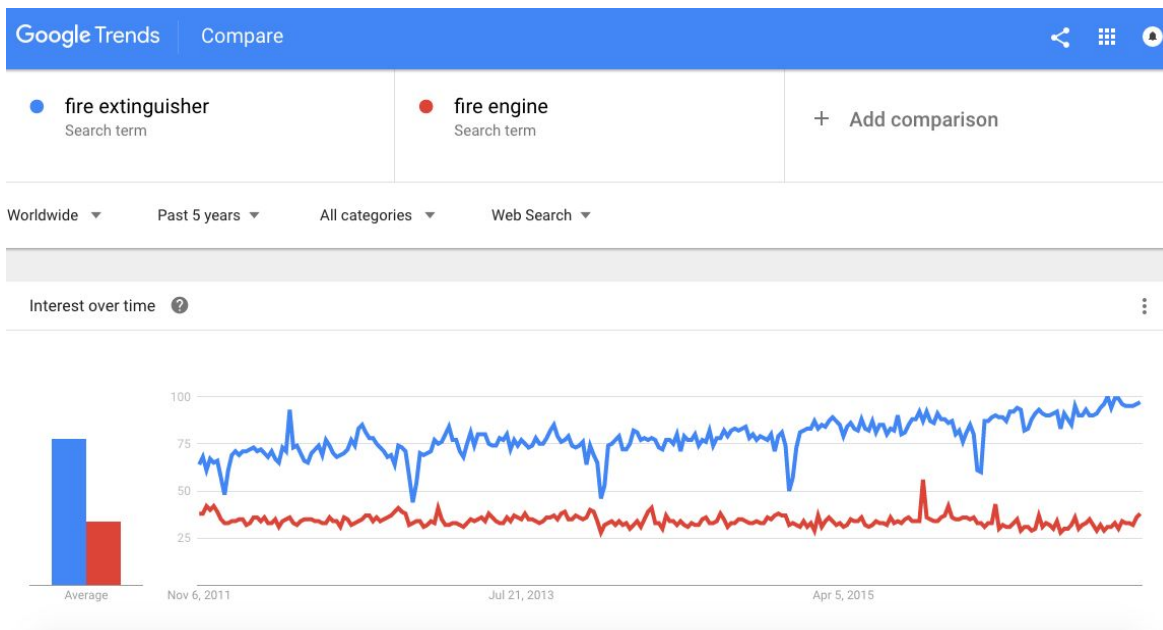
<https://www.google.com/trends/explore?q=goggles,eyeglasses>

LAB COAT - 72% popularity: Lab Coat 21 vs Necktie 29



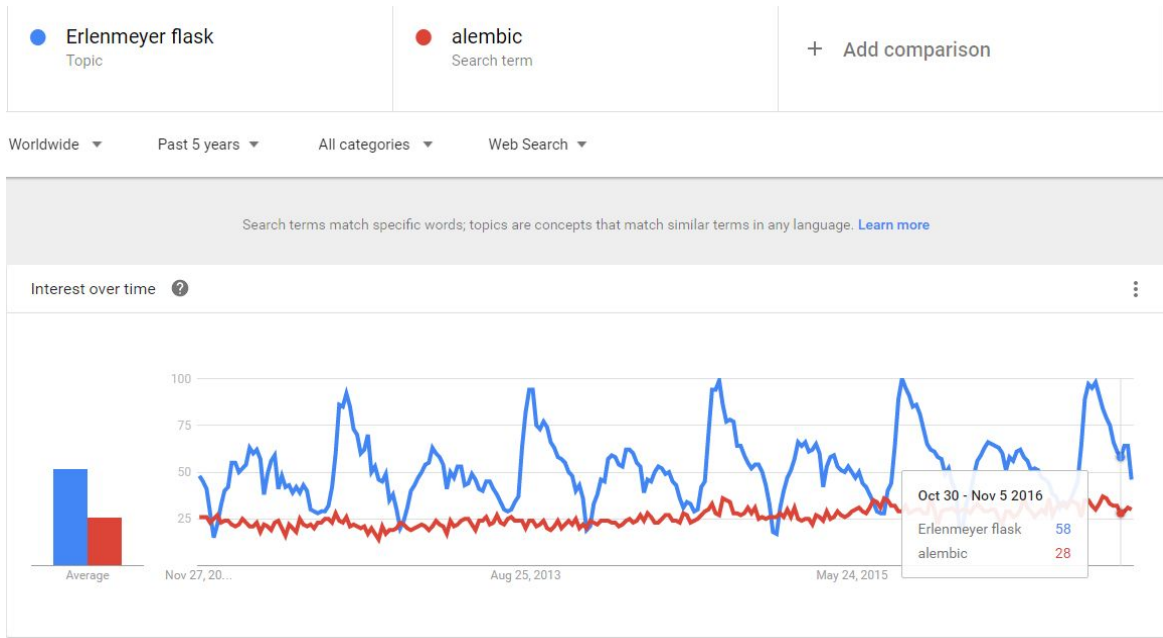
<https://www.google.com/trends/explore?q=lab%20coat,necktie>

EXTINGUISHER - 255% popularity: Fire Extinguisher 97 vs Fire Engine 38



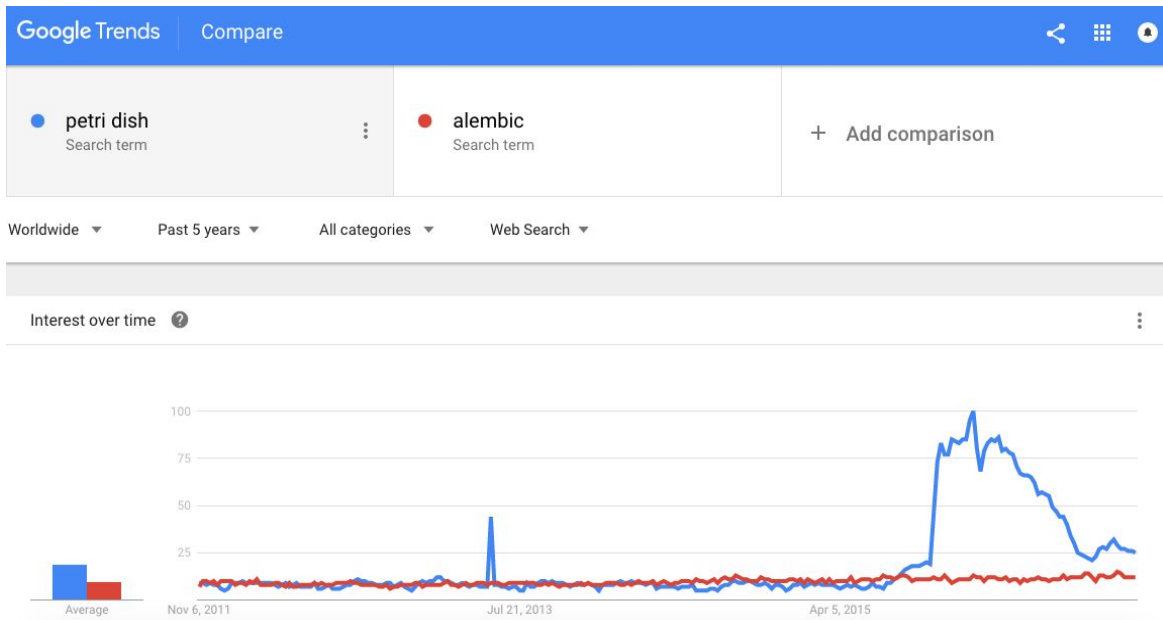
<https://www.google.com/trends/explore?q=fire%20extinguisher,fire%20engine>

BEAKER - 207% popularity: Beaker 58 vs Alembic 28



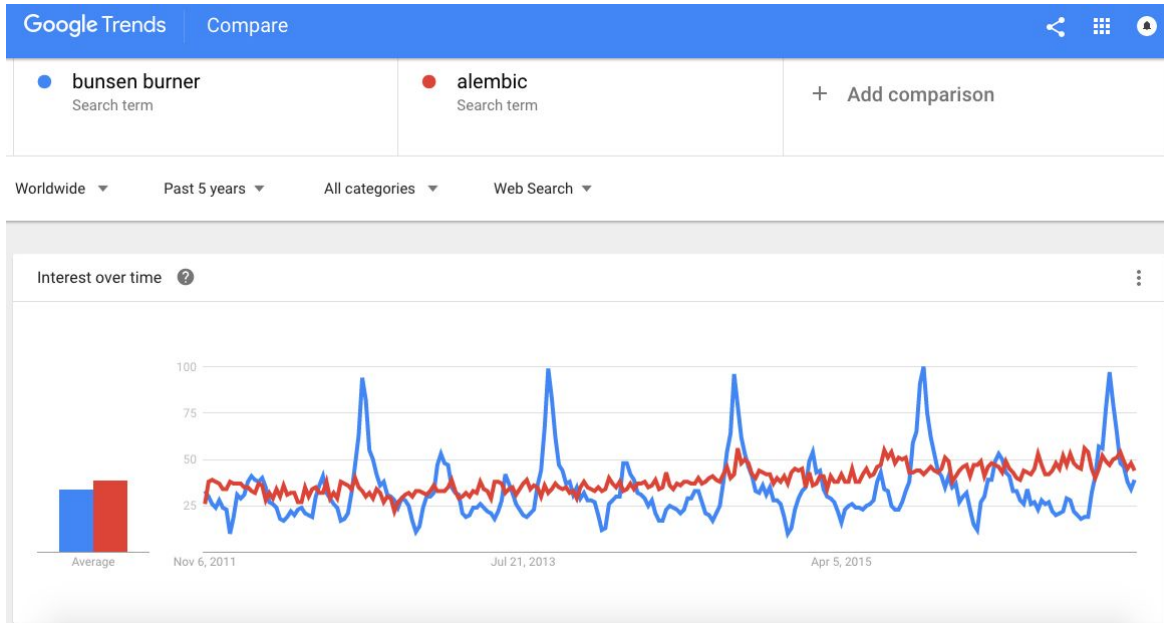
https://www.google.com/trends/explore?q=%2Fm%2F0b_s8,alembic

PETRI DISH - 208% popularity: Petri Dish 25 vs Alembic 12



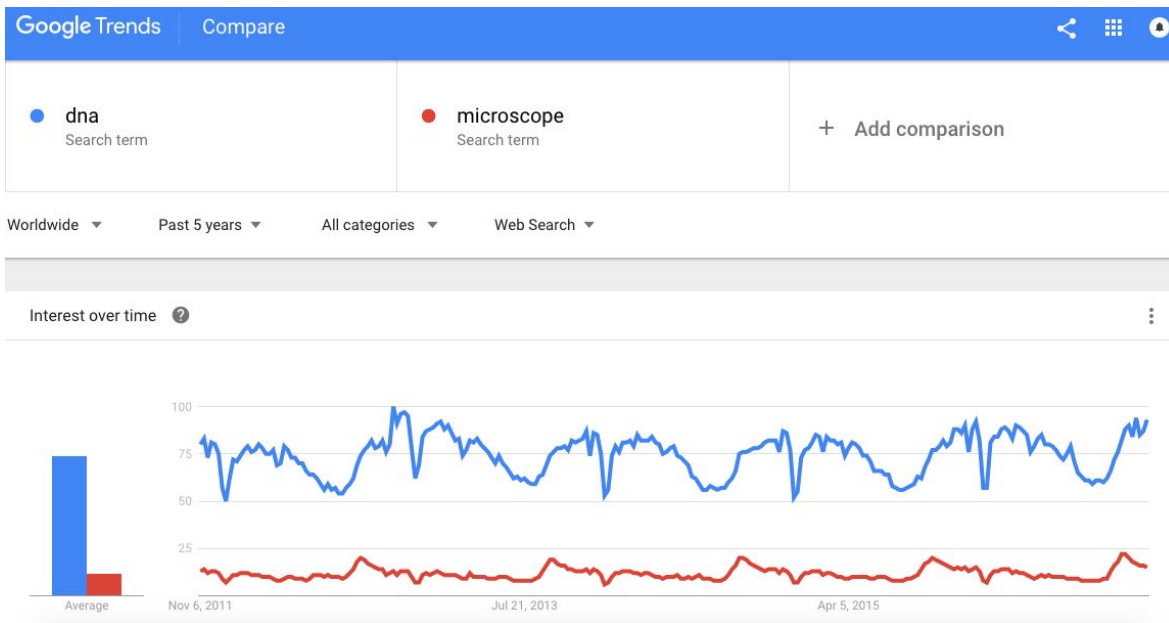
<https://www.google.com/trends/explore?q=petri%20dish,alembic>

BUNSEN BURNER - 88% popularity: Bunsen Burner 39 vs Alembic 44



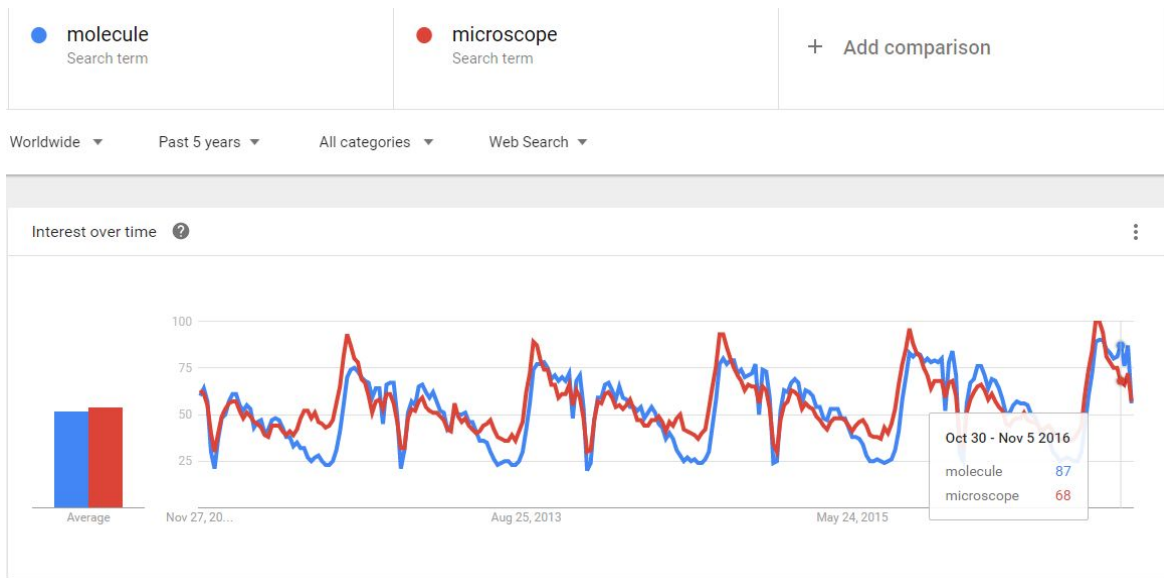
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DNA - 620% popularity: DNA 93 vs Microscope 15



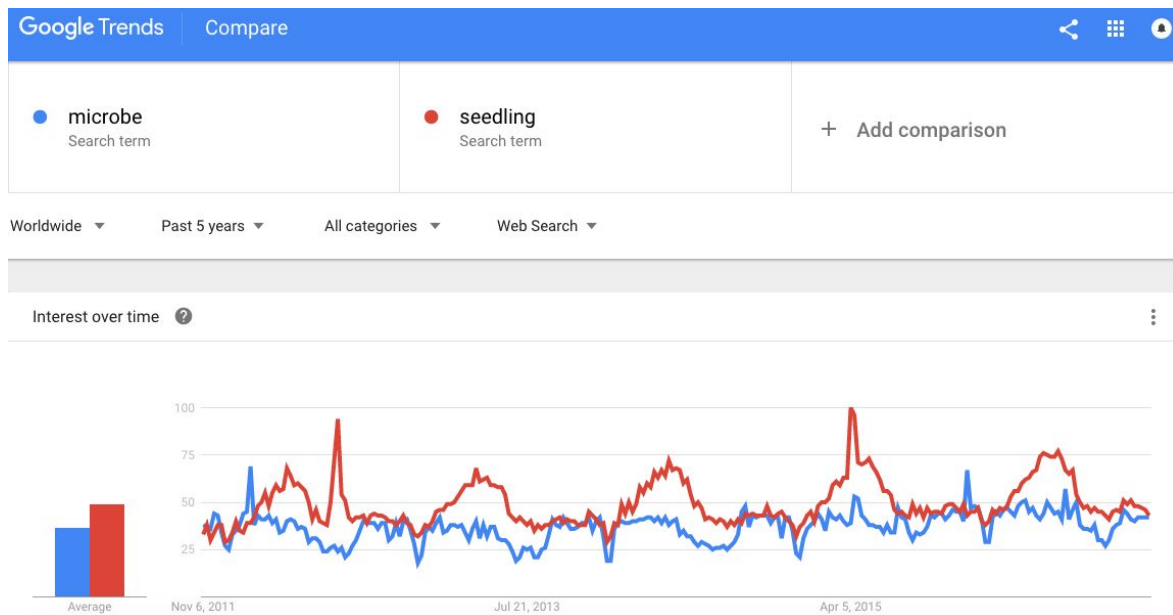
<https://www.google.com/trends/explore?q=dna,microscope>

MOLECULE - 128% popularity: Molecule 87 vs Microscope 68



<https://www.google.com/trends/explore?q=molecule,microscope>

MICROBE - 91% popularity: Microbe 42 vs Seedling 45



<https://www.google.com/trends/explore?q=microbe,seedling>

REFERENCES

[1] I Fucking Love Science has more than 25 million followers on Facebook.

<https://www.facebook.com/IFeekingLoveScience>

[2] Mentions of #science on Instagram <https://www.instagram.com/explore/tags/science/>

[3] Scientific American blog post by Dan Rather, 11/14/2016

<https://blogs.scientificamerican.com/guest-blog/dan-rather-now-more-than-ever-we-must-stand-up-for-science/>

[4] Accessed March 26, 2017: <https://www.facebook.com/groups/marchforscience/>

[5] Host of the web series “Emoji Science” was a clue on the Sept. 9, 2016, New York Times crossword puzzle <http://dailycrosswordsolver.com/host-of-the-web-series-emoji-science/>

NOTE

† This proposal was started during Emojicon with the support of GE's Emoji Science, with guidance from Craig Cummings and Jennifer 8. Lee, and additional contributions from scientists Rose Yen and Partha Jyoti Das. The current version includes suggestions from scientific organizations representing scientists and science enthusiasts globally based on ESC feedback (12/6/2016).

*All images by Anna Smylie unless otherwise noted.