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Koen Van den Eeckhout - Baryon



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baryon.be/visuals-resources

13 ms



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Comparative Study > Atten Percept Psychophys. 2014 Feb;76(2):270-9.

doi: 10.3758/s13414-013-0605-z.

FULL TEXT LINKS



Detecting meaning in RSVP at 13 ms per picture

Mary C Potter ¹, Brad Wyble, Carl Erick Hagmann, Emily S McCourt

Affiliations + expand

PMID: 24374558 DOI: [10.3758/s13414-013-0605-z](https://doi.org/10.3758/s13414-013-0605-z)

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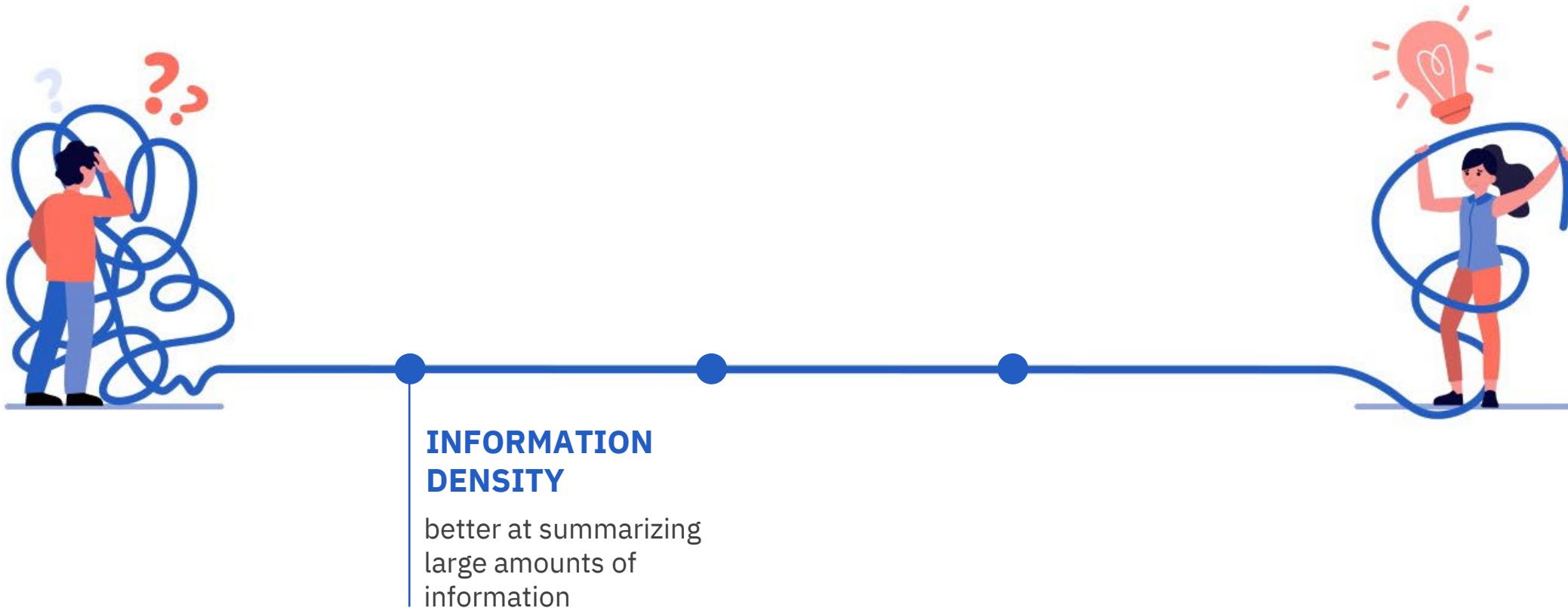
Publication types

Abstract

The visual system is exquisitely adapted to the task of extracting conceptual information from visual input with every new eye fixation, three or four times a second. Here we assess the minimum viewing time needed for visual comprehension, using rapid serial visual presentation (RSVP) of a series of six or 12 pictures presented at between 13 and 80 ms per picture, with no interstimulus interval.

Participants were to detect a picture specified by a name (e.g., smiling couple) that was given just before or immediately after the sequence. Detection improved with increasing duration and was better when the name was presented before the sequence, but performance was significantly above chance at all durations, whether the target was named before or only after the sequence. The results are consistent with feedforward models, in which an initial wave of neural activity through the ventral stream is sufficient to allow identification of a complex visual stimulus in a single forward pass. Although we discuss other explanations, the results suggest that neither reentrant processing from higher to lower levels nor advance information about the stimulus is necessary for the conscious detection of rapidly presented, complex visual information.

Why visual communication?





Introductions

2004 - 09

Engineering physics (Ghent University)

2009 - 13

PhD in physics (Ghent University)

2013 - 18

Post-doctoral researcher (Ghent University)

Grants & incentives consultant (EY)

Founded **Baryon**

2019 - now

Expanding Baryon as an
information design agency

Koen Van den Eeckhout | koen@baryon.be

Introductions

What's your **research** about?

What year are you in?

Why are you here today?

Session 1

Introduction

Elements of powerful visuals

Visual communication principles

lunch break

Graphical abstracts/posters

Design principles

Icons and illustrations

Editing vector images

HOMEWORK
Create a graphical abstract

Session 2

Homework feedback

Colours and text in your visuals

Editing bitmap images

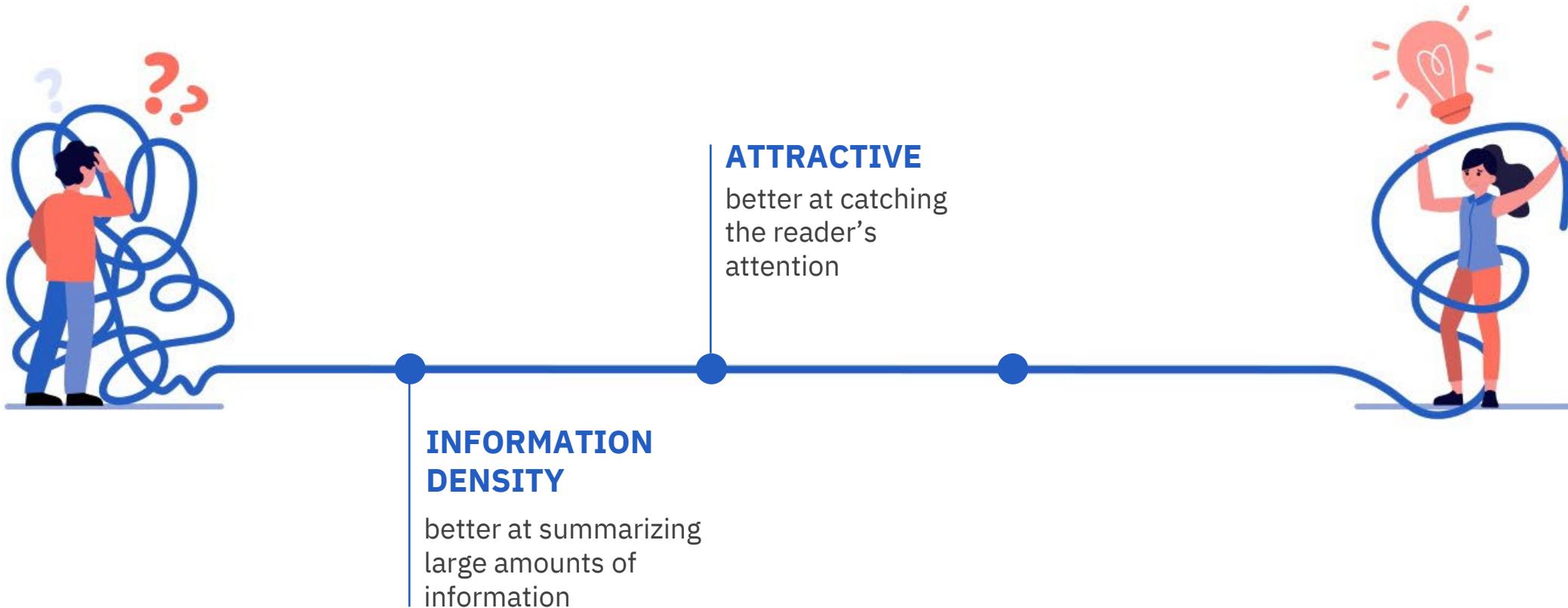
Creating layouts

Graphs

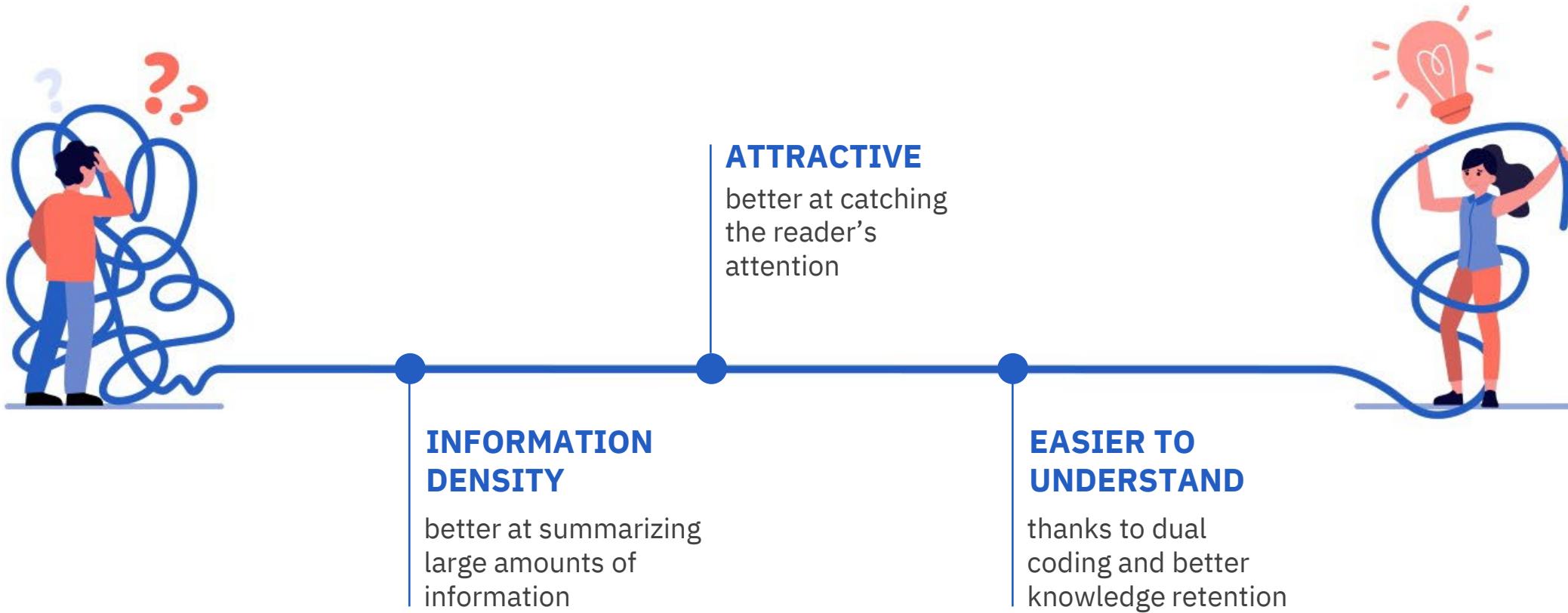
Legal and ethical aspects

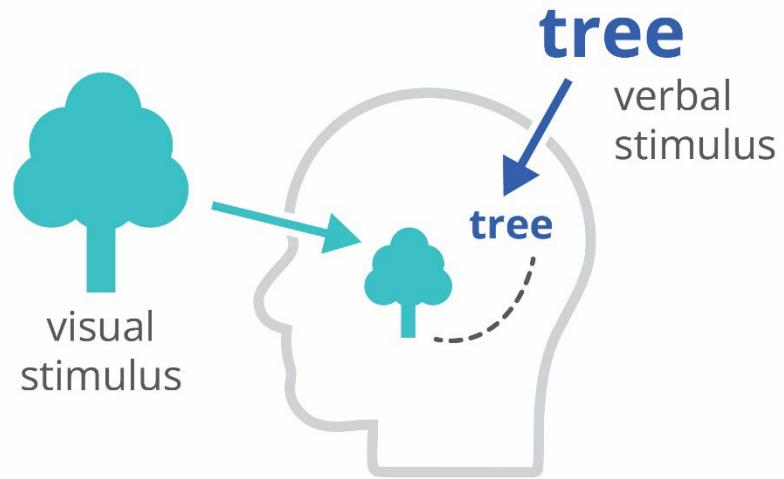
Recap and Q&A

Why visual communication?



Why visual communication?





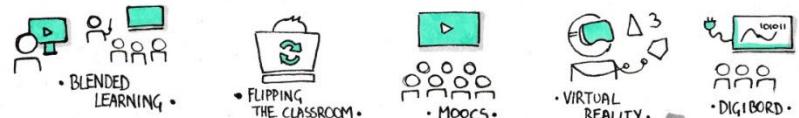
Dual-coding theory
a combination of
visual stimuli (pictures) and **verbal stimuli** (words)
stimulates the brain to make connections

Meester App

ONDERWIJSTECHNOLOGIE ANNO 2018

WETENSCHAPS-
CAFE

25 SEPTEMBER ★ 2018



POPULAIRE TYPES

ONDERWIJSTECHNOLOGIE

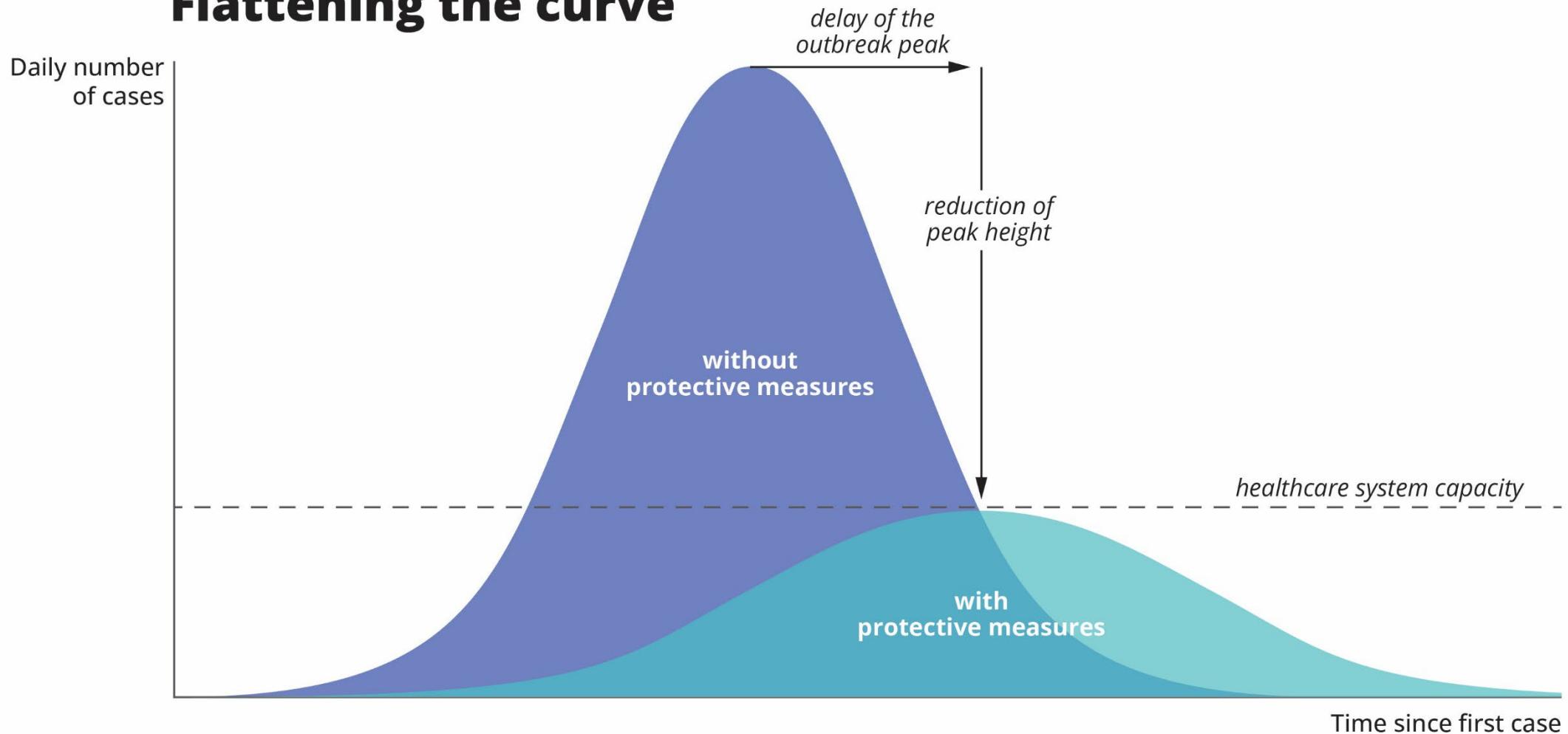
GROEP-
POTENTIEEL!



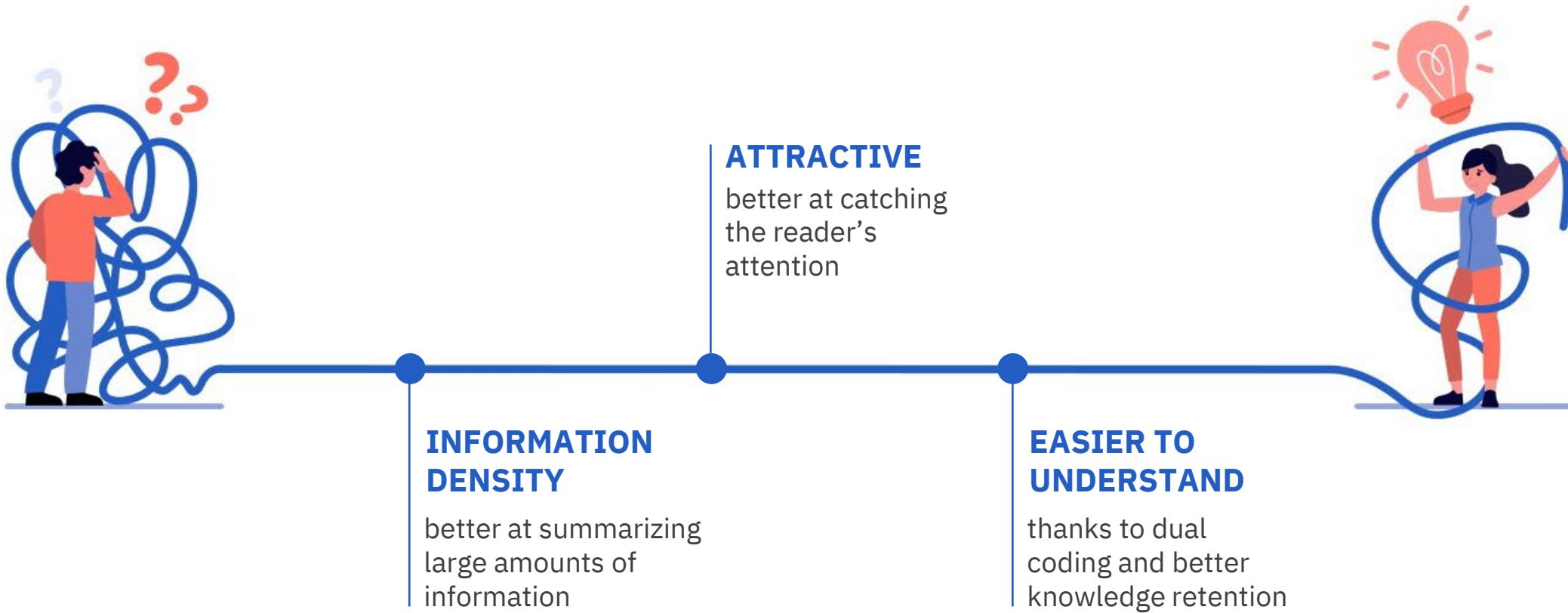
Sketchnoting

combining simple illustrations
with small amounts of text
= a great way of note-taking

Flattening the curve



Why visual communication?



How should I protect myself?

Health

There are some basic precautions you can take, which are the same as what you should be doing every day to stave off other respiratory diseases. You've seen the guidance before: Wash your hands. Cover your nose and mouth when you sneeze. And when you stay home from work or school and drink lots of fluids.

The CDC recommends washing with soap and water for at least 20 seconds after using the bathroom, before eating and after blowing your nose or sneezing. It also advises not to touch your eyes, nose and mouth and to clean objects and surfaces you touch often.

[Read more about preparing for coronavirus here.](#)

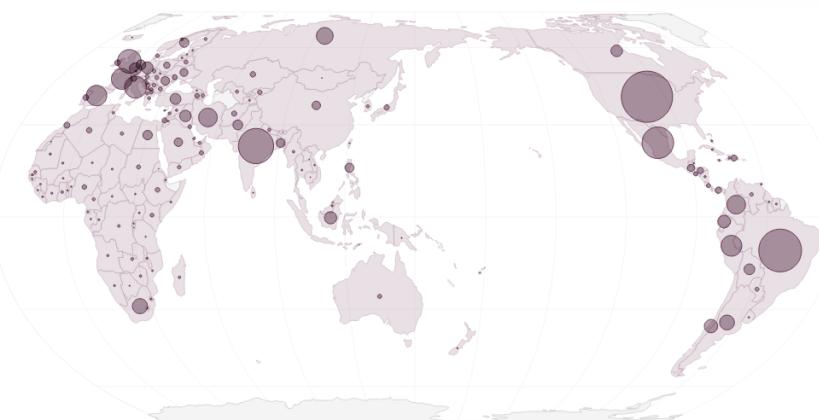
[Return to top](#)

Where has it spread in the world?

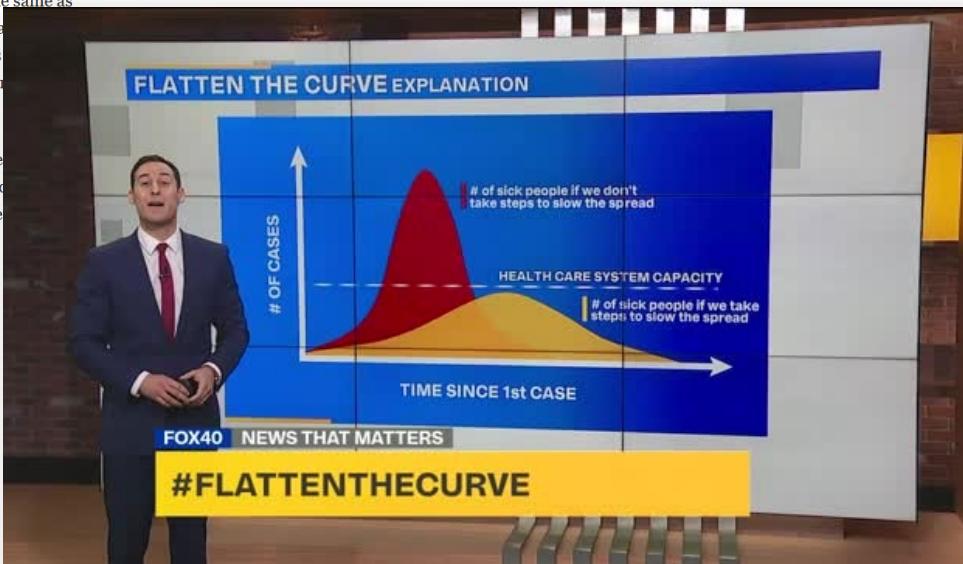
Reported deaths
997,000

Reported cases
33,087,000

Deaths Cases Adjusted for population Raw numbers



Country	Change from Sept. 21			
	Reported cases ▼	Total	Pct.	Deaths
U.S.	7,082,976 ▲ 272,069		+4%	204,370
India	6,074,702 ▲ 587,122		+11%	95,542
Brazil	4,732,309 ▲ 187,680		+4%	141,741
Russia	1,154,299 ▲ 49,251		+4%	20,299
Colombia	813,056 ▲ 47,980		+6%	25,488
Peru	800,142 ▲ 31,247		+4%	32,142
Mexico	730,317 ▲ 29,737		+4%	76,430



Why outbreaks like coronavirus spread exponentially, and how to “flatten the curve”

By Harry Stevens March 14, 2020

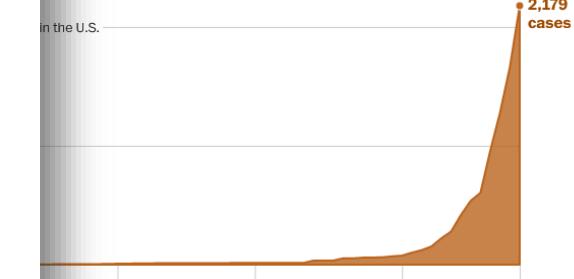
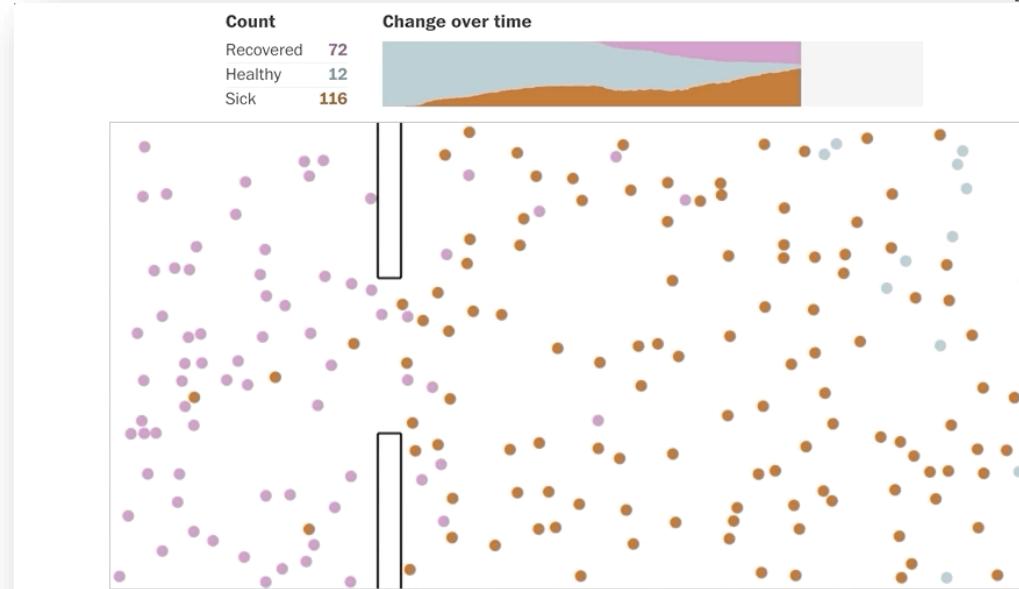
PLEASE NOTE

The Washington Post is providing this story for free so that all readers have access to this important information about the coronavirus. For more free stories, [sign up for our daily Coronavirus Updates newsletter](#).

After the first case of covid-19, the disease caused by the new strain of coronavirus, was announced in the United States, reports of further infections trickled in slowly. Two months later, that trickle has turned into a steady current.

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[» no pyccku](#) | [Lesen Sie auf Deutsch](#) | [Lees in het](#)
[lands](#) | [Prečítajte si po Slovensky](#) | [বাংলায় পড়ুন](#) | [ਵਿੰਦੀ ਮੈਂ ਪੜ੍ਹੋ](#)]



explore the number of cases over time.

called **exponential curve** has experts worried. If the of cases were to continue to double every three days, there would be about a hundred million cases in the United States by May.

The Washington Post to expand graphics and design teams with 14 new positions

The new roles will allow The Post to produce more visual journalism in response to news developments.

By WashPostPR

June 26, 2020



The Washington Post today announced plans to add 14 new positions to its design teams, expanding its visual journalism to communicate information in powerful ways. The job postings will be accessible at [careers.washingtonpost.com](#) in the coming weeks.



The Economist

@TheEconomist

Off the Charts launches next week. It's a newsletter containing the best of our data journalism from the team behind @EconDailyCharts. Sign up: econ.st/3qhaNGW

Tweet vertalen

We're launching a data newsletter

Off the Charts

The Economist

DE TIJD

NIEUWS > DOSSIERS

Het jaar in datajournalistiek

...ns of explaining complex data to readers," said Marjolein. "We have added data editors and designers, strengthening our team that is driven by passion.

28 december 2020 12:02

De beste datavisualisaties en -analyses waar De Tijd dit jaar aan gewerkt heeft.

©Mediafin

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News Opinion Sport Culture Lifestyle



The
Guardian
For 200 years



Guardian Masterclasses

Data visualisation: A six-week visual storytelling programme

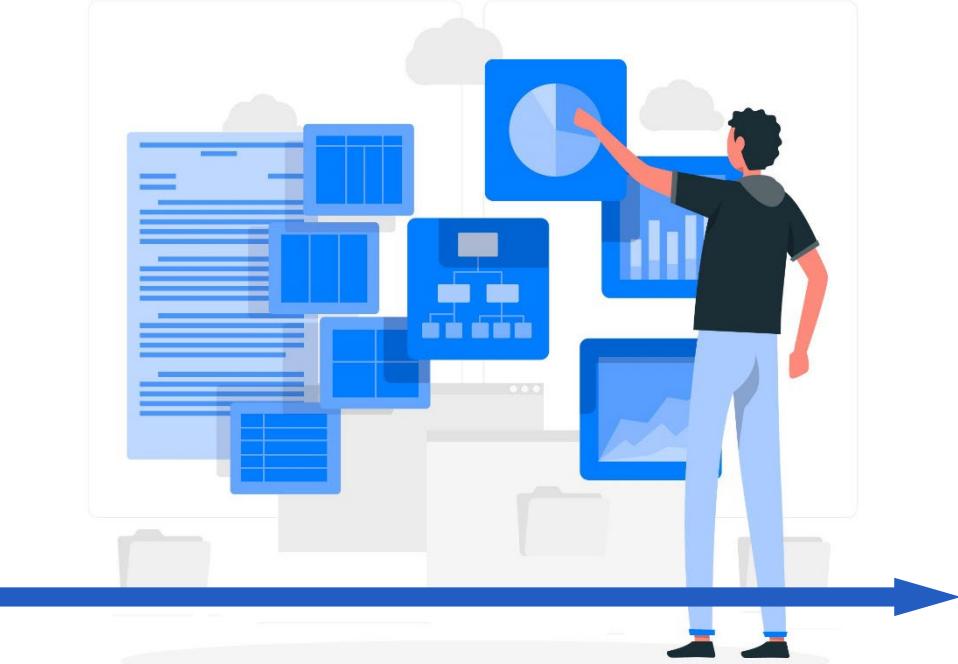
Over six consecutive weeks, this high-impact and practical workshop will give you the tools to transform your datasets into stunningly memorable visuals - with experts Adam Frost and Tobias Sturt

Online workshop

Dates: Six consecutive Thursdays, from 4 November until 9 December 2021

Times: 2pm-5pm (GMT)

journalists
financial institutions
researchers
marketing agencies
organisations
governments
technical start-ups
food producers
mobile health apps
...



complex insights
large amounts of data
technical information

readers
clients
general public
platform users
members
consumers
patients
students
management
...



Cramer classes of chemicals I, II and III

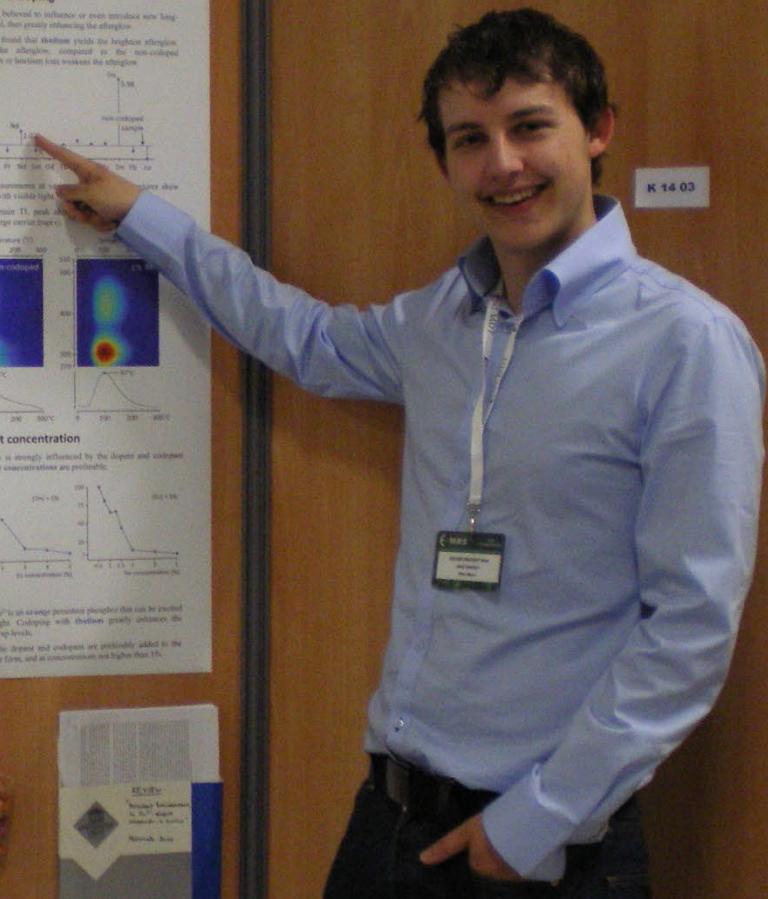
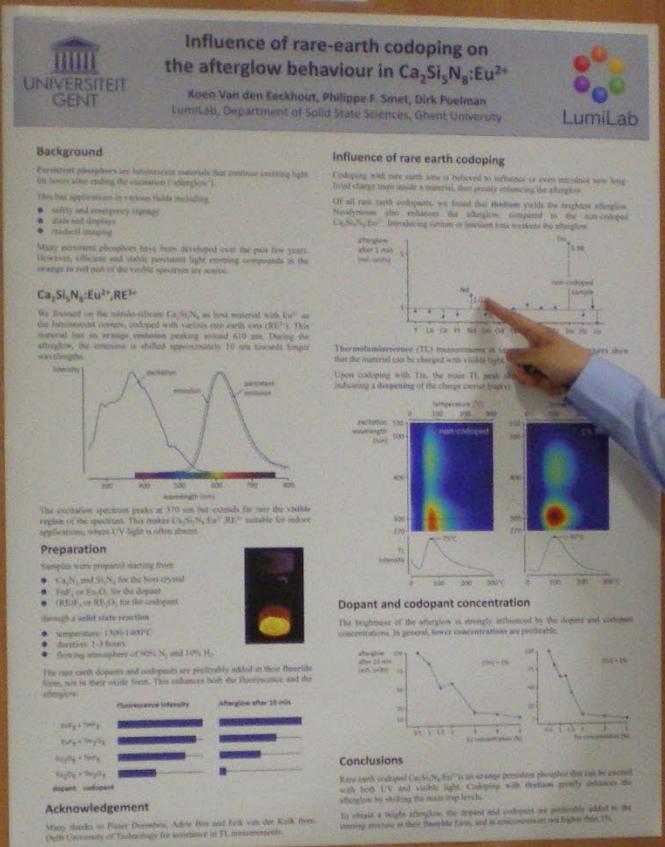
- **Class I:** Substances with simple chemical structures and for which efficient modes of metabolism exist, suggesting a low order of oral toxicity.
- **Class II:** Substances which possess structures that are less innocuous than class I substances, but do not contain structural features suggestive of toxicity like those substances in class I.
- **Class III:** Substances with chemical structures that permit no strong initial presumption of safety or may even suggest significant toxicity or have reactive functional groups.

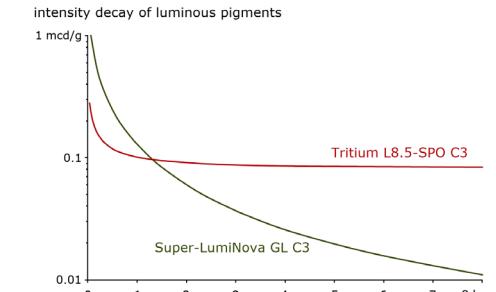
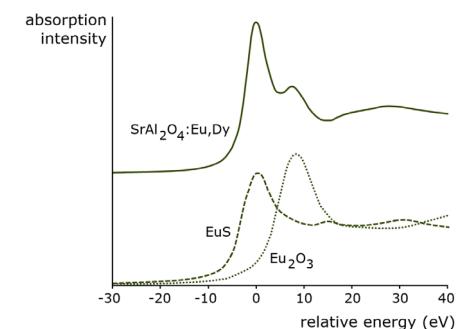
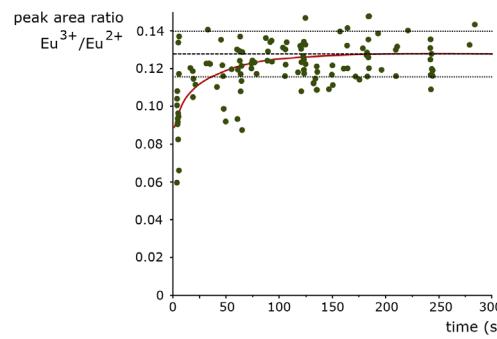
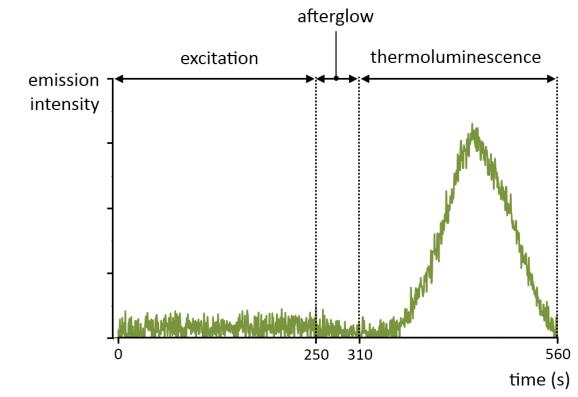
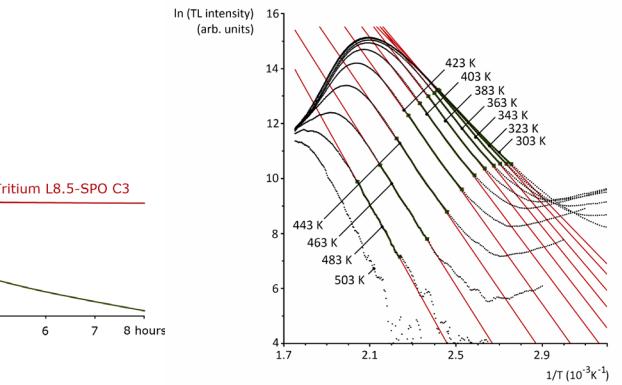
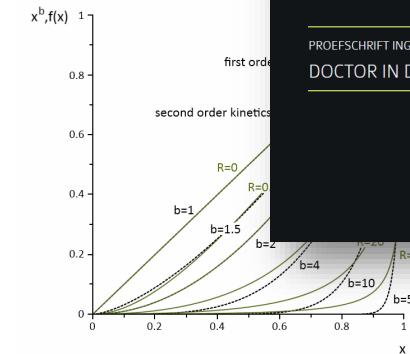
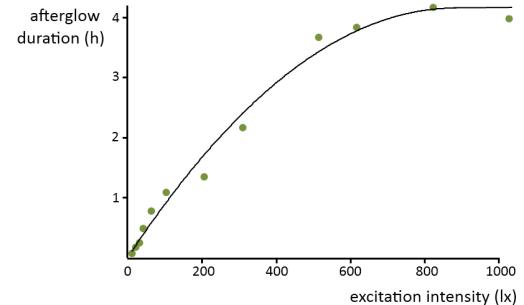
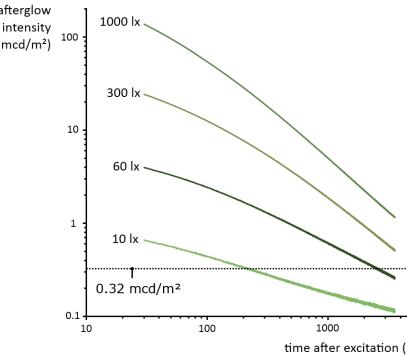
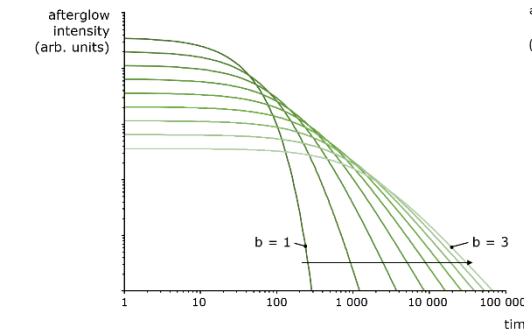
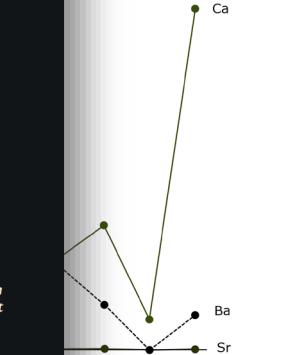
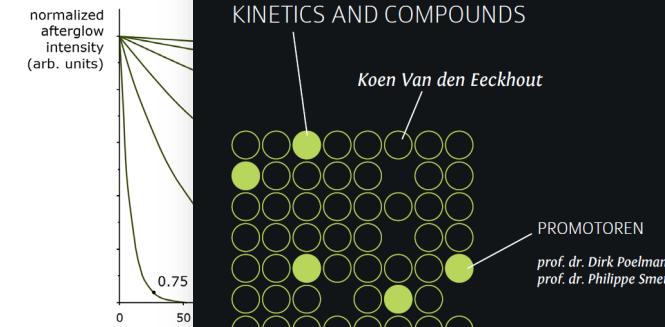
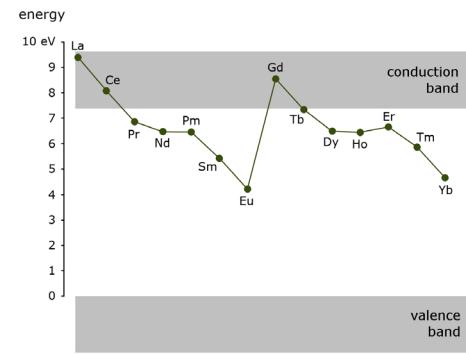
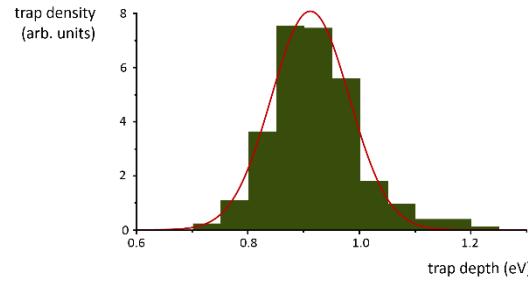
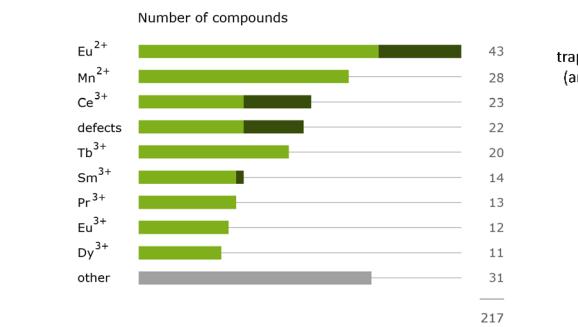
KWR

K 14 01

K 14 02

K 14 03





ORIGINAL RESEARCH

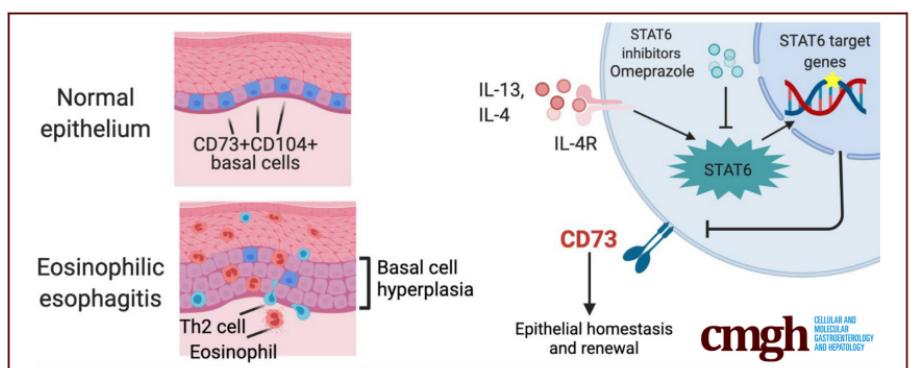
CD73⁺ Epithelial Progenitor Cells That Contribute to Homeostasis and Renewal Are Depleted in Eosinophilic Esophagitis

Takeo Hara,¹ Yuta Kasagi,^{1,2} Joshua Wang,¹ Masaru Sasaki,¹ Bailey Aaron,¹ Adam Karami,^{3,4} Masataka Shimonosono,^{5,6} Rieko Shimonosono,^{5,6} Hisatsugu Maekawa,^{5,6} Lauren Dolinsky,¹ Benjamin Wilkins,¹ Jeremy Klein,¹ Jane Wei,¹ Kathryn Nunes,¹ Kristle Lynch,⁷ Jonathan M. Spergel,^{8,9} Kathryn E. Hamilton,^{1,9} Melanie A. Ruffner,^{8,9} Tatiana A. Karakasheva,¹ Kelly A. Whelan,^{3,4} Hiroshi Nakagawa,^{5,6} and Amanda B. Muir^{1,9}

¹Division of Pediatric Gastroenterology, Hepatology, and Nutrition, The Children's Hospital of Philadelphia, Philadelphia, Pennsylvania; ²Department of Surgery, National Hospital Organization, Fukuokahigashi Medical Center, Koga, Fukuoka, Japan;

³Department of Pathology and Laboratory Medicine, Fels Institute for Cancer Research and Molecular Biology, Lewis Katz School of Medicine, Temple University, Philadelphia, Pennsylvania; ⁵Division of Digestive and Liver Diseases, Department of Medicine, Vagelos College of Physicians and Surgeons, ⁶Herbert Irving Comprehensive Cancer Center, Columbia University, New York, New York; ⁷Division of Gastroenterology, Department of Medicine, Philadelphia, University of Pennsylvania, Pennsylvania; ⁸Division of Allergy and Immunology, The Children's Hospital of Philadelphia, Philadelphia, Pennsylvania;

⁹Department of Pediatrics, Perelman School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania

**SUMMARY**

We show that the CD73⁺CD104⁺ progenitor population regulates epithelial renewal and homeostasis in the basal zone of esophageal epithelium. T helper 2 cytokines, interleukins 4 and 13 deplete this CD73⁺CD104⁺ self-renewing population via the signal transducer and activator of transcription 6 (STAT6) pathway, which may be perpetuating epithelial injury in the context of eosinophilic esophagitis.

BACKGROUND & AIM: Although basal cell hyperplasia is a histologic hallmark of eosinophilic esophagitis (EoE), little is known about the capabilities of epithelial renewal and differentiation in the EoE inflammatory milieu. In murine esophageal epithelium, there are self-renewing and slowly

proliferating basal stem-like cells characterized by concurrent expression of CD73 (5'-nucleotidase ecto) and CD104 (integrin $\beta 4$). Here, we investigated CD73⁺CD104⁺ cells within the basal population of human esophageal epithelium and clarified the biological significance of these cells in the EoE epithelium.

METHODS: We performed flow cytometry on esophageal biopsy samples from EoE and non-EoE patients to determine the quantity of CD73⁺CD104⁺ cells in the epithelium. Simulating the EoE milieu we stimulated primary patient-derived and immortalized cell line-derived esophageal organoids with interleukin (IL)4 and IL13 and analyzed by flow cytometry, immunohistochemistry, and quantitative reverse-transcription polymerase chain reaction. We performed single-cell RNA sequencing on primary organoids in the setting of IL13 stimulation and evaluated the CD73⁺CD104⁺ population. We performed fluorescent-activated cell sorting to purify

CD73⁺CD104⁺ and CD73⁻CD104⁺ populations and seeded these groups in organoid culture to evaluate the organoid formation rate and organoid size. We used RNA interference to knock down CD73 in esophageal organoids to evaluate organoid formation rates and size. We evaluated the effects of signal transducer and activator of transcription 6 (STAT6) signaling inhibition by RNA interference, a STAT6 inhibitor, AS1517499, as well as the proton pump inhibitor omeprazole.

RESULTS: EoE patients showed decreased epithelial CD73⁺CD104⁺ cell content. IL4 and IL13 stimulation depleted this population in 3-dimensional organoids with a recapitulation of basal cell hyperplasia as corroborated by single-cell RNA sequencing of the organoids, which suggests depletion of CD73⁺CD104⁺ cells. The CD73⁺CD104⁺ population had enhanced organoid formation compared with the CD73⁻CD104⁺ population. Similarly, knock-down of CD73 resulted in decreased organoid formation rate. Genetic and pharmacologic inhibition of STAT6 prevented T helper 2 cytokine-induced depletion of CD73⁺CD104⁺ cells. Lastly, omeprazole treatment prevented the effects of IL4 and IL13 on the CD73⁺CD104⁺ population.

CONCLUSIONS: This study addressed the role of CD73⁺CD104⁺ cells in epithelial renewal and homeostasis in the context of EoE. The depletion of the CD73⁺CD104⁺ self-renewal population by helper T cell 2 cytokines in EoE milieu may be perpetuating epithelial injury. Future therapies targeting epithelial restitution in EoE could decrease the need for immune modulation and steroid therapy. (*Cell Mol Gastroenterol Hepatol* 2022;13:1449–1467; <https://doi.org/10.1016/j.cmgh.2022.01.018>)

Keywords: Eosinophilic Esophagitis; Epithelium; Organoids; CD73; CD104.

The stratified squamous epithelium of the esophagus comprises basal, parabasal, and suprabasal cell layers that display an exquisite proliferation-differentiation gradient. The basal/parabasal cell layers contain proliferative basal cells (keratinocytes) that undergo postmitotic terminal differentiation within the suprabasal cell layer. Differentiated keratinocytes form intercellular bridges (desmosomes, tight junctions, and so forth) to provide the first line of defense against the chemical and biological milieu of luminal contents. Although exposure to acid, carcinogens, and allergens perturbs squamous cell differentiation,¹ it is unknown how these insults affect epithelial renewal and proliferation. Disruption of this homeostatic differentiation gradient or barrier function is linked to multiple human pathologies including gastroesophageal reflux disease and eosinophilic esophagitis (EoE).

EoE is an allergen-induced chronic inflammatory disease of the esophagus, characterized by dysphagia, food impactions, and fibrotic strictures.² Histologically, the most conspicuous finding in EoE, in addition to the eosinophilic infiltrate, is basal cell hyperplasia (BCH).^{3,4} BCH is induced by injury or inflammation and involves an expansion of basal cells (>20% of epithelial height) with limited formation of intercellular bridges, a hallmark of squamous cell differentiation. The EoE transcriptome suggests stalled differentiation of the esophageal epithelium, leading to

epithelial barrier defects and ongoing antigen exposure.^{5–7} Multiple EoE-relevant cytokines such as interleukin (IL)5 and IL13 induce BCH in murine models of EoE.^{4,8} These cytokines mediate the functional interplay between basal cells and fibroblasts to facilitate lamina propria fibrosis.^{3,9–12} Detailing the populations that exist within the basal epithelium and how these are perturbed in the EoE epithelium would allow for broader understanding of epithelial responses to inflammation. Similarly, therapies aiming to re-establish epithelial homeostasis represent an unexplored area that potentially could spare immune suppression or steroid exposure in EoE.

Basal cells are heterogeneous with variable expression of markers such as CD104 (integrin $\beta 4$) and CD73 (5'-nucleotidase ecto), as well as variable proliferation and differentiation capabilities.^{13–16} DeWard et al¹⁴ described heterogeneity within the murine esophageal basal epithelium, identifying CD73⁺CD104⁺ basal cells as a distinct stem cell-like population with self-renewal and epithelial formation capabilities. However, CD73⁺CD104⁺ cells remain uncharacterized in the human esophageal epithelium, and the effect of inflammation on homeostatic epithelial renewal remains unknown.

Herein, we observed alterations in the heterogeneity within proliferative and undifferentiated basal or basaloïd (defined as proliferative and undifferentiated basal-like cells present in the suprabasal cell layers population¹⁷) of the human esophageal epithelium and assessed perturbations that occur with allergic inflammation. Using patient biopsy specimens and single-cell-derived esophageal 3-dimensional (3D) organoids, a novel modeling platform in esophageal epithelial homeostasis, pathobiology, and personalized medicine,^{7,18} we show that the stem-like CD73⁺CD104⁺ population is diminished markedly in EoE, implicating helper T cell (Th)2 cytokines and signal transducer and activator of transcription 6 (STAT6) signaling as the effector and a promising target for therapy.

Results**CD73⁺ Cells Are Under-Represented in Active EoE Epithelium**

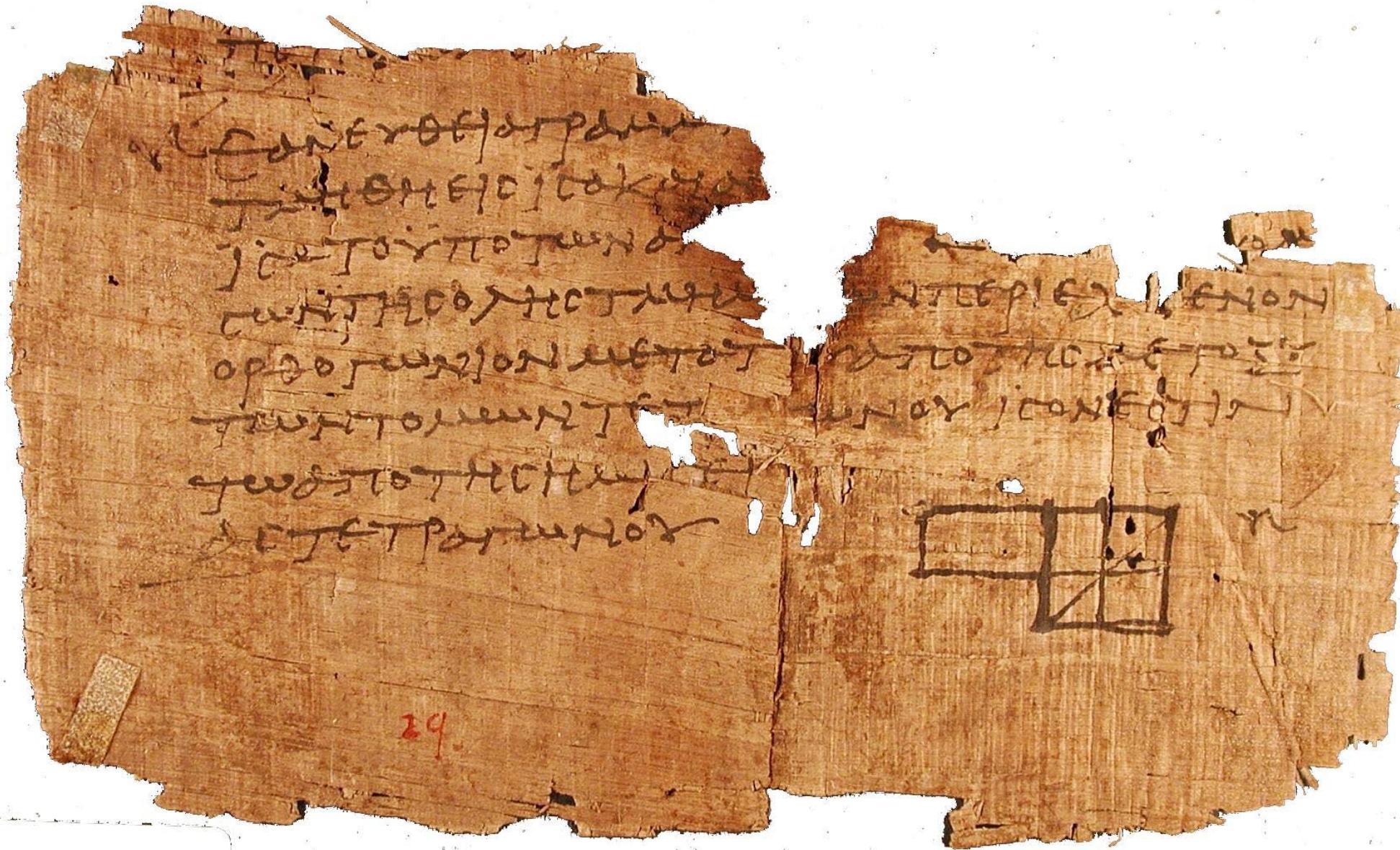
To assess the proliferation of the basal cells in the esophageal epithelium biopsy specimens, we performed

Abbreviations used in this paper: BCH, basal cell hyperplasia; DAPI, 4',6-diamidino-2-phenylindole; DEG, differentially expressed gene; EdU, ethynediodeoxyuridine; EGD, esophagogastroduodenoscopy; EoE, eosinophilic esophagitis; eos/hpf, esophageal mucosal eosinophils per high-power field; FACS, fluorescence-activated cell sorting; GO, Gene Ontology; IHC, immunohistochemistry; IL, interleukin; mRNA, messenger RNA; OFR, organoid formation rate; OVA, ova-albumin; PCA, principal component analysis; PDO, patient-derived organoid; PPI, proton pump inhibitor; qRT-PCR, quantitative reverse-transcription polymerase chain reaction; siRNA, small interfering RNA; STAT6, signal transducer and activator of transcription 6; 3D, 3-dimensional; Th, helper T cell.

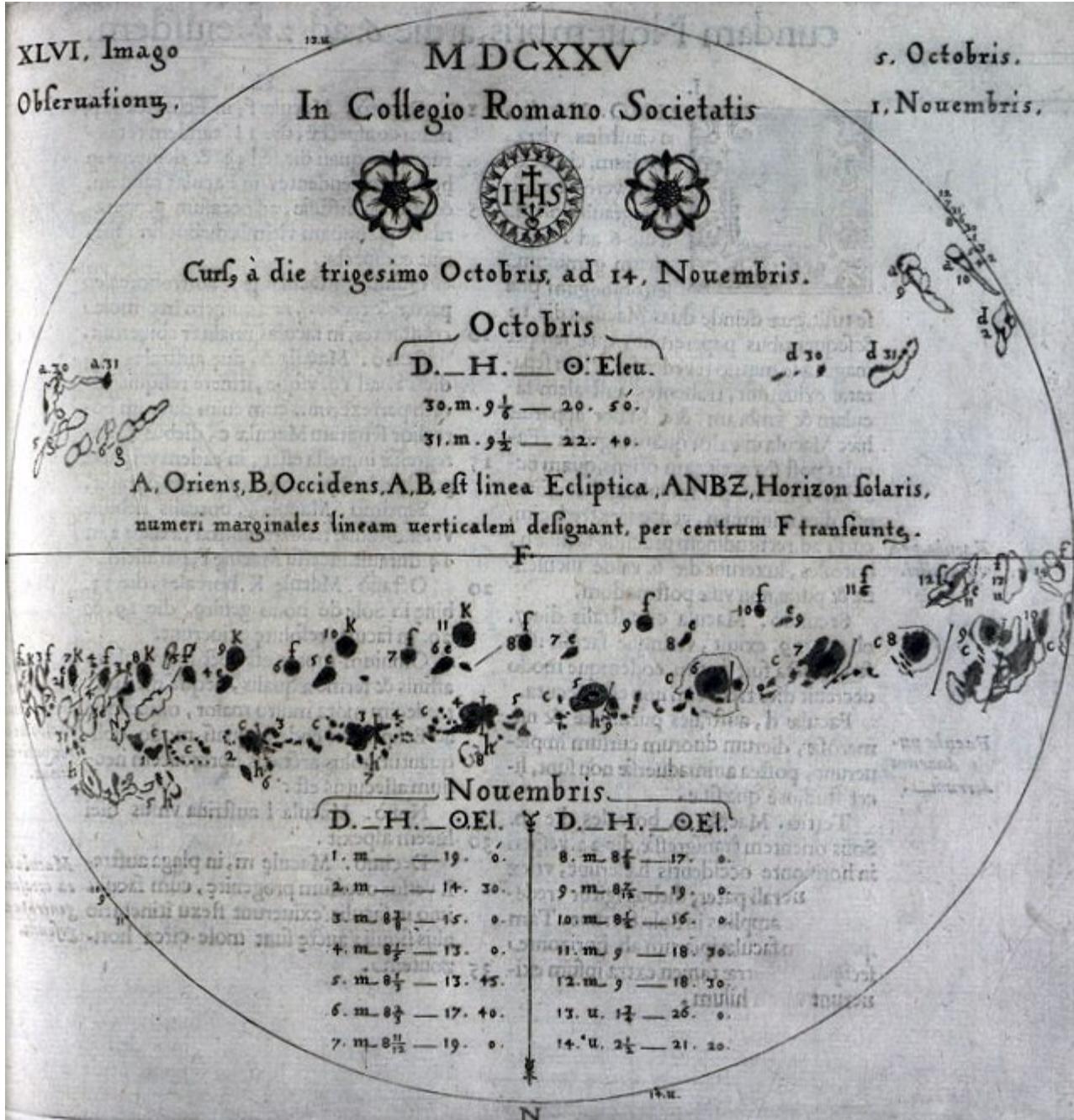
Most current article

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2352–345X
<https://doi.org/10.1016/j.cmgh.2022.01.018>

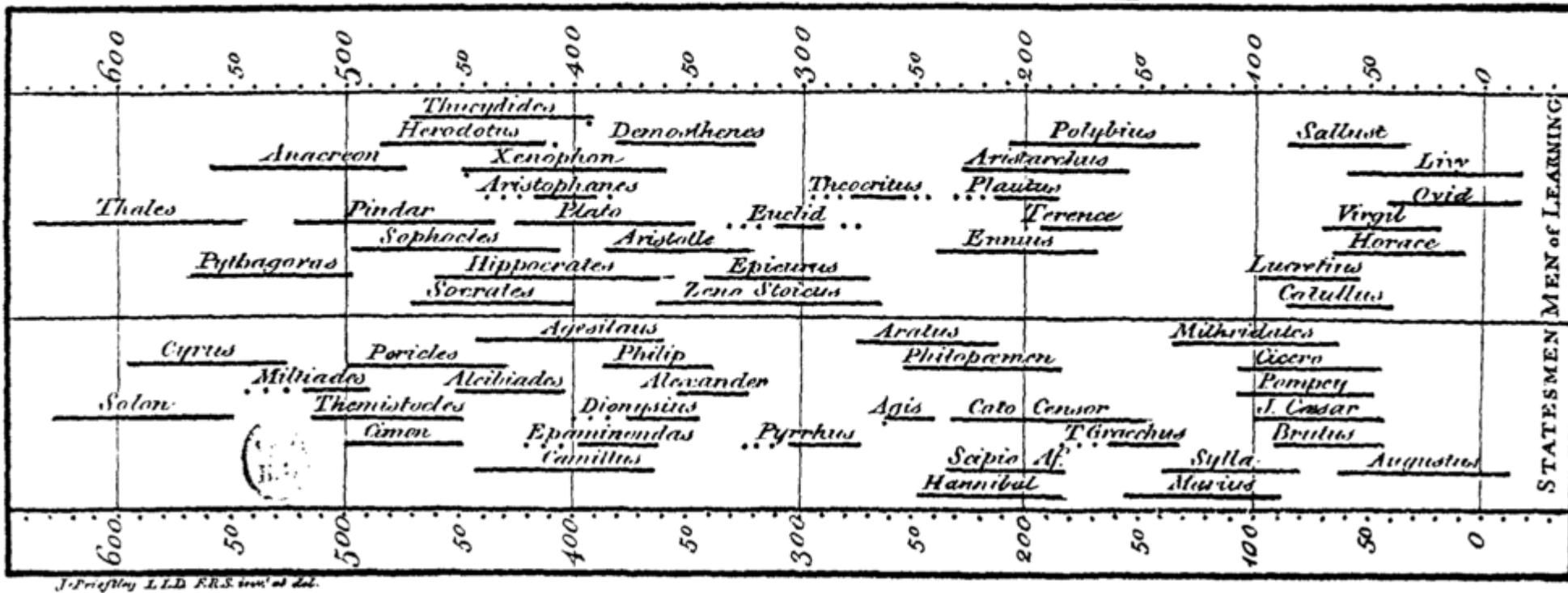


Euclid's Elements
around 300 BC



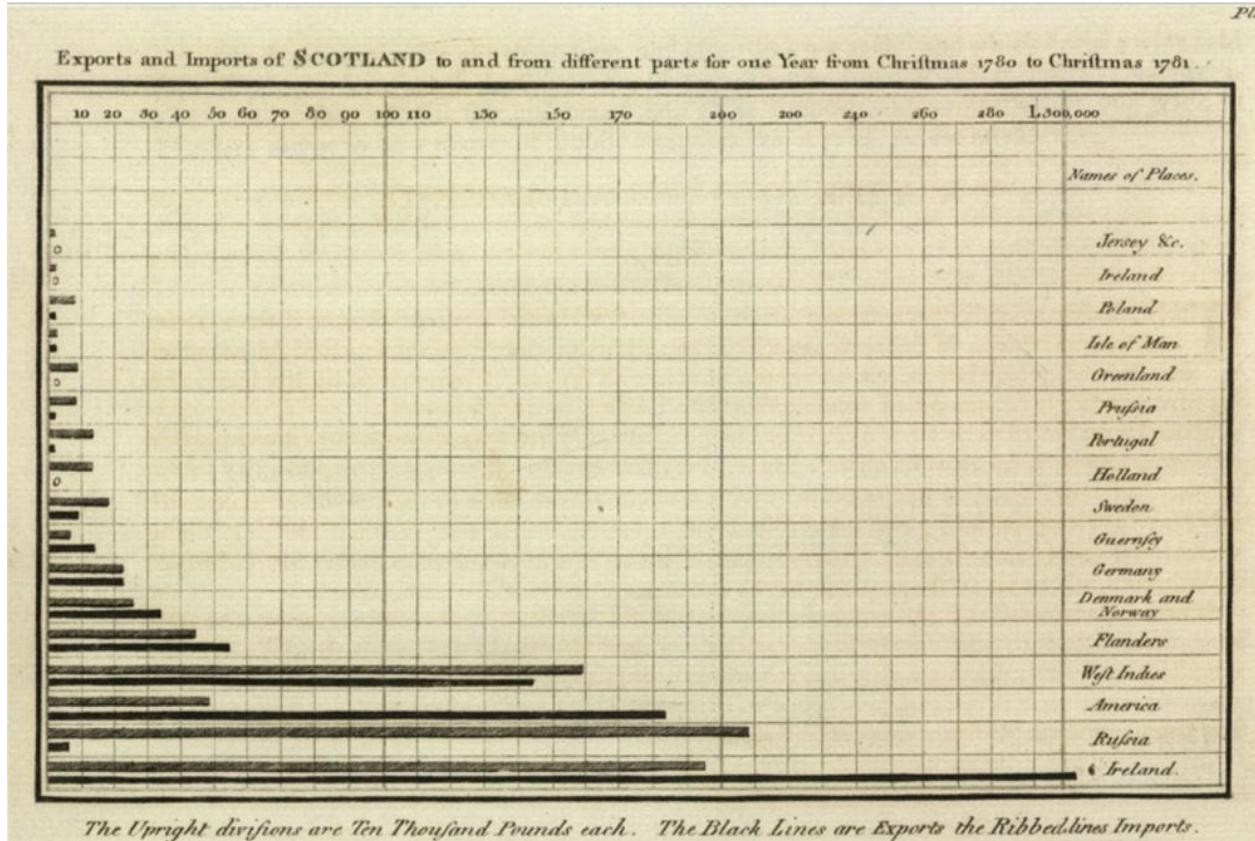
Christoph Scheiner
1626

A Specimen of a Chart of Biography.

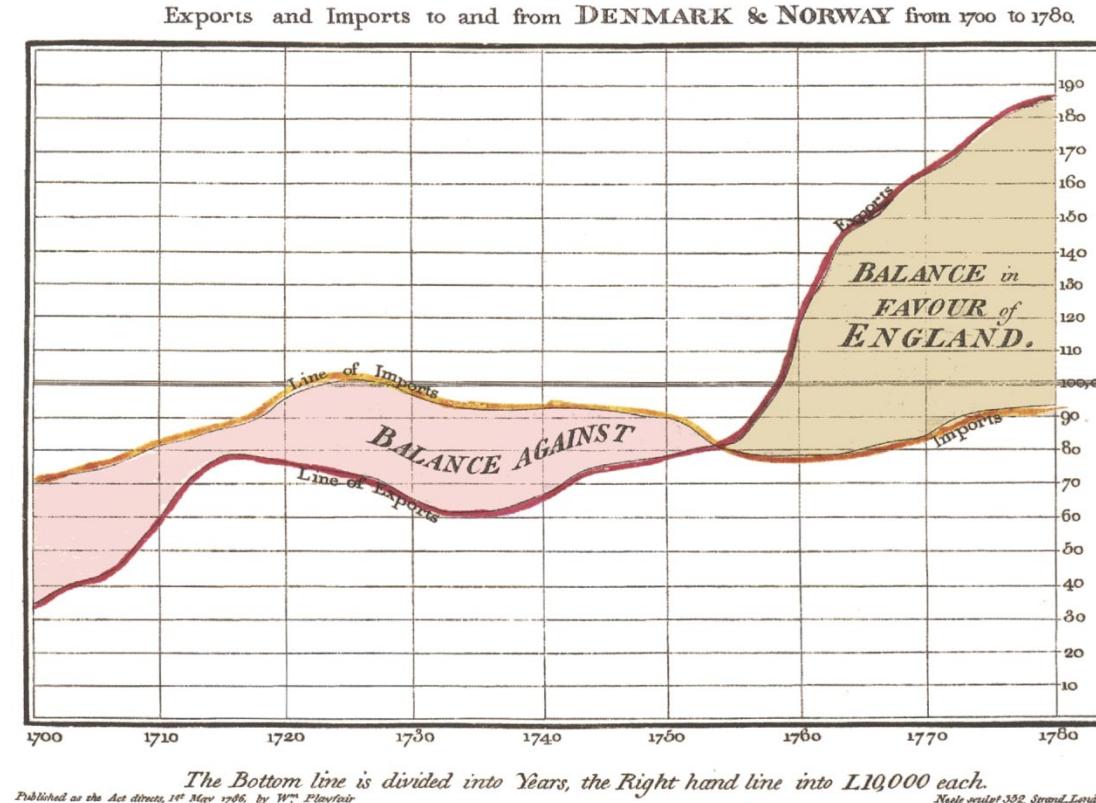


Joseph Priestley
1765

The inventor of the bar, line and pie chart



William Playfair
1781



William Playfair
1786



John Snow
1854

2.
APRIL 1855 TO MARCH 1856.

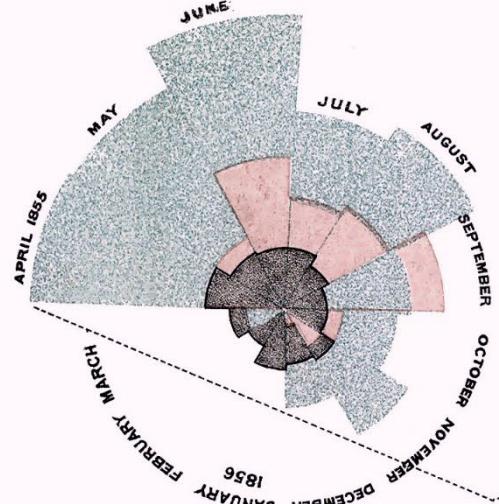
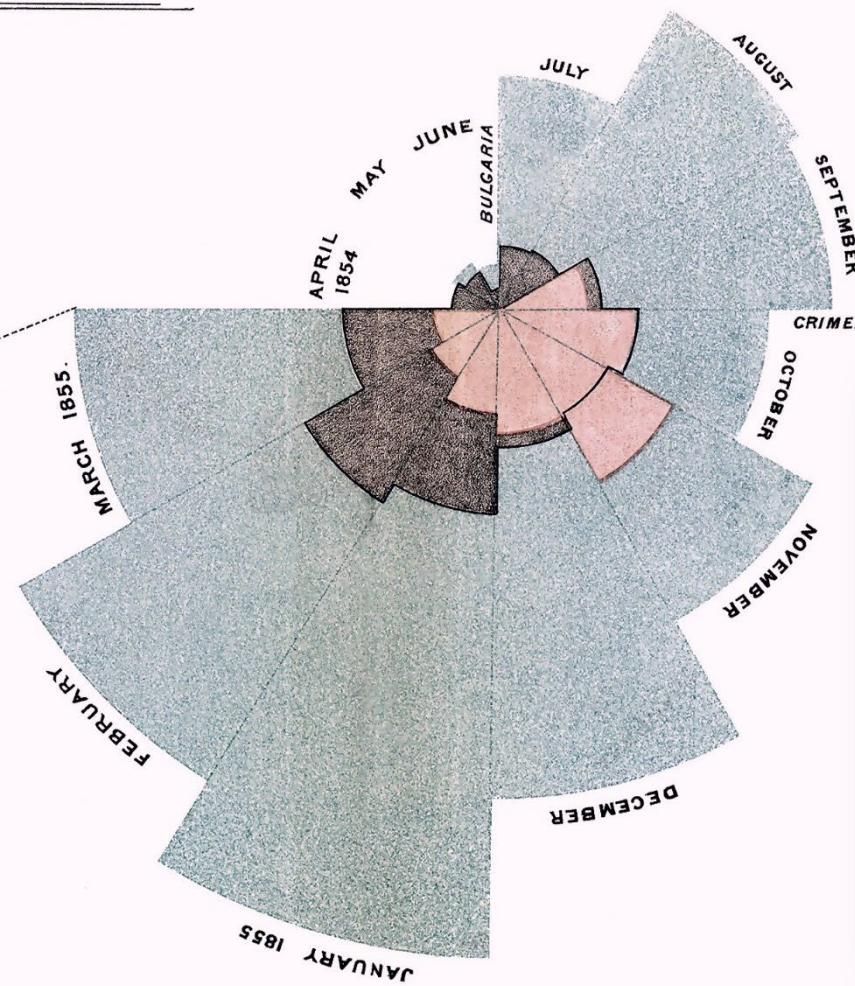


DIAGRAM OF THE CAUSES OF MORTALITY
IN THE ARMY IN THE EAST.

1.
APRIL 1854 TO MARCH 1855.



The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.

The blue wedges measured from the centre of the circle represent area for area the deaths from Preventible or Mitigable Zymotic diseases; the red wedges measured from the centre the deaths from wounds, & the black wedges measured from the centre the deaths from all other causes.

The black line across the red triangle in Nov. 1854 marks the boundary of the deaths from all other causes during the month.

In October 1854, & April 1855, the black area coincides with the red; in January & February 1856, the blue coincides with the black.

The entire areas may be compared by following the blue, the red & the black lines enclosing them.



Florence Nightingale
1858

MOLECULAR STRUCTURE OF NUCLEIC ACIDS

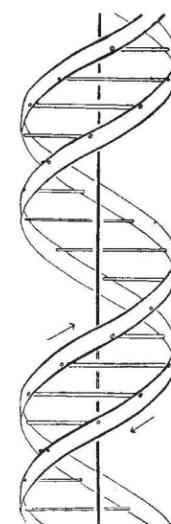
A Structure for Deoxyribose Nucleic Acid

WE wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.

A structure for nucleic acid has already been proposed by Pauling and Corey¹. They kindly made their manuscript available to us in advance of publication. Their model consists of three intertwined chains, with the phosphates near the fibre axis, and the bases on the outside. In our opinion, this structure is unsatisfactory for two reasons: (1) We believe that the material which gives the X-ray diagrams is the salt, not the free acid. Without the acidic hydrogen atoms it is not clear what forces would hold the structure together, especially as the negatively charged phosphates near the axis will repel each other. (2) Some of the van der Waals distances appear to be too small.

Another three-chain structure has also been suggested by Fraser (in the press). In his model the phosphates are on the outside and the bases on the inside, linked together by hydrogen bonds. This structure as described is rather ill-defined, and for this reason we shall not comment on it.

We wish to put forward a radically different structure for the salt of deoxyribose nucleic acid. This structure has two helical chains each coiled round the same axis (see diagram). We have made the usual chemical assumptions, namely, that each chain consists of phosphate diester groups joining β -D-deoxyribofuranose residues with 3',5' linkages. The two chains (but not their bases) are related by a dyad perpendicular to the fibre axis. Both chains follow right-handed helices, but owing to the dyad the sequences of the atoms in the two chains run in opposite directions. Each chain loosely resembles Furberg's² model No. I; that is, the bases are on the inside of the helix and the phosphates on the outside. The configuration of the sugar and the atoms near it is close to Furberg's 'standard configuration', the sugar being roughly perpendicular to the attached base. There



This figure is purely diagrammatic. The two ribbons symbolize the two phosphate-sugar chains, and the horizontal rods the pairs of bases holding the chains together. The vertical line marks the fibre axis.

except the bases so that the structure could become more compact.

The novel feature of the structure is the manner in which the two chains are held together by the purine and pyrimidine bases. The planes of the bases are perpendicular to the fibre axis. They are joined together in pairs, a single base from one chain being hydrogen-bonded to a single base from the other chain, so that the two lie side by side with identical z-coordinates. One of the pair must be a purine and the other a pyrimidine for bonding to occur. The hydrogen bonds are made as follows: purine position 1 to pyrimidine position 1; purine position 6 to pyrimidine position 6.

If it is assumed that the bases only occur in the structure in the most plausible tautomeric forms (that is, with the keto rather than the enol configurations) it is found that only specific pairs of bases can bond together. These pairs are: adenine (purine) with thymine (pyrimidine), and guanine (purine) with cytosine (pyrimidine).

In other words, if an adenine forms one member of a pair, on either chain, then on these assumptions the other member must be thymine; similarly for guanine and cytosine. The sequence of bases on a single chain does not appear to be restricted in any way. However, if only specific pairs of bases can be formed, it follows that if the sequence of bases on one chain is given, then the sequence on the other chain is automatically determined.

It has been found experimentally^{3,4} that the ratio of the amounts of adenine to thymine, and the ratio of guanine to cytosine, are always very close to unity for deoxyribose nucleic acid.

It is probably impossible to build this structure with a ribose sugar in place of the deoxyribose, as the extra oxygen atom would make too close a van der Waals contact.

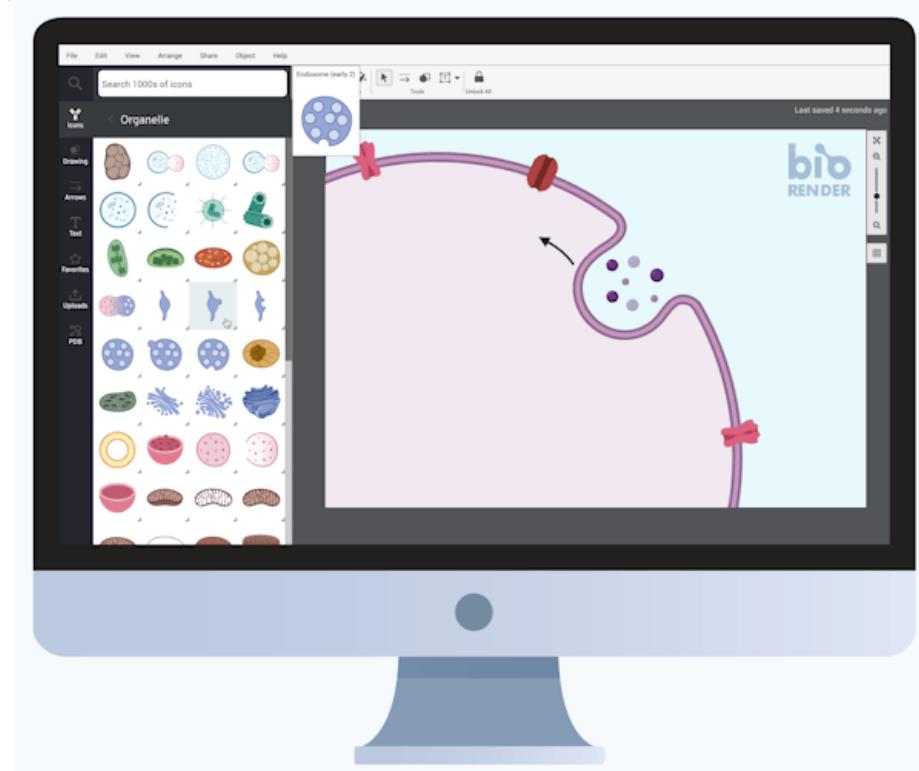
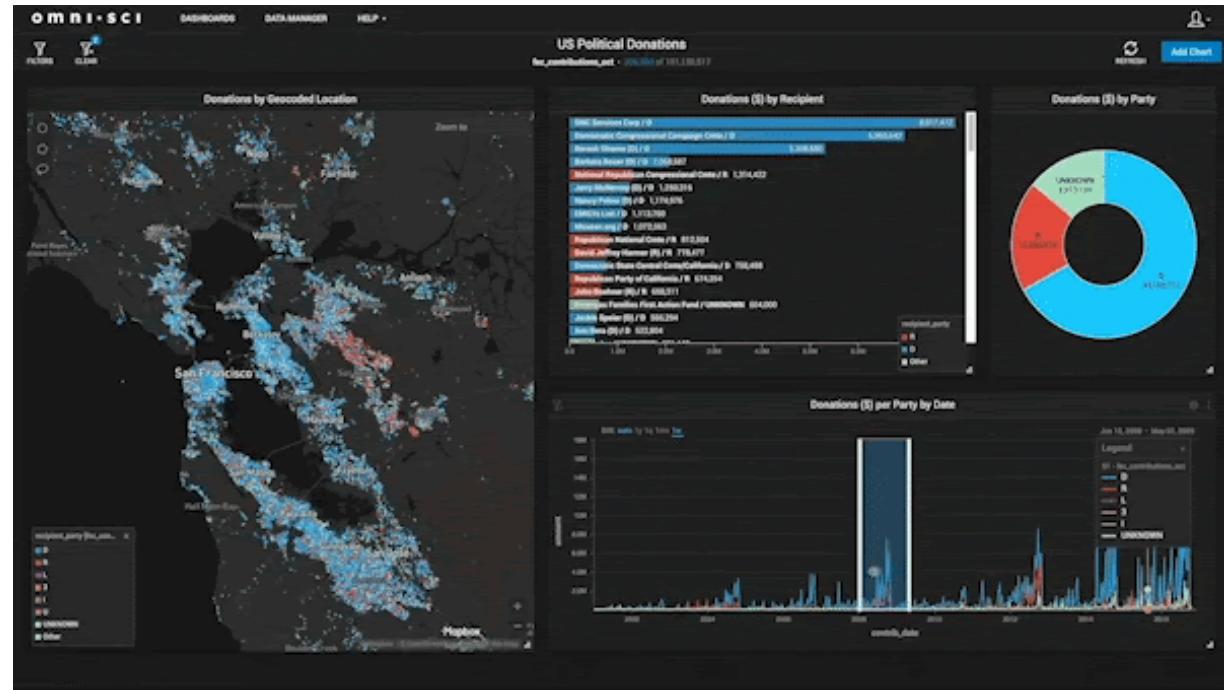
The previously published X-ray data^{5,6} on deoxyribose nucleic acid are insufficient for a rigorous test of our structure. So far as we can tell, it is roughly compatible with the experimental data, but it must be regarded as unproved until it has been checked against more exact results. Some of these are given in the following communications. We were not aware of the details of the results presented there when we devised our structure, which rests mainly though not entirely on published experimental data and stereochemical arguments.

It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.

Full details of the structure, including the conditions assumed in building it, together with a set of co-ordinates for the atoms, will be published elsewhere.

We are much indebted to Dr. Jerry Donohue for constant advice and criticism, especially on interatomic distances. We have also been stimulated by a knowledge of the general nature of the unpublished experimental results and ideas of Dr. M. H. F. Wilkins, Dr. R. E. Franklin and their co-workers at

Watson & Crick
1953



What is a good visual?

Group exercise

Each group receives **a set of visuals to discuss.**

As a group, choose your
most and least favorite visual
and explain why.



What is a good visual?



Hierarchy

Overview first,
zoom and filter,
then **details-on-demand.**

Ben Shneiderman



Story

Aside from being clear and well-designed,
visuals must also forge
an emotional connection with readers.

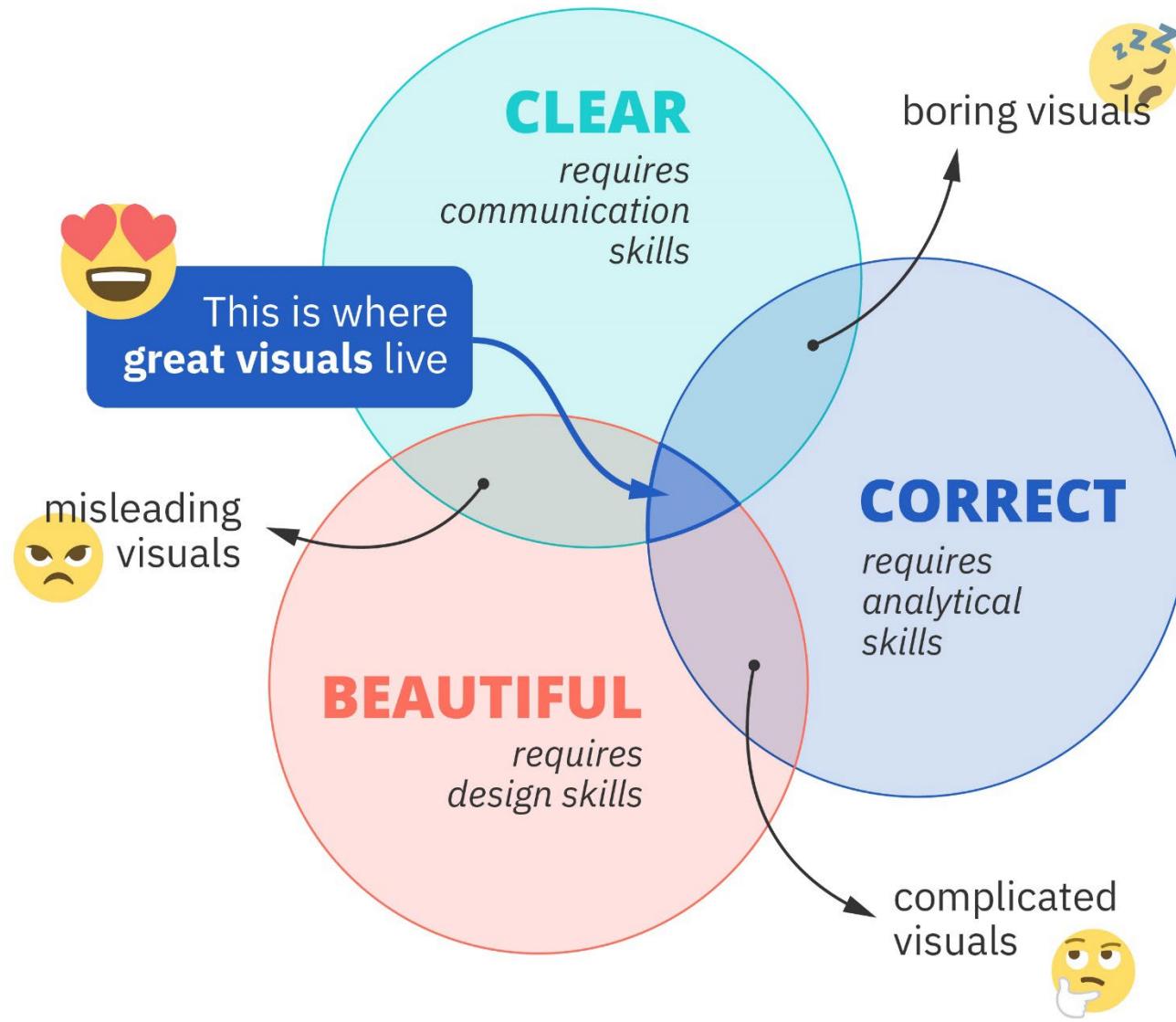
Kat Downs Mulder

Simplicity

Move away from complexity
and **remove irrelevant detail**
until only what is essential remains.

Nigel Holmes







Break

All the slides and all the links:

baryon.be/visuals-resources

Session 1

Introduction

Elements of powerful visuals

**Visual communication
principles**

lunch break

Graphical abstracts/posters

Design principles

Icons and illustrations

Editing vector images

HOMEWORK
**Create a
graphical
abstract**

Session 2

Homework feedback

Colours and text
in your visuals

Editing bitmap images

Creating layouts

Graphs

Legal and ethical aspects

Recap and Q&A

Communication principles

Communication principles

1. Identify your _____
2. Adapt to your _____
3. Improve the _____ - _____ - _____ ratio

The basic model of communication



Communication principles

1. Identify your **message**
2. Adapt to your _____
3. Improve the _____ - _____ - _____ ratio

A good visual shows the data,
a great visual tells a story.

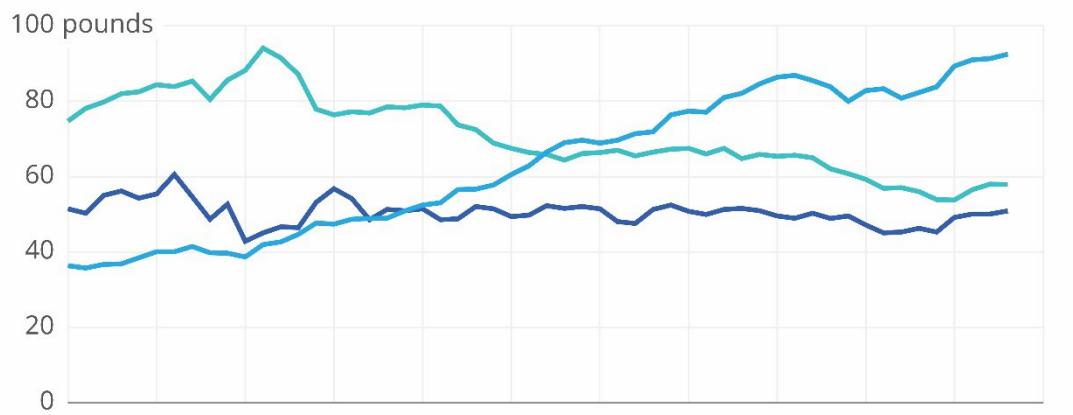
~~data~~



story

US per capita consumption of poultry and livestock

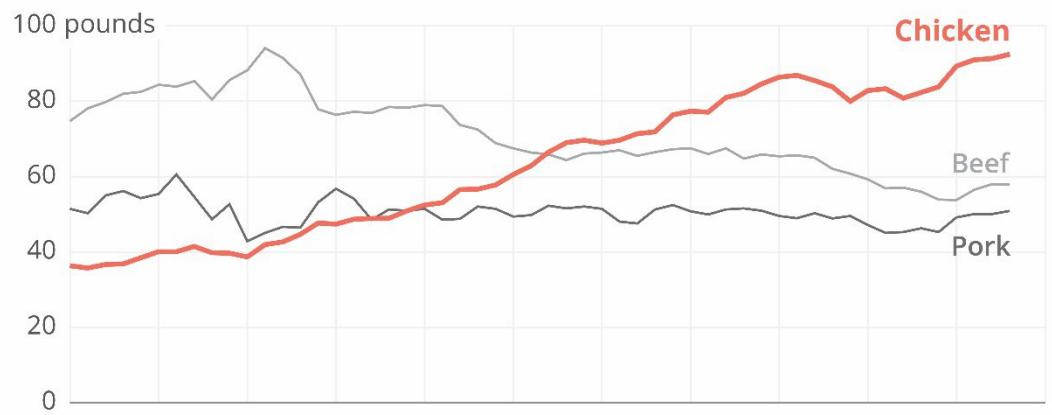
Pork Beef Chicken



Data: National Chicken Council

Americans are eating more chicken than ever before

U.S. per capita consumption of chicken has more than doubled since 1965.



Data: National Chicken Council

~~data~~



story

~~what~~



so what

Identify your message

list available data and illustrations

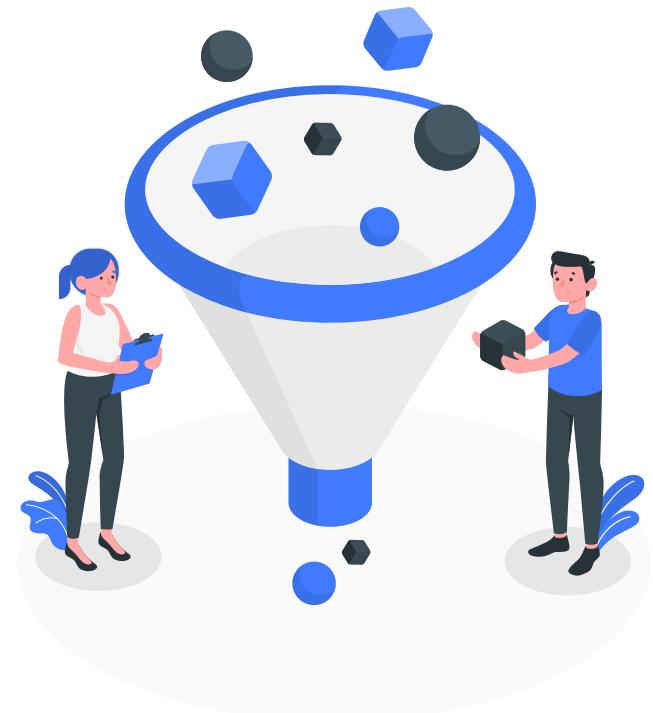
explore, refine, combine, complete

look for outliers & surprises

separate main and side issues

define key message(s)

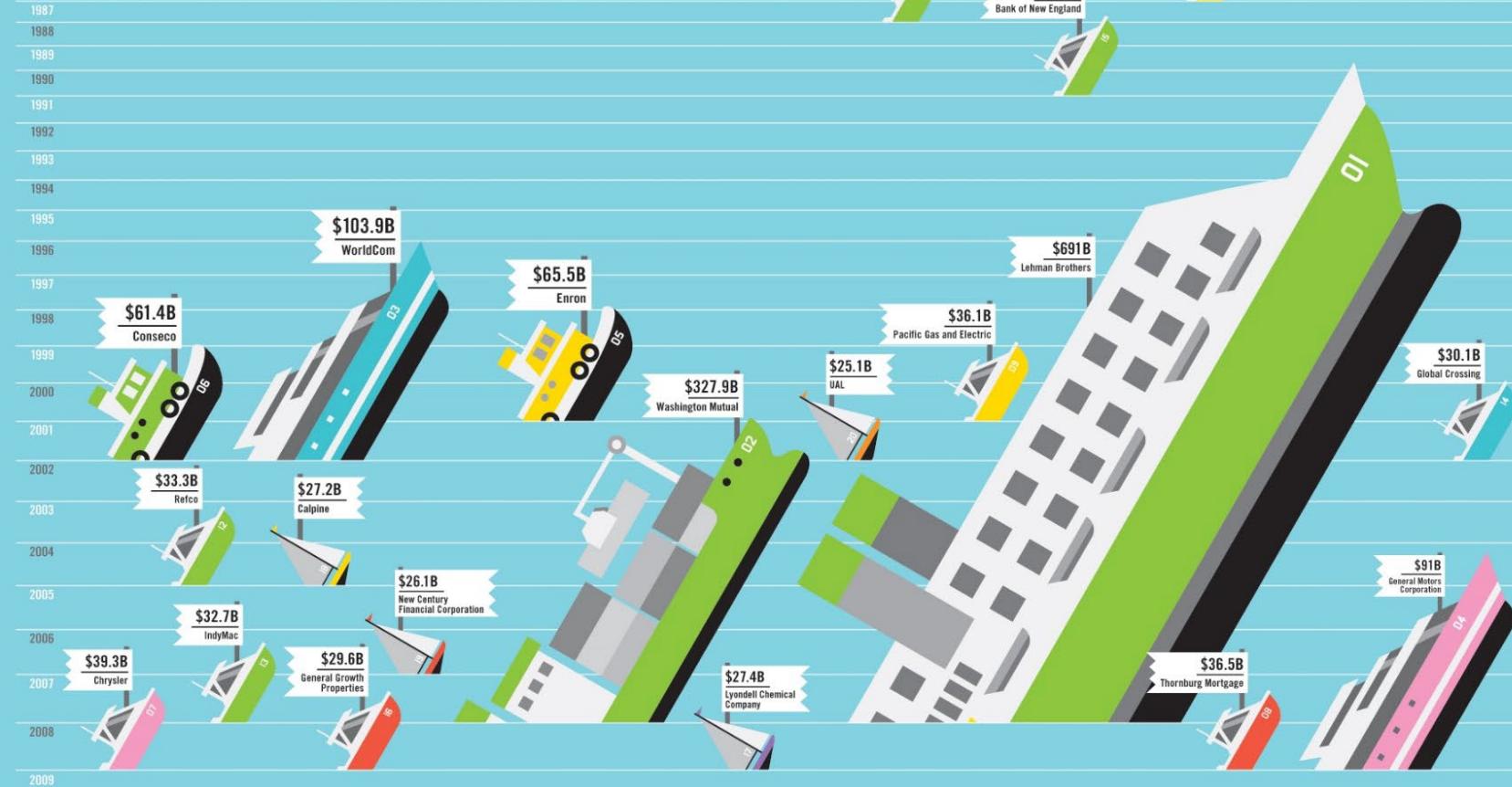
limit yourself





LARGEST BANKRUPTCIES IN HISTORY

Last week, General Motors began the fourth largest bankruptcy proceedings in history, joining the many other large and venerable companies that have sunk to the bottom during this economic crisis. In fact, eight of the 20 largest bankruptcies have happened during the last two years of crisis. Here is a look at the biggest sinking ships in business history.



BOAT TO PRE-BANKRUPTCY ASSETS (in billions)



SECTOR



PRE-BANKRUPTCY ASSETS (in billions) / Company



SOURCE: BankruptcyData.com

Always With Honor

Identify your message

list the available data and illustrations

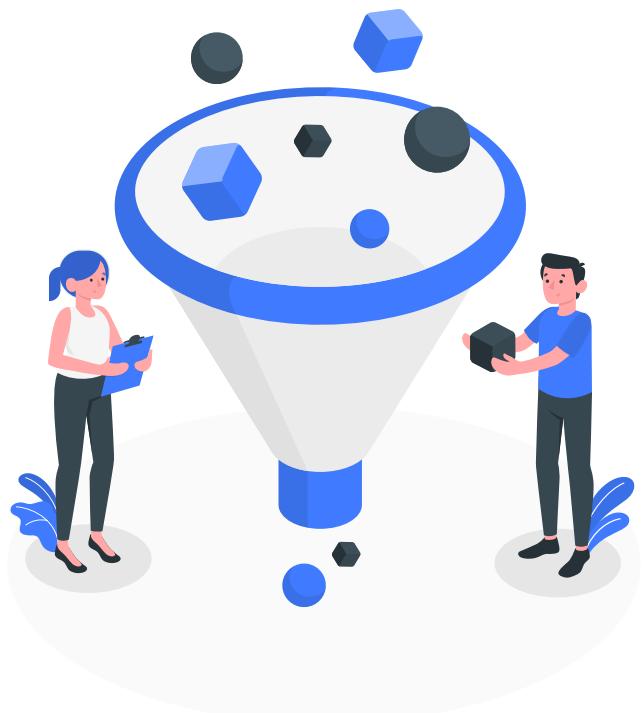
explore, refine, combine, complete

look for outliers & surprises

separate main and side issues

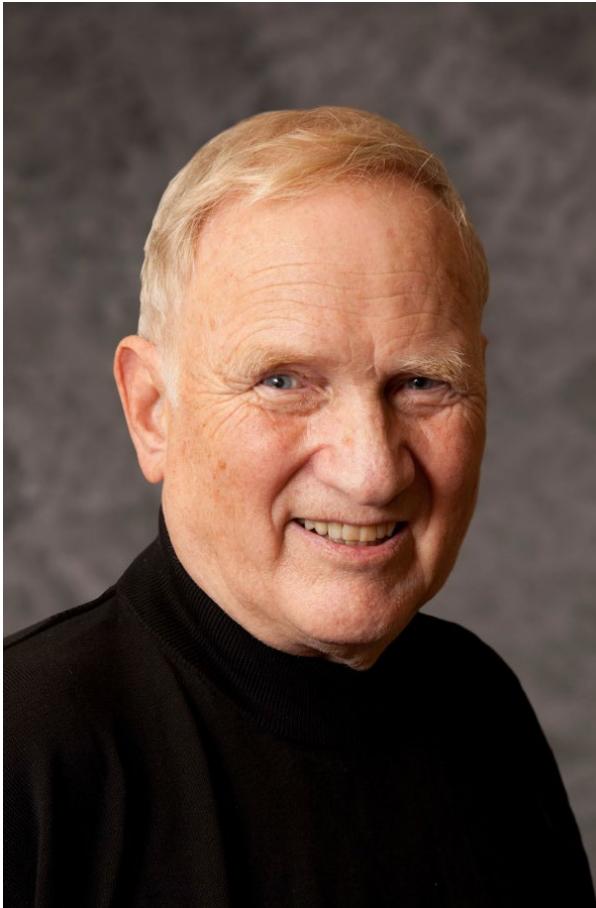
define key message(s)

limit yourself

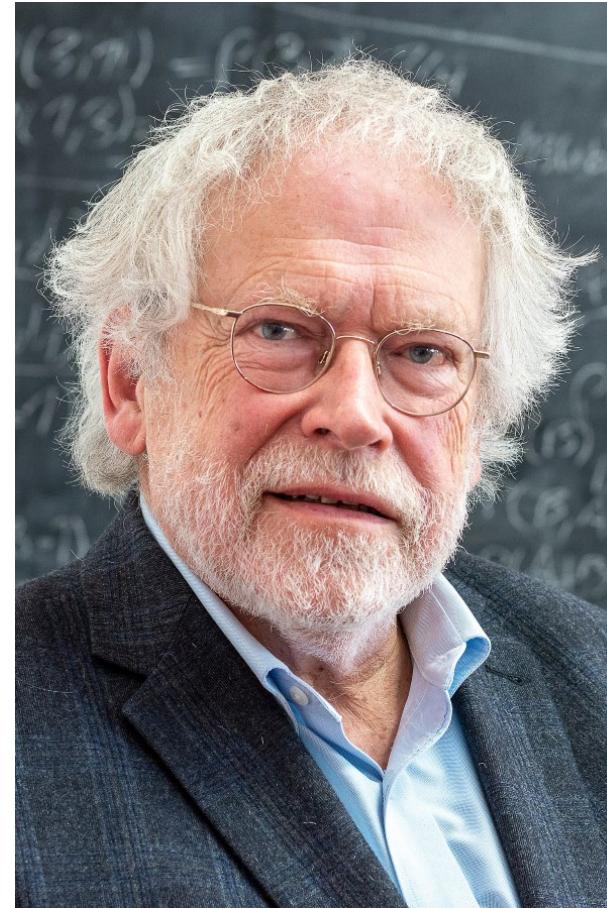




Alain Aspect



John F. Clauser



Anton Zeilinger

Cecil Powell

Facts

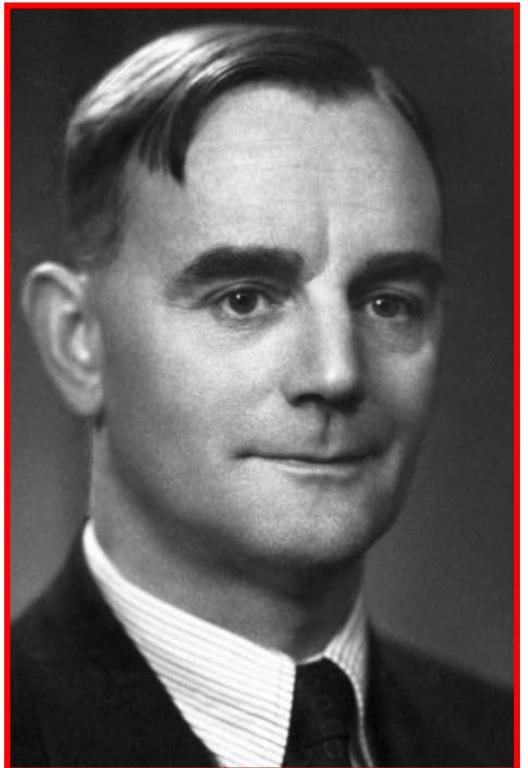


Photo from the Nobel Foundation archive.

Cecil Frank Powell

The Nobel Prize in Physics 1950

Born: 5 December 1903 Tonbridge, United Kingdom

Died: 9 August 1969, Italy

Affiliation at the time of the award: Bristol University, Bristol, United Kingdom

Prize motivation: "for his development of the photographic method of studying nuclear processes and his discoveries regarding mesons made with this method."

Prize share: 1/1

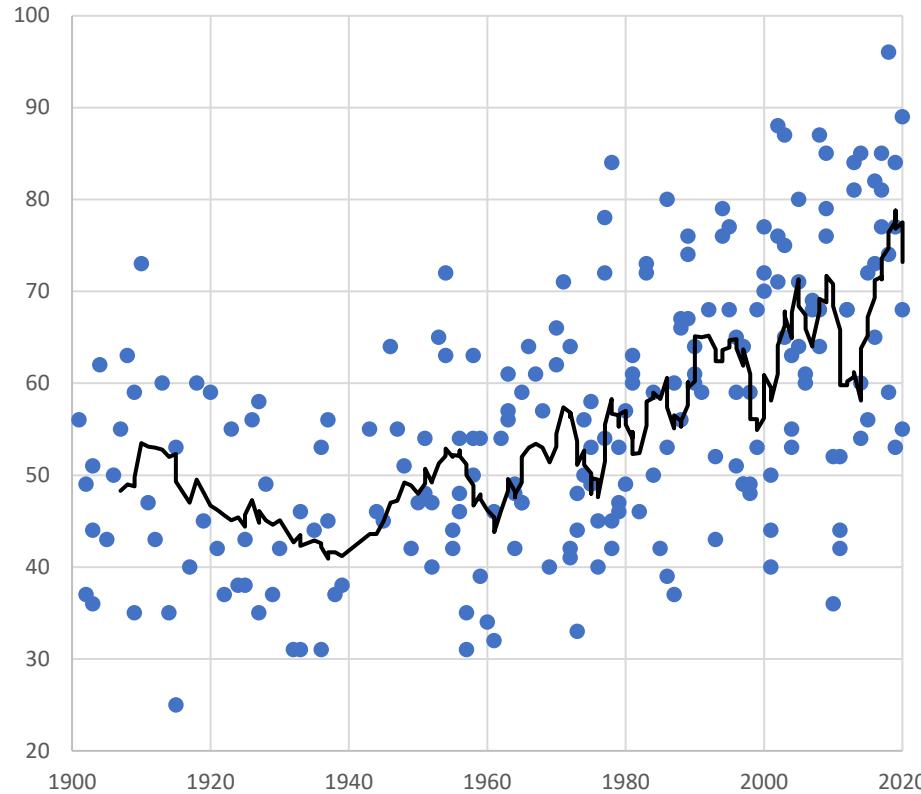
full name
year of award
date of birth
place of birth
date of death
prize share
picture

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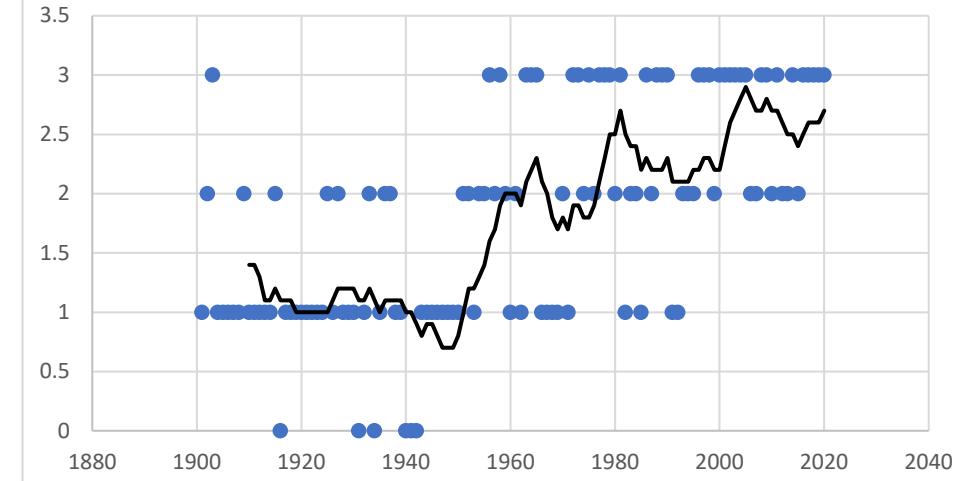
gender

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	firstname	surname	born	died	gender	year	category	share	name_of_university	city_of_university	country_of_university	born_month	age	age_get_prize
2	Wilhelm Conrad	Röntgen	DE	DE	male	1901	physics	1	Munich University	Munich	Germany	Mar	78	56
3	Hendrik A.	Lorentz	NL	NL	male	1902	physics	2	Leiden University	Leiden	the Netherlands	Jul	75	49
4	Pieter	Zeeman	NL	NL	male	1902	physics	2	Amsterdam University	Amsterdam	the Netherlands	May	78	37
5	Henri	Becquerel	FR	FR	male	1903	physics	2	École Polytechnique	Paris	France	Dec	56	51
6	Pierre	Curie	FR	FR	male	1903	physics	4	École municipale de physique et de chimie inc Paris	Paris	France	May	47	44
7	Marie	Curie	PL	FR	female	1903	physics	4				Nov	67	36
9	Lord	Rayleigh	GB	GB	male	1904	physics	1	Royal Institution of Great Britain	London	United Kingdom	Nov	77	62
10	Philipp	Lenard	SK	DE	male	1905	physics	1	Kiel University	Kiel	Germany	Jun	85	43
11	J.J.	Thomson	GB	GB	male	1906	physics	1	University of Cambridge	Cambridge	United Kingdom	Dec	84	50
12	Albert A.	Michelson	PL	US	male	1907	physics	1	University of Chicago	Chicago IL	USA	Dec	79	55
13	Gabriel	Lippmann	LU		male	1908	physics	1	Sorbonne University	Paris	France	Aug	76	63
14	Guglielmo	Marconi	IT	IT	male	1909	physics	2	Marconi Wireless Telegraph Co. Ltd.	London	United Kingdom	Apr	63	35
15	Ferdinand	Braun	DE	US	male	1909	physics	2	Strasbourg University	Strasbourg	Germany (now France)	Jun	68	59
16	Johannes Diderik	van der Waals	NL	NL	male	1910	physics	1	Amsterdam University	Amsterdam	the Netherlands	Nov	86	73
17	Wilhelm	Wien	RU	DE	male	1911	physics	1	Würzburg University	Würzburg	Germany	Jan	64	47
18	Gustaf	Dalén	SE	SE	male	1912	physics	1	Swedish Gas-Accumulator Co.	Lidingö Stockholm	Sweden	Nov	68	43
19	Heike	Kamerlingh Onnes	NL	NL	male	1913	physics	1	Leiden University	Leiden	the Netherlands	Sep	73	60
20	Max	von Laue	DE	DE	male	1914	physics	1	Frankfurt-on-the-Main University	Frankfurt-on-the-Main	Germany	Oct	81	35
21	William	Bragg	GB	GB	male	1915	physics	2	University College	London	United Kingdom	Jul	80	53
22	Lawrence	Bragg	AU	GB	male	1915	physics	2	Victoria University	Manchester	United Kingdom	Mar	81	25
23	Charles Glover	Barkla	GB	GB	male	1917	physics	1	Edinburgh University	Edinburgh	United Kingdom	Jun	67	40
24	Max	Planck	DE	DE	male	1918	physics	1	Berlin University	Berlin	Germany	Apr	89	60
25	Johannes	Stark	DE	DE	male	1919	physics	1	Greifswald University	Greifswald	Germany	Apr	83	45
26	Charles Edouard	Guillaume	CH	FR	male	1920	physics	1	Bureau International des Poids et Mesures (In Sèvres		France	Feb	77	59
27	Albert	Einstein	DE	US	male	1921	physics	1	Kaiser-Wilhelm-Institut (now Max-Planck-Inst Berlin		Germany	Mar	76	42
28	Niels	Bohr	DK	DK	male	1922	physics	1	Copenhagen University	Copenhagen	Denmark	Oct	77	37
29	Robert A.	Millikan	US	US	male	1923	physics	1	California Institute of Technology (Caltech)	Pasadena CA	USA	Mar	85	55
30	Manne	Siegbahn	SE	SE	male	1924	physics	1	Uppsala University	Uppsala	Sweden	Dec	92	38
31	James	Franck	DE	DE	male	1925	physics	2	Goettingen University	Göttingen	Germany	Aug	82	43
32	Gustav	Hertz	DE	DE	male	1925	physics	2	Halle University	Halle	Germany	Jul	88	38
33	Jean Baptiste	Perrin	FR	US	male	1926	physics	1	Sorbonne University	Paris	France	Sep	72	56
34	Arthur H.	Compton	US	US	male	1927	physics	2	University of Chicago	Chicago IL	USA	Sep	70	35
35	C.T.R.	Wilson	GB	GB	male	1927	physics	2	University of Cambridge	Cambridge	United Kingdom	Feb	90	58
36	Owen Willans	Richardson	GB	GB	male	1928	physics	1	London University	London	United Kingdom	Apr	80	49
37	Louis	de Broglie	FR	FR	male	1929	physics	1	Sorbonne University Institut Henri Poincaré	Paris	France	Aug	95	37
38	Sir Chandrasekhara Venkata	Raman	IN	IN	male	1930	physics	1	Calcutta University	Calcutta	India	Nov	82	42
39	Werner	Heisenberg	DE	DE	male	1932	physics	1	Leipzig University	Leipzig	Germany	Dec	75	31
40	Erwin	Schrödinger	AT	AT	male	1933	physics	2	Berlin University	Berlin	Germany	Aug	74	46
41	Paul A.M.	Dirac	GB	US	male	1933	physics	2	University of Cambridge	Cambridge	United Kingdom	Aug	82	31
42	James	Chadwick	GR	GB	male	1935	nphysics	1	Liverpool University	Liverpool	United Kingdom	Oct	83	44

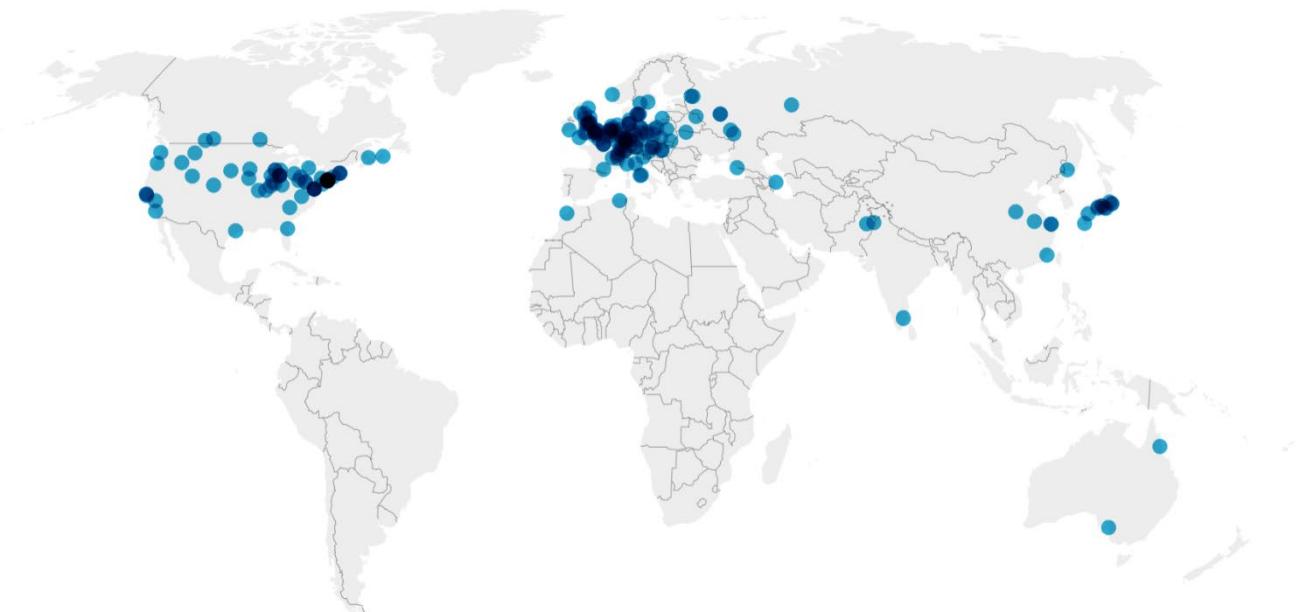
Average age



Number of laureates



Laureate birth place



gender balance

Men: 218

Women: 4

The Nobel Prize in Physics

114 years, 108 prizes, 198 laureates



25 YOUNGEST LAUREATE



William Lawrence Bragg
1915

88 OLDEST LAUREATE



Raymond Davis Jr.
2002

2 HIGHEST NUMBER OF PRIZES WON



John Bardeen
1956, 1972

Laureates' gender

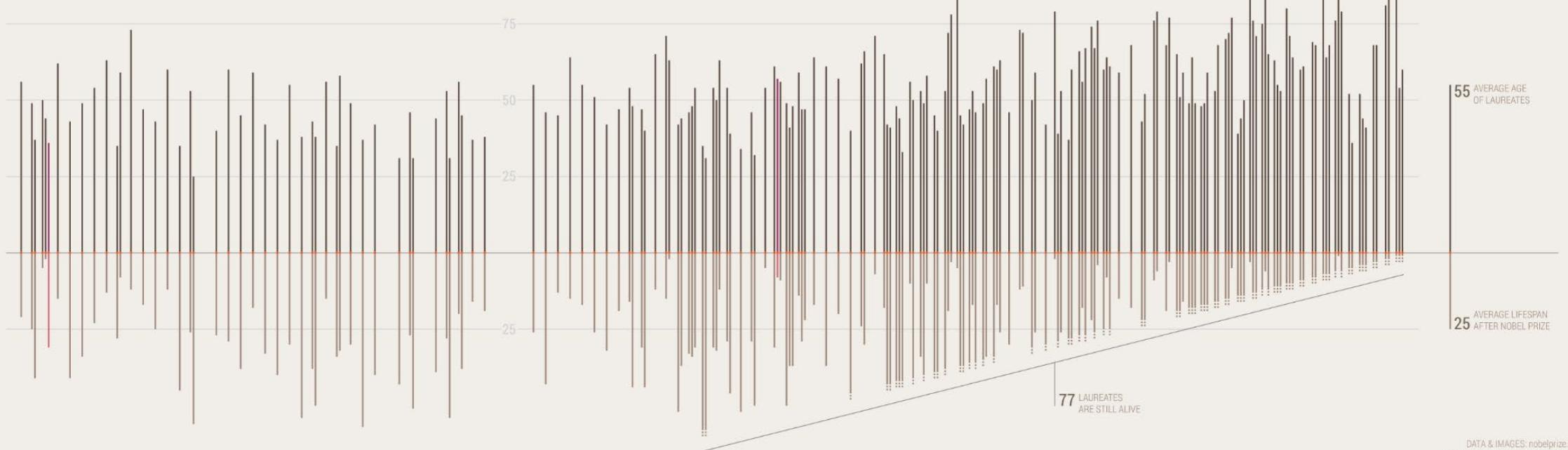
MALE ————— 196
FEMALE + 2



Most successful research domains

PARTICLE PHYSICS ————— 34
ATOMIC PHYSICS ————— 28
CONDENSED MATTER ————— 28
INSTRUMENTATION ————— 20

19 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14



DATA & IMAGES: nobelprize.org
VISUALIZATION & DESIGN: baryon.be

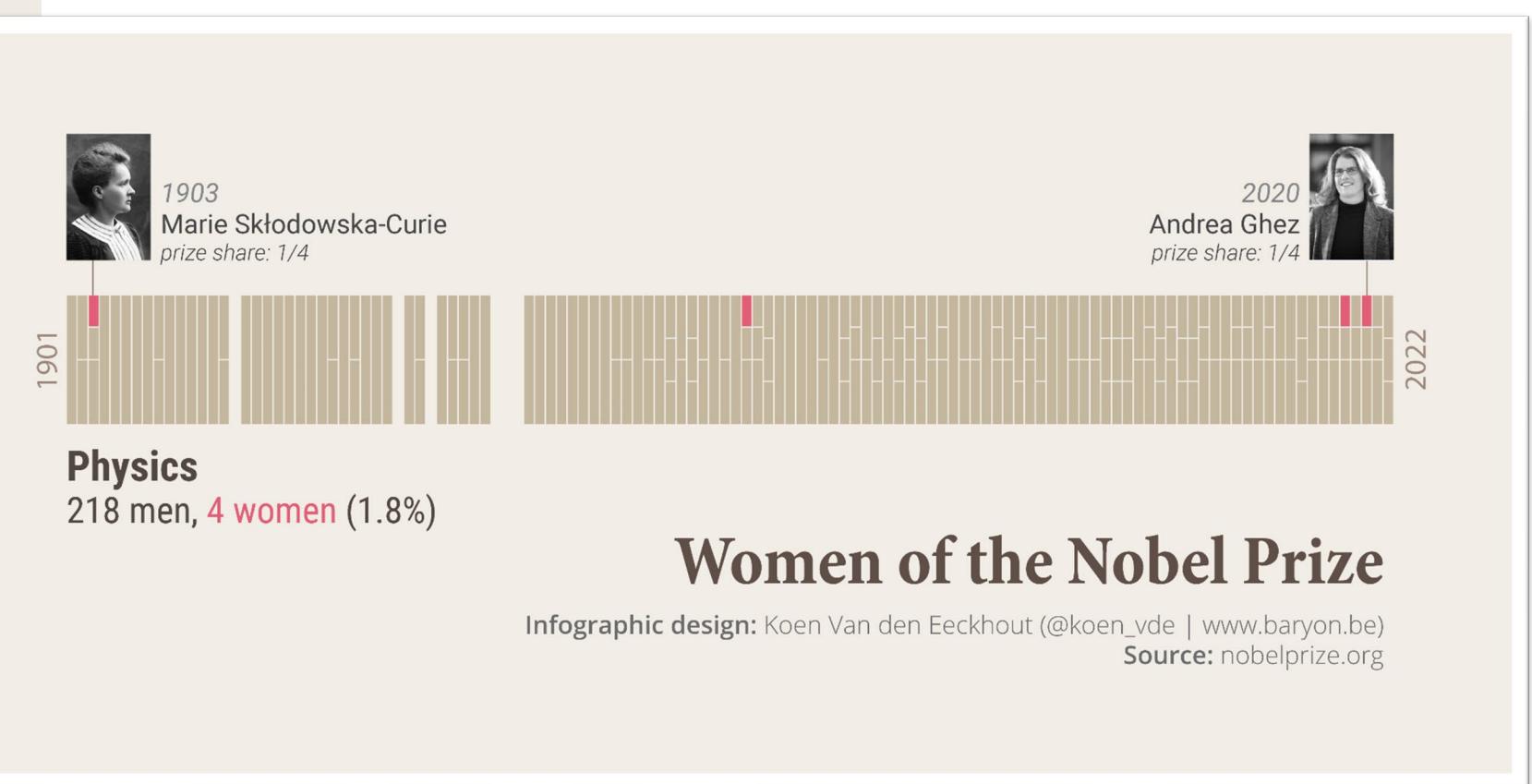
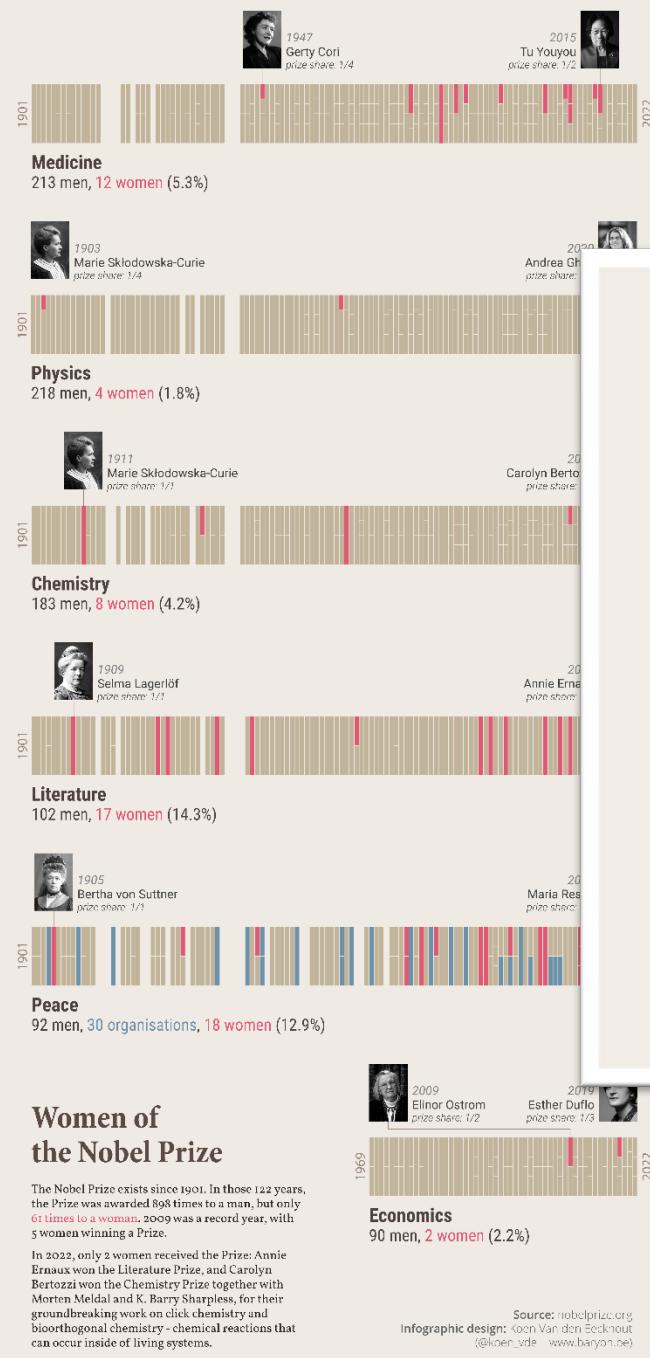
The average laureate

The average laureate of the Nobel Prize in Physics is a white male of 56 years old.
Obviously, there is no such thing as an 'average Nobel Prize winner'. However, it is safe
to say your chances of winning are pretty slim if you are a woman. In the past 118
years, only 3 women have won the Nobel Prize in Physics - versus 206 men.



Looking at age, we can safely say that laureates are getting older and older. Well, of course they are, just like all of us, but the age at which laureates receive their prize is going up. In the period before 1960, the average age of a laureate was 47, with William Lawrence Bragg being the youngest winner at the age of 25. However, since 1960, the average age has gone up to 61 years. In 2018, Arthur Ashkin was the oldest laureate to ever receive a Nobel Prize (in any field) at the age of 96.





Communication principles

1. Identify your **message**
2. Adapt to your _____
3. Improve the _____ - _____ - _____ ratio

**my most challenging
presentation ever**



DARK”

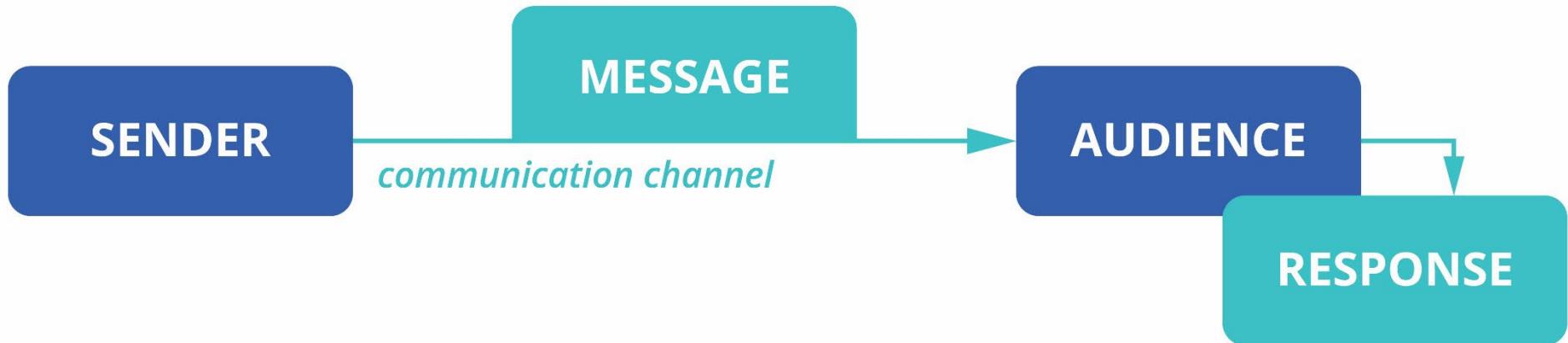




Communication principles

1. Identify your **message**
2. Adapt to your **audience**
3. Improve the _____ - _____ - _____ ratio

The basic model of communication



Who is my audience?

What do they want to know?

What do they need to do?

How much time do they have?

How far away are they?

How frequently will they look at this?

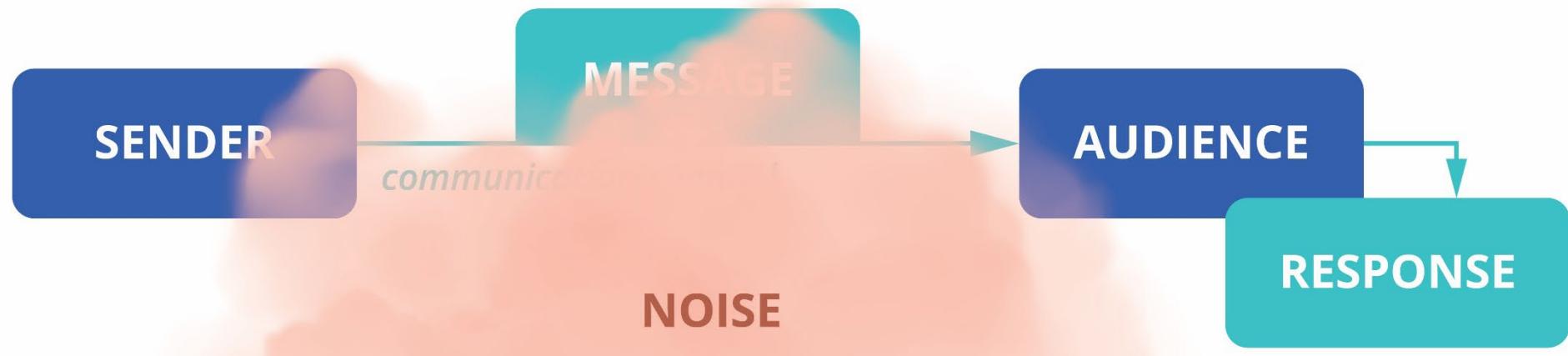


when you don't adapt
to your audience...

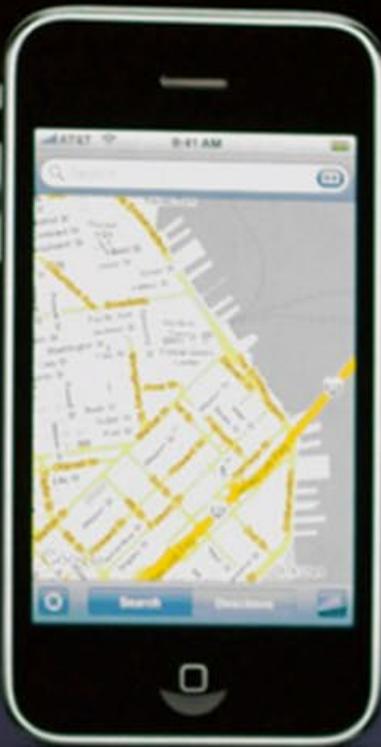
Communication principles

1. Identify your **message**
2. Adapt to your **audience**
3. Improve the _____ - _____ - _____ ratio

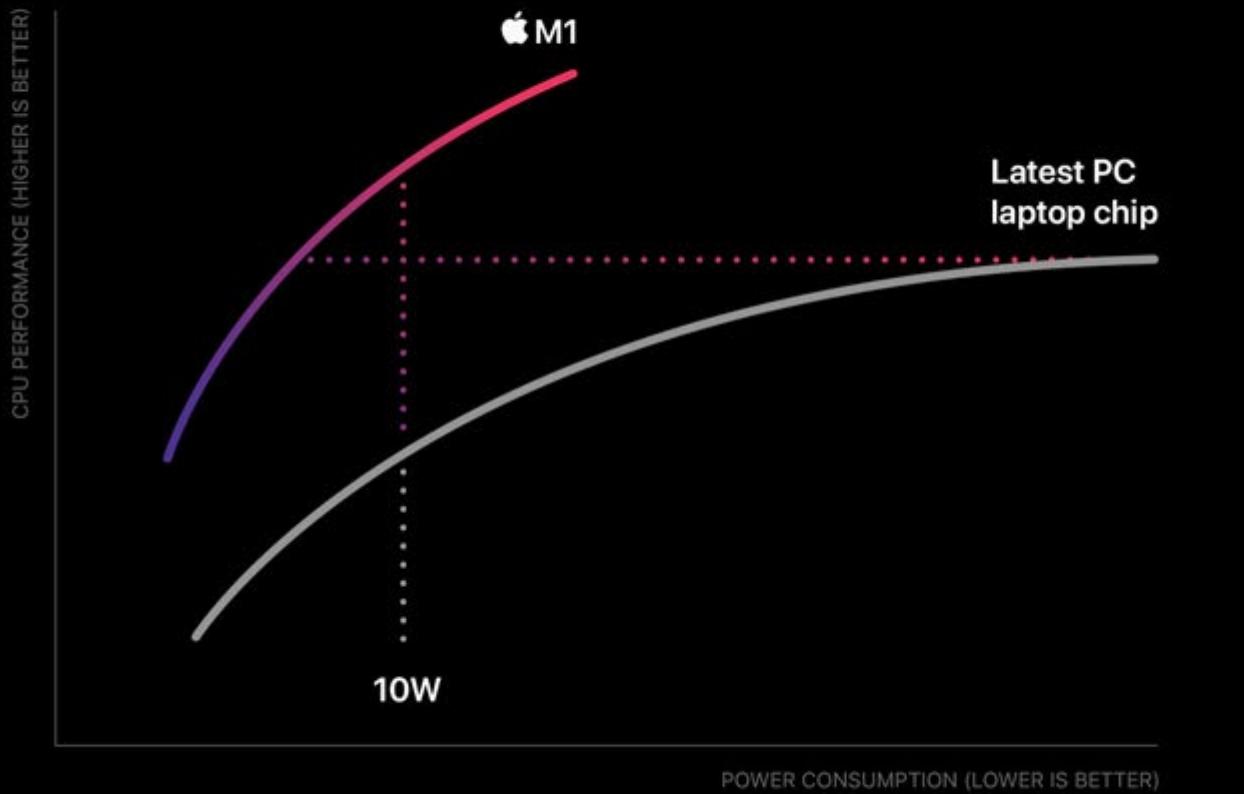
The basic model of communication



GPS



CPU performance vs. power



Up to
2x
faster CPU
performance¹

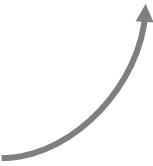
Matches peak PC
performance using
25%
of the power¹

Communication principles

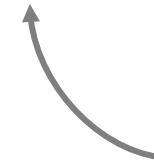
1. Identify your **message**
2. Adapt to your **audience**
3. Improve the **signal-to-noise** ratio

Maximize the **signal-to-noise ratio**

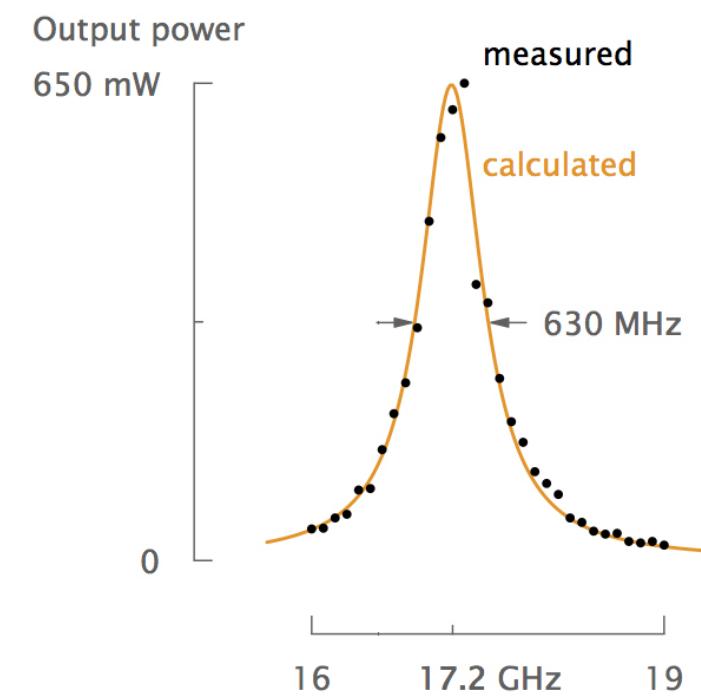
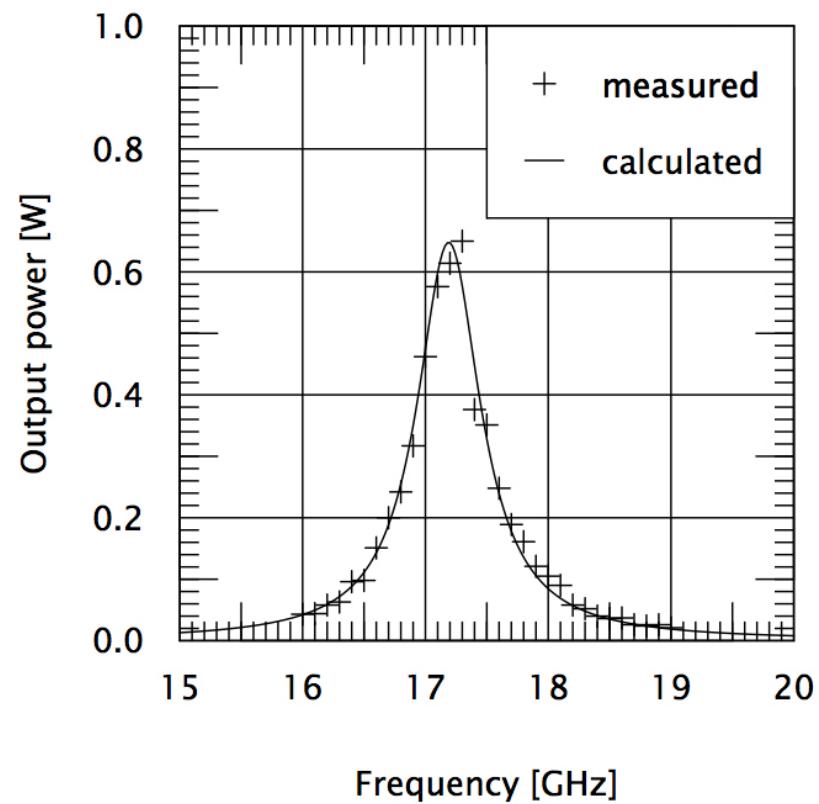
your message



*everything that can
distract your audience
from your message*







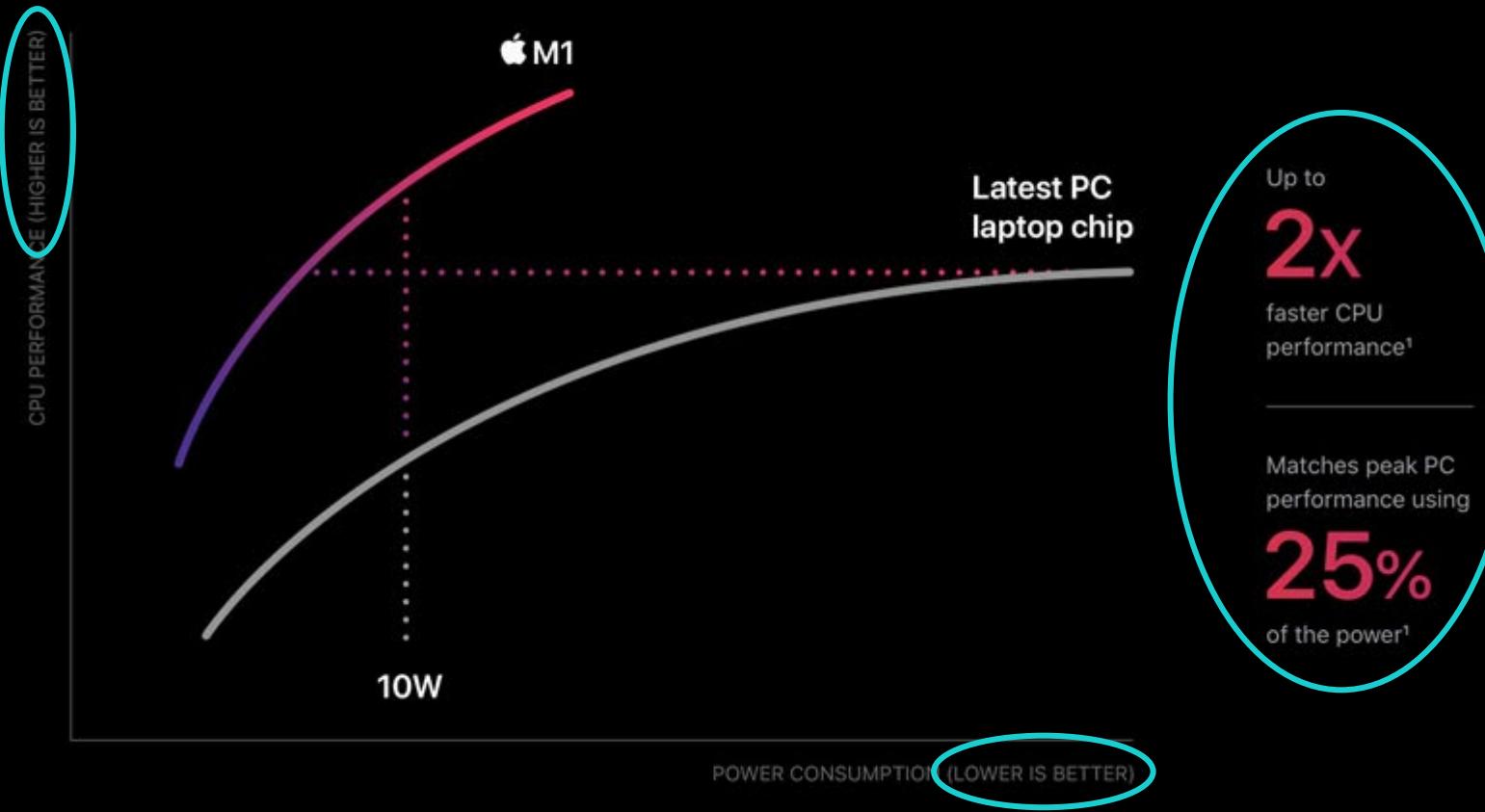
Noise = physical noise

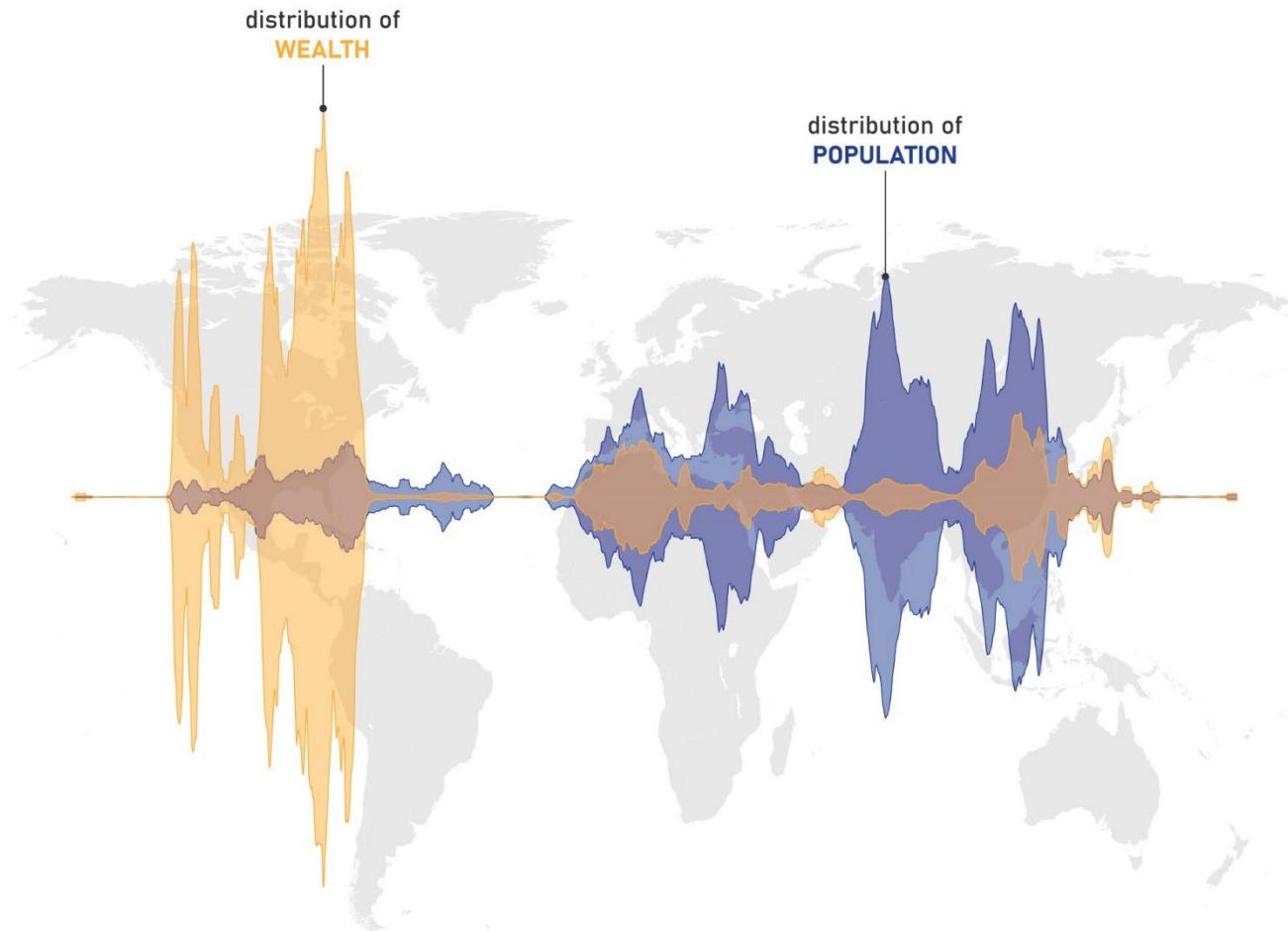
elements which are on the visual
but are not helpful

+ mental noise

thinking work required
from your audience

CPU performance vs. power





The Wealthy West

Inequality is not just limited to North versus South

Source: Credit Suisse Global Wealth Report 2019; Socioeconomic Data and Applications Center - Gridded Population of the World v.11

A #MakeoverMonday visualization
by **Koen Van den Eeckhout** (@koen_vde)

anklemeat13 3 points · 14 days ago

Seriously how does this have so many awards it's doesn't even make sense.

Reply Give Award Share Report Save

Craigmm114 680 points · 14 days ago

Am I reading this wrong or is this a terrible representation? Europe is completely skewed since it is right above Africa which would definitely mess it up.

Reply Give Award Share Report Save

willjoke4food 256 points · 14 days ago

This is extremely useless visualisation

Reply Give Award Share Report Save

d80hunter 35 points · 14 days ago

You wasn't supposed to look that hard and notice the fine details, it is a reactionary click bait graph. The keywords "wealth inequality" and "west" with the data shown sure make it seem that way.

Reply Give Award Share Report Save

Specialey 36 points · 14 days ago

I cannot read the graph, it's either that I'm graphically illiterate or this is a terribly made graph

Reply Give Award Share Report Save

BillyBuckets 17 points · 14 days ago

The second one.

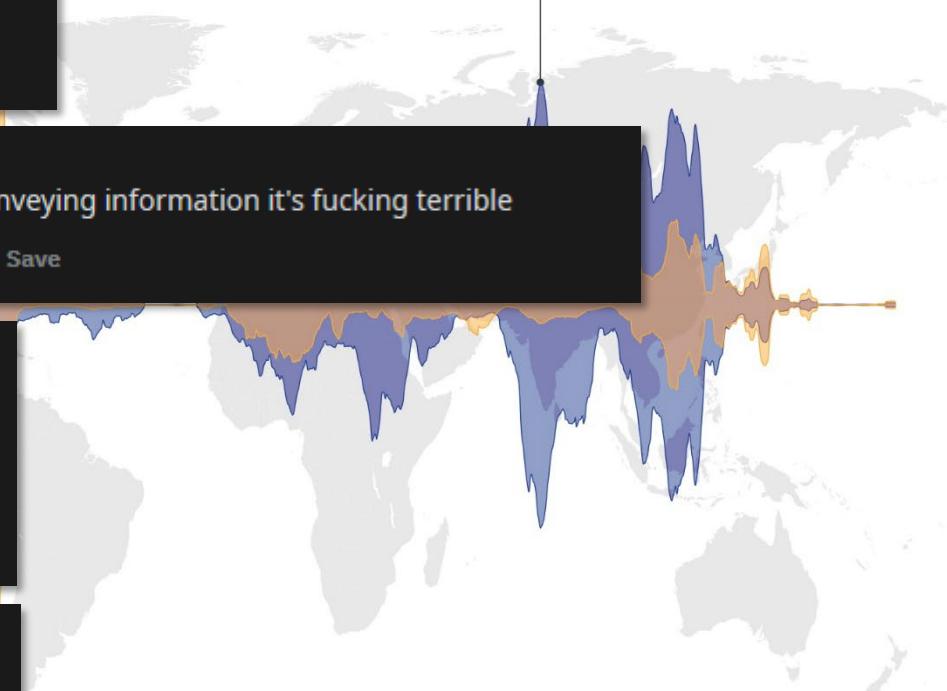
Reply Give Award Share Report Save

bodie_ 4 points · 13 days ago

This graph is horrendous. I've read more than a hundred comments and no-one is able to explain how it's supposed to be read.

Reply Give Award Share Report Save

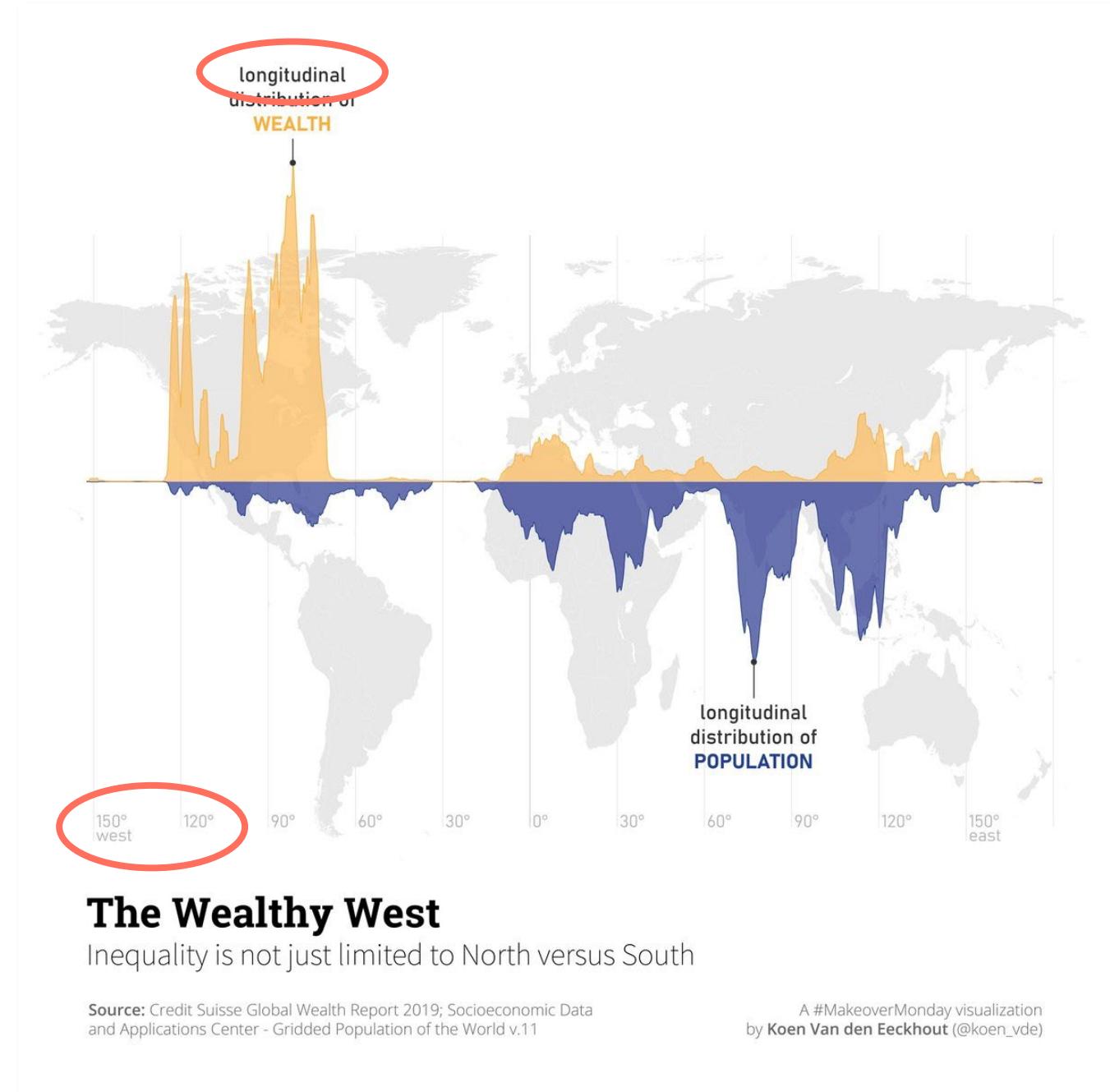
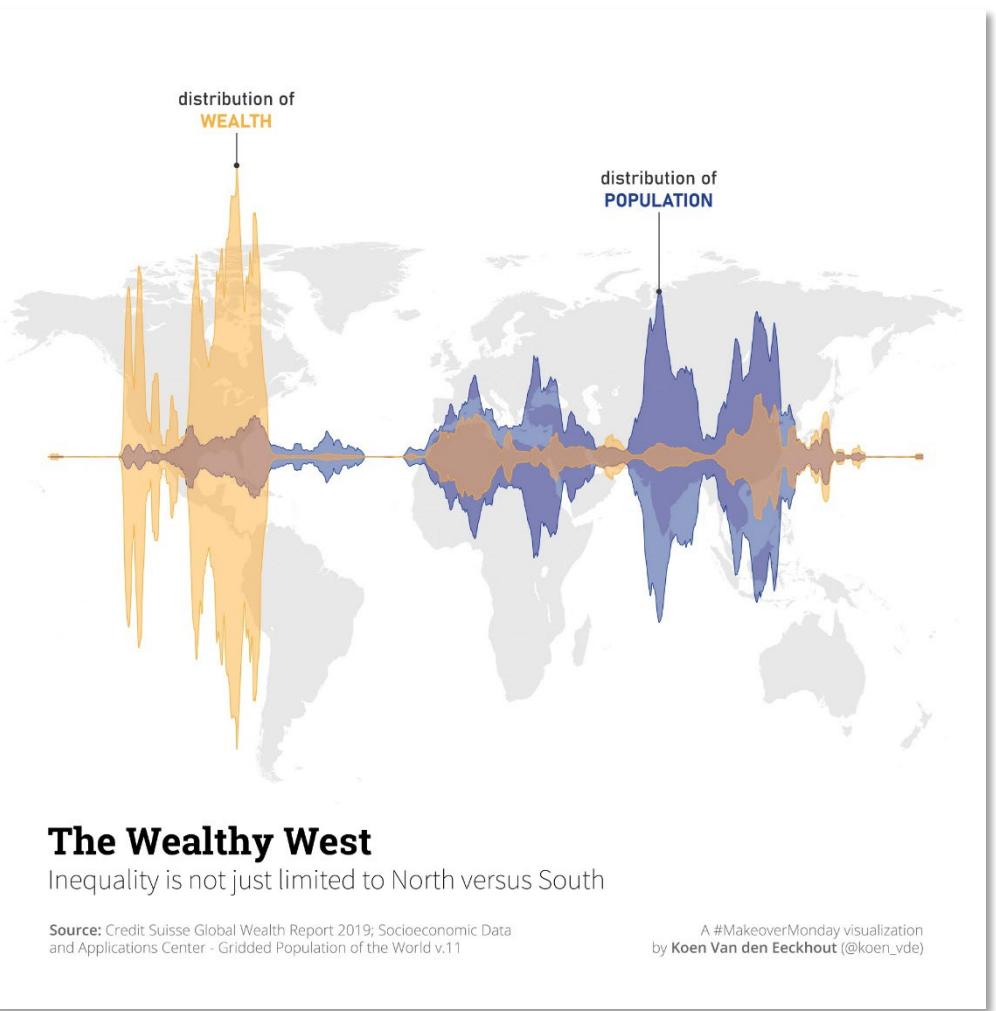
distribution of
POPULATION



Pikesmakker 8 points · 14 days ago

This presentation is fucking terrible

Reply Give Award Share Report Save



Quick tip

Direct labeling

World carbon dioxide emissions from the consumption and flaring of fossil fuels

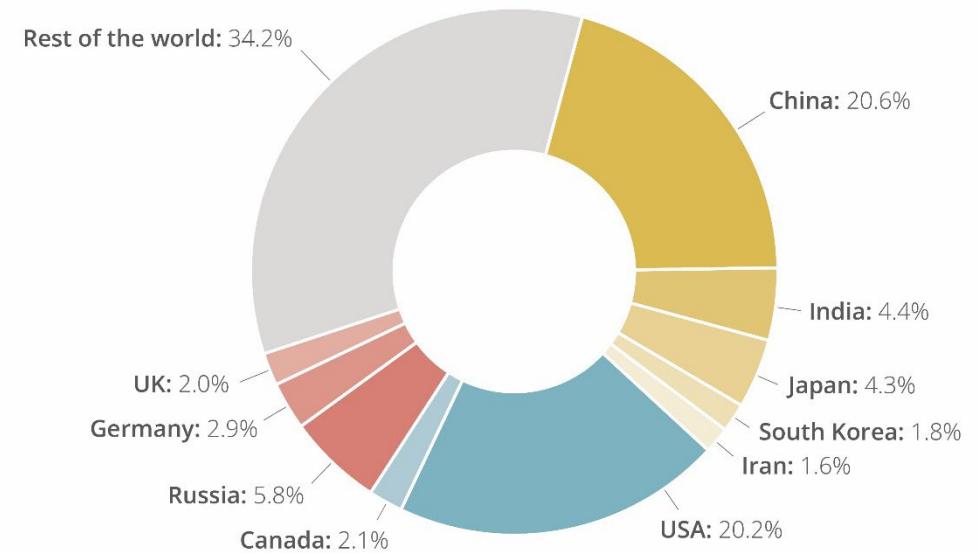
Million metric tons of carbon dioxide, in 2006



Source: Energy Emission Administration

Global share of CO₂ emissions (2006)

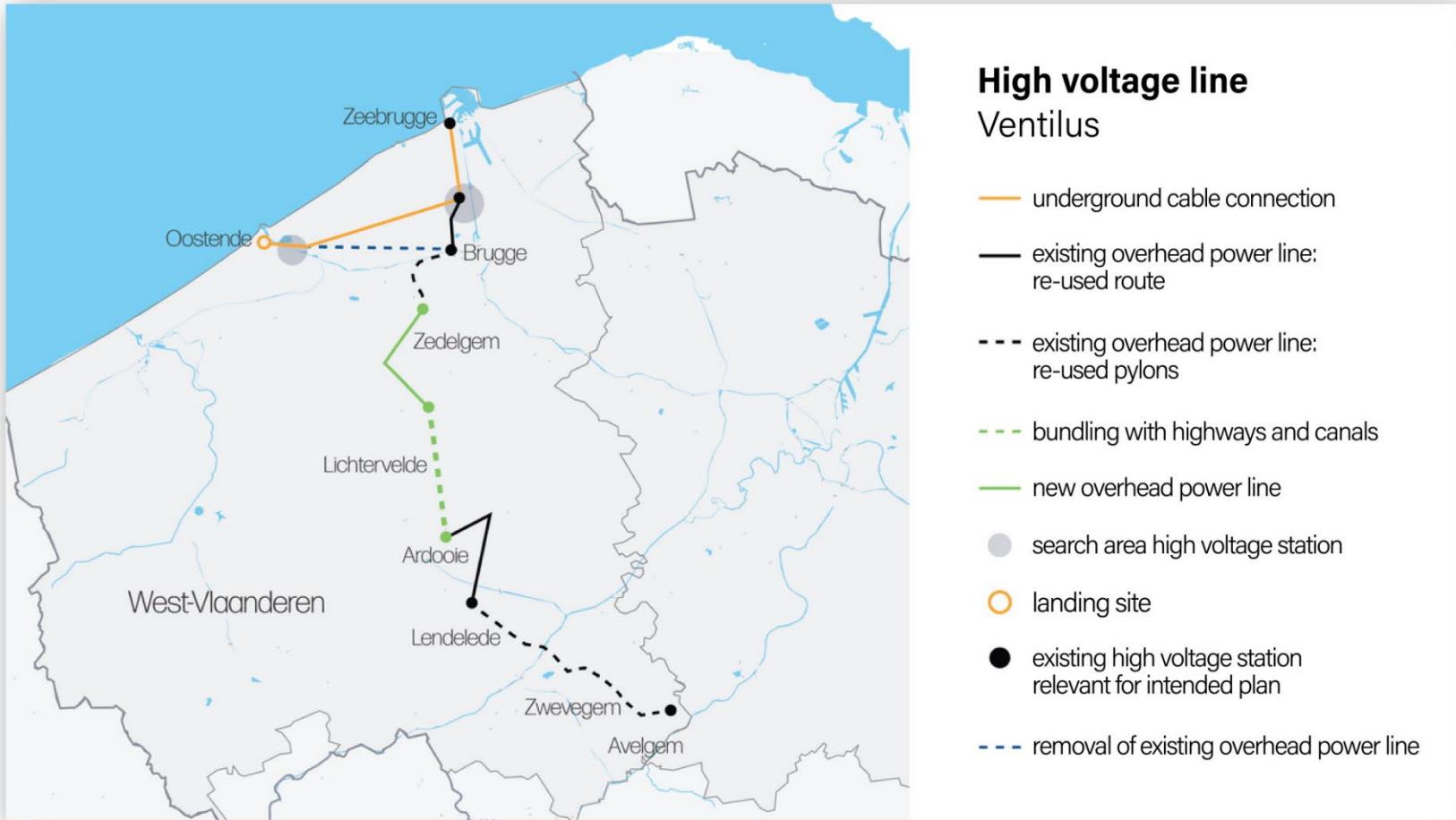
Carbon dioxide emissions are dominated by China and the USA



Source: Energy Emission Administration

Quick tip

Direct labeling

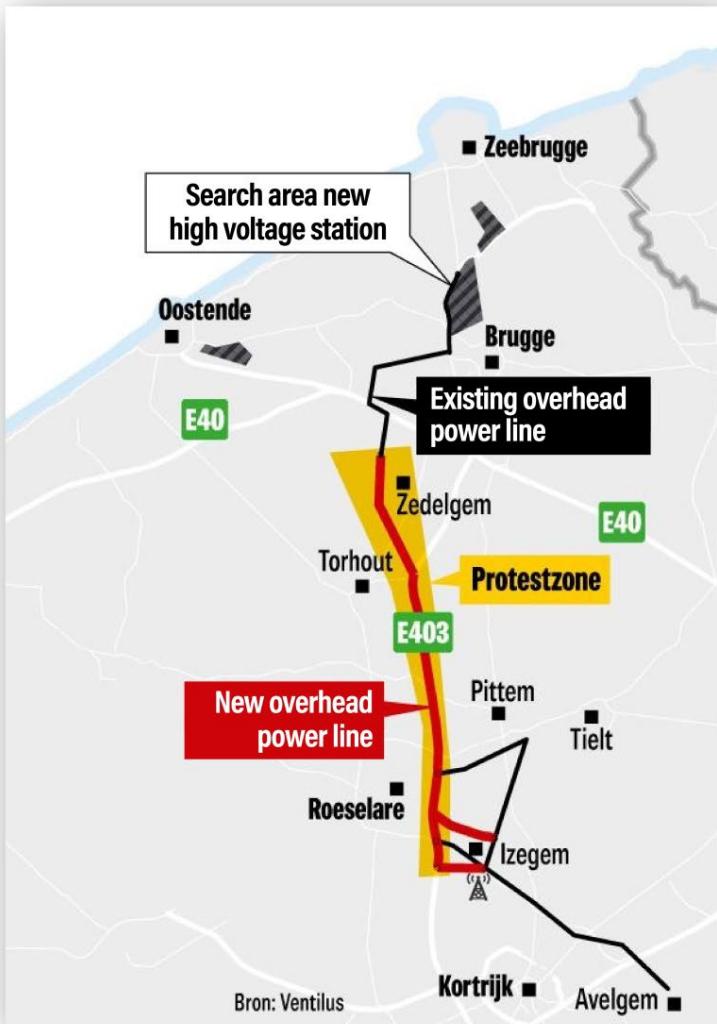


Hard to read

This map uses a legend, forcing us to constantly switch from left to right in order to read it.

Quick tip

Direct labeling



Easy to read

This map uses direct labeling, so we can immediately see what we need to know without moving around.

Communication principles

1. Identify your **message**
2. Adapt to your **audience**
3. Improve the **signal-to-noise** ratio

What's your story?

Exercise in pairs

Identify **a key message** about your research or domain.

Turn it into a **short, memorable sentence**.

Share your key message with your partner, **discuss and improve**.

Can you break it up into shorter, more elemental key messages?

Can you make it less vague, more specific?

Does it answer the 'what' question, or the 'so what' question?



Lunch break

All the slides and all the links:

baryon.be/visuals-resources

Session 1

Introduction

Elements of powerful visuals

Visual communication principles

lunch break

Graphical abstracts/posters

Design principles

Icons and illustrations

Editing vector images

HOMEWORK
Create a graphical abstract

Session 2

Homework feedback

Colours and text in your visuals

Editing bitmap images

Creating layouts

Graphs

Legal and ethical aspects

Recap and Q&A

Graphical abstracts



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Graphical abstracts

A graphical abstract is a **single, concise, pictorial and visual summary** of the main findings of the article. This could either be the concluding figure from the article or a figure that is specially designed for the purpose, which captures the content of the article for readers at a single glance. Please see examples below.

The graphical abstract will be displayed in online search result lists, the online contents list and the online article, but will not (yet) appear in the article PDF file or print.

Author instructions

A graphical abstract should allow readers to quickly gain an understanding of the main take-home message of the paper and is intended to encourage browsing, promote interdisciplinary scholarship, and help readers identify more quickly which papers are most relevant to their research interests.

Authors must provide an image that clearly represents the work described in the paper. A key figure from the original paper, summarising the content can also be submitted as a graphical abstract. Graphical abstracts should be submitted as a separate file in the submission system by selecting "graphical abstracts" from the drop-down list when uploading files.

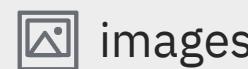
Specifications:

A graphical abstract should be a one-image file and should visualize one process or make one point clear. For ease of



information

represented by



images

+

Aa minimal text



arranged in a
structure

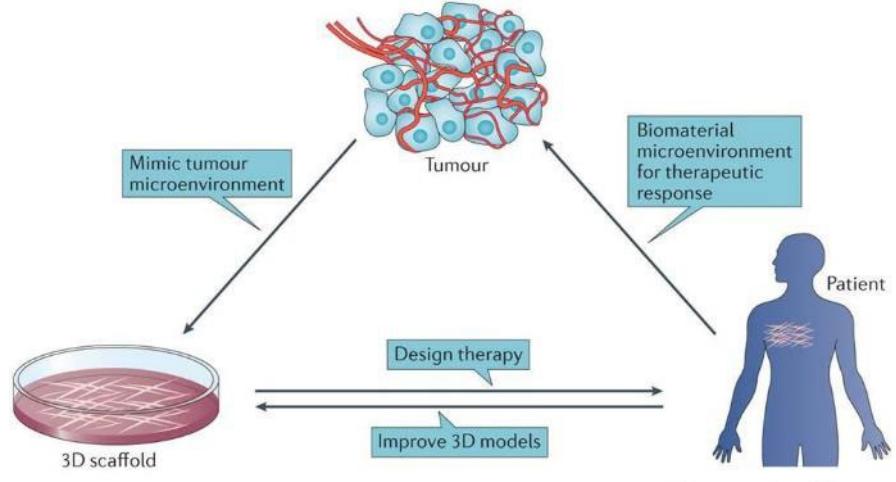
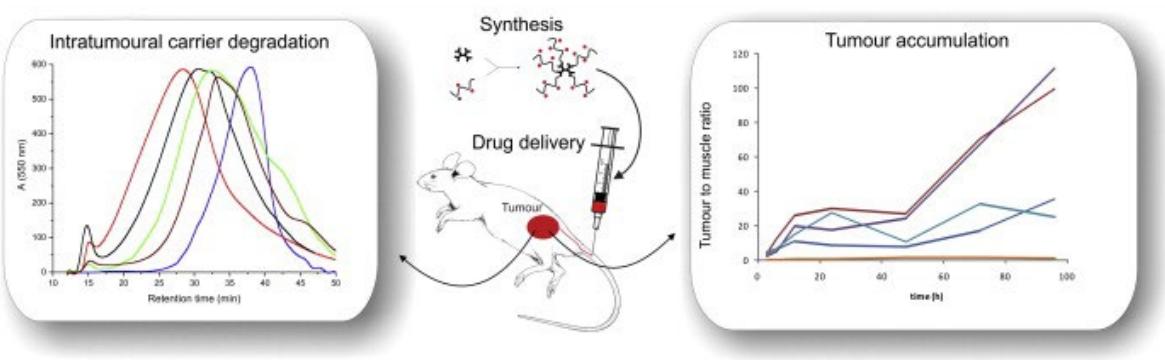
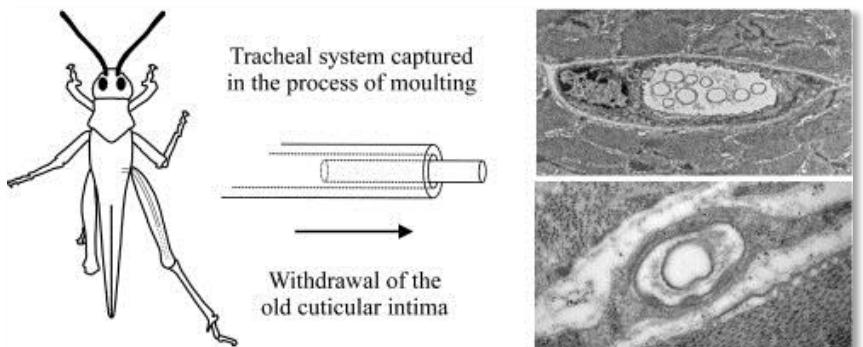
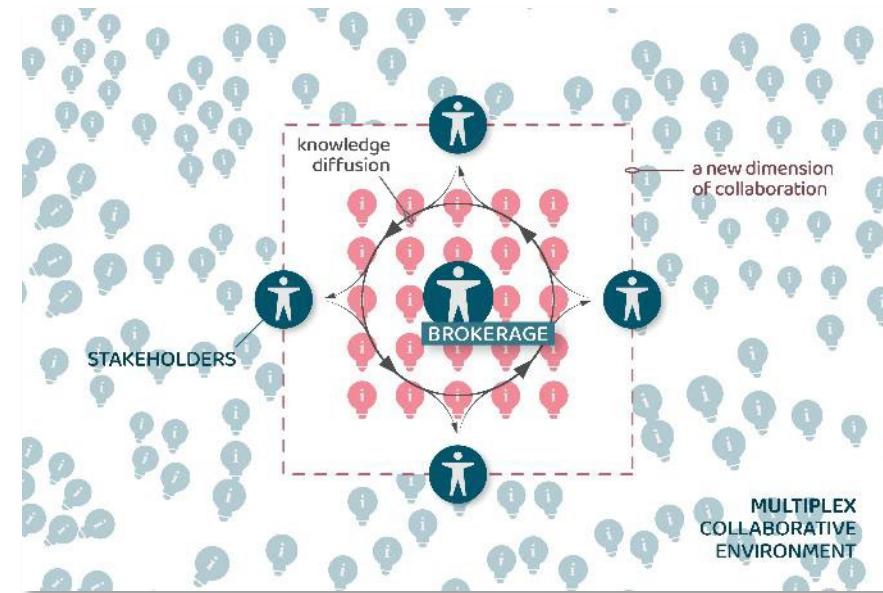
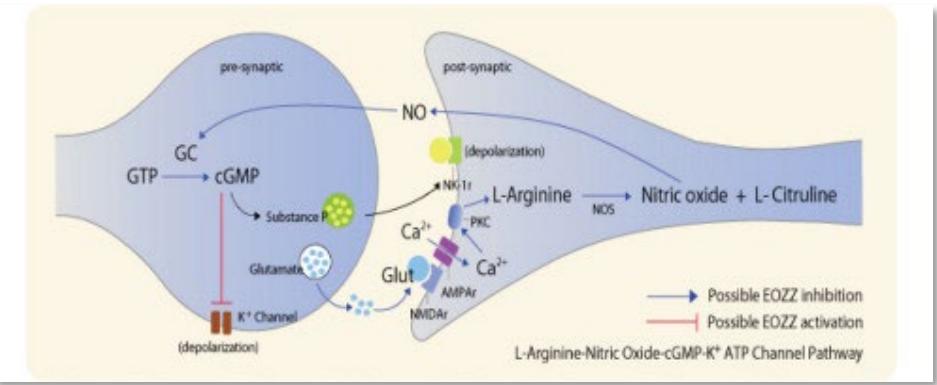
to tell a



story

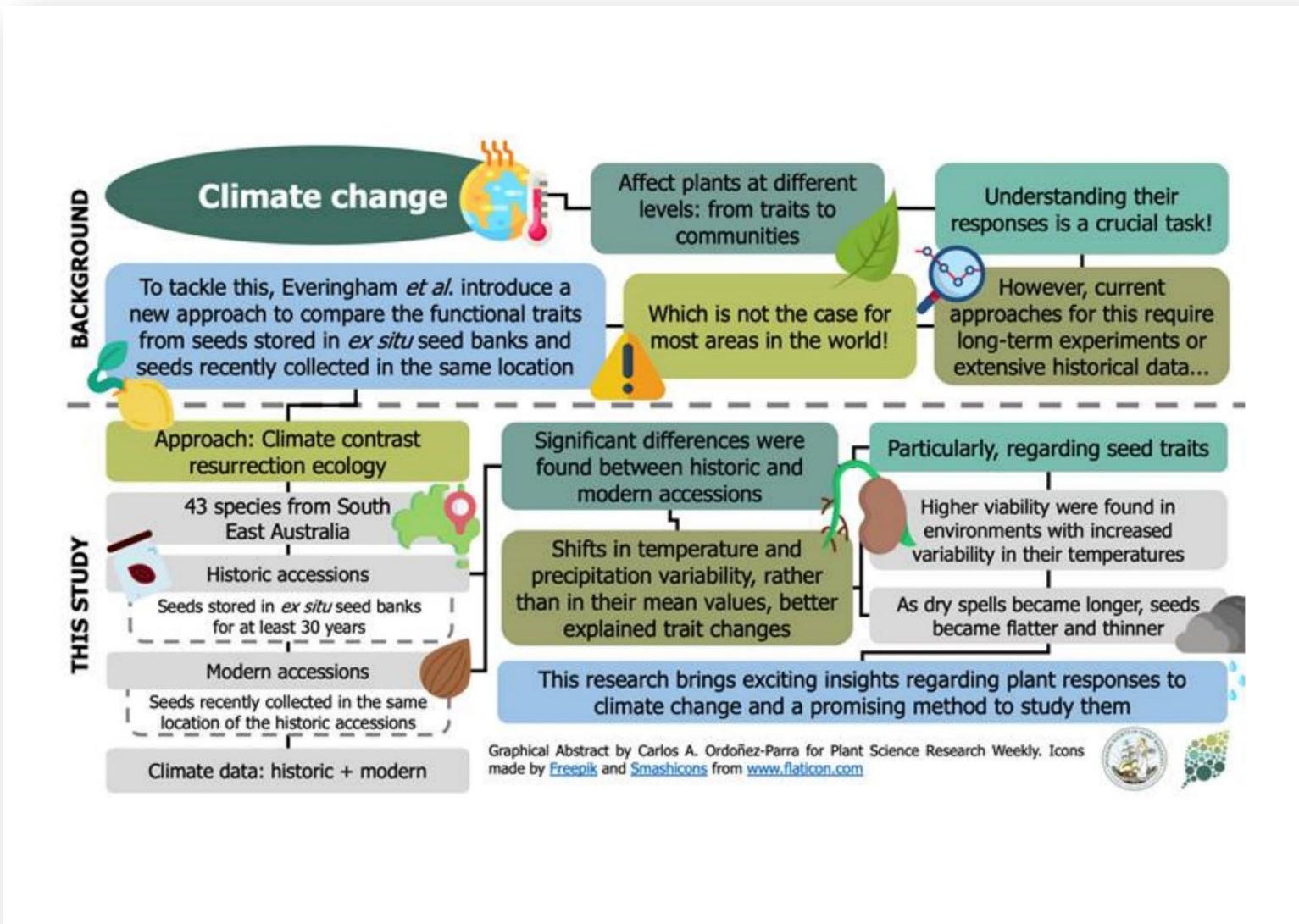


to **educate/engage**
an audience



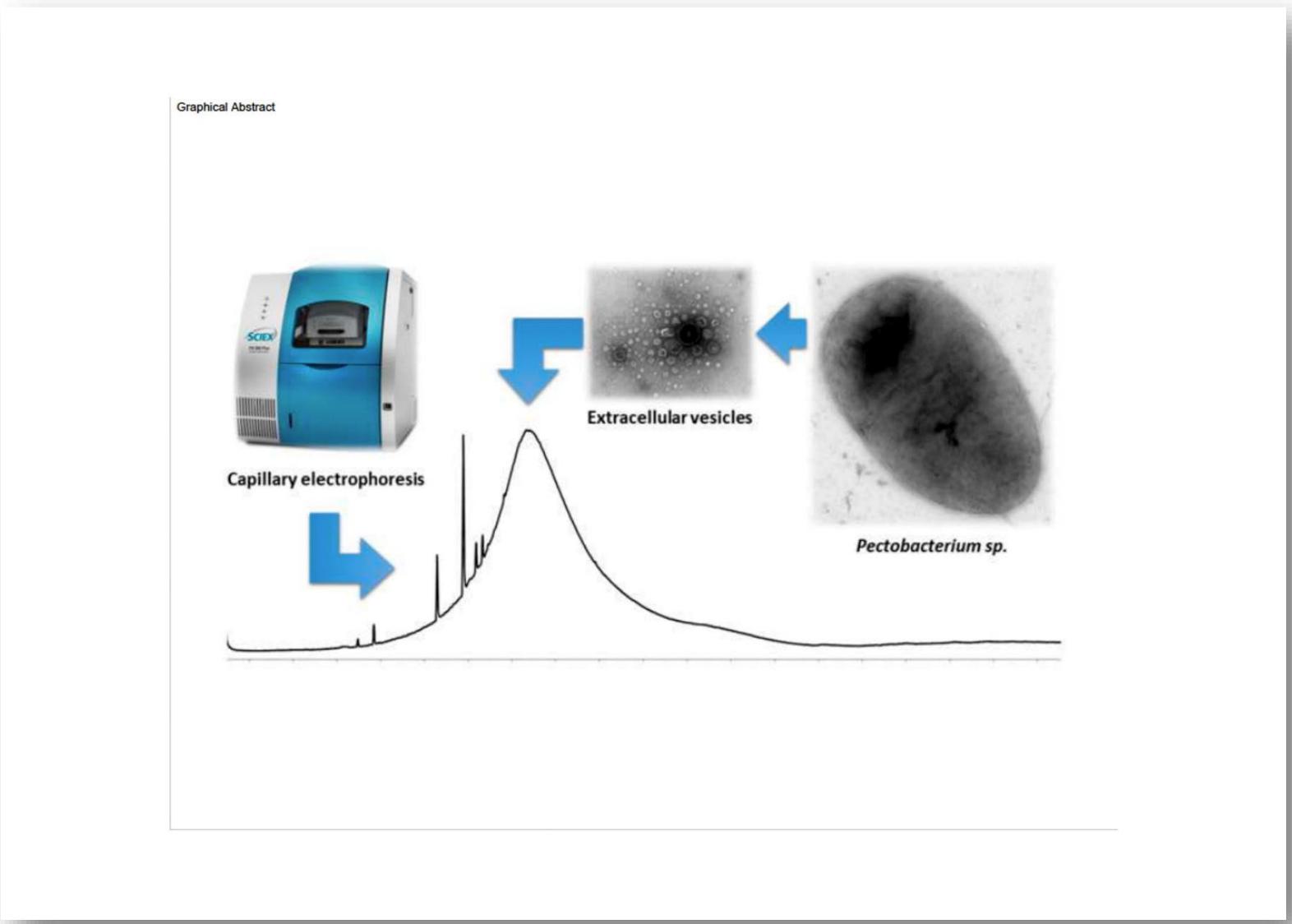
Common pitfalls

Too much text



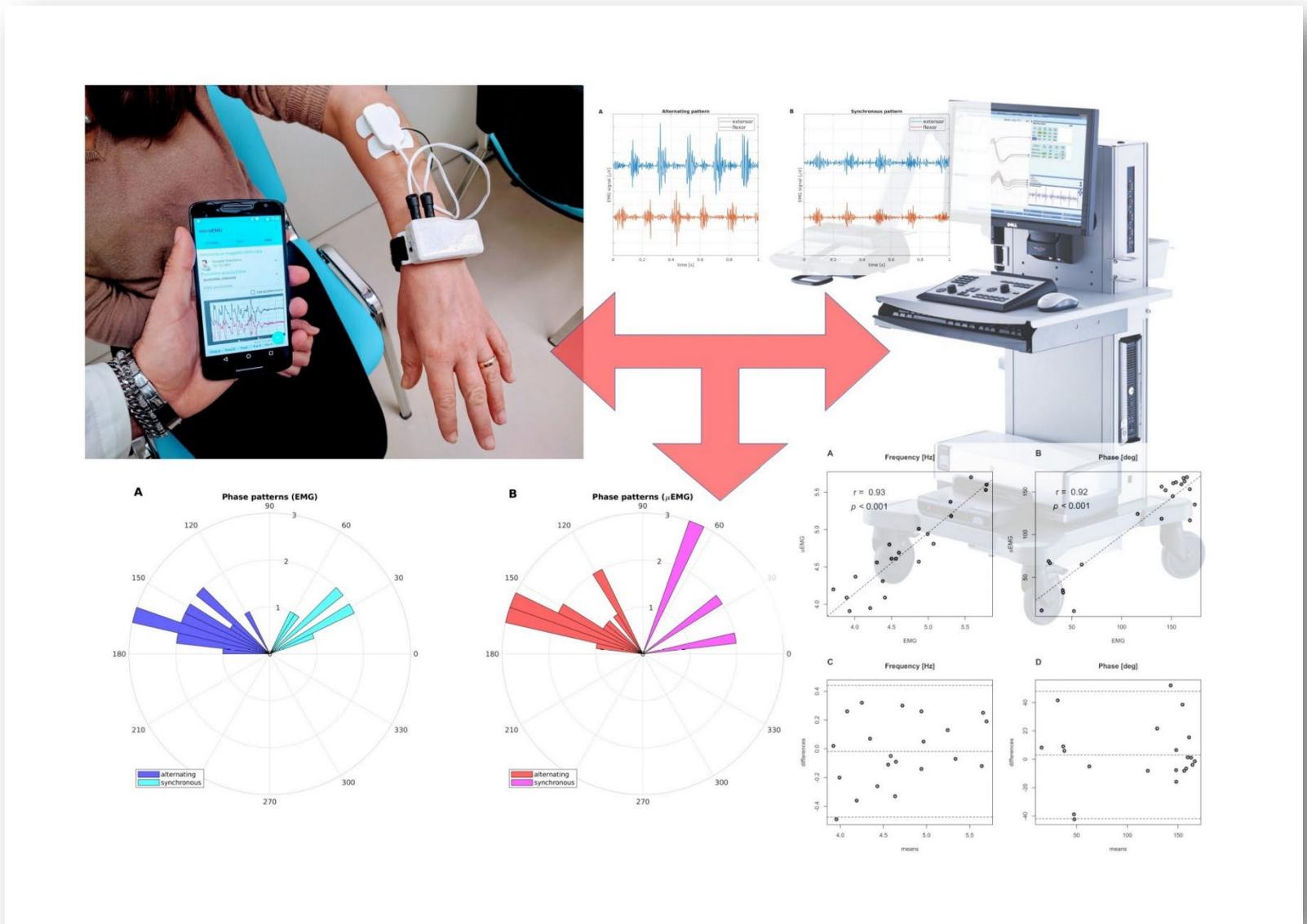
Common pitfalls

Too little text



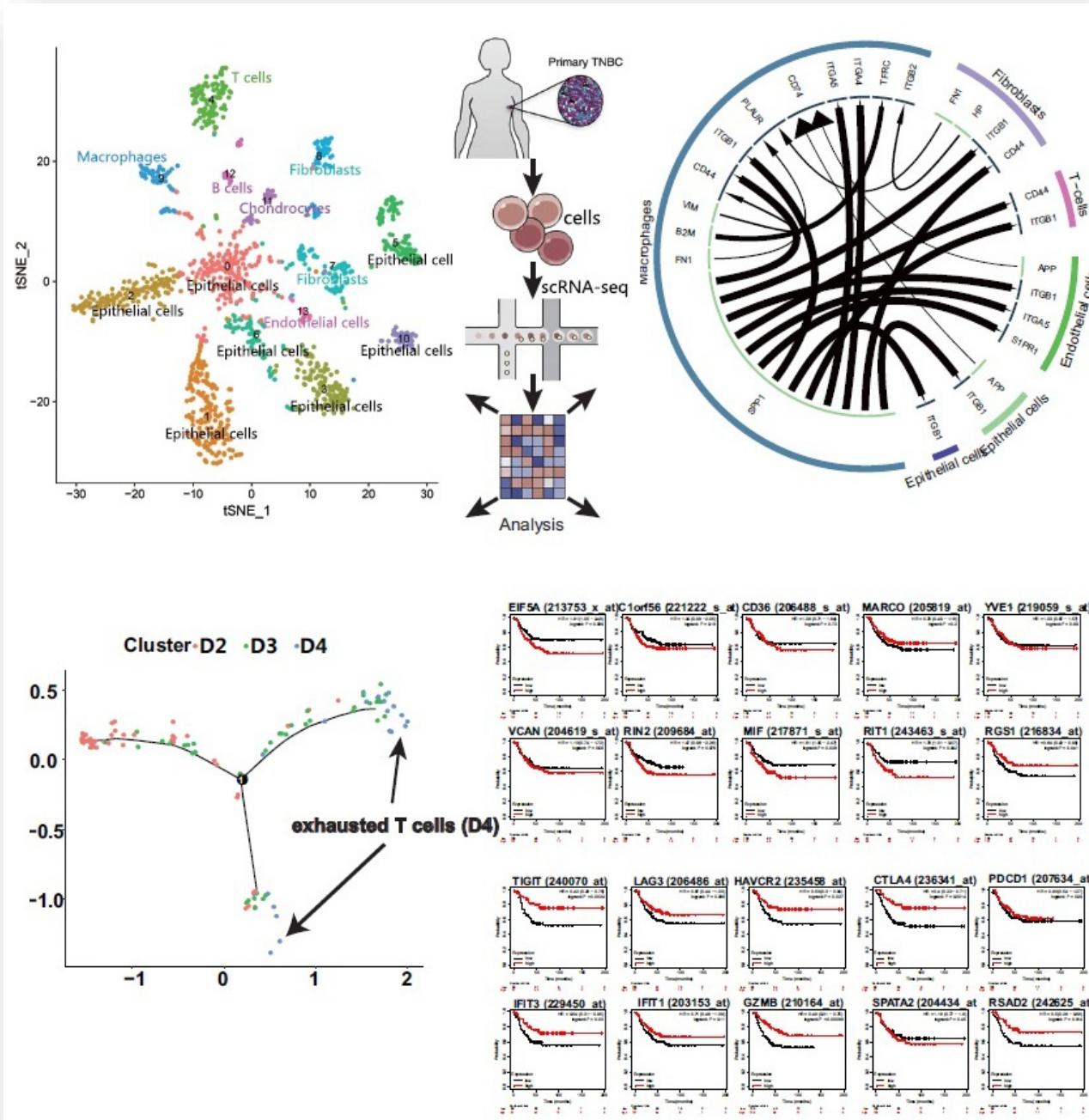
Common pitfalls

No clear flow



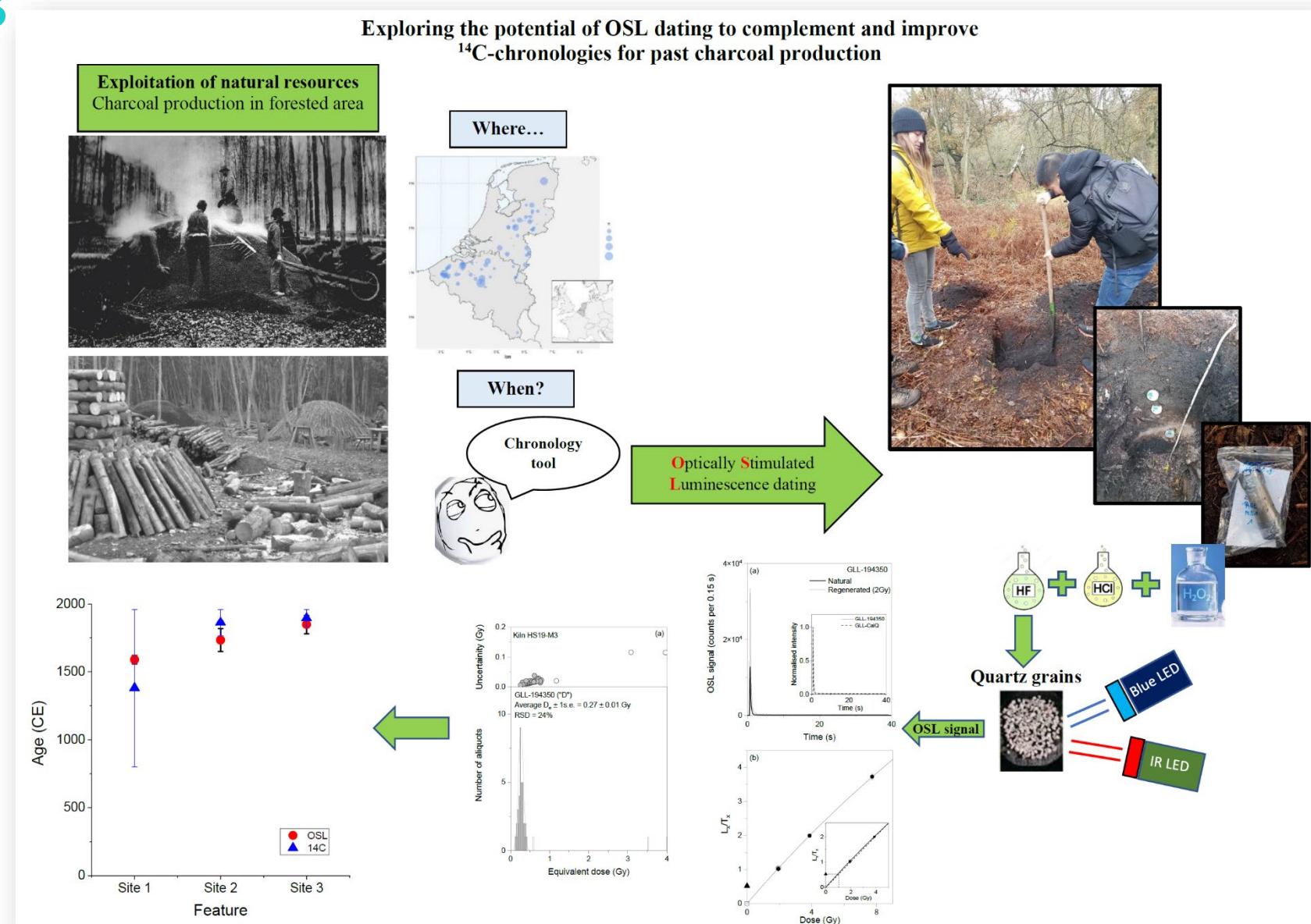
Common pitfalls

Not adapted to the medium (e.g., size)



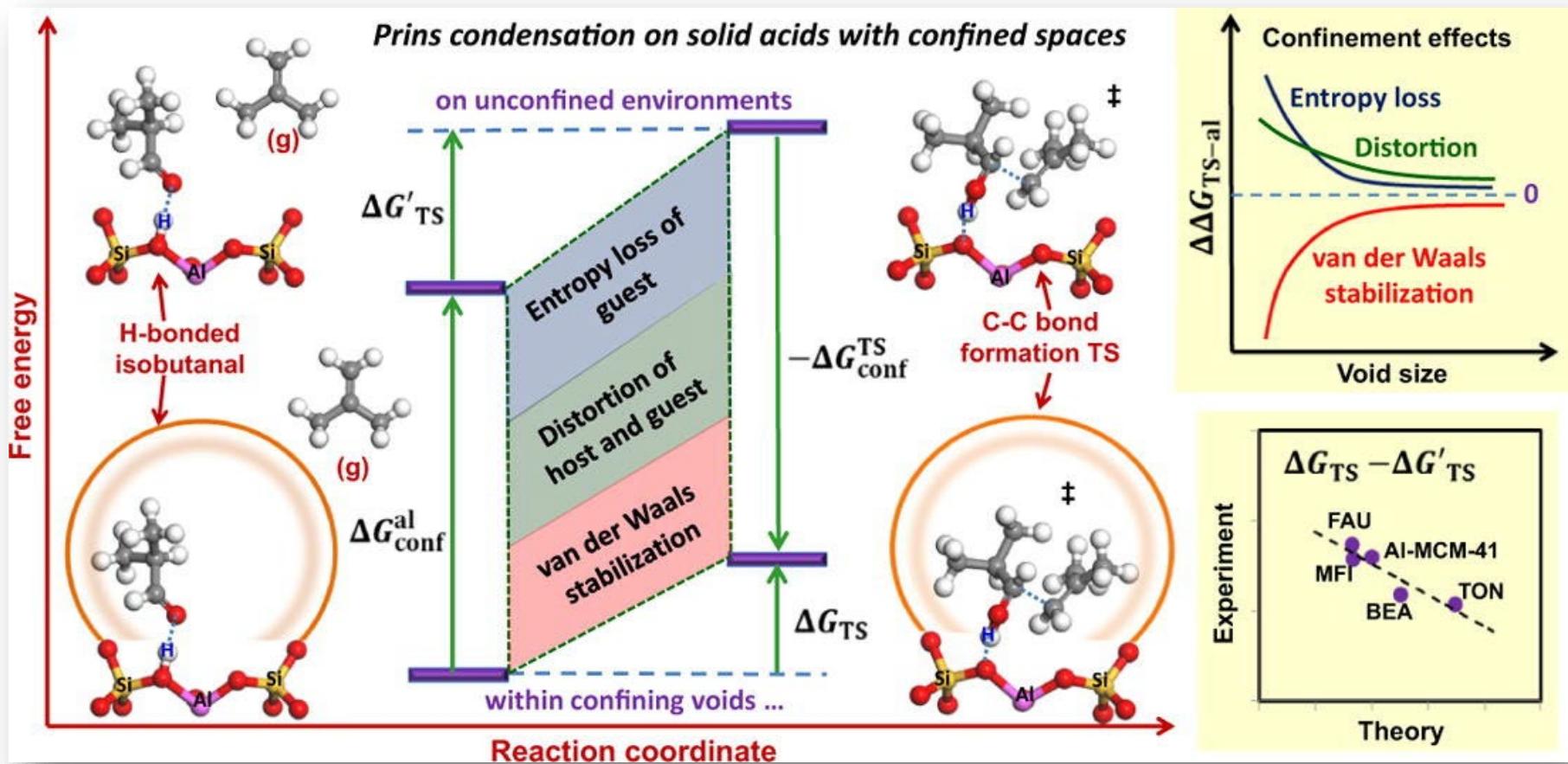
Common pitfalls

Hierarchy – e.g.,
photographs can take up
a lot of space, without
much added value



Common pitfalls

No room to breathe, make sure to leave some white space!



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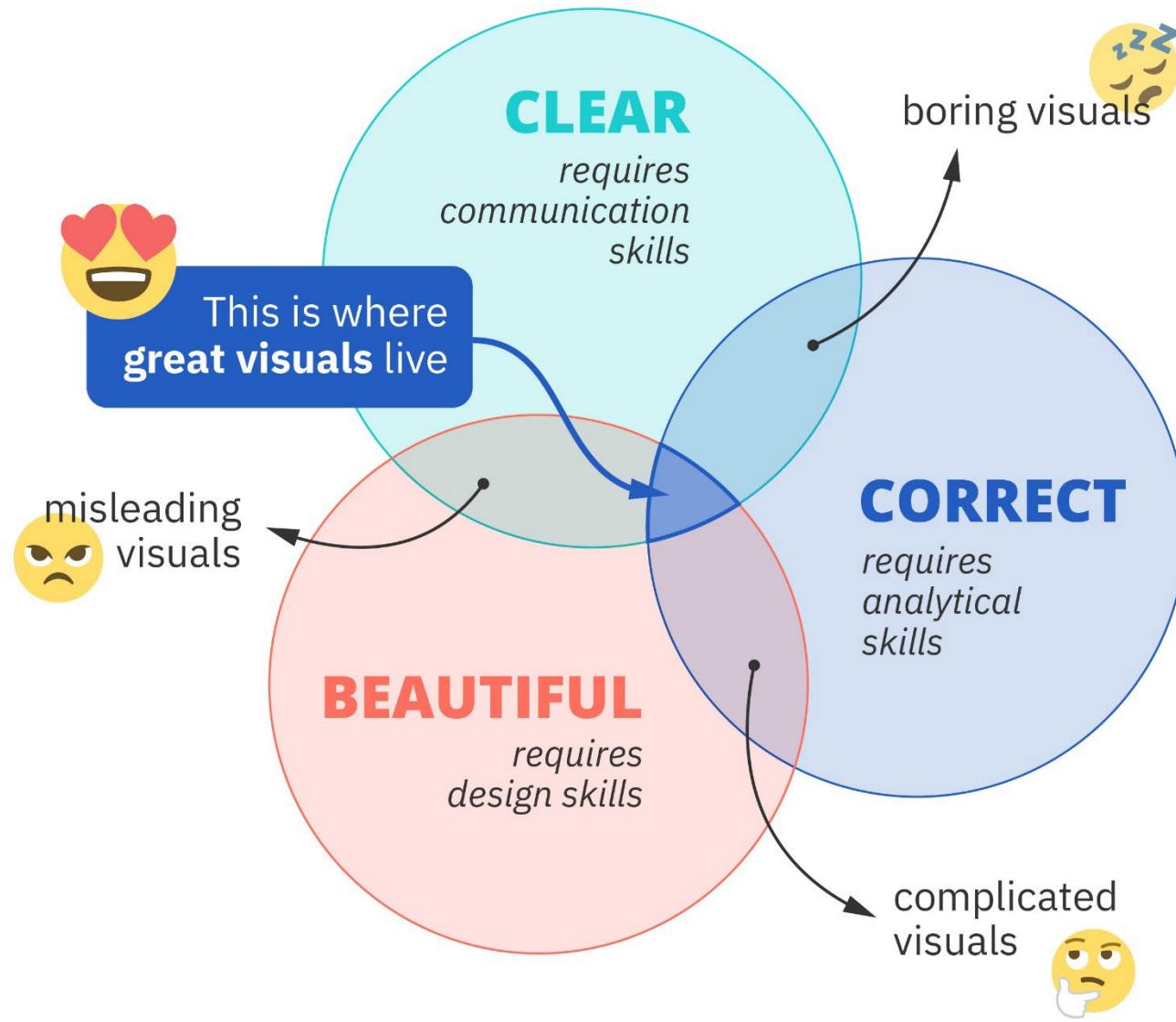
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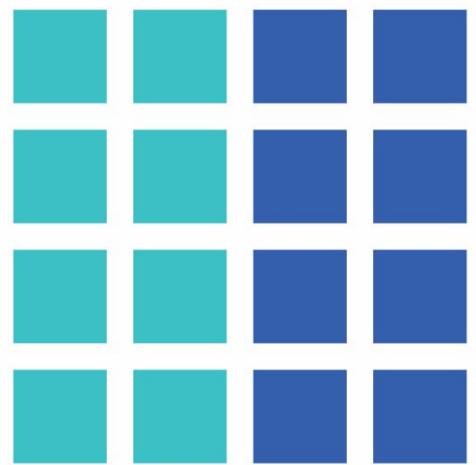
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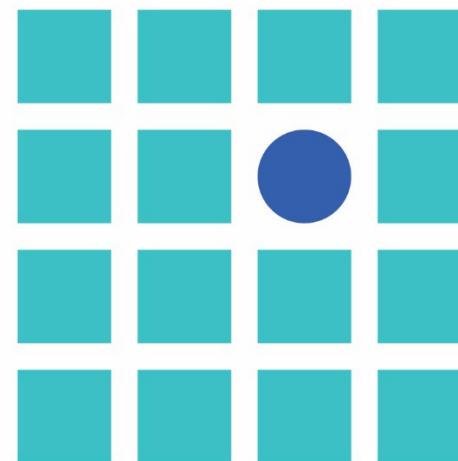


Design principles





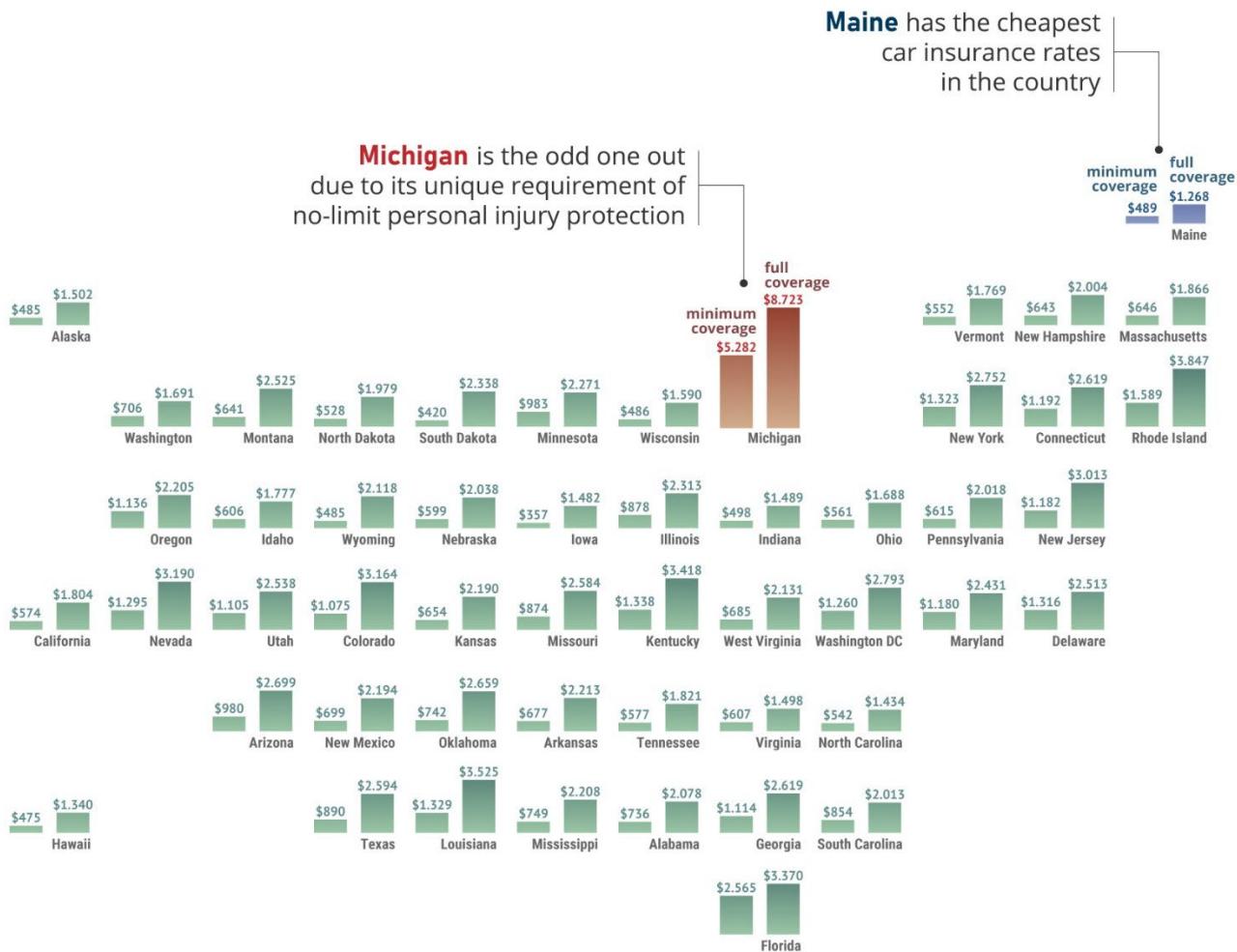
similarity



emphasis

The price of security

US car insurance rates vary wildly between states



Source: ValuePenguin, Average cost of car insurance (2020)
<https://www.valuepenguin.com/average-cost-of-insurance>

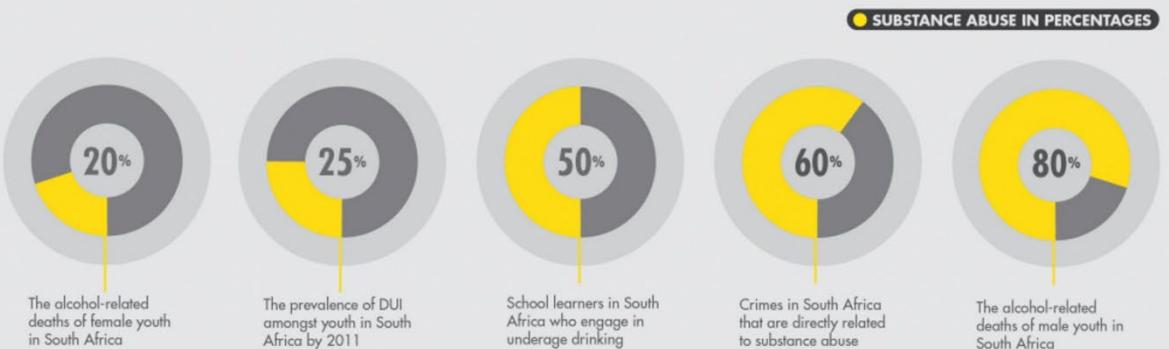
A #MakeoverMonday visualization
by Koen Van den Eeckhout (@koen_vde)

HOW SUBSTANCE ABUSE EFFECTS SOUTH AFRICA

The South African Depression & Anxiety Group (SADAG) take a look at the deadly influence of substance abuse in every day South African life

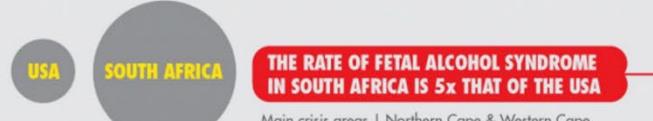
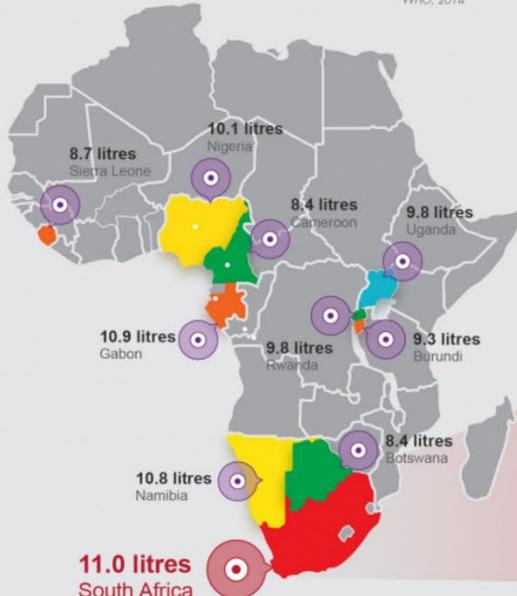
A crisis in South Africa

Substance Abuse in South Africa is increasing. Alcohol, marijuana (dagga), cocaine, tik and heroin are some of the most frequently used substances in the country. South Africa has also become a key area for international drug trafficking networks, and up to 60% of crimes committed involve the use of substances



PURE ALCOHOL CONSUMPTION PER COUNTRY IN 2010

WHO, 2014



RISK AREAS

182 000

Estimated illegal shebeens in SA

7000

Deaths per year caused by DUI

2x

Drug consumption in South Africa is twice the world norm

4 to 1

Men receiving AA treatment in relation to women

Design

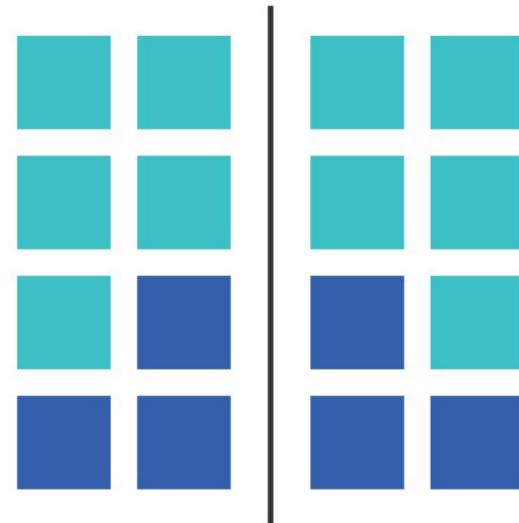
Simphiwe Xulu
@Mr_MediaX

Sources

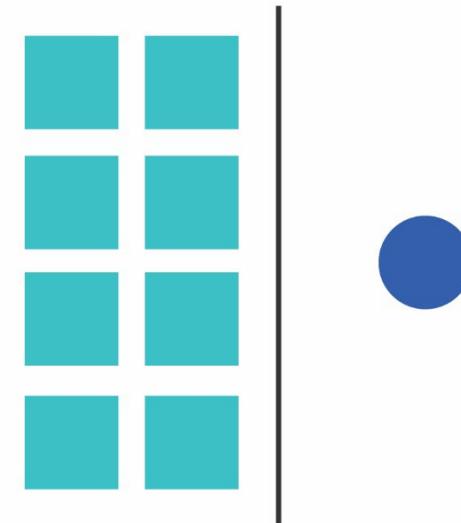
www.Sadag.org
www.FreeVectorMaps.com

References

CDA, 2011
MRC, 2008
SAPS, 2011
YRB5, 2008
WHO, 2014



symmetry

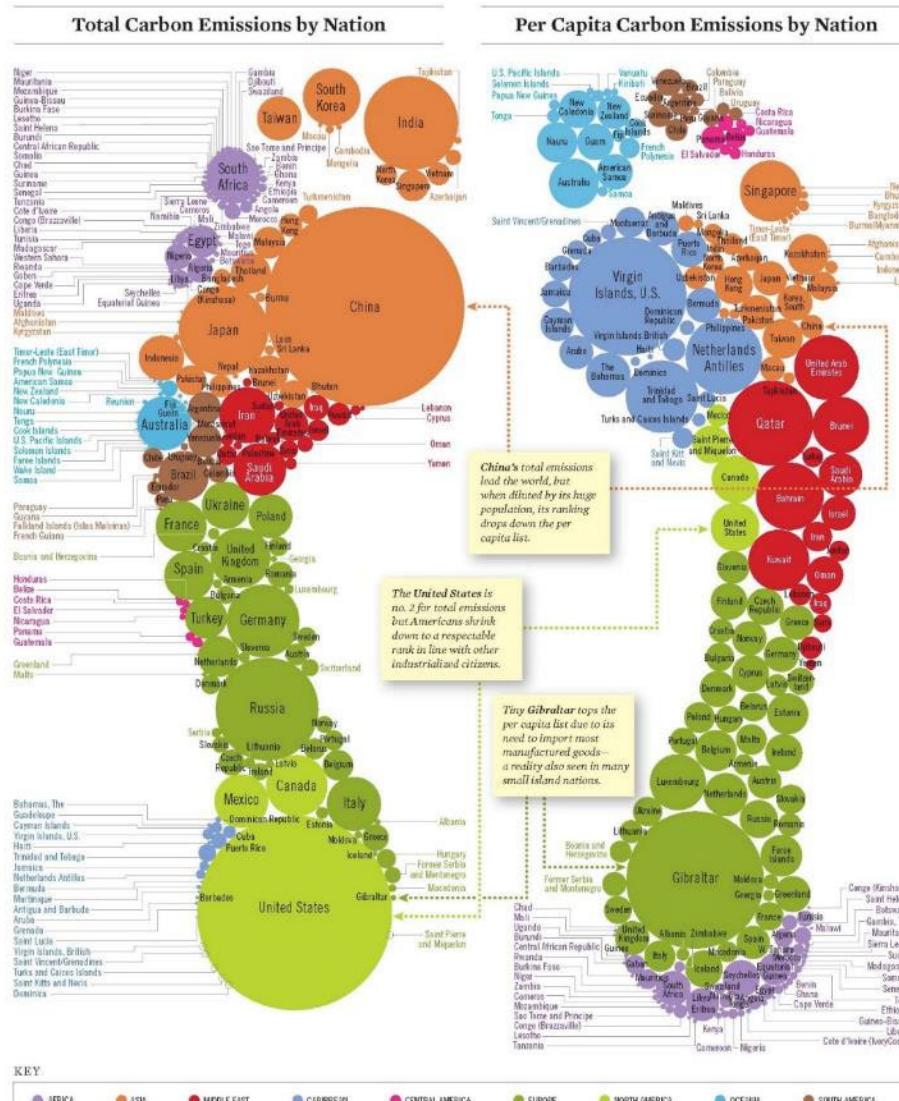


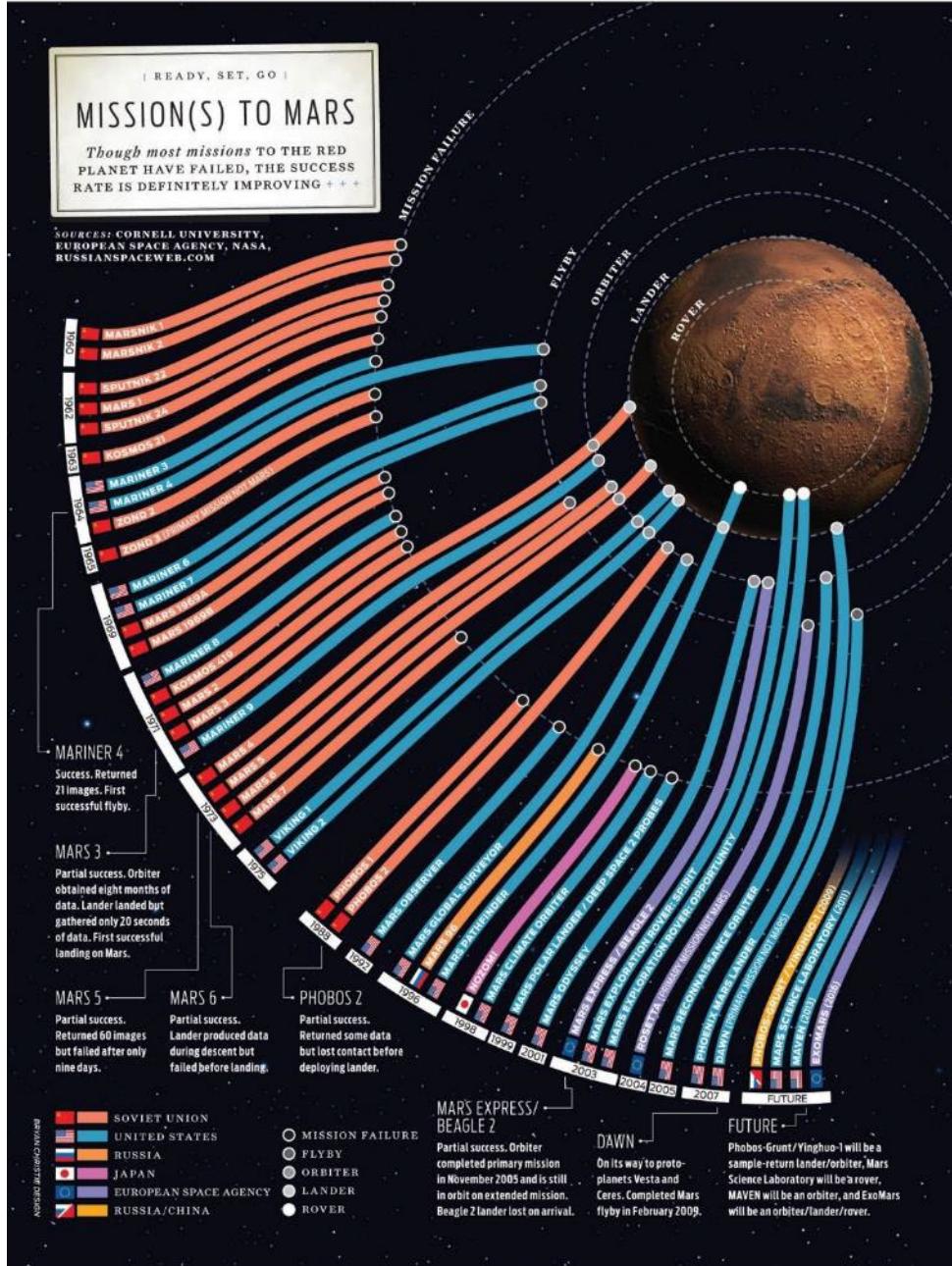
asymmetry

Tracking Carbon Emissions

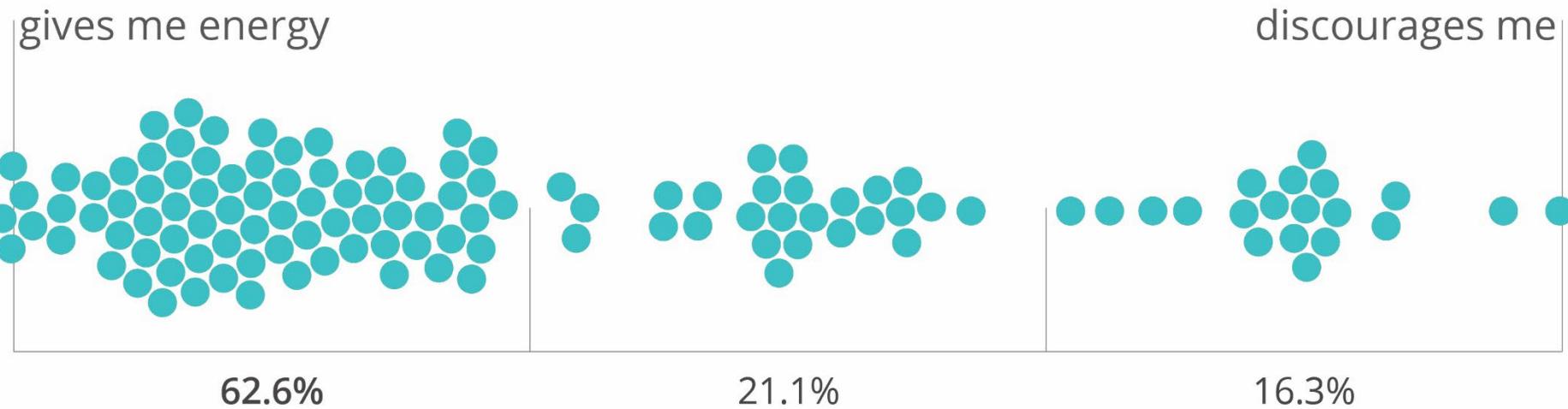
A footprint comparison of total carbon dioxide emissions by nation and per capita shows there's plenty of room for smaller countries to reduce their carbon footprints.

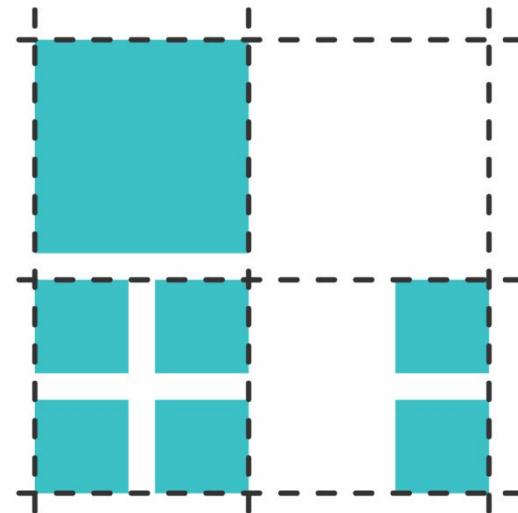
By Stanford Kay





This situation...



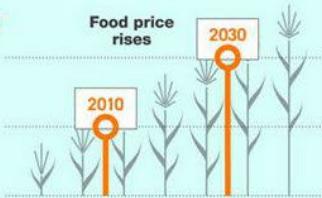


alignment

WHAT'S WRONG WITH OUR FOOD SYSTEM?

CLIMATE CHANGE & FOOD PRICES

The average price of staple foods could more than double by 2030—
with more than half of that increase due to changes in average temperatures and rainfall patterns.



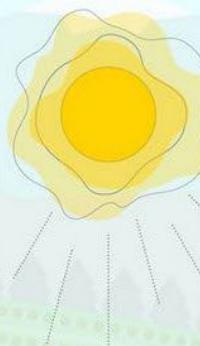
HIGH TEMPERATURES

In July 2010, temperatures exceeded 40°C (104°F) in Russia, destroying millions of acres of wheat. Wheat production plunged 30% and the price internationally increased by 85%.



DROUGHT

In 2010, a drought in Ukraine caused wheat production to plummet 20% compared to the year before.



MONSOON

Heavy rainfall and multiple typhoons hit Southeast Asia in 2011, severely affecting 6% of the region's total rice area and driving prices up by 30% in some areas.



WASTE

In both industrialized and developing countries, unacceptable quantities of food are wasted but for entirely different reasons.

HARVEST WASTE

Currently, developing countries waste **nearly one third of food supply**. With better access to adequate storage, refrigeration and transportation this could be reduced.

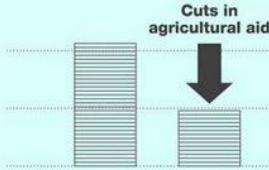
DEVELOPING WORLD



Every night **1 in 7 people go to bed hungry**—that's almost 1 billion people worldwide. People are hungry not because there isn't enough food produced but because our food system is broken. In fact, **80% of the world's hungry are directly involved in food production**. We can address this hunger if we support small-scale food producers, tackle climate change and reduce food waste.

HUNGER

There have been **cuts of more than 50% in government aid** to small-scale producers, even though the majority of the world's hungry are involved in food production.



1 IN 7 ON THE PLANET GO HUNGRY



60% OF THE HUNGRY ARE WOMEN

By providing women with equal access to farming resources such as tools, seeds and transport



100–150 MILLION COULD HAVE ENOUGH TO EAT

CHANGE CAN HAPPEN

By investing in small-scale farmers, Brazil reduced the number of people living in poverty by 20 million between 2003-9. We can tackle extreme hunger by helping small-scale producers grow more food more sustainably.

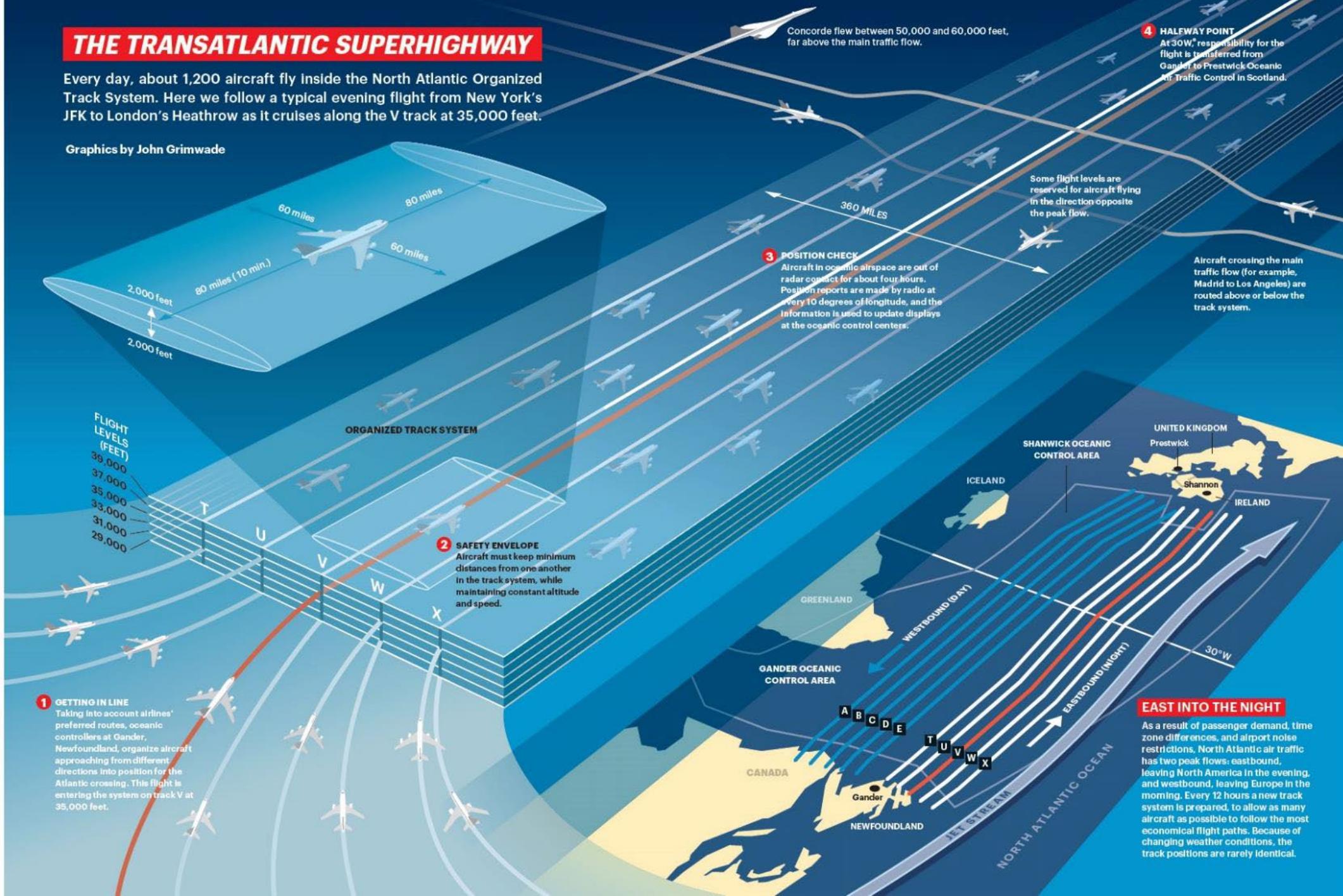


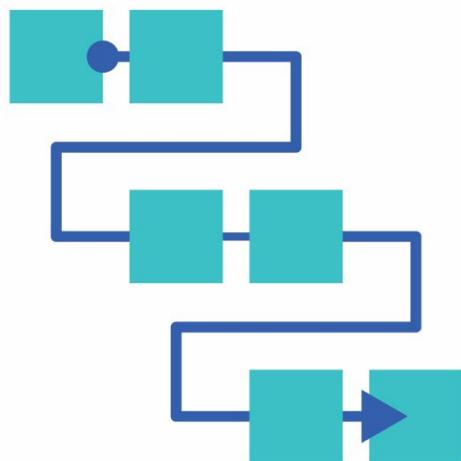
BREAKING THE GRID SUGGESTS MOVEMENT

THE TRANSATLANTIC SUPERHIGHWAY

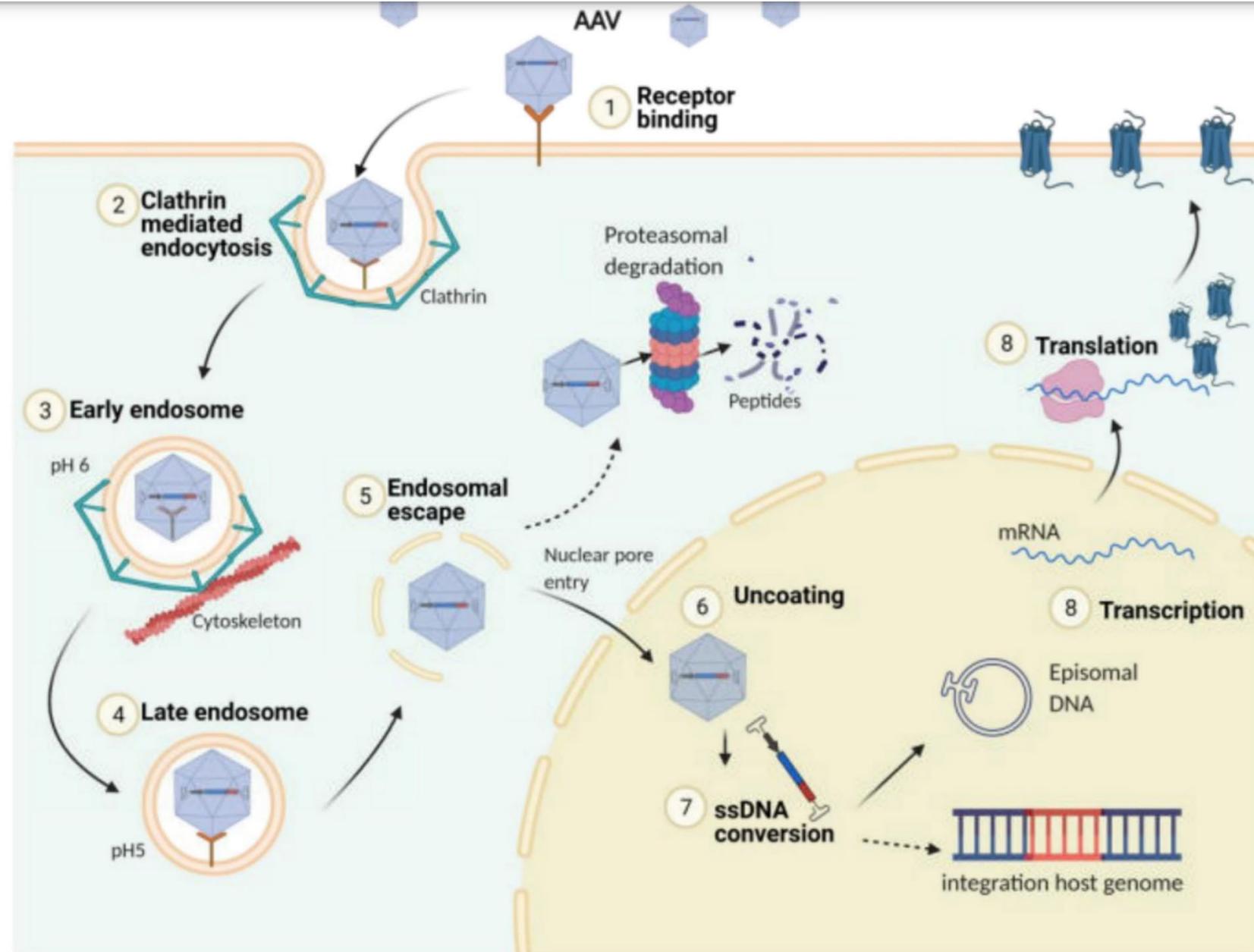
Every day, about 1,200 aircraft fly inside the North Atlantic Organized Track System. Here we follow a typical evening flight from New York's JFK to London's Heathrow as it cruises along the V track at 35,000 feet.

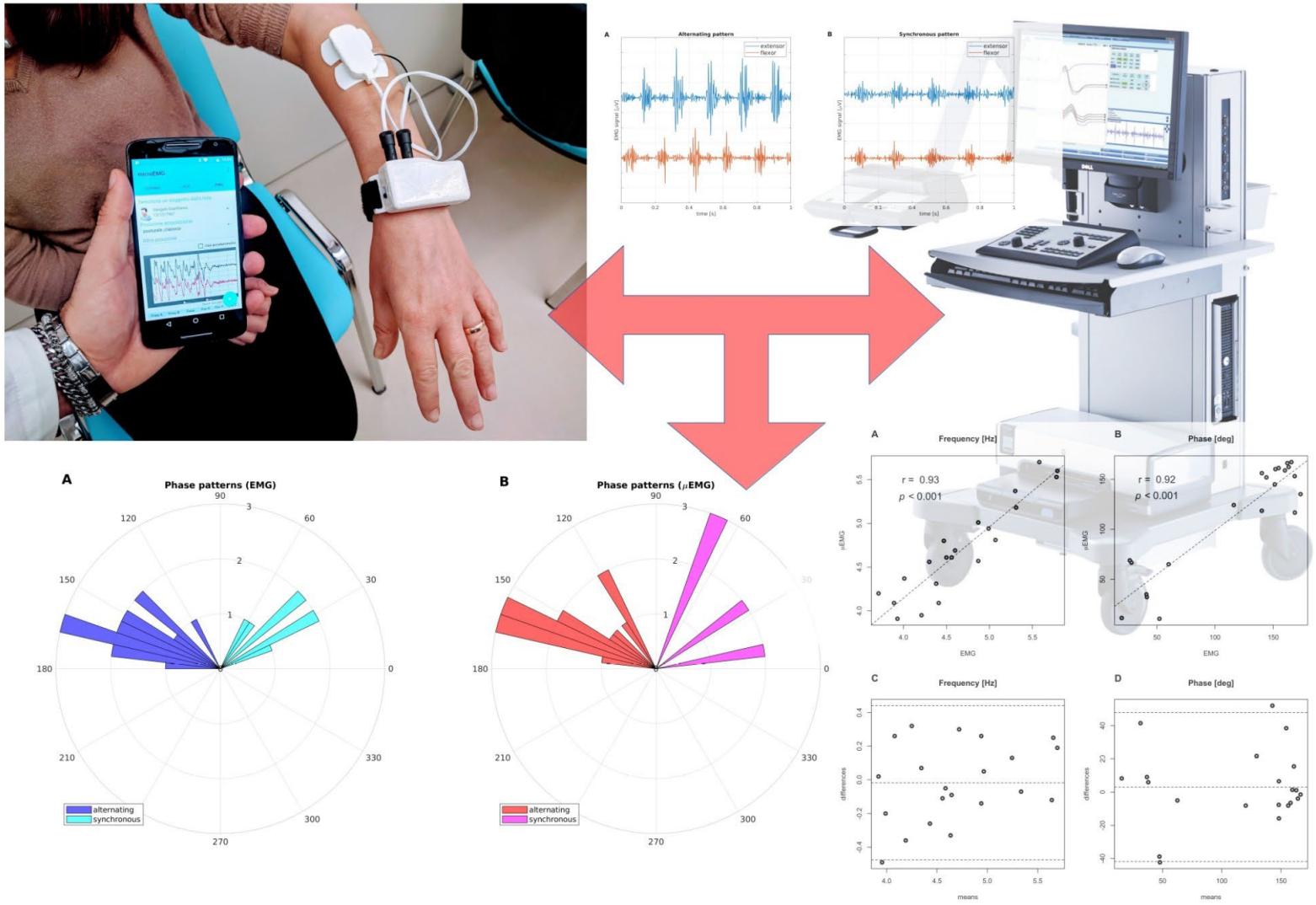
Graphics by John Grimwade

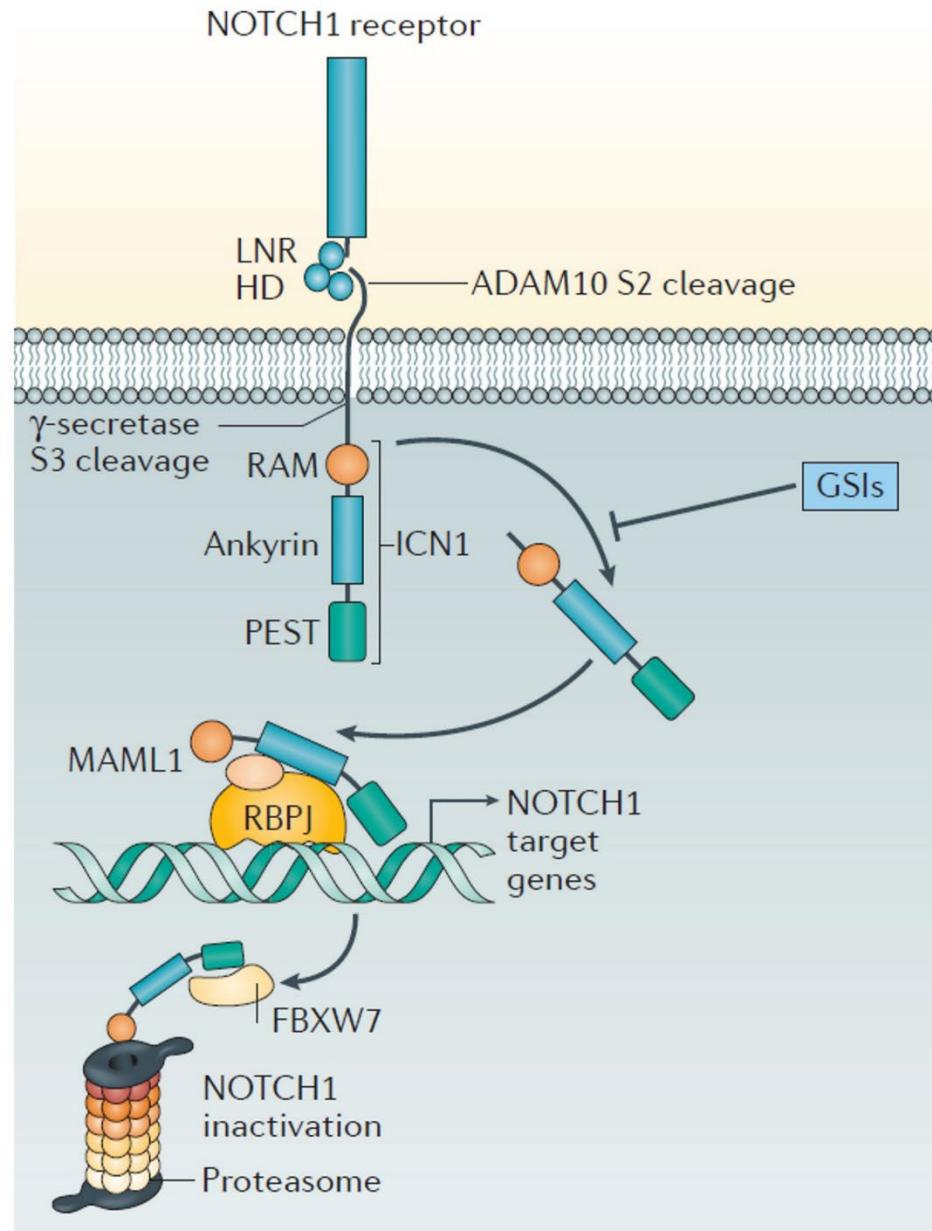


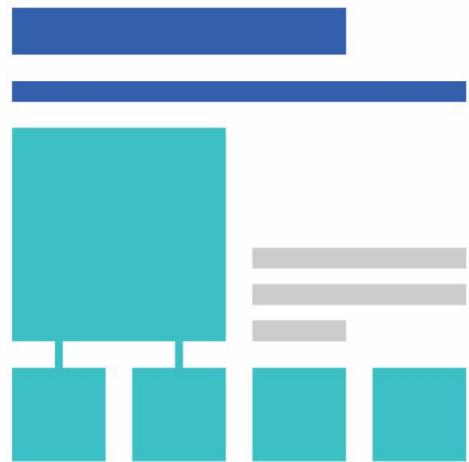


flow









hierarchy

CORSI SENZA FRENI

Design avveniristico e materiali tecnologici: la sperimentazione sulle bici non conosce sosta. Ecco alcuni modelli



Senza catena

Trek District Bike: al posto della catena monta una cinghia in fibra di carbonio. 725 euro • trekbikes.com

Pieghevole

Mj Uno: una bici pieghevole con ruote da 10" e freno posteriore a pedale. 450 euro • dahon.com

BIANCHI, ATALA, BOTTECCIA, COLNAGO

Nella classifica dei maggiori produttori mondiali di biciclette l'Italia si piazza alle spalle di Cina e Taiwan: due colossi che riconoscono i mercati di mezzo globo. I maggiori importatori sono gli Stati Uniti

Luci nel telaio

Da un progetto di Bortolani e Righi, la Plus Bike: il telaio incorpora i fari anteriori e posteriori. • devetasa.it



Artigianato italiano

Modello Fuga di Abici, prodotto artigianalmente in Italia, ricorda le bici da pista. 950 euro • abici-italia.it



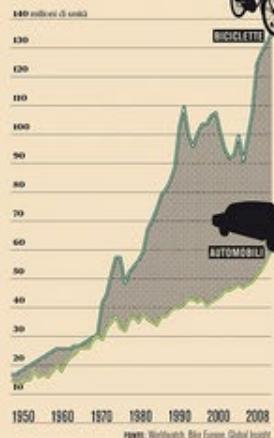
È la bicicletta che fa girare il mondo

"Bike sharing" e investimenti per le piste ciclabili, integrazioni con autobus e metropolitane e domeniche chiuse al traffico: si moltiplicano nel mondo le iniziative per promuovere l'uso della bicicletta. Un mezzo di trasporto ecologico, economico e "city friendly". Insomma, il mezzo del futuro

- di Francesco Franchi

DUE RUOTE RADDOPIANO LE QUATTRO

La produzione mondiale di biciclette ha toccato quota 130 milioni nel 2007: più del doppio rispetto ai 52 milioni di auto immesse sul mercato. Il boom registrato dopo il 2004 è in parte dovuto alla crescente domanda di bici elettriche

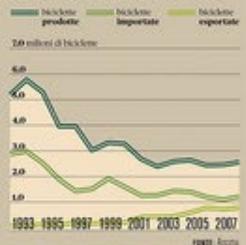


28,1 metri: è quanto misura la bici più lunga del mondo



MADE IN ITALY A MARCIA INDietro

Nonostante i trend mondiali di crescita generale, in Italia la produzione di biciclette è andata calando negli anni



PEDALA BAGAZZO, PEDALA



SUL SELLINO CHE NOI PORTIAMO



METTI L'ALVEARE SUL GAGLIARDETTO

Le api sono simbolo di operosità e delicatezza. Per questo compare in molti stemmi, dal più famoso, quello della famiglia Barberini, a più piccoli e poco conosciuti comuni italiani.



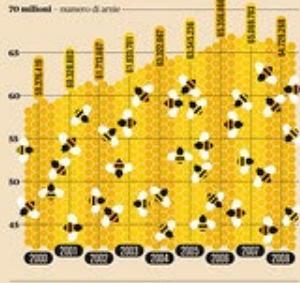
Se le api non volano

Da anni continuano a diminuire. Vari i motivi (ipotetici, finora): parassiti, pesticidi, cambiamenti climatici. Eppure, dall'impollinazione (di cui sono vettori) dipende il 76 per cento della produzione alimentare europea. Il parlamento di Bruxelles ha votato una risoluzione per tutelarne la salute. E arriveranno un po' di fondi in più

— di Sara Deganello, Francesco Franchi - Roberta Giacconi | illustrazioni di Francesco Muzzi

QUANDO COMINCIARONO A RONZARE MENO

Secondo gli ultimi dati Fao, il numero delle colonie di api nel mondo (in crescita costante dal 2000) ha subito un rallentamento a partire dal 2007.



TUTTI GLI ATTORI DELL'ALVEARE

A — Nelle colonie di Apis mellifera il solo l'ape regina ad accoppiarsi: in un solo volo nuziale incappa diversi maschi. C — Le api operai raccolgono nectar (danno da mangiare alle larve), creano cestini (affiancano e proteggono l'alveare) e misurano l'umidità (lavori ripetitivi, pulizia, apertura).

perché le api operai non li nutrono più. C — Le api operai raccolgono nectar (danno da mangiare alle larve), creano cestini (affiancano e proteggono l'alveare) e misurano l'umidità (lavori ripetitivi, pulizia, apertura).

API REGINA

FUCI

PROTEZIONE

PRODUZIONE MIELE

BOTTINO

REGOLAZIONE TERMICA

PREPARAZIONE CELLE E NUTRIMENTI LARVE

STADIO LARVALE

NASCITA

PRIMI 10 GIORNI DI VITA

DA 10 A 20 GIORNI

ULTIME 4-5 SETTIMANE

PERCHÉ MUOIONO. ECCO LE IPOTESI

La sorgente più diffusa (il primo colpo) è l'apicoltura.

DOVE MANCANO DI PIÙ NEL MONDO

Le aree nel mondo (i primi cinque Paesi) che tra il 2007 e il 2008 hanno registrato il maggior tasso di mortalità di api.

DOVE MANCANO DI PIÙ IN EUROPA

I Paesi europei con il numero maggiore di apicoltori dichiarati (Germania, Francia, Italia, Repubblica Ceca, Regno Unito) e i totali. I dati sono confrontati negli anni.

CHIEDI AI APRICOLTORI

I dati sono dichiarati dagli utenti interessati e non sono considerati molto attendibili.

EUROPA SI INTERROGA SU DIRITTI DELLE API

Salviamo le api. La richiesta, già sostanziosa a gran voce degli apicoltori di tutto il mondo, è stata raccolta anche a Parigi e a Bruxelles. Il testo (sui diritti delle api) chiede di aumentare i fondi all'apicoltura e di migliorare la ricerca sulle cause della scomparsa, creando anche un gruppo nazionale per le api morte. «Riconoscere le api come uno bene da oltre 10 milioni di acri».

IMPOLLINAZIONE DEI VEGETALI

Varie vettori trasportano il polline dall'apparato maschile a quello femminile: insetti (A), insetti (B), pipistrelli (C), vento, acqua, piccoli animali, esseri umani.

QUANTE PIANTE DIPENDENTI

Quanto incide l'impollinazione delle api sulla riproduzione delle piante?

Mattresso. A destra le specie più dipendenti degli insetti.

PIANTE DA CANTINA

Eurodeputato socialista, è l'autore della risoluzione sull'apicoltura. Agronomo e figlio di imprenditori agricoli, è stato ministro delle Politiche agricole nel governo D'Alema e poi nel secondo governo Prodi.

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GERMANIA E SCANDINAVIA, CASO PER CASO

Andamento della morte di colonie in alcune tra gli Stati europei più colpiti.

I PADRONI DELL'ARANNA

I Paesi europei con il numero maggiore di apicoltori dichiarati (Germania, Francia, Italia, Repubblica Ceca, Regno Unito) e i totali. I dati sono confrontati negli anni.

CASSETTE DIVERSE

Gli apicoltori con il tipo di arnia (il luogo dove vive la colonia di Apis mellifera), comprendono da 4,5 a 8,7 kg di ap.

ARRIVANO I FONDI EUROPEI

I cinque Paesi con il maggior budget Ue destinato all'apicoltura e la totale europea.

PERCHÉ MUOIONO LE API

«Non lo sappiamo con certezza. È un fenomeno che colpisce Paesi con situazioni diverse. Cosa spera di ottenere con la sua risoluzione?»

PORTARE L'ATTENZIONE

sul problema. Le api, oltre a produrre il miele, sono fondamentali per l'impollinazione da cui dipende il 76 per cento della produzione alimentare europea. Inoltre sono un indicatore ambientale. Se muoiono, vuol dire che ci dobbiamo preoccupare».

PERCHÉ SONO AUMENTATI I FONDI

al settore monotonante le api stimolavano?

«Per permettere indagini più

approfondite sulle cause

della morte. Io già da ministro

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DOVE MANCANO DI PIÙ NEL MONDO

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DOVE MANCANO DI PIÙ IN EUROPA

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CASSETTE DIVERSE

Gli apicoltori con il tipo di arnia (il luogo dove vive la colonia di Apis mellifera), comprendono da 4,5 a 8,7 kg di ap.

ARRIVANO I FONDI EUROPEI

I cinque Paesi con il maggior budget Ue destinato all'apicoltura e la totale europea.

PERCHÉ SONO AUMENTATI I FONDI

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«Per permettere indagini più

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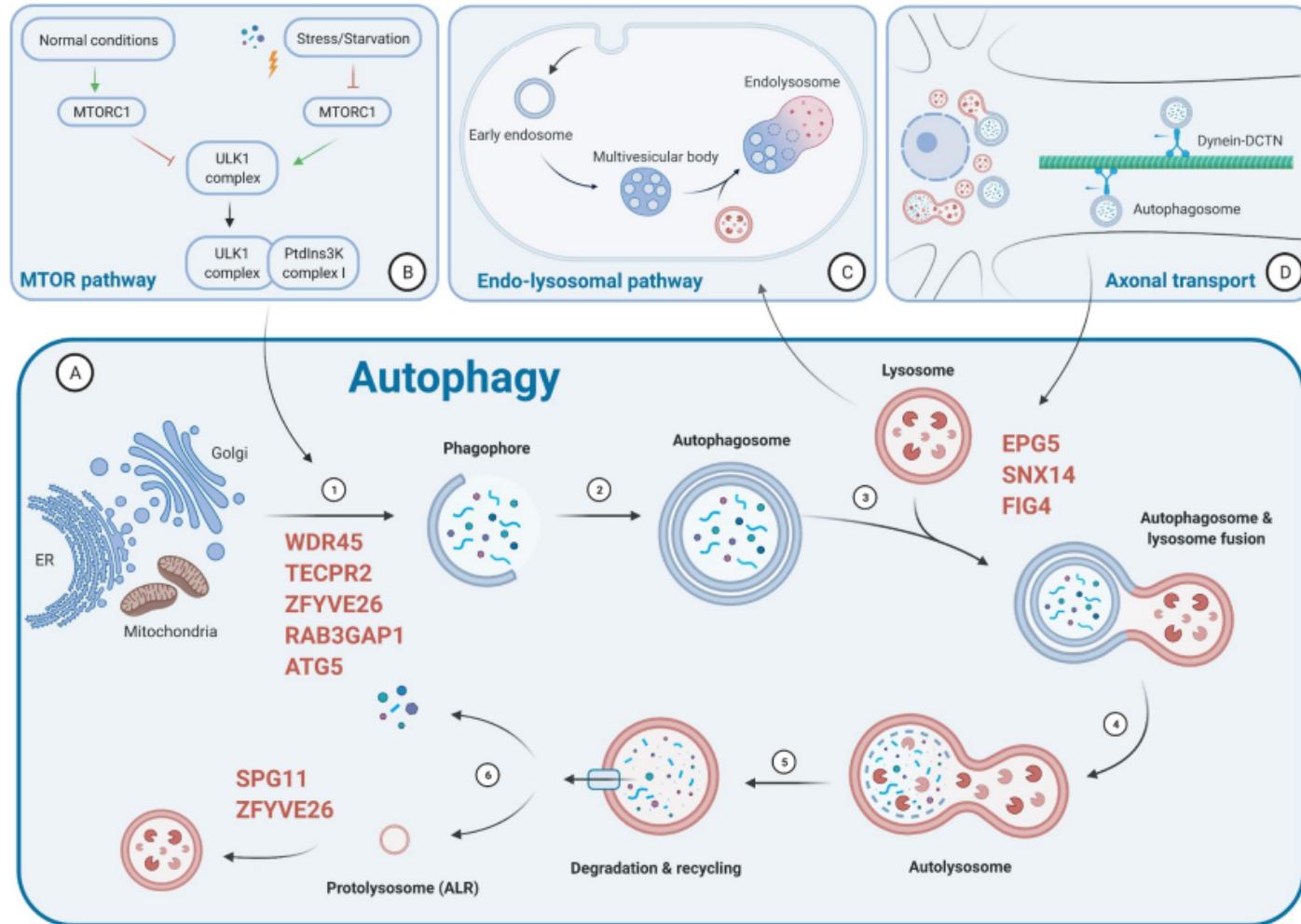


Figure 1. The autophagy pathway and its relation to other intracellular regulatory and trafficking pathways. **(A)** Schematic representation of the autophagy pathway and the key steps involved, ranging from phagophore formation utilizing lipid membranes from various donor compartments (such as ER, Golgi and mitochondria), autophagosome formation, autolysosomal fusion and cargo degradation, and, finally, autophagic lysosomal reformation (ALR). Gene mutations can disturb any (and often multiple) part(s) of the complex autophagic machinery; the proteins most commonly implicated in the congenital disorders of autophagy are indicated in red, in relation to the part of the autophagy pathway affected. Close relations to the MTOR pathway **(B)**, the endo-lysosomal pathway **(C)** and (neuronal) axonal transport **(D)** emphasize that any genetic defect primarily affecting these intricately linked cellular processes may cause clinical presentations very similar to those concerning the primary autophagy machinery. Along similar lines, primary disturbances of other cellular processes and structures essential for the normal functioning of autophagy (for example, disturbances of lipid metabolism affecting the membrane sources required for phagophore formation, or of the glycosylation of autophagy proteins) may have similar biological and clinical consequences. Figure created with BioRender.com.

Design principles

similarity

emphasis

(a)symmetry

alignment

flow

hierarchy

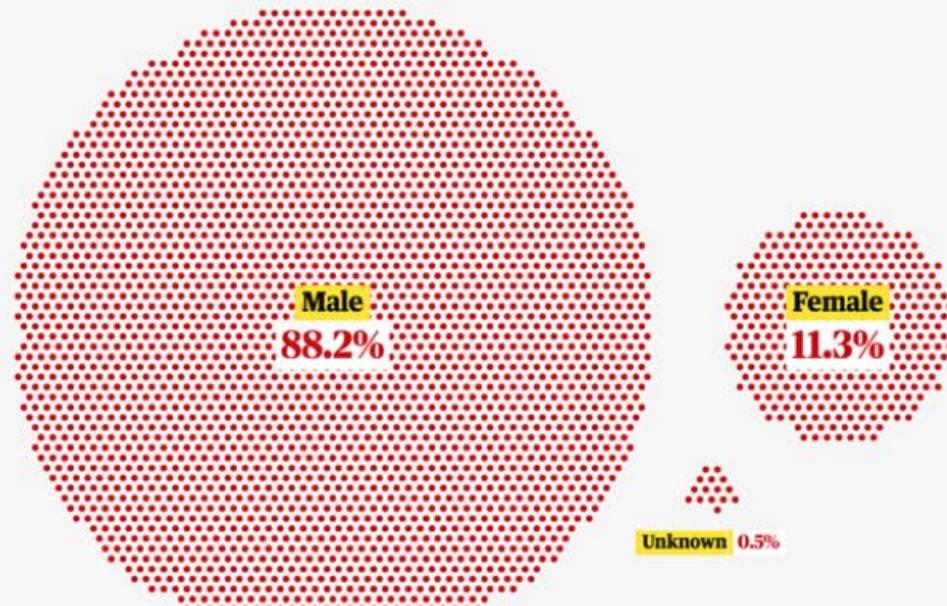
simplicity



Dieter Rams

Good design is innovative
is aesthetic
is unobtrusive
is honest
is long-lasting
is thorough down to the last detail
is environmentally friendly
makes a product useful
makes a product understandable
is as little design as possible

Weniger, aber besser.



Far more men were arrested than women

Court documents do not record gender so we made educated guesses based on individuals' first names and the pronouns used in the documents.



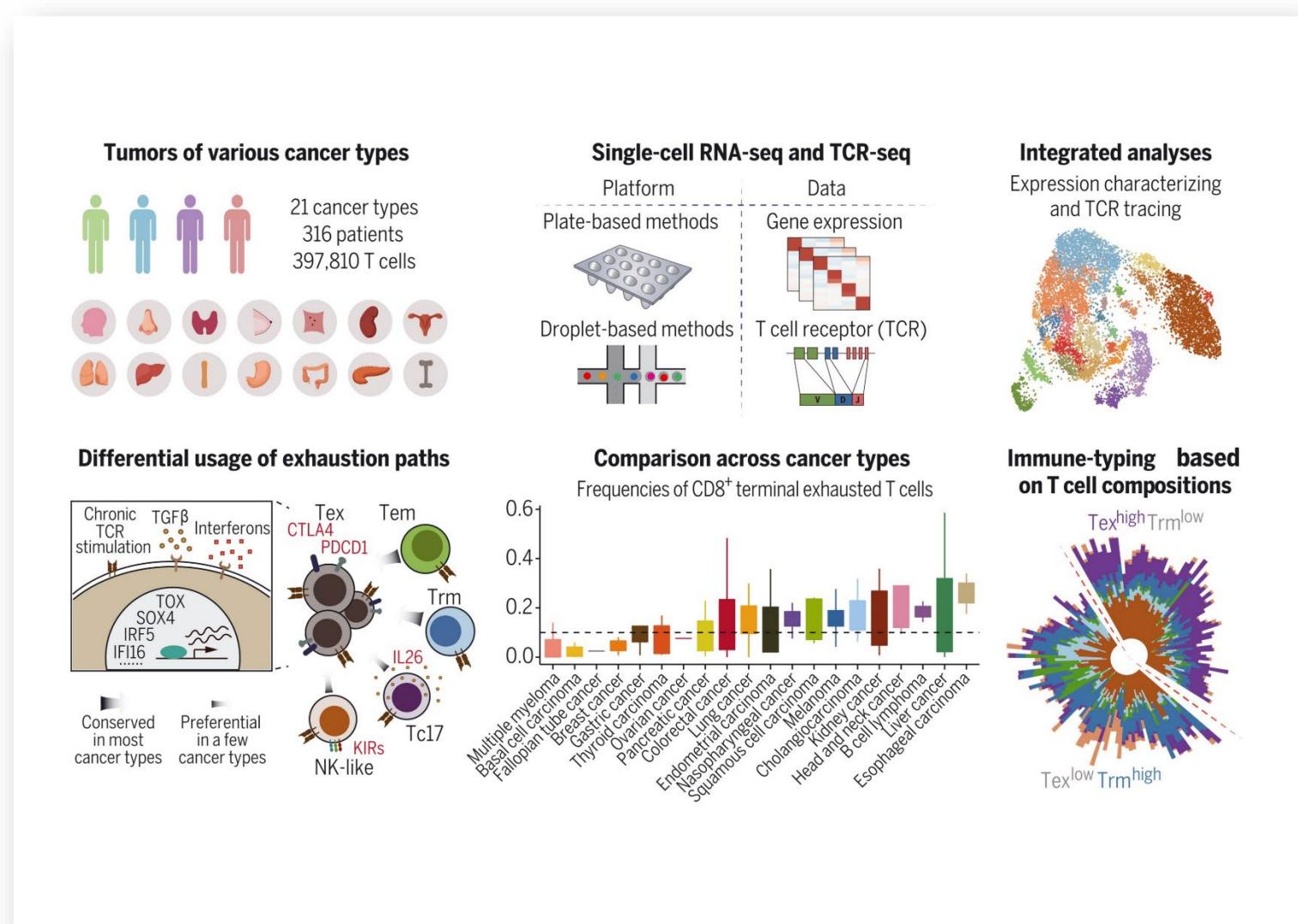
<https://www.youtube.com/watch?v=HlcBh7kDrRk>

Improving a visual

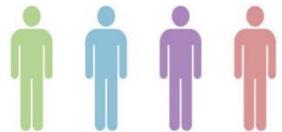
Group exercise

Write down what you **don't like** about this visual

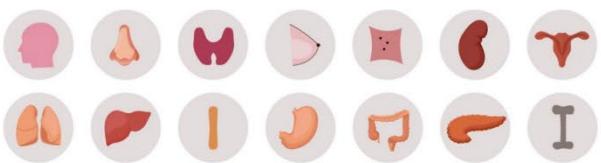
What would you change to **improve** it?



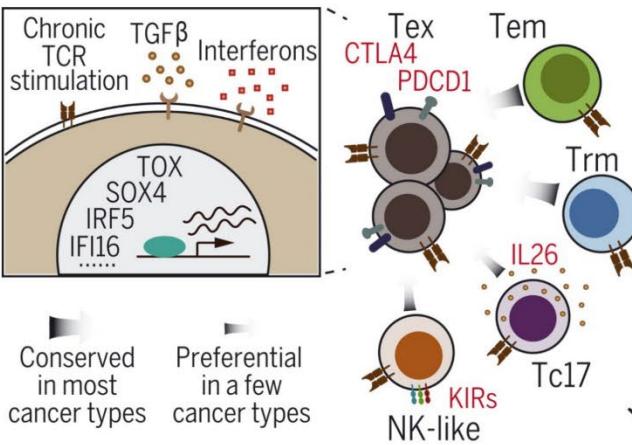
Tumors of various cancer types



21 cancer types
316 patients
397,810 T cells



Differential usage of exhaustion paths



Single-cell RNA-seq and TCR-seq

Platform

Plate-based methods

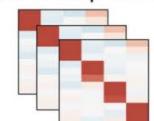


Droplet-based methods

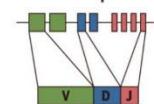


Data

Gene expression

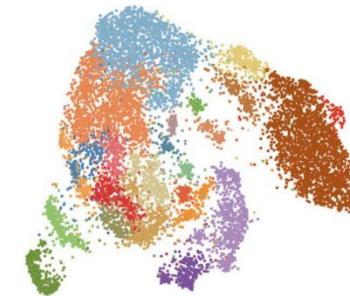


T cell receptor (TCR)



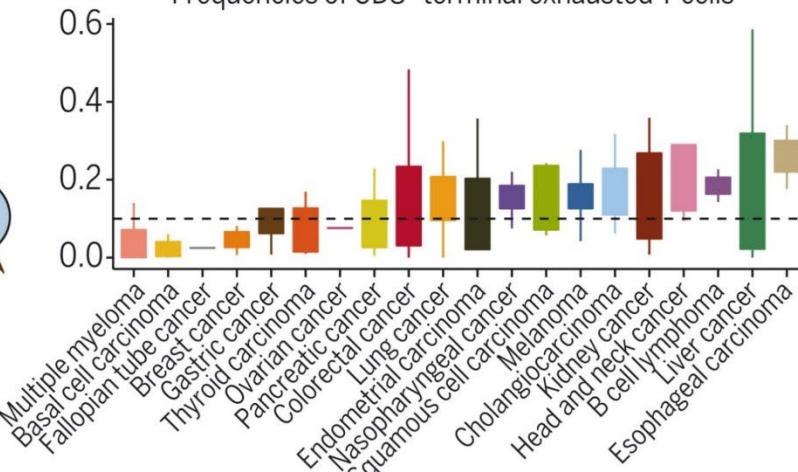
Integrated analyses

Expression characterizing and TCR tracing

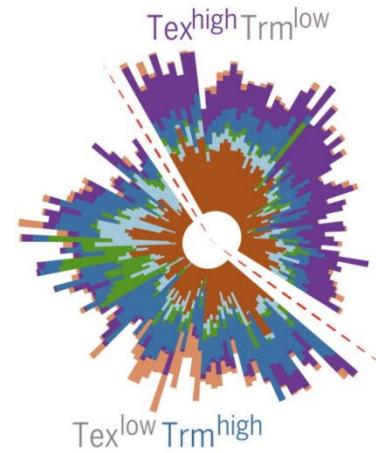


Comparison across cancer types

Frequencies of CD8 $^{+}$ terminal exhausted T cells



Immune-typing based on T cell compositions



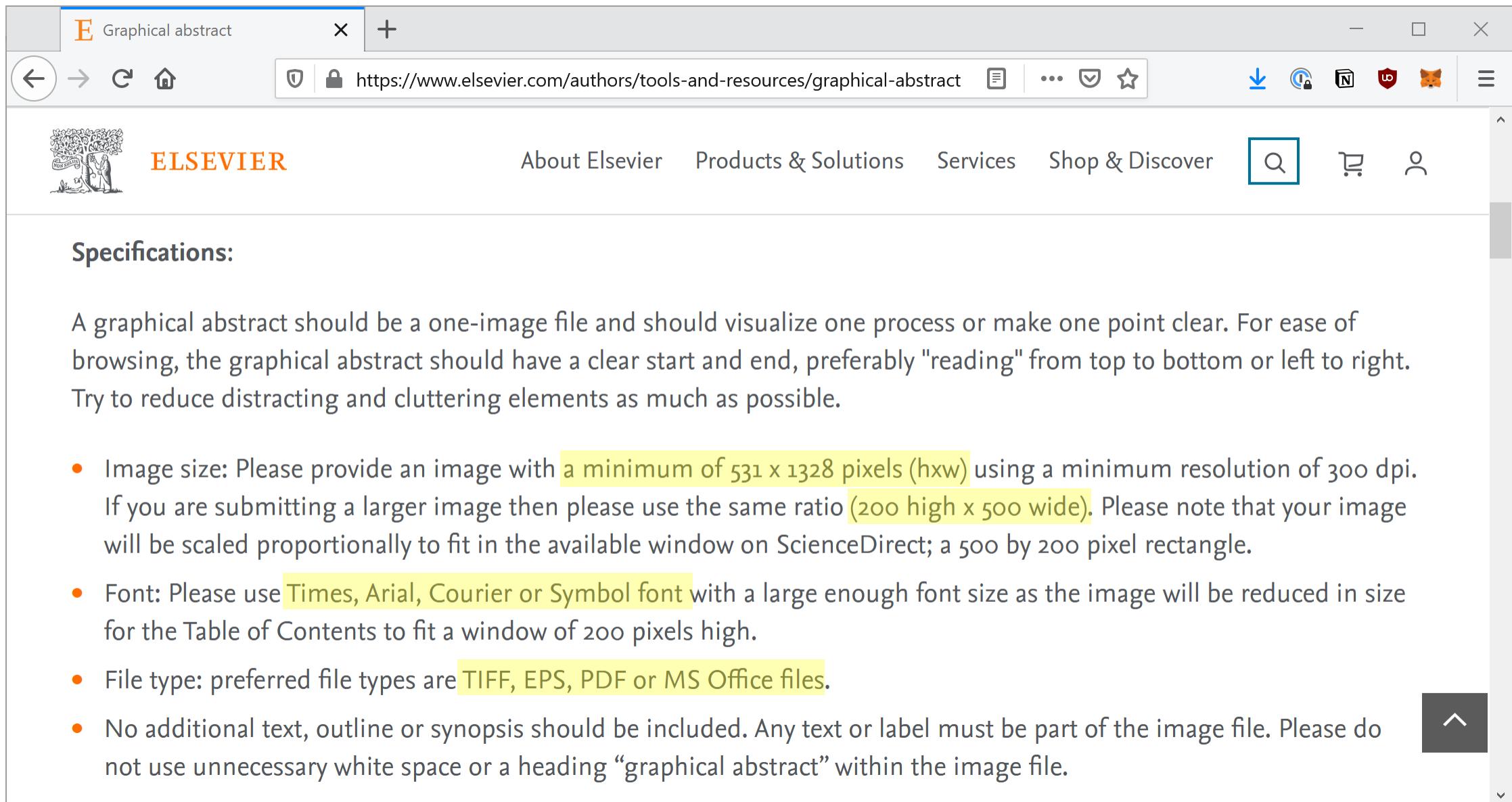
Workflow

identify your story

check the requirements

sketch your concept

design



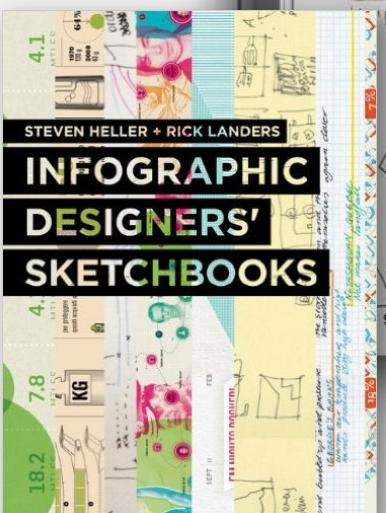
Workflow

identify your story

check the requirements

sketch your concept

design



Accurat | Giorgia Lupi

Exploring the phenomenon of geniuses and the brain drain

'Drawing plays an important role in the production and communication of knowledge, and in the genesis of new ideas,' says design director Giorgia Lupi, founder of Accurat, an information design agency with offices in Milan and New York. 'In addition, the act of drawing and the fact we choose to stop and draw focuses the attention. When I'm sketching, I always try to find a way to interpret both the single visual elements and the overall composition.'

Lipi draws on white paper with Micron black-ink pens. Drawing is her primary expression, a 'functional tool for capturing

and exploring thoughts and exploring ideas towards the production of the final piece'. Her team approaches problems in the way that journalists would, rather than as data analysts, understanding in which contexts

When denominising, Visualized, the company's project for *Lo Lettore*, a magazine supplement in the Italian newspaper *Corriere dello Seta*, Lugi says: "We aim to deliver rich visual narratives, able to maintain the complexity of the data but still make them interpret their data."

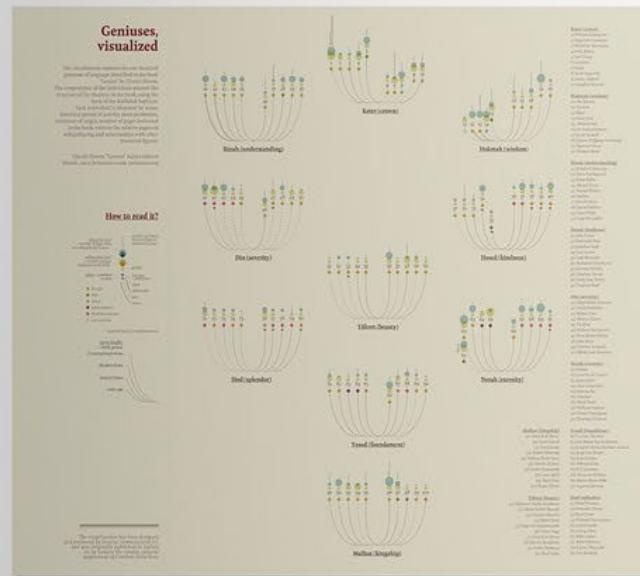
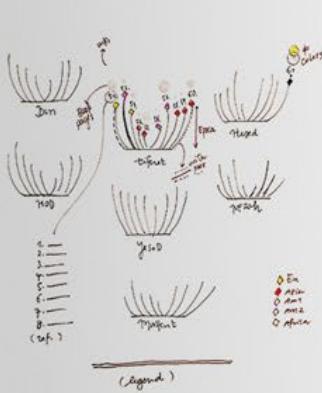
The image contains several hand-drawn diagrams illustrating the life cycle and reproductive structures of a plant, likely a fern or similar pteridophyte. The drawings show various stages of sporangia development, sori placement, and spore release. Labels include:

- S-p-a (Sporangium)
- tan. (Tan)
- doma (Doma)
- Bianco (White)
- colorato (Colored)
- m (male)
- f (female)
- p (pinnule)
- PW (Pinnule)
- 1, 2, 3, 4, 5, 6, 7, 8 (indicating sequence or stages)

The diagrams show different views of the plant's surface, with sporangia appearing as small circles or ovals, often with stalks. Some diagrams show clusters of sporangia, while others show individual ones. The labels 'Bianco' and 'colorato' refer to the color of the spores, with 'Bianco' typically representing the initial stage and 'colorato' representing a later, more mature stage. The labels 'm' and 'f' indicate the gender of the plant parts. The labels 'p' and 'PW' indicate the presence of pinnules, which are small leaflets. The numbers 1 through 8 are used to indicate the sequence of events or stages in the life cycle.

Geniuses, Visualized

This infographic looked at the 100 'exemplary creative minds' identified in literary critic Harold Bloom's book *Genius*. Playing off Bloom's use of the *Sefirot*, the ten emanations of the Kabbalah, to organize the taxonomy of his chosen 'geniuses' of language – from Shakespeare to Lewis Carroll – the visualization depicts the geographical origin, time period and field of each genius, correlated with number of Wikipedia hits and connection to related historical figures.



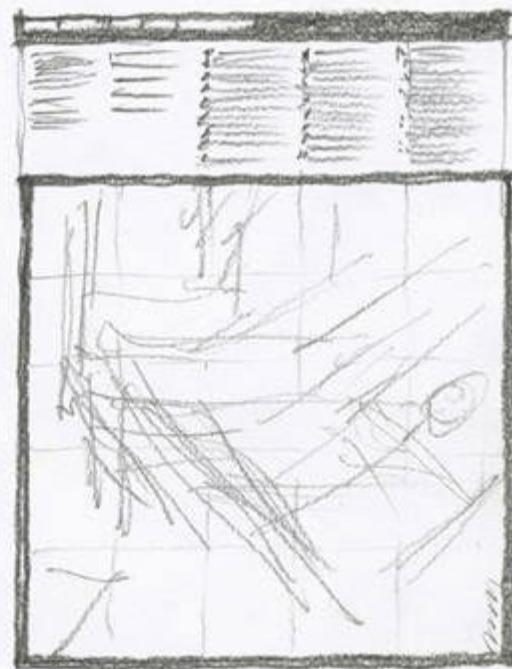
128 Massimo Vignelli

- Designing a map that is really a diagram

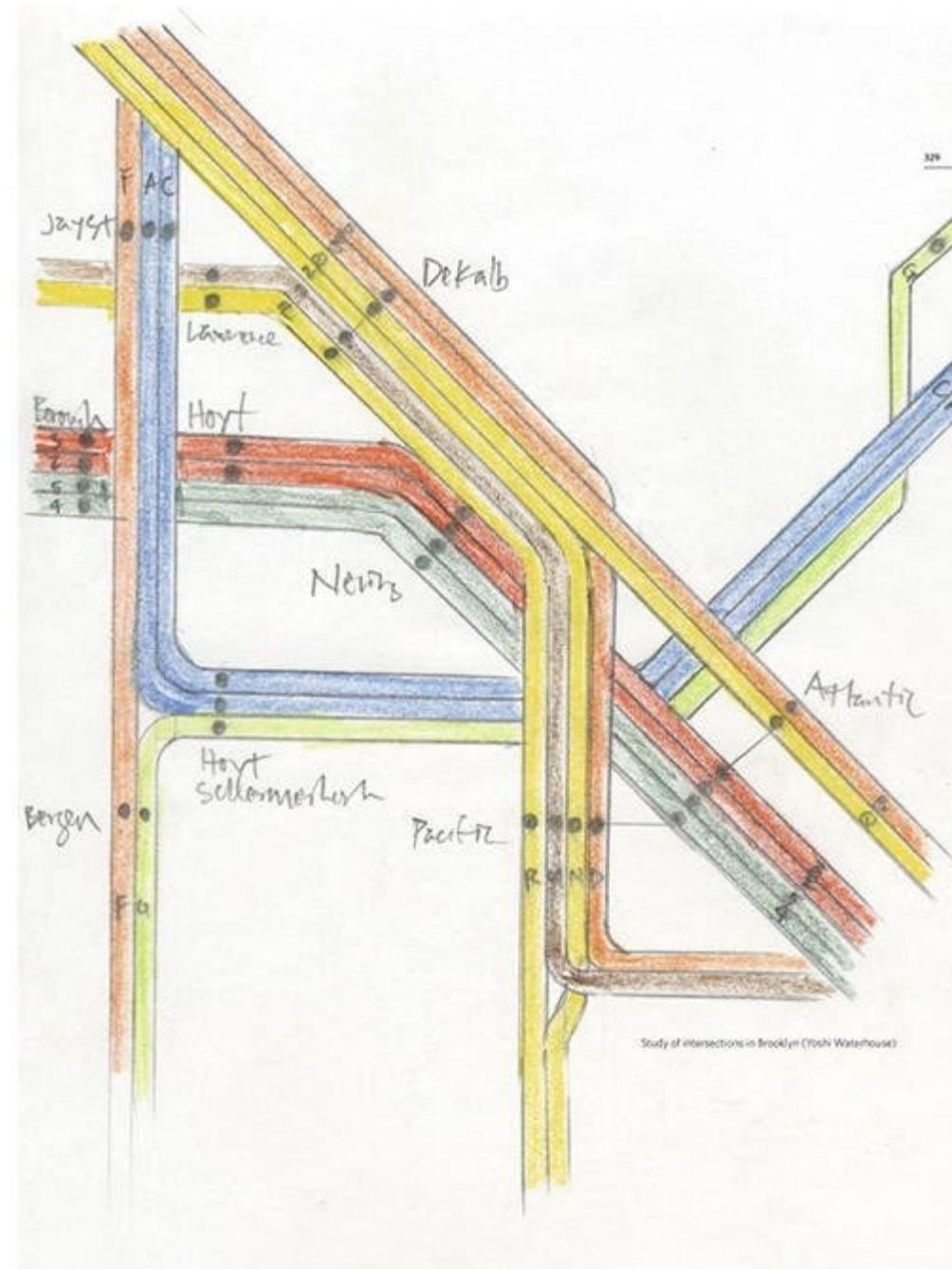
In 1972, Massimo Vignelli designed a diagrammatic for the New York City subway. He replaced the serpentine maze of geographically accurate train routes with simple, bold bands of colour that turned at 45° and 90° angles. Each route was colour-coded, its stops indicated by black dots. To make the map function more effectively, a few geographic liberties were taken, something that didn't sit well with New Yorkers. For instance, the new map showed Central Park as a square; Vignelli reasoned that for people riding underground, the park's rectangular proportions were irrelevant. There are fewer stops along Central Park West than in Midtown, so logic dictated that less map space was required. But New Yorkers wanted their rectangle back, and in 1979 the map was replaced.

As it turned out, that original map of 1972 was ahead of its time; Vignelli's economical format was perfect for web-accessibility. In 2010 a new digital iteration, *The Weekender* (these pages), the result of the combined efforts of Vignelli and two associates, Beatriz Cifuentes and Yoshi Waterhouse, went online. One of their first acts was to re-term the map; it is now a diagram. The design process began the traditional way, using black-and-white and coloured pencils. 'Sketching forces us to concentrate on the details,' Vignelli explains. 'We use the computer to refine details, but the concept is expressed with a 3b Caran d'Ache.'

The team rebuilt the diagram geometry from scratch. 'Based on a grid and a masterplan established in advance,' Vignelli says, 'we analysed the situation and worked to find the most appropriate solution for every station with several connections by discussing and sketching alternatives until we found the best one.'

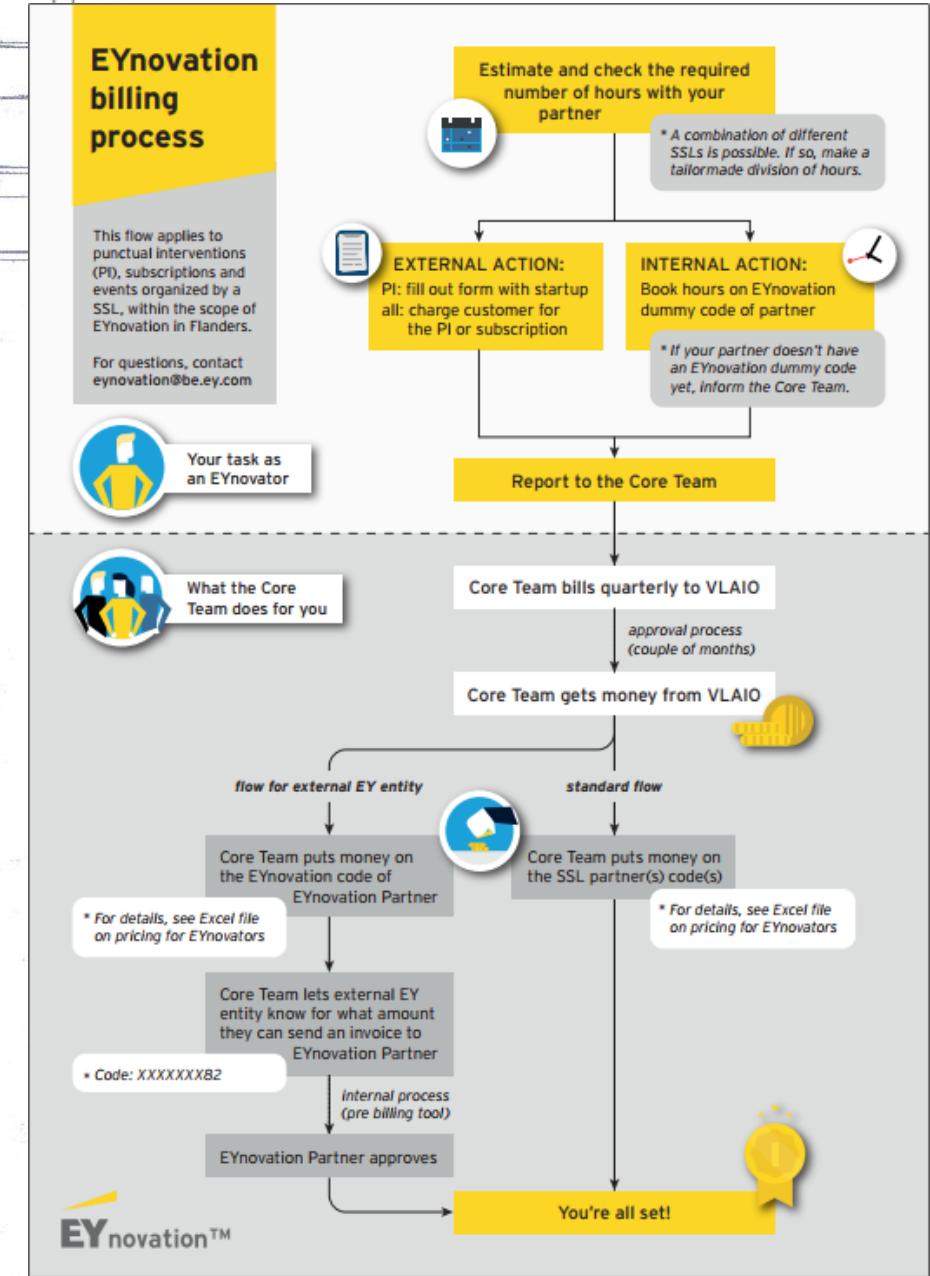
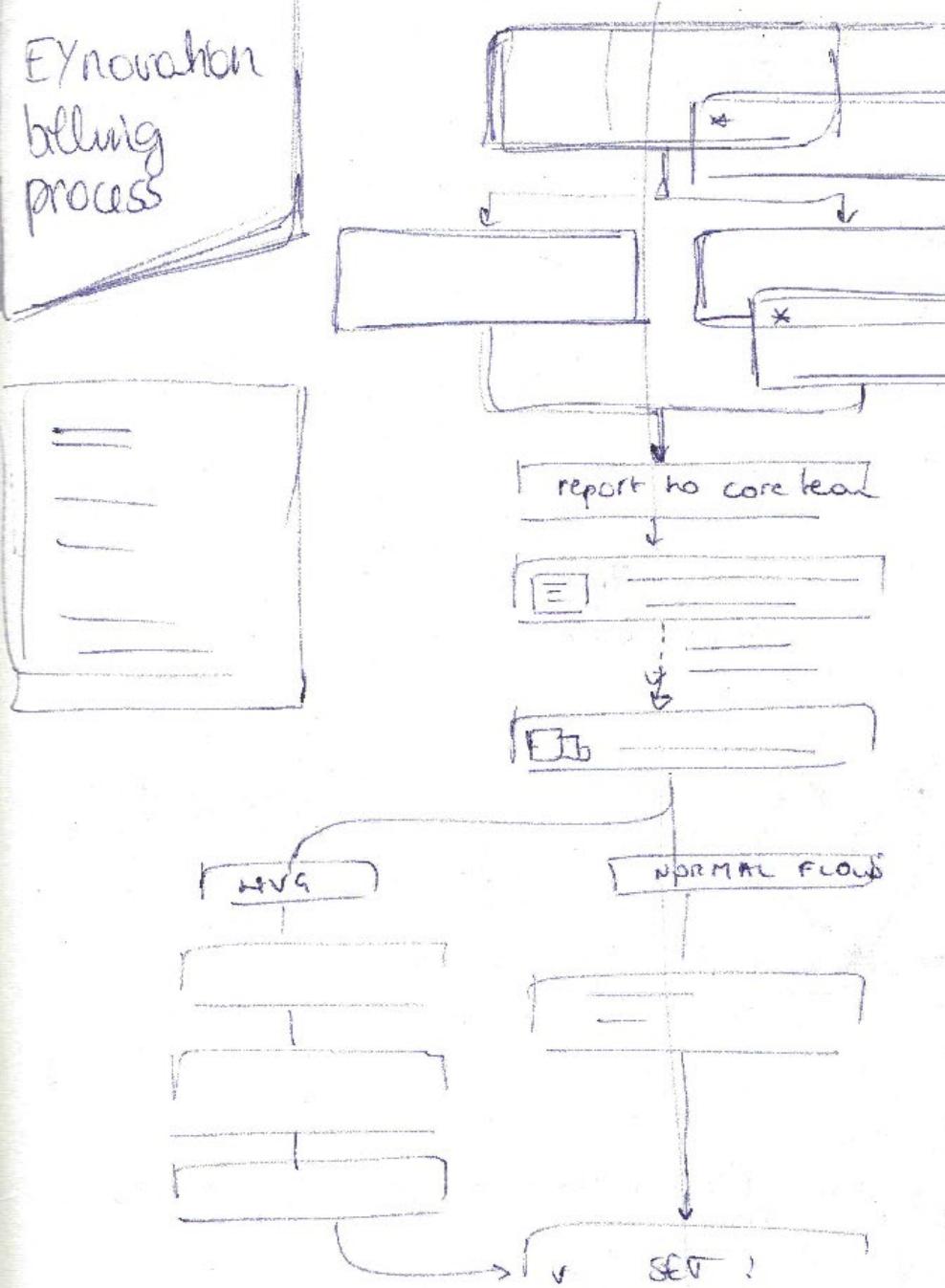


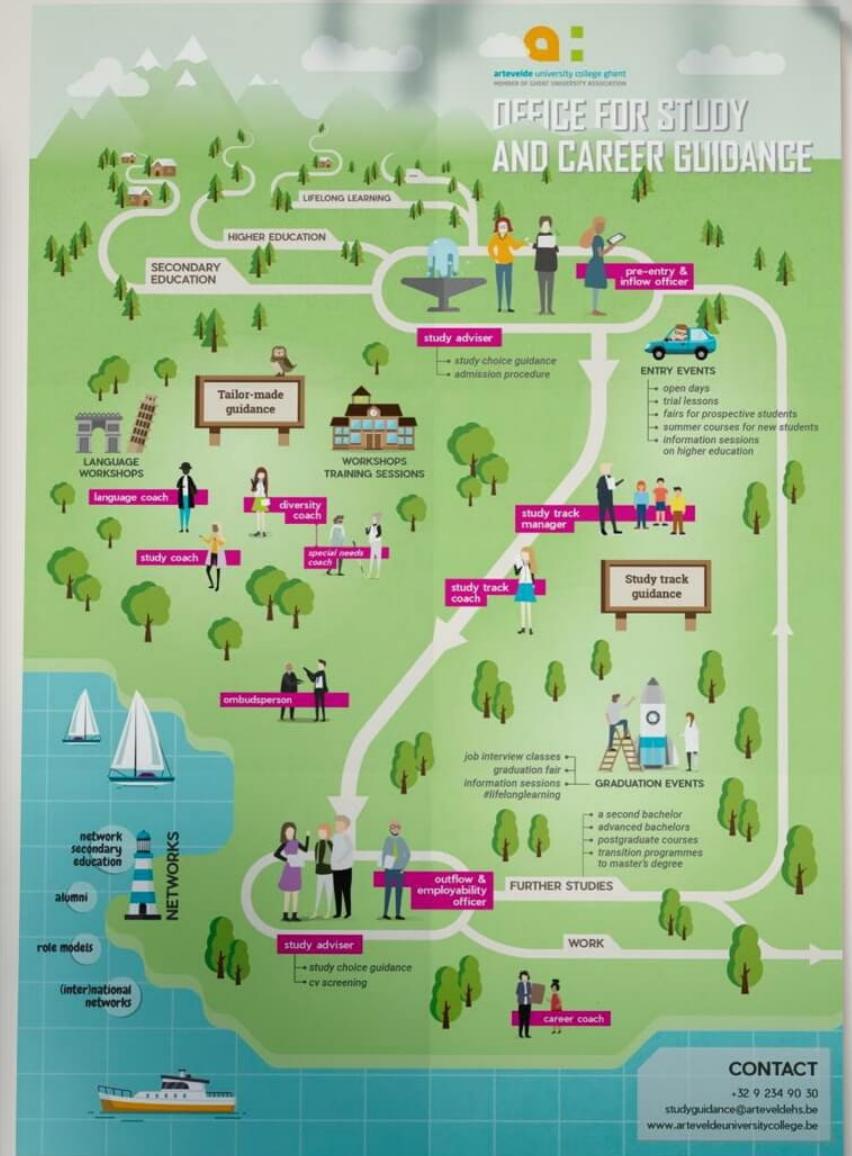
Drawing, final diagram layout with frame and legend



Study of intersections in Brooklyn (Yoshi Waterhouse)

EYnovation billing process





Homework: your own graphical abstract

Revisit the key message(s) you wrote down during the previous exercise.
If you prefer, you can use someone else's article to start from.

Use **pen and paper** to produce a sketch for a **graphical abstract**.

Think of visual elements you can use: graphs, photographs, icons, shapes, arrows, colors,...



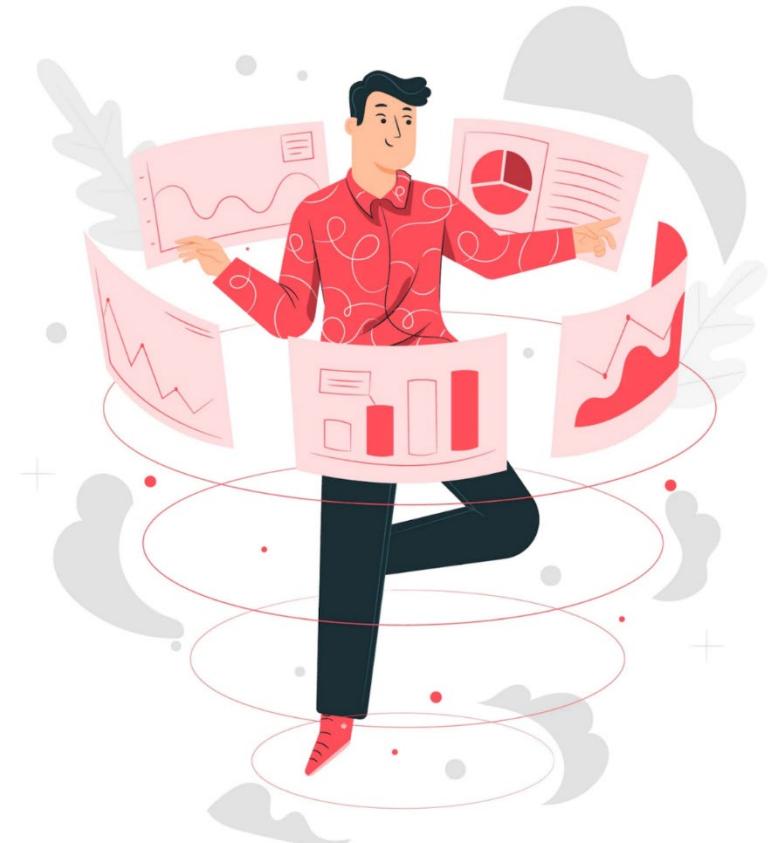
*We'll share some ideas and resources
in the upcoming sections of the course*

Make sure to add strong labels, annotations and captions to make the graphical abstract easy to read.



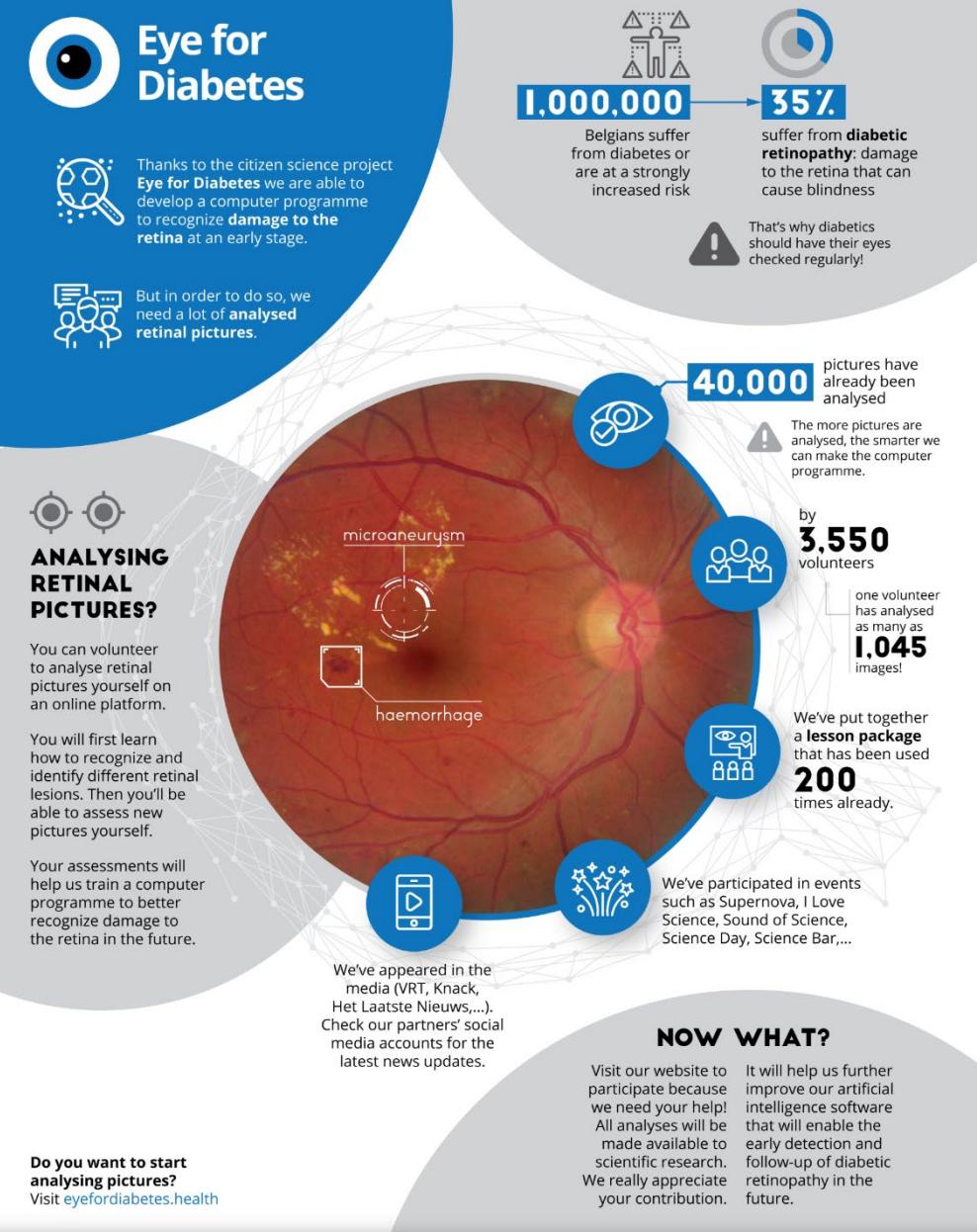
*We'll talk more about these textual
elements in the next session*

Send your **concept sketch** to koen@baryon.be.



Scientific posters





i use design principles to your advantage!

create a structured layout

Genetic diversity and evolutionary history of the lion in West and Central Africa

D.L. Berzola, *W.E. van Hooff*, **K. Vrielink**, **R.D. Uit de Weerd**¹⁰, **D.S. York**¹¹, **H. Baurer**¹², **H.H.T. Prins**¹³, **P.J. Funatsu**¹⁴, **H.A. Udo de Haes**¹⁵, **H. Leirix**¹⁶, **W.A. van Haeringen**¹⁷, **E. Sogboholou**¹⁸, **PN. Tuncuca**¹⁹ and **I.H.M. de Jongh**²⁰
¹Leiden University, Institute of Environmental Sciences (CML), PO Box 9513, 2300 RA Leiden, The Netherlands
²Utrecht University, Research Group Geochronology
³Utrecht University, Institute of Biology Leiden (IBL), The Netherlands
⁴Universität Regensburg, Institute of Geosciences, Department of Earth Sciences, The Netherlands
⁵Wageningen University and Research Centre, Animal Sciences, The Netherlands
⁶Wageningen University and Research Centre, Soil Sciences, The Netherlands
⁷Universität Bayreuth, Institute of Geosciences, South Africa
⁸University of Amsterdam, Geological Survey Groningen, The Netherlands
⁹Utrecht University, Institute of Geochemistry, The Netherlands
¹⁰Utrecht University, Institute of Geochemistry, The Netherlands
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¹⁹Utrecht University, Institute of Geochemistry, The Netherlands
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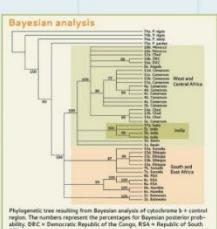
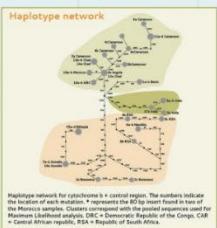
1 Introduction

Genetic diversity in lions is greater than modern classification implies^{1,2,3}. This study illustrates the phylogenetic relationships between lion populations from their entire geographic range.

Presently, two subspecies of the lion are recognized by IUCN: the African lion, *Panthera leo leo*, and the Asiatic lion, *Panthera leo persica*⁴. However, hyperaridity during Holocene glacial periods in West and Central Africa led to genetic distinct lineages in several animal species⁵⁻¹⁷. A similar genetic pattern is expected in lions.

In West and Central Africa populations are small, isolated, and subject to (genetic) threats^{18,19,20}. In West and Central Africa there are still 1800 lions.

there are still 1800 lions. In West Africa there are an estimated 850 lions and IUCN classified these lions as Regionally Endangered. Lion populations with a unique evolutionary history need to be determined to protect and preserve the lion's genetic variation.²¹



3 Results

West and Central African lions are more closely related to Asiatic lions than to the South and East African lions. Furthermore, populations in South and East Africa are genetically highly diverse, while populations in West and Central Africa show a low genetic diversity.

5 Conclusion

This study shows a clear distinction between West and Central African lions (including India) on one hand, and South and East African lions on the other. This finding is critical for conservation management for both wild populations and for breeding of captive stock.

Besides their current endangered status lions in West and Central Africa should be prioritized based on their genetic distinctiveness, their level of genetic variation, and their evolutionary history.



2 Methods

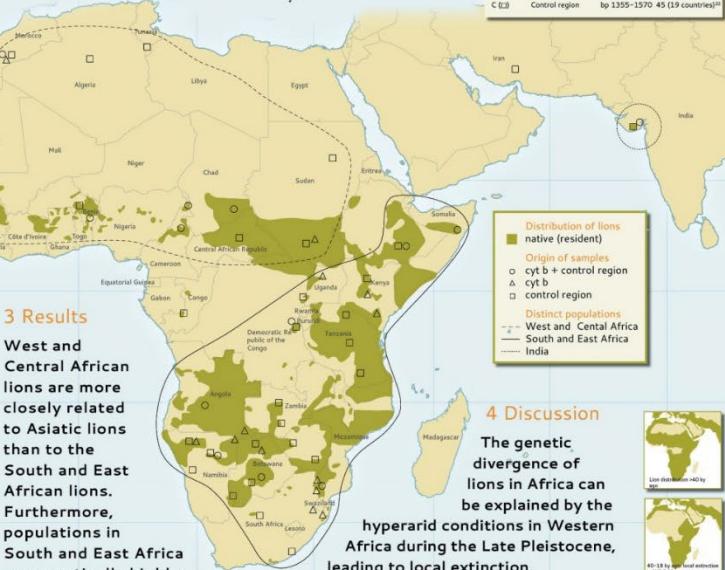
Samples: 126 samples, throughout the lion's complete geographic range, were subject to phylogenetic analyses. Scat, hair, blood or tissue were obtained from wild ranging lions and captive animals in zoos. 53 individuals from 73 sequences from GenBank were

15 countries were sampled, and 73 sequences from GenBank were added at a later stage for phylogenetic analysis^{1,22}.

DNA data: sequences of a mitochondrial region, containing the cytochrome b gene, tRNA_{Pro}, tRNA_{Thr}, and the left part of the control region, were analysed.

Phylogenetic analysis Bayesian, Maximum Likelihood and Maximum Parsimony analysis.

Sets for Analysis	Genetic region	Position	Samples
A (C)	Cytochrome b (rRNApro, TrNATHr, control region)	bp 1-1764	53 (15 countries) ¹
B (Δ)	Cytochrome b	bp 1-1140	28 (28 countries) ¹
C (Δ)	Control region	bp 1355-1570	45 (19 countries) ¹⁰



4 Discussion

The genetic divergence of lions in Africa can be explained by the hyperarid conditions in Western Africa during the Late Pleistocene, leading to local extinction.

When the climate became more humid, lions recolonized Western Africa from refugia in the Middle East. Lions in West and Central Africa are an evolutionary young clade and have therefore a low genetic variation.



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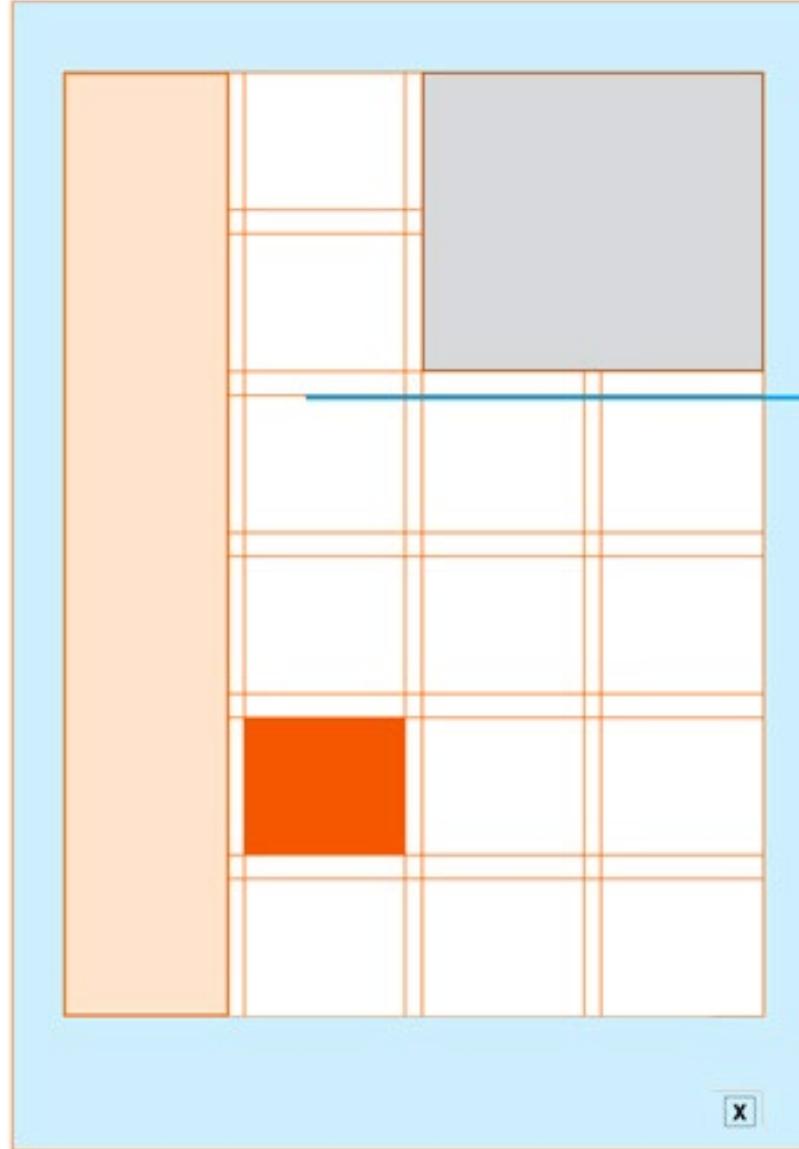
are vertical containers that hold type or images. The width and number of columns on a page or screen can vary, depending on the content.

MODULES

are individual divisions separated by consistent space, providing a repeating, ordered grid. Combining modules can create columns and rows of varying sizes.

MARGINS

are buffer zones. They represent the amount of space between the trim size, including gutter, and the page content. Margins can also house secondary information, such as notes and captions.



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are groups of modules or columns that can form specific areas for type, ads, images, or other information.

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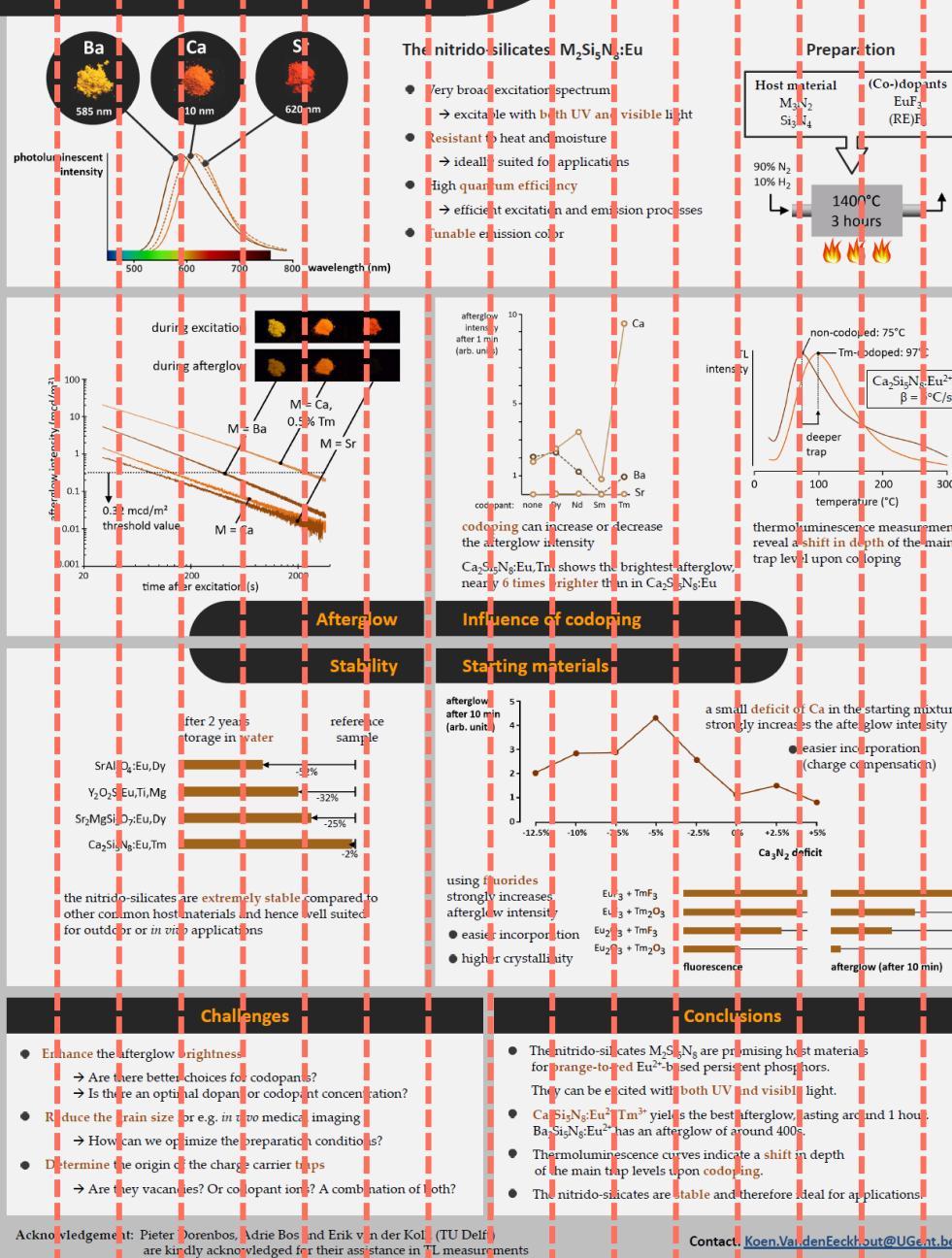
are alignments that break space into horizontal bands. Not actual lines, flowlines are a method for using space and elements to guide a reader across a page.

MARKERS

help a reader navigate a document. Indicating placement for material that appears in the same location, markers include page numbers, running heads and feet (headers and footers), and icons.

Persistent luminescence in rare-earth doped nitrido-silicates

Koen Van den Eeckhout | Philippe F. Smet | Dirk Poelman



Persistent luminescence in the $M_2Si_5N_8:Eu^{2+},RE^{3+}$ family ($M=Ca,Sr,Ba$)



Koen Van den Eeckhout | Philippe F. Smet | Dirk Poelman

LumiLab, Department of Solid State Sciences, Ghent University

Background

Persistent phosphors = luminescent materials that continue emitting light for hours after ending the excitation ('afterglow').

- Applications:
 - safety and emergency signage
 - dials and displays
 - medical imaging

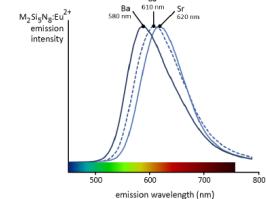
Wanted: efficient and stable persistent phosphor in the orange to red part of the visible spectrum

Preparation

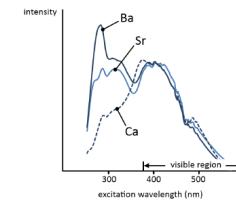
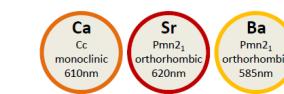
- Host material:
- M_3N_2 ($M = Ca,Sr,Ba$)
 - Si_3N_4
- (Co-)dopants:
- EuF_3 , $(RE)F_3$



The alkali-earth nitrido-silicates: $M_2Si_5N_8:Eu^{2+}$



- Requirements for good host materials:
- ✓ odorless
 - ✓ resistant to heat
 - ✓ resistant to moisture
 - ✓ excitable with both UV and visible light

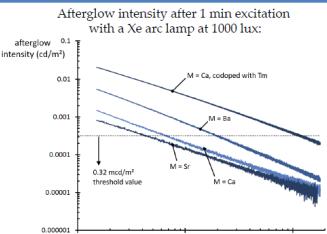


1 After excitation, all materials, even non-codoped, show some form of persistent luminescence.

2 The decay curves follow straight lines in a log-log plot, implying that they can be modelled by a power law with negative scaling exponent. In other words, the decay is initially fast, but slows down over time.

3 $Ca_2Si_5N_8:Eu^{2+},Tm^{3+}$ yields the brightest and longest afterglow, nearly 6 times brighter than the non-codoped variant. It lasts around 1 hour.

Afterglow



4

The afterglow of $Ba_2Si_5N_8:Eu^{2+}$ lasts around 400s, and can be slightly increased by dysprosium codoping.

5

The emission spectra during the afterglow in $Ca_2Si_5N_8:Eu^{2+},Tm^{3+}$ and $Ba_2Si_5N_8:Eu^{2+}$ are redshifted by about 10 nm.

6

Codoping with samarium weakens the afterglow considerably, for all materials.

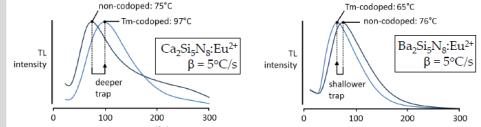
7

For $Sr_2Si_5N_8:Eu^{2+}$ the afterglow is very weak, even upon codoping with rare earths.

Thermoluminescence

Thermoluminescence = measuring the light emission while heating a previously charged sample

Deep traps → glow peaks at higher temperature ($\pm 100^\circ C$ for optimal afterglow)
Shallow traps → glow peaks at lower temperature



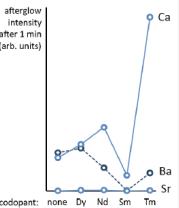
Conclusions

The $M_2Si_5N_8:Eu^{2+},RE^{3+}$ family are promising host materials for orange-to-red Eu^{2+} -based persistent phosphors.

They can be excited with both UV and visible light.

$Ca_2Si_5N_8:Eu^{2+},Tm^{3+}$ yields the best afterglow, lasting around 1 hour. $Ba_2Si_5N_8:Eu^{2+}$ has an afterglow of around 400s.

Thermoluminescence curves indicate a shift in depth of the main trap levels upon codoping.



Acknowledgement: many thanks to Pieter Dorenbos, Adrie Bos and Erik van der Kolk from Delft University of Technology for assistance in TL measurements.

Contact: Koen.VandenEeckhout@UGent.be

Persistent luminescent nanophosphors for *in vivo* medical imaging



Koen Van den Eeckhout | Philippe Smet | Dirk Poelman

Center for Nano- and Biophotonics (NB-Photonics), Ghent University
LumiLab, Department of Solid State Sciences, Ghent University
Université Paris Descartes, Chimie ParisTech, Paris, France

Motivation

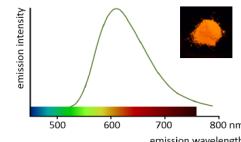
Typical *in vivo* medical imaging requires radioactive tracer particles to follow the drug distribution throughout the body.



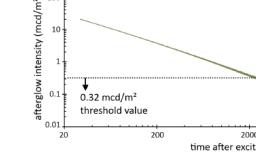
Persistent luminescent tracer particles can be excited **before injection**, outside of the patient's body.

Persistent luminescent nanophosphors

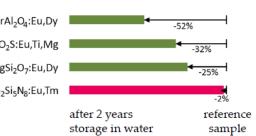
$Ca_2Si_5N_8:Eu,Tm$ shows broadband emission by divalent europium in the **orange-red** region of the spectrum.



The decay of the afterglow follows a power law and lasts around **45 minutes**.



Compared to other common host materials, the nitrido-silicates are **very stable** and hence well suited for *in vivo* applications.



In vivo medical imaging

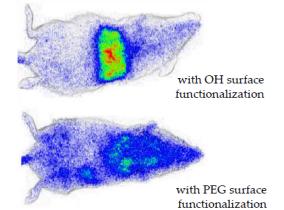
In vivo medical imaging using persistent luminescent particles:

- Excitation of the persistent luminescent nanoparticles
- Injection of the excited particles in the patient's body
- Detection of the radiation from outside of the body

Requirements for efficient *in vivo* imaging probes:

- ✓ long and intense persistent luminescence
- ✓ emission in the range of low tissue absorption
- ✓ good chemical stability
- ✓ ability to be functionalized
- ✗ small particle size (nanometer range)

Biodistribution of $Ca_2Si_5N_8:Eu,Tm$ 15 minutes after tail vein injection:



Challenges

Enhance the afterglow **brightness**

- Are there better choices for codopants?
- Can we optimize the dopant or codopant concentration?
- Are there alternative host materials?

Reduce the **particle size** to nanometer range

- Can we optimize the preparation conditions?
- Are there alternative preparation routes?

Conclusions

Persistent luminescent nanoparticles are a harmless alternative for radioactive tracer particles for *in vivo* medical imaging.

$Ca_2Si_5N_8:Eu,Tm$ persistent luminescent particles can be used for *in vivo* imaging:

- they have a **long afterglow** in the **tissue transparency** window,
- they are chemically **stable** and can be functionalized.

Better preparation conditions or alternative preparation techniques are desired to obtain a **smaller particle size**.

koen.vandeneeckhout@ugent.be

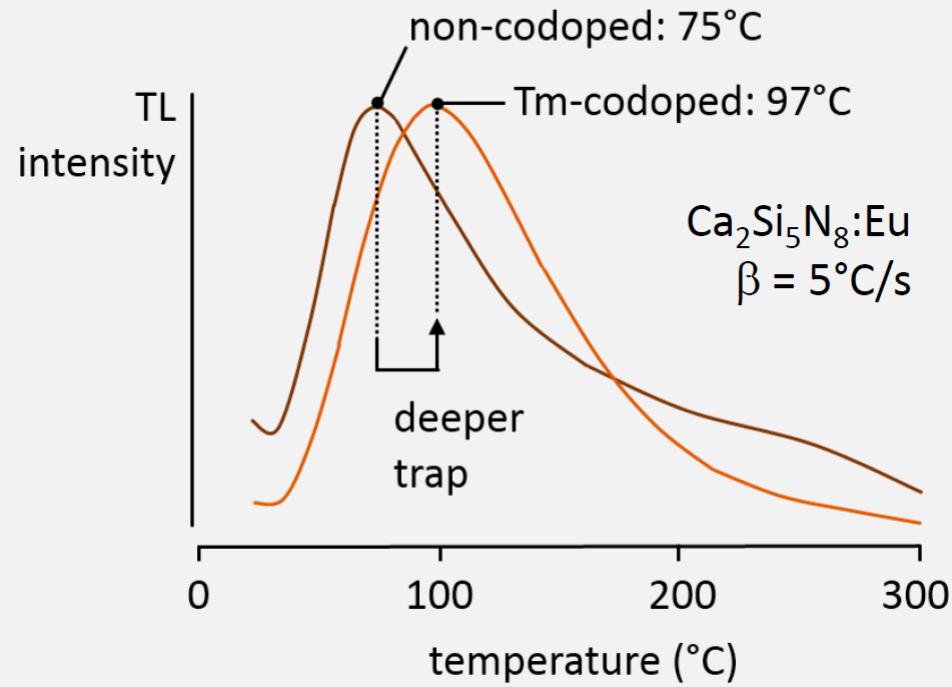
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Deep traps – slow decay

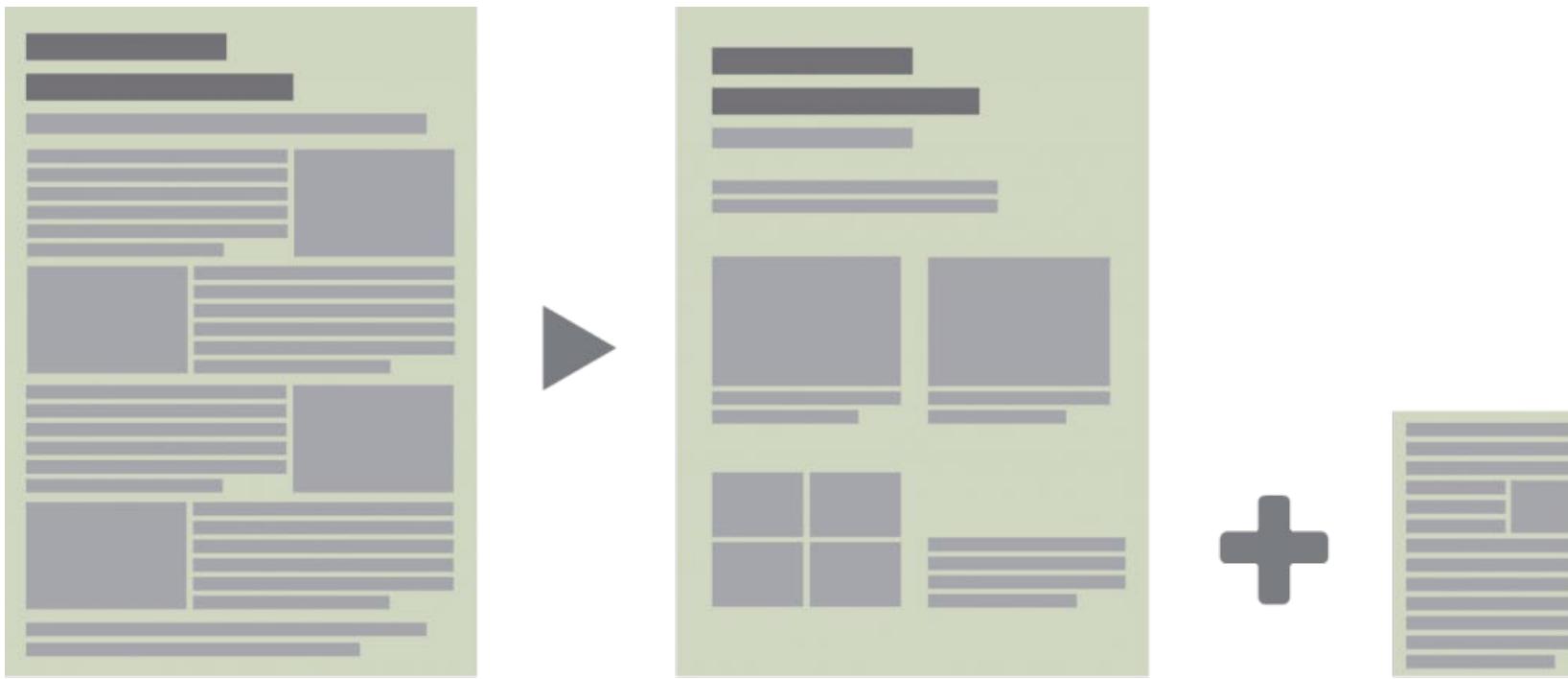
= glow peaks at higher temperature

Shallow traps – fast decay

= glow peaks at lower temperature



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lunch break

Graphical abstracts/posters

Design principles

Icons and illustrations

Editing vector images

HOMEWORK
Create a graphical abstract

Session 2

Homework feedback

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Creating layouts

Graphs

Legal and ethical aspects

Recap and Q&A

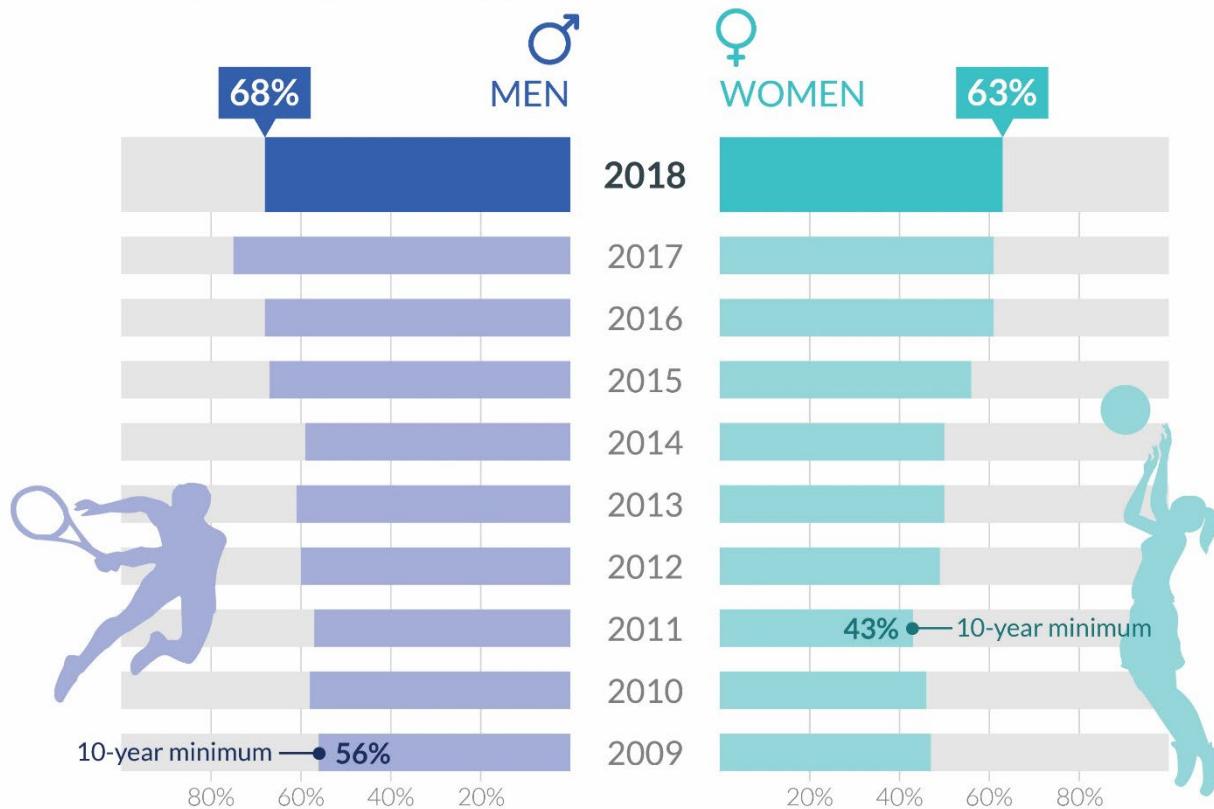
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More men than women participate in sports, but the gap is shrinking

Residents of Flanders over 18 years old indicating they play one or more sports

Source: SCV survey, Statistics Flanders





Icons

research

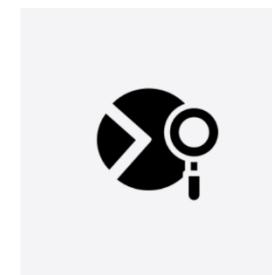
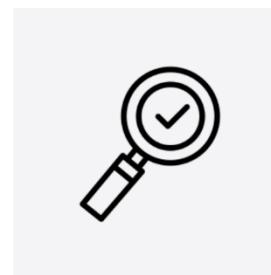
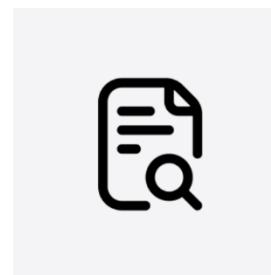
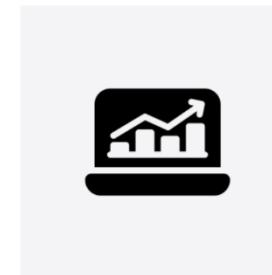
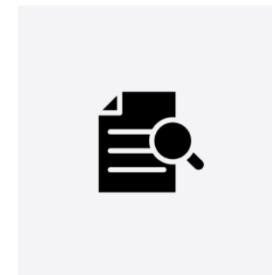
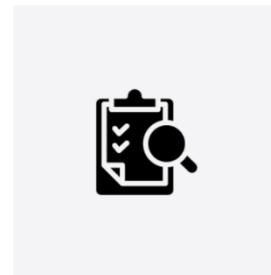
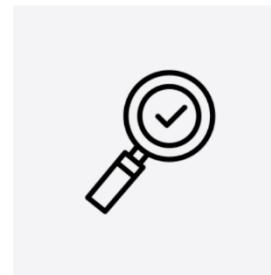


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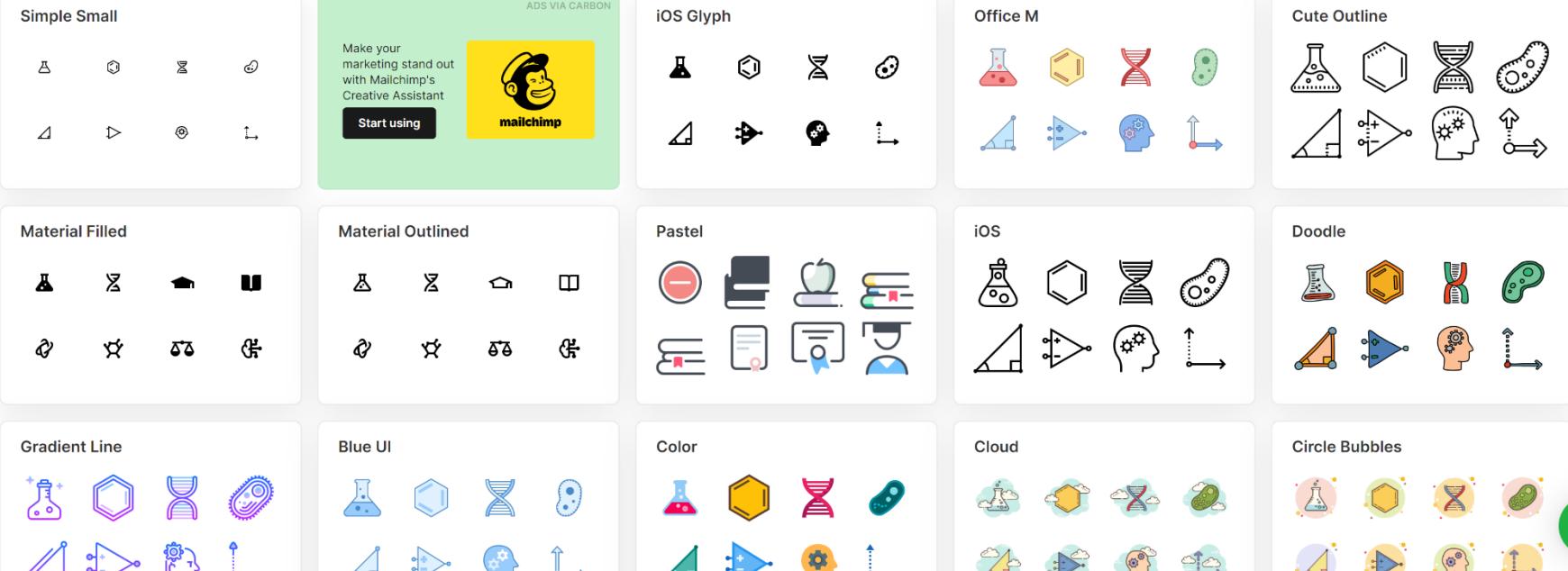
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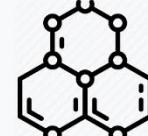
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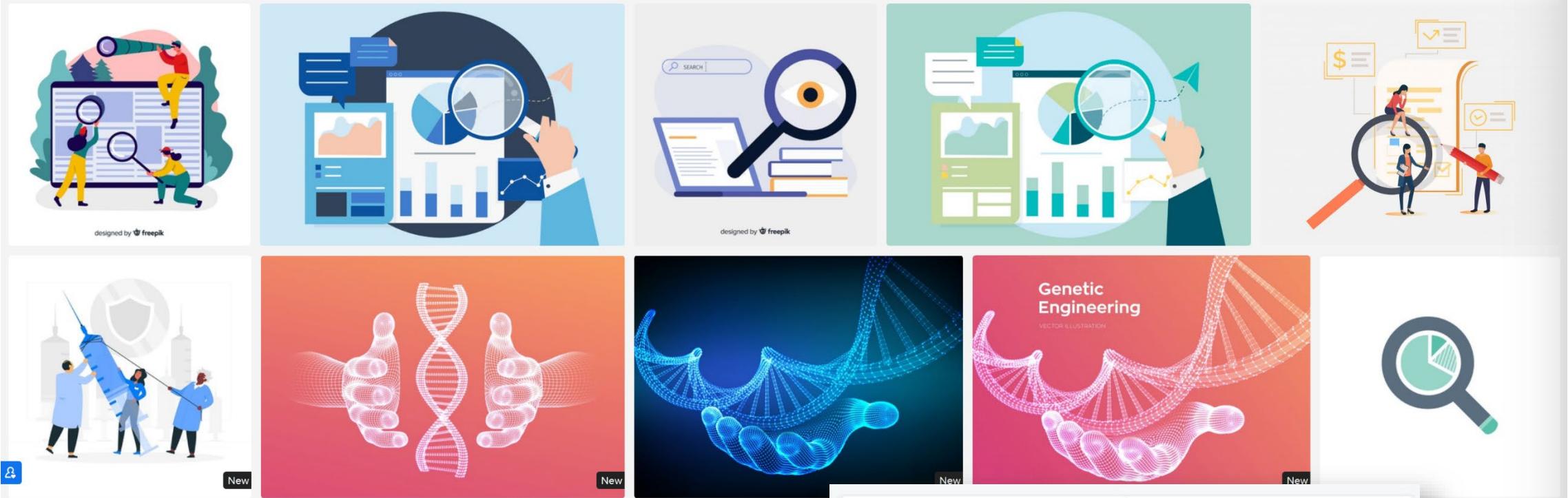


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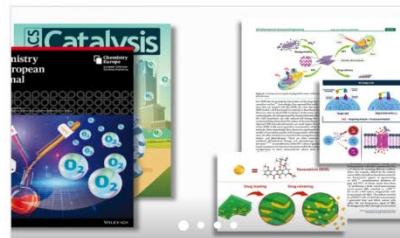
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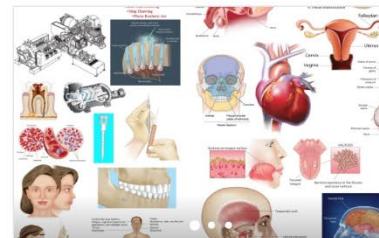
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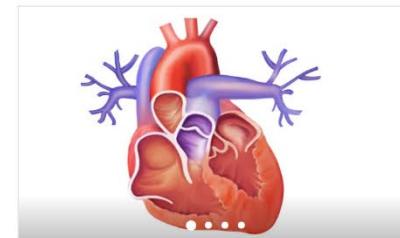
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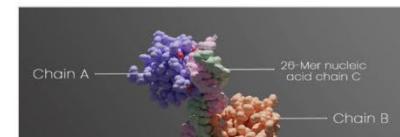
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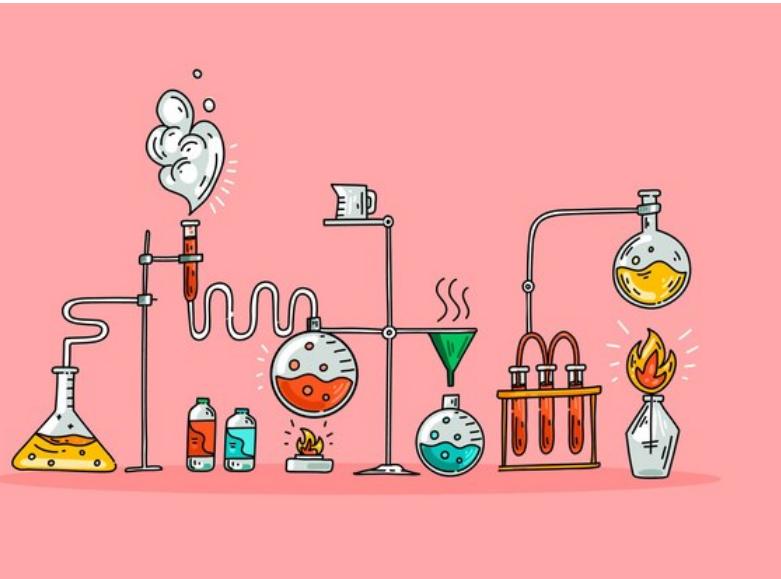


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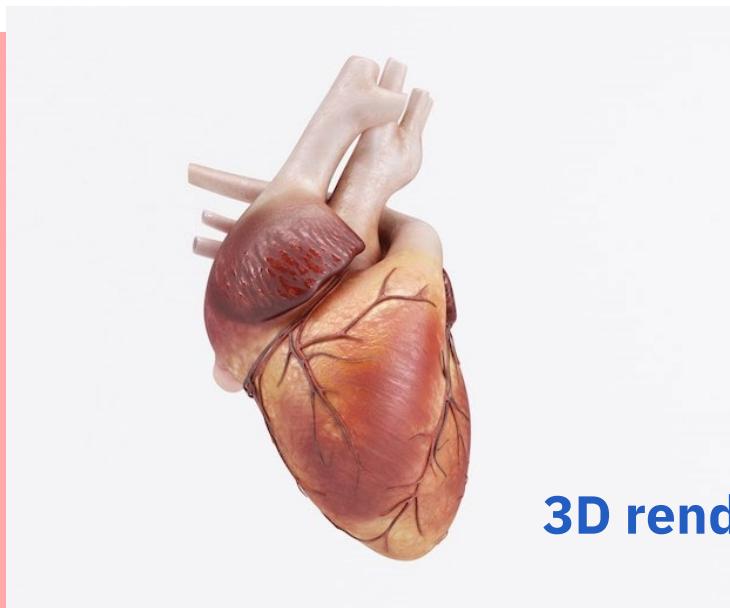


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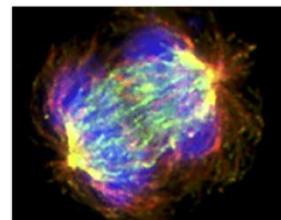
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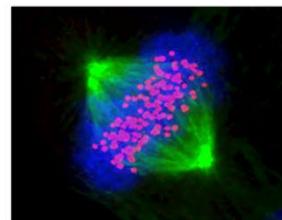
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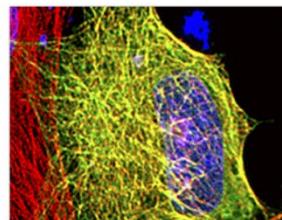
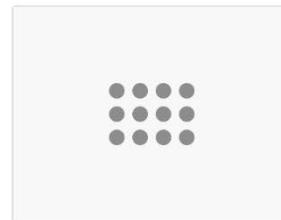
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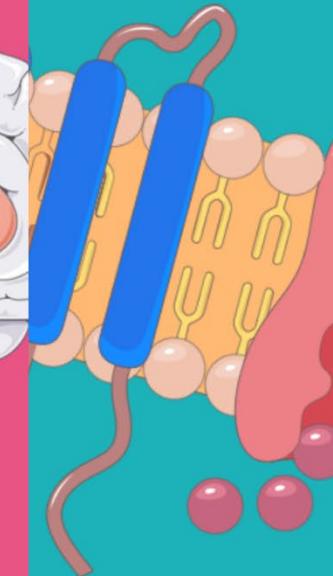


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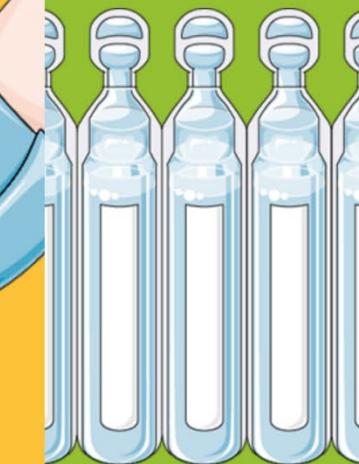
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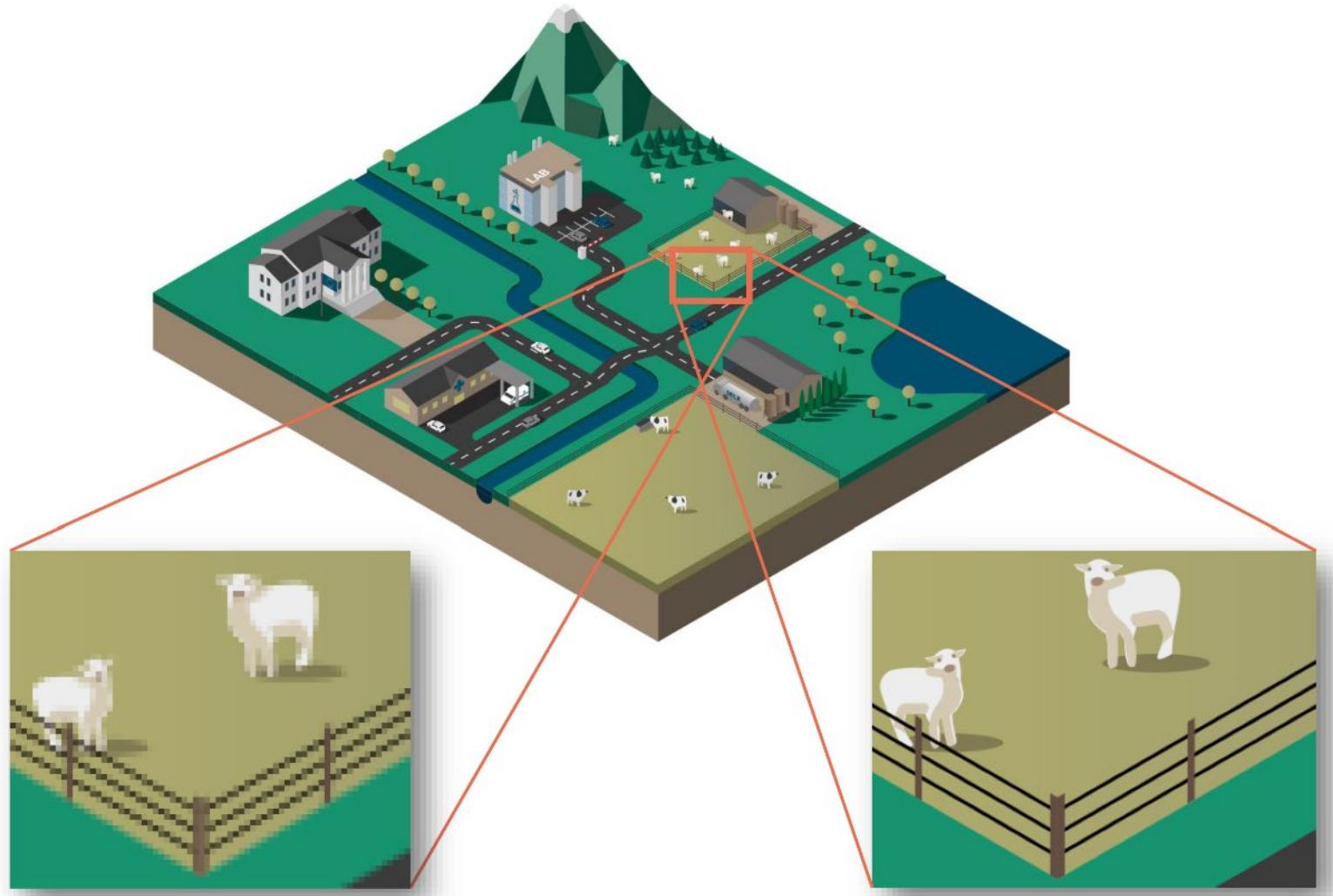
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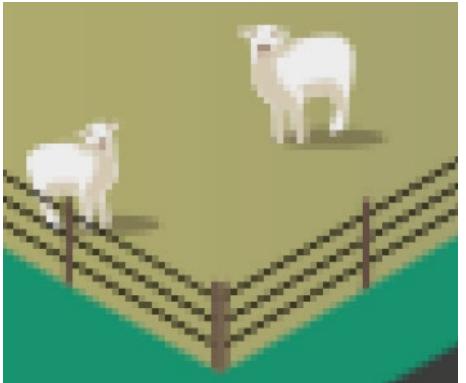


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Elements of powerful visuals

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Design principles

Icons and illustrations

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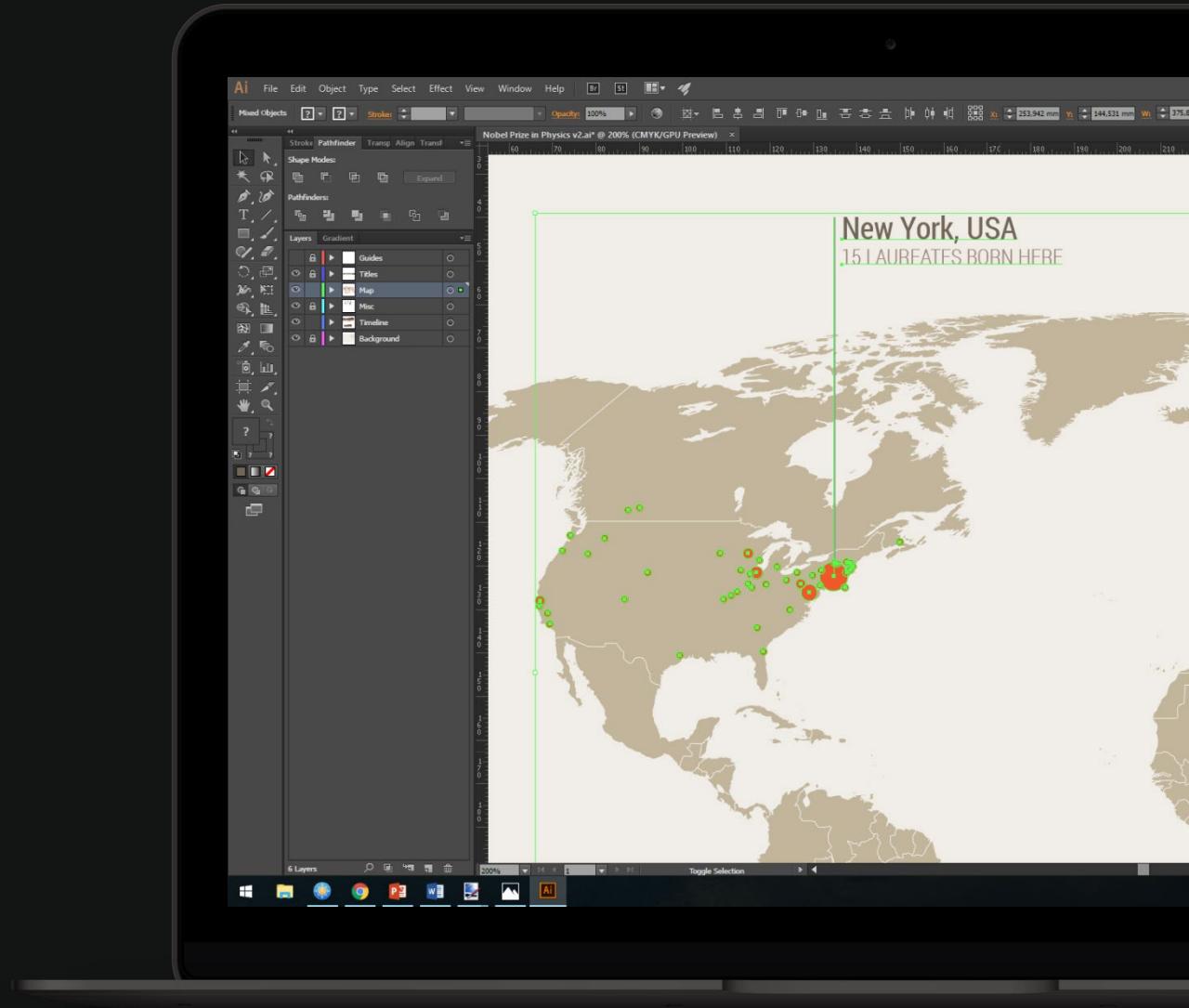




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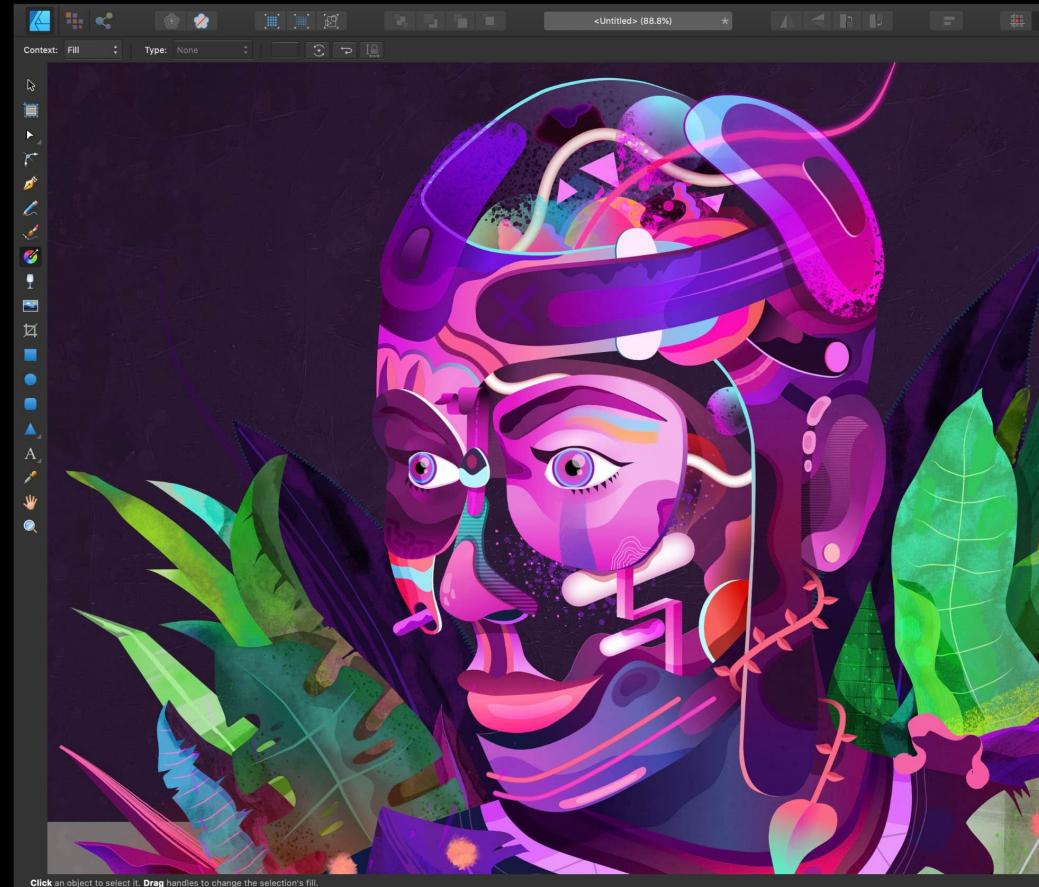
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The E Myth

Why most small businesses don't work and what to do about it

THE MYTH

understanding the **technical** work

I know how to make pies!

understanding a **business** that does that technical work

I know how to run a pie shop!

THE CHALLENGE

We are **three people** at the same time:



The entrepreneur vision, future, dreams, change

The technician doing, present, producing

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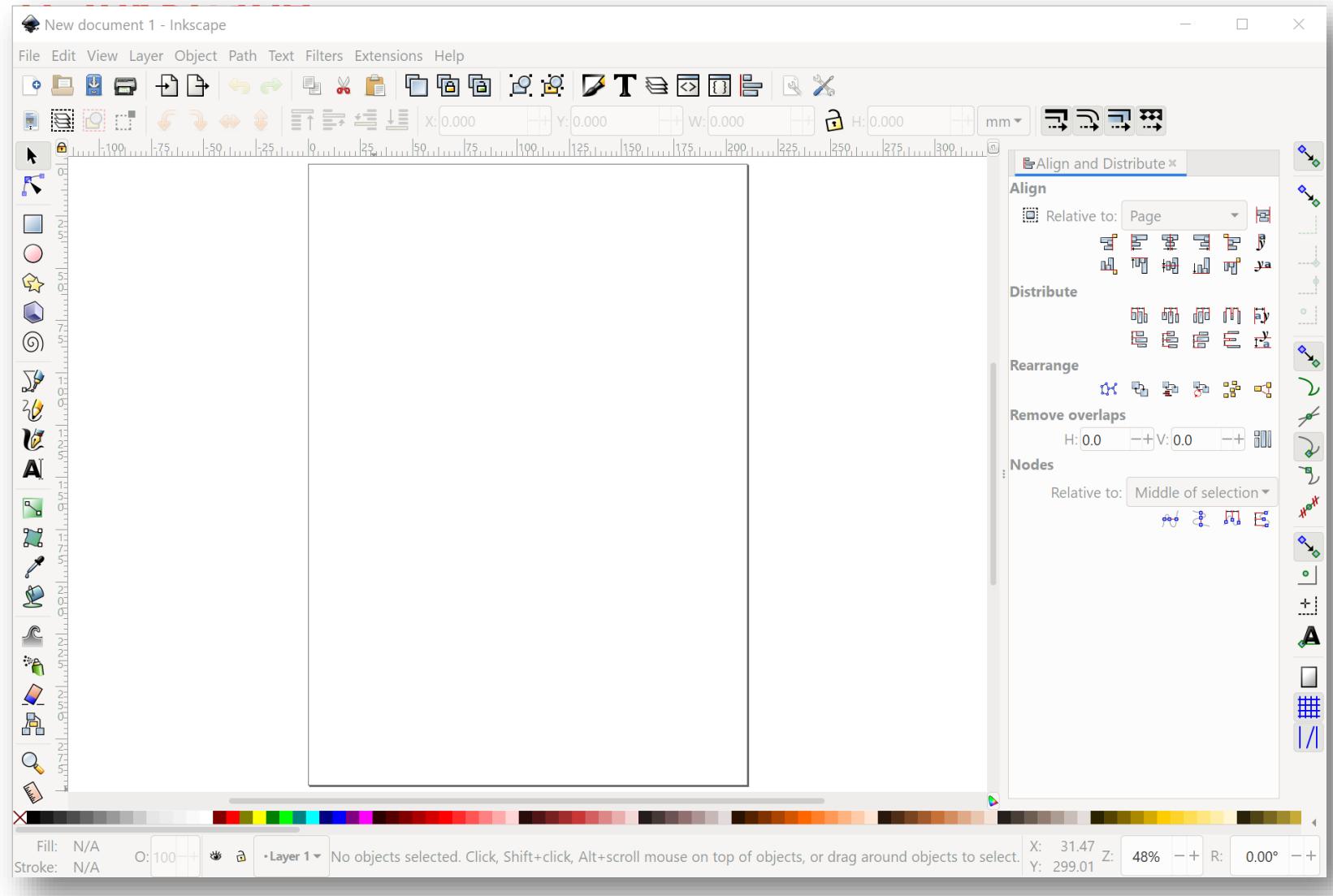
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Release Notes

Inkscape 1.1.2 is a maintenance and bugfix release, which brings you more than 40 bug fixes, 11 crash fixes, 8 fixes for extension failures, 15 improved user interface translations and improved documentation.

Bug fixes

General

- Fixed **Windows test builds**, so testers can again try out intermediate versions ([MR #3762](#))
- Fixed **building Inkscape with GCC 12 / C++17** ([MR #3683](#))
- Fixed **building Inkscape with Poppler 21.11.0**, e.g. on Slackware Linux ([MR #3636](#), [Bug #2906](#))
- **Toolbar fields** now use the units the user selected as display units (in Document preferences) again ([MR #3716](#), [Bug #1747](#))
- **Mouse cursors** for tools are now completely visible, no matter how transparent the currently selected color is ([MR #3640](#), [Bug #2025](#))

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1.1.2 2022

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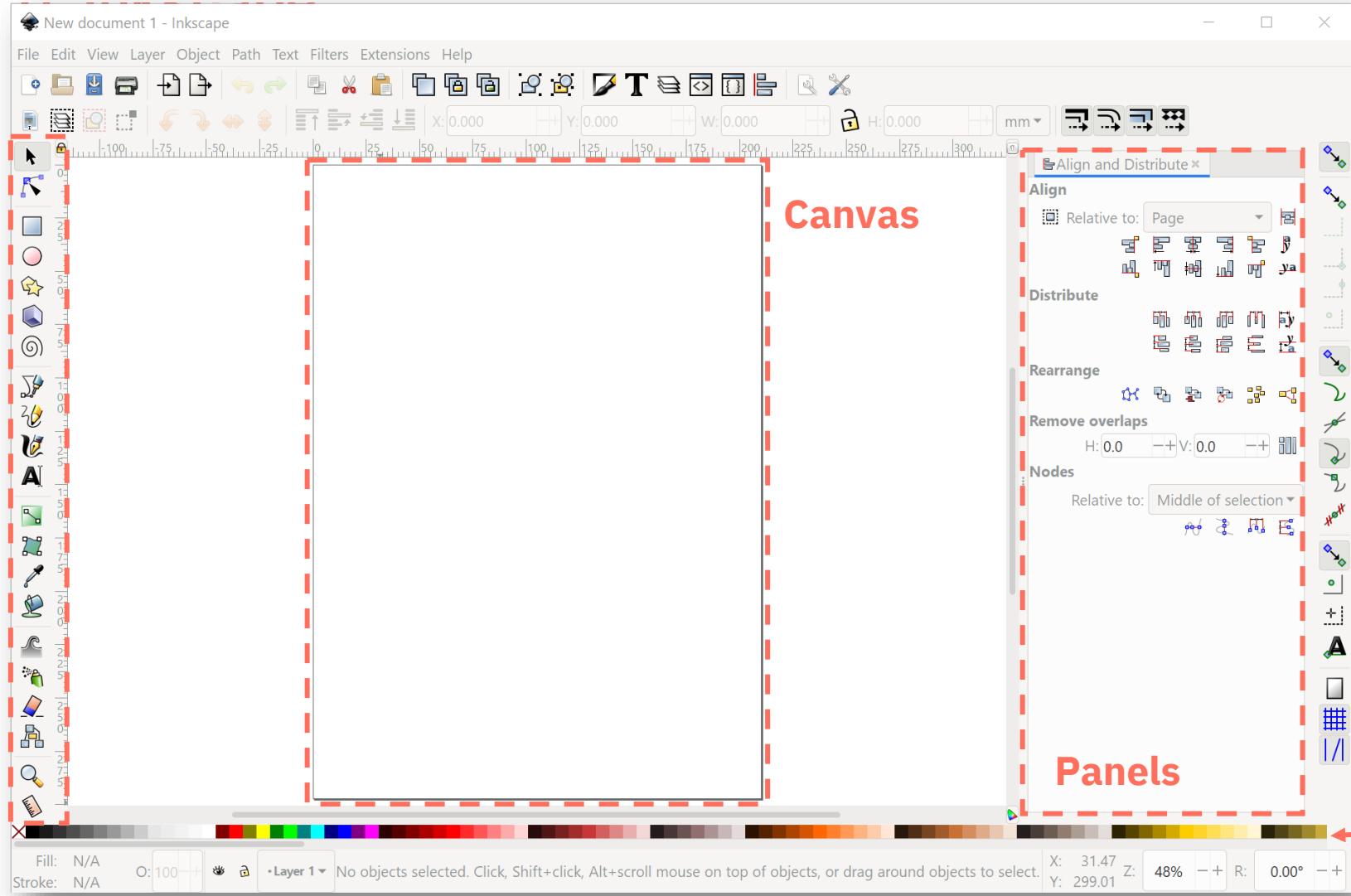
1.1 2021

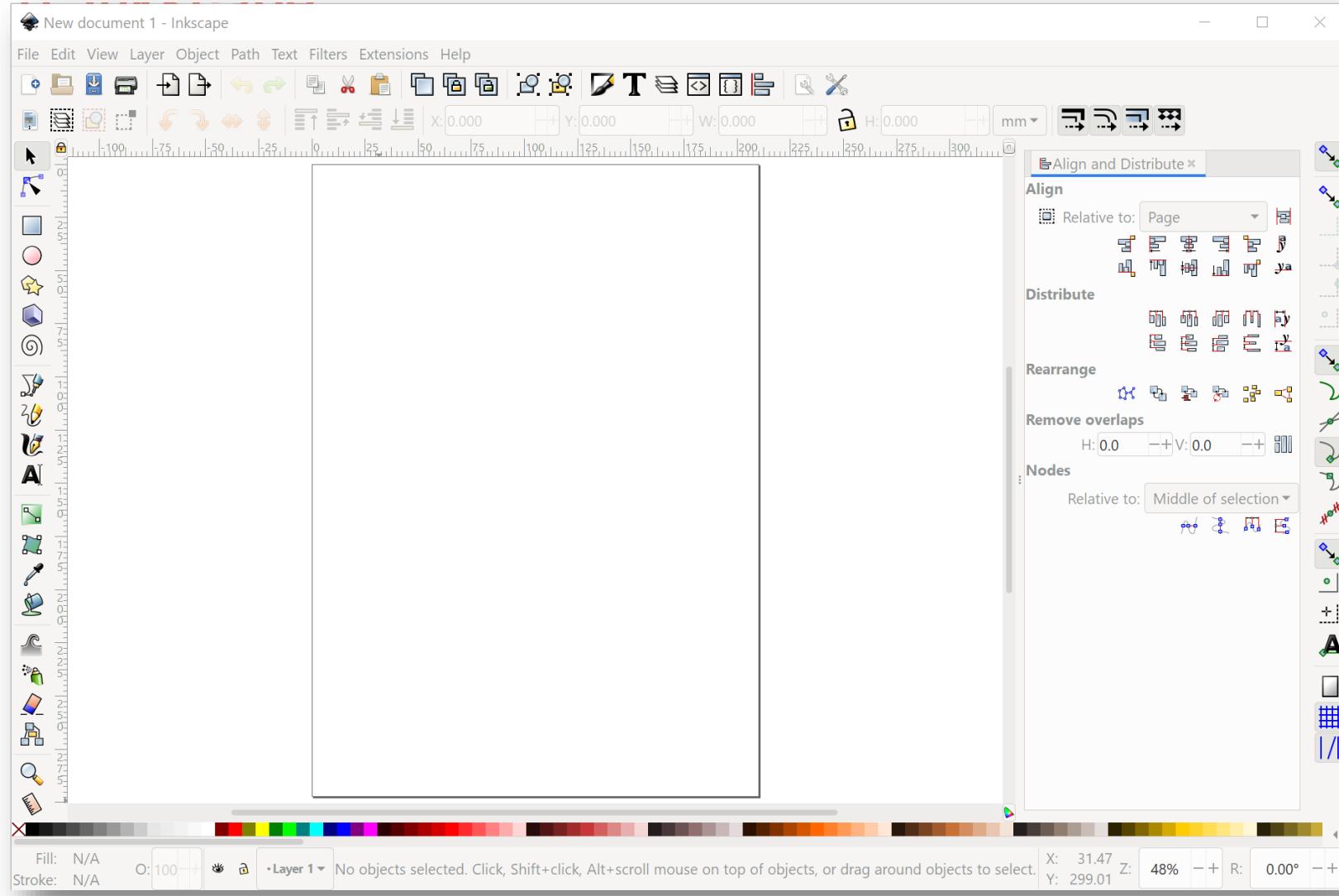
1.0 2020

0.92 2017

inkscape.org/release/

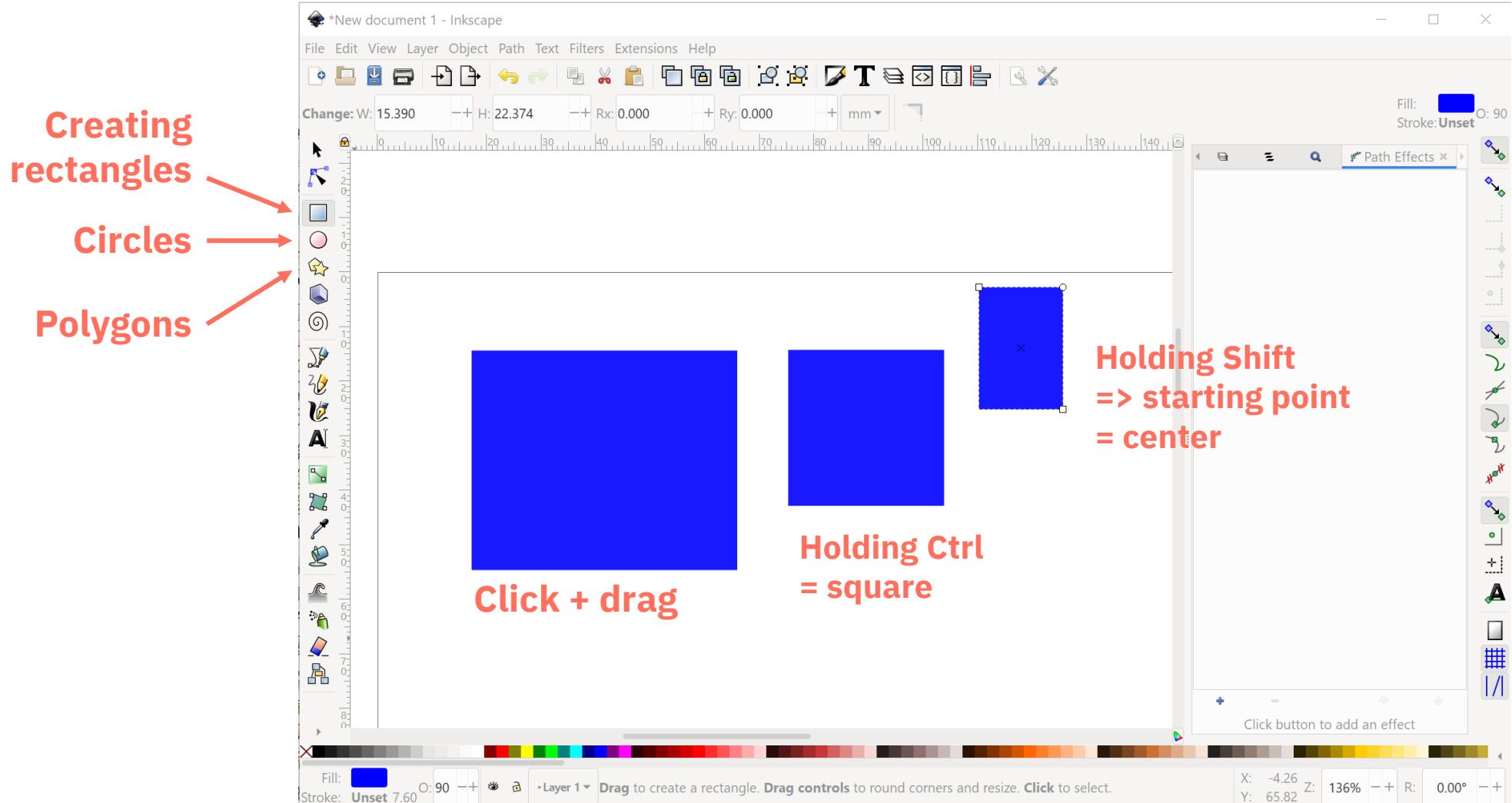
Toolbox



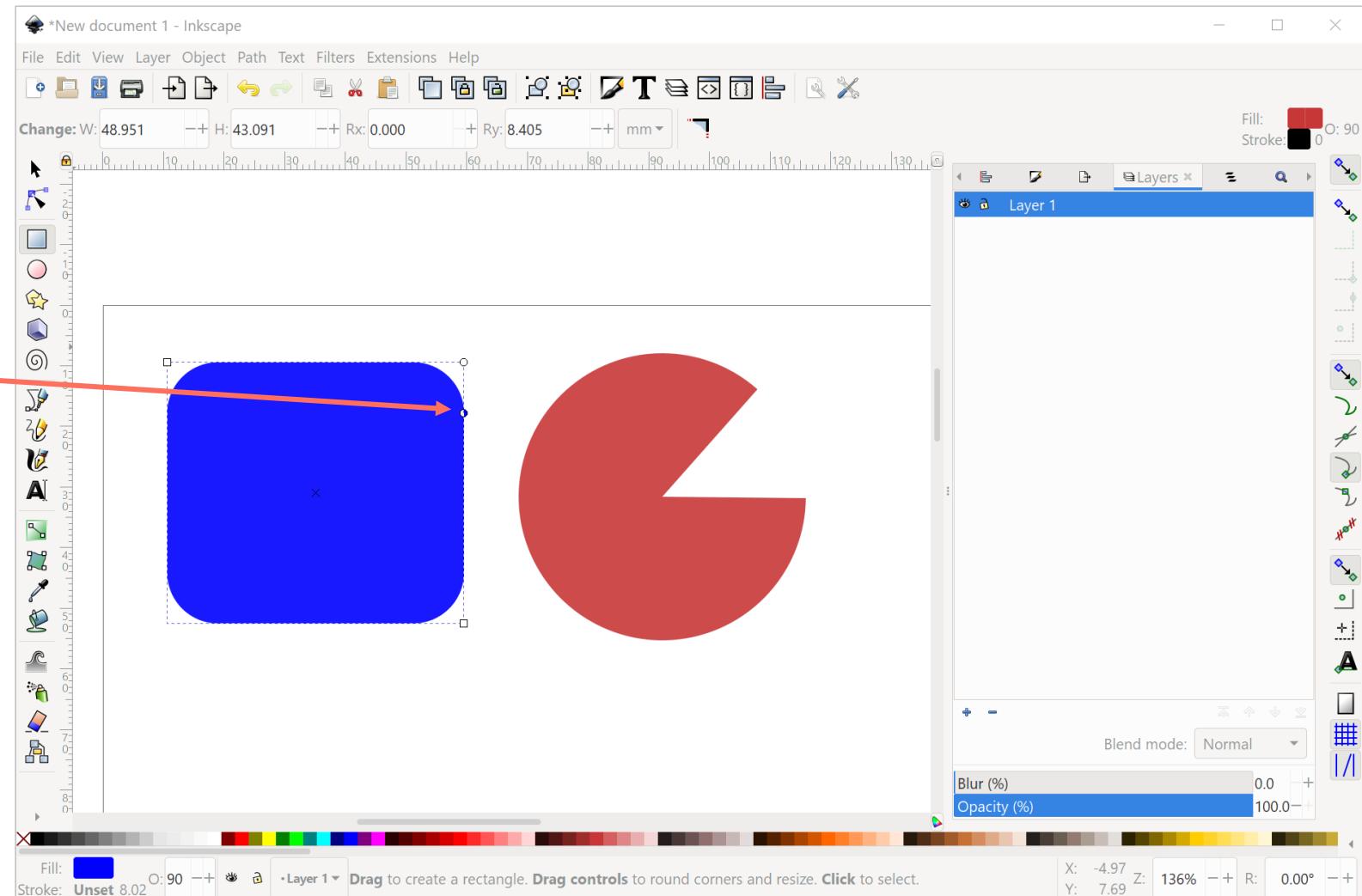


Moving around

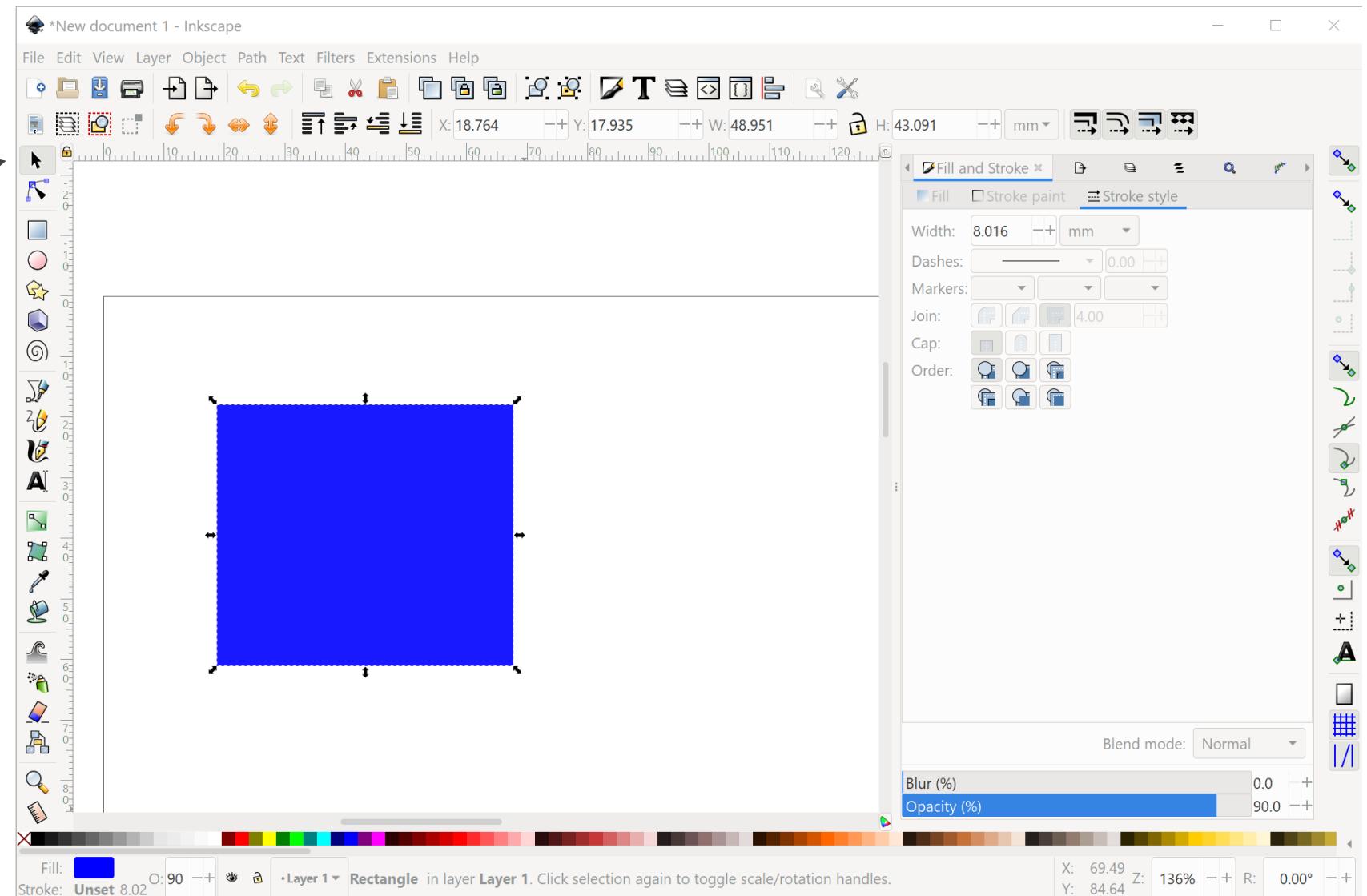
- Scroll wheel
= up and down
- Scroll wheel + shift
= left and right
- Scroll wheel + control
= zoom in / out
- Drag + spacebar
= pan around



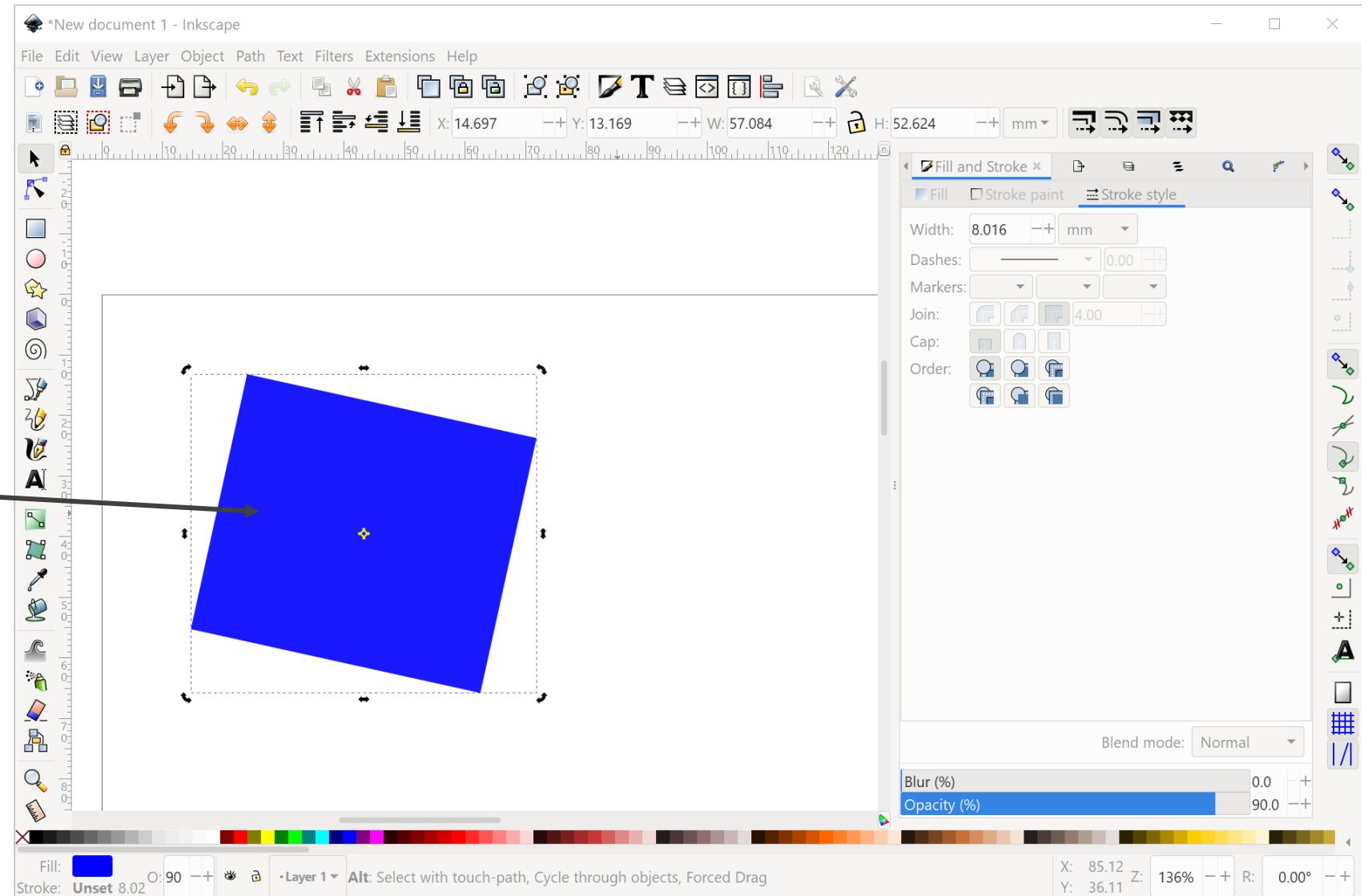
Using the little dots, you can change certain shape properties (e.g. rounded corners)

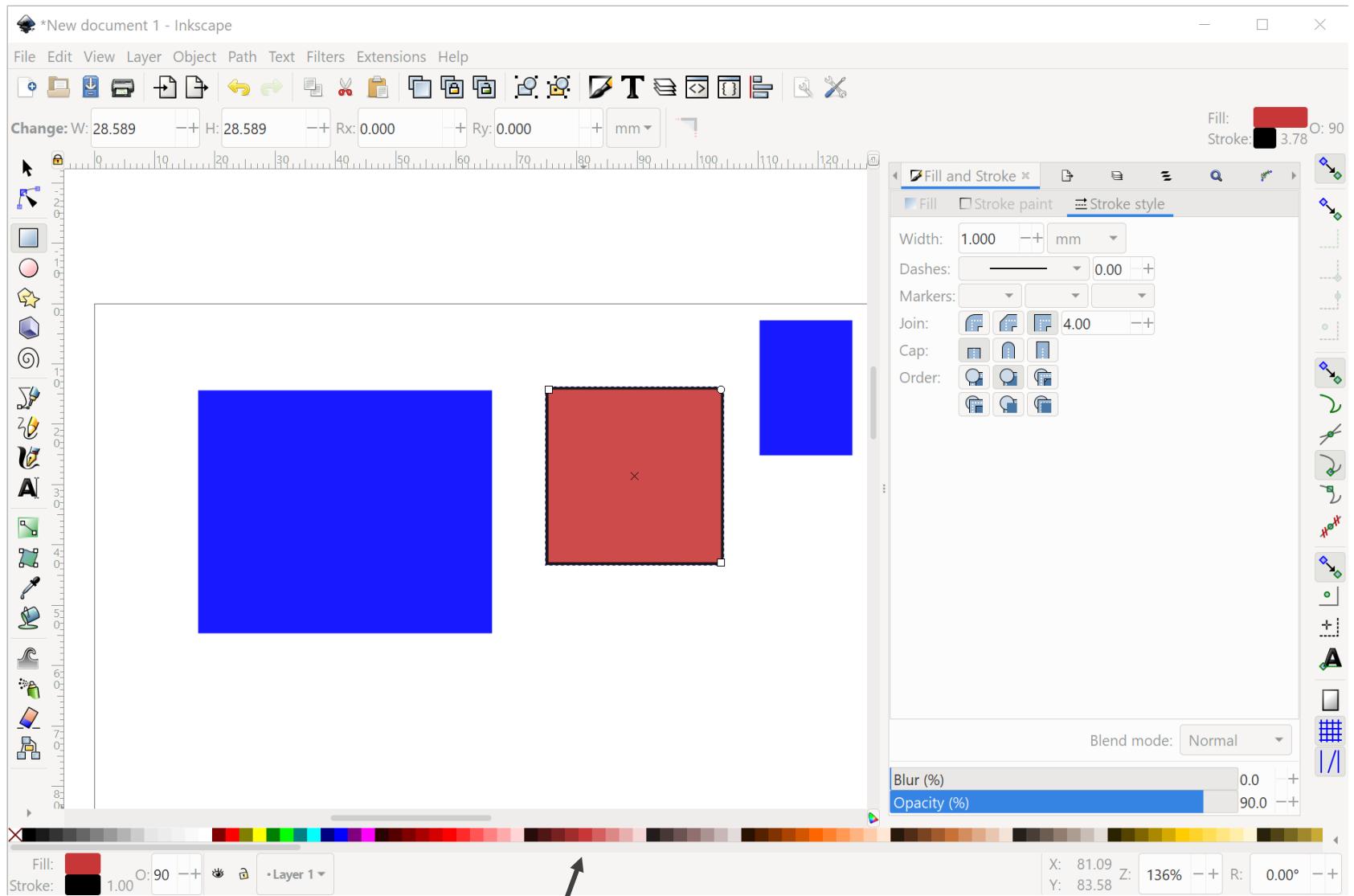


With the selection tool selected, you can change the size and position of the shape



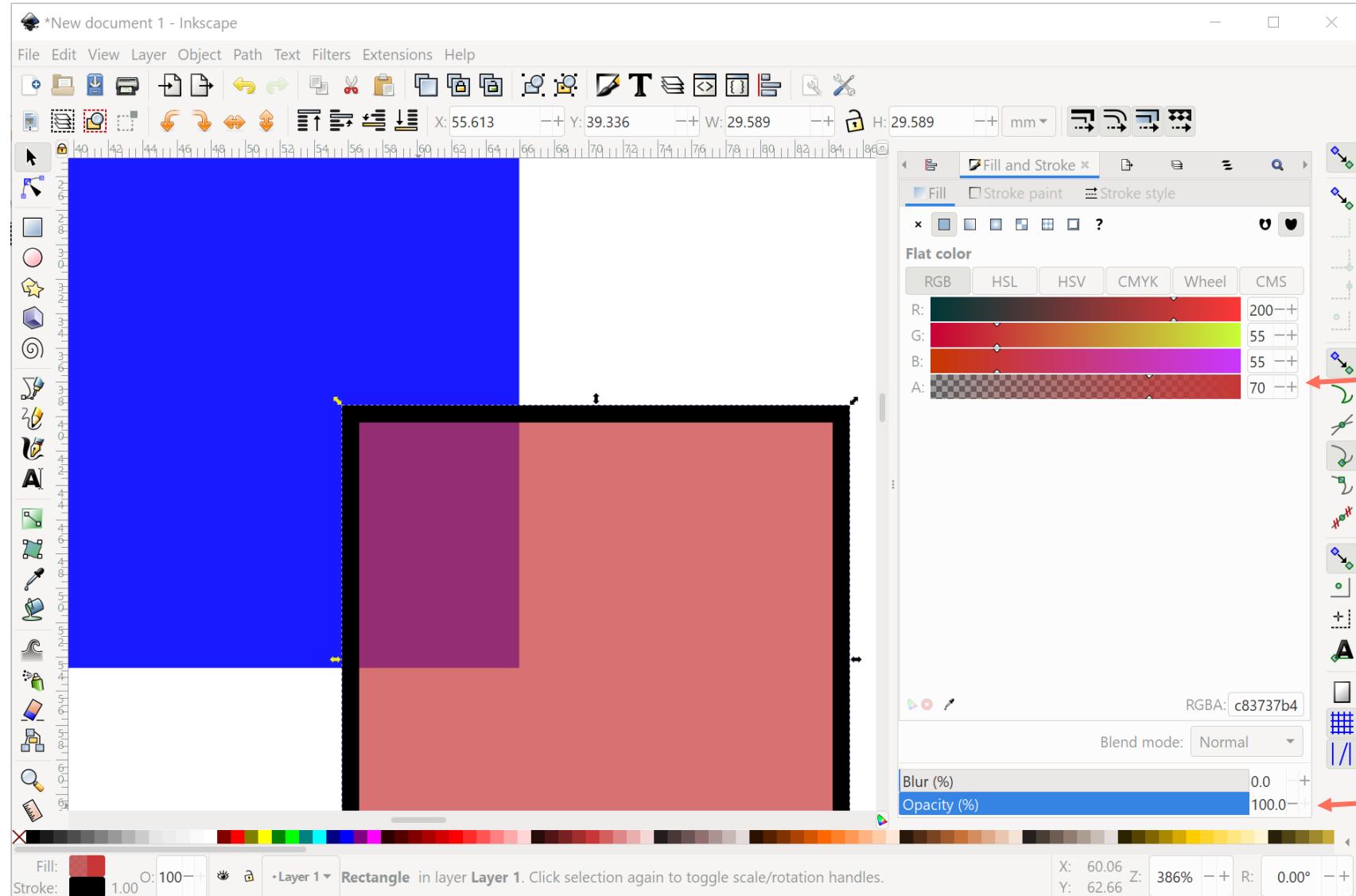
Click a second time on the shape to change rotation and skew





**With the shape selected,
click a color to set the FILL**

**Shift + click to set
the STROKE**



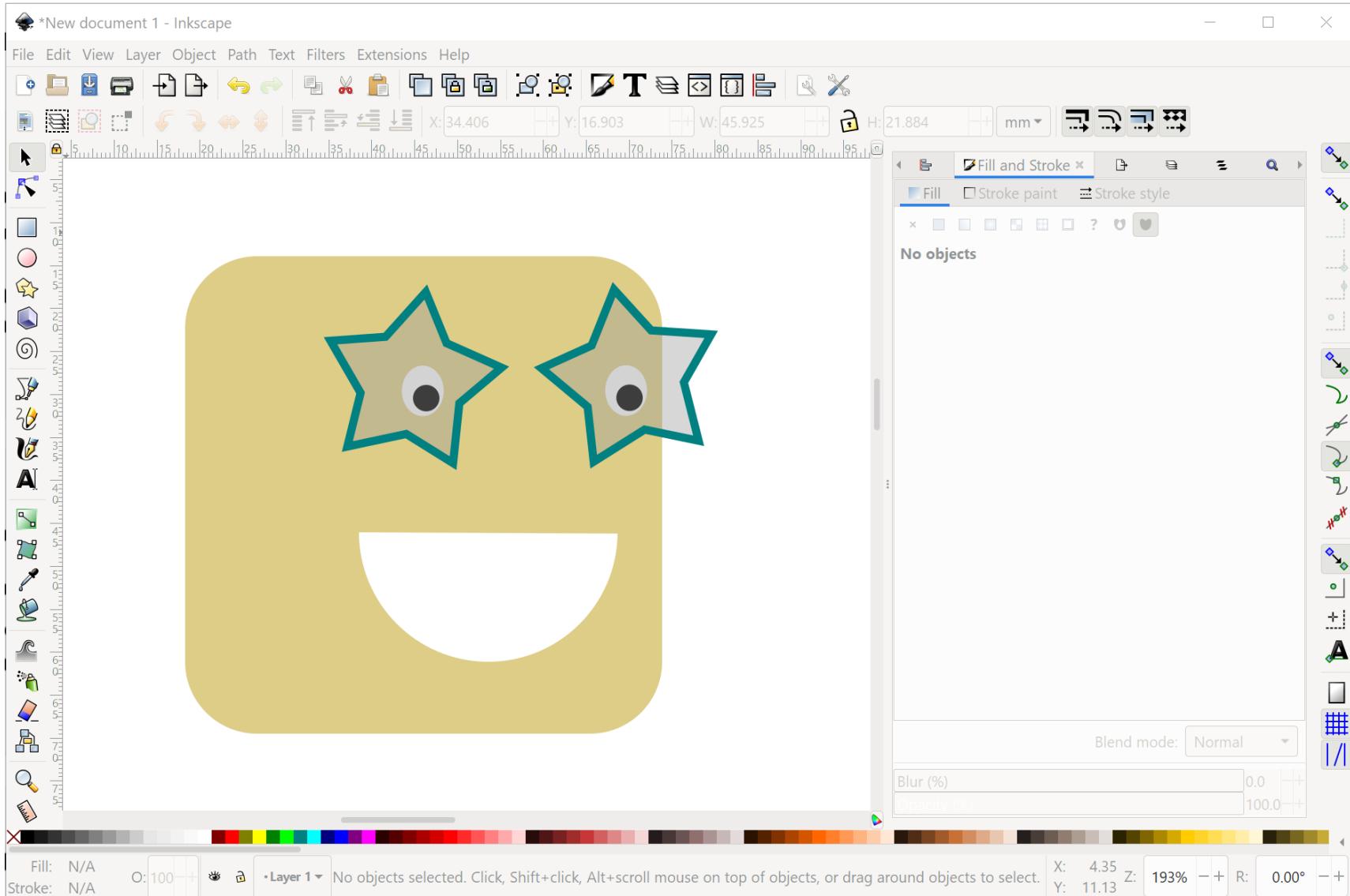
In the **fill and stroke** panel, you can change the colors and style of stroke and fill

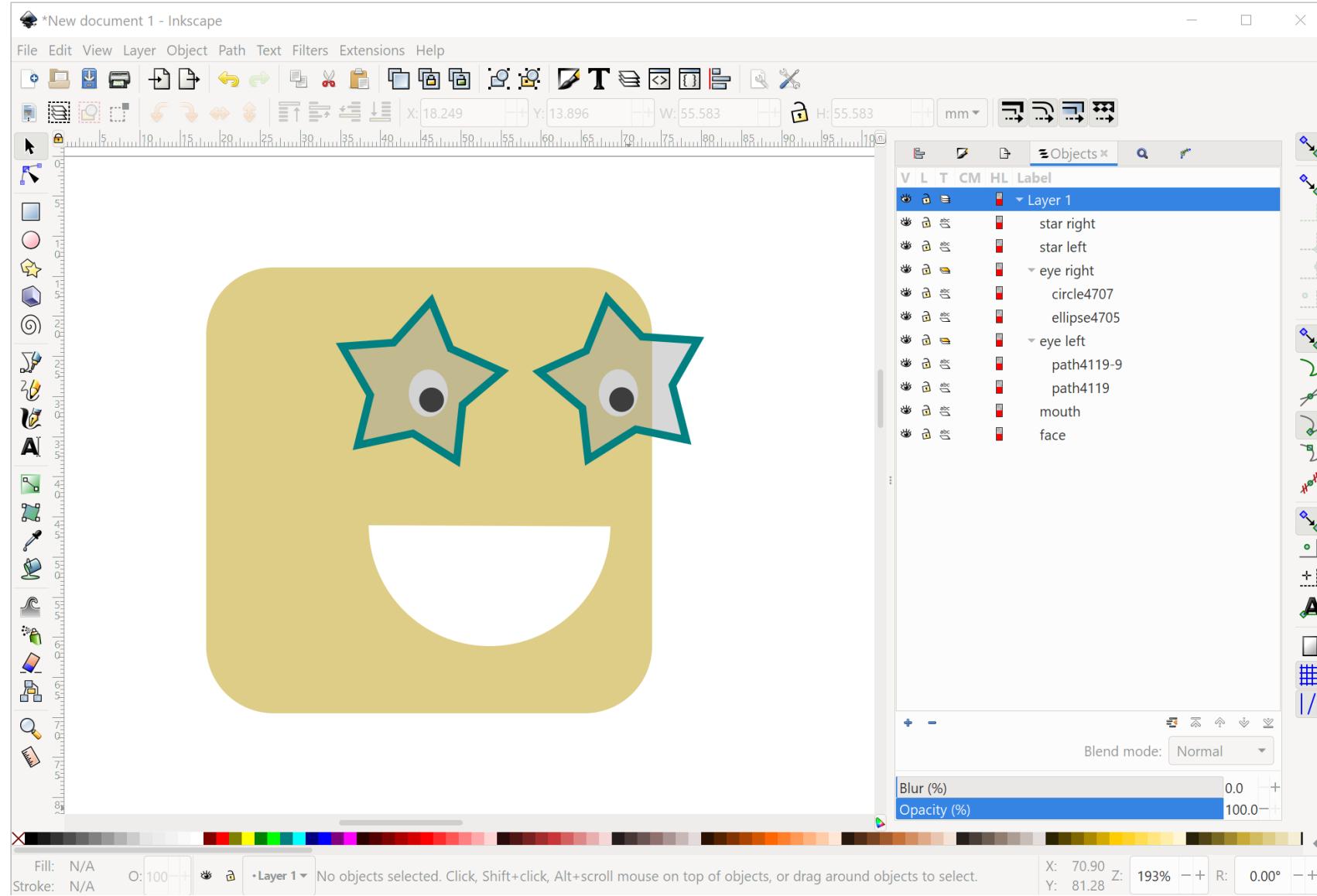
Transparency of the fill only

Transparency of the entire shape (stroke + fill)

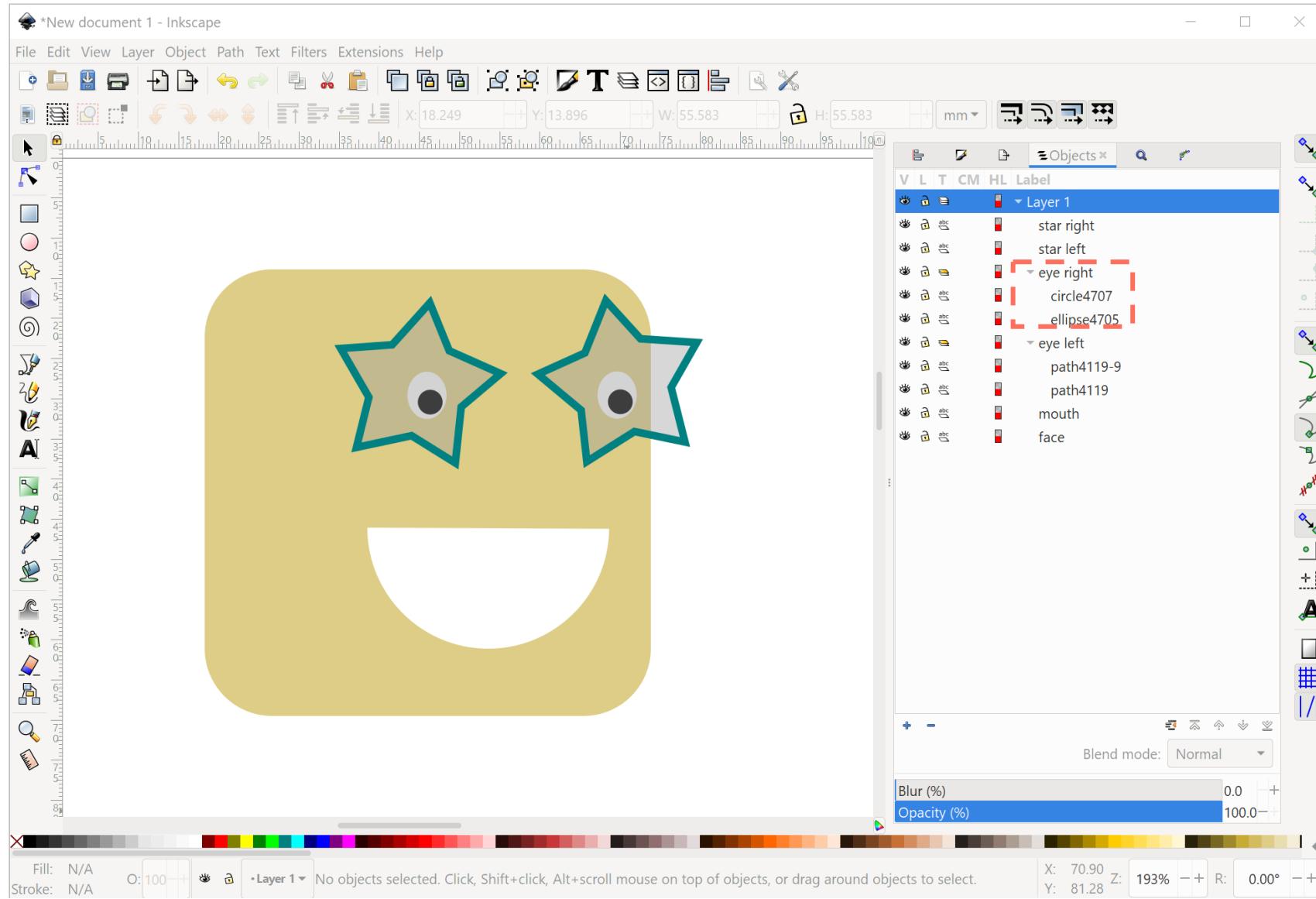
Exercise: shapes

Recreate the following visual as good as possible:



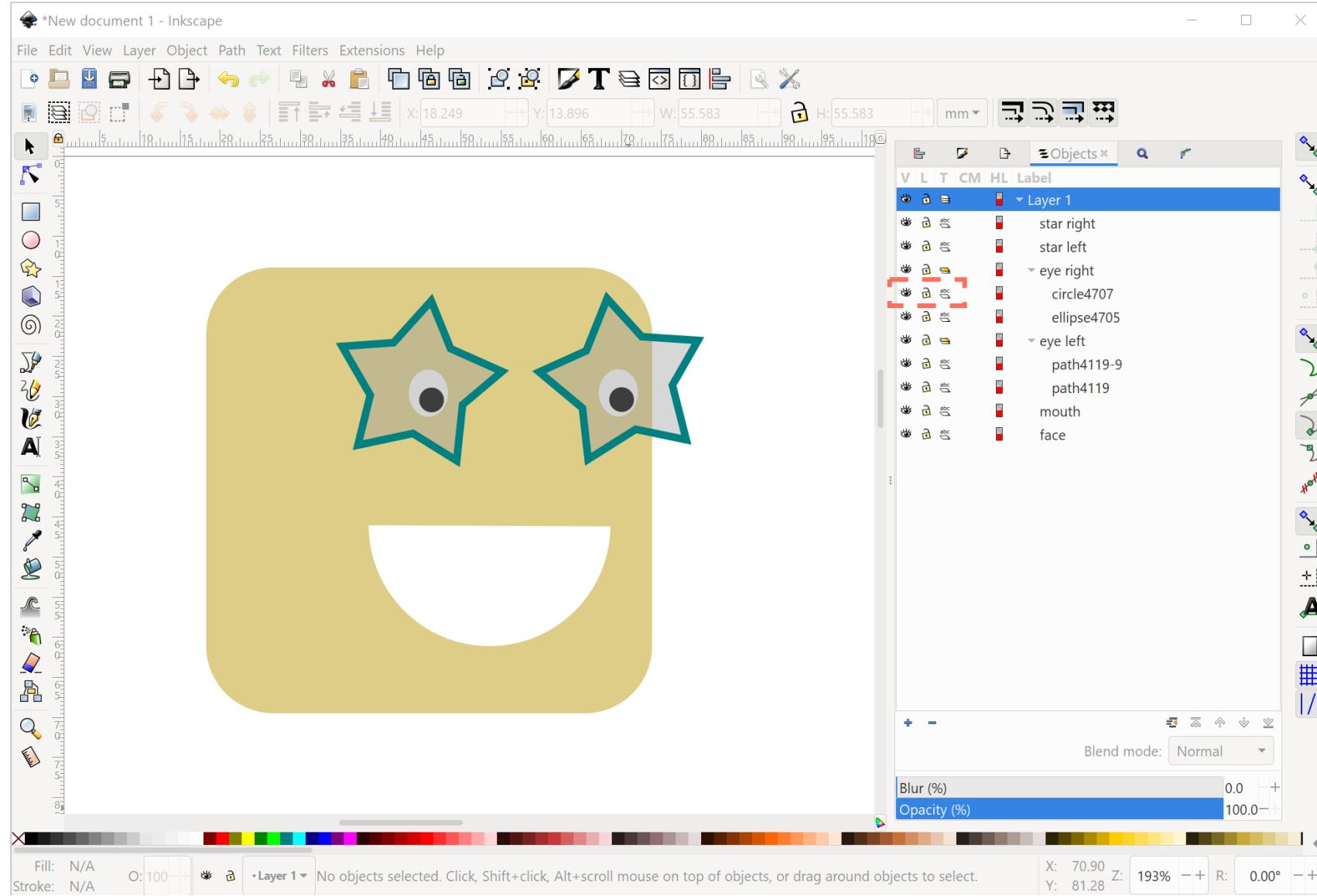


In the **objects** panel, you get an overview of all the shapes in your picture

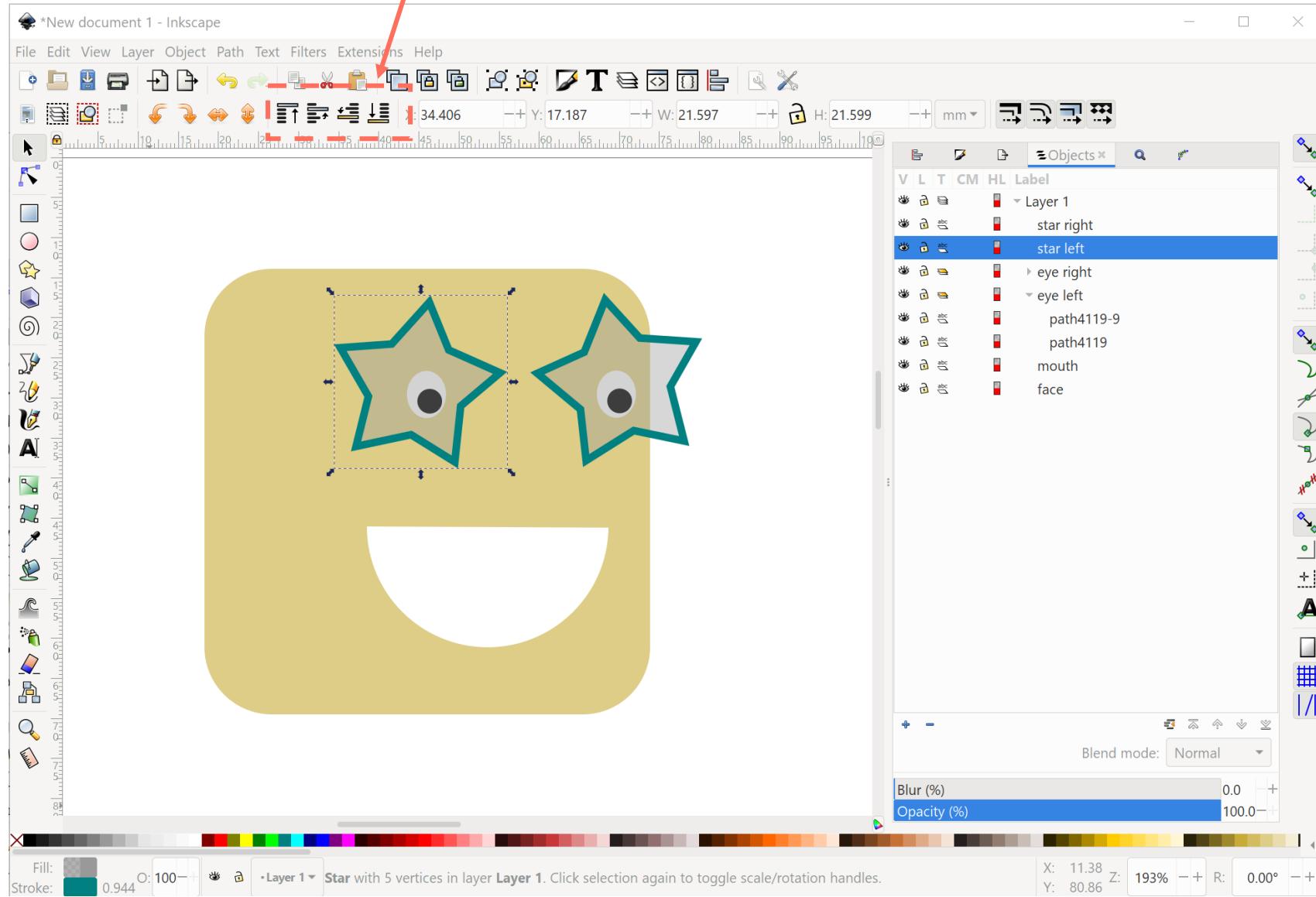


Select objects and
group them to keep
them together
(Shift + G)

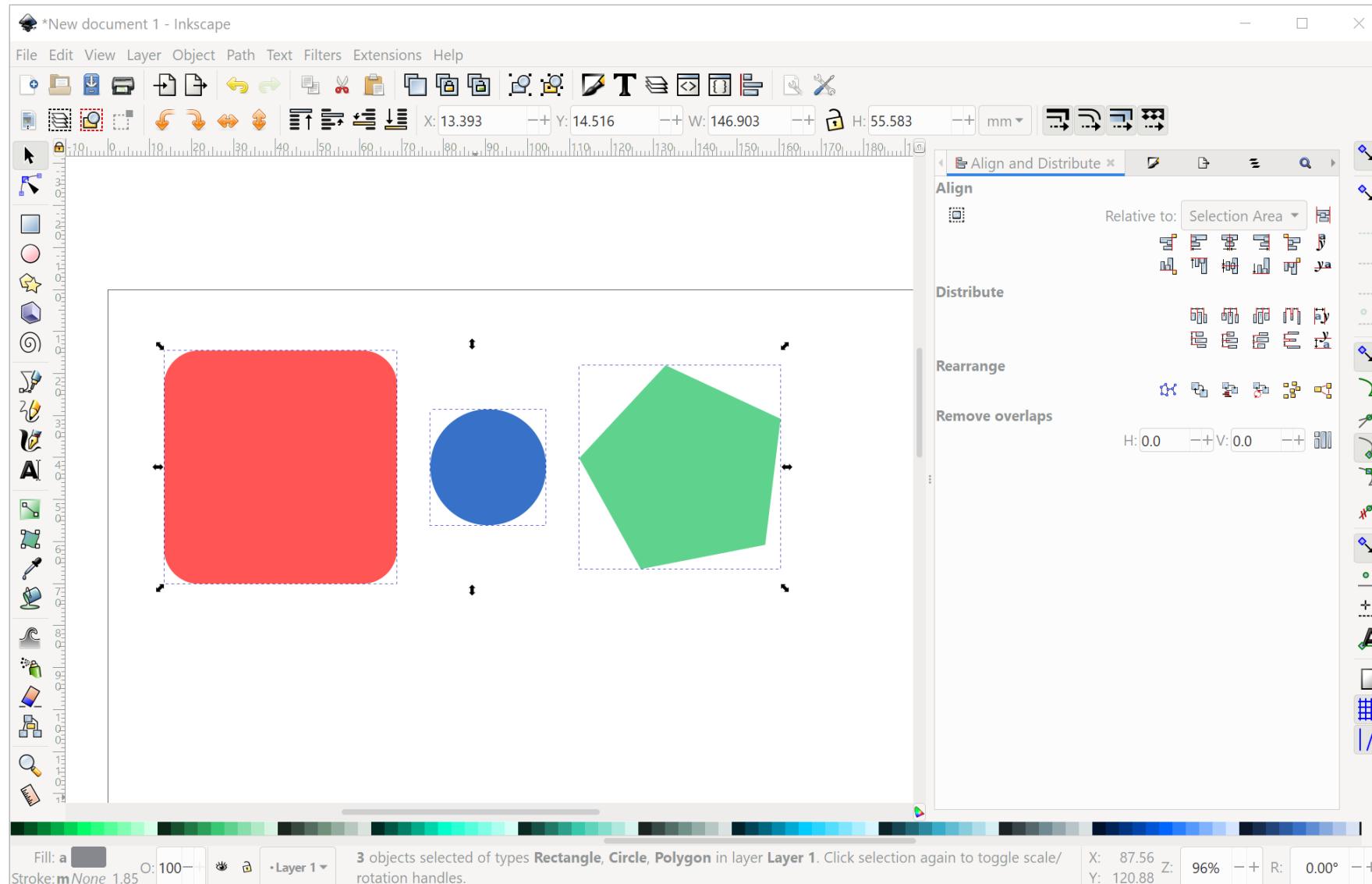
(Ungroup:
Ctrl + Shift + G)



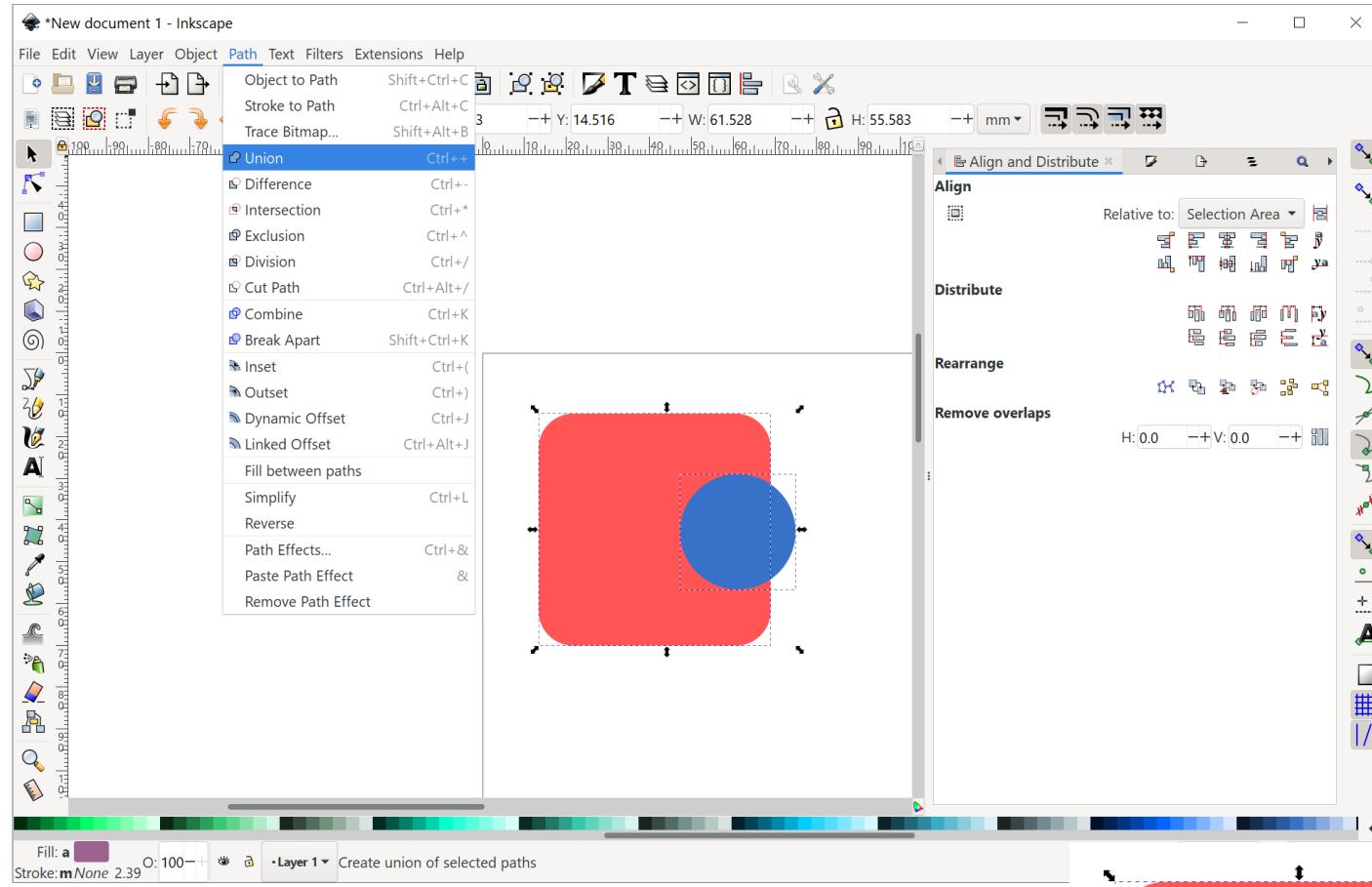
Or by using the
lower/raise buttons



Move items up or down
in the stack by
dragging them

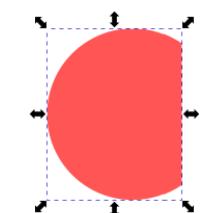
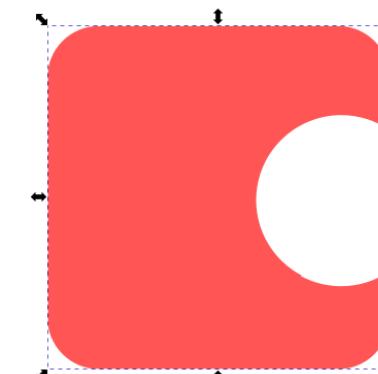
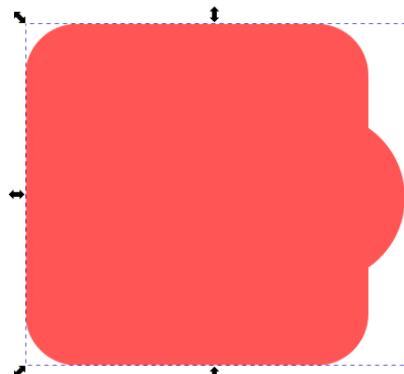


Nicely align objects
relative to the page or
each other using the
Align and Distribute
panel



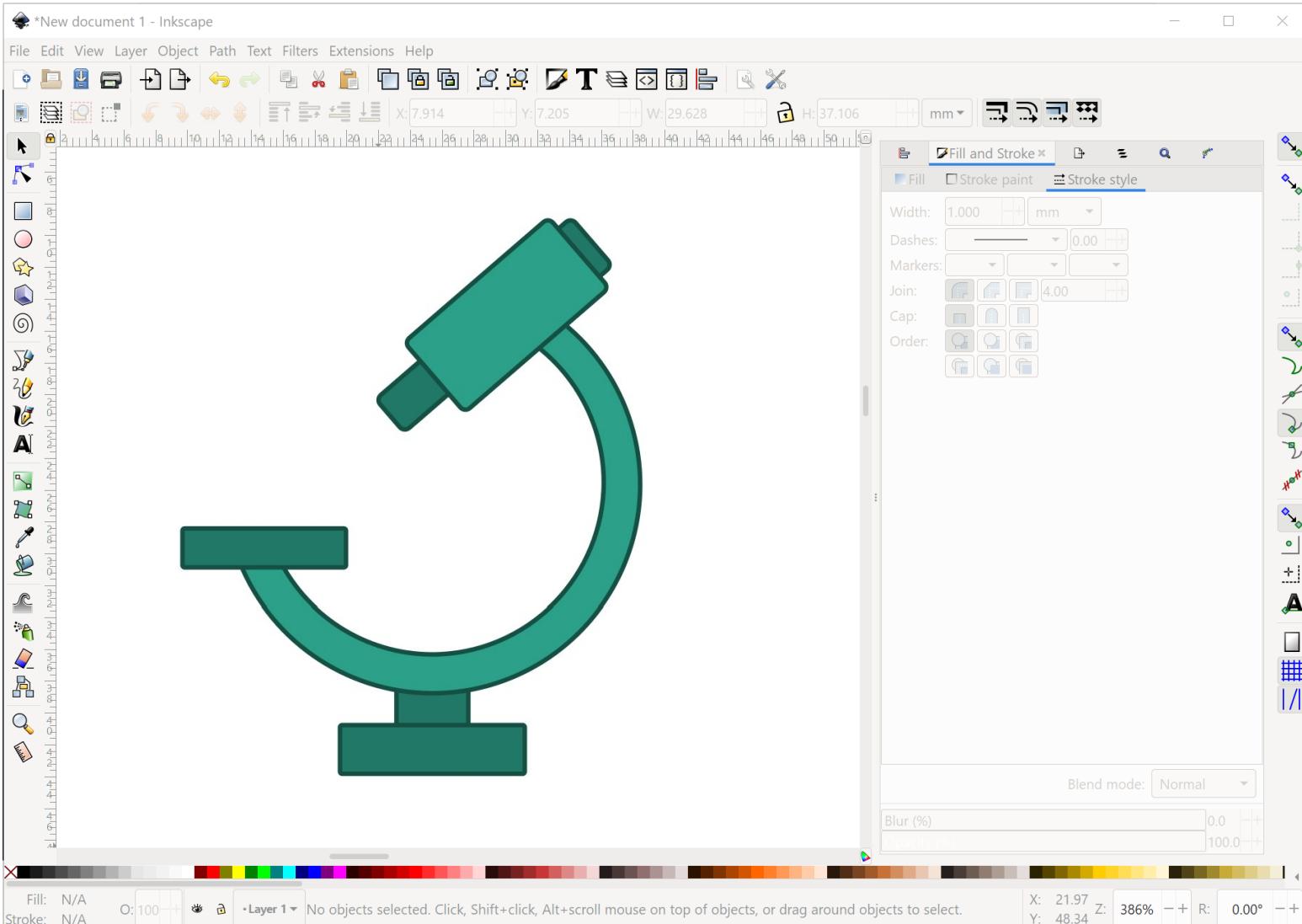
Create complex shapes by **combining** simple shapes in different ways:

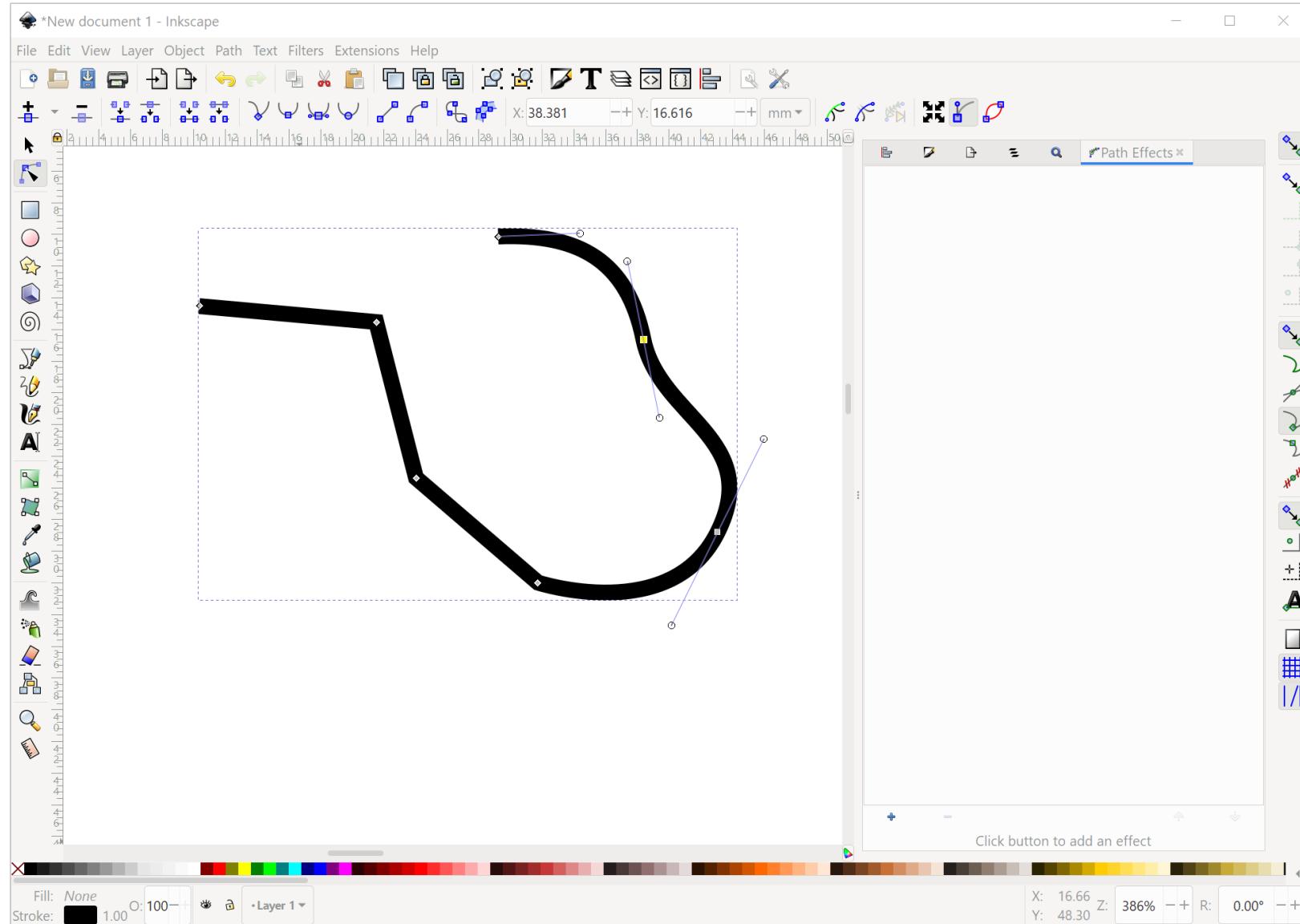
- union
- difference
- intersection
- ...



Exercise: advanced shape manipulation

Recreate the following icon as good as possible:

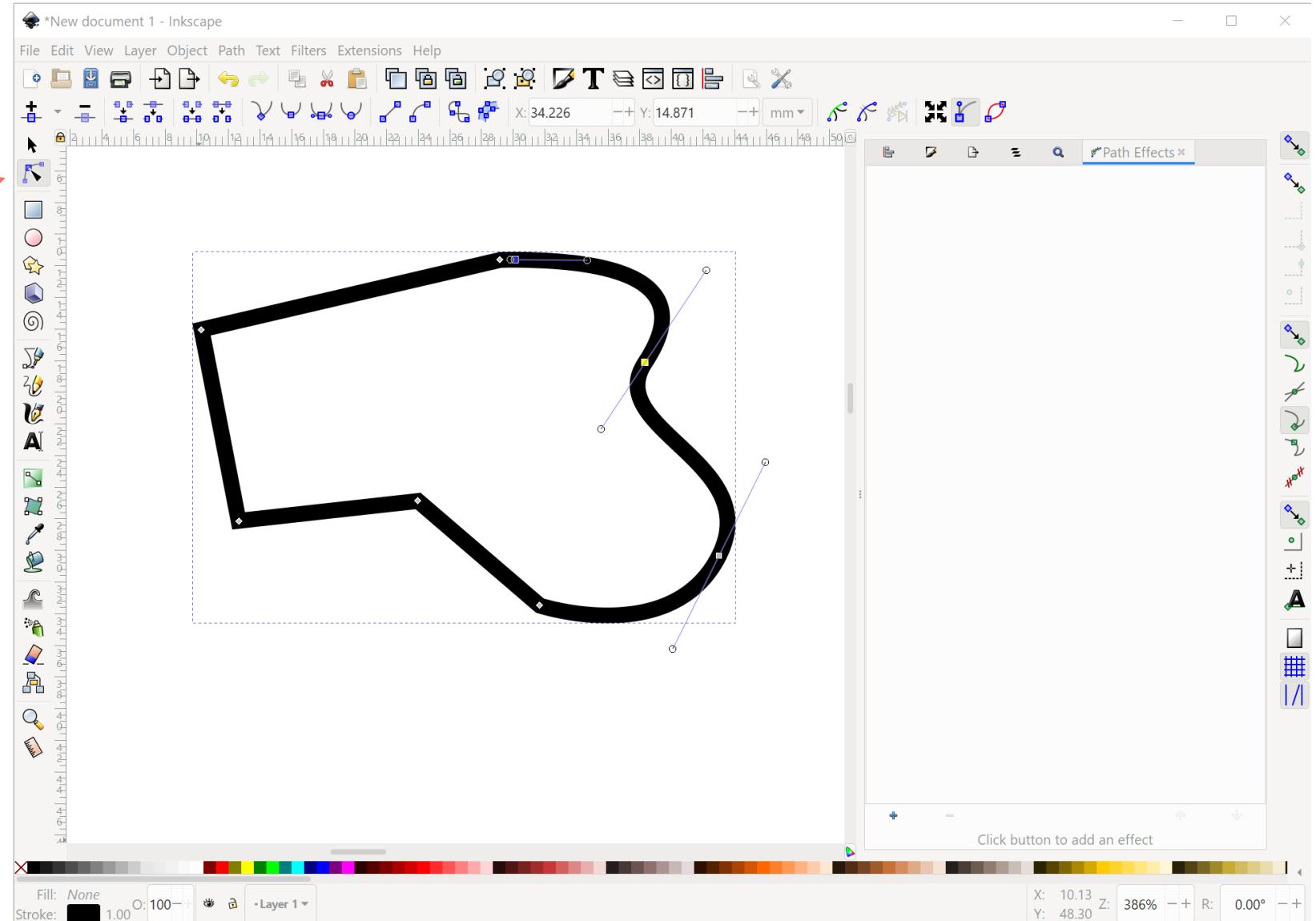


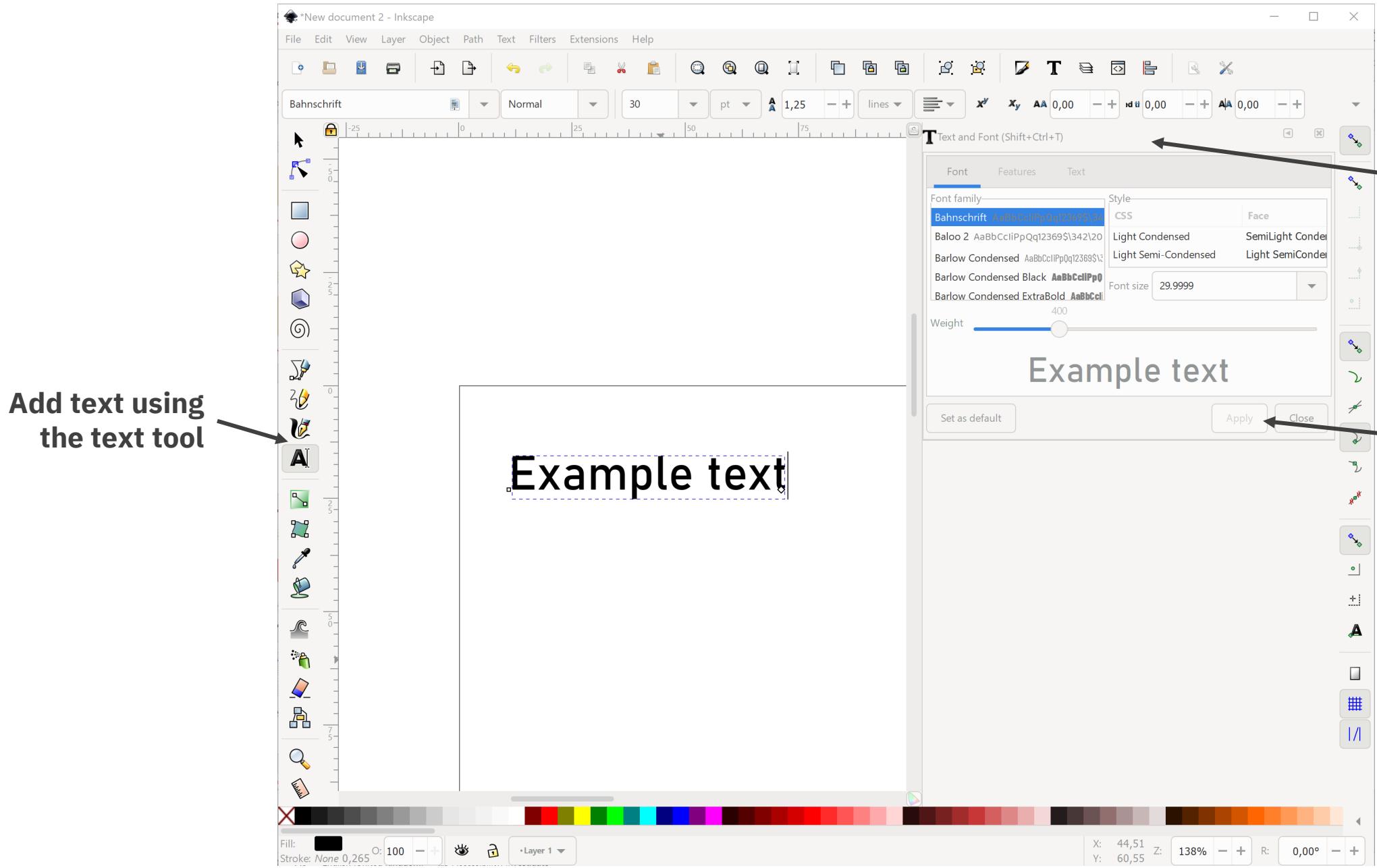


Draw your own paths
using the **Bezier** path
drawing tools:

- click for a corner point
(consists of only an anchor)
- click and drag for a bending point
(consists of an anchor with handles)

Manipulate the anchors
and handles using the
Node tool



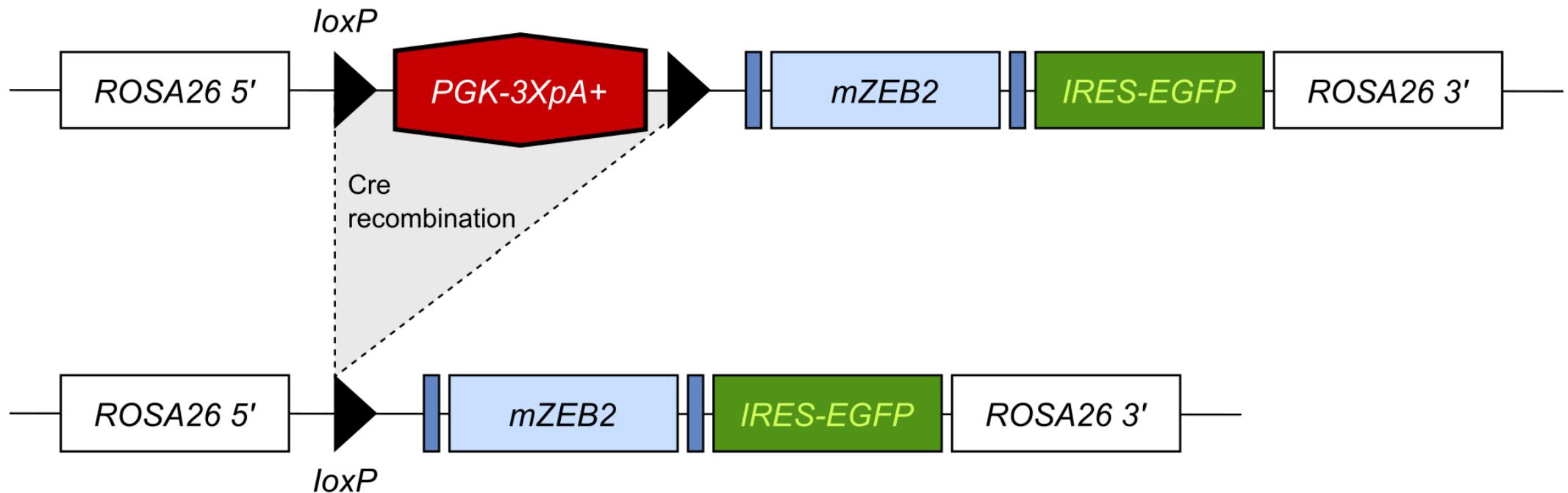


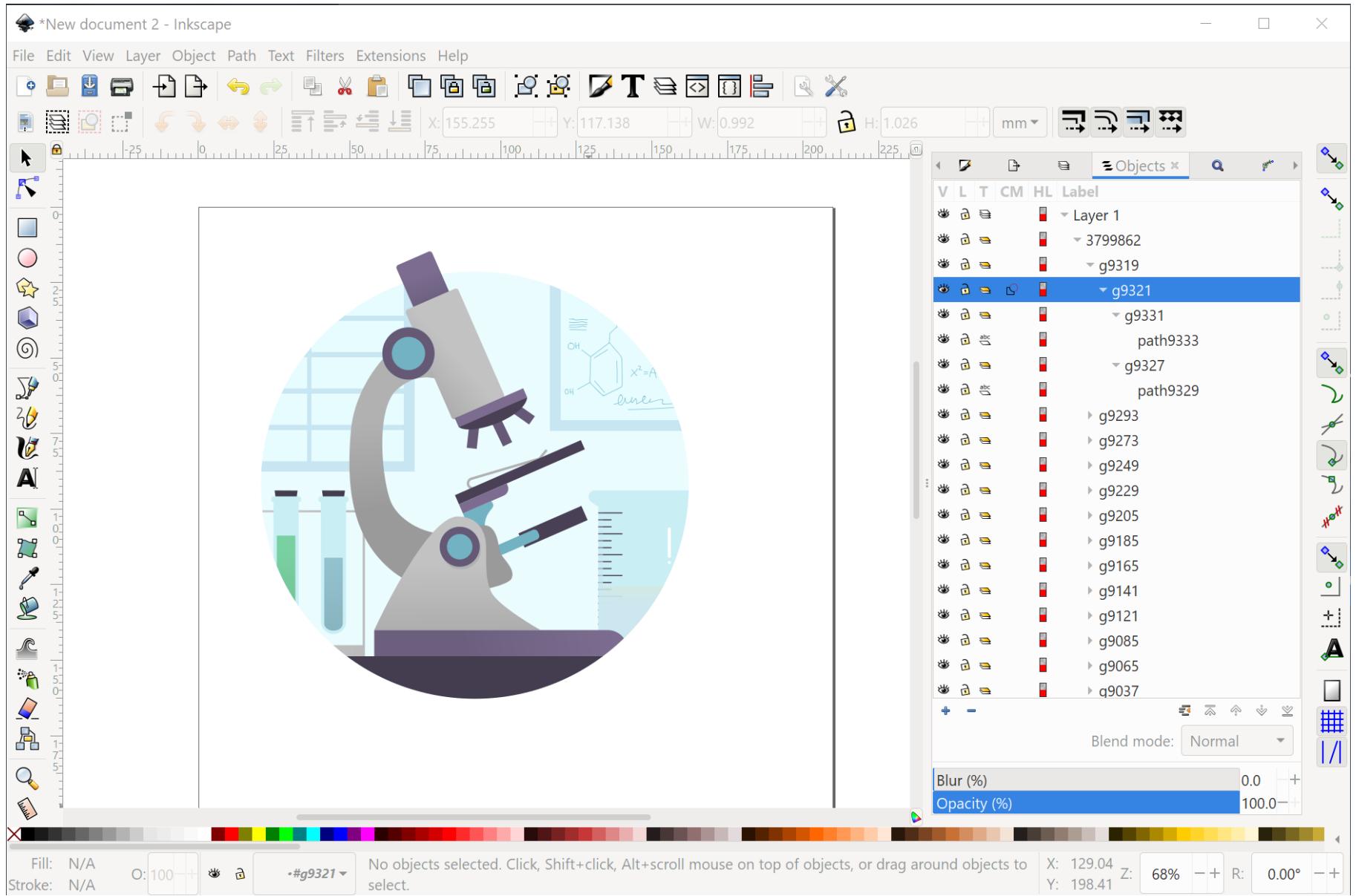
Change settings in the 'Text and Font' panel or the tool controls bar

Hit 'Apply' to update the text

Exercise: shapes, text and alignment

Recreate the following flowchart as good as possible

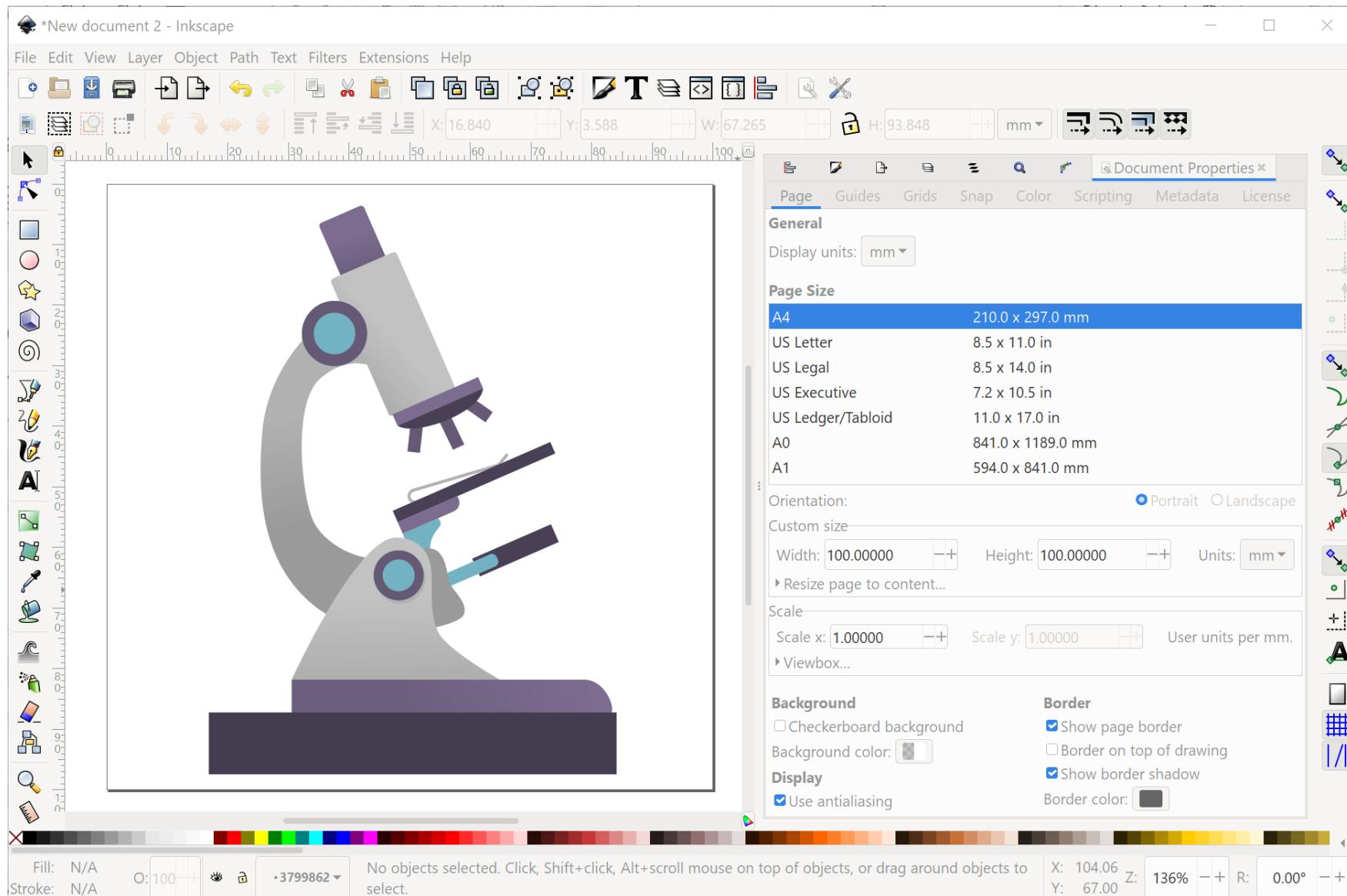




Edit an existing vector image (e.g. one you downloaded from Freepik) using **File > Import**

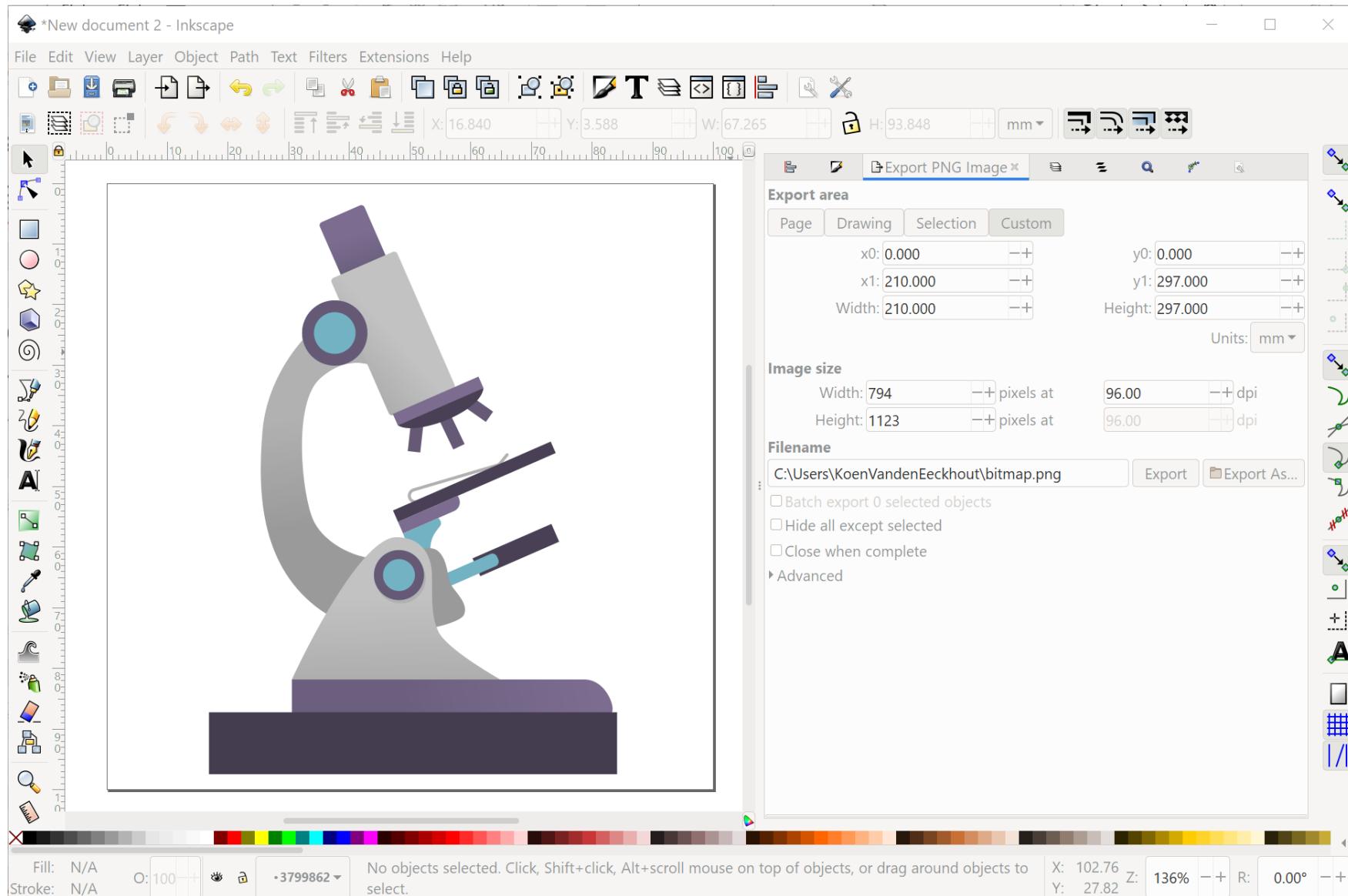
Some troubles you might run into:

- Inkscape doesn't support .eps files
 - if you have an .eps file, use [these steps](#) to get it into Inkscape, or an online tool to convert it into an .svg file
- Some downloads come in .ppt format (e.g. from smart.servier)
 - open the .ppt file and copy-paste the image into Inkscape
 - or save the .ppt file as a .pdf file and open it in Inkscape



Saving your file

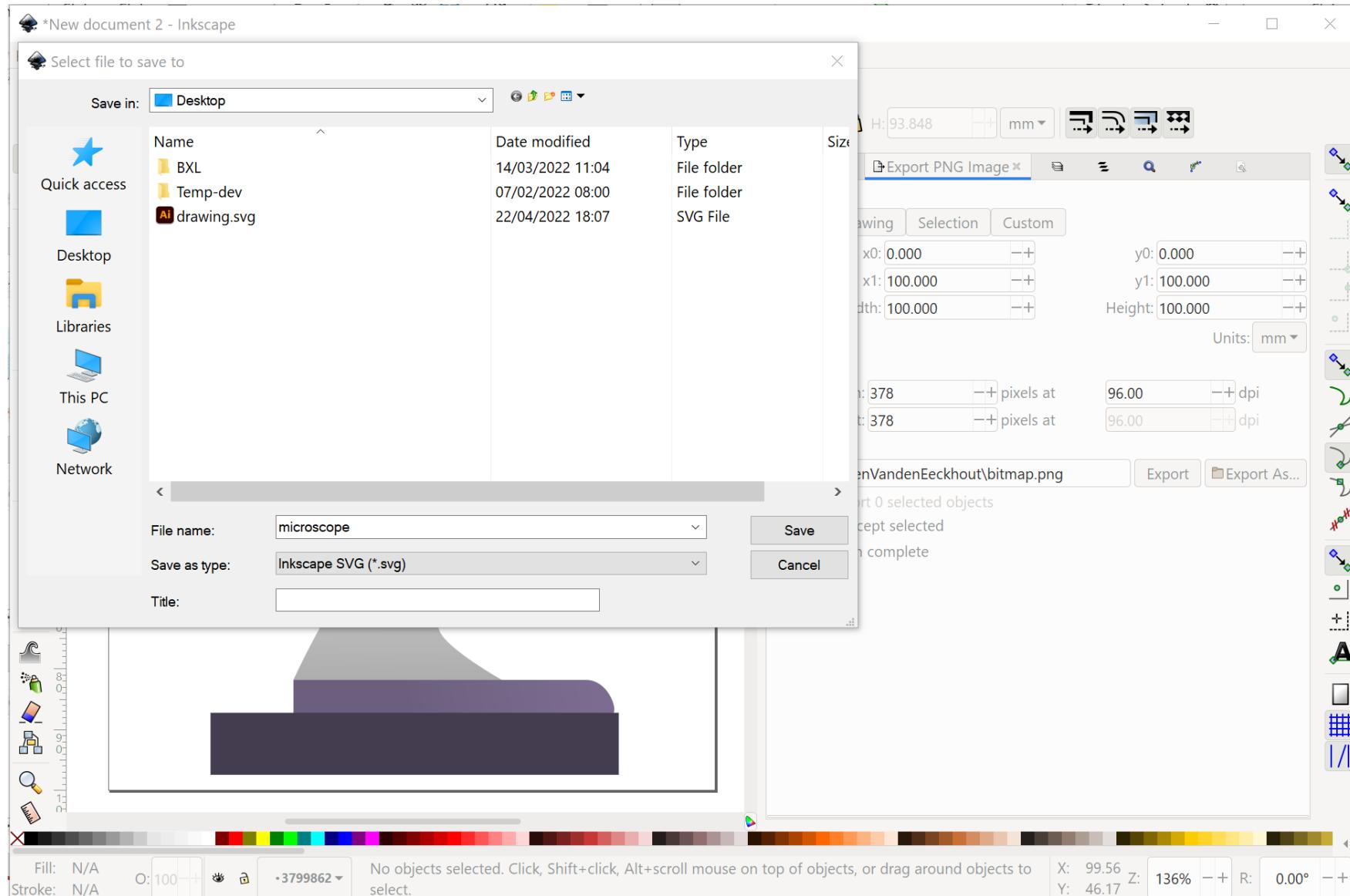
Step 1: set the desired canvas / document size



Saving your file

Step 1: set the desired canvas / document size

Step 2: if you want to save as a bitmap image, choose File > Export PNG image



Saving your file

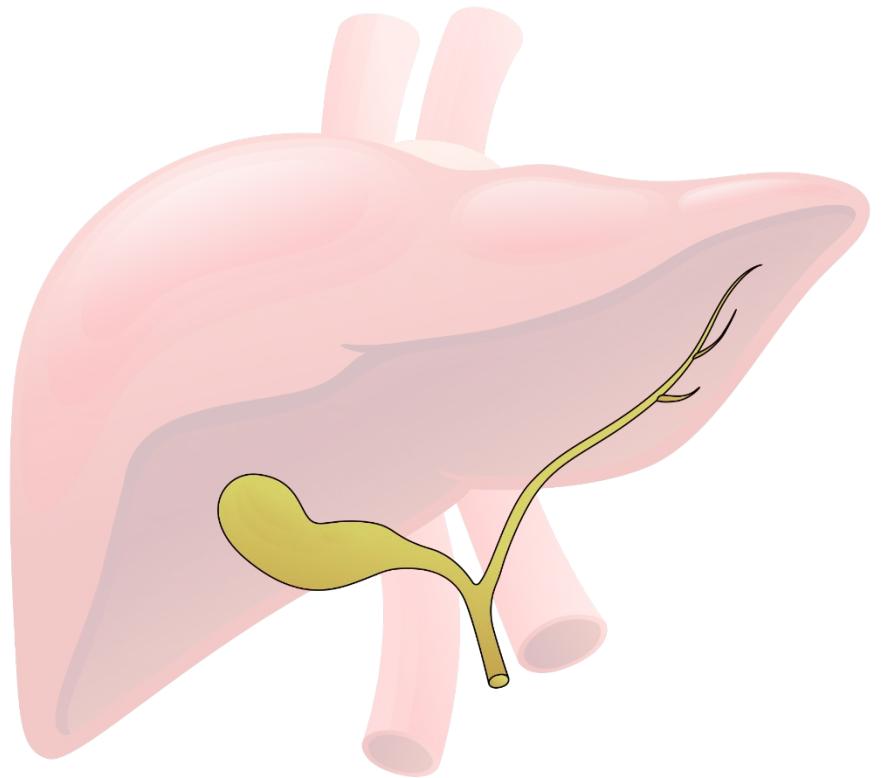
Step 1: set the desired canvas / document size

Step 2: if you want to save as a bitmap image, choose File > Export PNG image

Step 3: if you want to save as a vector image, choose File > Save

Exercise: editing vector images

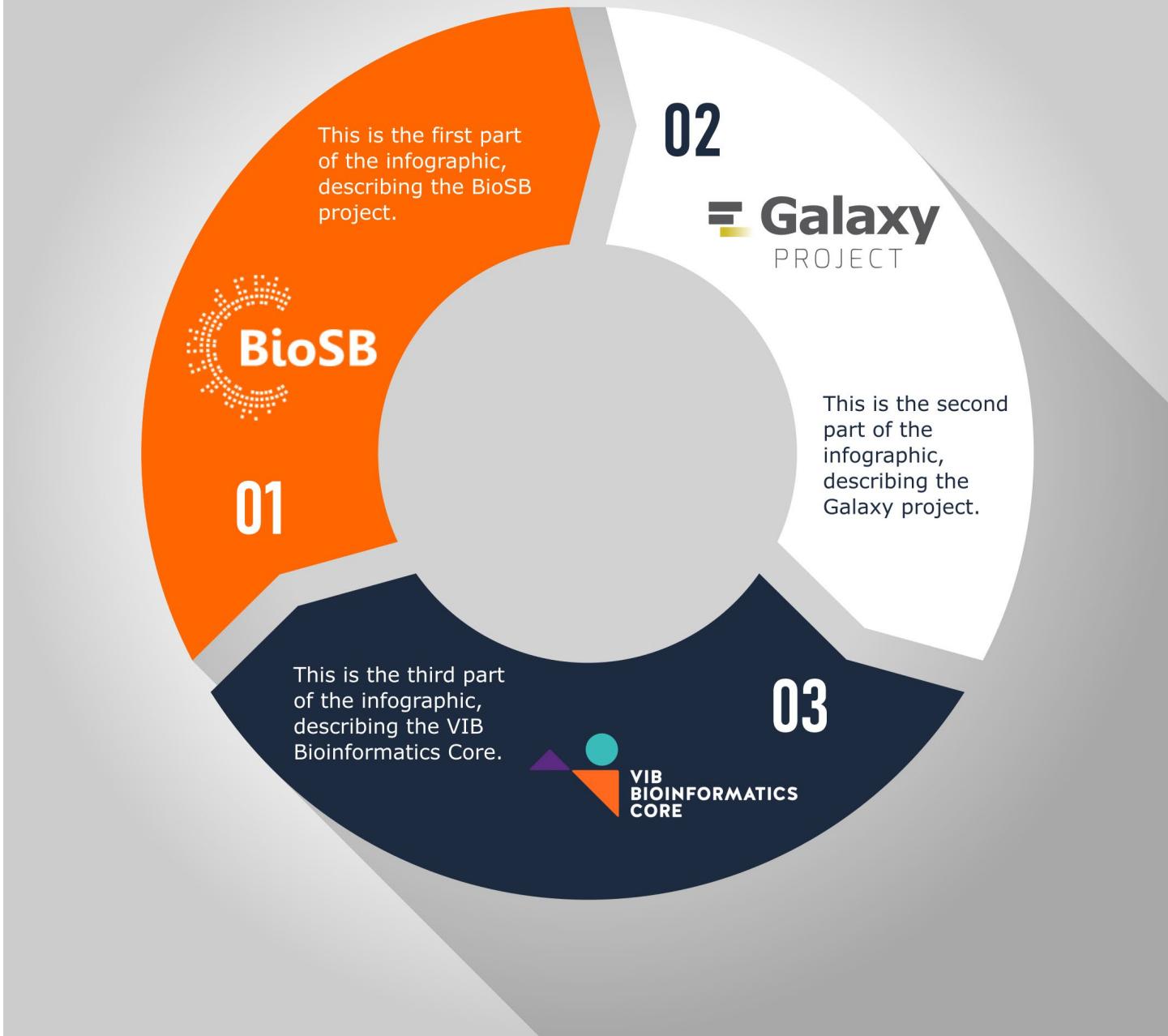
Find the following image on [freepik.com](https://www.freepik.com)
(search for 'liver'):



- Remove everything which is not the liver or gallbladder
- Reduce the liver transparency to make it lighter
- Give the gallbladder a stroke to make it stand out more
- Save the image as gallbladder.png with a transparent background

Exercise: complex layouts

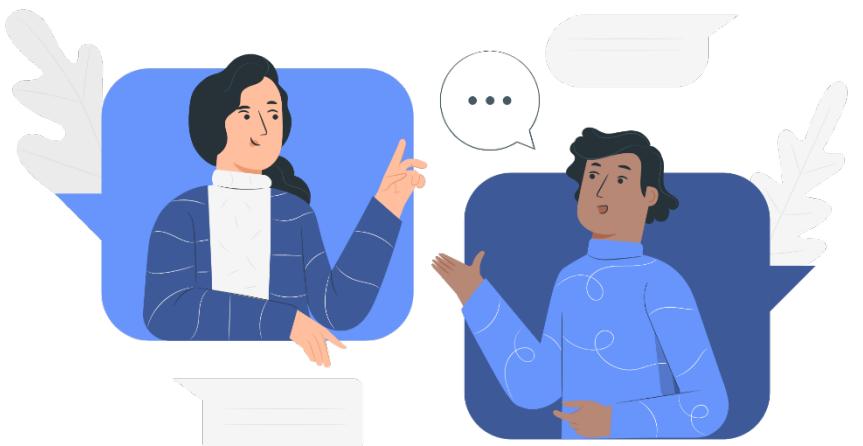
Let's recreate the following infographic as good as possible:



Thank you!

All the slides and all the links:

baryon.be/visuals-resources



Koen Van den Eeckhout – koen@baryon.be - @koen_vde