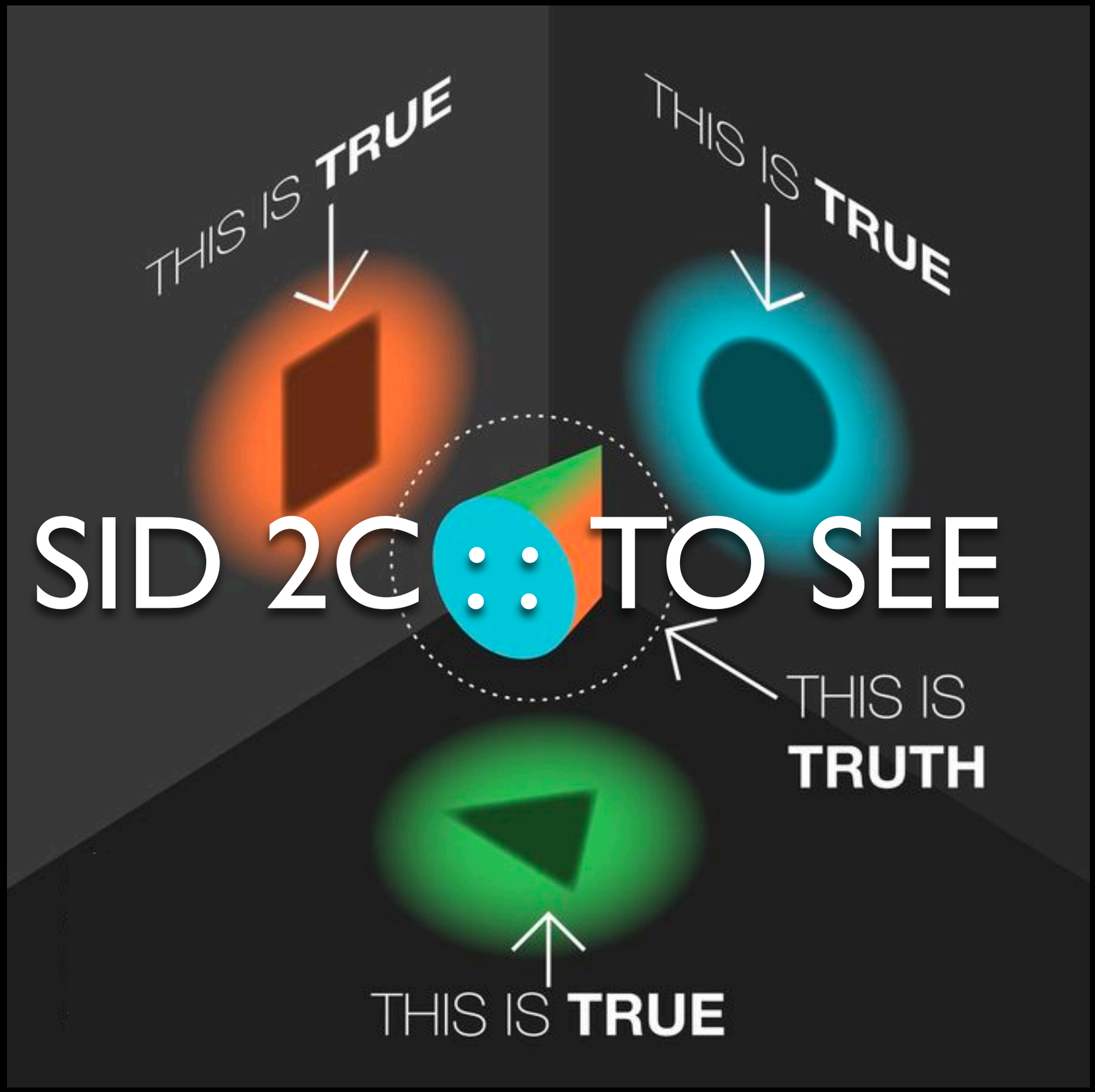
SID 2C


THIS IS TRUE
THIS IS TRUE
SID 2C :: TO SEE
THIS IS
TRUTH
THIS IS TRUE

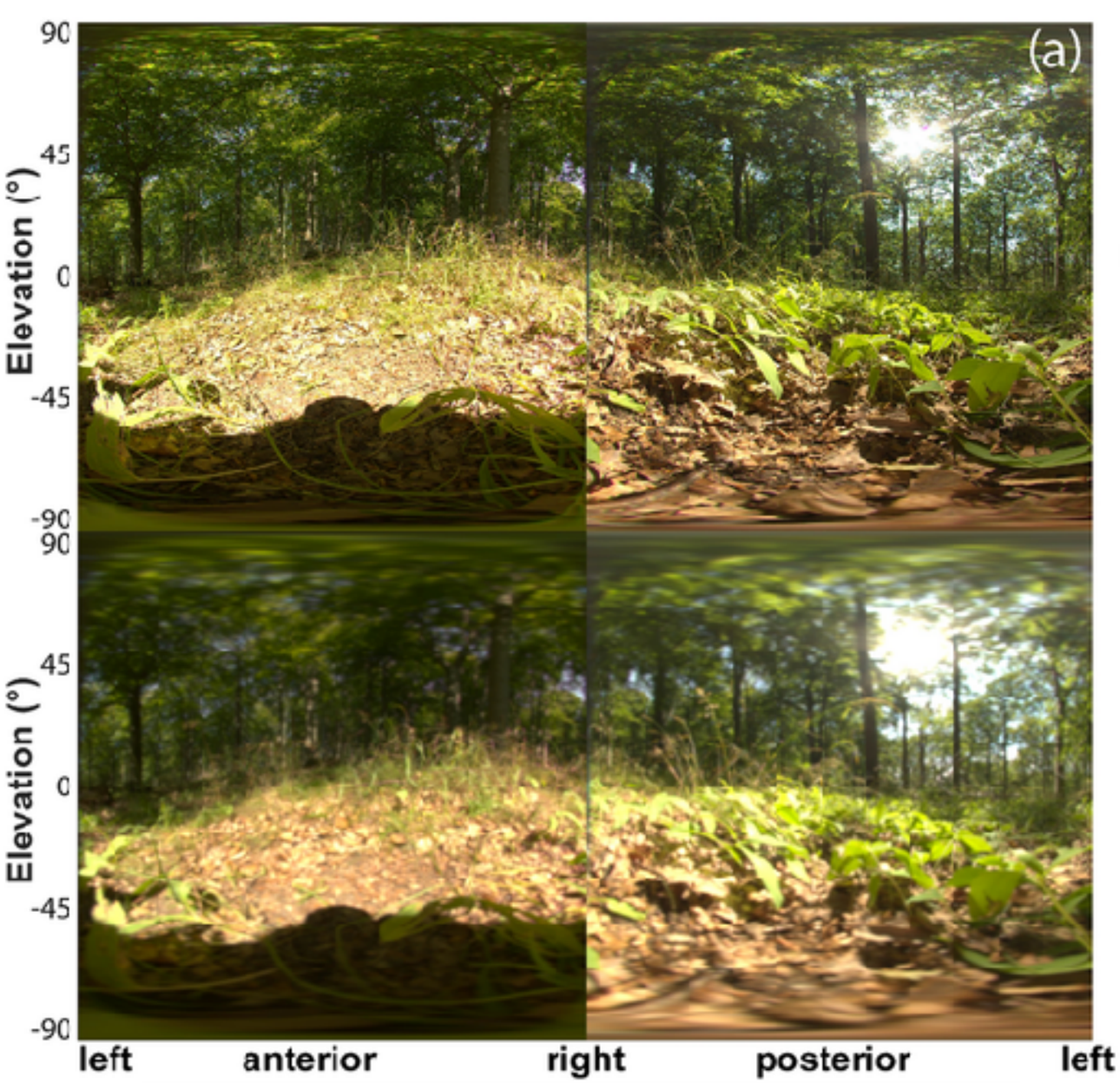
SEEING IS BELIEVING

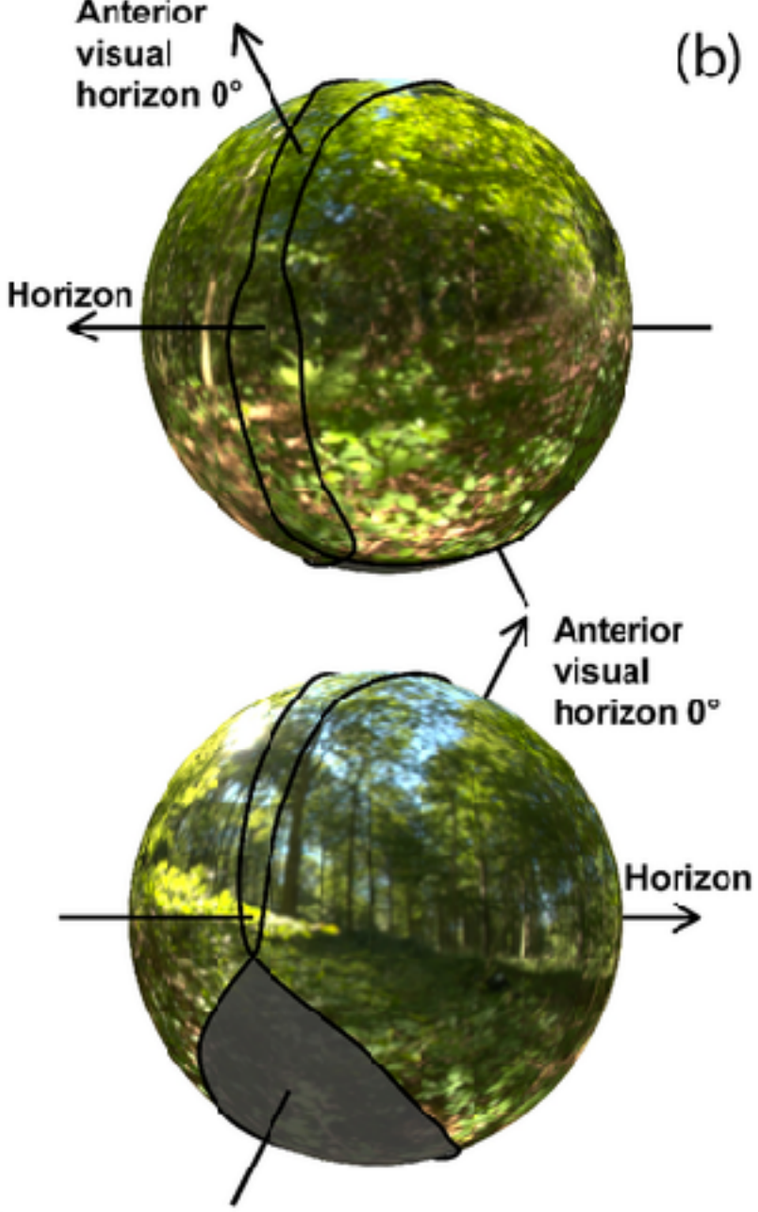
How would that be?

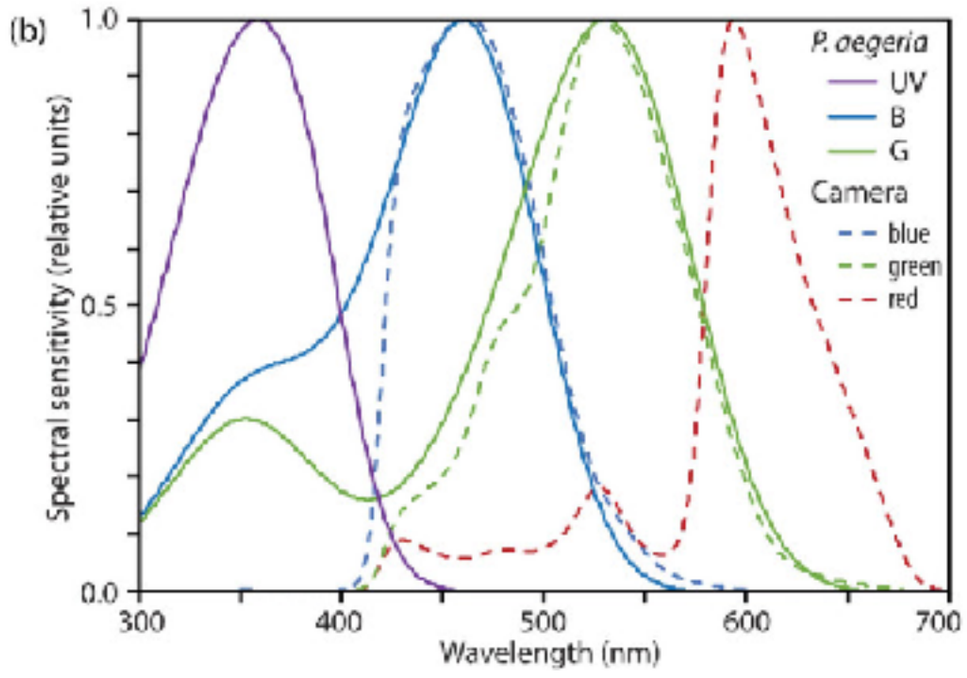
What does a butterfly dream look like?

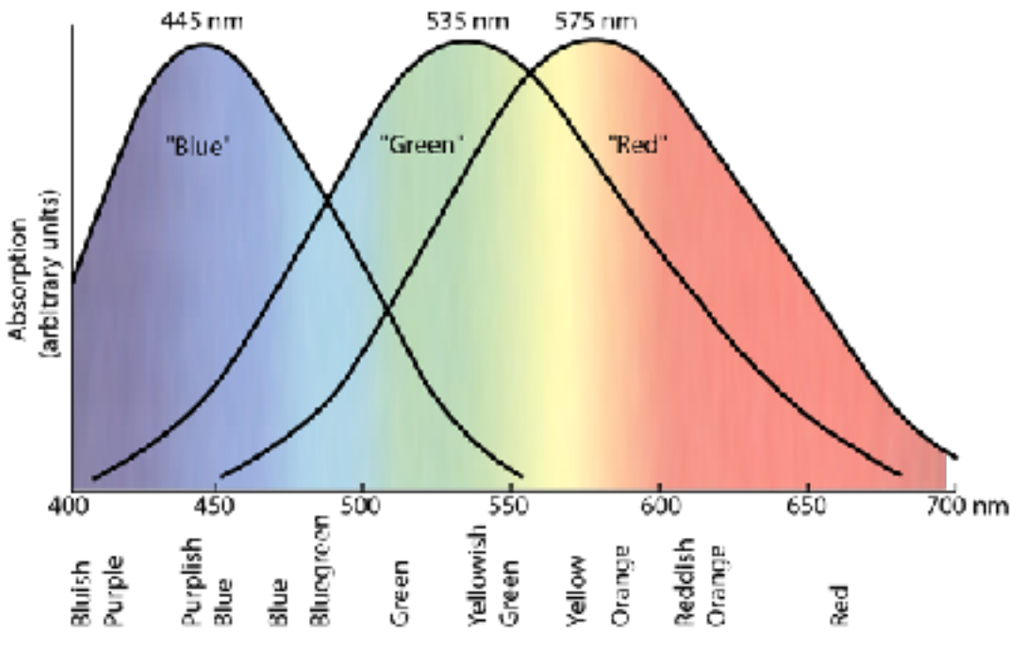
Pimpernelblauwtje

	Me	You	We
Seeing			
Hearing			
Feeling			
. . .			


(a)
90
45
0
-45
-90
Elevation (°)
left
anterior
right
posterior
left


(b)
Anterior visual horizon 0°
Horizon
Anterior visual horizon 0°
Horizon


(b)
P. aegeria
UV
B
G
Camera
blue
green
red
Spectral sensitivity (relative units)
1.0
0.5
0.0
300
400
500
600
700
Wavelength (nm)


445 nm
535 nm
575 nm
"Blue"
"Green"
"Red"
Absorption (arbitrary units)
400
450
500
550
600
650
700 nm
Bluish Purple
Purplish Blue
Blue
Bluish Green
Green
Yellowish Green
Yellow
Orange
Reddish Orange
Red

	Me	**You**	**We**
Seeing	My eye(s) see the butterfly, its shape, its limbs, its wings, when I look closer. . .	Compound eye (facet-oog) sees the world in 360º, in other colours (incl. UV)	kunnen elkaar zien
Hearing			
Feeling			
. . .			

SEEING IS BELIEVING

(linear)
time

(atoms)
matter

no-space
(virtual)

space
(real)

no-matter
(bits)

no-time
(non-linear)

Realiteit

Informatie

Waarnemen

Data

Perceptie

(mentaal) model

Realiteitszin

2C, TO SEE, “You have to see it for yourself”

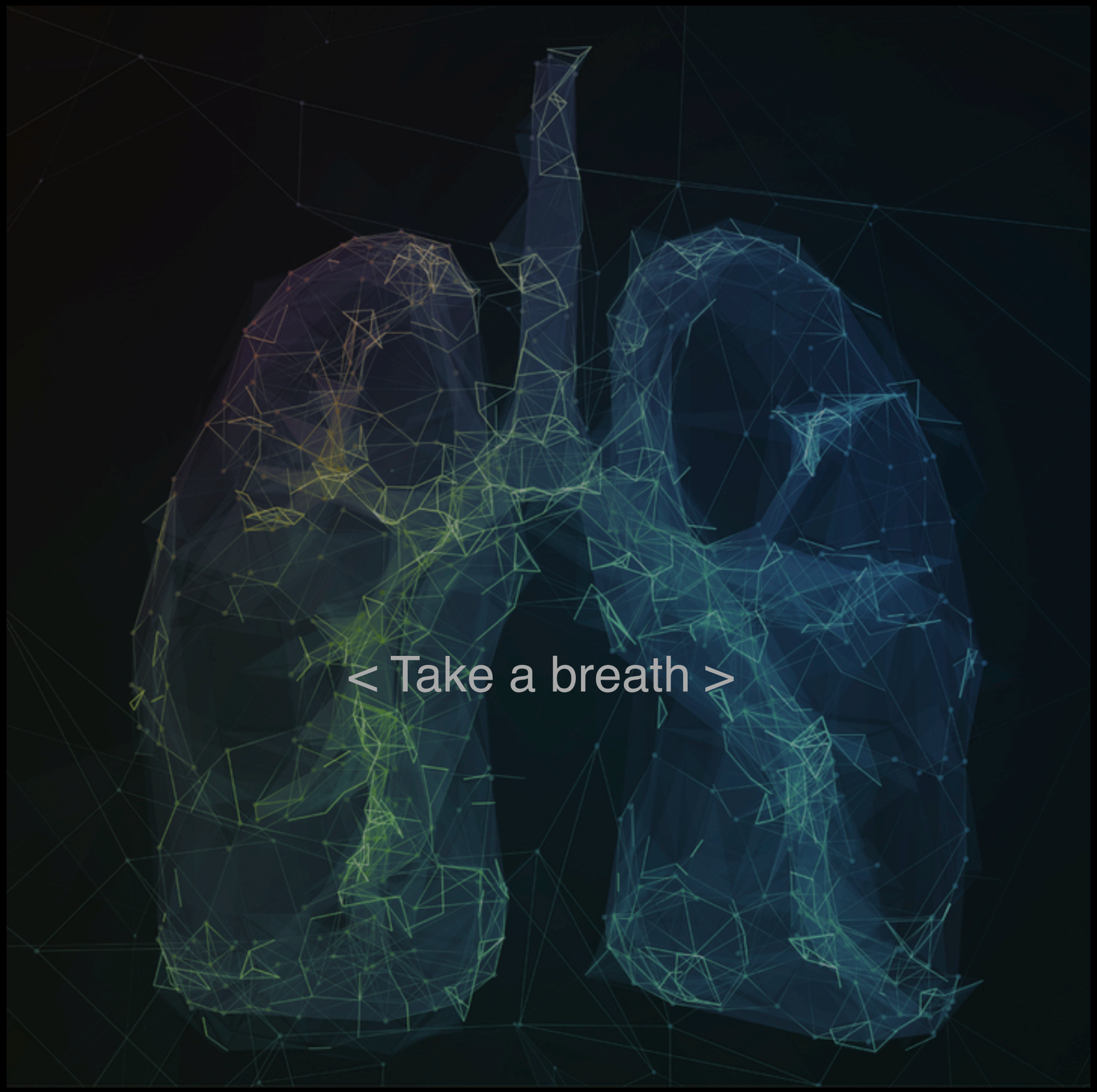
Once Zhuangzi dreamt he was a butterfly, a butterfly flitting and fluttering around, happy with himself and doing as he pleased. He didn't know he was Zhuangzi. Suddenly he woke up and there he was, solid and unmistakable Zhuangzi. But he didn't know if he was Zhuangzi who had dreamt he was a butterfly, or a butterfly dreaming he was Zhuangzi.

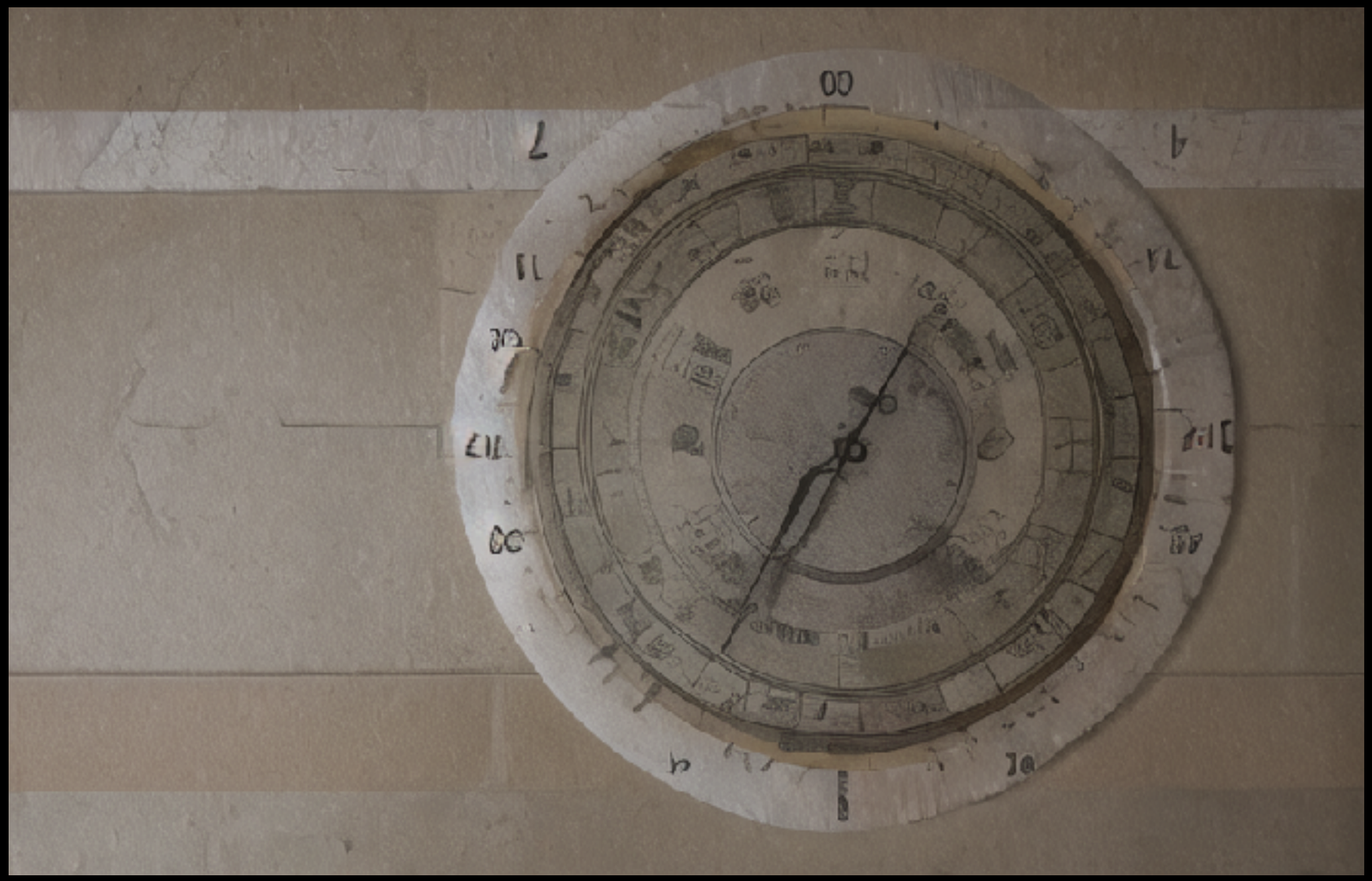
Zhuangzi (4th century BCE)

Zhuang Zi droomde eens dat hij een vlinder was, een fladderende vlinder die, volkomen in z'n sas, niet wist dat ie Zi was.
Toen hij plotseling ontwaakte, was hij in levenden lijve Zi.
Nu weet ik niet of Zhou droomde dat hij een vlinder was of dat de vlinder droomde dat ie Zi was.
Toch moet er tussen Zi en de vlinder een onderscheid bestaan. Dit is wat de "*transformatie der dingen*" genoemd wordt.

Blok 2C :: De Gebruiker

Welkom bij Blok 2, ‘gebruiker’!


< Take a breath >



SID

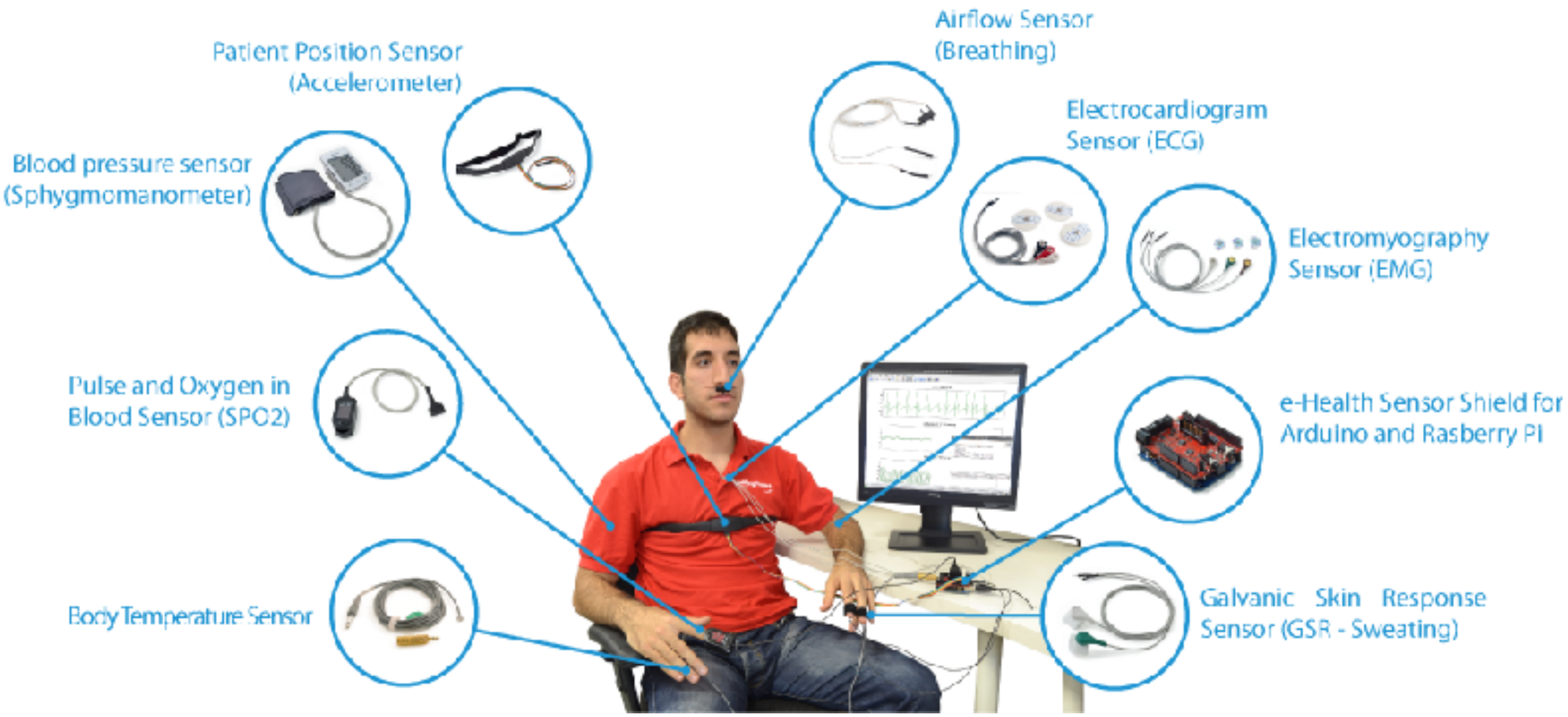
Blok 2a	Audio only
Blok 2b To Be	Systemen
Blok 2c To See	**De gebruiker**
Blok 2d TO DO	Game Audio
Blok 3	Audio integratie
Proj 3	Divers project

SID

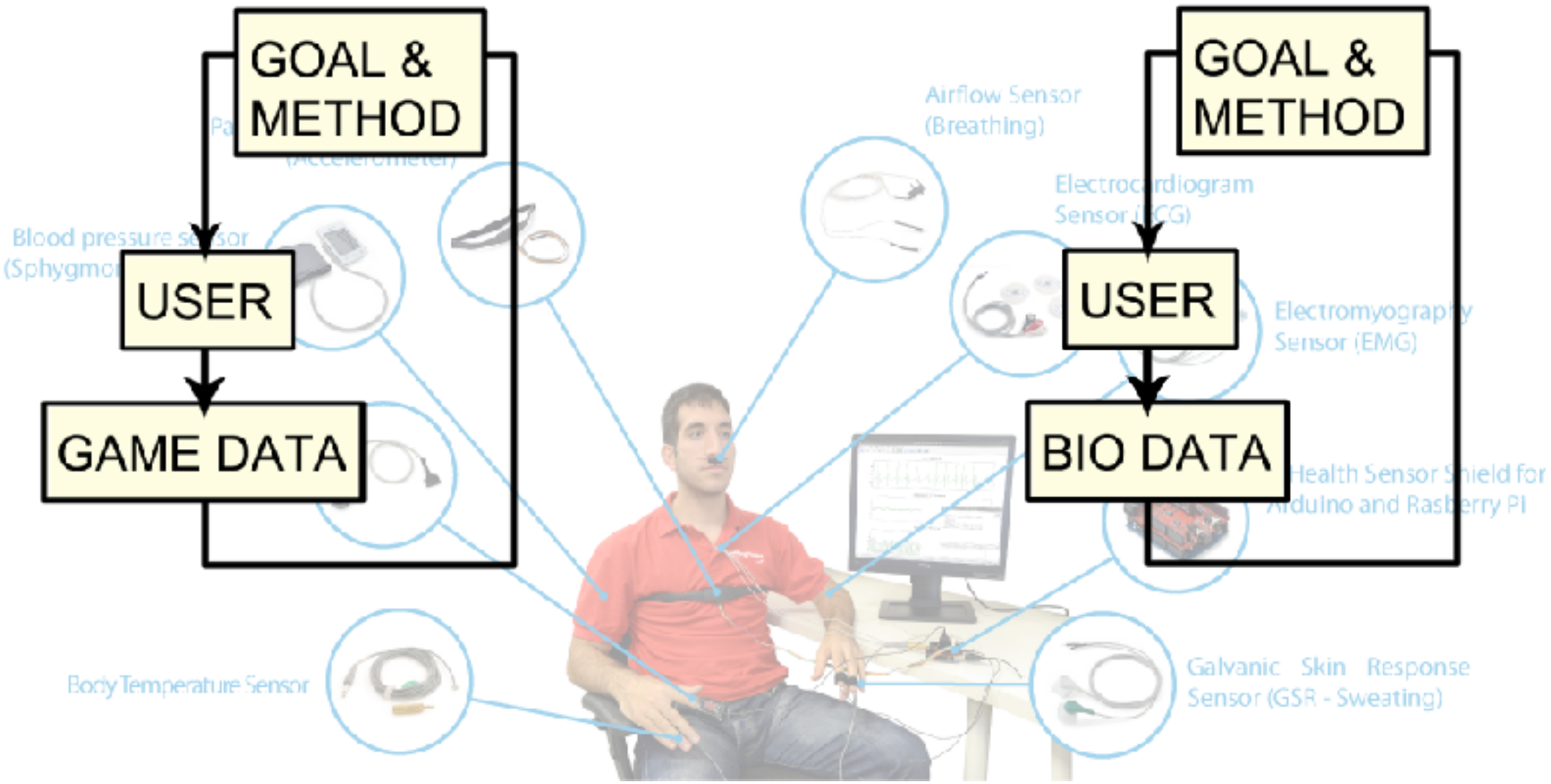
Project	
Verdieping	
BioHakdag	Eindpresentatie
MakerSkills	Documentatie

BioFeedback

codenaam: “Zweten is Weten”



BioFeedback

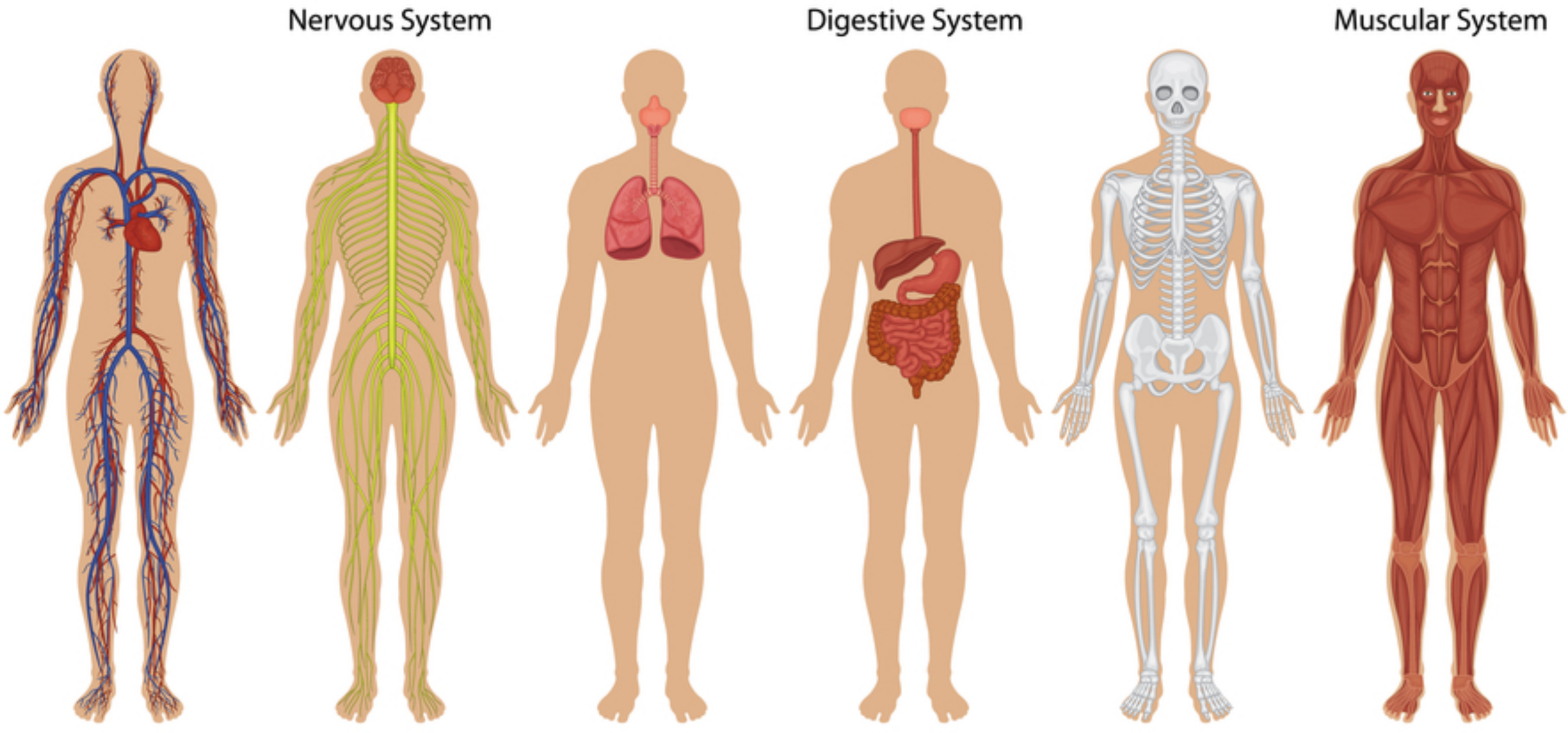


Eindopdracht

Grofweg:

Ontwerp in een groep (2-4) een interactief audiosysteem met een bepaald doel op basis van samengestelde variabele van (bio)data.

Human Body Systems

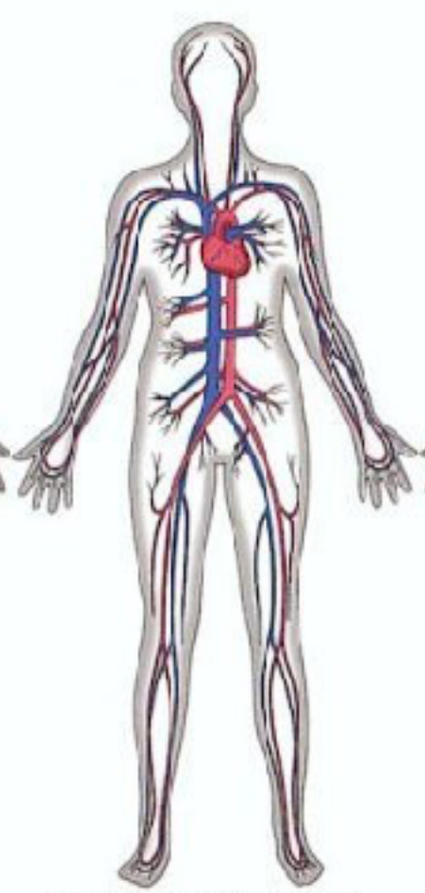


▲ MUSCULAR SYSTEM

The muscular system consists of layers of muscles that cover the bones of the skeleton, extend across joints, and can contract and relax to produce movement.

▲ SKELETAL SYSTEM

The skeleton is a strong yet flexible framework of bones and connective tissue. It provides support for the body and protection for many of its internal parts.

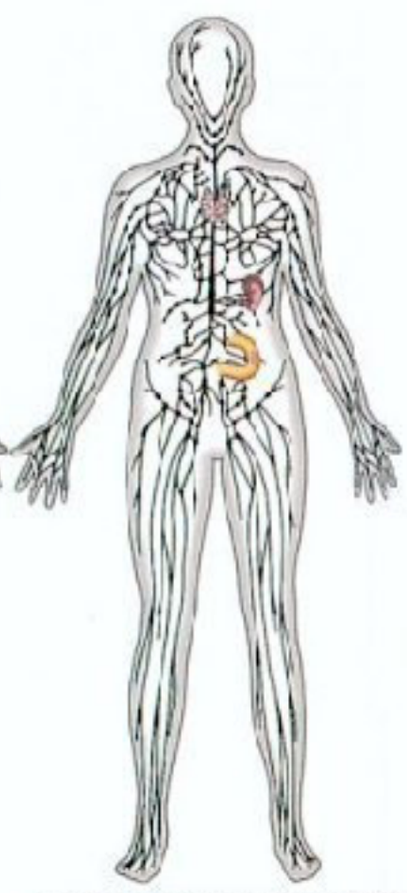


▲ CIRCULATORY SYSTEM

This system consists of the heart and a network of vessels that carry blood. It supplies oxygen and nutrients to the body's cells and removes waste products.

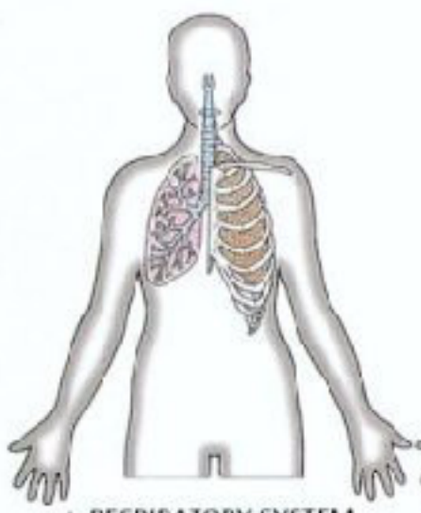
▲ NERVOUS SYSTEM

The nervous system is the body's main control system. It consists of the brain, the spinal cord, and a network of nerves that extend out to the rest of the body.



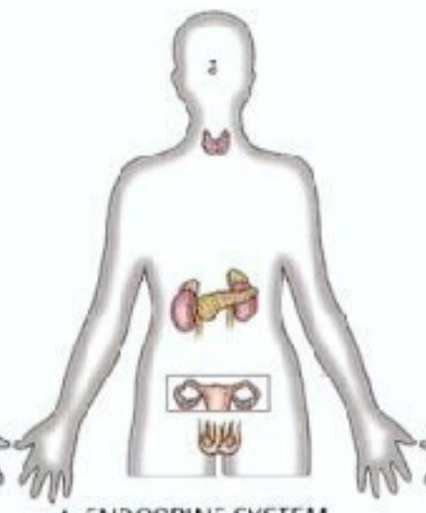
▲ LYMPHATIC (IMMUNE) SYSTEM

This system is a network of vessels that collects fluid from tissues and returns it to the blood. It also contains groups of cells that protect the body against infection.



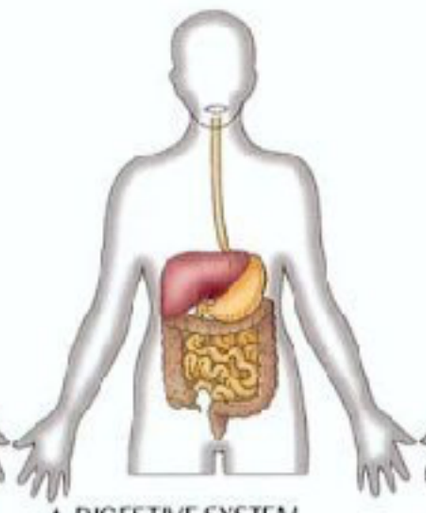
▲ RESPIRATORY SYSTEM

The respiratory system is centered on the lungs, which work to get life-giving oxygen into the blood. They also rid the body of a waste product, carbon dioxide.



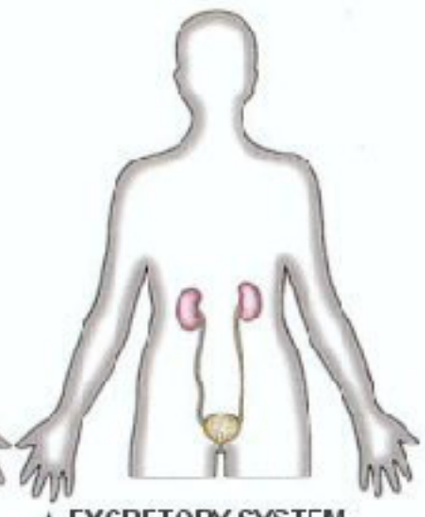
▲ ENDOCRINE SYSTEM

Many body processes, such as growth and energy production, are directed by hormones. These chemicals are released by the glands of the endocrine system.



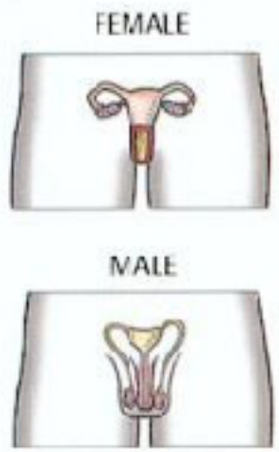
▲ DIGESTIVE SYSTEM

The digestive system takes in the food the body needs to fuel its activities. It breaks the food down into units called nutrients and absorbs the nutrients into the blood.



▲ EXCRETORY SYSTEM

The body's cells produce waste products, many of which are eliminated in urine. The job of the urinary system is to make urine and expel it from the body.



▲ REPRODUCTIVE SYSTEM

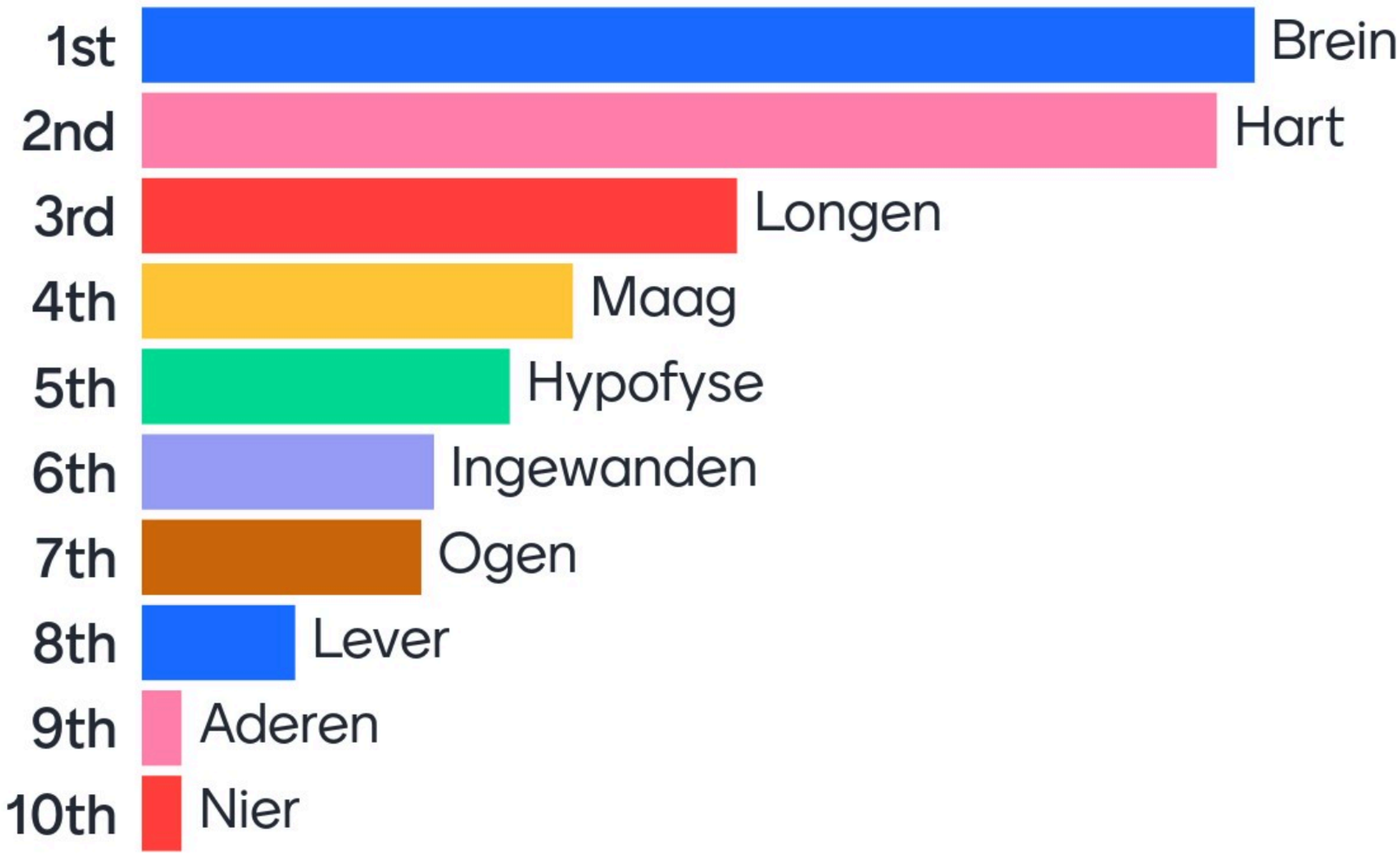
The male and female parts of the reproductive system produce the sperm and eggs needed to create a new person. They also bring these tiny cells together.

Jouw top 10 organen!

(of the human body)

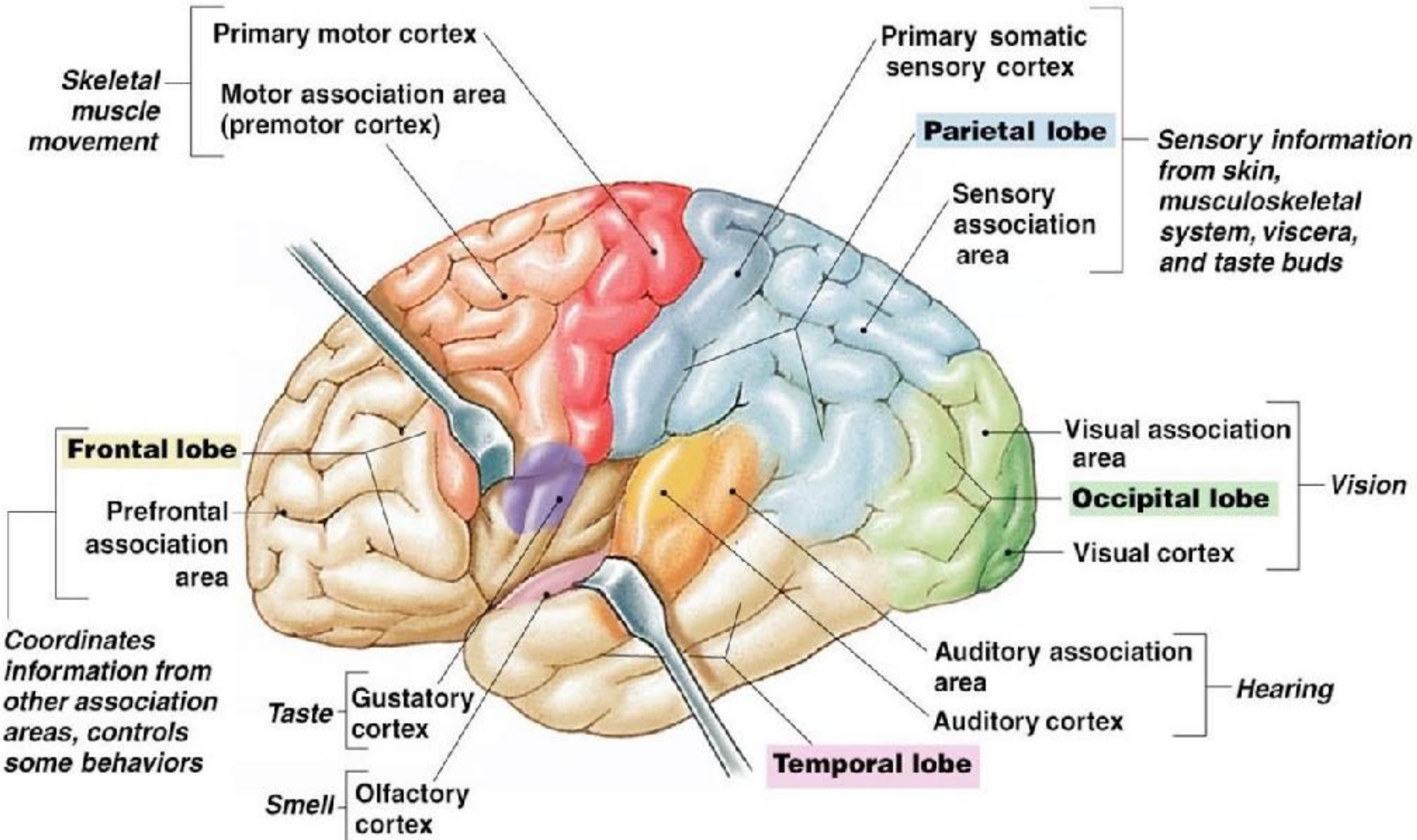
1. Brein
2. Hart
3. Longen
4. Lever
5. Maag
6. Nier
7. Ogen
8. Ingewanden
9. Aderen
10. Hypofyse

Wat zijn jouw top 3 organen ?




WILLIAM TAFT
ANDREW JACKSON
WARREN HARDIN
PRESIDENT CHOW
JIMMY CARTER
JAMES MADISON
RONALD REAGAN

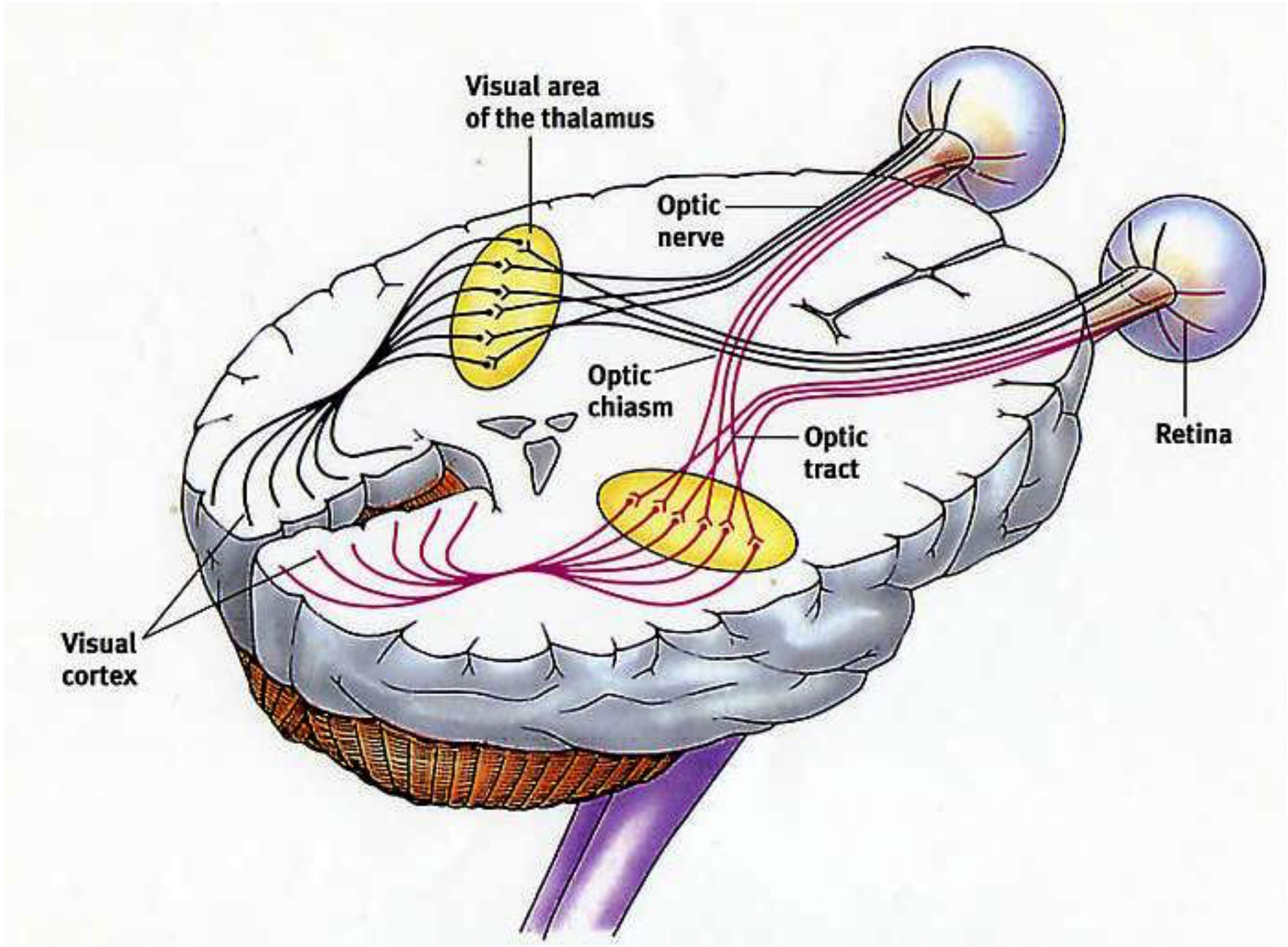
Je Brein


Primary motor cortex
Skeletal muscle movement
Motor association area (premotor cortex)
Primary somatic sensory cortex
Parietal lobe
Sensory association area
Sensory information from skin, musculoskeletal system, viscera, and taste buds
Frontal lobe
Prefrontal association area
Coordinates information from other association areas, controls some behaviors
Visual association area
Occipital lobe
Visual cortex
Vision
Auditory association area
Auditory cortex
Hearing
Taste
Gustatory cortex
Temporal lobe
Smell
Olfactory cortex

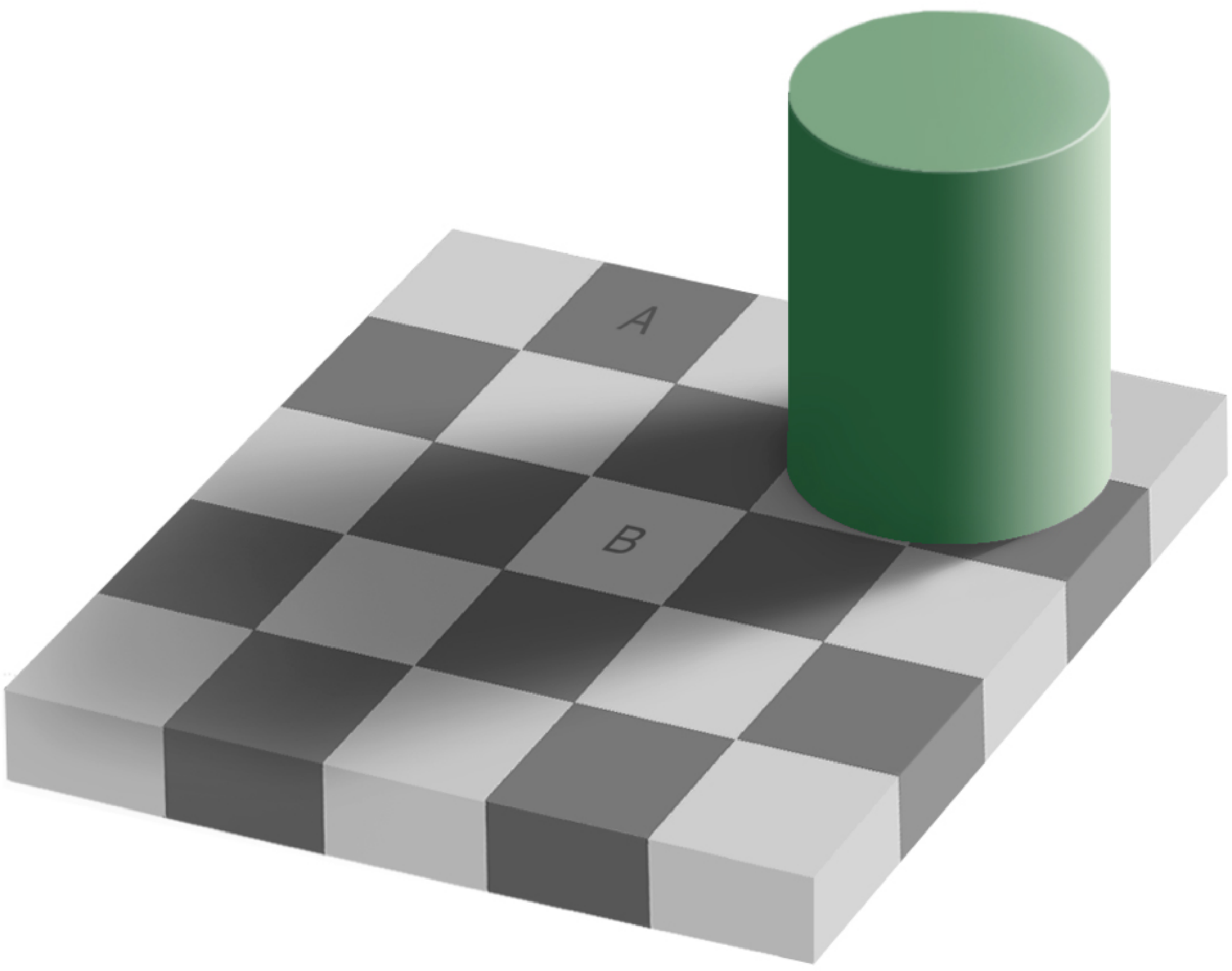
Human senses

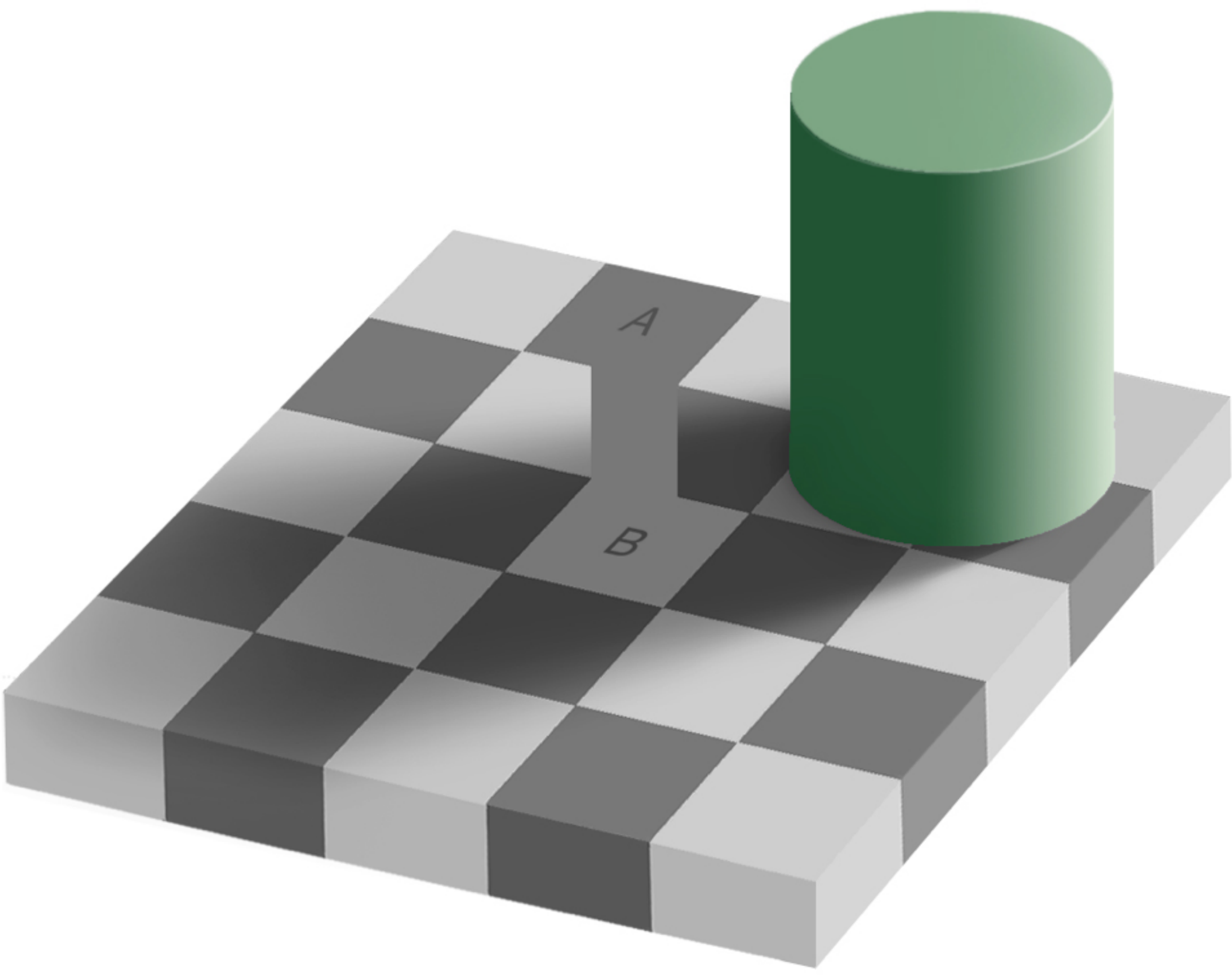
- Seeing
- Hearing
- Smelling
- Tasting *(& spiciness)*
- Touch *(pressure, warmth, hairs)*
- Balance & acceleration
- Temperature
- Kinesthesis
- Pain
- Chronoception

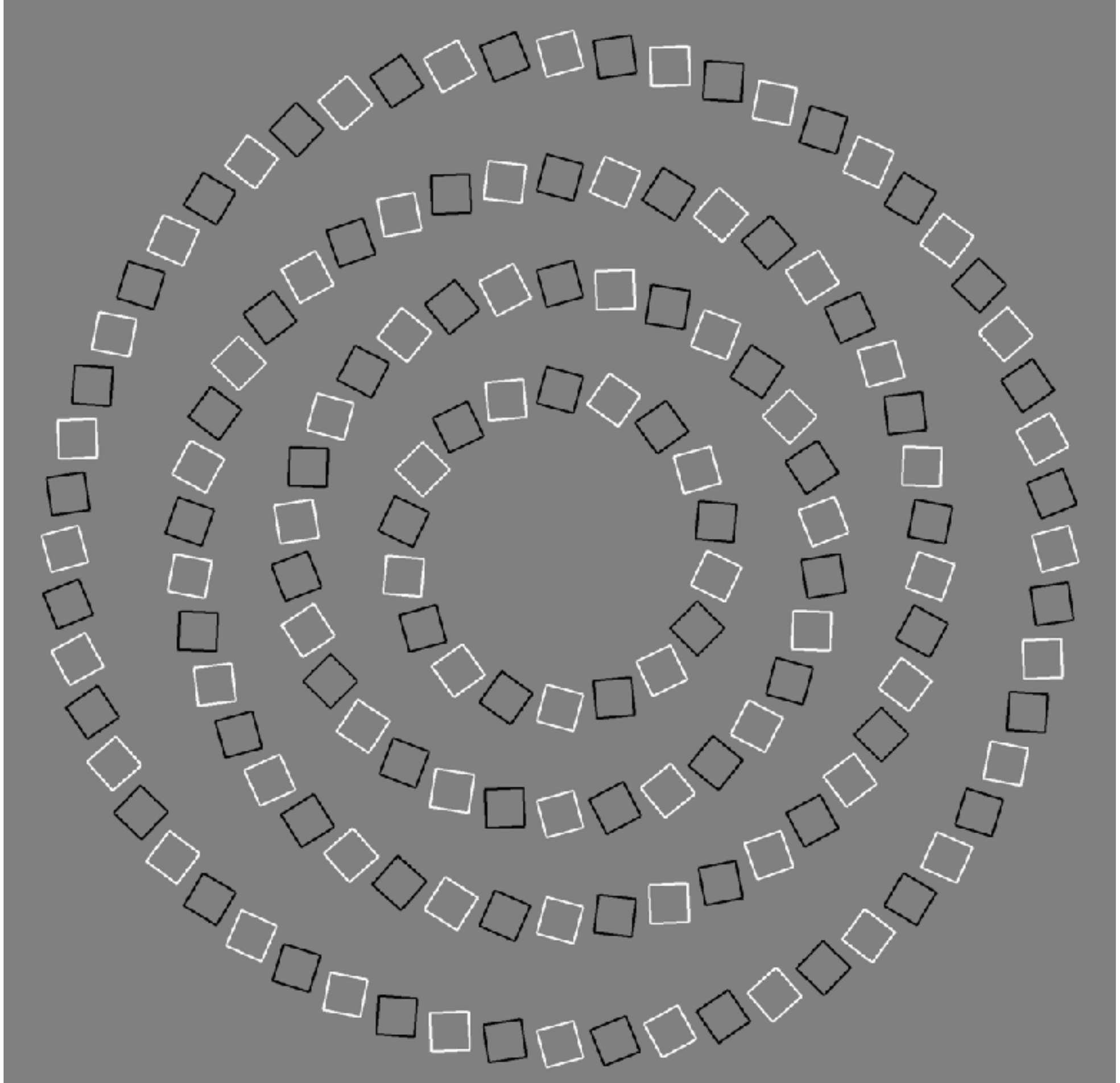
Seeing

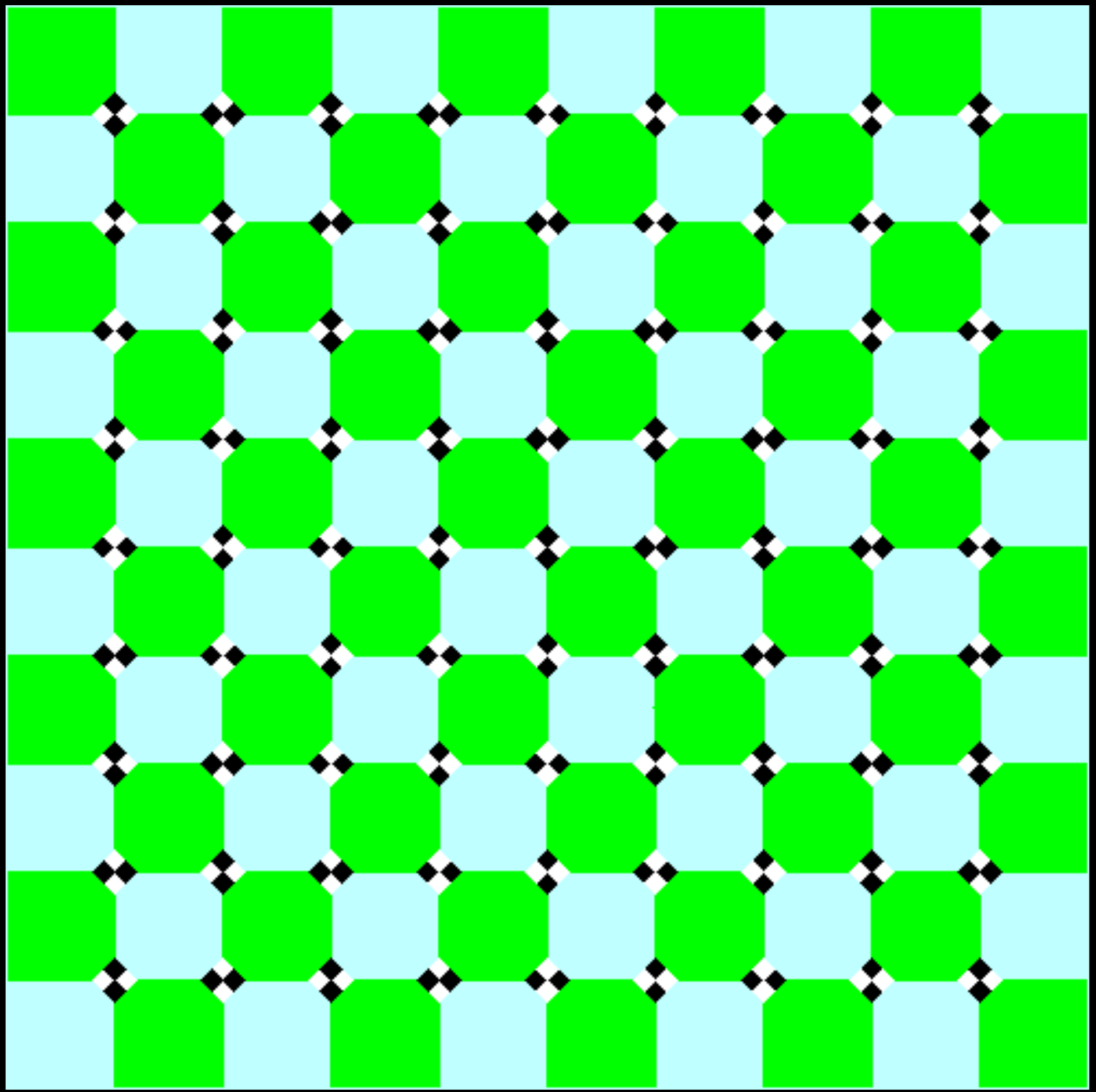


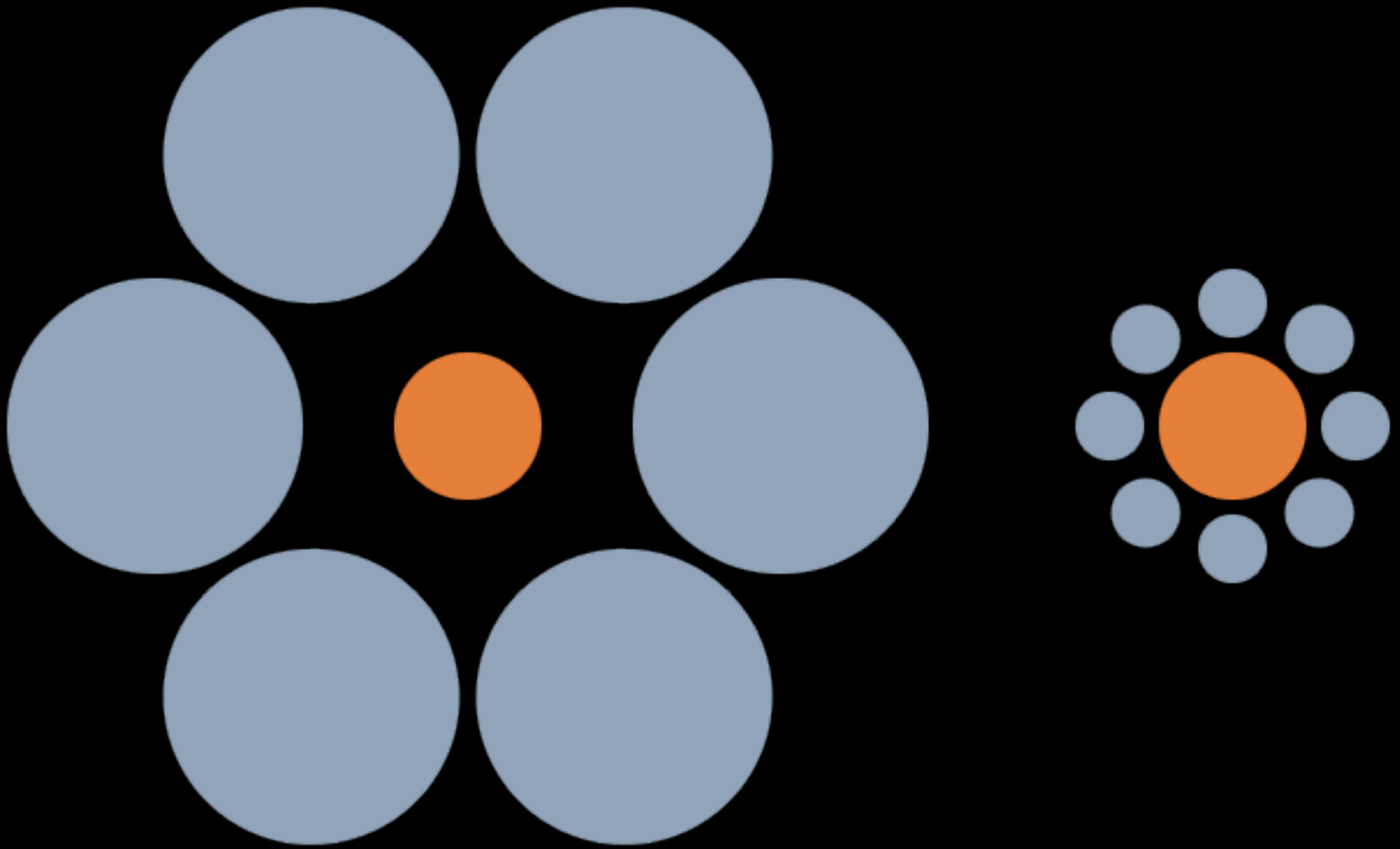
plaatje van oog - staafjes - occipital lobe


A
B

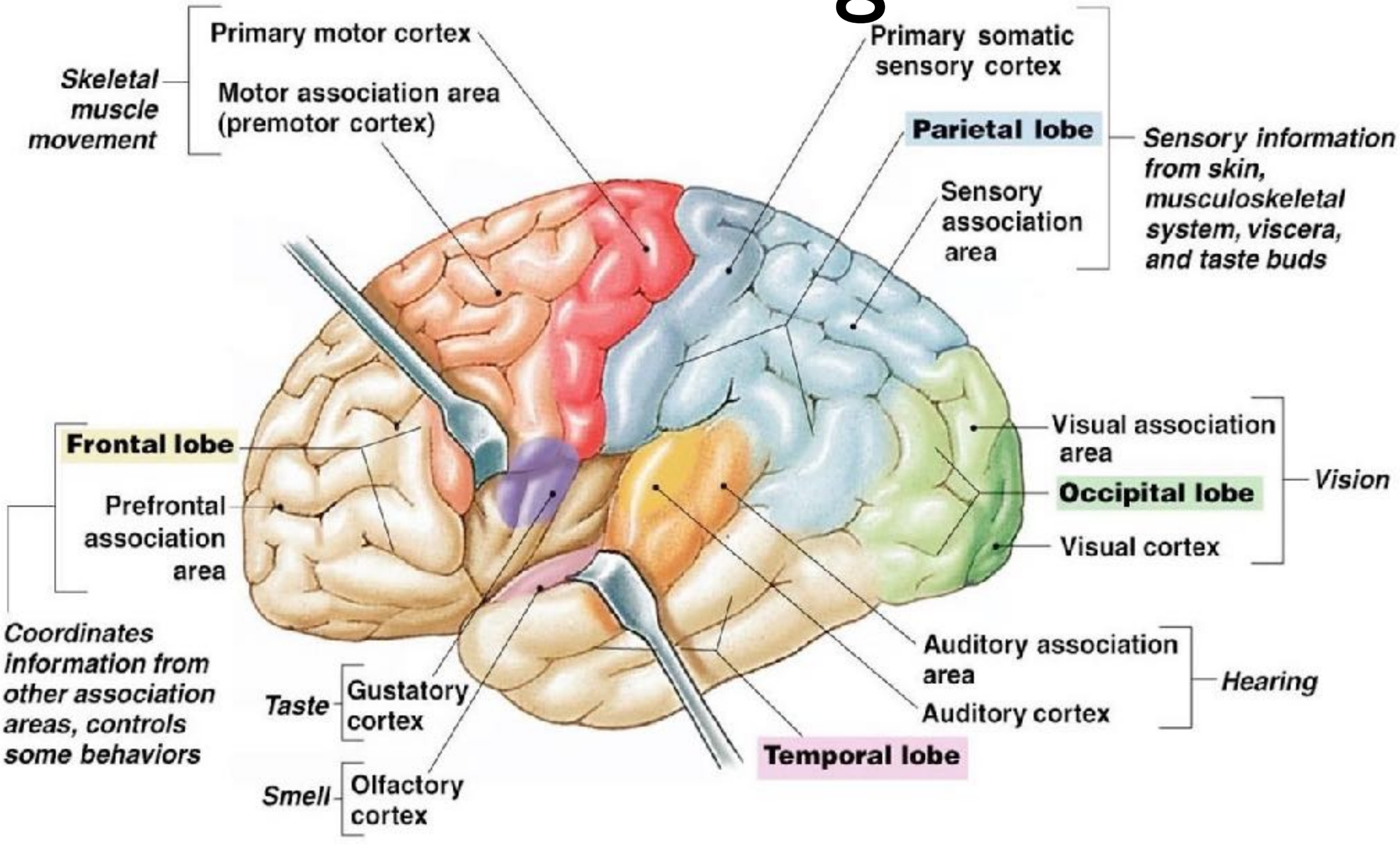

A
B

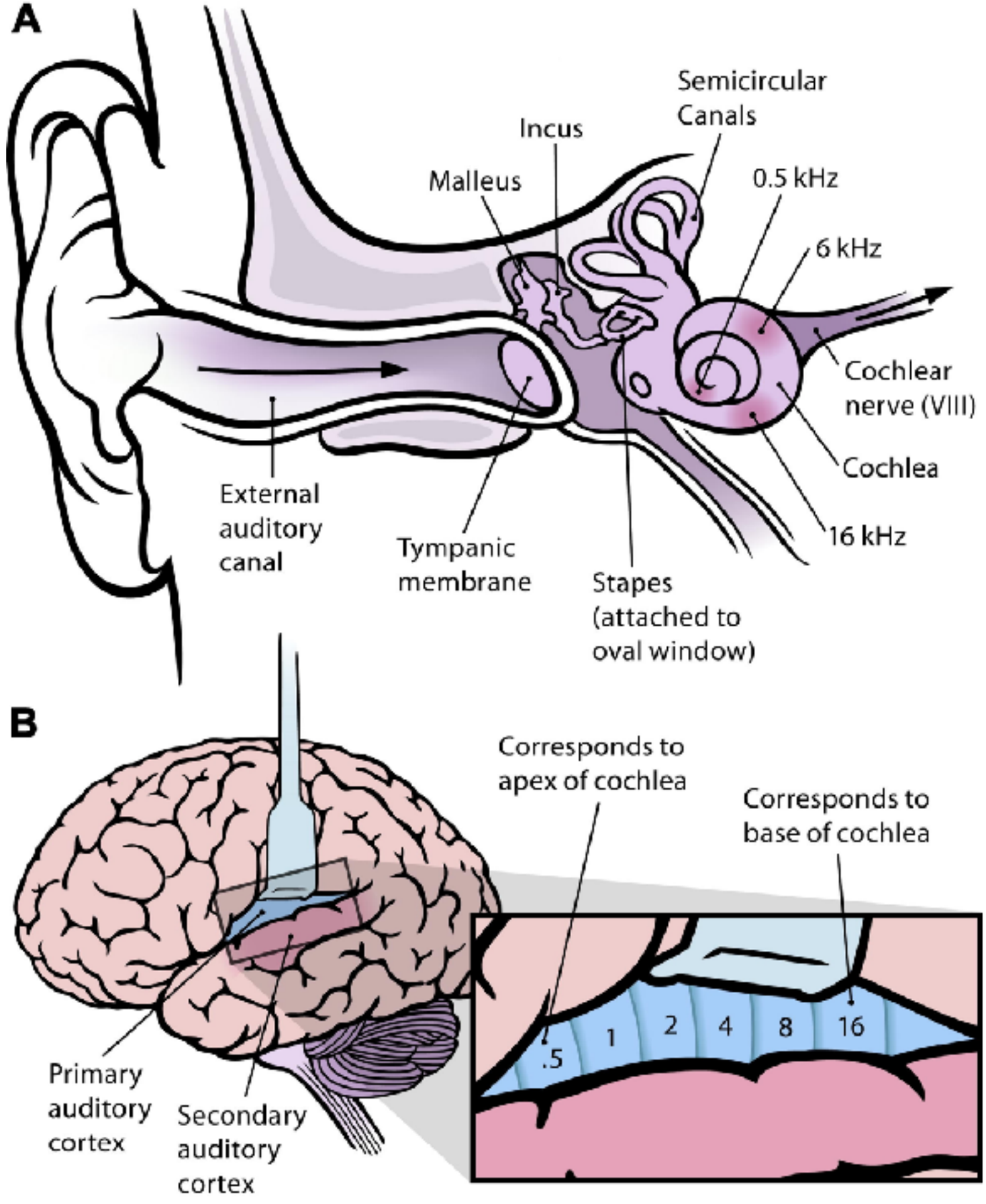


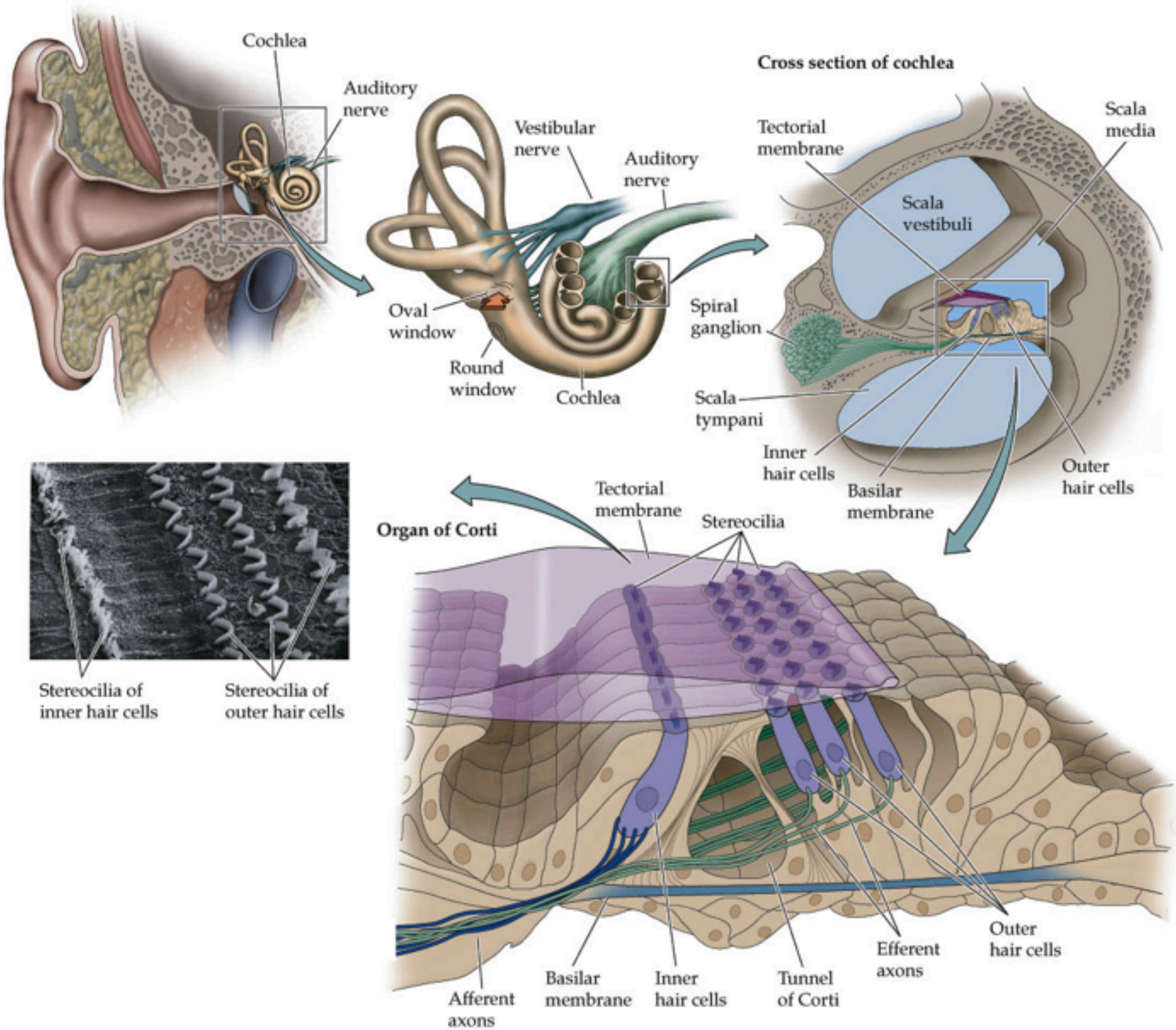




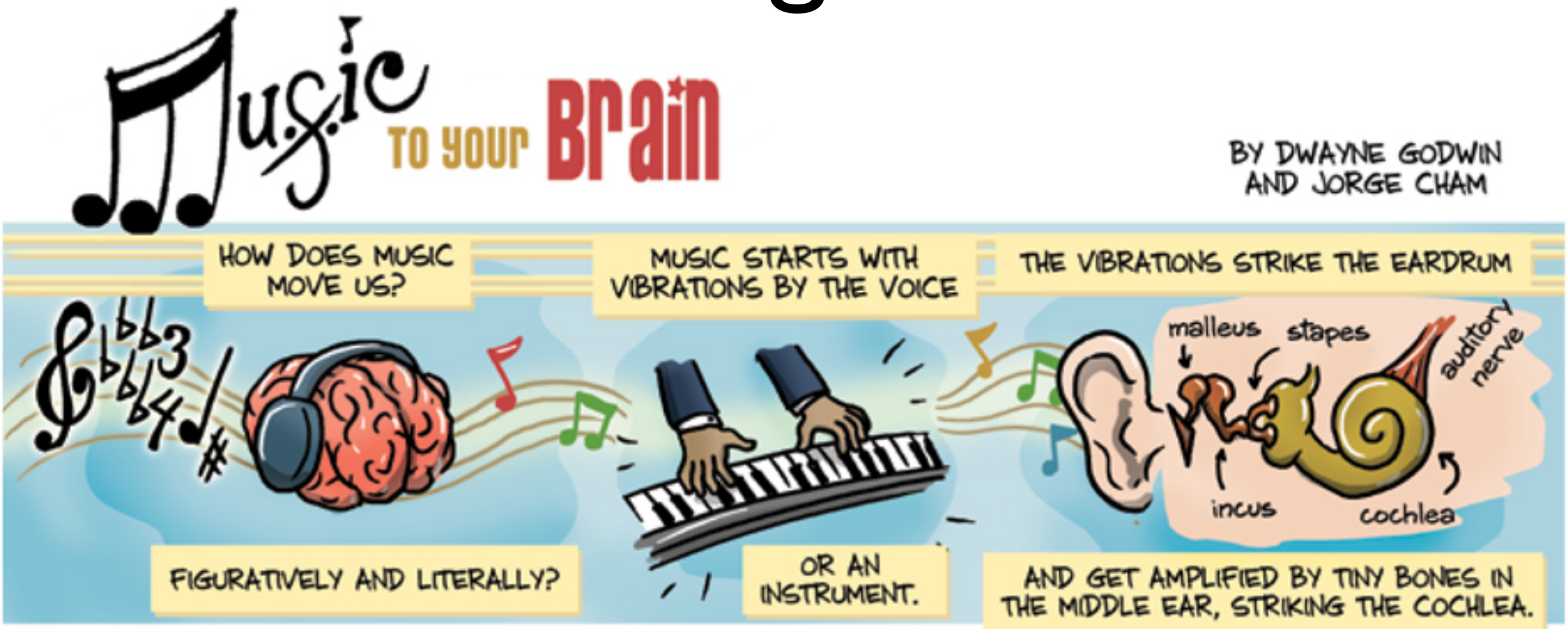
Hearing


Primary motor cortex
Skeletal muscle movement
Motor association area (premotor cortex)
Primary somatic sensory cortex
Parietal lobe
Sensory association area
Sensory information from skin, musculoskeletal system, viscera, and taste buds
Visual association area
Occipital lobe
Visual cortex
Vision
Frontal lobe
Prefrontal association area
Coordinates information from other association areas, controls some behaviors
Auditory association area
Auditory cortex
Hearing
Taste
Gustatory cortex
Temporal lobe
Smell
Olfactory cortex

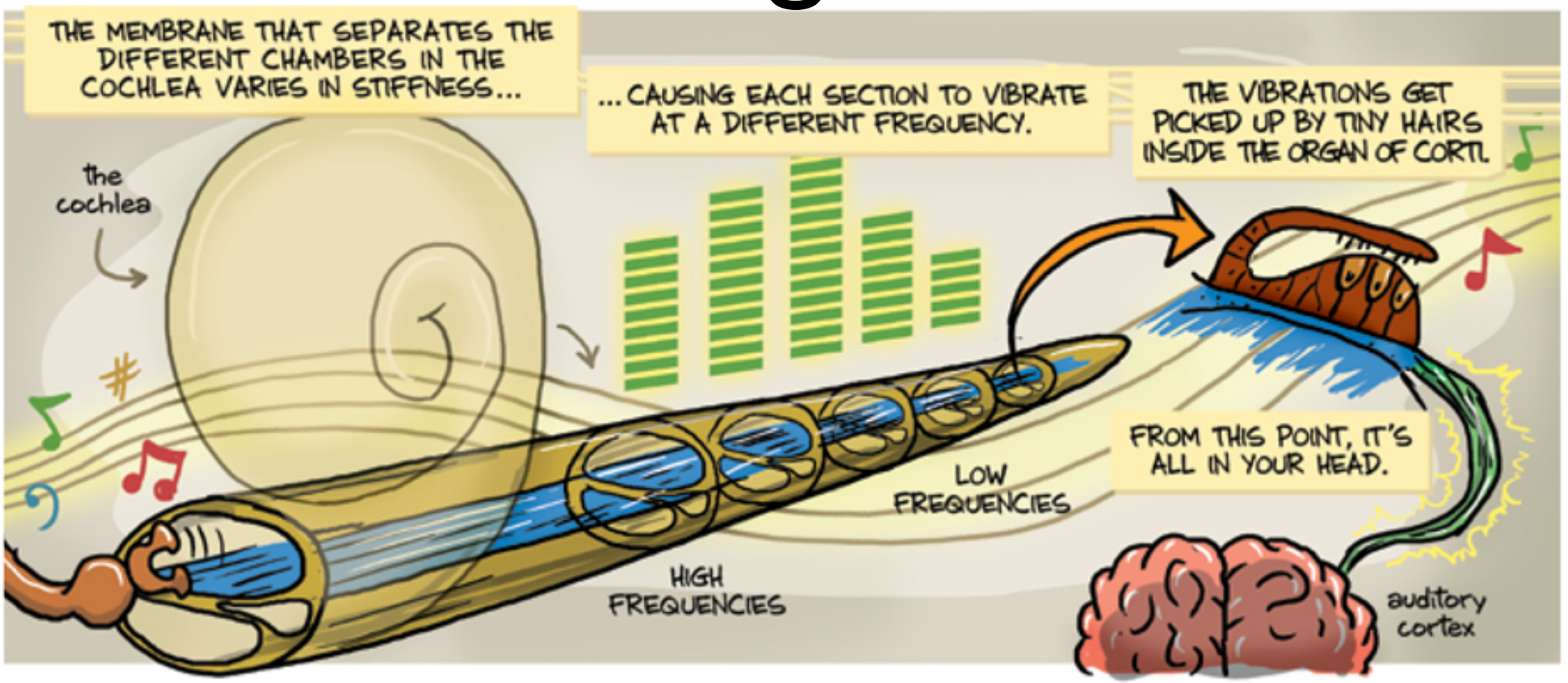

A
Semicircular Canals
Incus
Malleus
0.5 kHz
6 kHz
Cochlear nerve (VIII)
Cochlea
16 kHz
External auditory canal
Tympanic membrane
Stapes (attached to oval window)
B
Corresponds to apex of cochlea
Corresponds to base of cochlea
.5
1
2
4
8
16
Primary auditory cortex
Secondary auditory cortex


Cochlea
Auditory nerve
Vestibular nerve
Auditory nerve
Oval window
Round window
Cochlea
Cross section of cochlea
Tectorial membrane
Scala media
Scala vestibuli
Spiral ganglion
Scala tympani
Inner hair cells
Basilar membrane
Outer hair cells
Organ of Corti
Tectorial membrane
Stereocilia
Stereocilia of inner hair cells
Stereocilia of outer hair cells
Afferent axons
Basilar membrane
Inner hair cells
Tunnel of Corti
Efferent axons
Outer hair cells

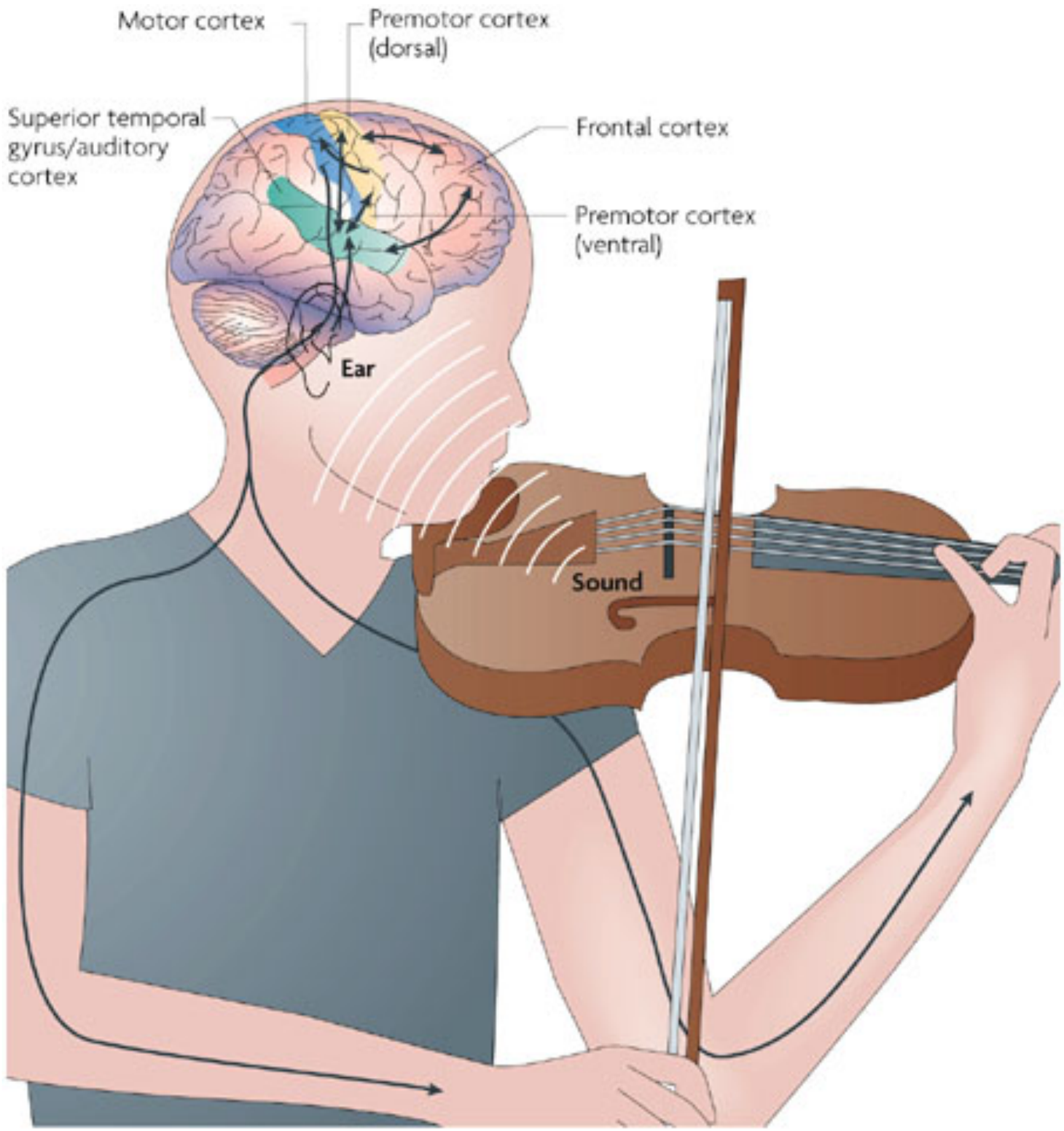
Hearing Music

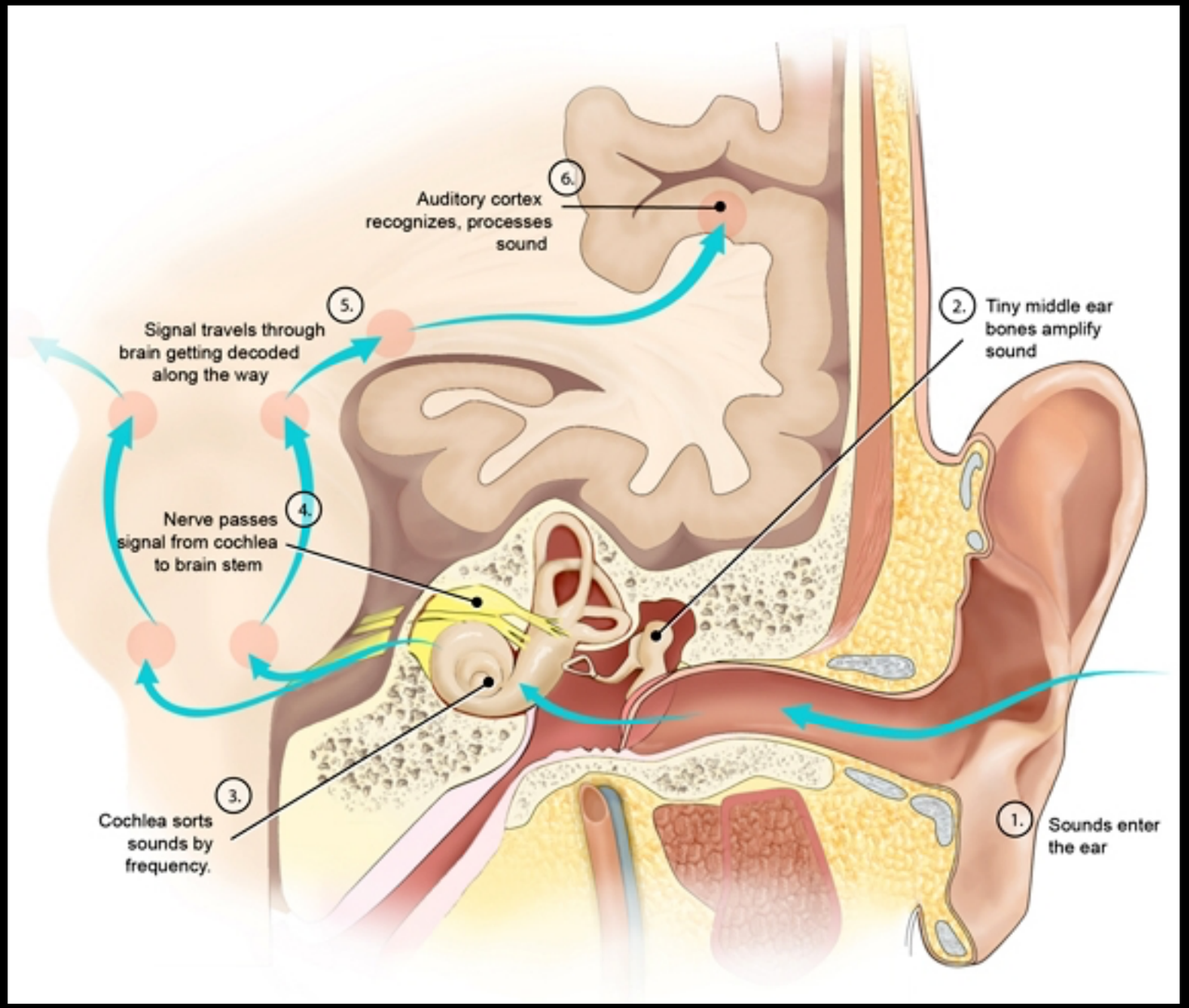


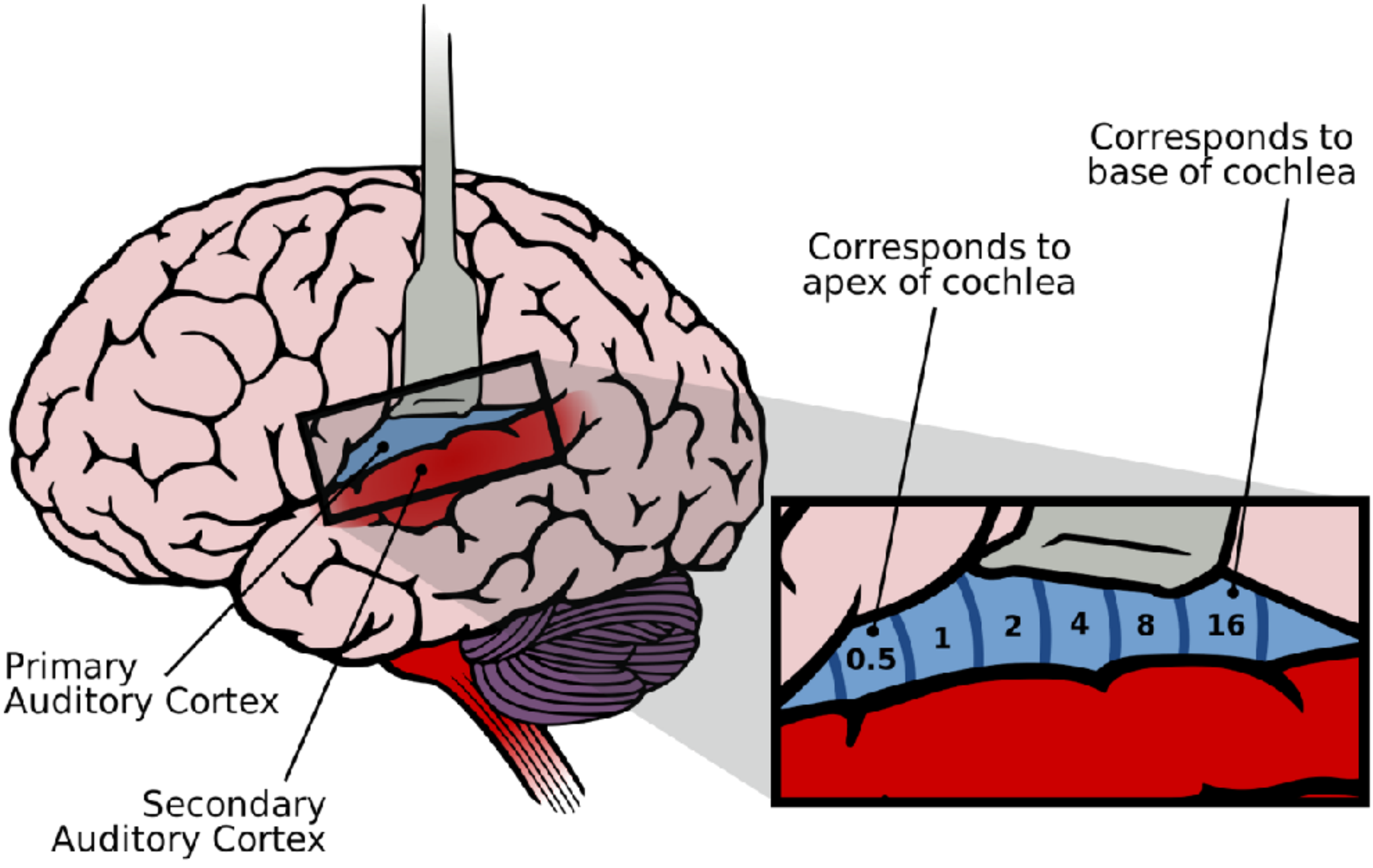
Hearing Music



Hearing Music


Motor cortex
Premotor cortex (dorsal)
Superior temporal gyrus/auditory cortex
Frontal cortex
Premotor cortex (ventral)
Ear
Sound

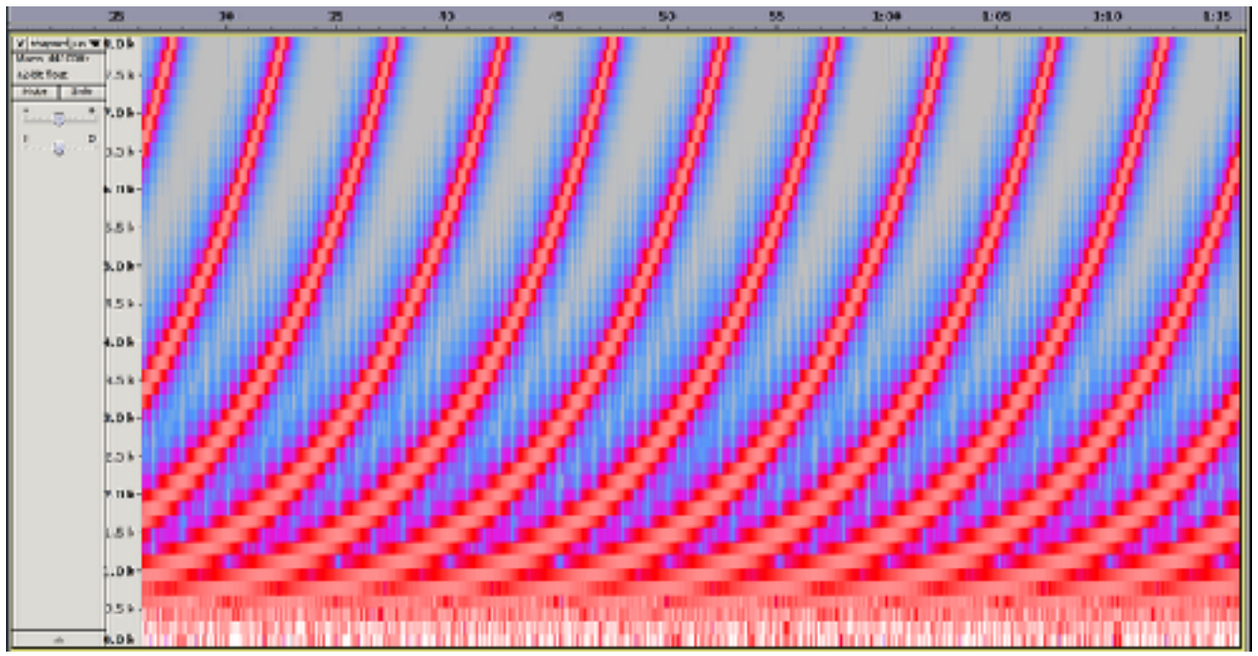

6.
Auditory cortex recognizes, processes sound
5.
Signal travels through brain getting decoded along the way
4.
Nerve passes signal from cochlea to brain stem
3.
Cochlea sorts sounds by frequency.
2.
Tiny middle ear bones amplify sound
1.
Sounds enter the ear


Corresponds to
base of cochlea
Corresponds to
apex of cochlea
0.5
1
2
4
8
16
Primary
Auditory Cortex
Secondary
Auditory Cortex

Auditory illusions

- Mc Gurk Effect
- fallingfalling.com
- Wikipedia Auditory illusions

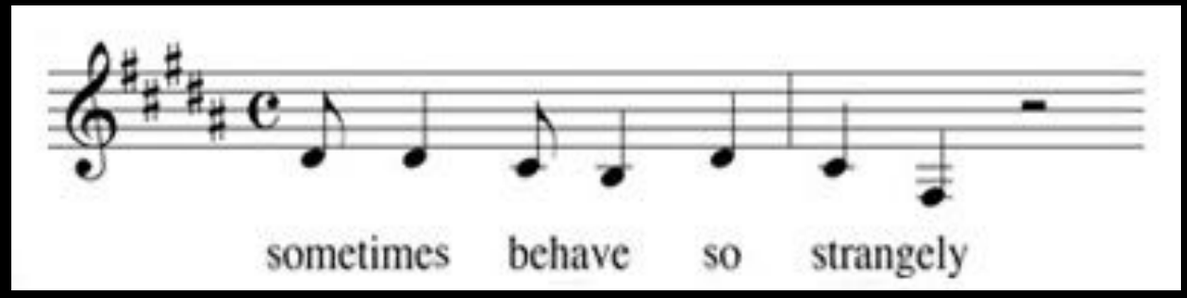
Shepard tone



More? :) See: https://en.wikipedia.org/wiki/Auditory_illusion

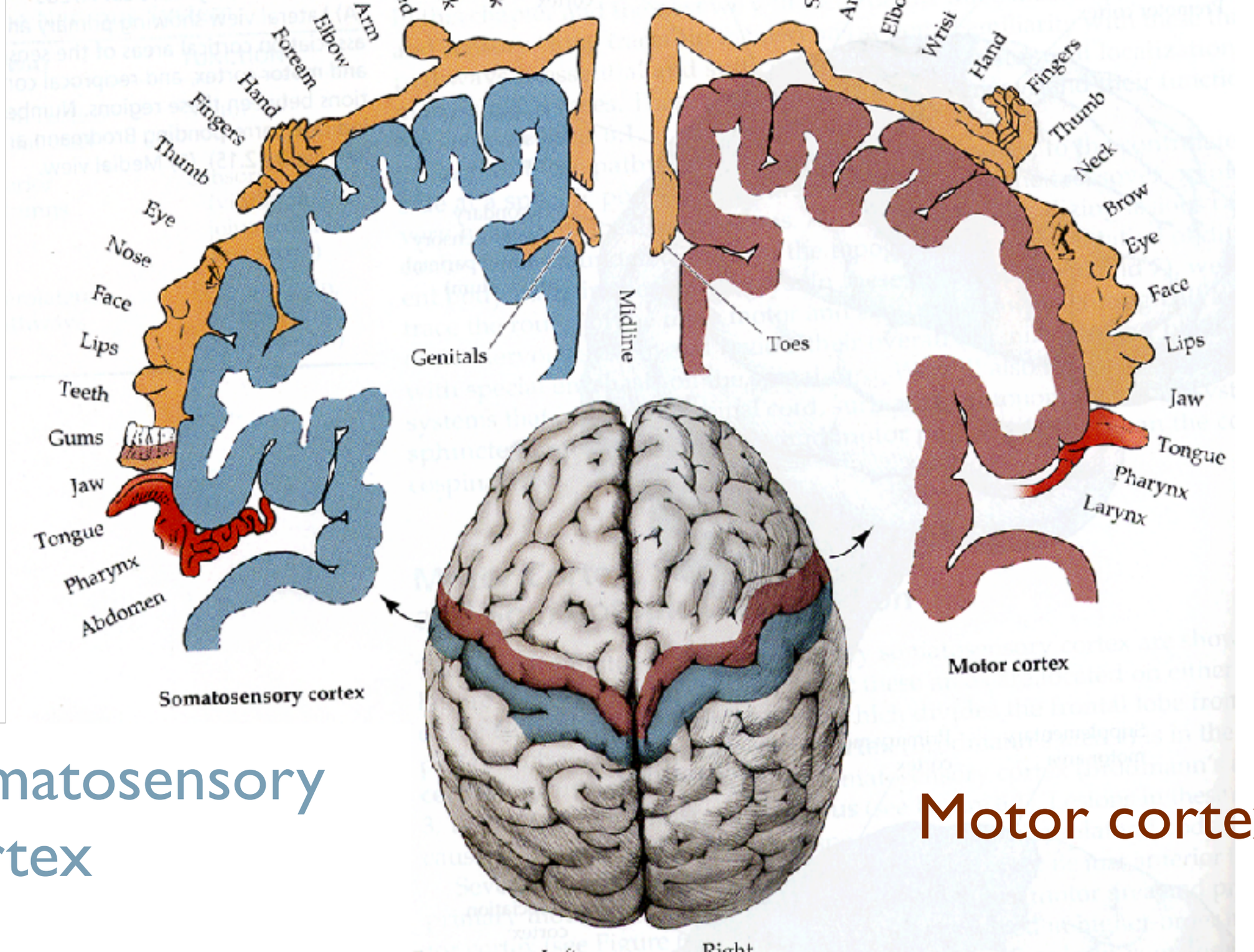
Language vs. Music

Diana Deutsch : “The sounds as they appear to you are not only different from those that are really present, but they sometimes behave so strangely as to seem quite impossible.”



http://deutsch.ucsd.edu/psychology/pages.php?i=212

Homunculus



Somatosensory cortex

Motor cortex

Waarnemen

Re Bio t Informatie

Perceptie

(mentaal) model

Realiteitszin

Data

Wat is BioData ?

BIO-DATA

Name:	Sangita Kaushik
Father's Name:	Sir Santosh Kaushik
Date of Birth:	07/10/1984
Height:	5'1"
Complexation:	Fair
Qualification:	I.A.
Gotra:	Kaushik
Sashan:	खुद "Lata" माँ "Indoria" दादी "mamdolia"
Brothers:	1 Younger Brother & 2 Elder Brothers
Sister:	1 Sister
Chacha:	(1) Shree Kishor Kaushik (Gurubazar, Katihar) (2) Shree Shrinarayan Kaushik (Raigunj WB)
Mama:	(1) Shree Prem Shankar Sharma (Begusarai) (2) Shree Gopal Sharma (Banaras)
Address:	Santosh Kaushik, Anand kaushik Gurubazar, Katihar
Contact Number:	Phone: 06457/265045, Mo.9430050132
Nepal Address:	Santosh Kaushik, Sanihat, Biratnagar, Nepal
Contact Number:	Mo. +9779804317445/9842280662

Bio (Data) Sonification

Coronavirus the musical: U.S. scientists turn virus into melody to aid research

By Reuters Staff

3 MIN READ

(Reuters) - From tinkling harmonies as the virus disarms cells to clashing and stormy as it replicates, U.S. scientists have translated the novel coronavirus' spiked protein structure to music in an effort to better understand the pathogen.

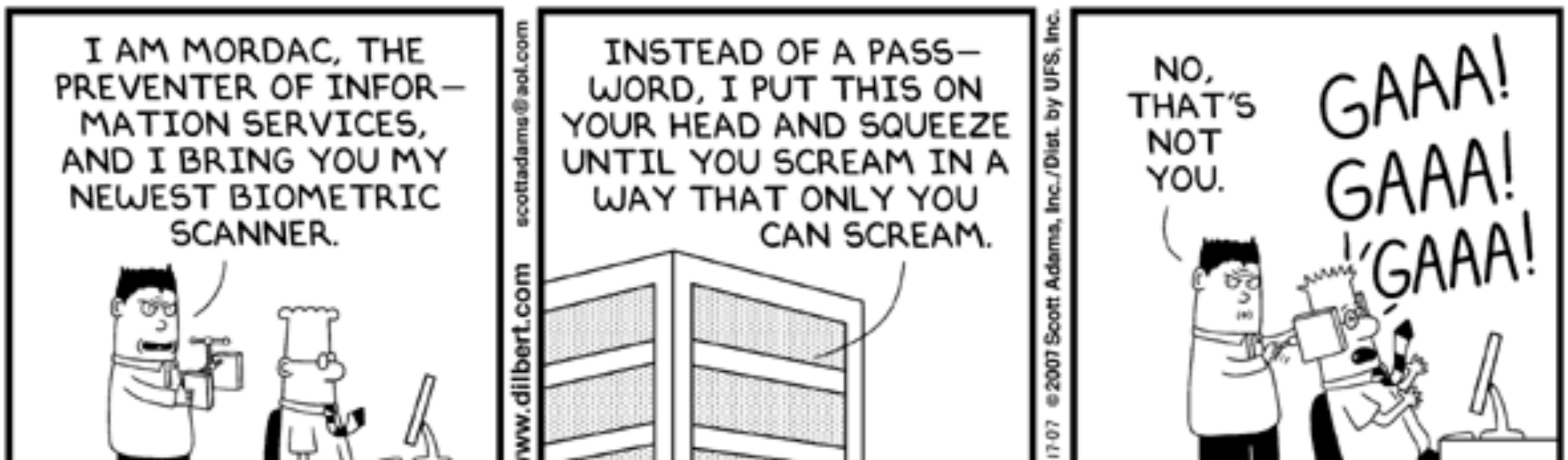
https://www.reuters.com/article/us-health-coronavirus-music-idUSKBN2222O7

https://www.sciencemag.org/news/2020/04/scientists-have-turned-structure-coronavirus-music

Bio Sensing

A biosensor is an analytical device, used for the detection of a chemical substance, that combines a biological component with a physicochemical detector.

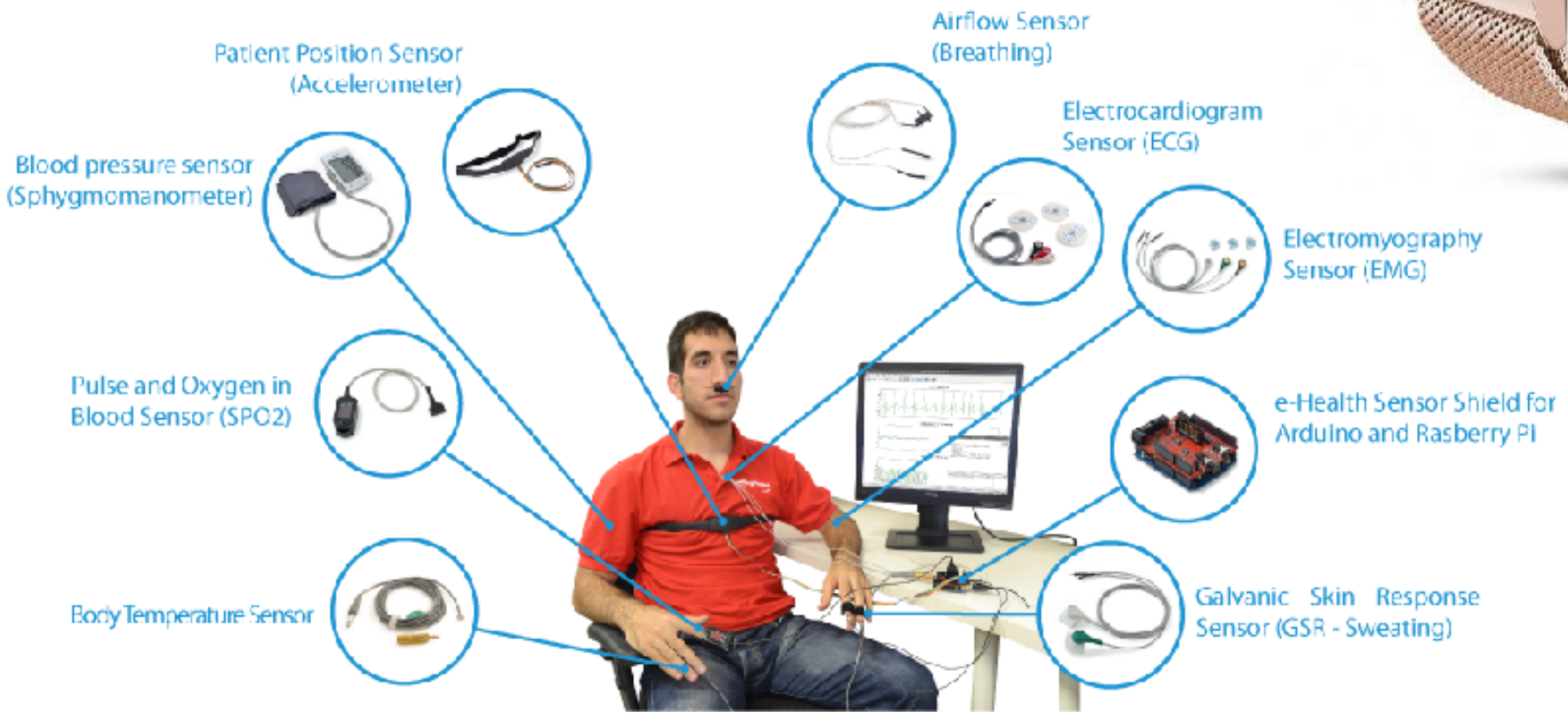

Rejected Biometric Technologies
tongue prints
FEEEEELINGS
Hans Kessler
catscan sign-ins
karaoke voice i.d.

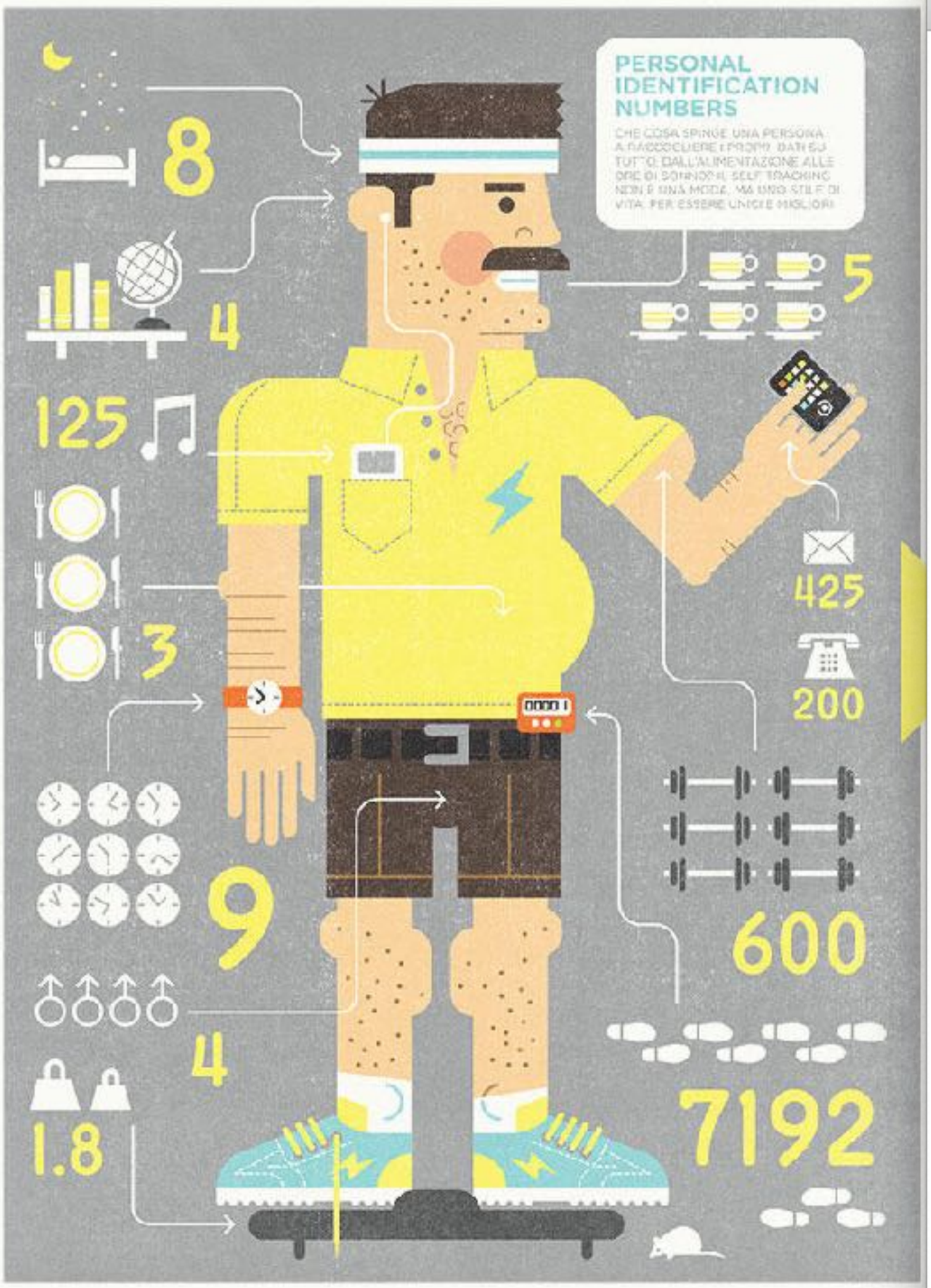

I AM MORDAC, THE PREVENTER OF INFOR-MATION SERVICES, AND I BRING YOU MY NEWEST BIOMETRIC SCANNER.
www.dilbert.com scottadams@aol.com
INSTEAD OF A PASS-WORD, I PUT THIS ON YOUR HEAD AND SQUEEZE UNTIL YOU SCREAM IN A WAY THAT ONLY YOU CAN SCREAM.
1-7-07 ©2007 Scott Adams, Inc./Dist. by UFS, Inc.
NO, THAT'S NOT YOU.
GAAA! GAAA! GAAA!


Continue


0.0
BOMANN

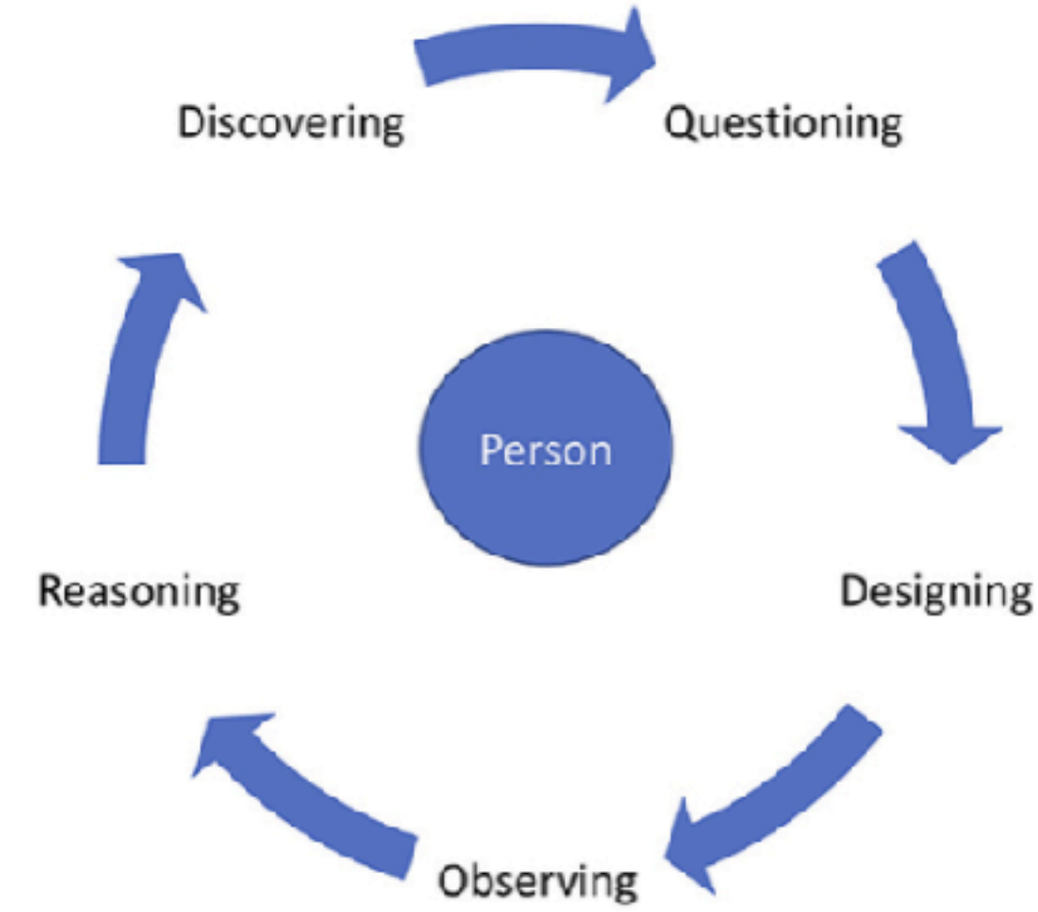

37.0
3.12mi
132
bpm
28:34.s


Airflow Sensor
(Breathing)
Patient Position Sensor
(Accelerometer)
Electrocardiogram
Sensor (ECG)
Blood pressure sensor
(Sphygmomanometer)
Electromyography
Sensor (EMG)
Pulse and Oxygen in
Blood Sensor (SPO2)
e-Health Sensor Shield for
Arduino and Rasberry PI
Body Temperature Sensor
Galvanic Skin Response
Sensor (GSR - Sweating)



quantifiedself.com

QUANTIFIED SELF
SELF KNOWLEDGE THROUGH NUMBERS



A Framework for Personal Science

Self-tracking. Self-experiment. N-of-1 methods. Single subject research. The kinds of self-research seen in the Quantified Self community are described by a thicket of labels. In a perspective article recently published in *Frontiers in Computer Science*, Gary Wolf and Martijn de Groot attempt to provide a clear definition and framework for research.

The Entire History of You - Black Mirror

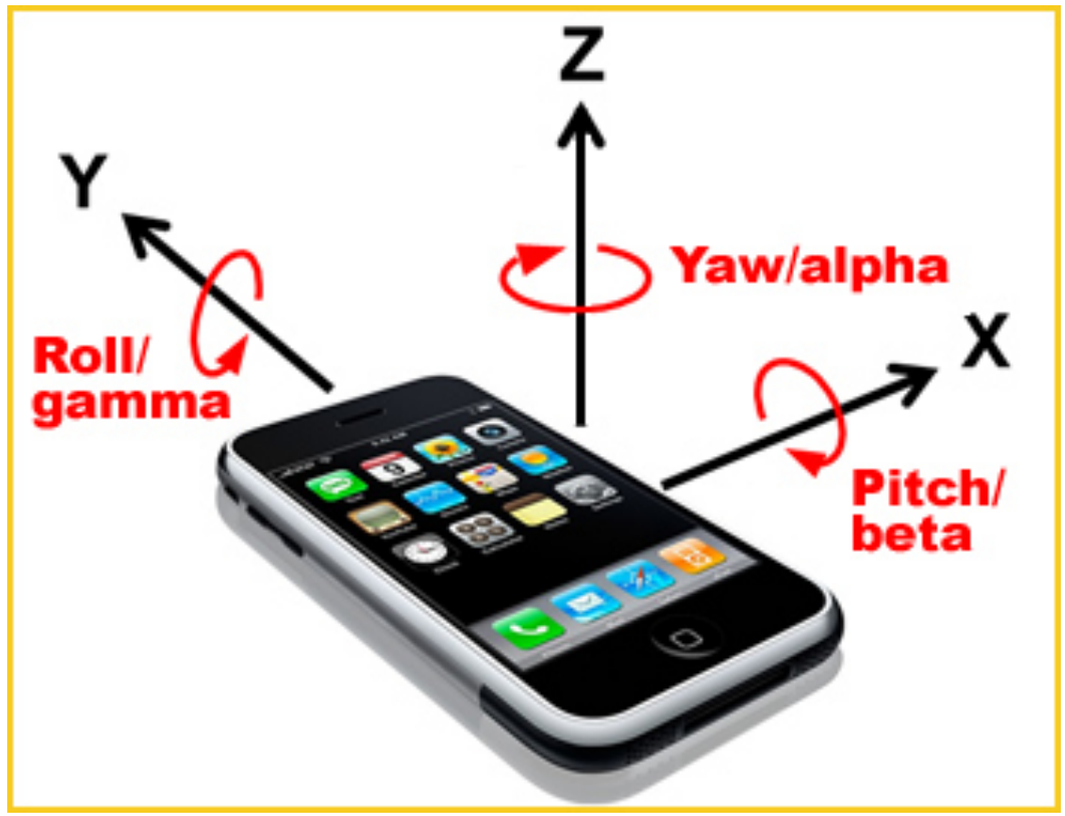
Be Right Back - Black Mirror

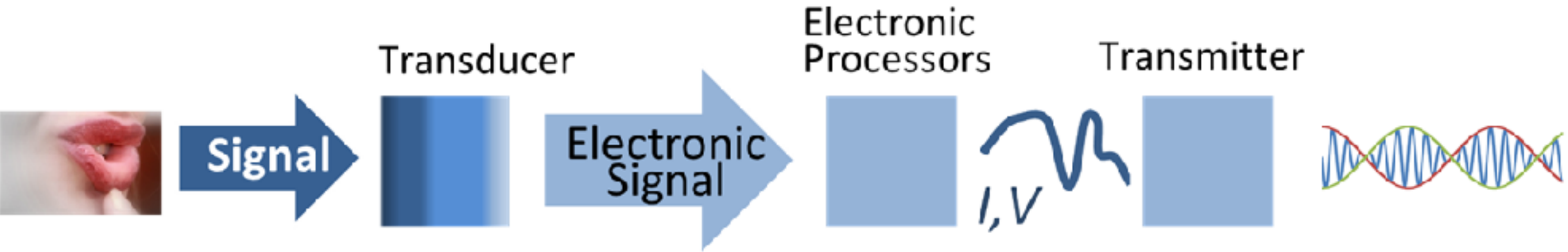
SENSORS

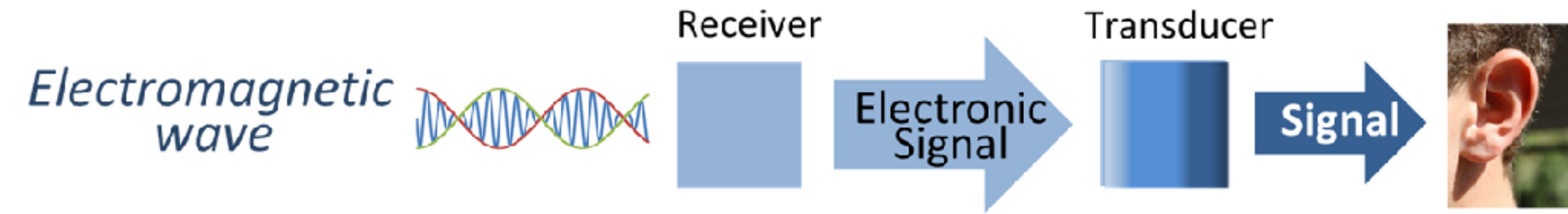
a.k.a.

Interfacing to the Physical World

Human ~~sensors~~ senses

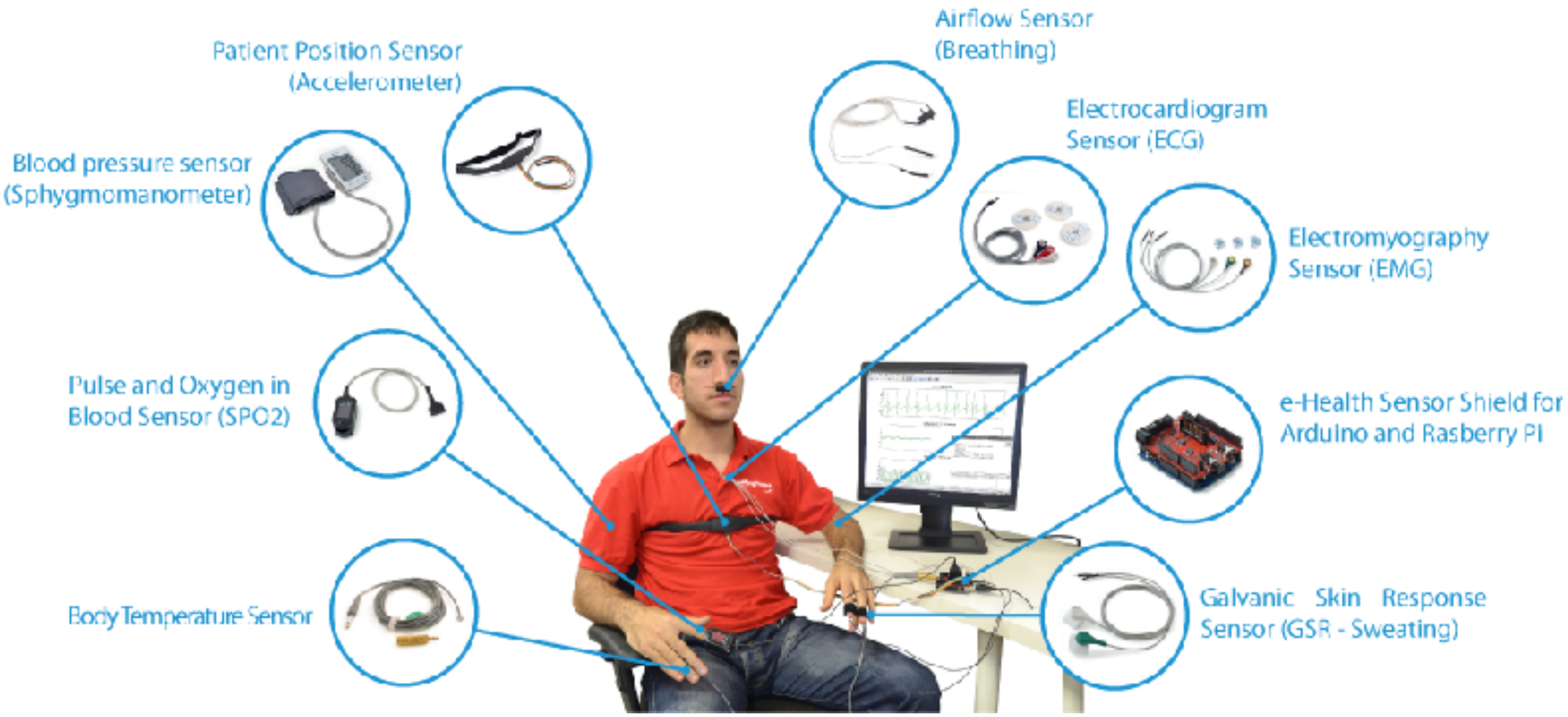

Z
Y
X
Yaw/alpha
Roll/
gamma
Pitch/
beta


Transducer
Electronic Processors
Transmitter
Signal
Electronic Signal
I, V

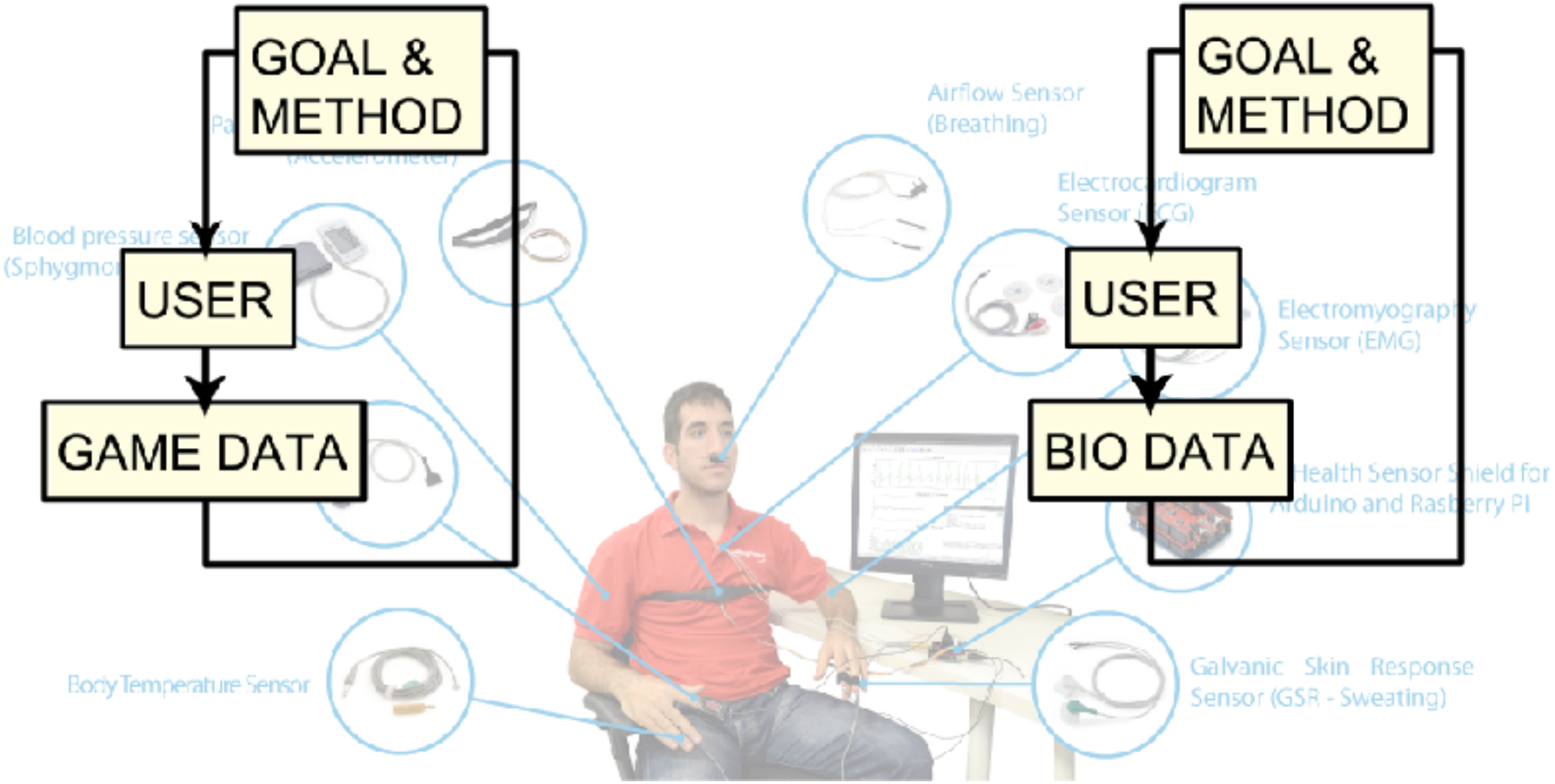

Electromagnetic wave
Receiver
Electronic Signal
Transducer
Signal

BioData

codenaam: “Zweten is Weten”

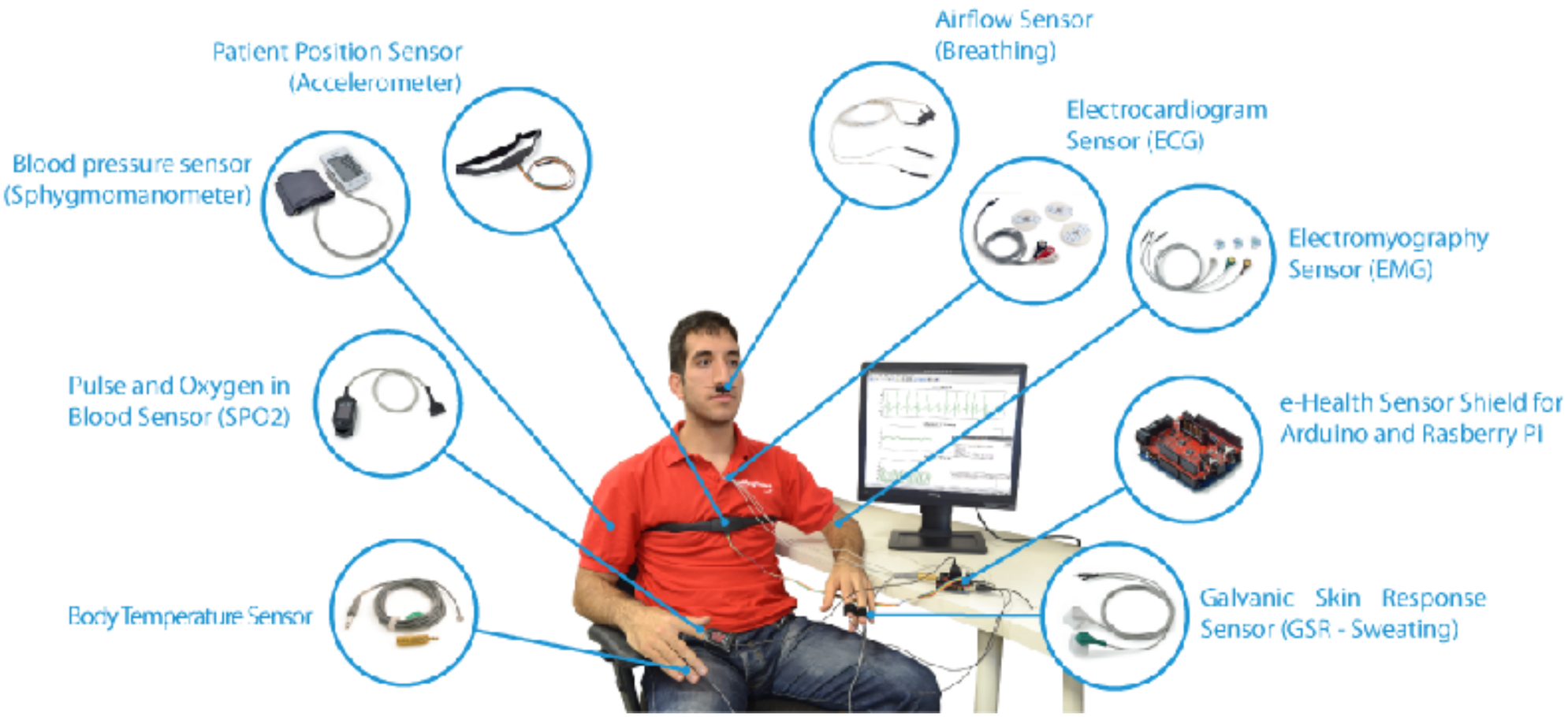


BioFeedback



BioSensing

codenaam: "Zweten is Weten"

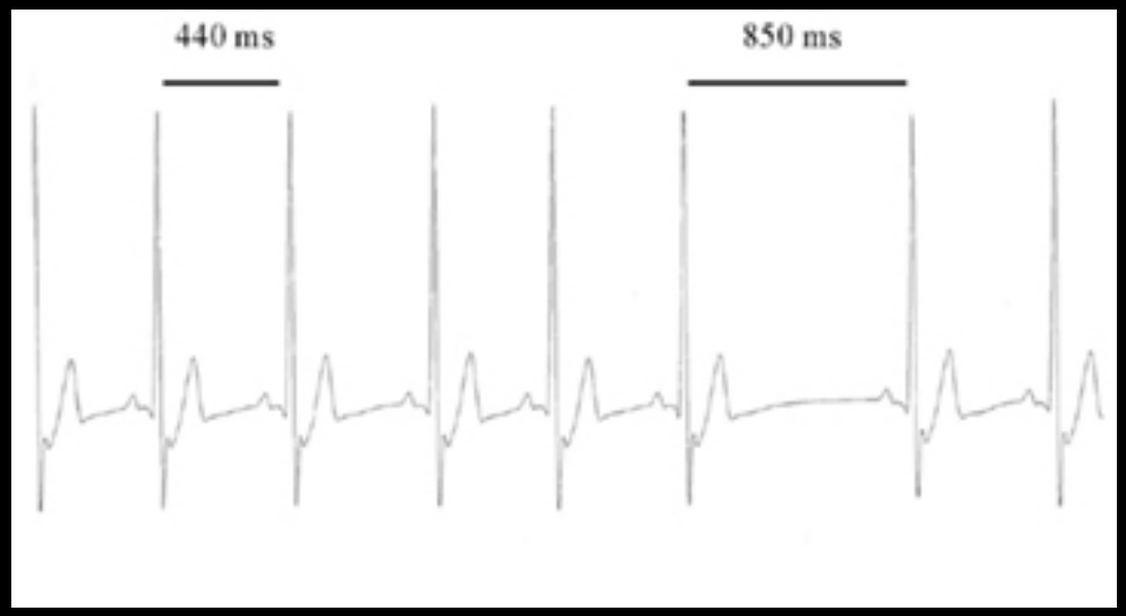


BioSensing

- EEG
- ECG
- EMG
- Galvanic Skin Conductance
- Breath
- Blood Pressure
- etc...

Je Hart(Live)

- Blood circulation (circulatory system)
- Pulse
- ‘Heart Sound’
- HRV (Hart Ritme Variabiliteit)



Source

(Courtesy of Winchester Hospital. Do not copy)

ECG

Hospital monitor

Bandpass signal + peaks (pulse)

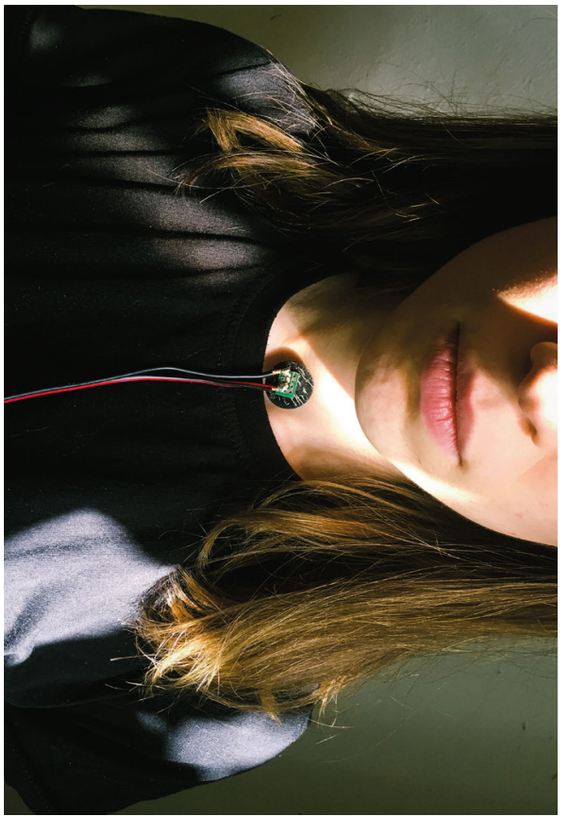
Estimated heart rate

146 bpm

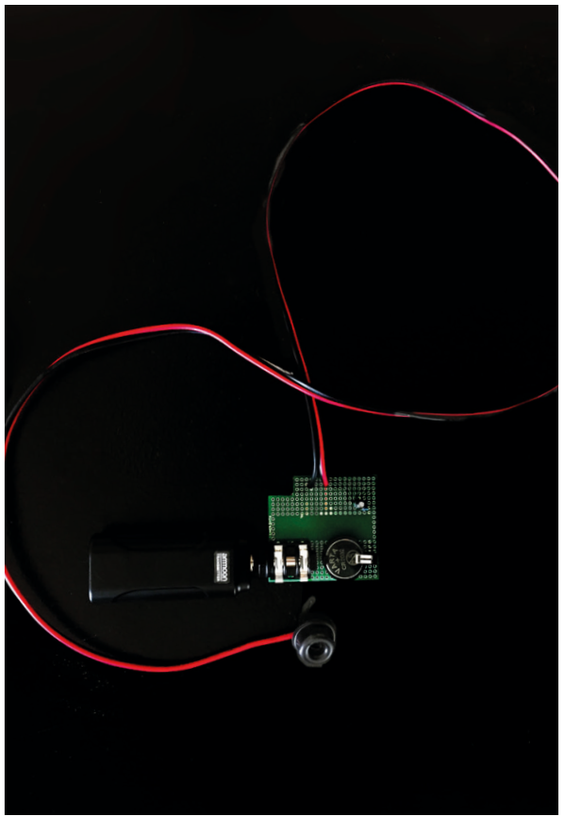
Color-amplified (x150)

First sketches of the garment for the sensor by Bianca Huisman.

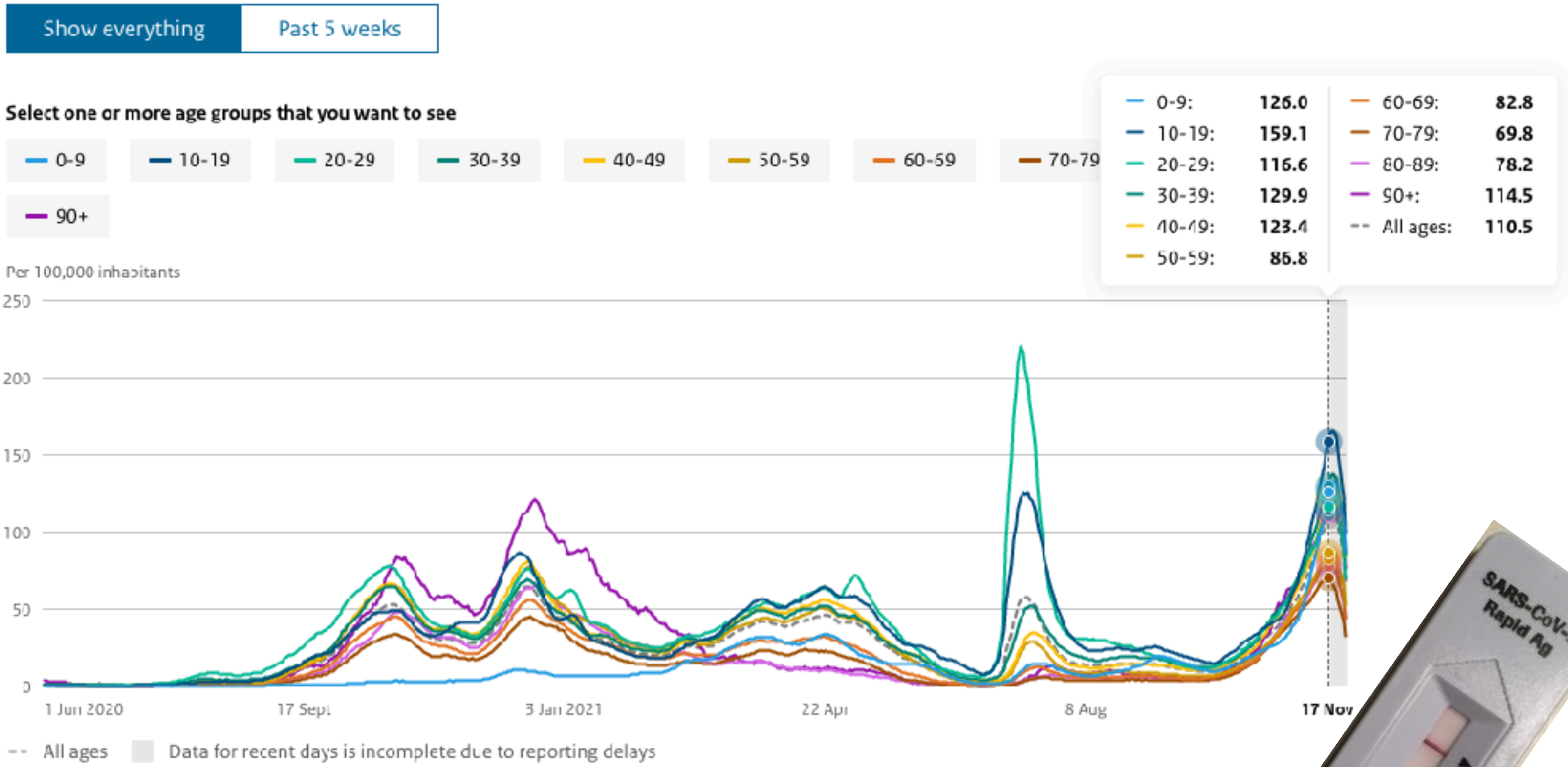
Position of the sensor in human body.

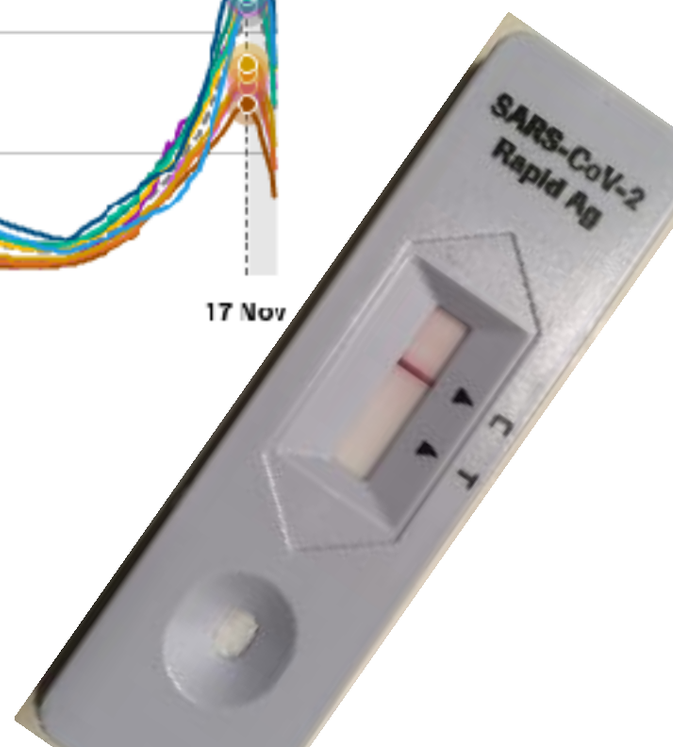


Self-made sensor that captures heartbeat and respiration.

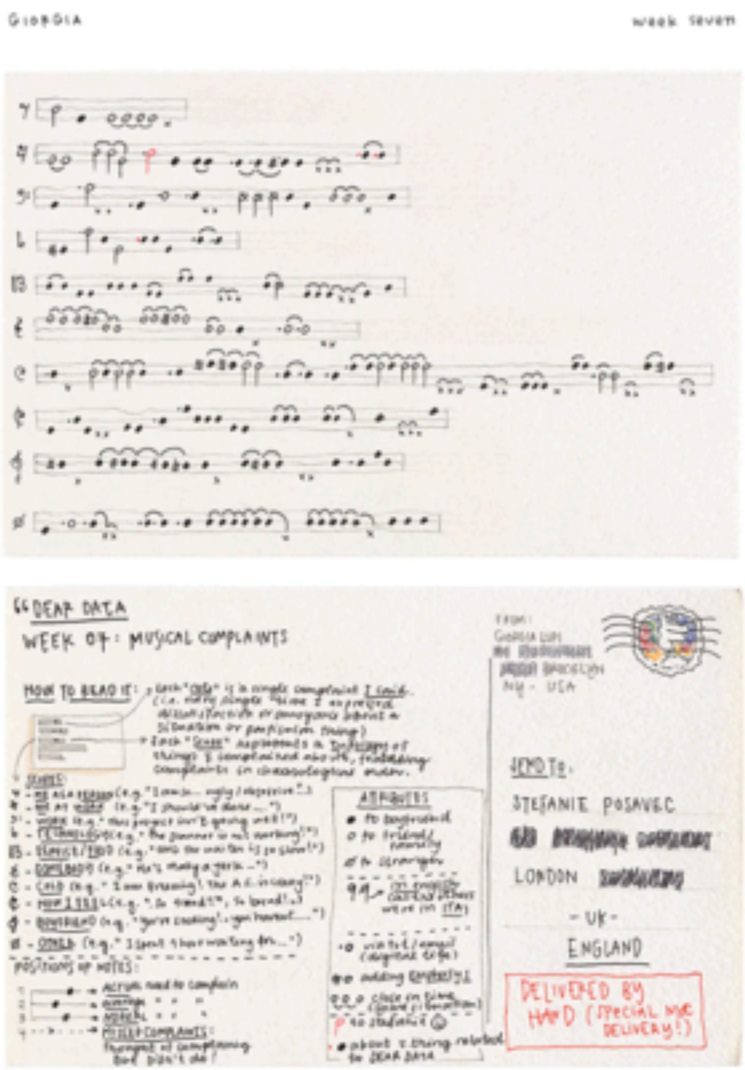


What does (Bio)Data look like?





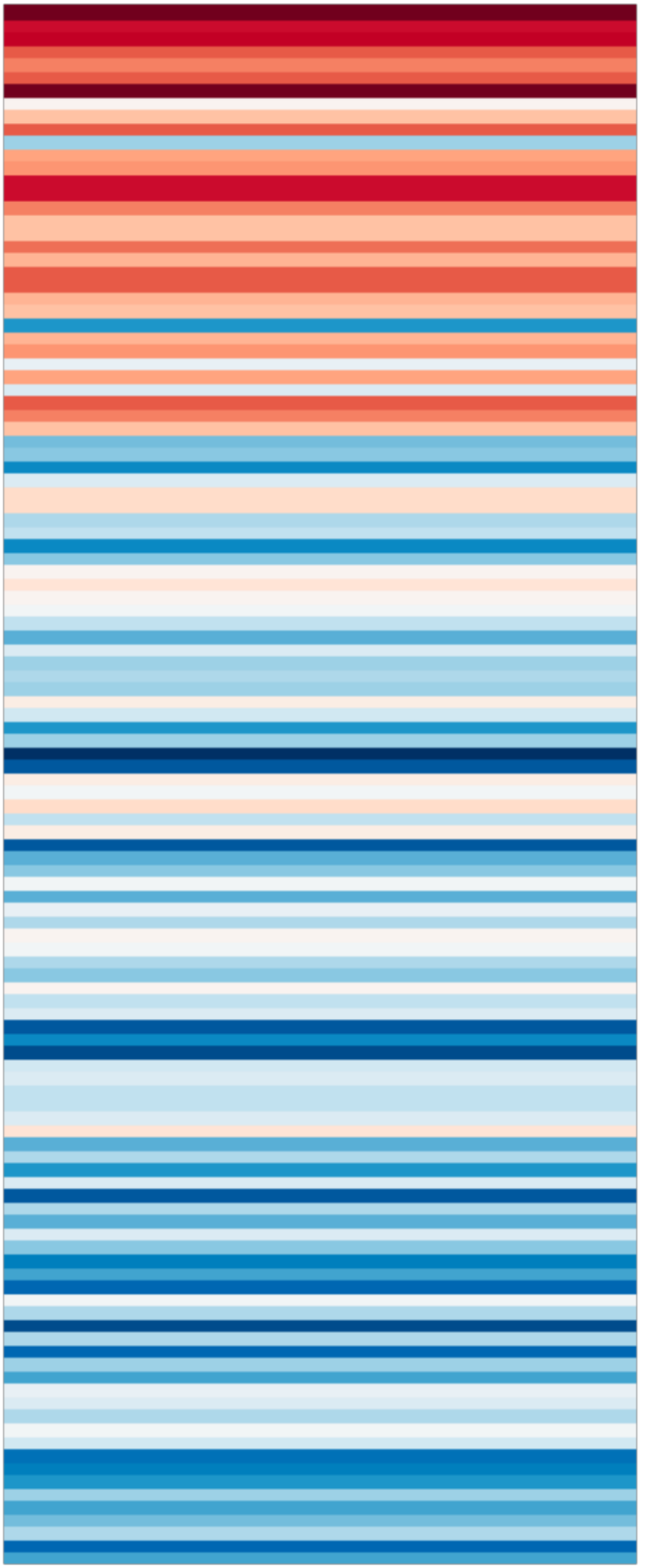
Dear Data

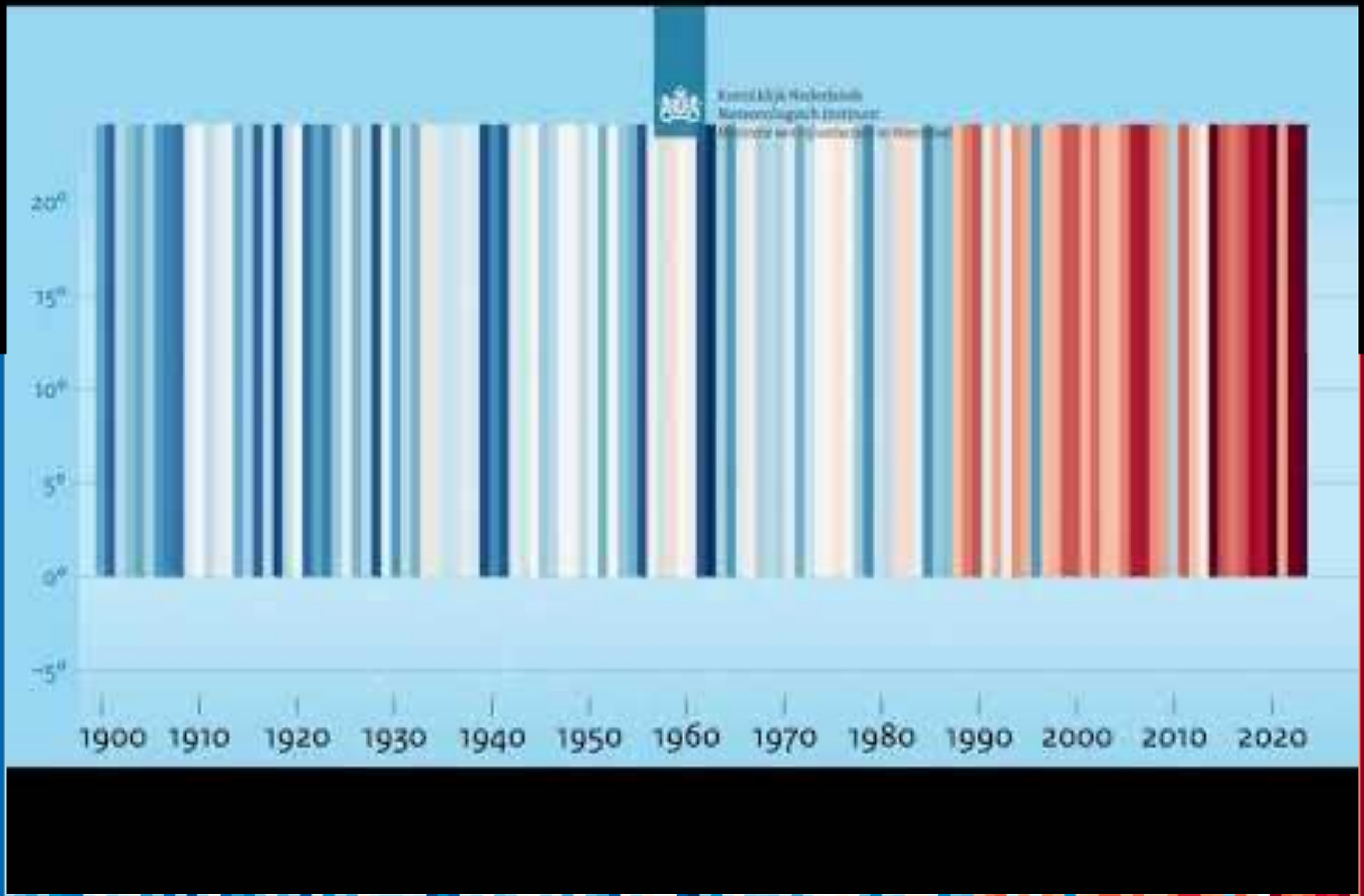


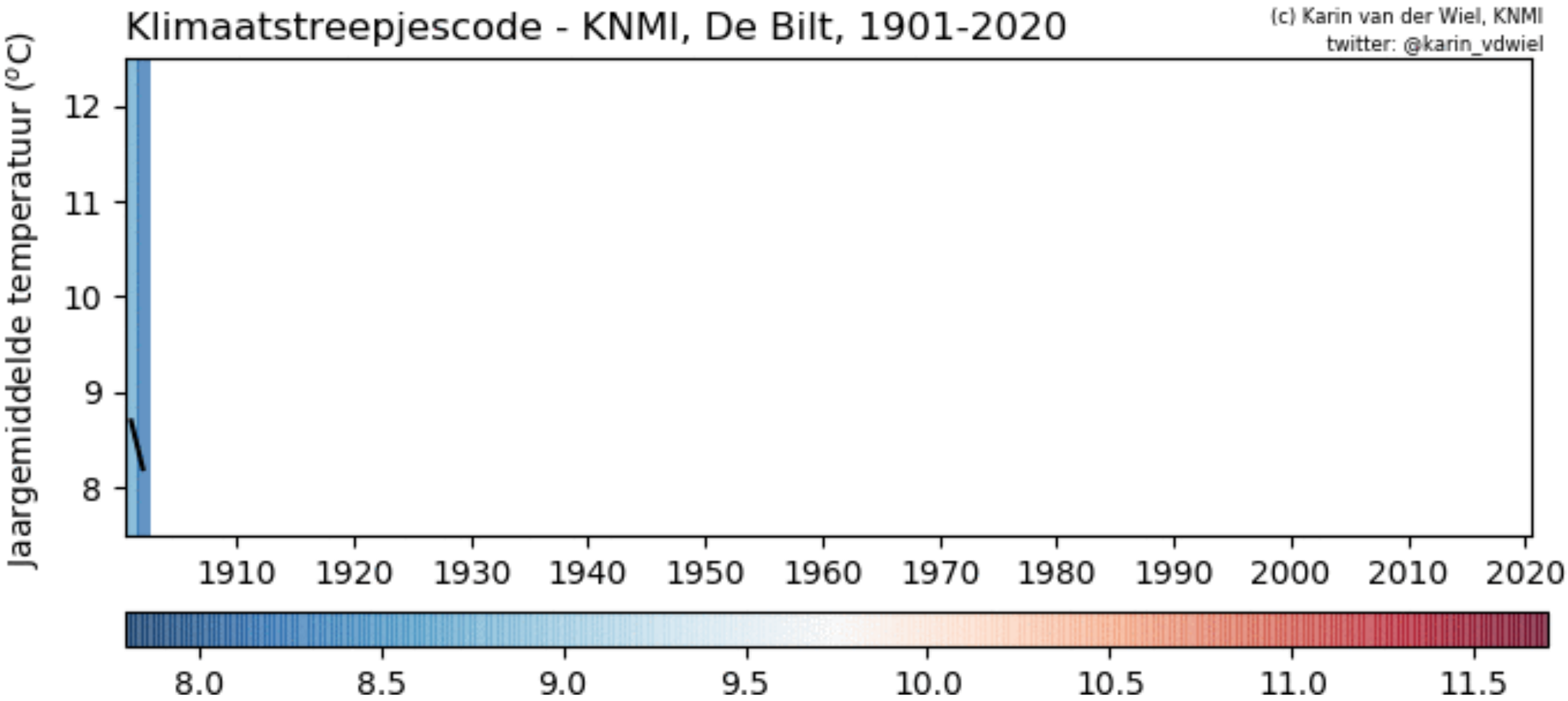
Dear Data - Giorgia Lupi & Stefanie Posavec: *http://www.dear-data.com/theproject*

GIORGIA

Stefanie

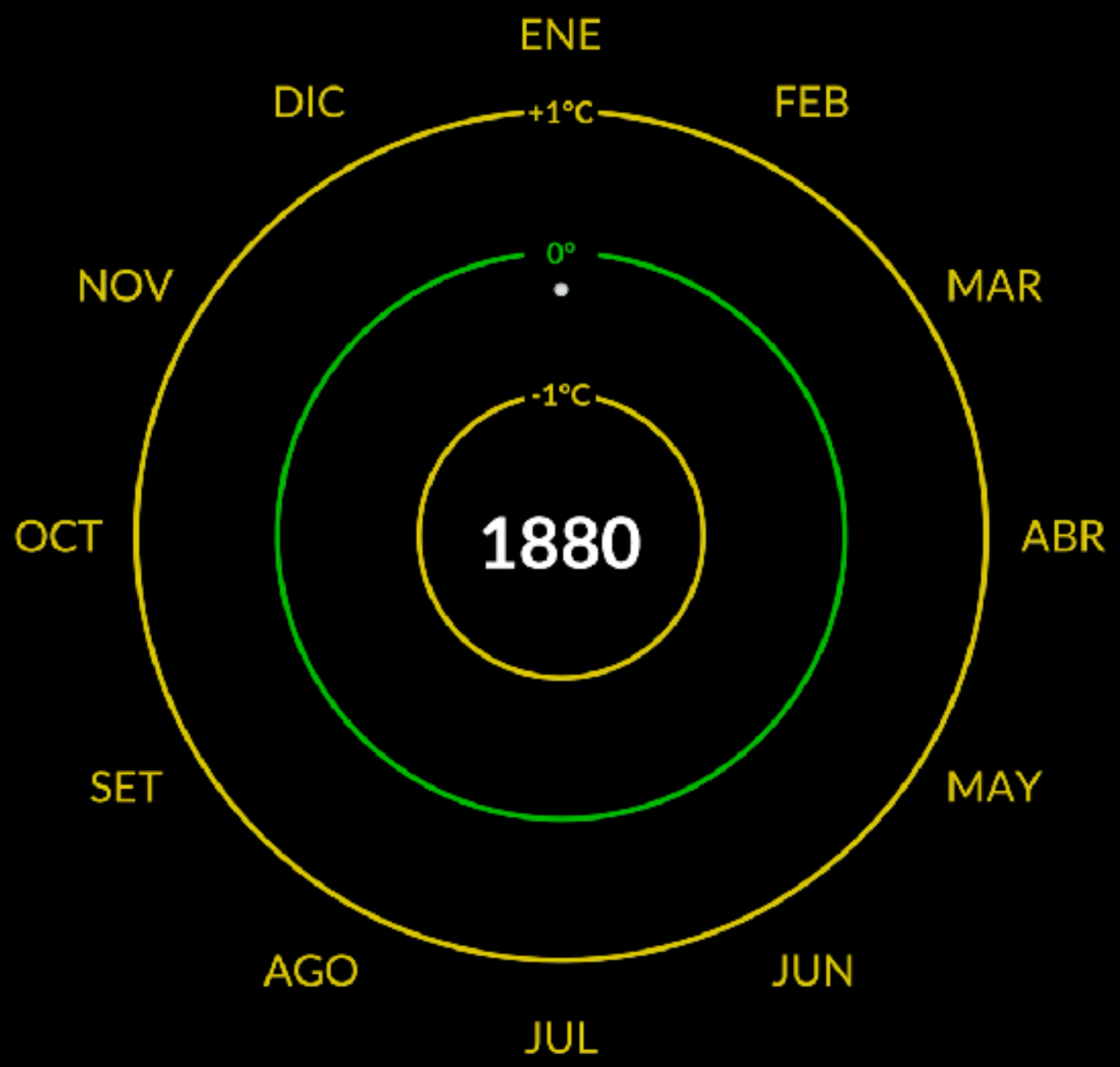



20°
15°
10°
5°
0°
-5°
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020



https://en.wikipedia.org/wiki/Warming_stripes

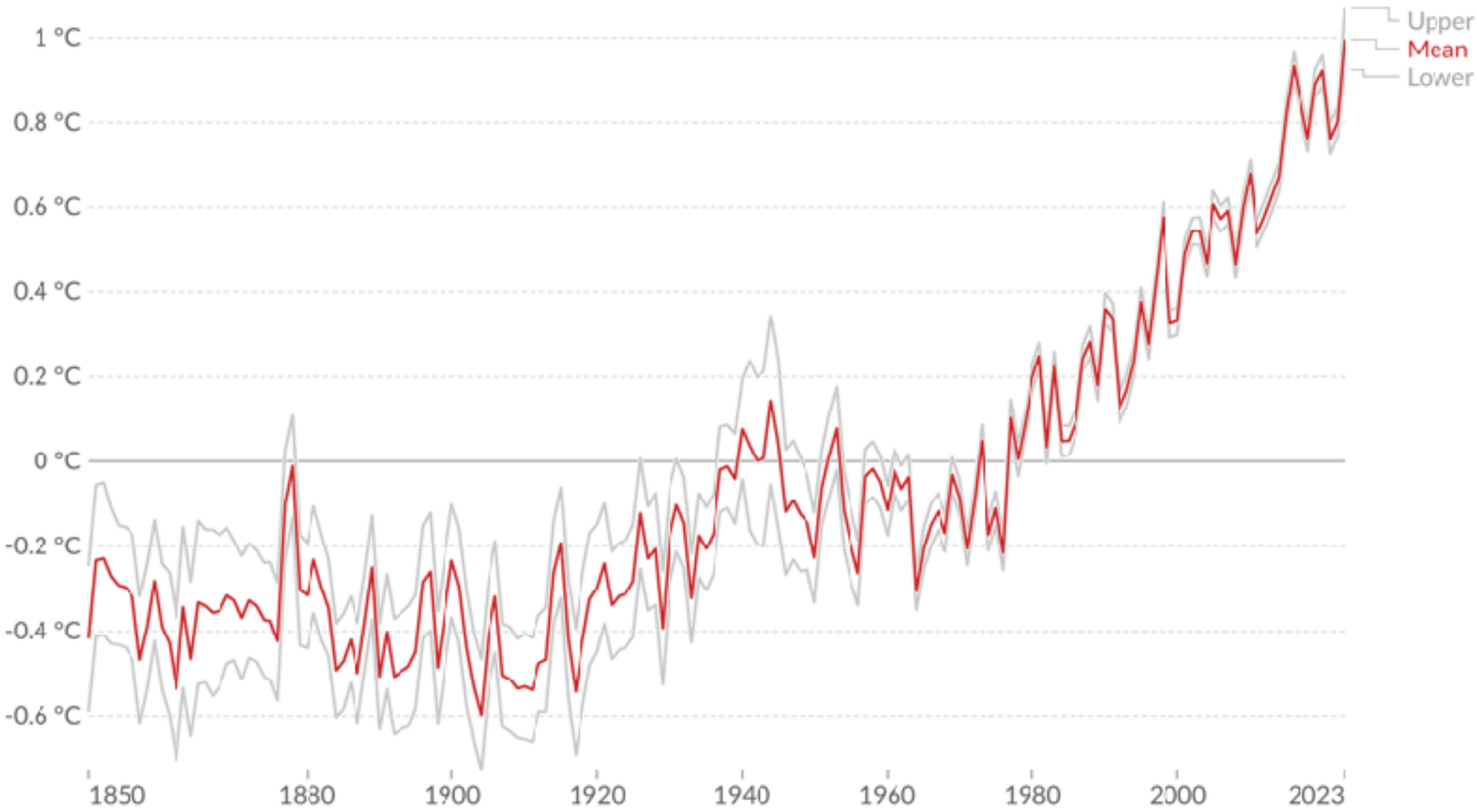
https://www.ableton.com/en/blog/sound-the-alarm-data-sonification-as-a-tool-for-climate-action/


ENE
FEB
MAR
ABR
MAY
JUN
JUL
AGO
SET
OCT
NOV
DIC
+1°C
0°
-1°C
1880

Average temperature anomaly, Global

Our World in Data

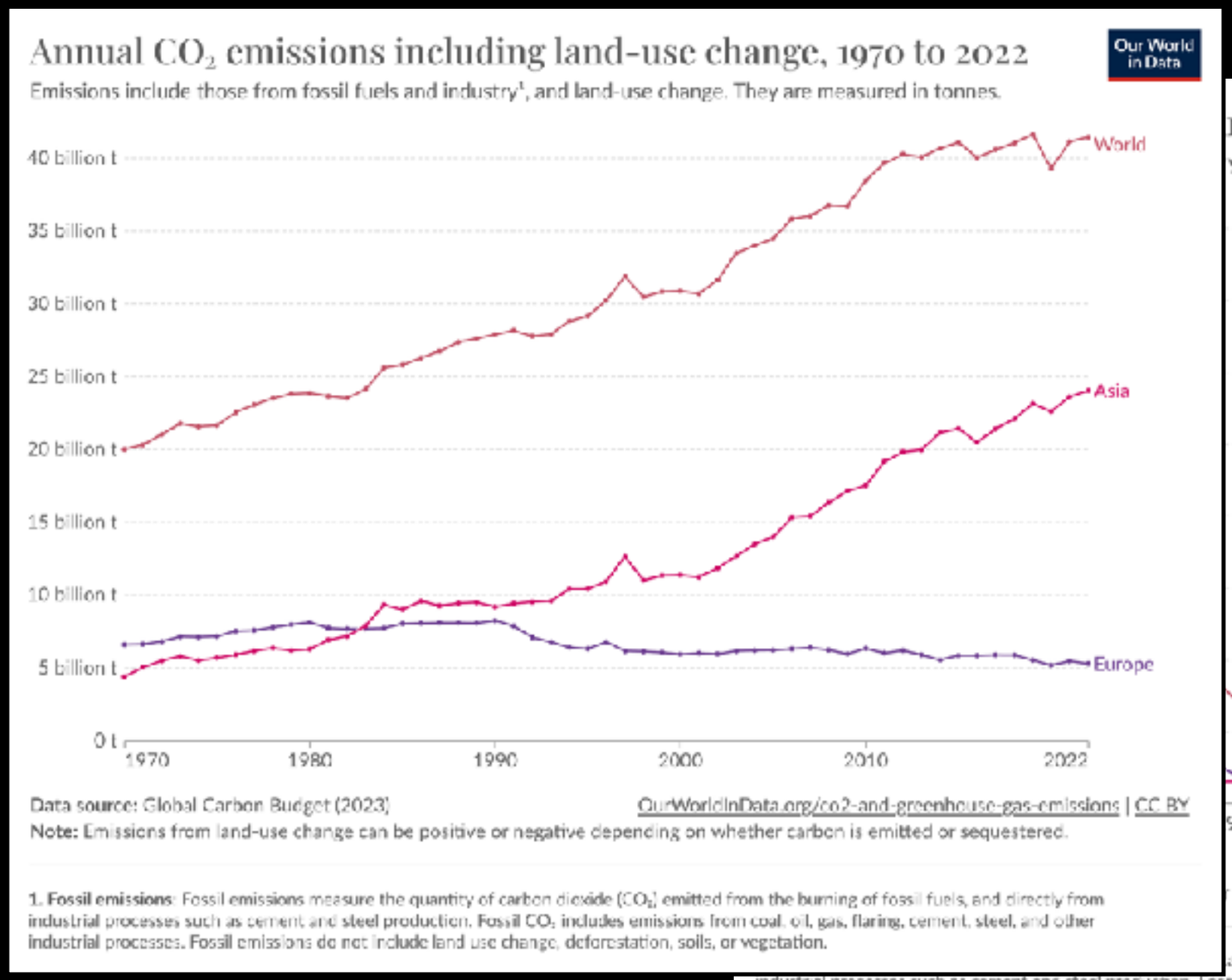
Global average land-sea temperature anomaly relative to the 1961-1990 average temperature.

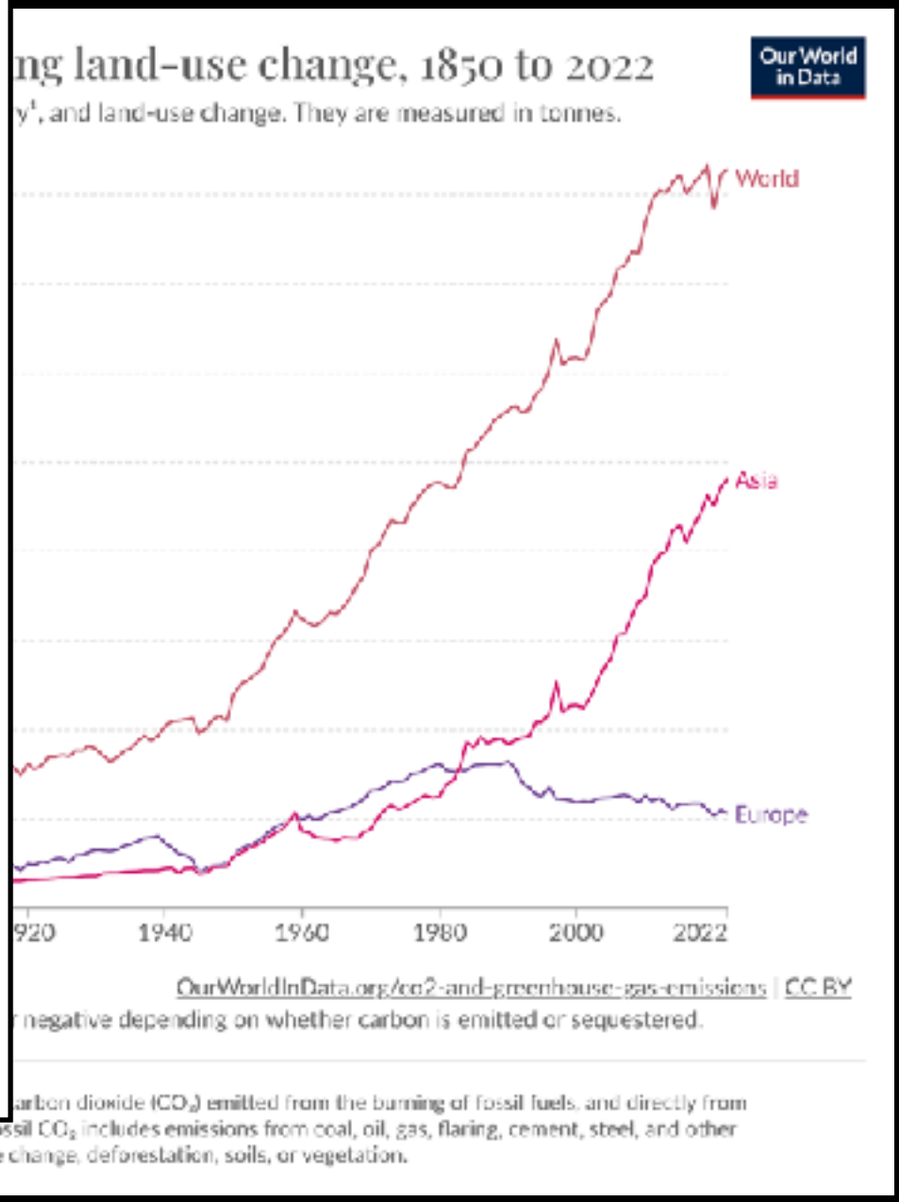


Data source: Met Office Hadley Centre (2023)

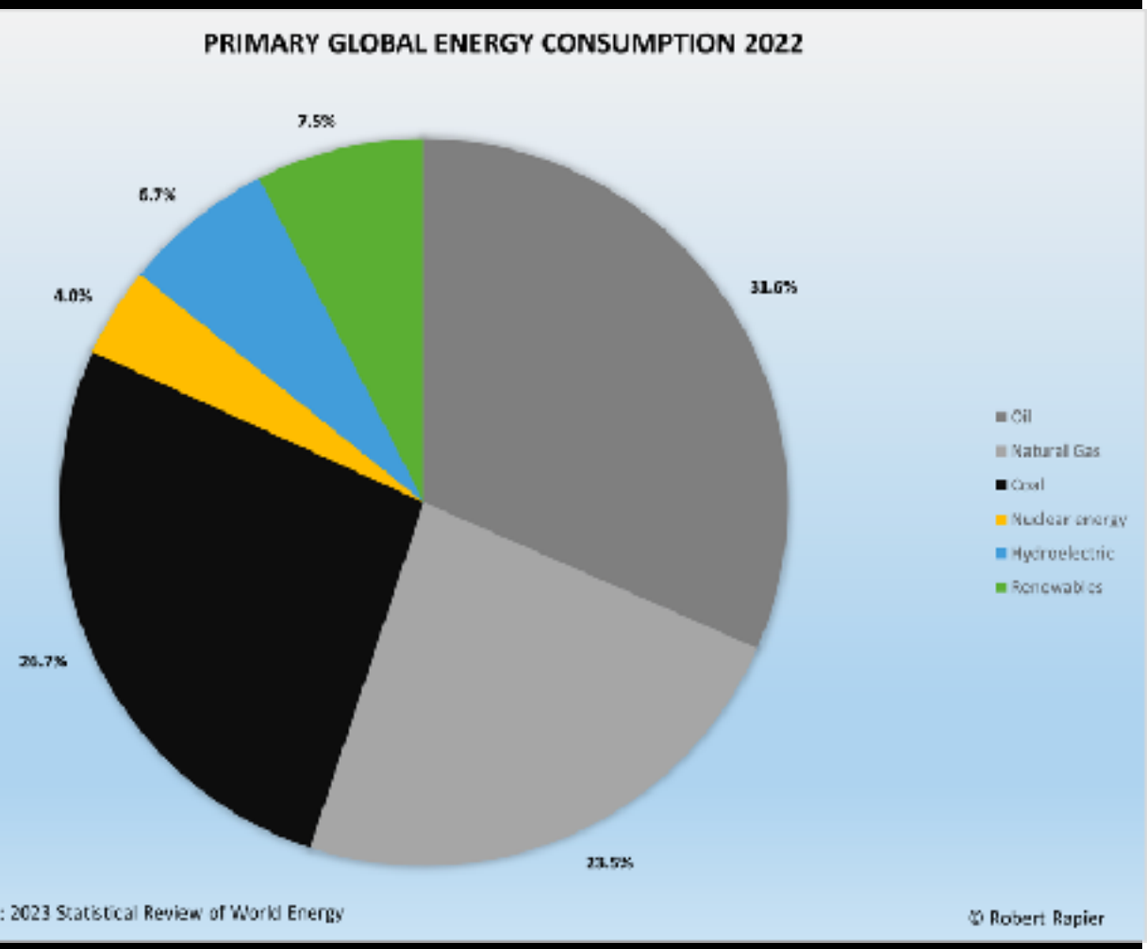
OurWorldInData.org/co2-and-greenhouse-gas-emissions | CC BY

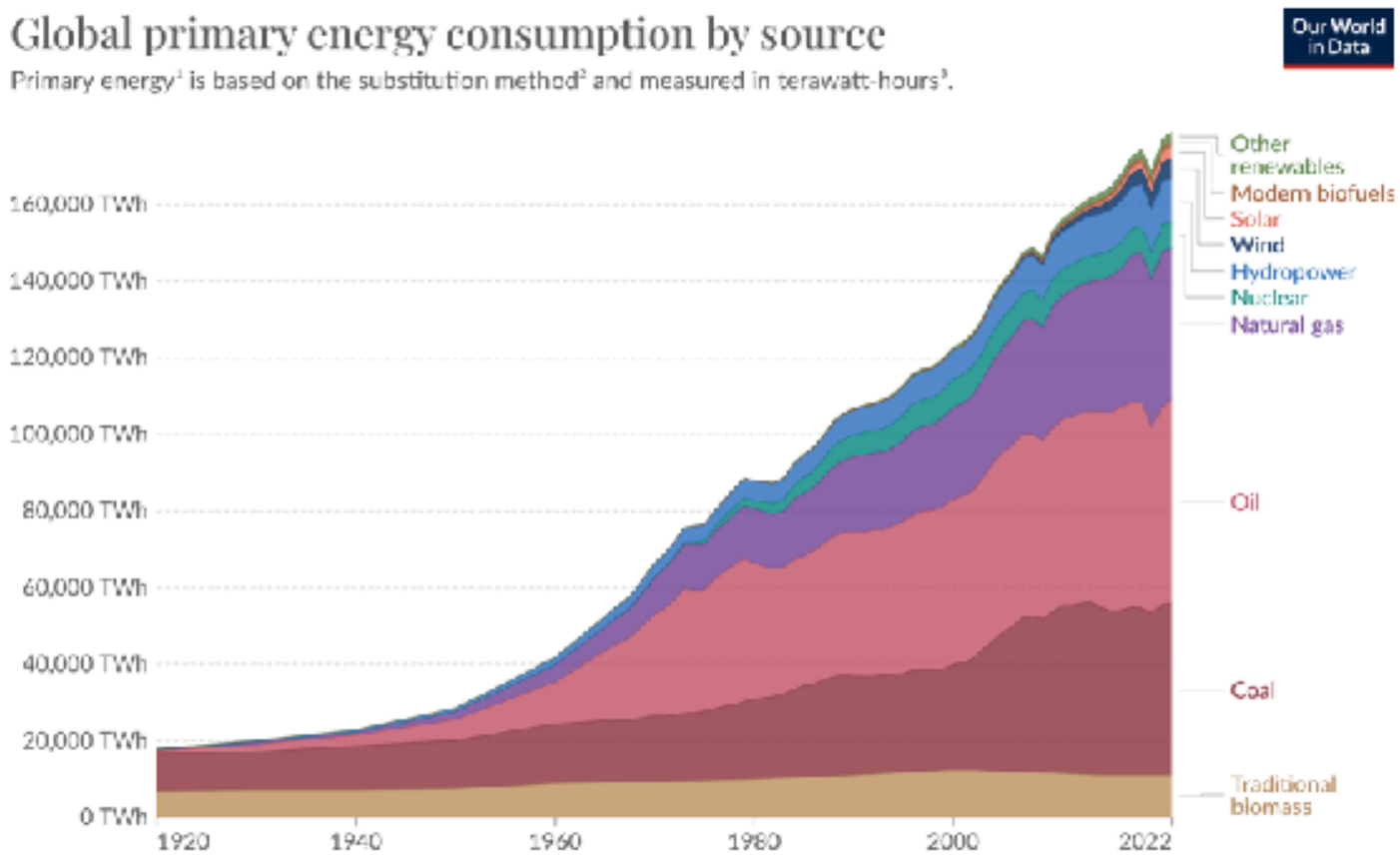
Note: The gray lines represent the upper and lower bounds of the 95% confidence intervals.





https://ourworldindata.org/explorers/co2?facet=none&country=OWID_ASI~OWID_WRL~OWID_EUR&Gas+or+Warming=CO%E2%82%82&Accounting=Territorial&Fuel+or+Land+Use+Change=Fossil+%2B+land+use+change&Count=Per+country&Relative+to+world+total=false





1. **Primary energy:** Primary energy is the energy available as resources – such as the fuels burnt in power plants – before it has been transformed. This relates to the coal before it has been burned, the uranium, or the barrels of oil. Primary energy includes energy that the end user needs, in the form of electricity, transport and heating, plus inefficiencies and energy that is lost when raw resources are transformed into a usable form. You can read more on the different ways of measuring energy in our article.

2. **Substitution method:** The 'substitution method' is used by researchers to correct primary energy consumption for efficiency losses experienced by fossil fuels. It tries to adjust non-fossil energy sources to the inputs that would be needed if it was generated from fossil fuels. It assumes that wind and solar electricity is as inefficient as coal or gas. To do this, energy generation from non-fossil sources are divided by a standard 'thermal efficiency factor' – typically around 0.4. Nuclear power is also adjusted despite it also experiencing thermal losses in a power plant. Since it's reported in terms of electricity output, we need to do this adjustment to calculate its equivalent input value. You can read more about this adjustment in our article.

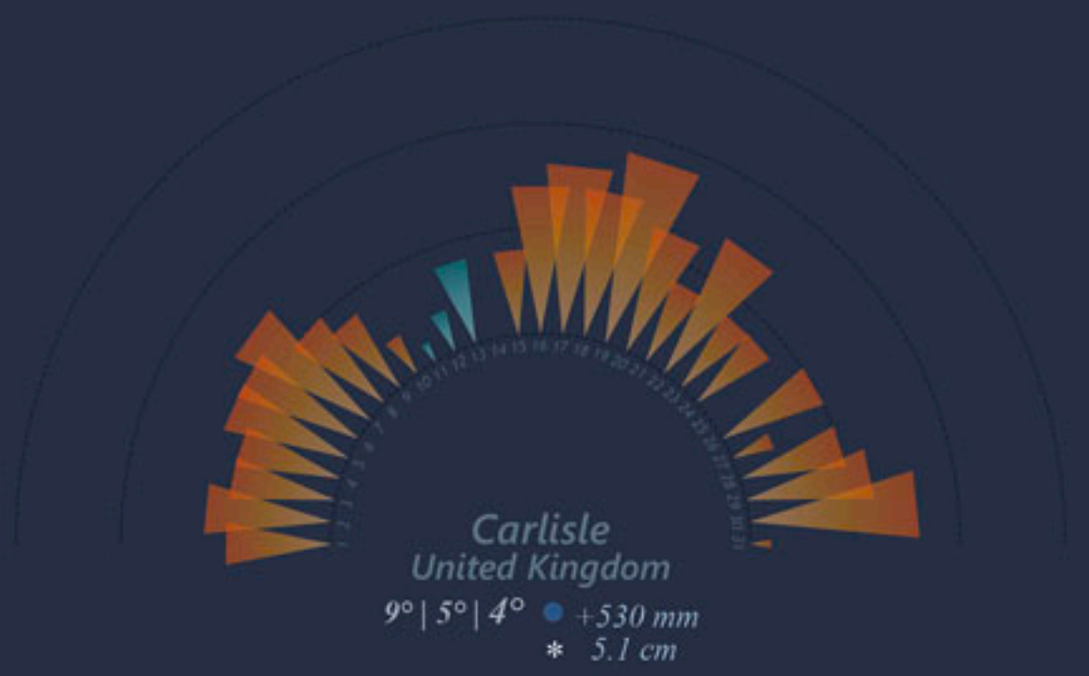
3. **Watt-hour:** A watt-hour is the energy delivered by one watt of power for one hour. Since one watt is equivalent to one Joule per second, a watt-hour is equivalent to 3600 Joules of energy. Metric prefixes are used for multiples of the unit, usually: - kilowatt-hours (kWh), or a thousand watt-hours. - Megawatt-hours (MWh), or a million watt-hours. - Gigawatt-hours (GWh), or a billion watt-hours. - Terawatt-hours (TWh), or a trillion watt-hours.

It's gettin hot out here

2015: WARMEST DECEMBER

HOW TO READ IT

This visualization shows 8 places around the globe chosen for their location in areas where anomalies occured. Shown are the number of °C departing from the average temperature of each December day.

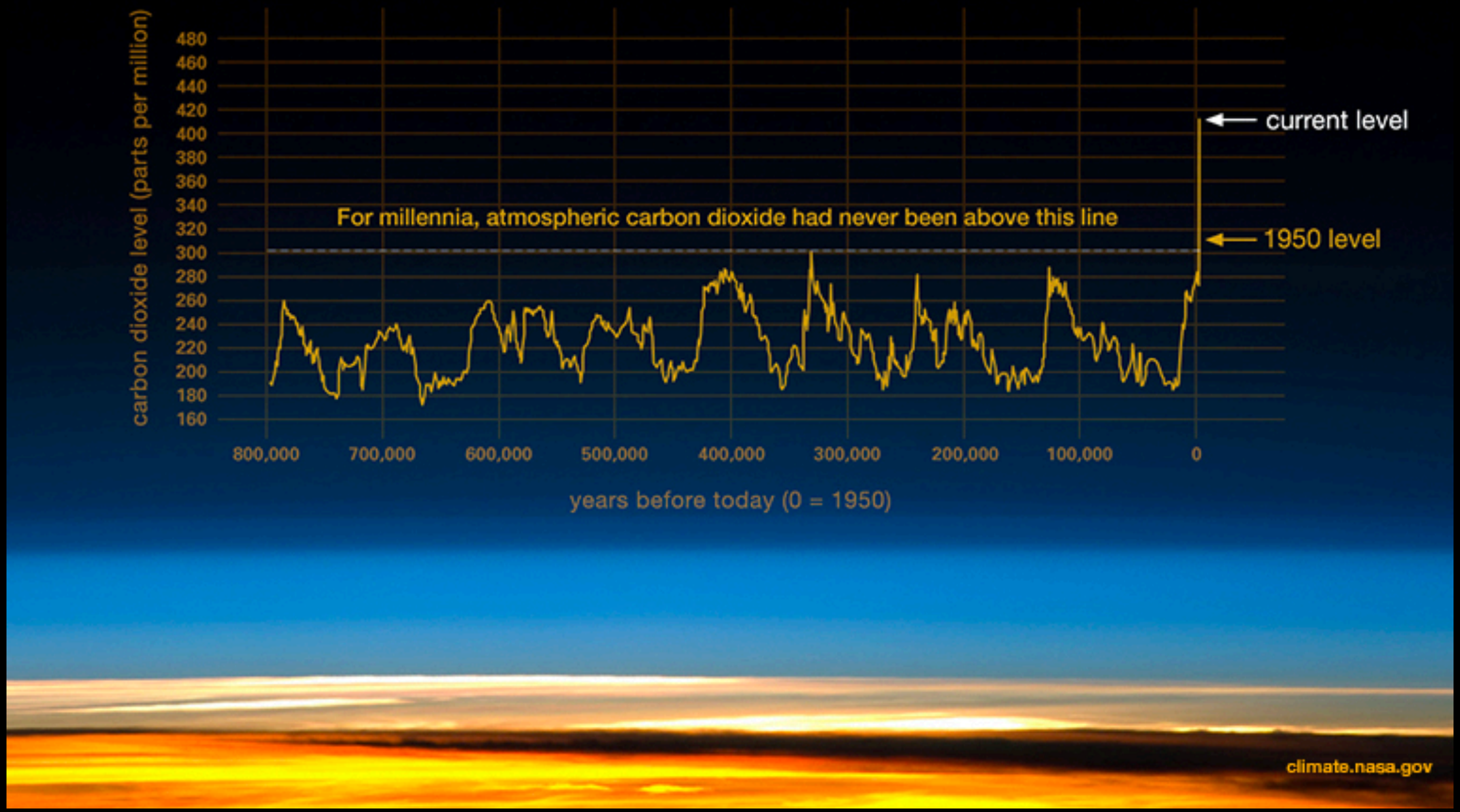


year

1924

CO2,
ppm

~ 325.


carbon dioxide level (parts per million)
480
460
440
420
400
380
360
340
320
300
280
260
240
220
200
180
160
For millennia, atmospheric carbon dioxide had never been above this line
current level
1950 level
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
years before today (0 = 1950)
climate.nasa.gov

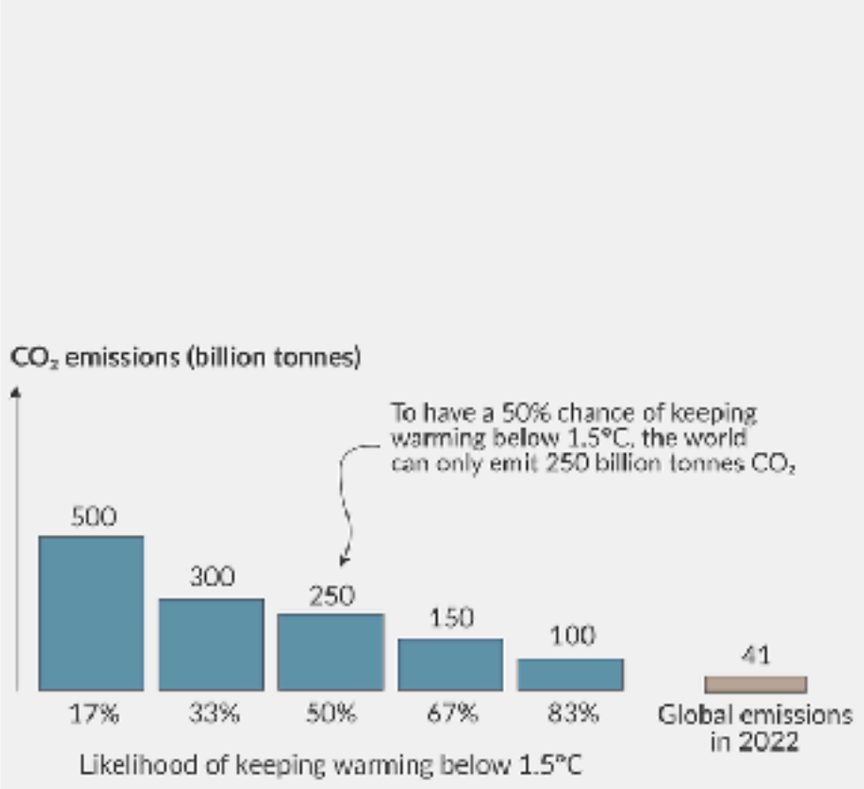
Carbon budget to keep global warming below 1.5°C and 2°C

How much total CO_2 can be emitted to keep global average temperature rise below 1.5C and 2C, compared to pre-industrial temperatures. This is remaining budget from the start of 2023. Current annual emissions from fossil fuels, industry and land use are shown for context.

Our World in Data

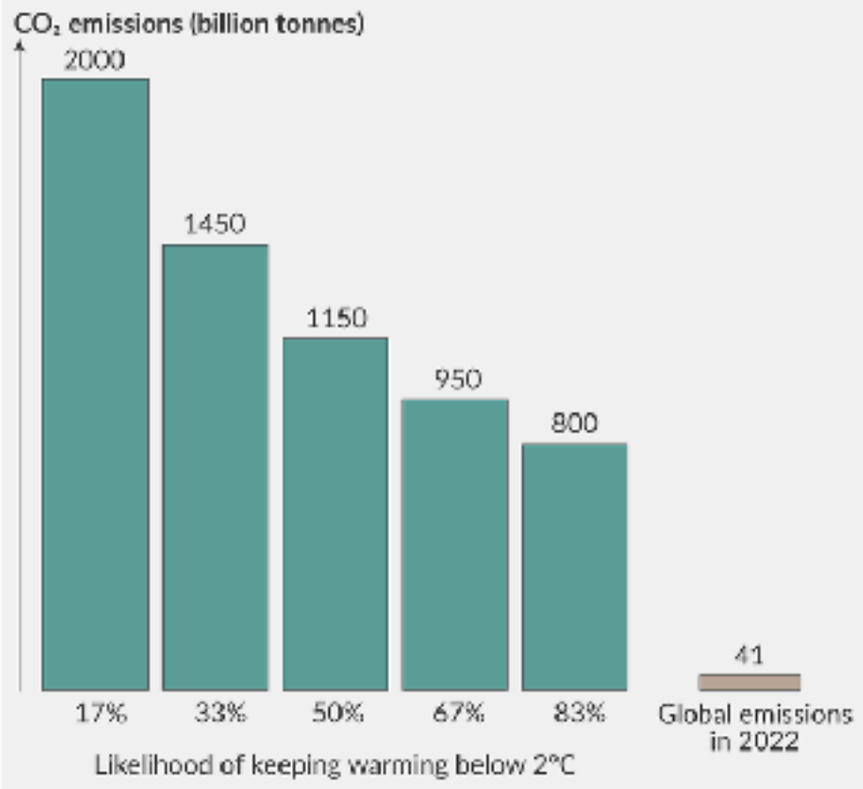
1.5°C

Keeping global average temperature rise below 1.5°C above pre-industrial



2°C

Keeping global average temperature rise below 2°C above pre-industrial



Data source: Budgets from Forster et al. (2023). Current emissions data from the Global Carbon Project.

OurWorldinData.org – Research and data to make progress against the world's largest problems.

Earth ‘well outside safe operating space for humanity’, scientists find

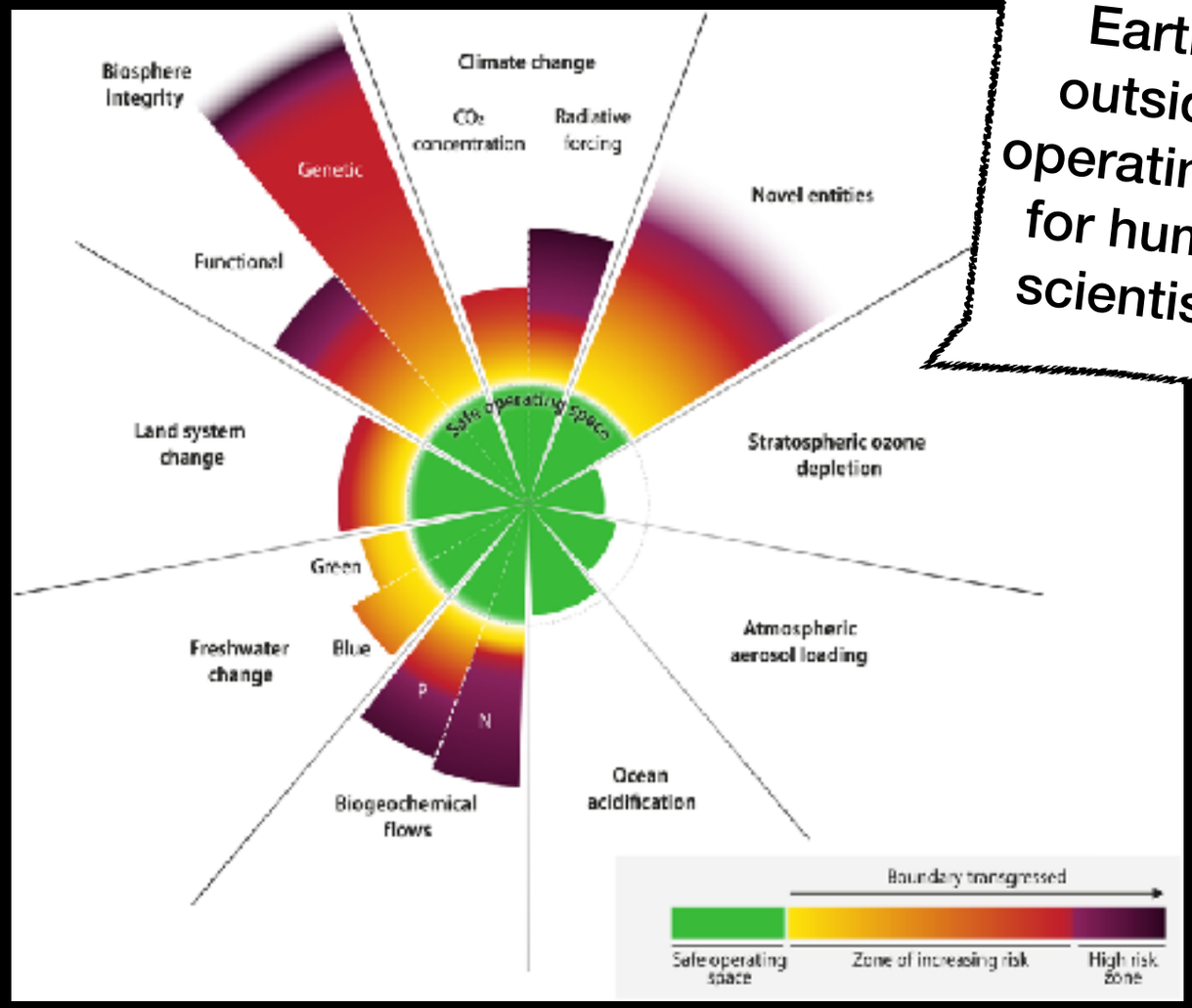


Fig. 1. Current status of control variables for all nine planetary boundaries. https://www.science.org/doi/10.1126/sciadv.adh2458 (13/09/2023)

https://en.wikipedia.org/wiki/Planetary_boundaries

ABP stopt met beleggen in producenten van fossiele brandstoffen

Na klimaatrapporten IPCC en IEA

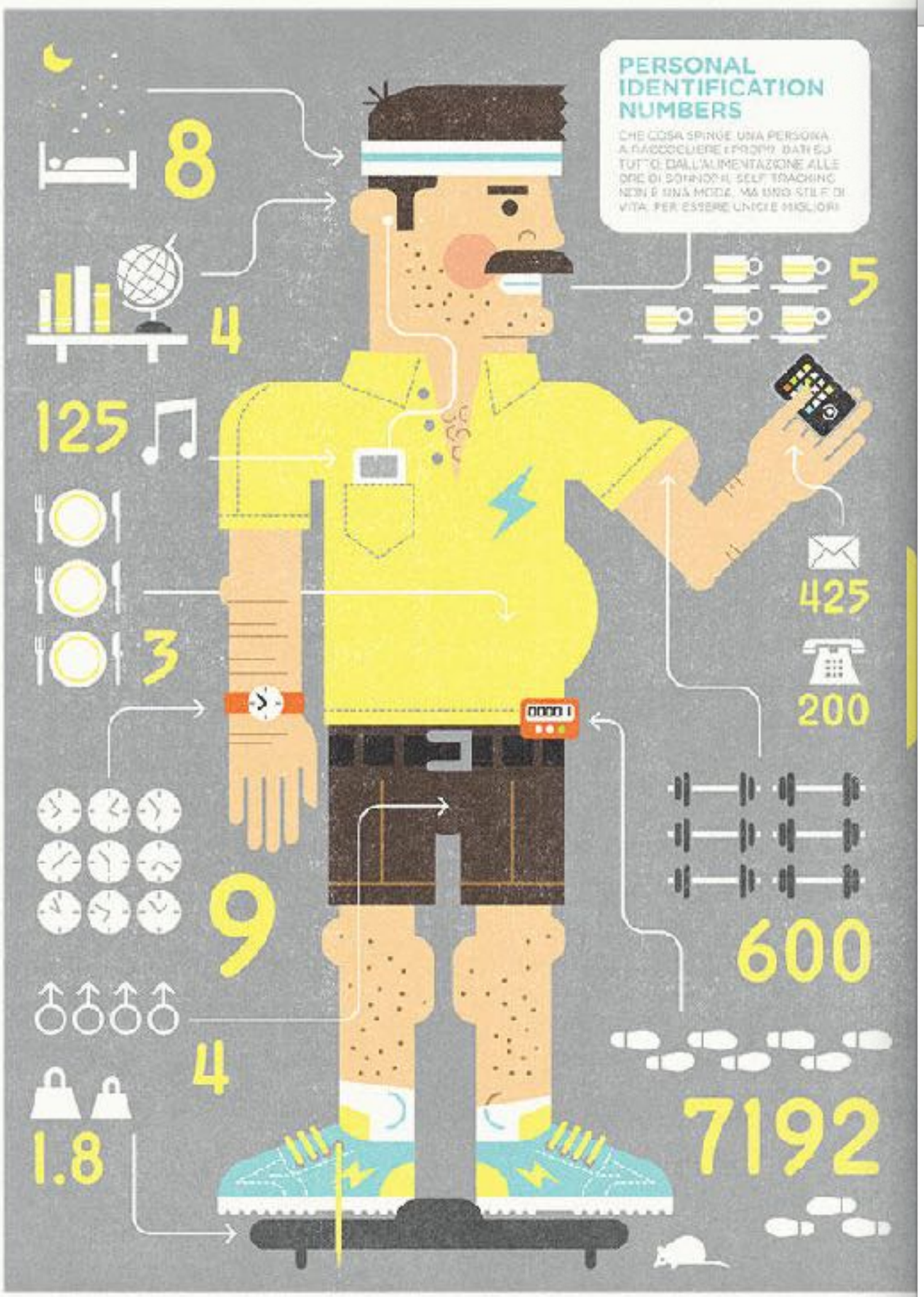
26 oktober 2021

We trekken ons terug uit beleggingen in producenten van fossiele brandstoffen (olie, gas en kolen). Dit heeft het bestuur van ABP besloten na onlangs verschenen klimaatrapporten. Voor het besluit is veel steun. Veel deelnemers en werkgevers wilden al langer dat we zouden stoppen met beleggen in fossiele brandstoffen.

We verkopen de beleggingen stap voor stap. De laatste zullen naar verwachting in het eerste kwartaal van 2023 verkocht zijn. In totaal gaat het om een belegd vermogen van ruim 15 miljard euro, bijna 3% van ons totaal belegd vermogen. We verwachten dat dit besluit geen negatief effect heeft op het langjarig rendement en uw pensioen heeft.

Gevolgen van opwarming zijn wereldwijd merkbaar

ABP baseert haar klimaatbeleid sinds 2015 op de inzichten van het VN-klimaatpanel (IPCC). Het recente IPCC-rapport laat zien dat mensen wereldwijd nu al de fysieke gevolgen van klimaatverandering ondervinden en dat zonder steviger ingrijpen de opwarming van de aarde op een onacceptabel niveau uitkomt. Om de opwarming tegen te gaan moet de CO2-uitstoot snel en ingrijpend omlaag.



quantifiedself.com

QUANTIFIED SELF
SELF KNOWLEDGE THROUGH NUMBERS

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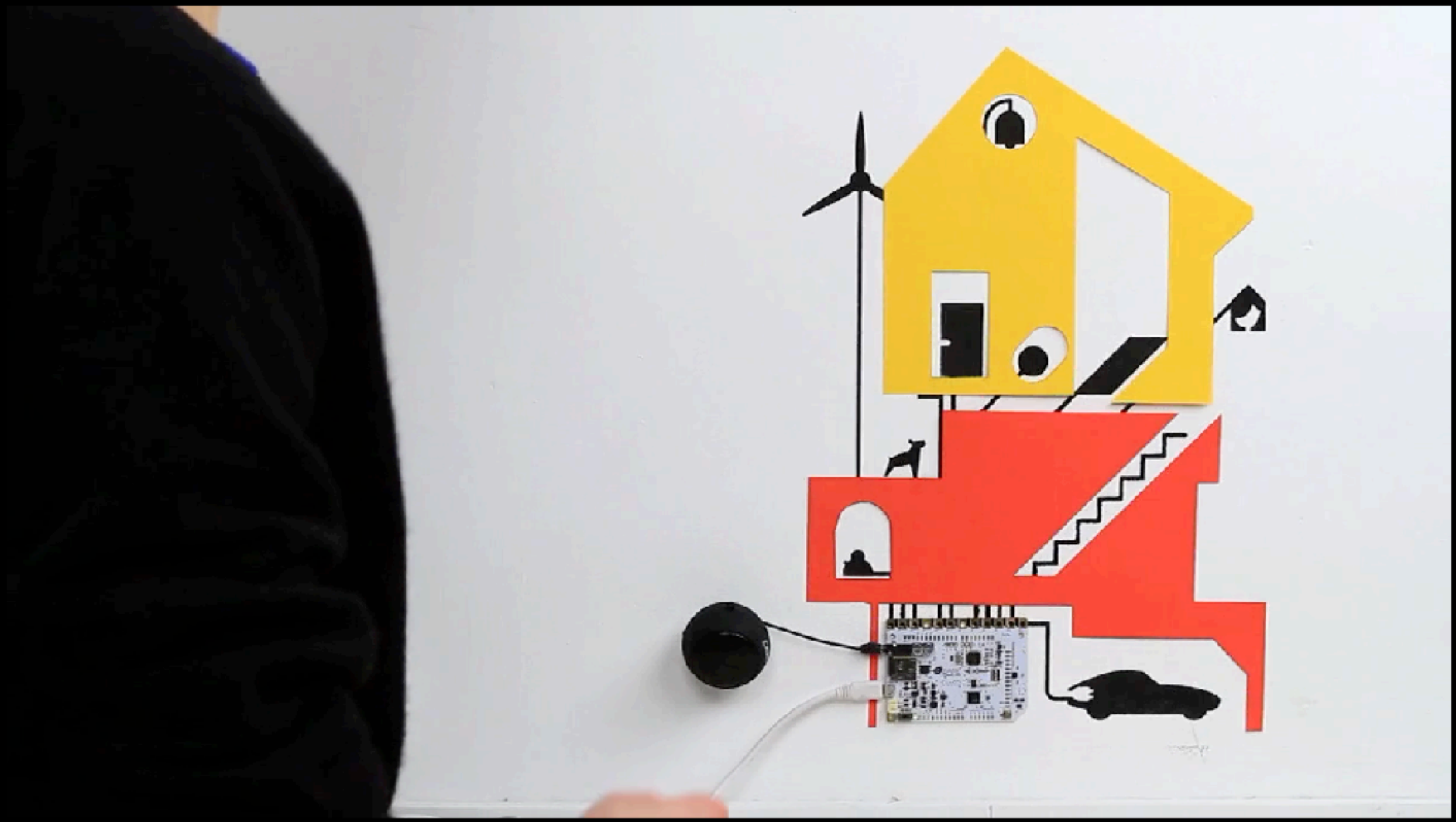
The Entire History of You - Black Mirror

Be Right Back - Black Mirror

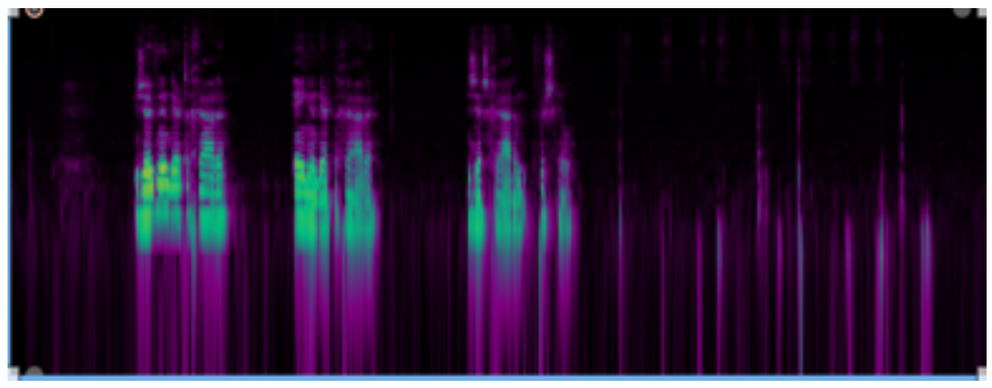


📊 Quantify thyselve ! 📊

This week: collect data about yourself **DAILY** and **visualise**, **physicalise**, or **sonify** it

Bring your visualisation, physicalisation or sonification for the next session.

A few other examples:



Kwantificeer uzelve !

Waag x Hogeschool van Amsterdam (2018) – Zichtbaar Slimmer

Thorsten Kiesl, Harald Moser, and Timm-Oliver Wilks (2007) – Garden of Eden

Mother of Sara Weber (2019) – Self Knitted Scarf of Train Delays

Meer datafysicalisatie-projecten op: http://dataphys.org/list/gallery/

Kwantificeer uzelve !

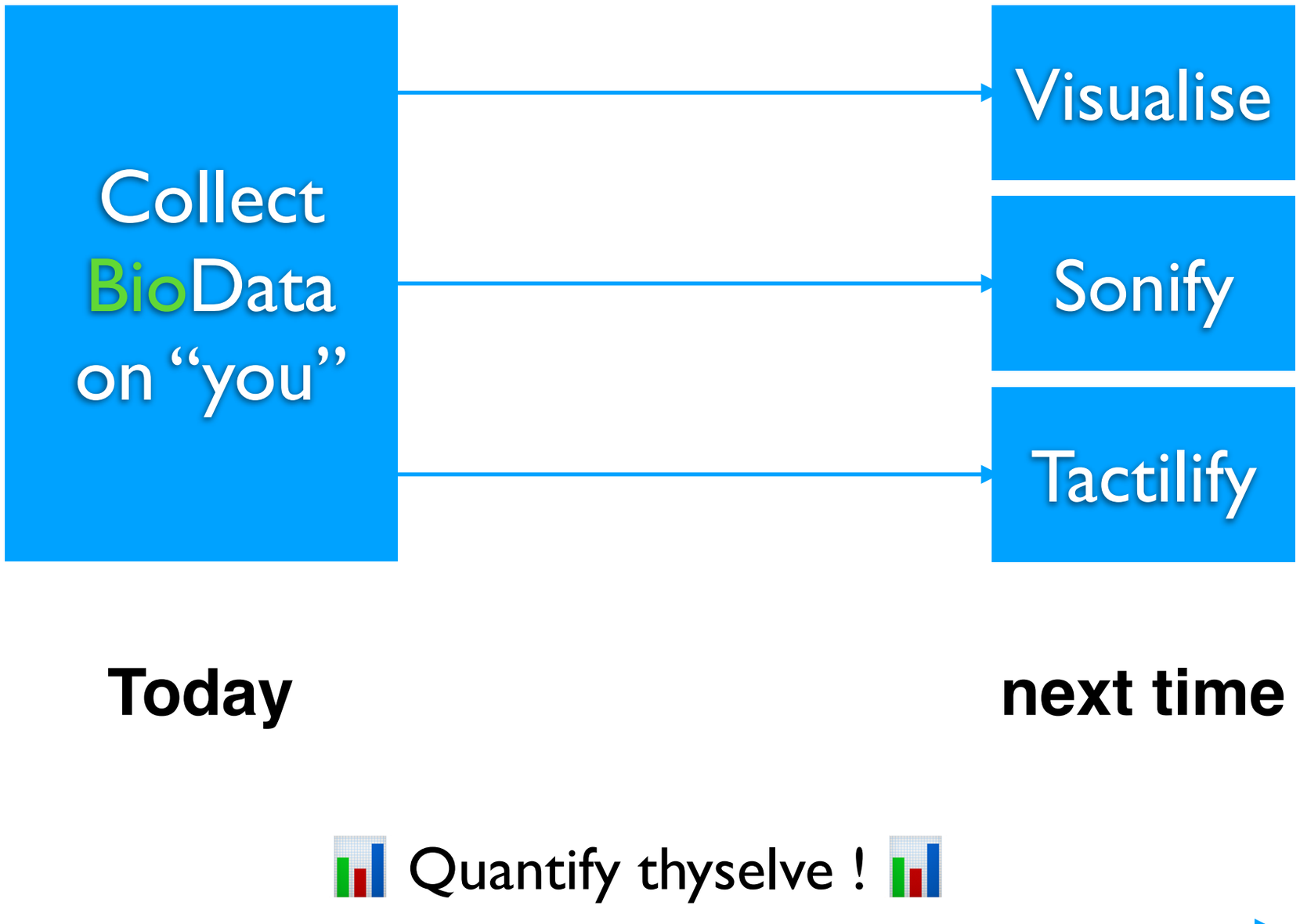
NASA (2020) – Bullet Cluster Sonification

Datavized (2013) – Basque Country EUSTAT 'SONG of the Day"

Karina Nguien (2021) – US population of adults living below the poverty threshhold

Meer sonificatieprojecten op https://soundcloud.com/datavized
Gratis online datasonificatietool: https://twotone.io/

Assignment


Collect
BioData
on “you”
Visualise
Sonify
Tactilify
Today
next time
Quantify thyselve !

Bio-data (zweten is weten)

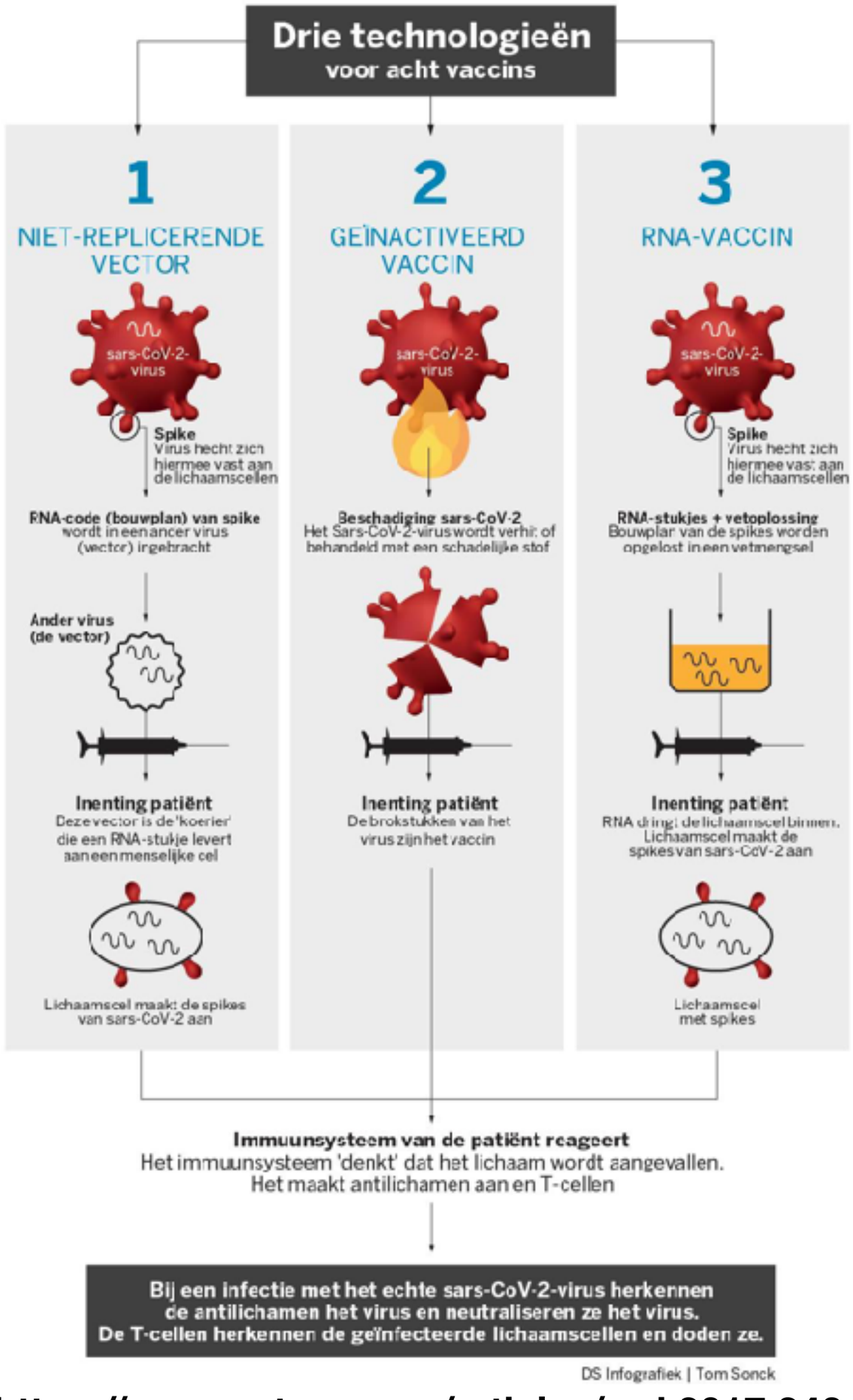
- EEG
- ECG
- EMG
- Galvanic Skin Conductance
- Breath
- Blood Pressure
- etc...

Eindopdracht

Grofweg:

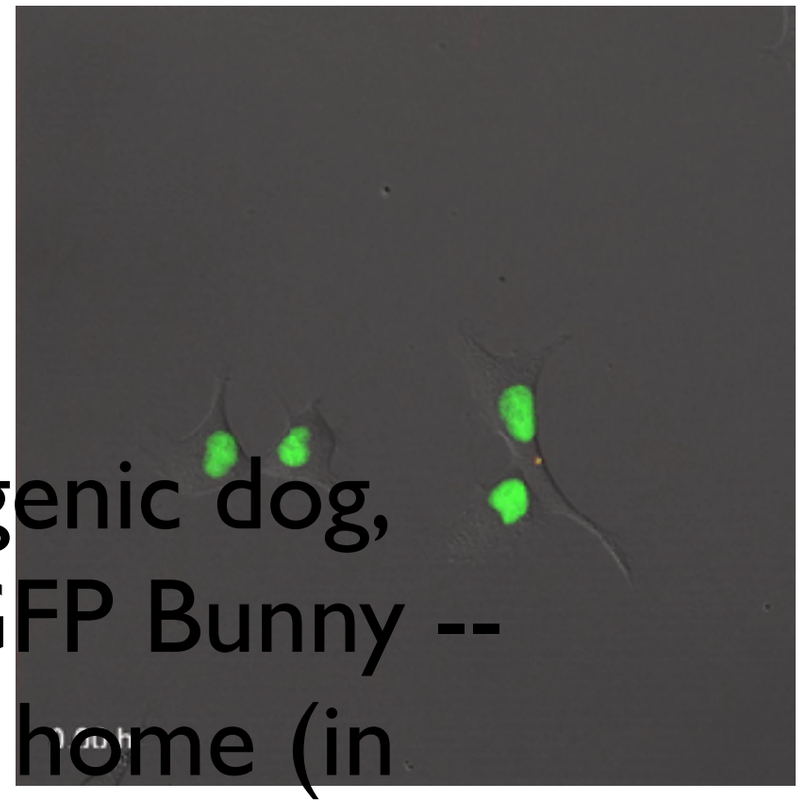
Ontwerp in een groep (2-4) een interactief audiosysteem met een bepaald doel op basis van samengestelde variabele van (bio)data.

Wat is BioHacking ?



https://www.nature.com/articles/nrd.2017.243

BioHack : Eduardo Kac



2000 : Transgenic Bunny

1998 (ongoing) GFP K-9
aspires to create a healthy transgenic dog, integrate it socially and -- as in GFP Bunny -- provide him or her with a loving home (in this case, the artist's own)

http://www.ekac.org/timcap.html

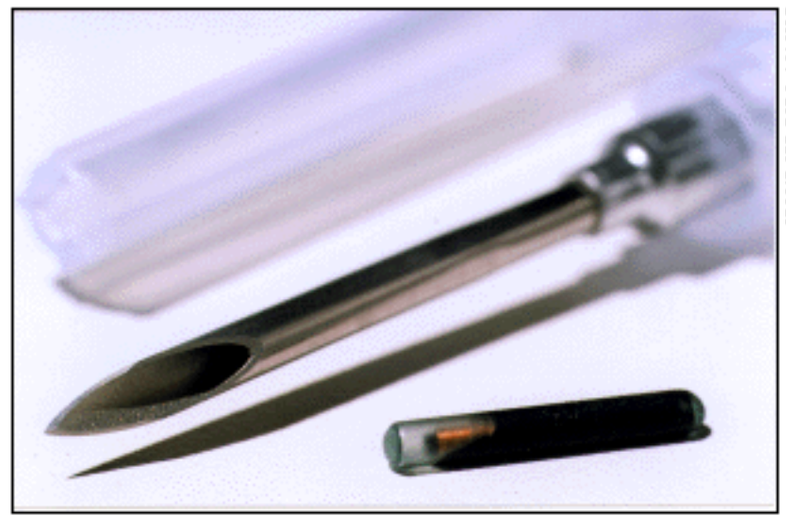


Photo: Casa das Rosas

Needle and microchip used in "Time Capsule," Eduardo Kac, 1997

Bio Art

“ .. onderdeel van een recente ontwikkeling in de hedendaagse kunst, waarbij kunstenaars werken met organismen, of processen van biotechnologie, zoals genetische modificatie.”

De Engelse benaming "BioArt" is in 1997 gemunt door Eduardo Kac om zijn kunstwerk Time Capsule te beschrijven.

https://nl.wikipedia.org/wiki/Bio-kunst
http://www.ekac.org/timcap.html

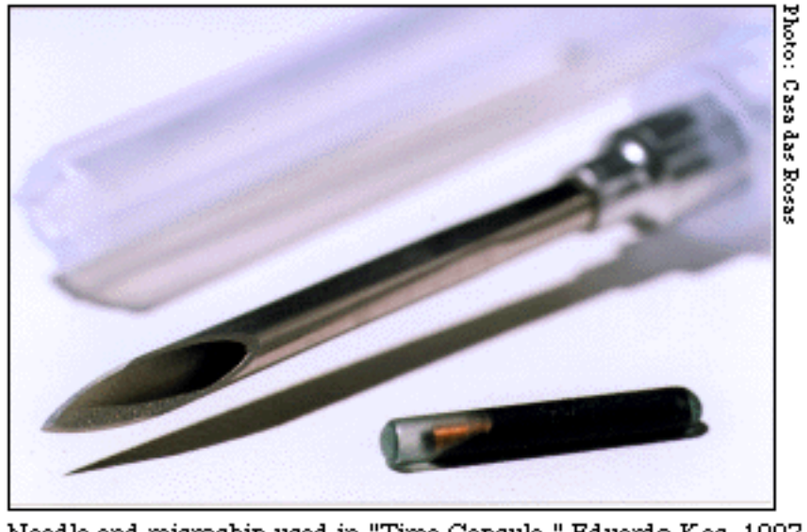
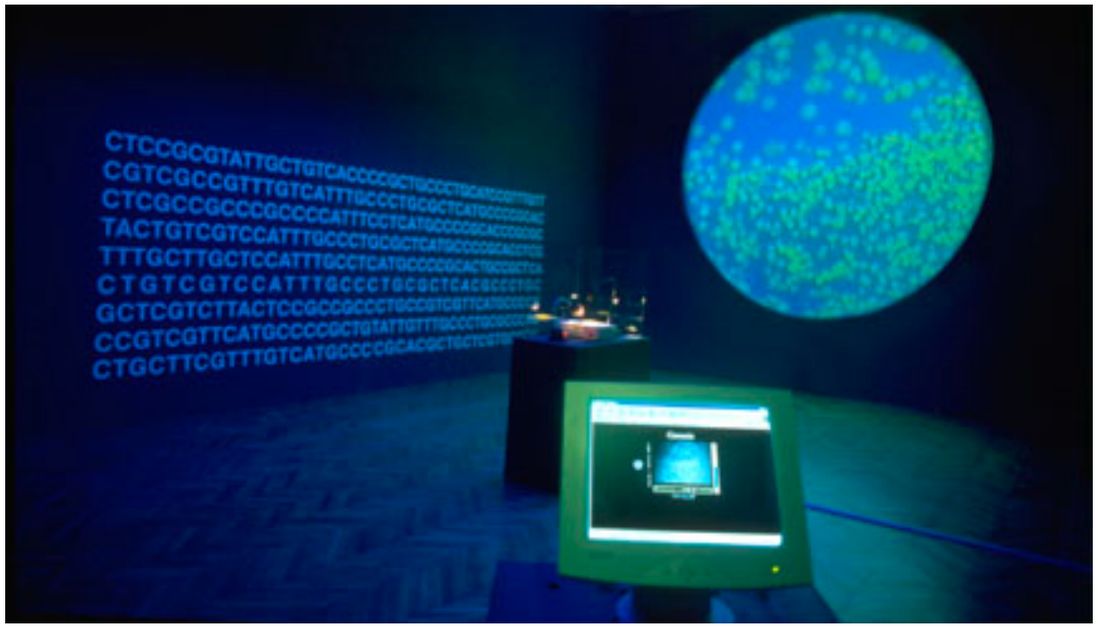


Photo: Casa das Rosas

Needle and microchip used in "Time Capsule," Eduardo Kac, 1997

Eduardo Kac : GENESIS



https://youtu.be/3LSJVD0m1Mg?t=1926

https://youtu.be/vQgWYQBkNBk

ORLAN

Que le cheval vive en moi *(May the horse live in me)*

Marion Laval-Jeantet

Art Orienté objet, Que le cheval vive en moi, 2011. Photo: Miha Fras

https://www.wired.com/2011/08/horse-blood-art/

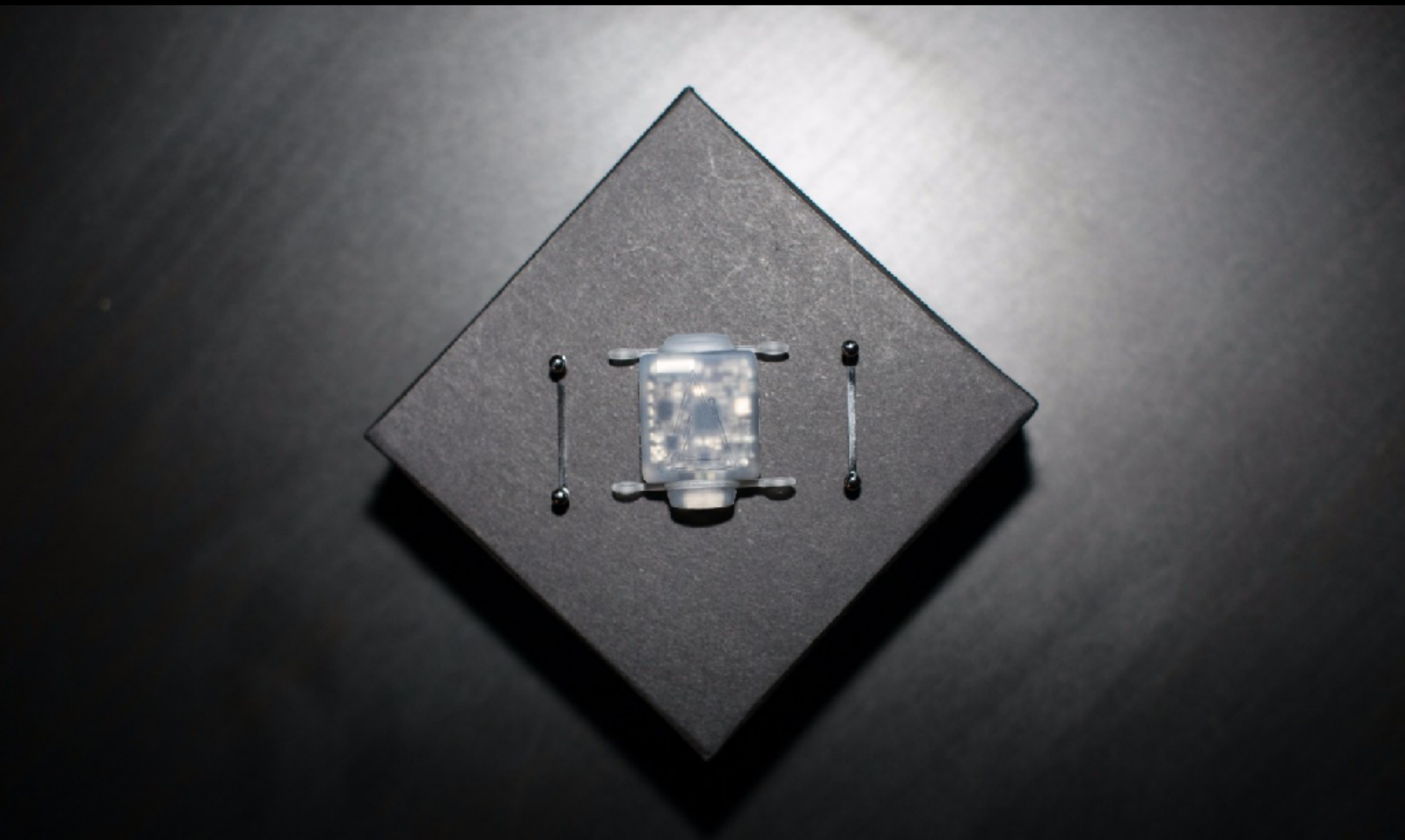
One more thing…

Do try this at home!

But please be a little careful with the phenomenon called ‘biohacking’.

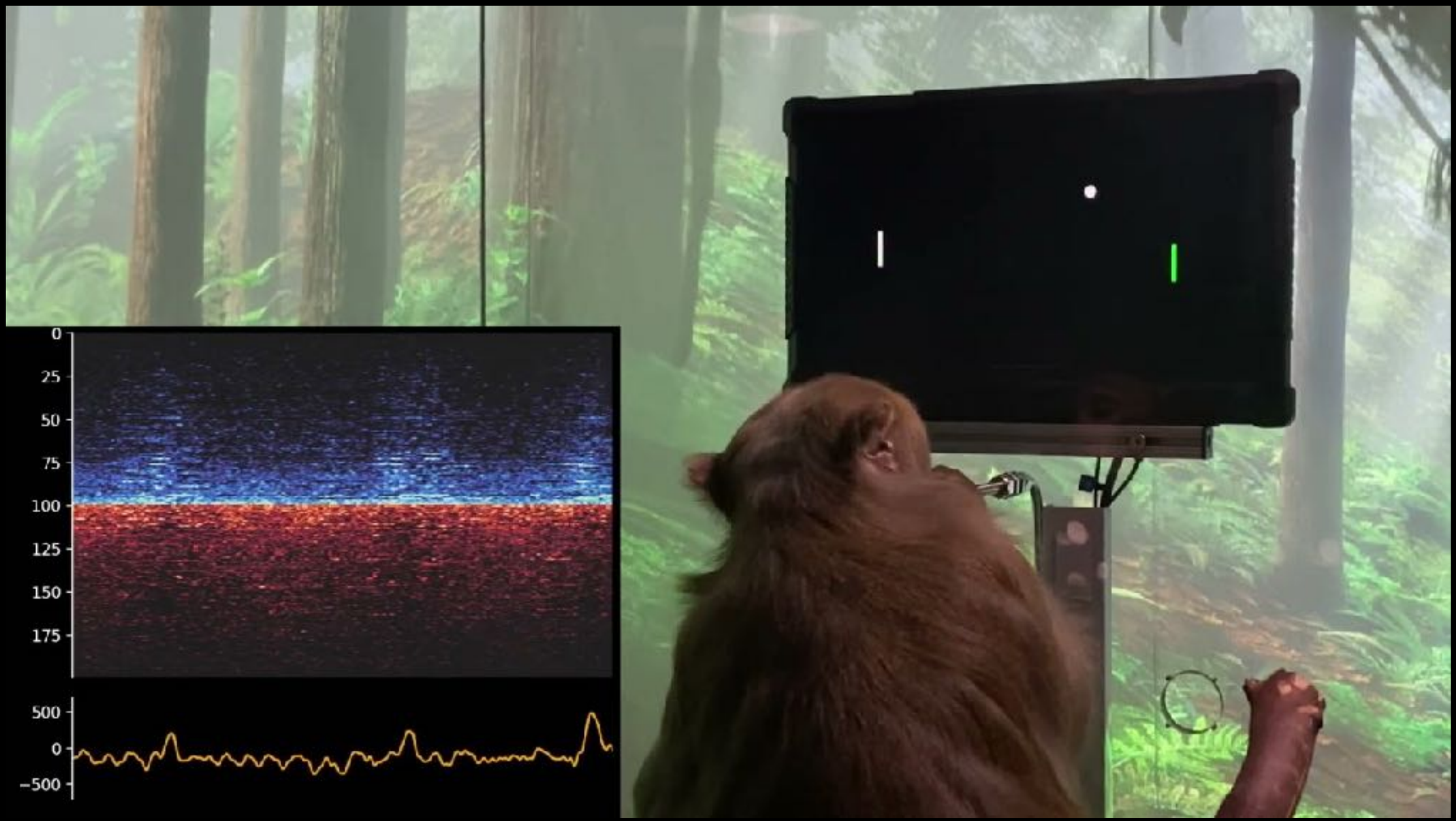
Biohacking — also known as DIY biology — is an extremely broad and amorphous term that can cover a huge range of activities, from performing science experiments on yeast or other organisms to tracking your own sleep and diet to changing your own biology by pumping a younger person's blood into your veins in the hope, etc . .

Neil Harbisson - Cyborg



https://www.cyborgnest.net/sentero

Neuralink brain implants


0
25
50
75
100
125
150
175
500
0
−500

August 2024 : https://neuralink.com/blog/prime-study-progress-update-second-participant/

Jason Barnes - Bionic Drummer


BIOHACKERS

~~un~~ natural selection®

Gut Hack on : https://youtu.be/uO6I6Bgo3-A