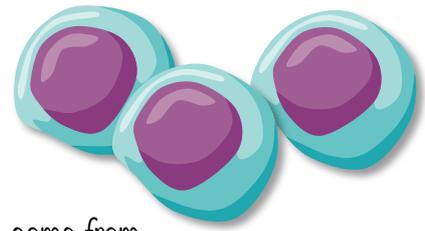
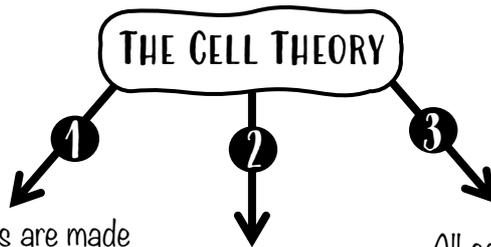
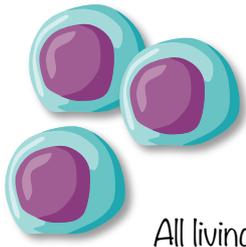


Origin of Cells (HL)



All living organisms are made up of one or more cell.

Cells are the smallest unit of life.

All cells come from pre-existing cells.

Anything is considered living if they can carry out the functions of life



Viruses are considered **NON-LIVING** as they cannot carry the functions of life

2 The 7 functions of Life

HOMEOSTASIS - Maintenance of a constant internal environment.

METABOLISM - The sum of all the chemical reactions that occur within an organism.

RESPONSE - As the environment changes, the organism adapts.

GROWTH - The development of an organism.

REPRODUCTION - The ability to produce offspring.

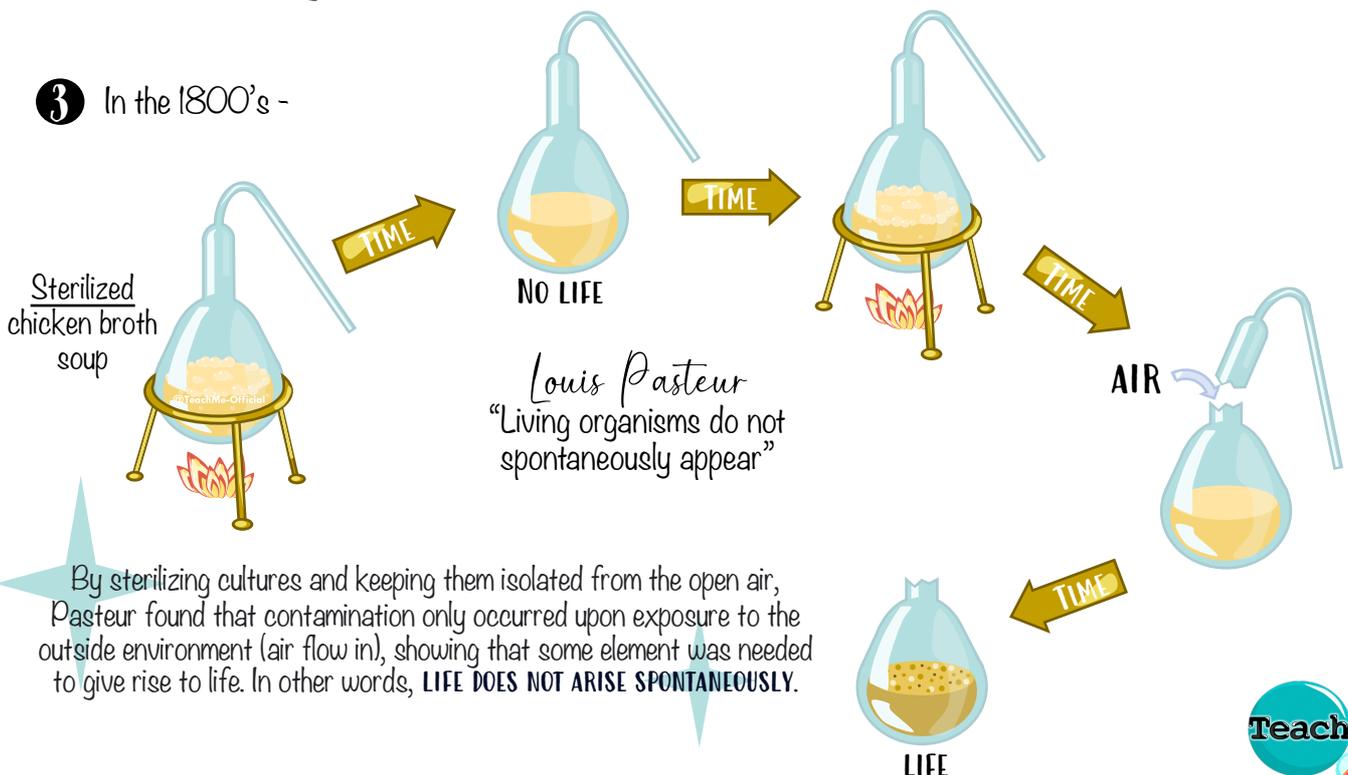
EXCRETION - The ability to release materials not needed or harmful into the surrounding environment.

NUTRITION - The ability to acquire the energy and materials needed to maintain life.

HOW TO REMEMBER?

HI MR. GREN!

3 In the 1800's -



By sterilizing cultures and keeping them isolated from the open air, Pasteur found that contamination only occurred upon exposure to the outside environment (air flow in), showing that some element was needed to give rise to life. In other words, **LIFE DOES NOT ARISE SPONTANEOUSLY.**

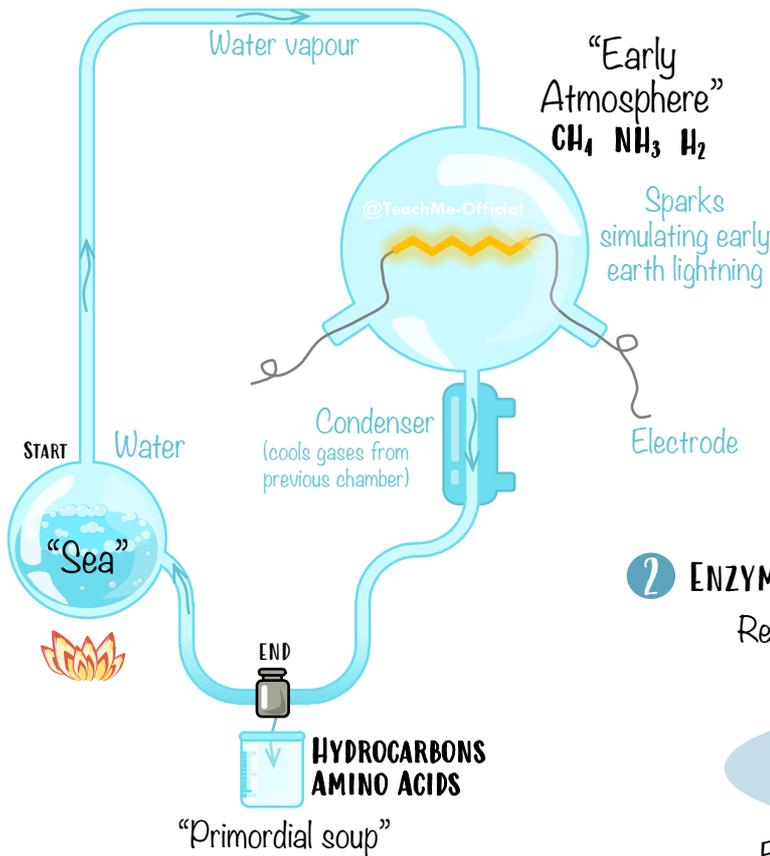


How DID CELLS COME INTO EXISTENCE?

- 1 Organic (carbon) molecules must have existed and been synthesized from abiotic (non-living) molecules. → **MILER-UREY EXPERIMENT**
- 2 Assembly of smaller organic molecules into larger ones must have been possible. Forming polymers. → **ENZYME**
- 3 Membranes must have been formed to enclose all these molecules. → **VESICLE FORMATION**
- 4 Molecules that can replicate must have existed in order for inheritance to occur. → **RNA**

1 MILER-UREY EXPERIMENT

Designed to simulate the conditions of early Earth's atmosphere and oceans to test the hypothesis that organic molecules, could spontaneously form under those conditions.



CRITIQUES?

- NO IDEA what early earth conditions actually were.

Alternative Hypothesis -> Meteorites

- Water mixed with amino acids do not form proteins.

- Miller-Urey gases are NOT accurate. Rather from volcano.

- No methane or ammonia (miler false)



2 ENZYME

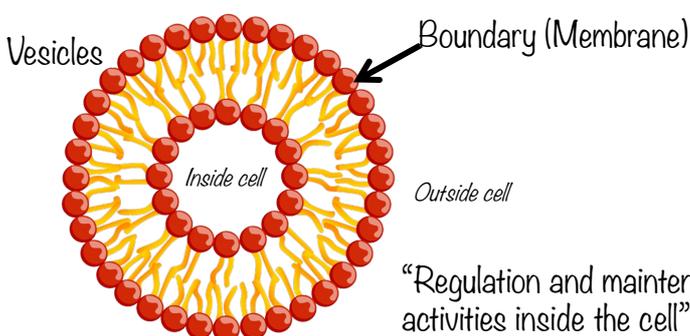
Reactions are super slow so something must have existed to speed it up.



Enzyme like components should have existed. Enzymes are carbon based and so it would have had to be something else. Like, hot sand, clay or rock.

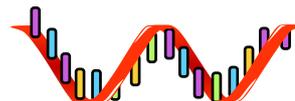
For example, sugar cubes (A) is difficult to dissolve in water (B) to form sugar-water (C) unless helped using heat or mixing with a spoon (the enzyme)

3 VESICLE FORMATION



"Regulation and maintenance of activities inside the cell"

4 RNA Must have existed



Summary

PROCESS OF THE ORIGIN OF CELLS

