



Radka Pittnerova

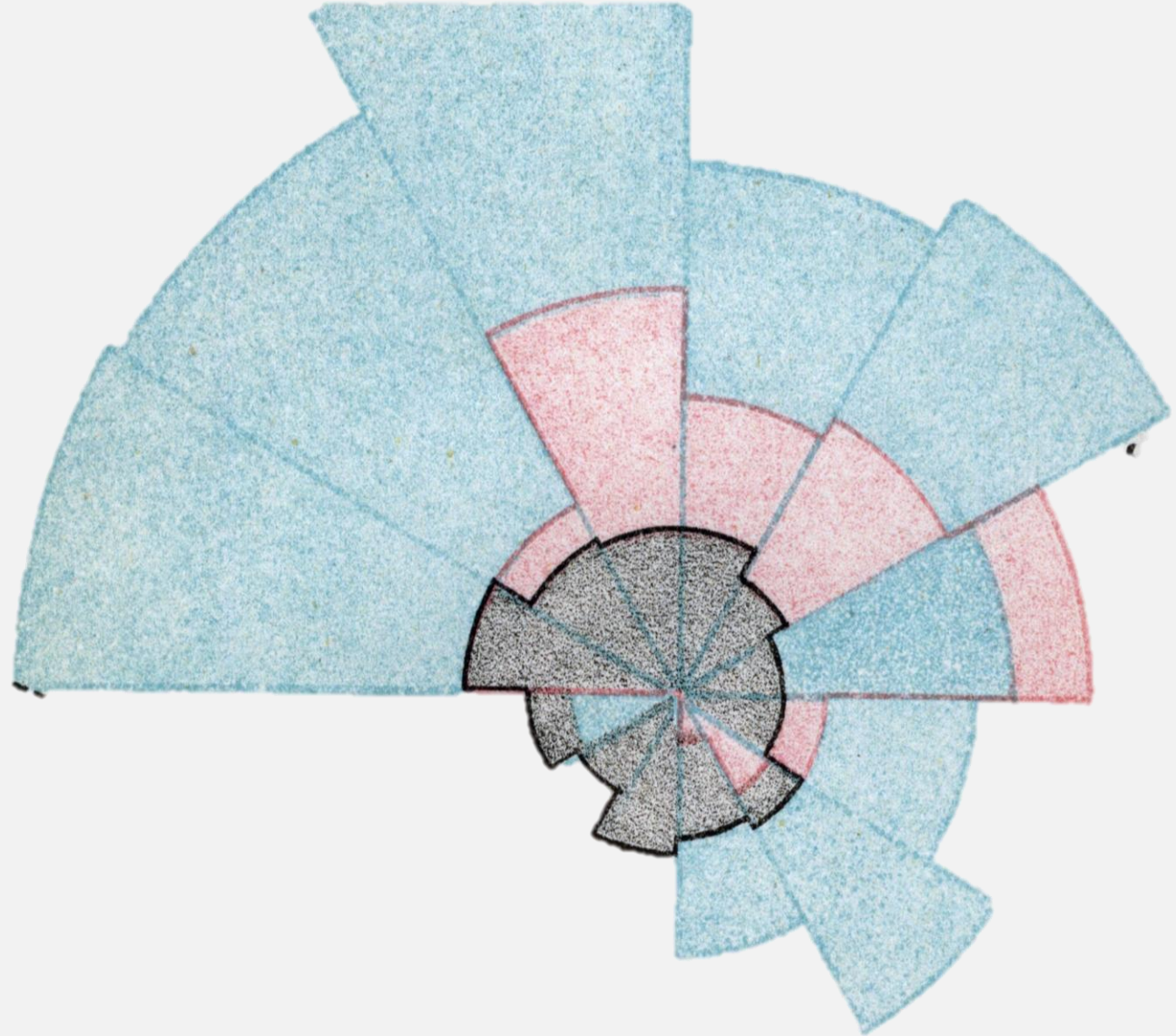
Visual communication

A Matter of life and death?



Visualisations that saved lives.

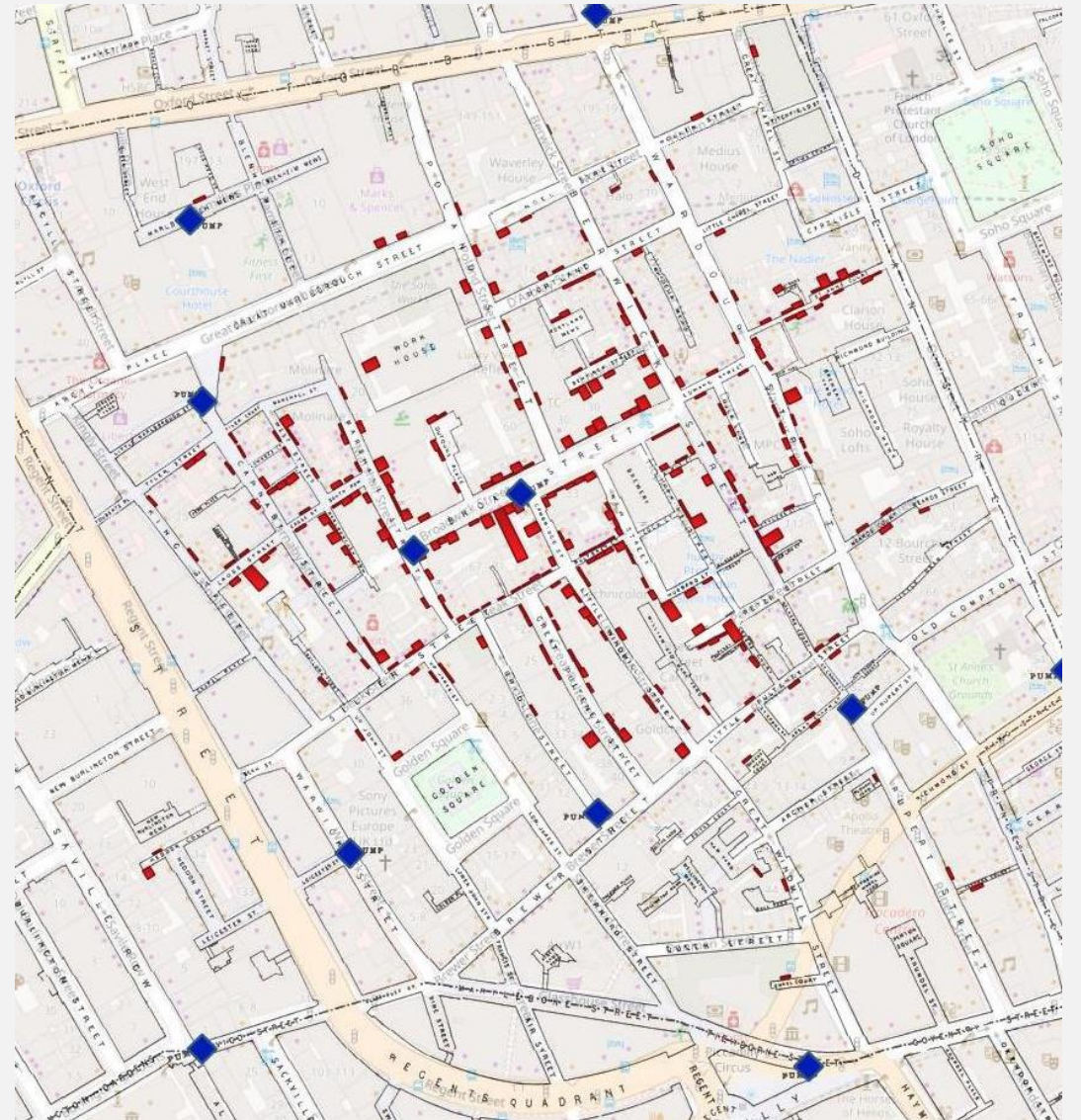
1858, **Florence Nightingale's** polar area diagram proved preventable diseases killed more soldiers than battle wounds, driving Parliament to pass sanitation reforms.



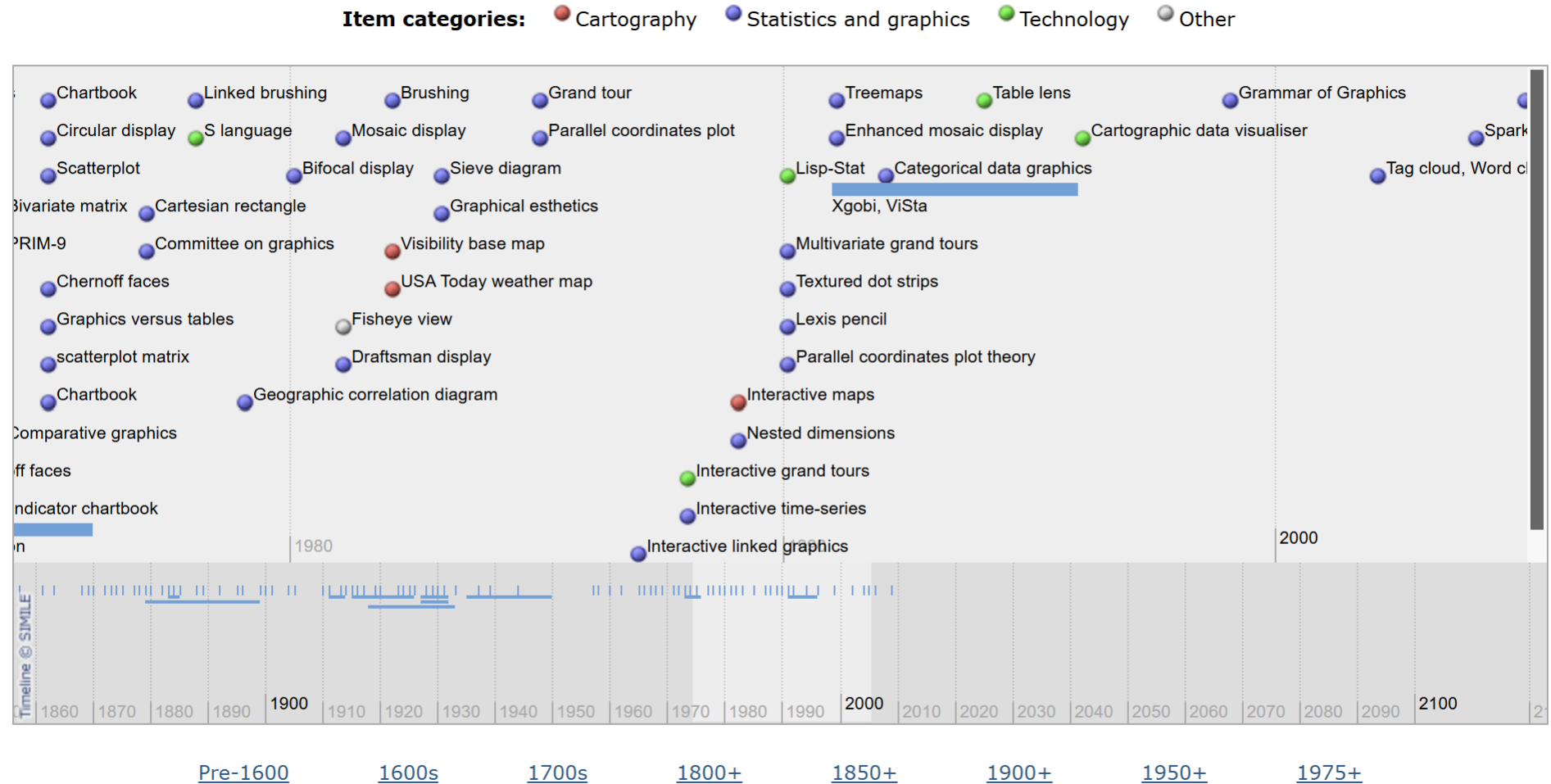


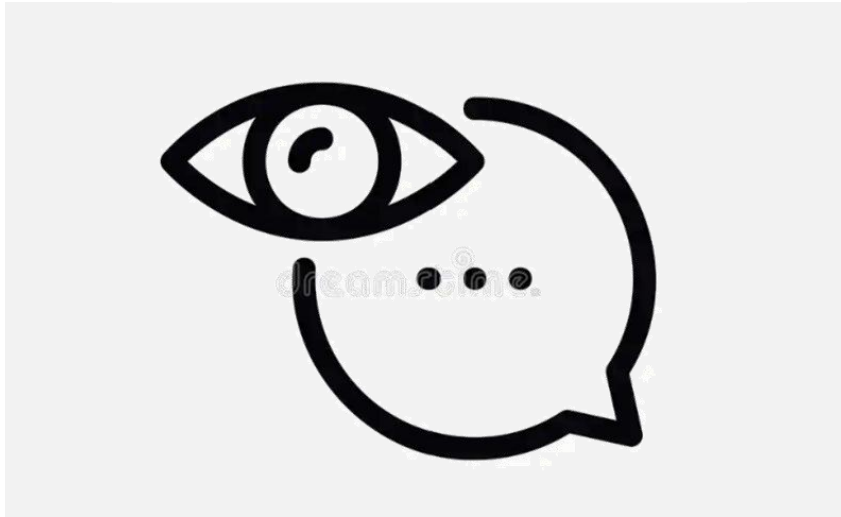
Visualisations that saved lives.

1854, **Dr. John Snow** shattered the myth that disease spread through bad air, proving instead that it was carried in contaminated water,



Dataviz.ca





PPT Presentations
Scientific Posters
Data Visualizations
Schematics & Diagrams
Graphical Abstracts

Visual Outputs

In research

The Communication Model

Encoding → GAP → Decoding

Encoding → Transmission → Decoding

EXPLORE DESIGN TEST



The Communication Model

Encoding & Decoding

Purpose

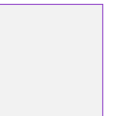
- Exploration or Explanation?
- Who is the audience?
- What is the environment?

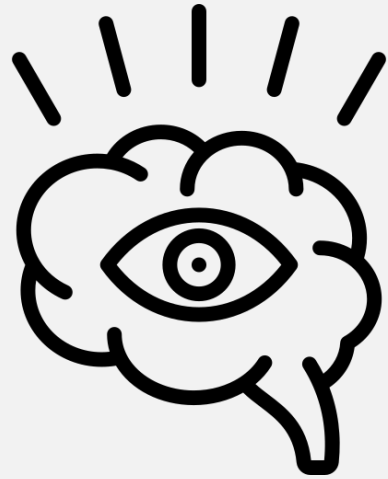
Encoding

- Information architecture
- **Graphic Design**
(a problem-solving strategy)

Decoding

- Visual perception
- Visual literacy





Why visuals work?

Parallel Processing:

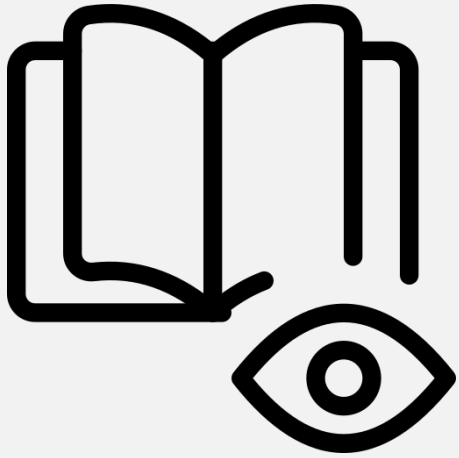
- the brain processes visual pathways simultaneously,
- near-instant detection of patterns.

Cognitive Load Management:

- Human working memory is strictly limited.
- Effective visuals "offload" mental effort
- Improved Recall: Humans are wired for spatial memory;

Pre-attentive Attributes:

- The visual system detects basic properties—such as contrast, size, and orientation—within milliseconds and before conscious awareness.



If your audience cannot read your visual, you have not communicated.

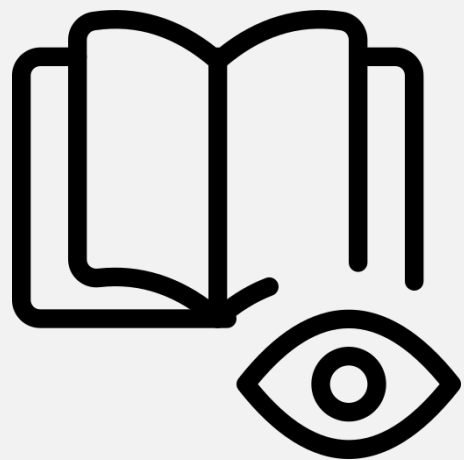
What this means for you:

- Know your audience before you open the software.
- Adjust the complexity to the reader, not to yourself.
- Simplification is not dumbing down. It is respecting the decoder.

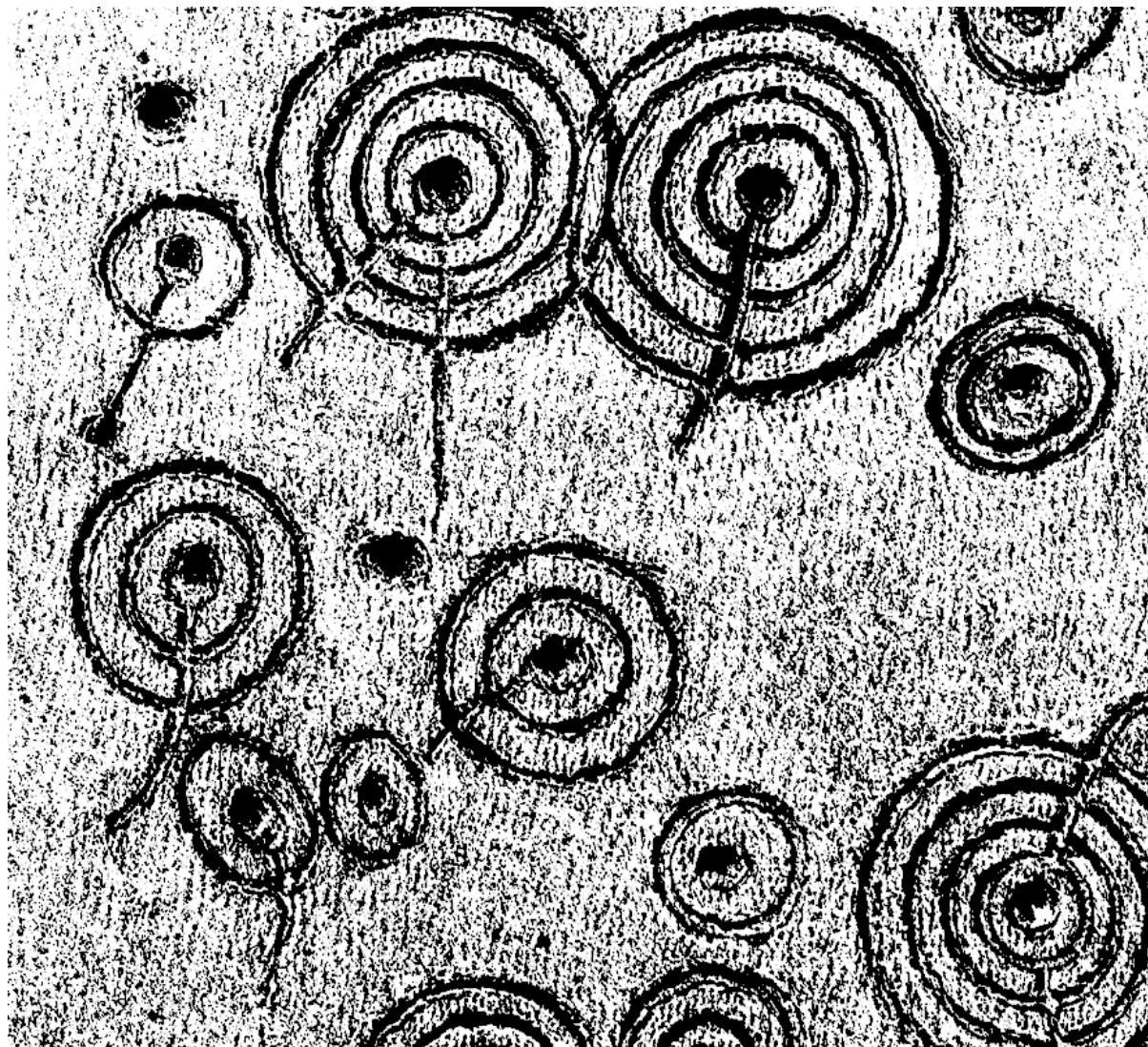
Visual literacy

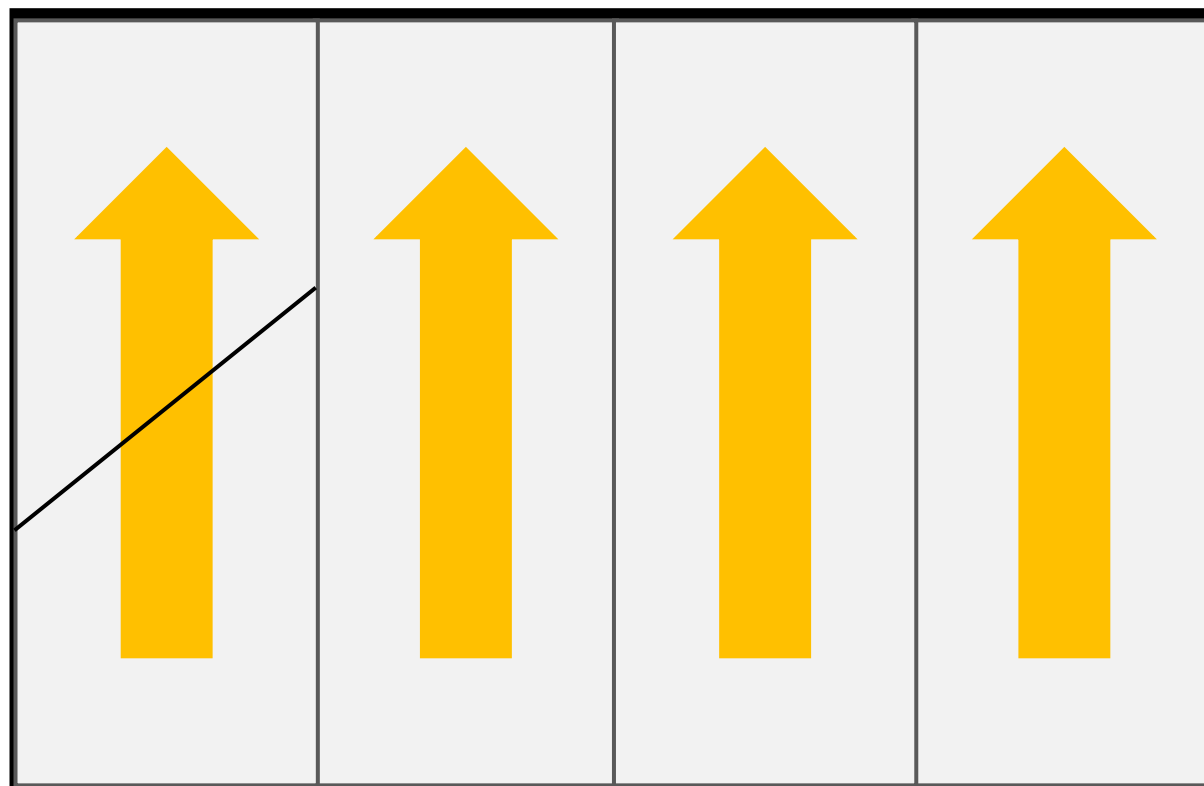
One line to carry away:

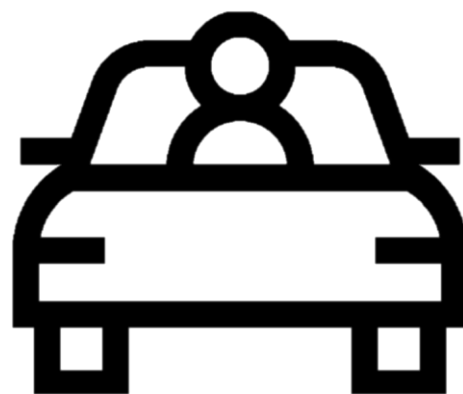
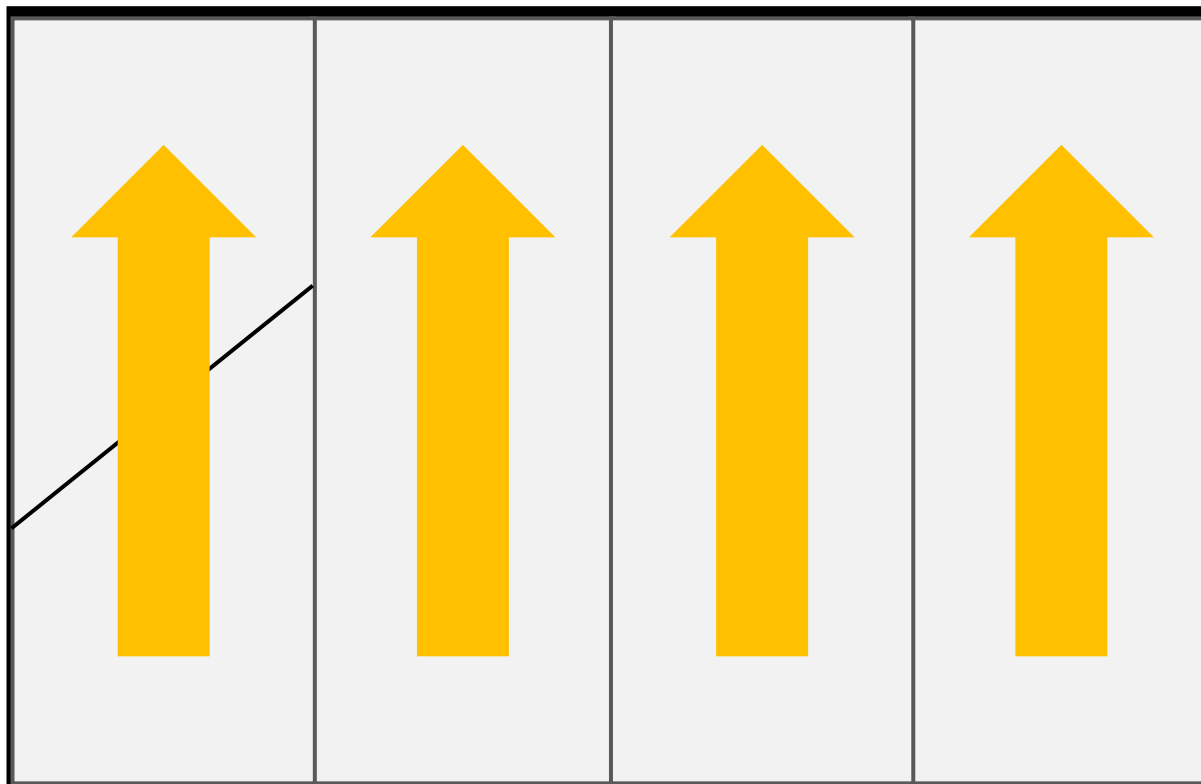
The encoder who ignores the audience is not communicating. They are displaying.



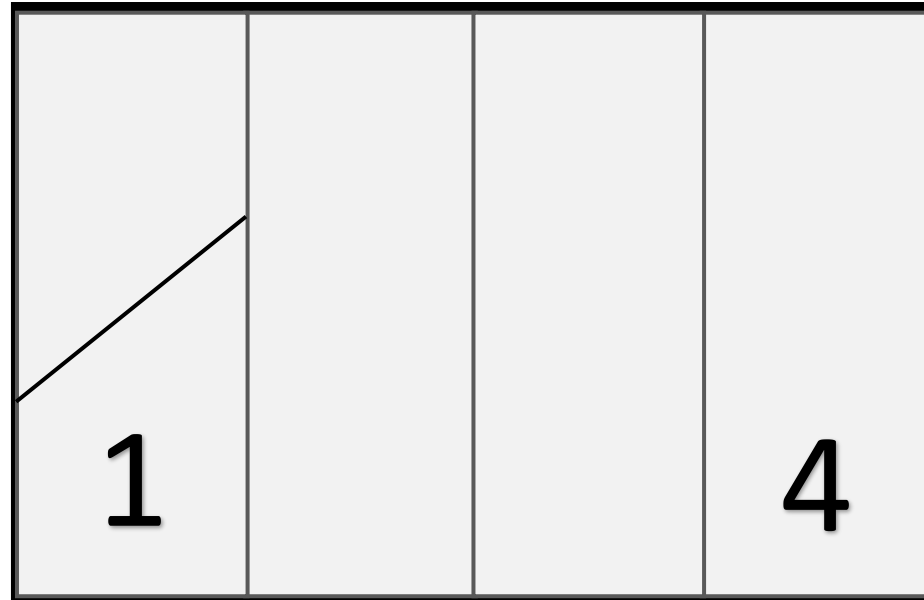
Visual literacy

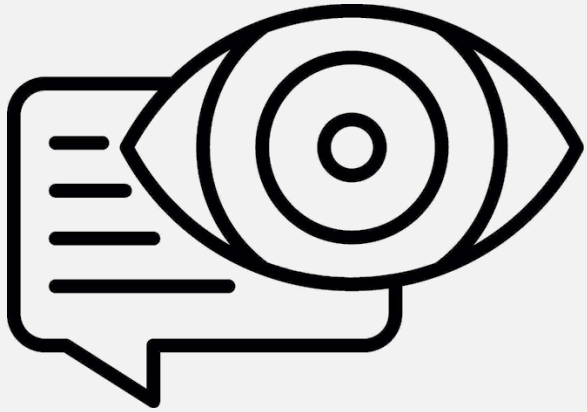






What works the best for the target audience?





The Litmus test

how you make a visual work

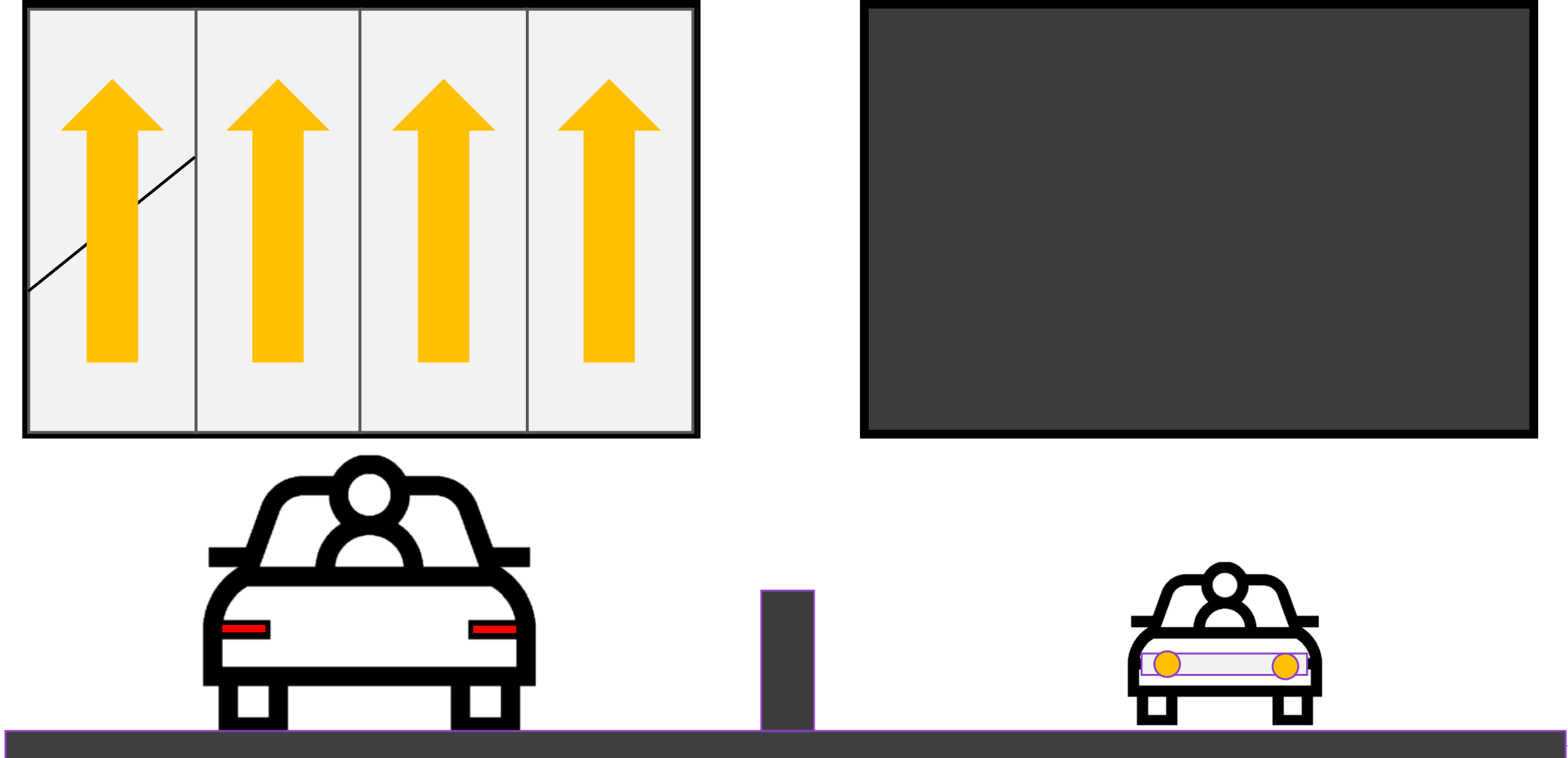
Step 1: Remove one element.

Step 2: Ask whether the message still works.

If yes, it was decoration.

If no, it was functional.

What works the best for the target audience?



The Design tools I

Design is about making information understood.

Informational architecture

Space

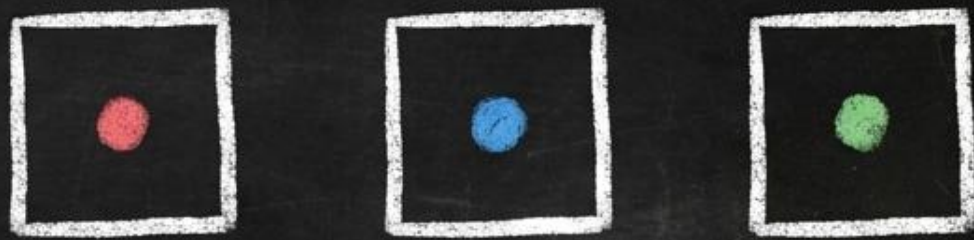
Hierarchy

Structure

Proximity

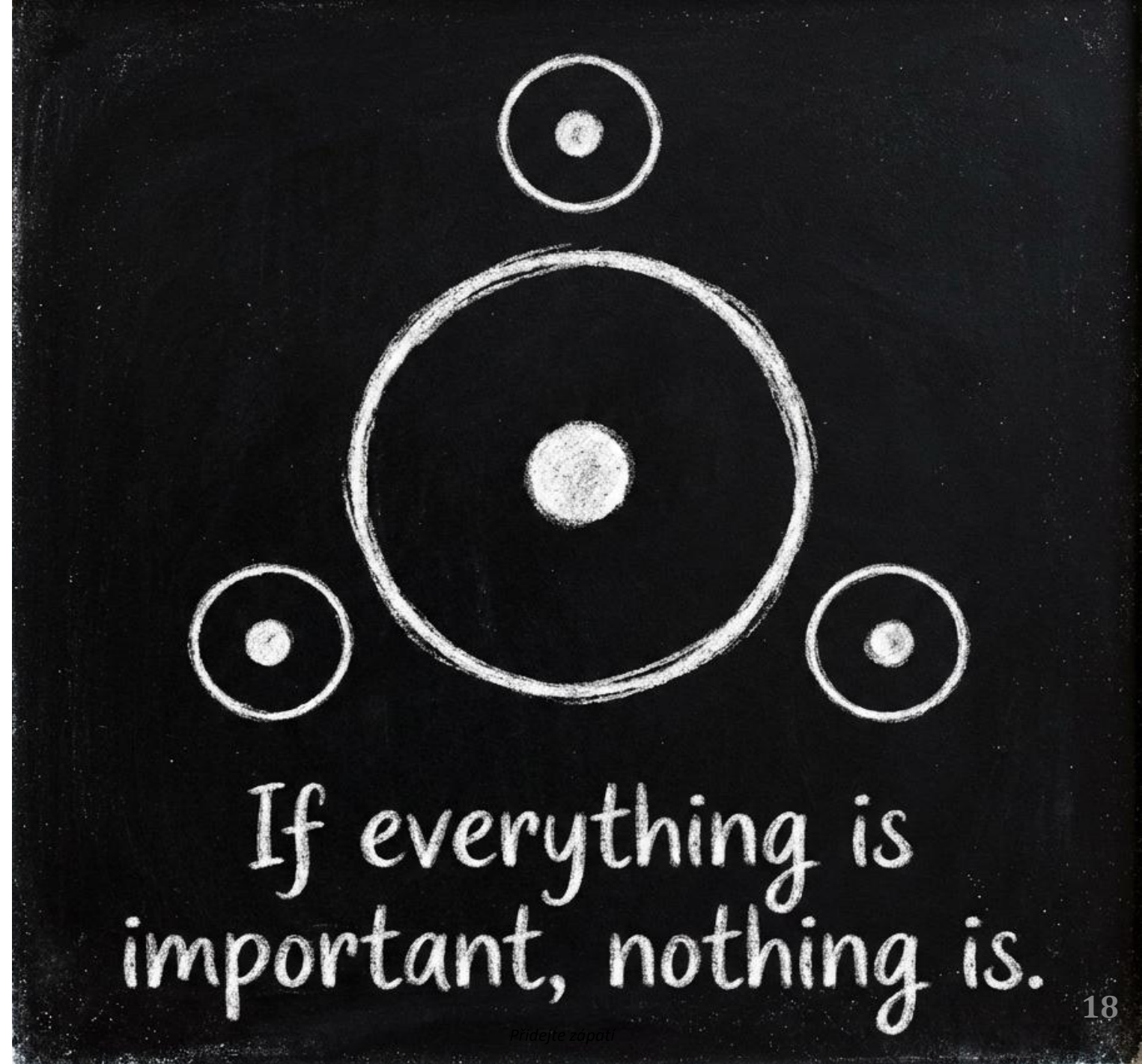
Relations

Value



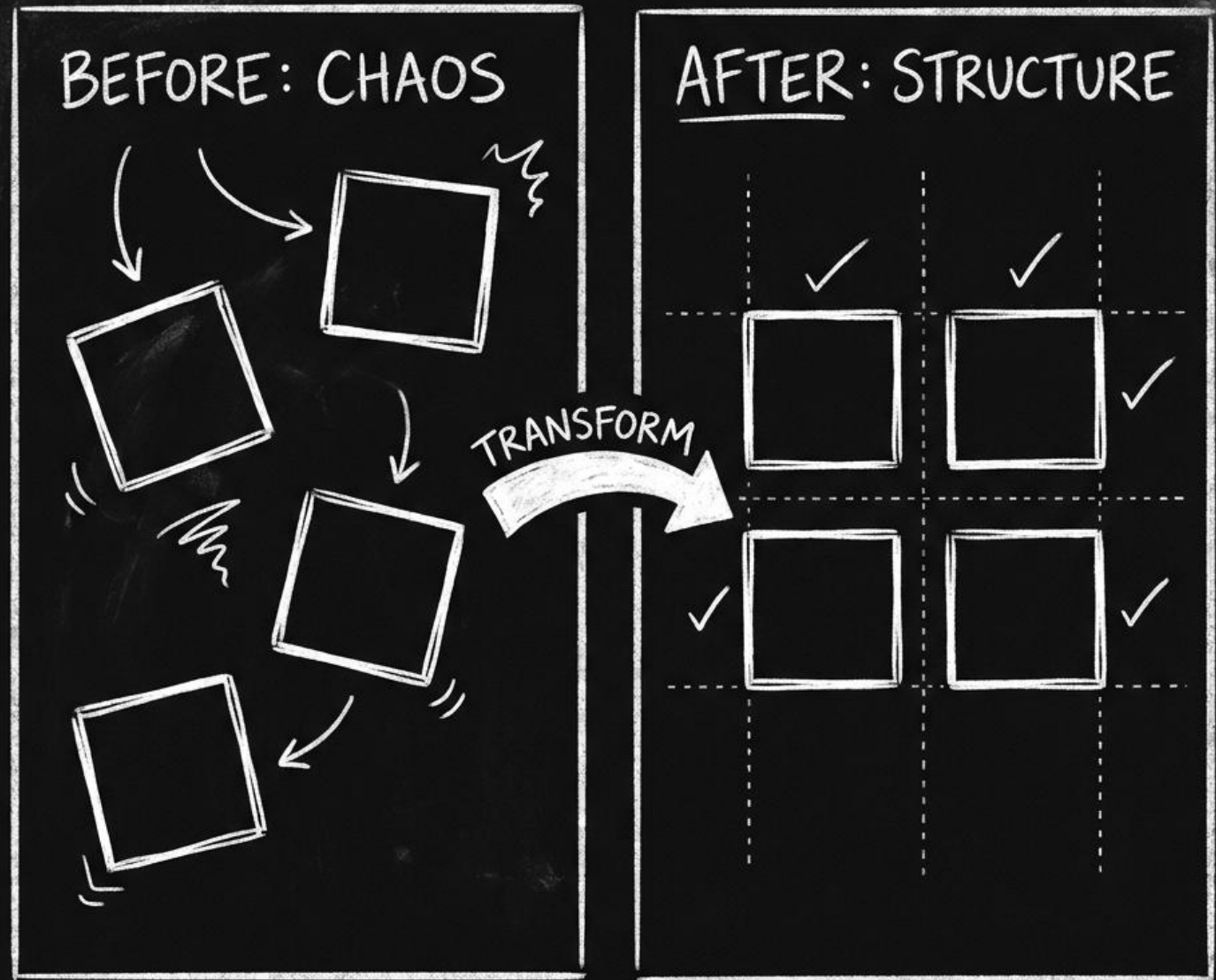
Space is not emptiness. It is structure.

Hierarchy



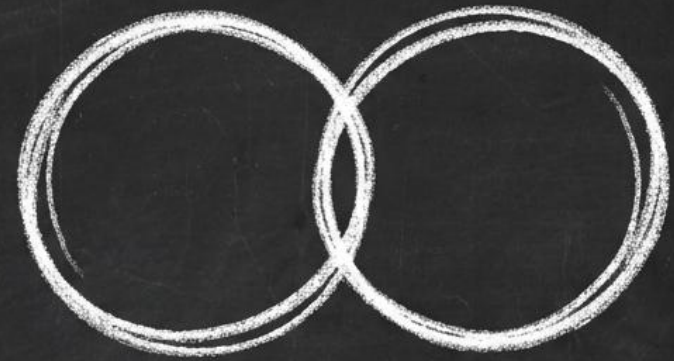
hierarchy
space
alignment

Grid/ Structure



Structure is the decision map. It frees you from guessing where things go.

Proximity / Relations



related ↗



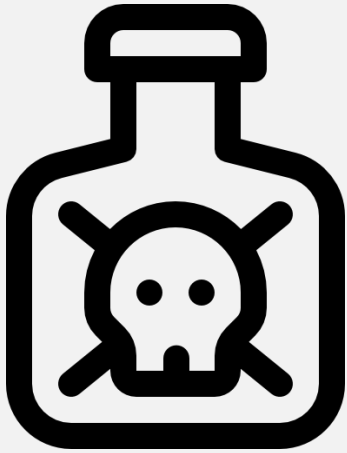
not related ↗

Review of Test Data Indicates Conservatism for Tile Penetration

- The existing SOFI on tile test data used to create Crater was reviewed along with STS-87 Southwest Research data
 - Crater overpredicted penetration of tile coating significantly
 - Initial penetration to be described by normal velocity
 - Varies with volume/mass of projectile (e.g. 200ft/sec for 3cu. Ln)
 - Significant energy is required for the softer SOFI particle to penetrate the relatively hard tile coating
 - Test results do show that it is possible at sufficient mass and velocity
 - Conversely, once tile is penetrated SOFI can cause significant damage
 - Minor variations in total energy (above penetration level) can cause significant tile damage
 - Flight condition is significantly outside of test database
 - Volume of ramp is 1920cu in vs 3 cu in for test

Space
Hierarchy
Proximity
Relations
Structure
Value





Death by PowerPoint

On February 1, 2003, the Space Shuttle **Columbia disintegrated** during re-entry into Earth's atmosphere,

The Disaster

Re-entry failure: broke apart over Texas just 16 minutes before its scheduled landing.

Launch damage: A piece of foam insulation had broken off the external fuel tank during launch..

Wing breach: The foam struck and damaged the thermal protection tiles on the left wing.

Atmospheric entry: Intense heat entered the wing through the damaged area during re-entry.

Structural collapse: The extreme heat melted the airframe, causing the shuttle to lose control and break apart.

The Crew

Rick Husband (Commander)

William McCool (Pilot)

Michael Anderson (Payload Commander)

Kalpana Chawla (Mission Specialist)

David Brown (Mission Specialist)

Laurel Clark (Mission Specialist)

Ilan Ramon (Payload Specialist, Israel's first astronaut)

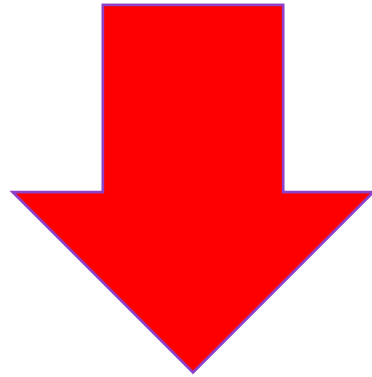


**What was the
message?**

**foam strike
more than 600
times bigger
than test data**

Is it safe to land?

foam strike more than 600 times
bigger than test data



NO data to answer

The Design tools I

Design is about making information understood.

Informational architecture

Space

Hierarchy

Structure

Proximity

Relations

Value

Design rules to remembers

Space is silence

Grid is structure

Typography is hierarchy

Color is function

Proximity is relation

Alignment is flow

The Design tools II

Build your visual vocabulary

images / photos

diagrams / charts

Icons / sketchnotes

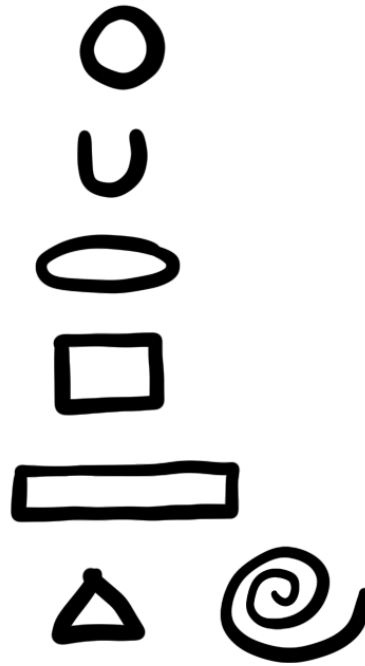
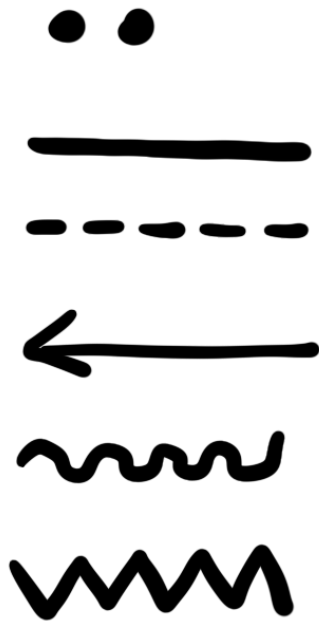
text / typography

shapes / connectors

color /structure

Where to start?

Build your visual vocabulary



BASIC
FORM ALPHABET

← If you can
make these
forms ... you
can draw

You can create complex visual messages



5 basic shapes

THE ROAD TO PROJECT HELL
IS PAVED WITH
TOO MANY
MILESTONES AND
DELIVERABLES



ANY PROPOSAL
WELCOME !

PROJECT
GRAVEYARD
REST IN STRESS



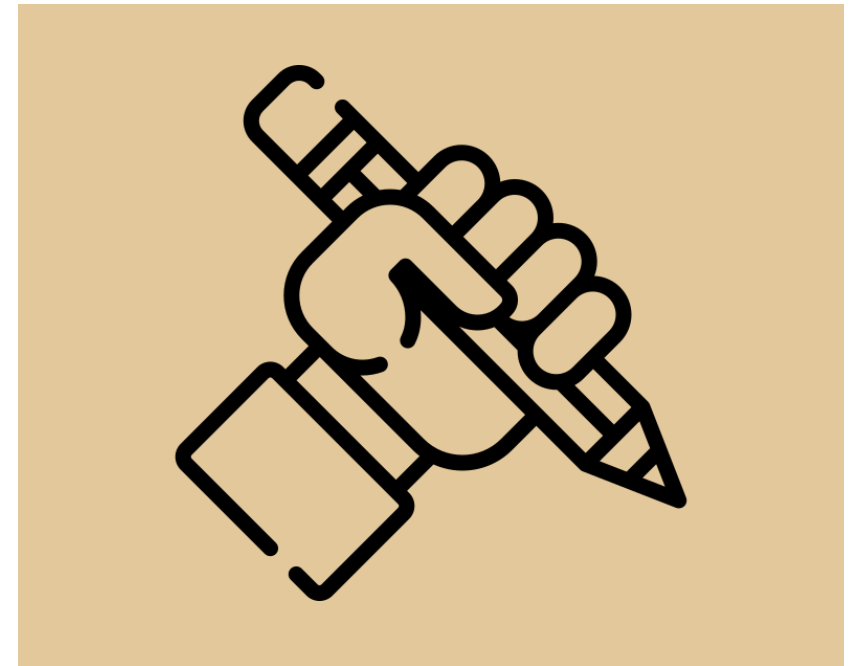
Visual Translation (Part 1)

Your task: Turn one paragraph into one visual.

1. Take one slip from the table
2. Read it twice. Decide what the core message is.
3. Use your A4 and one black pen. Use color only for what matters most.
4. Name your visual at the top. Hang it on the wall.

Time: 2 min read. 18 min draw. 3 min hang.

The test: Can a stranger tell what the text was about just by looking at your visual?



Hands on nr.1

Visual Translation (Part 2)

Now work as a group.

1. Walk to the wall.
2. Sort the A4 visuals into three groups.
3. Name each group.

The three groups are:

Process (encoding, decoding, transmission)

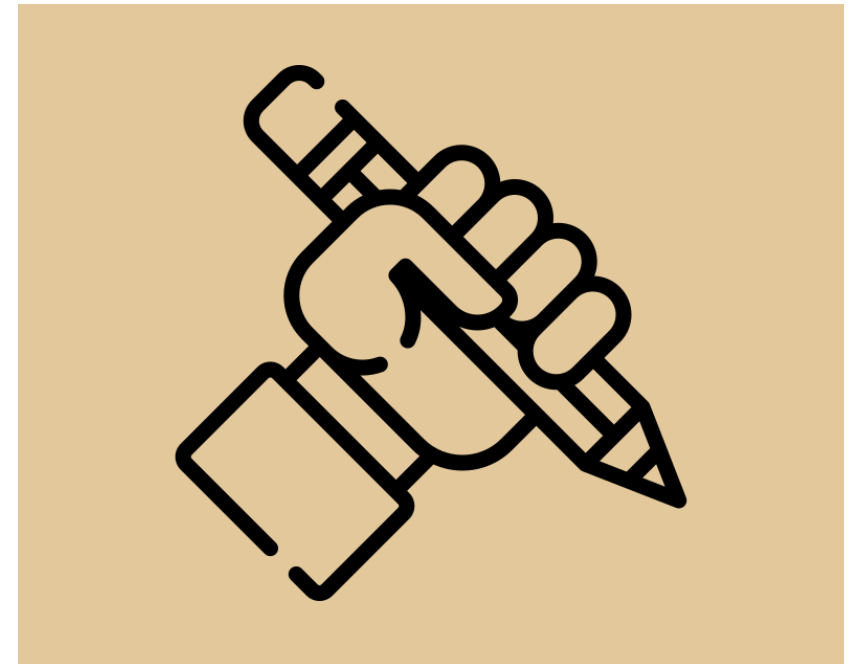
Brain (cognitive load, parallel processing,
pre-attentive)

Design (principles, grid, hierarchy, typography)

Then we discuss:

Where did color do the most work?

Which category was hardest to translate?



Hands on nr.1

**A visual is successful
only if the audience
can read it, understand
it, and use it.**

Create a poster

Your task: Create one poster that explains visual communication to your assigned audience.

GROUP A **Your audience is an early-stage researcher**

GROUP B **Your audience is a school child aged 10–12.**

Before the task:

Check your printed instruction sheet for your group's assigned audience.

Materials;: A2 paper with grid. Two pen thicknesses. One colored thick pen. A4 for drafting.

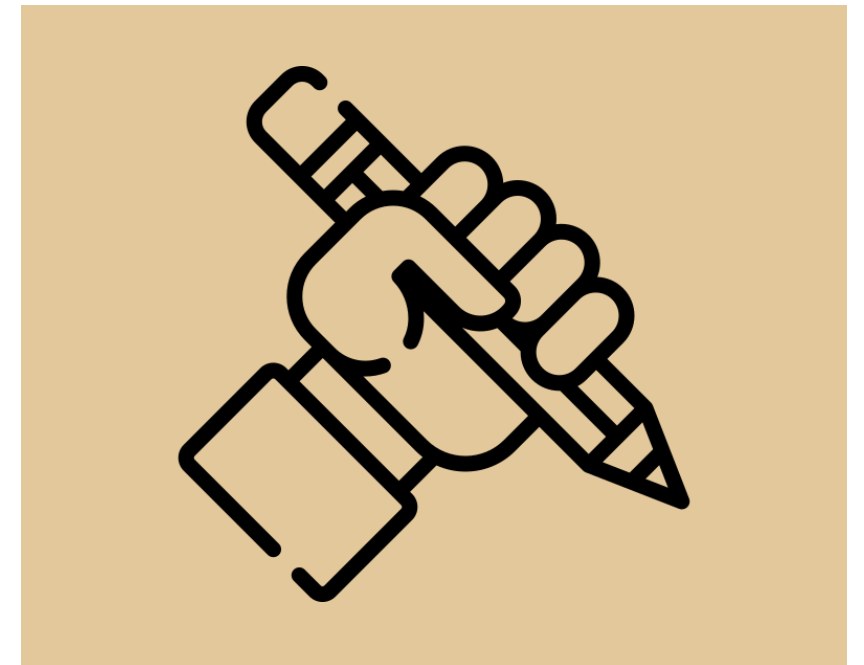
Constraint: Your poster must communicate without you standing next to it.

Time: **30 minutes build.** 12 minutes gallery walk.

Mode: Groups of 3.

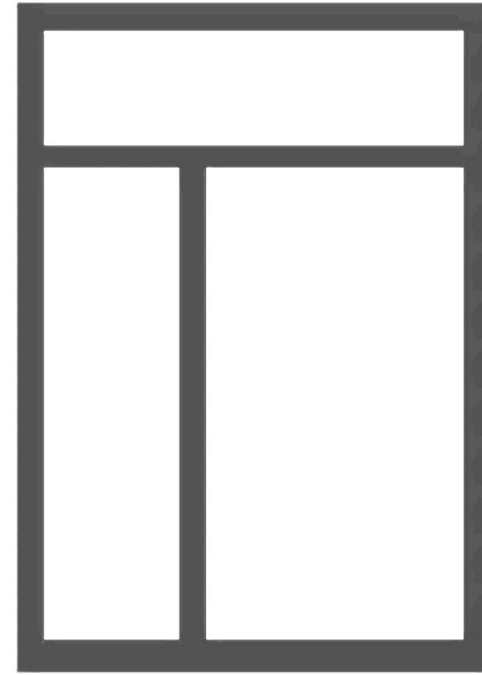
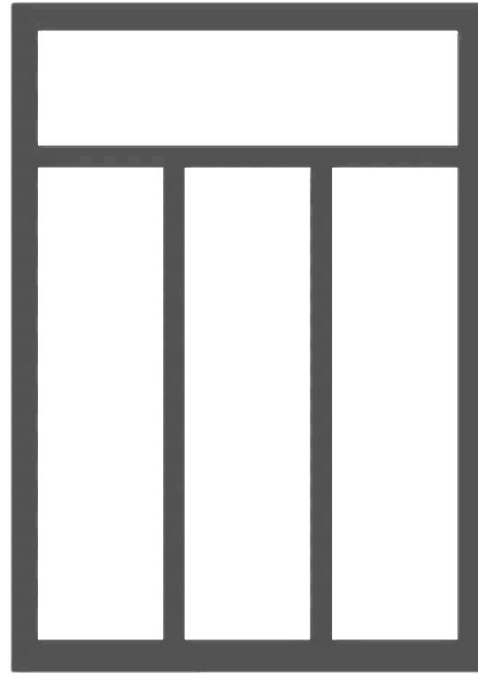
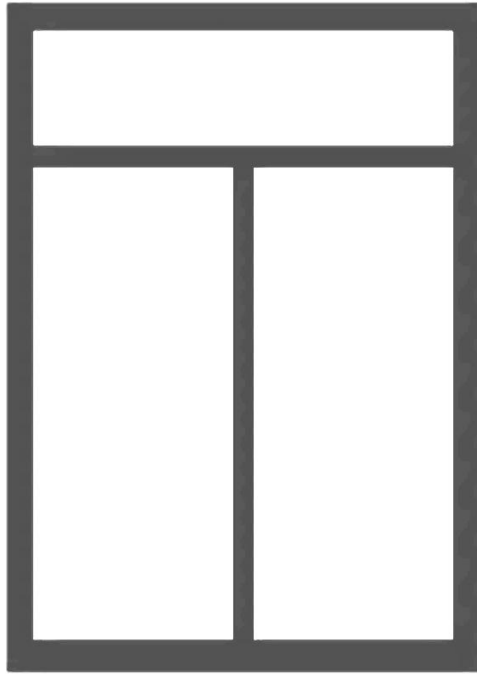
Deliverable: One poster explaining visual communication to your assigned audience.

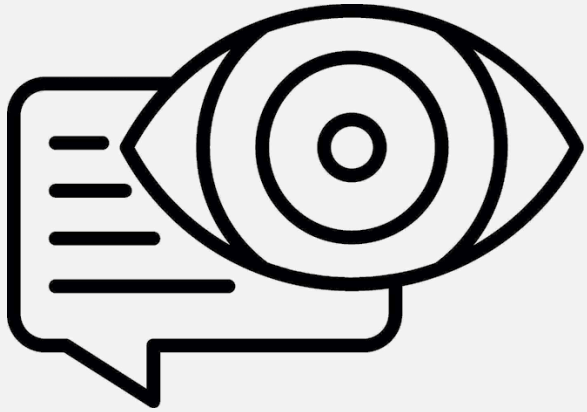
The Test: A stranger must decode your message from across the room.



Hands on nr.3

visuals are not decoration
visuals are encoding
decoding depends on the audience
design is not beautification
successful visuals are readable,
useful, and ethically made



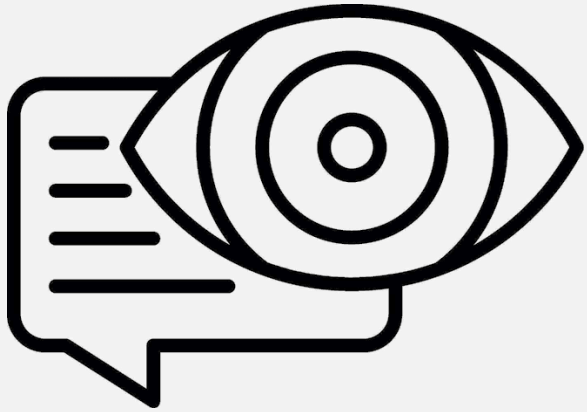


Data Integrity & Ethics

Final note

Use AI as inspiration and support, not as a substitute for your own thinking.

Do not fake authorship, do not pretend generated material is your own, and always check whether the result is accurate, appropriate, and clear for your audience.



The challenge

A good visual is worth thousands words (and can save lives).

Visual communication in research

is the intentional use of graphical forms and design principles to encode data into a perceivable and actionable format.

To understand this process, we must look past the "image" and examine the underlying **Information Architecture**.