

Welcome to Class 9: Life on Earth

Remember: sit only in the first 10
rows of the room

What are we going to discuss today?

What is the scientific debate over Evolution?

What is too extreme for life to thrive in?



PRS: Gravity is _____

1. A scientific theory
2. An observed phenomenon
3. A theory for how the universe came to be
4. All of the above.

Remember to set your channel to 80!

PRS: Evolution is _____

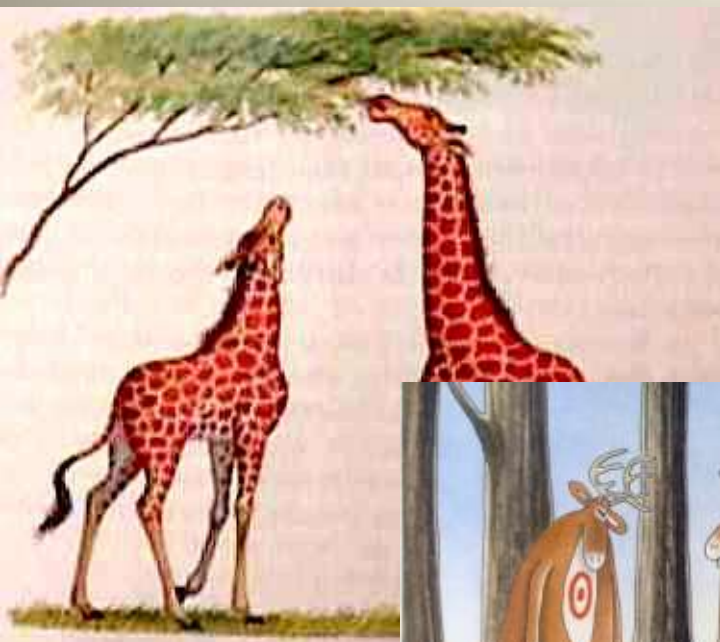
1. A scientific theory
2. An observed phenomenon
3. A theory for how the animals came to be
4. All of the above.

PRS: If evolution is an observed phenomenon, then what is the 'theory' part about?

1. How long evolution has been going on.
2. Does all life evolve.
3. What drives evolution.

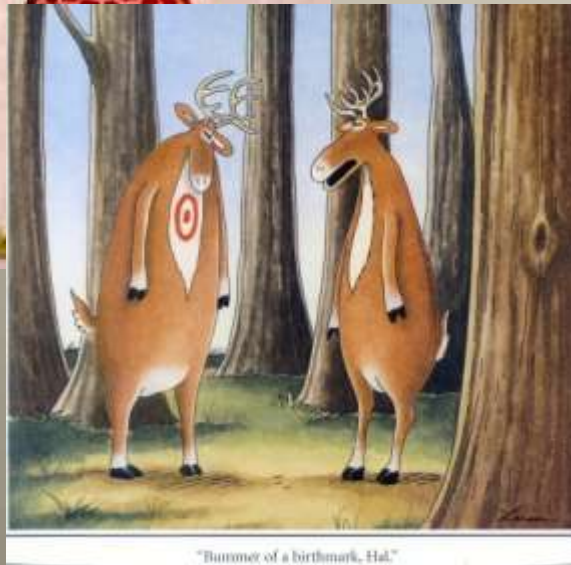
Example of two theories for Evolution: Lamarck's vs. Darwin

Why do giraffe's have such long necks?



Lamarckian Theory: The constant stretching to reach for the highest leaves caused the neck's to stretch.

Darwinian Theory: The giraffes with the longest neck ate best and lived to produce offspring with equally long necks.



Can you think of other examples?

We can only pass down traits in our DNA. Stretching your neck doesn't change your DNA.

The success of one generation is passed on to the next generation.

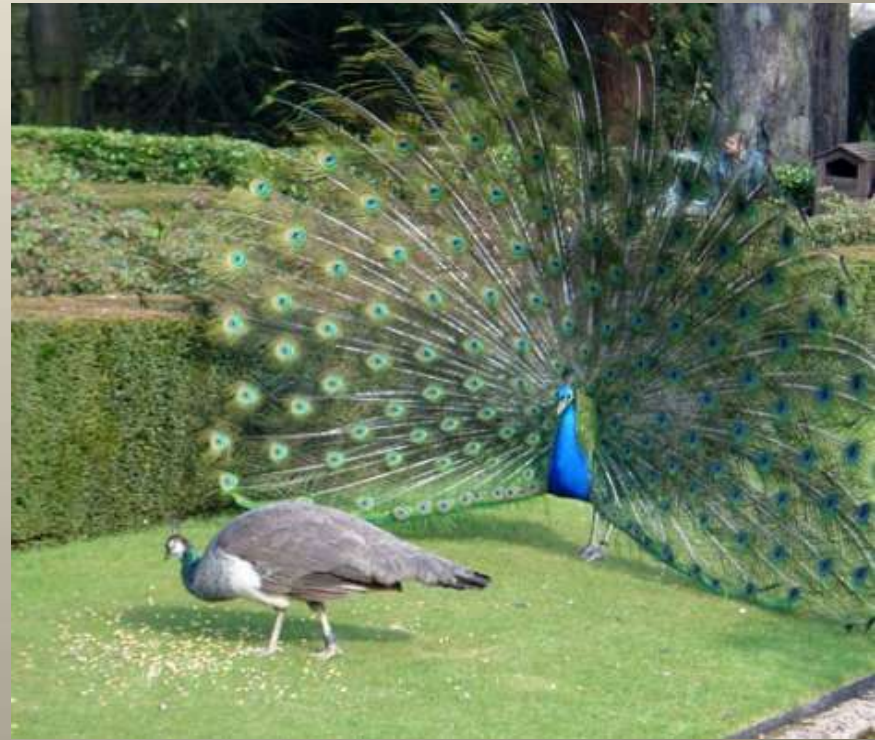
Life evolves, driven by advantageous characteristics.

‘Survival of the fittest’

But some characteristics are advantageous in a different way:

‘Sexual selection’ is an equally effective method for driving evolution

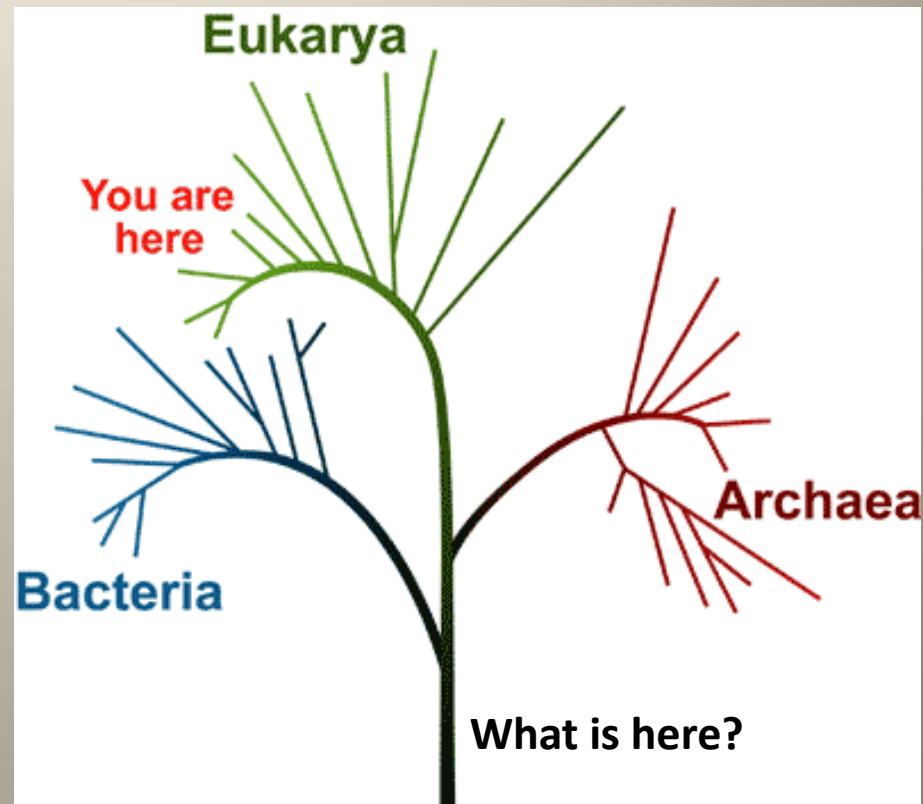
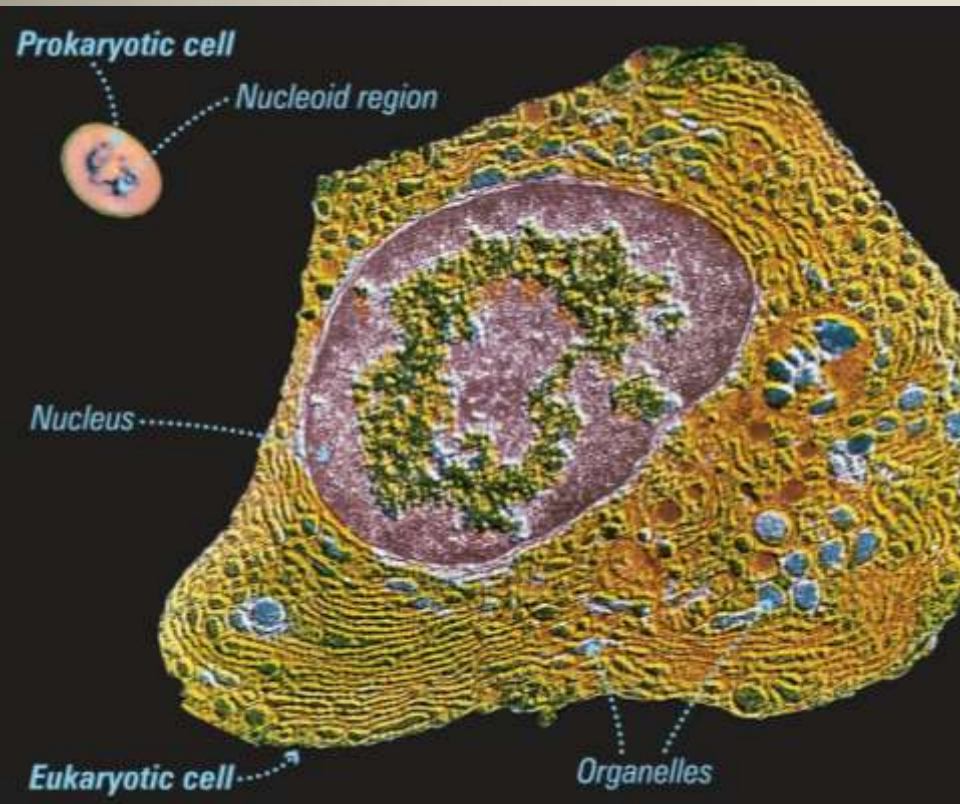
All of these drivers fall under the category of: **Natural Selection**



THIS IS DARWIN'S THEORY for why evolution occurs.

On Earth: Two kinds of `Cells` and Three kinds of `Life` (domains)

Prokaryotes are always single-celled microorganisms. Eukaryotes are single and multi-celled



Bacteria & Archaea are Prokaryotes. Eukarya are Eukaryotes

PRS: From what Domain are Humans?

1. Bacteria
2. Eukarya
3. Archaea

PRS: From what Domain is *E.Coli*

1. Bacteria
2. Eukarya
3. Archaea

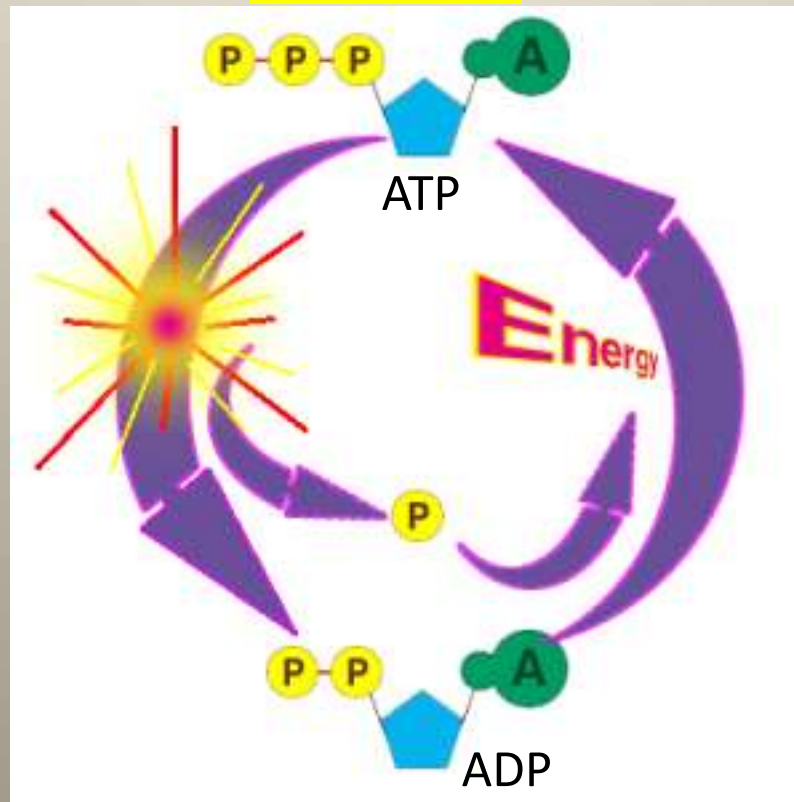
PRS: What does a cell use ATP for?

1. Transmitting genetic information
2. Mutations
3. Storing energy
4. Locomotion

ATP = **A**denosine **Tri-P**hosphate

ADP = **A**denosine **Di-P**hosphate

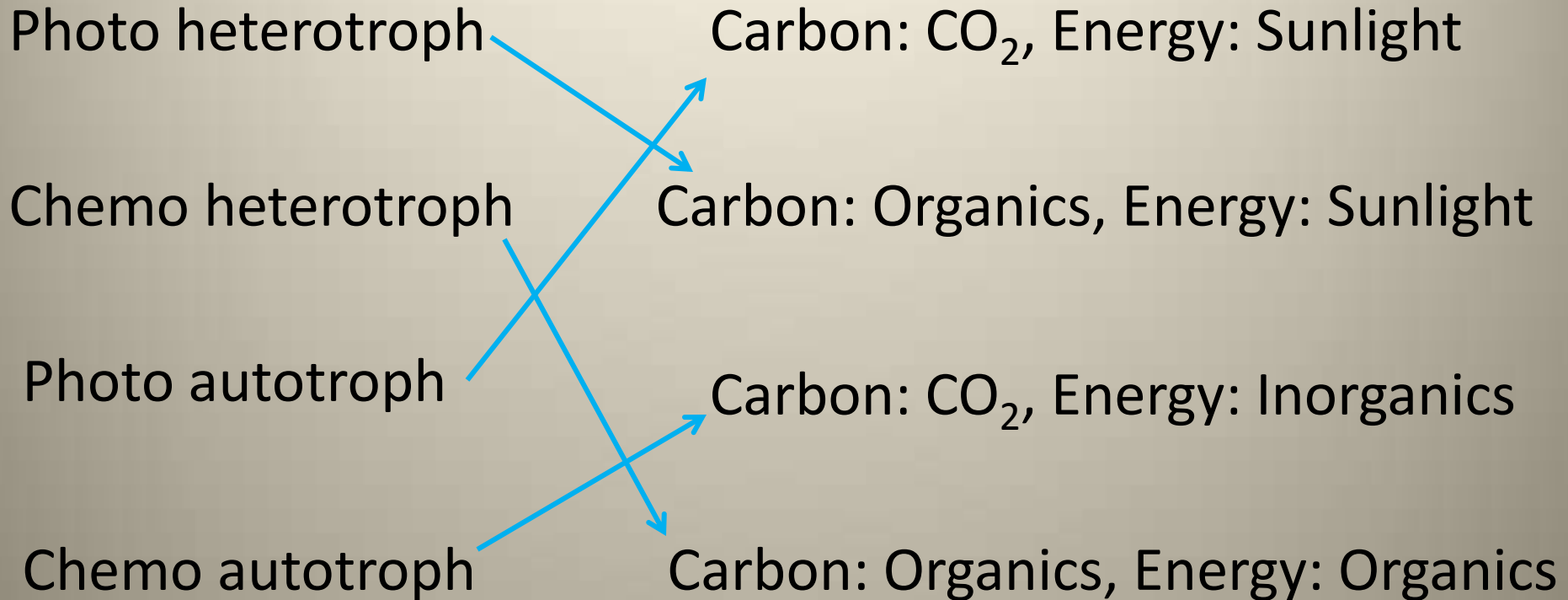
The P is like an energy packet



Fuel for
Cell
functions
Here

Input
energy
here
(storage)

Match the word with the definition



Source of carbon: Autotroph = CO₂, Heterotroph = Organics

Source of energy: Photo = Sunlight, Chemo = Chemicals

What kind of 'troph' are humans?

1. Photo autotroph
2. Chemo autotroph
3. Photo heterotroph
4. Chemo heterotroph

What is a habitable world?

Not too hot.. How hot is that?

Not too cold.. How cold is that?

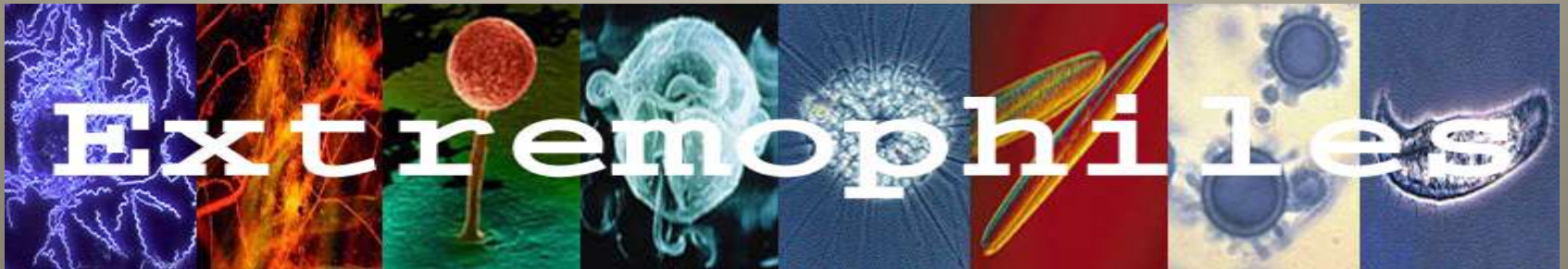
Protected from radiation.. But at what level?

Not too acidic.. But how acidic is ok?

Not at high pressure.. But how high a pressure is ok?

What are the limits of what life can WITHSTAND?

Welcome to the world of...



These micro organisms like heat

1. Thermophile
2. Psychrophile
3. Halophile
4. Barophile
5. Endolith
6. Xerophiles

Thermophiles in Hot Pools and Deep Sea spreading centers.



These micro organisms like cold

1. Thermophile
2. Psychrophile
3. Halophile
4. Barophile
5. Endolith
6. Xerophiles

Psychrophiles can survive in ice

Eventually, when it thaws, they come 'back to life'



These micro organisms live in rock

1. Thermophile
2. Psychrophile
3. Halophile
4. Barophile
5. Endolith
6. Xerophiles

Endoliths live within rock

These sandstone rocks come from the Antarctic.



Both light and water can filter into the rock so they can survive.

These micro organisms can live at times with little or no water

1. Thermophile
2. Psychrophile
3. Halophile
4. Barophile
5. Endolith
6. Xerophiles

PRS: From what Domain are HYPER thermophiles?

1. Bacteria
2. Eukarya
3. Archaea

Can you name two advantages to living in extreme physical environments?

Here are two hints:



PRS: Are extremophiles happy?

1. No, they would live better in not so extreme conditions
2. Yes, they only like where they live
3. No, they would live better in more extreme conditions.

Put all your materials on the floor and place your PRS clicker in front of you.

Please: use just one clicker for yourself.

Take care that others can not view your selection

1. If you lift weights, your offspring will be stronger. Who's theory is that?

1. Newton's

2. Galileo's

3. Darwin's

4. Lamarck's

5. Einstein's

2. Sexual Selection is

1. one form of natural selection which drives evolution
2. A theory of Lamarck's
3. new dating show.

3. Which is not a domain of Life?

1. Archaea
2. Bacteria.
3. Eucalyptus
4. Eukarya

4. A life form which gets its carbon from CO_2 and energy from sunlight is a

1. Photo autotroph
2. Photo heterotroph
3. Chemo heterotroph
4. Chemo autotroph

5. Extremophiles ...

1. Live in extreme conditions.
2. Demonstrate the wide range of habitability
3. Typically die outside their extreme environment.
4. All of the above.

To do list for next class

- Refer to the class syllabus
- Read assigned pages in textbook and review study questions on objectives list
- Bring PRS transmitter to class