Big History Project

Gatsby Tea Talk
Ben Huh?

Big History

- History of everything - 13.8 Billion years
- Life, the universe, everything
- Broader historical questions by zooming out
- Merge of cosmology, geology, biology, social science, literature, physics
- How did we get here?
- How does order arise from disorder?
- Growing Complexities
- Requires Goldilocks Condition

WHAT IS BIG HISTORY?

A social studies course covering 13.8 billion years of shared history.

Big History weaves evidence and insights from many disciplines across 13.8 billion years into a single, cohesive, science-based origin story. The concept arose from a desire to go beyond specialized and self-contained fields of study to grasp history as a whole. Big History explores how we are connected to everything around us and where we may be heading. It provides a foundation for thinking about the future and the changes that are reshaping our world.

WHAT IS THE BIG HISTORY PROJECT?

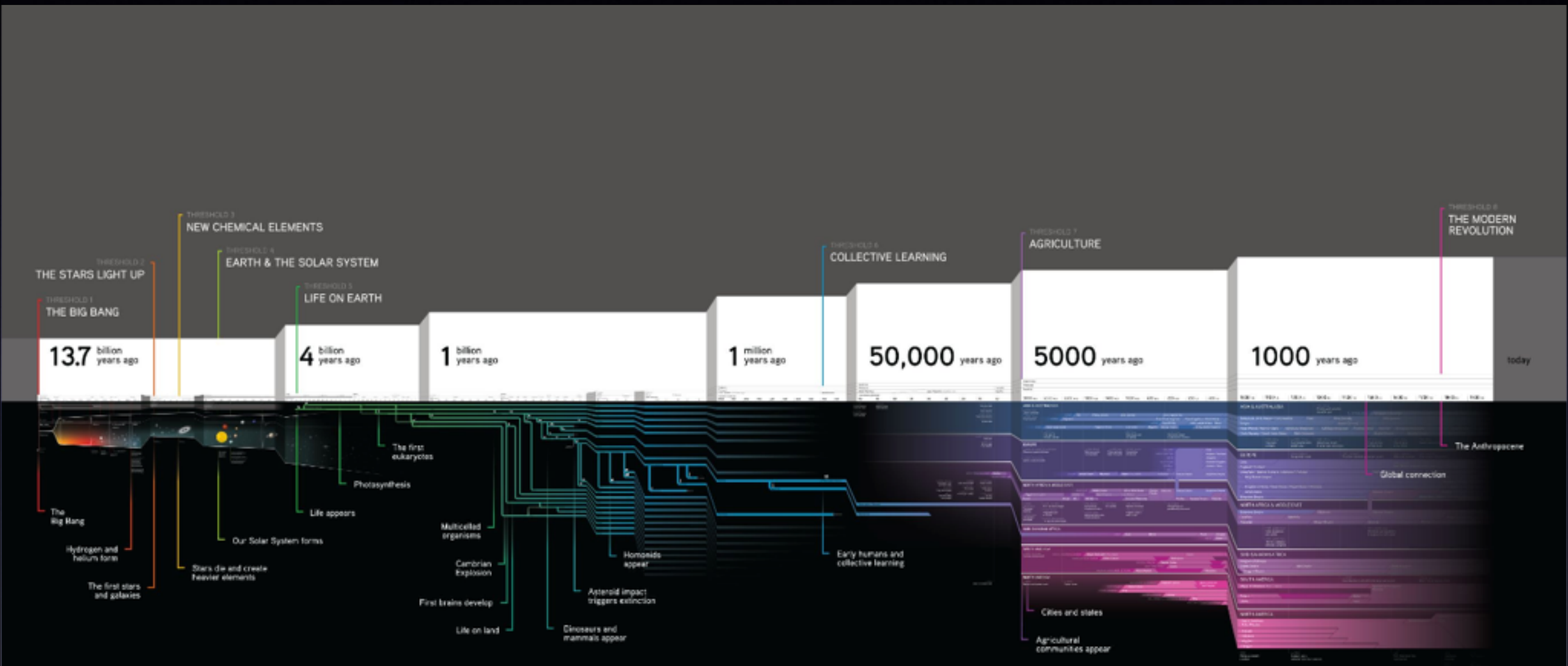
A collaborative effort to create a Big History course for teachers everywhere.

- Complete, free curriculum including assessments, lessons, and hundreds of diverse content items.
- A website that provides easy access to course materials for educators and students.
- Training and professional development opportunities.
- Active community of “Big Historians” to keep the course fresh, impactful, and connected.
- Advocacy organization to support schools and districts seeking to deploy the course.

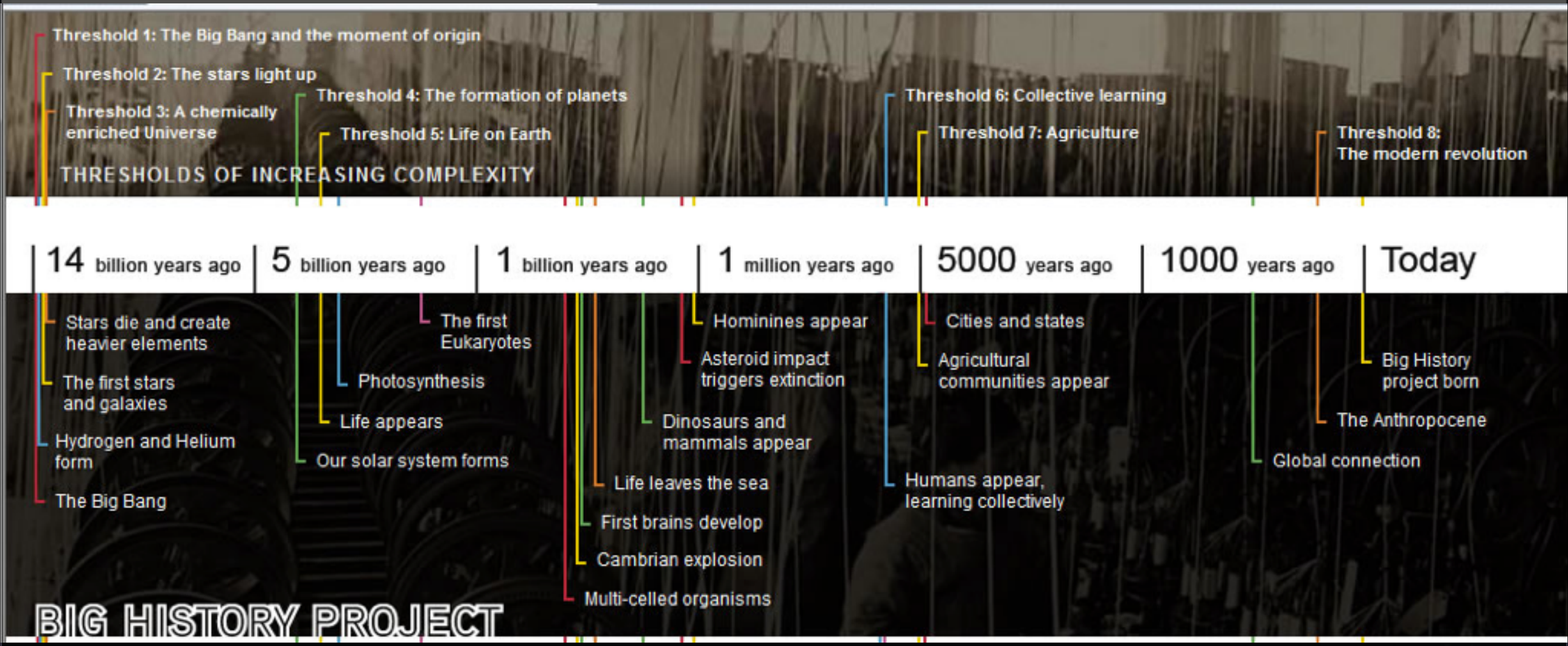
Threshold events

- Big bang
- Stars light up
- New Chemical Elements
- Earth & the Solar system
- Life on Earth
- Human Race
- Agriculture
- The Modern Revolution

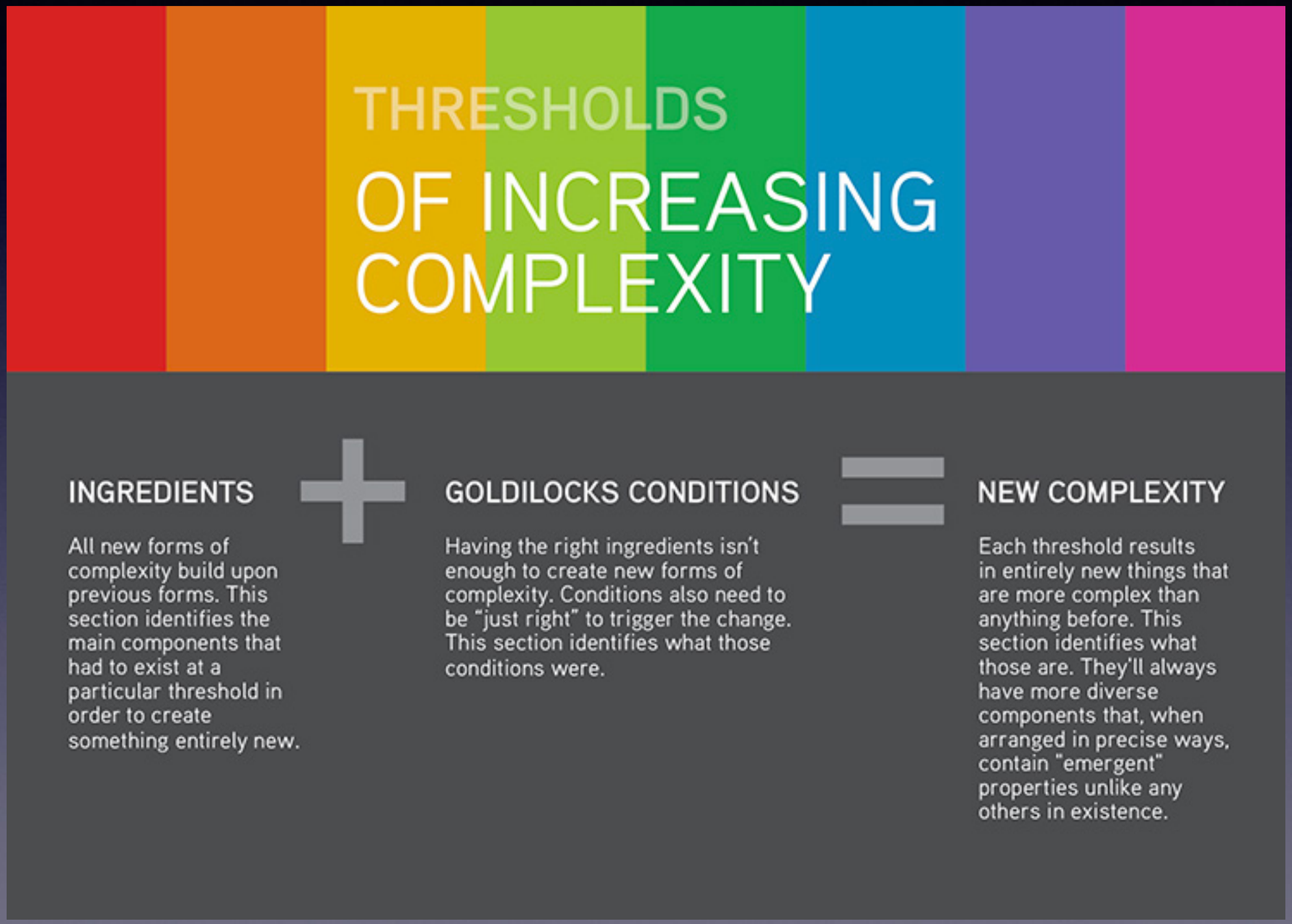
Threshold events



Threshold events



Threshold events



Big History

- Divide Big History into eight *thresholds* — Major events
- creates something completely new
- Requires Goldilocks Condition

Big Bang

1

THRESHOLD

THE BIG BANG

The Big Bang remains a mystery in many ways. We have a lot of evidence for what happened just after the event but can only guess what existed before it, if anything, and what conditions made it possible. Even so, we know the Big Bang is an important threshold because it created time, space, and the "building blocks" for everything in the known Universe.

13.7 BILLION YEARS AGO

13.6

Big Bang

THRESHOLD 1

THE BIG BANG

INGREDIENTS

We can only speculate

+

GOLDILOCKS CONDITIONS

We can only speculate

=

NEW COMPLEXITY

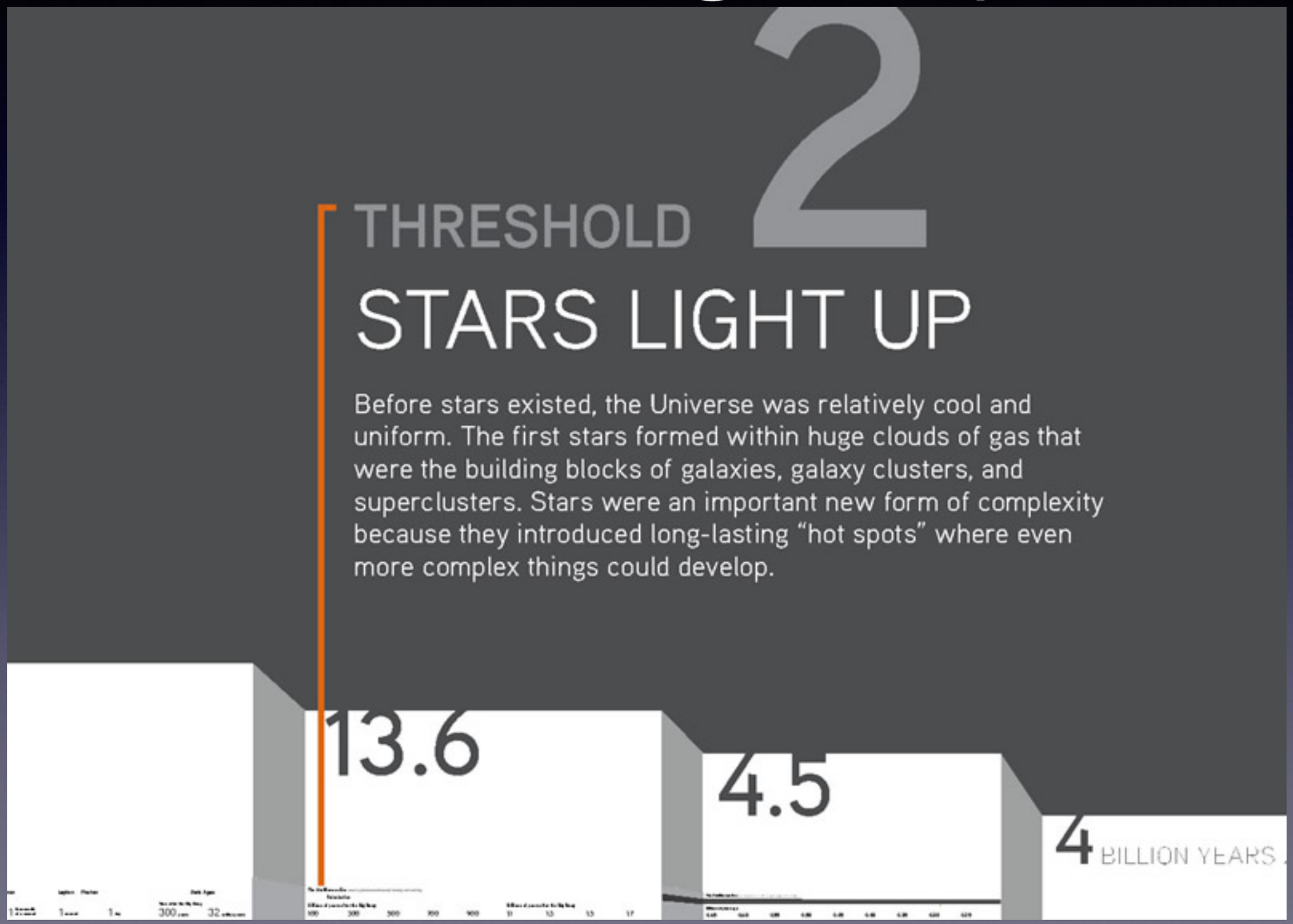
The Universe

Time and space

Different forms of energy (including gravity and electromagnetism)

Different forms of matter (including quarks and electrons)

Stars Light up



Stars Light up

THRESHOLD 2

STARS LIGHT UP

INGREDIENTS

Hydrogen and helium

Gravity

\+

GOLDILOCKS CONDITIONS

Tiny variations in the density of matter throughout the Universe

Enable gravity to pull matter together into increasingly dense clouds, which grow hotter as they form

Temperatures > 10 million degrees Celsius

Are hot enough for the strong nuclear force to fuse protons and release huge amounts of energy

=

NEW COMPLEXITY

"Hot spots"

Places in the Universe where there is enough energy and matter to create entirely new Goldilocks Conditions

New structures

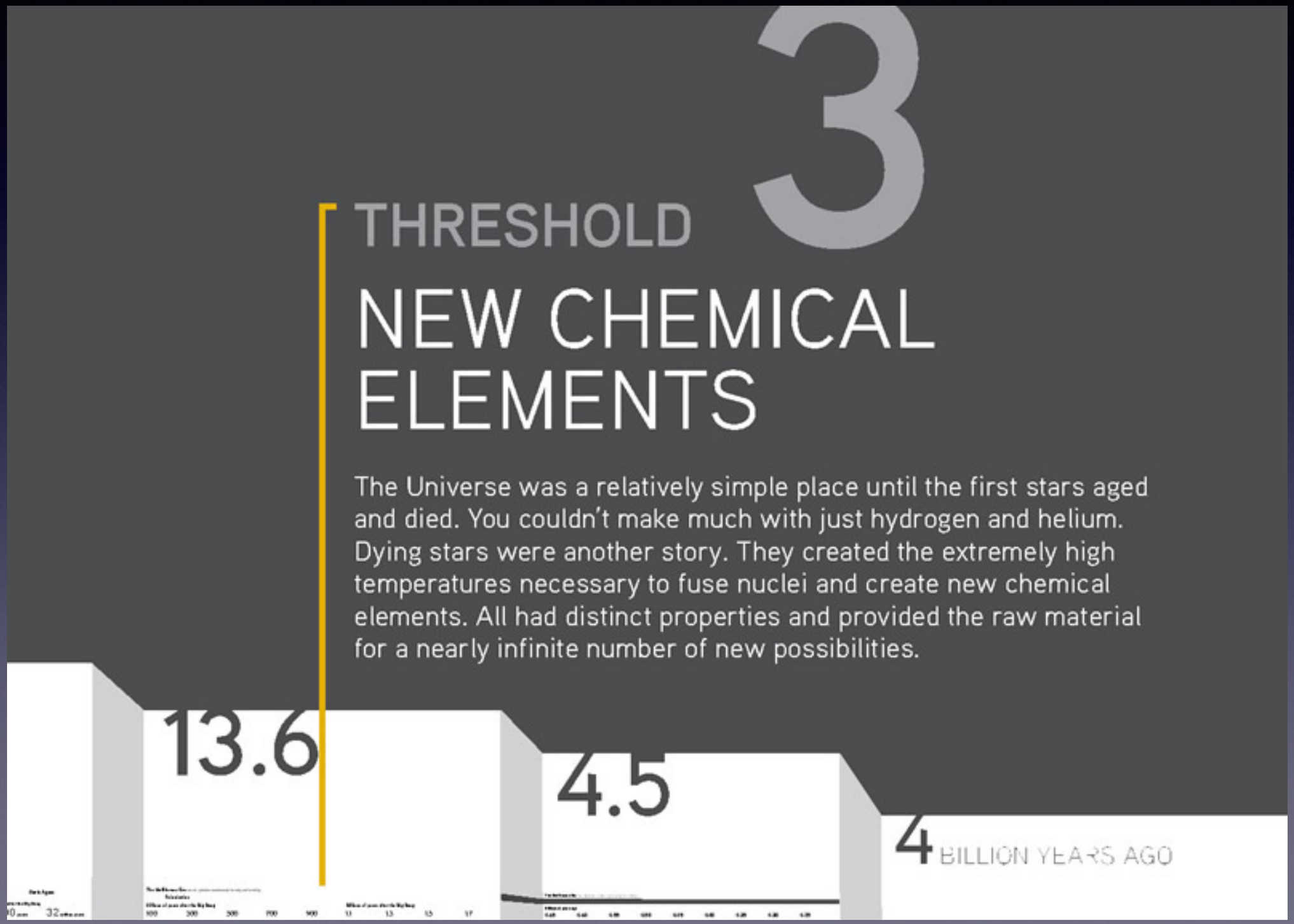
Stars

Galaxies

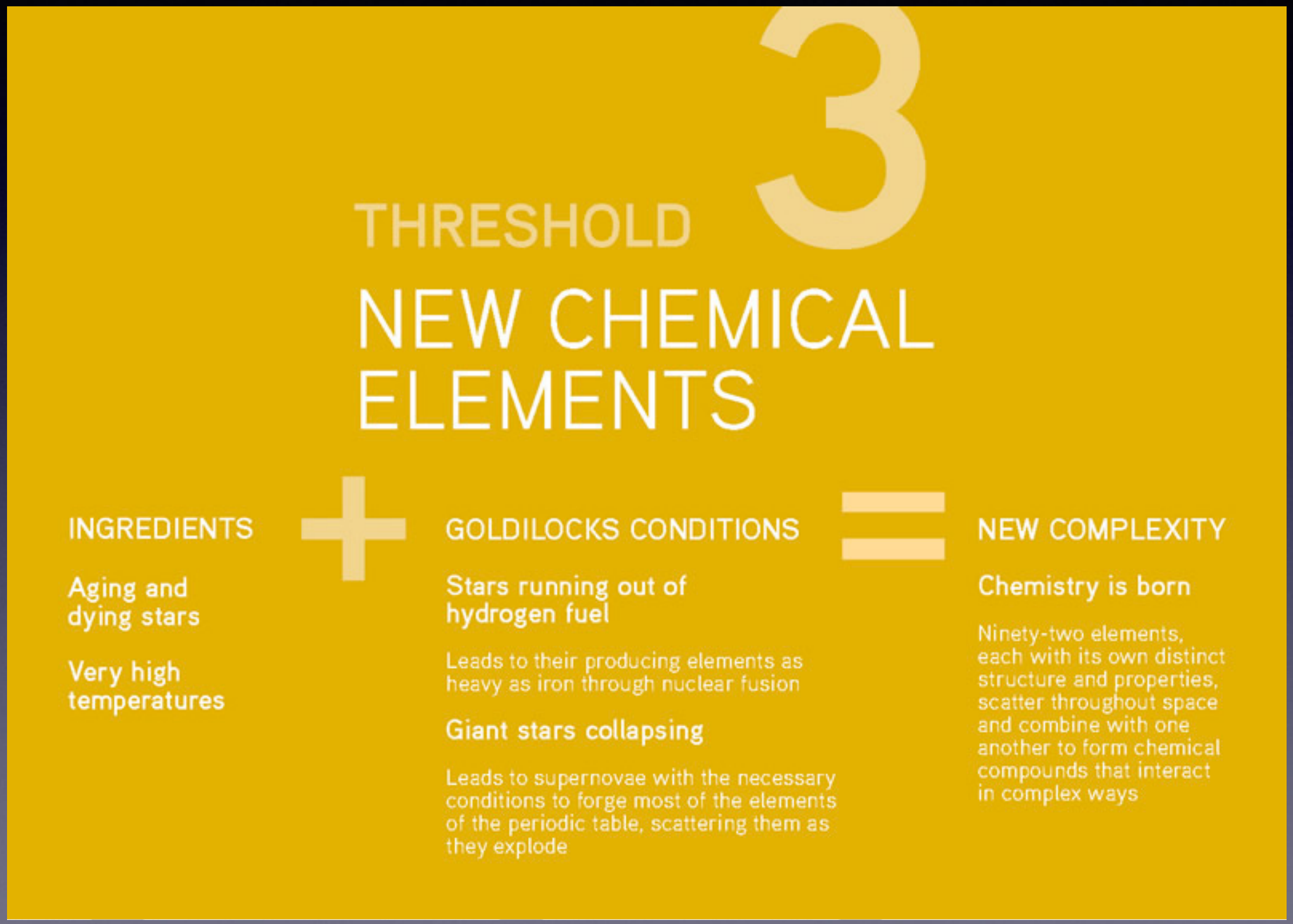
Clusters

Superclusters

New Chemical Elements



New Chemical Elements



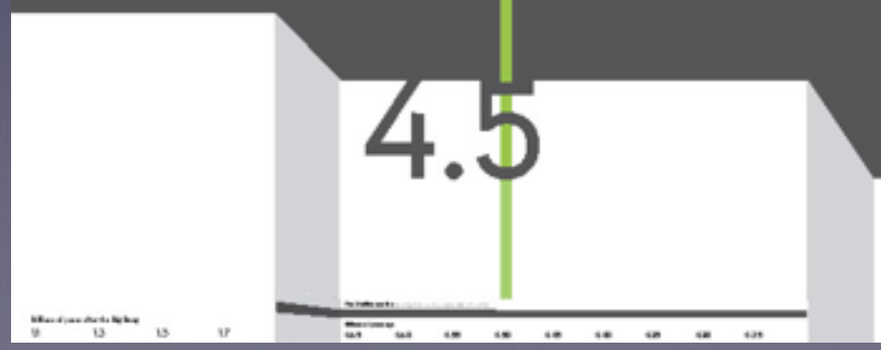
Earth & Solar system

4

THRESHOLD

EARTH & THE SOLAR SYSTEM

Even after millions of supernovae exploded to create new elements, most of the Universe still consisted of hydrogen, helium, and empty space. Planets, which formed from leftover debris around newborn stars, contained much greater chemical complexity than anything else in the Universe. On rocky planets like our Earth, even more remarkable things could happen.



4 BILLION YEARS AGO

Earth & Solar system

THRESHOLD 4

EARTH & THE SOLAR SYSTEM

INGREDIENTS

New chemical elements

Clouds of chemically rich matter

Newly forming stars

\+

GOLDILOCKS CONDITIONS

Gravity, accretion, and random collisions

Create environments where elements gather, combine, and form chemical bonds

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NEW COMPLEXITY

Astronomical bodies more chemically rich than stars

Planets

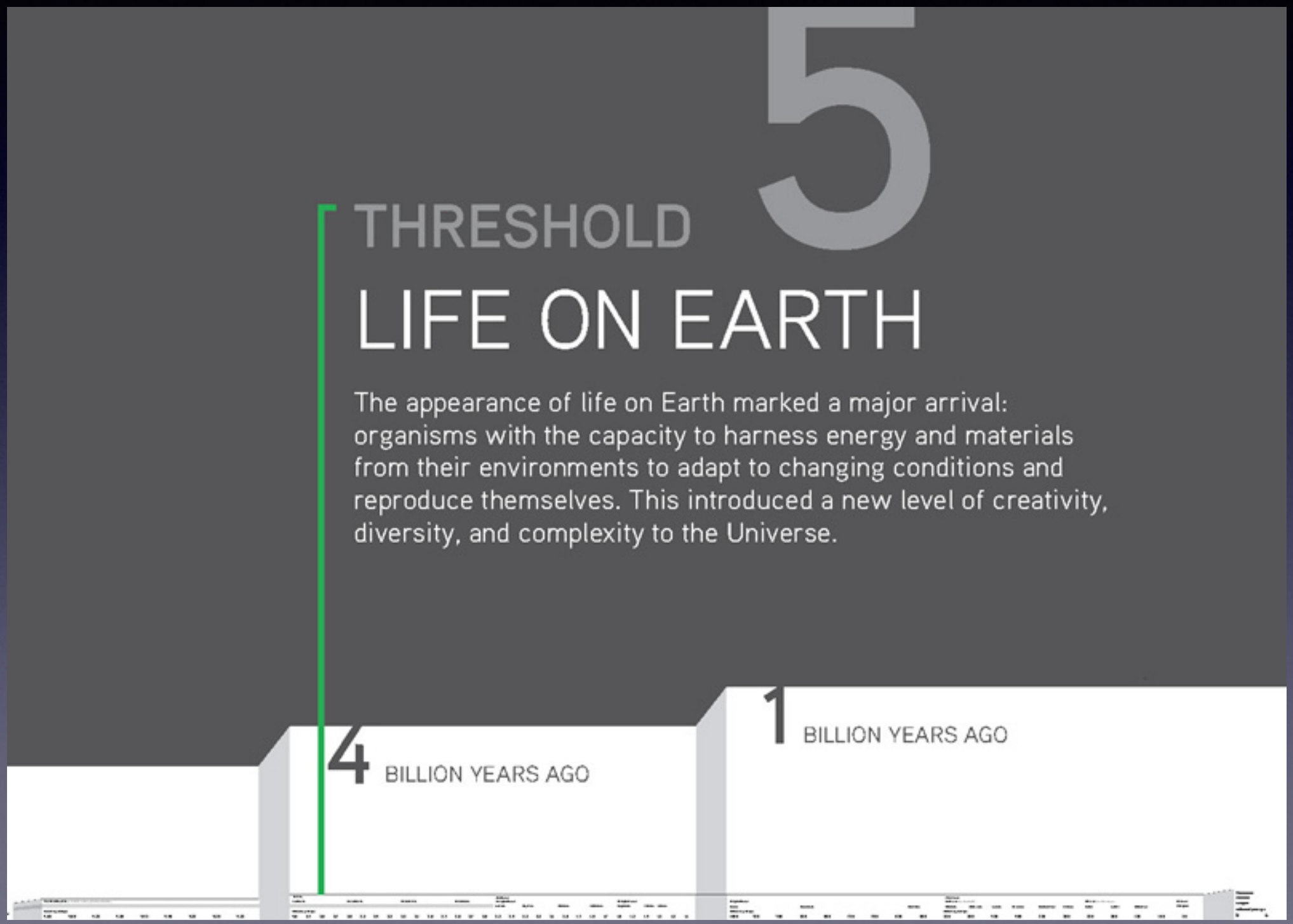
Planetesimals

Comets / asteroids

More complex structures

Our Solar System

Life on Earth



Life on Earth

THRESHOLD 5

LIFE ON EARTH

INGREDIENTS

Complex chemical compounds (including RNA and DNA)

+

GOLDILOCKS CONDITIONS

Just the right amount of energy

Enables diverse and stable chemical reactions

Liquid water

Makes it easy for atoms and molecules to combine and recombine

=

NEW COMPLEXITY

New organisms with the ability to

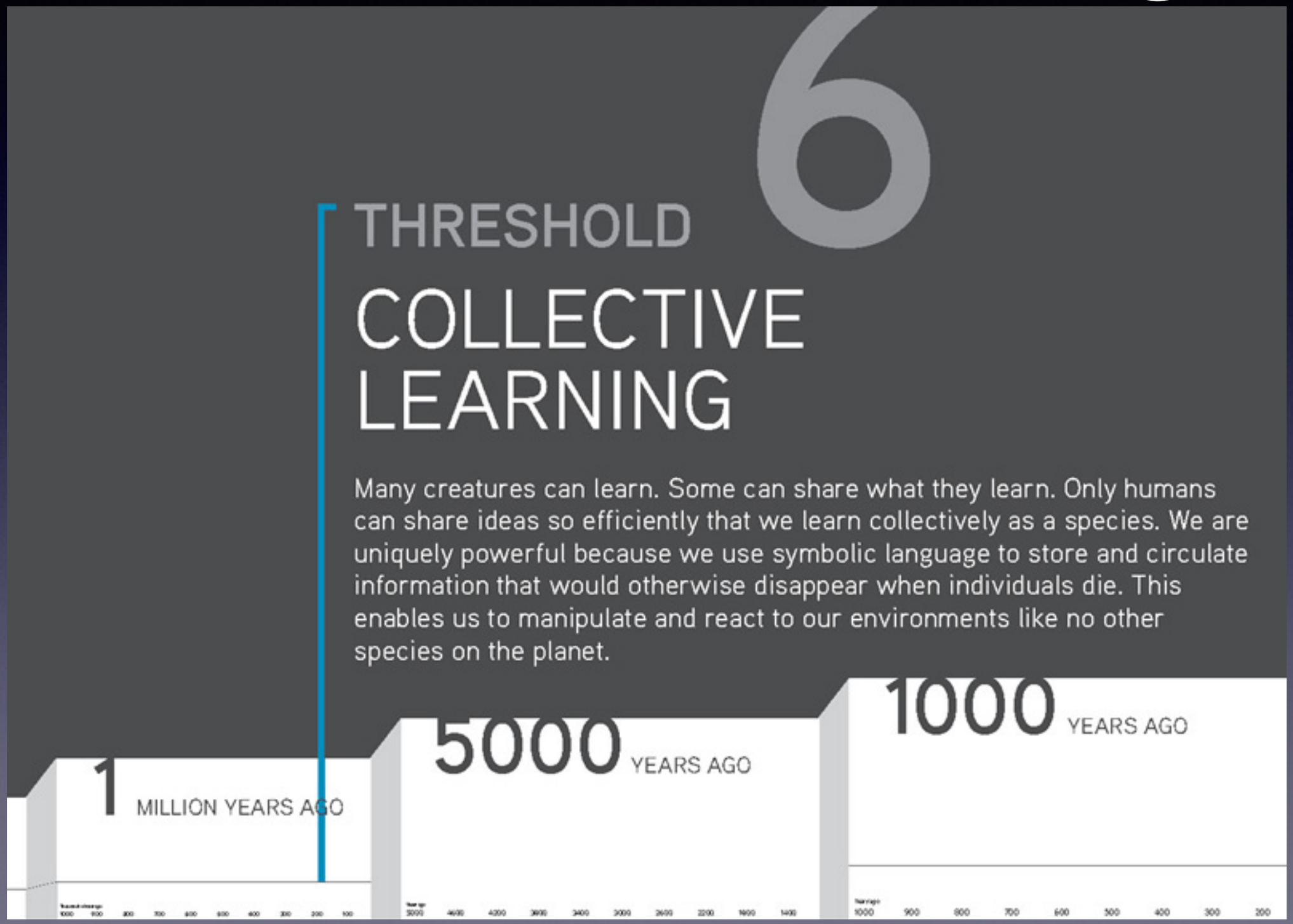
Maintain and fuel themselves (metabolism)

Adjust to changes around them (homeostasis)

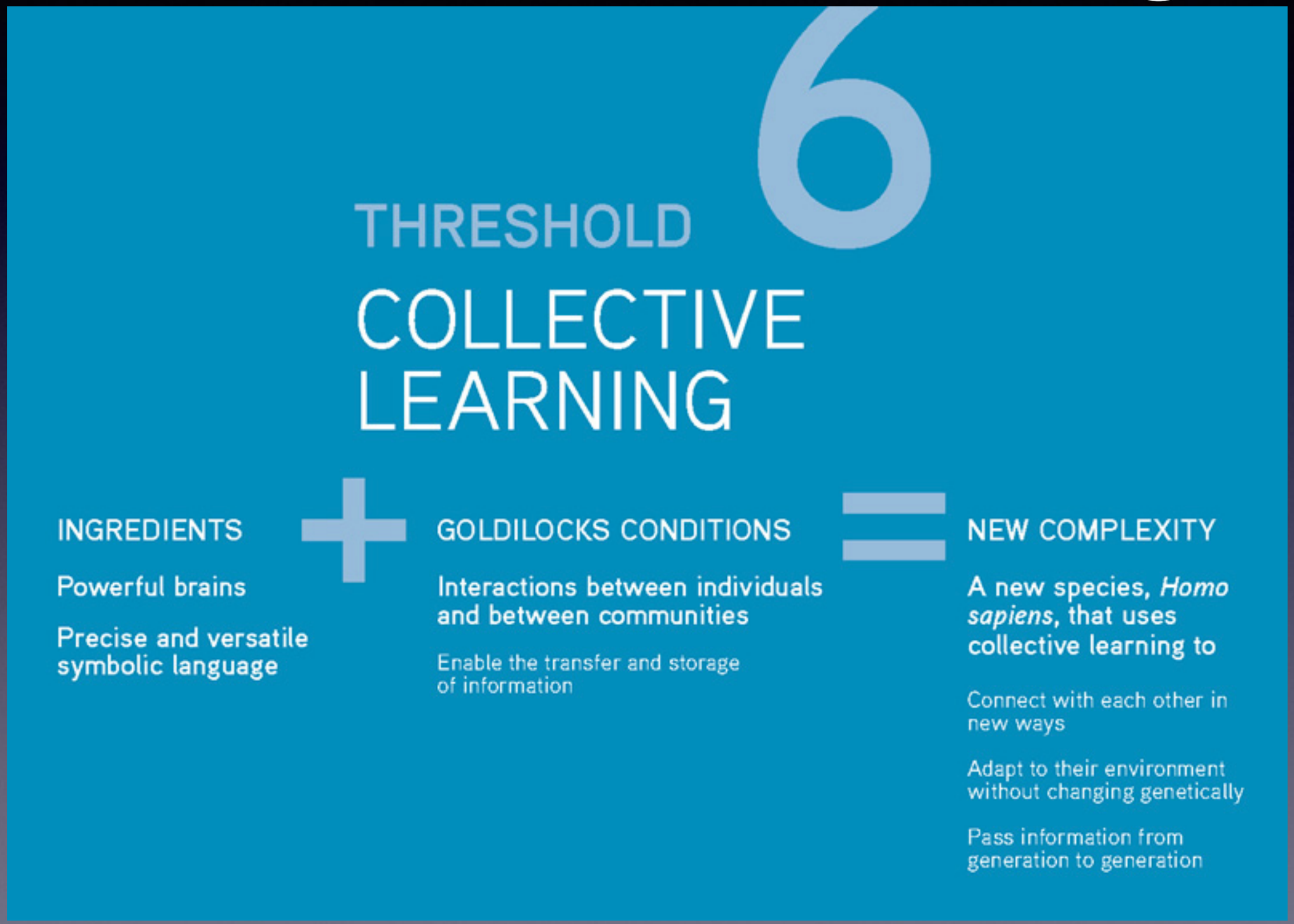
Copy themselves (reproduction)

Gain new characteristics over time (adaptation)

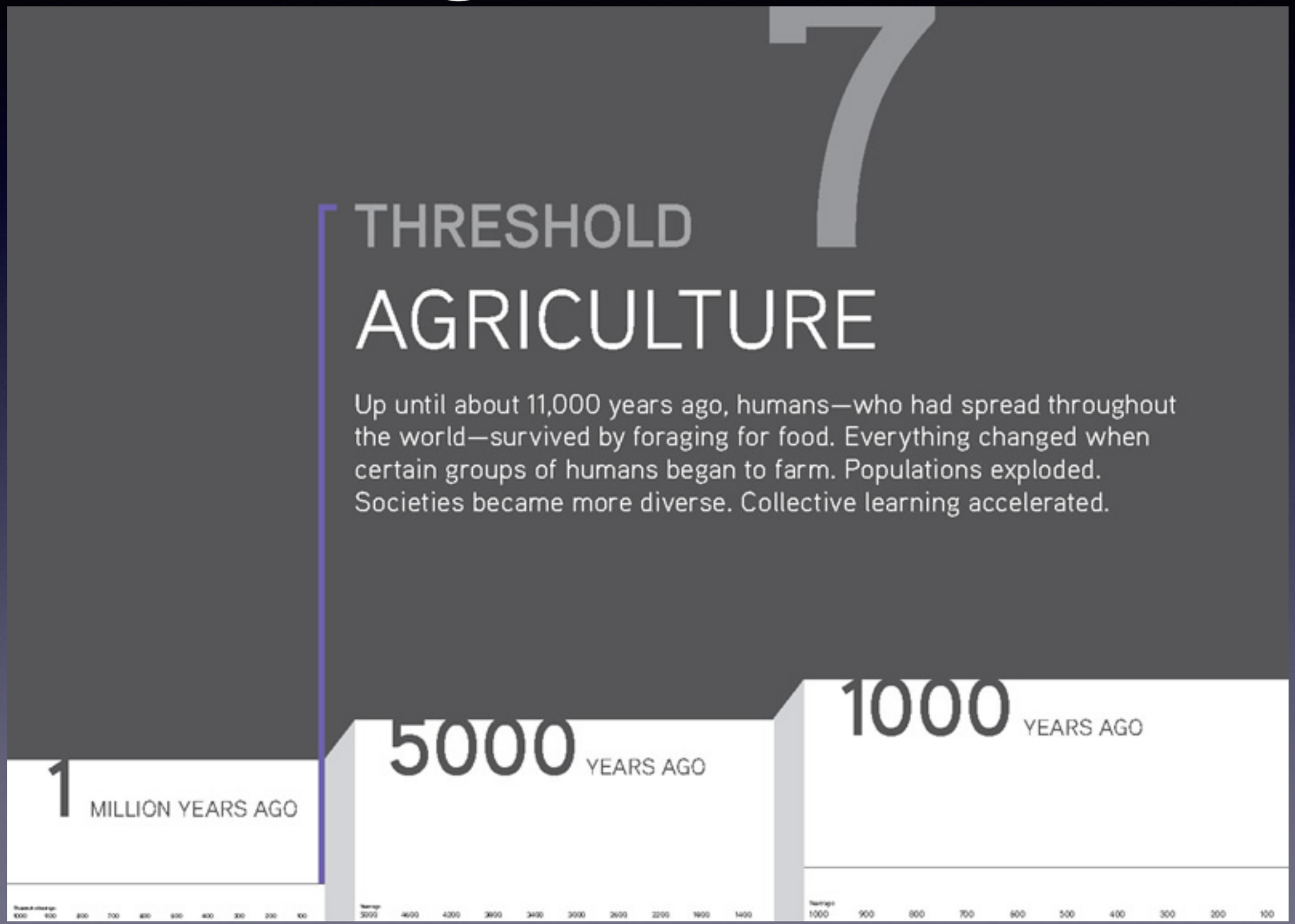
Collective Learning



Collective Learning



Agriculture



Agriculture

THRESHOLD 7

AGRICULTURE

INGREDIENTS

Increasingly dense human communities

Knowledge about the environment

Accumulated through collective learning over many generations

+

GOLDILOCKS CONDITIONS

Warmer climates after the last ice age

Enable the proliferation of plants and animals in many regions

Increasing competition for resources

Forces foragers to find ways to increase production from their environments

=

NEW COMPLEXITY

Domestication of plants and animals

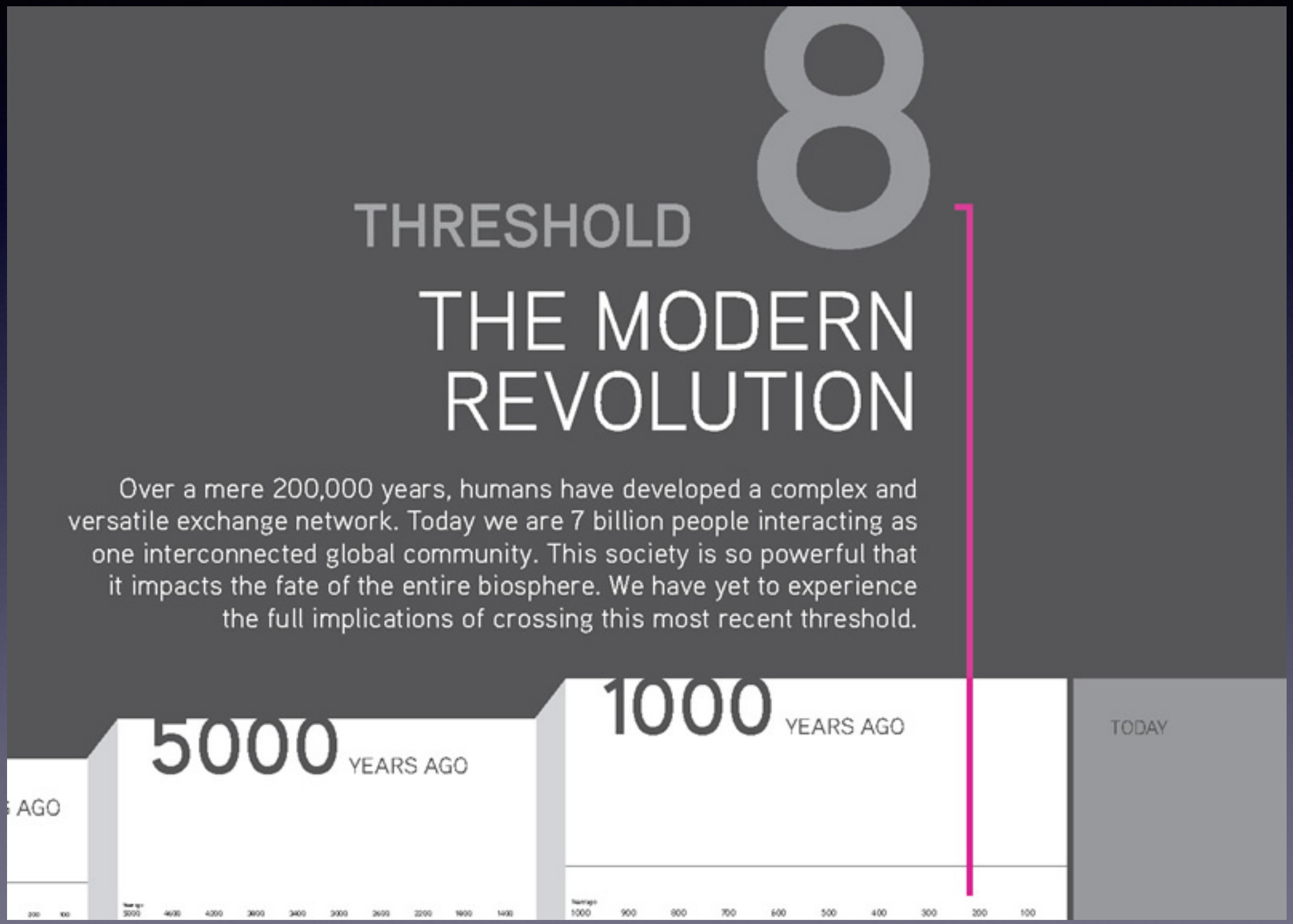
Increases access to food and energy sources

Villages, cities, and agrarian civilizations

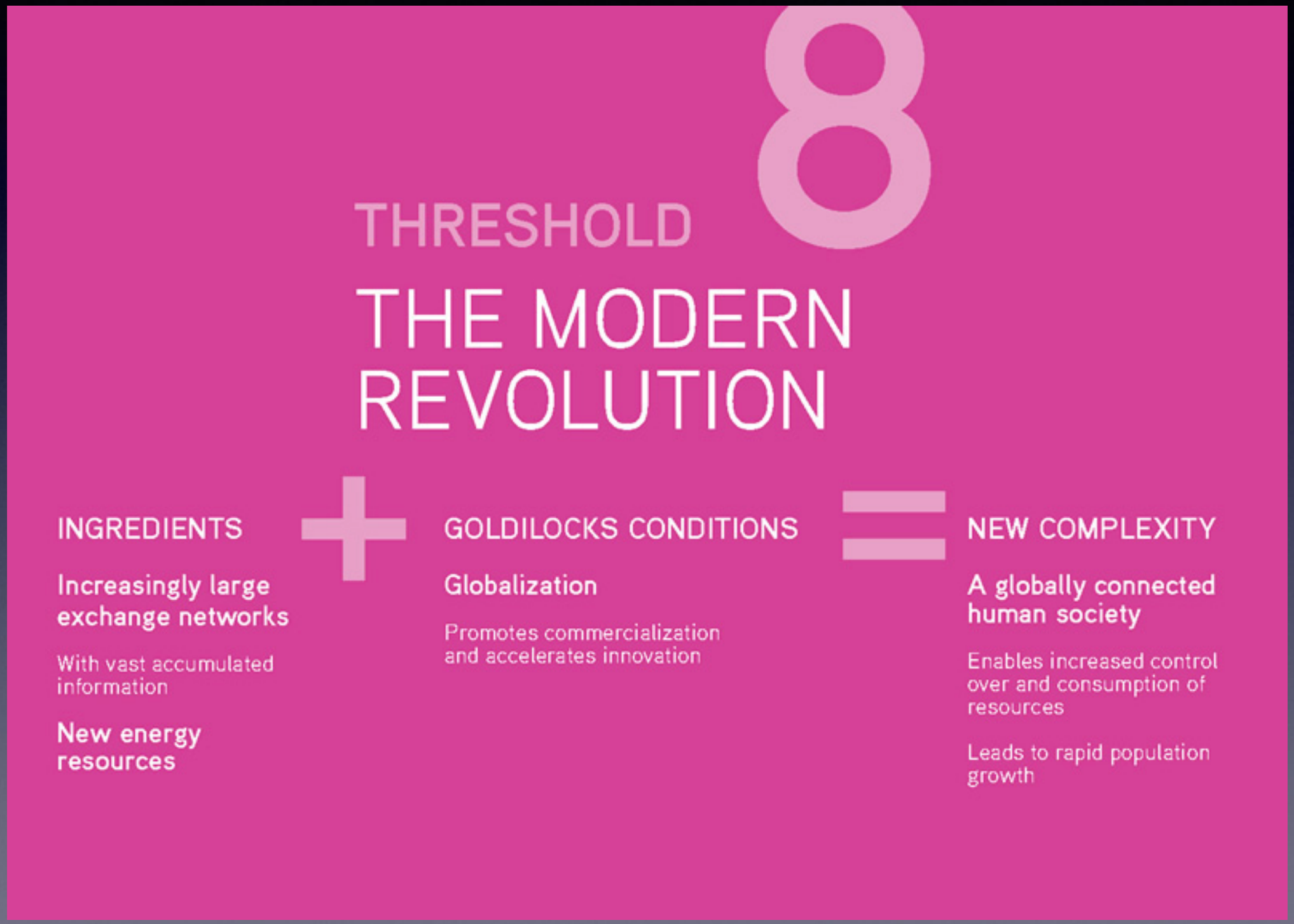
Generate new social systems and complex infrastructures

Enable rapid acceleration of collective learning and even greater innovation

Modern Revolution



Modern Revolution



WHO IS BEHIND THE BIG HISTORY PROJECT?

1

Teachers and Schools

The engine behind BHP: The course is built in conjunction with a core set of pilot schools, both public and independent

2

University of Michigan

Research partner: Manages student data (always anonymous!) and drives course strategy

3

Experts / Guest Lecturers

Broad range of experts on cutting edge of their fields – Walter Alvarez, Janna Levin, Skip Gates, John Green, and many more share their perspectives throughout the course

4

David Christian and Bill Gates

David Christian was one of the pioneers of Big History, and his college-level course inspired Bill Gates to explore a collaboration designed to bring Big History to high school students everywhere.

- https://www.bighistoryproject.com/home