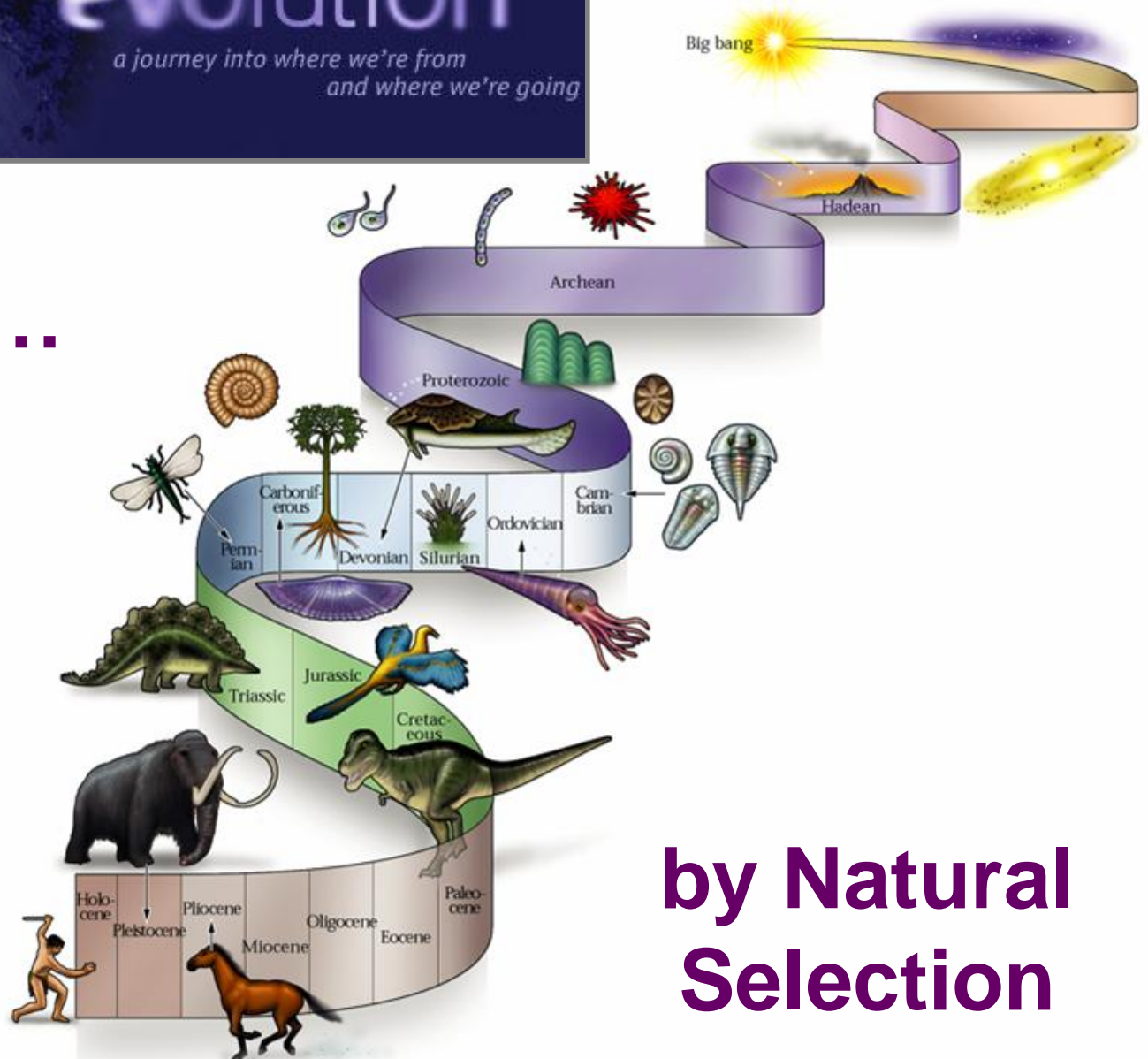


evolution

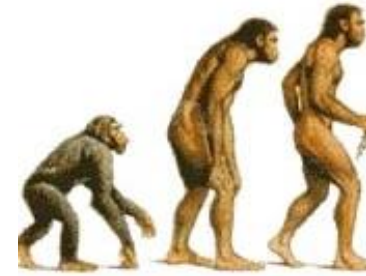
a journey into where we're from
and where we're going

Evolution...



by Natural
Selection

What is Evolution?



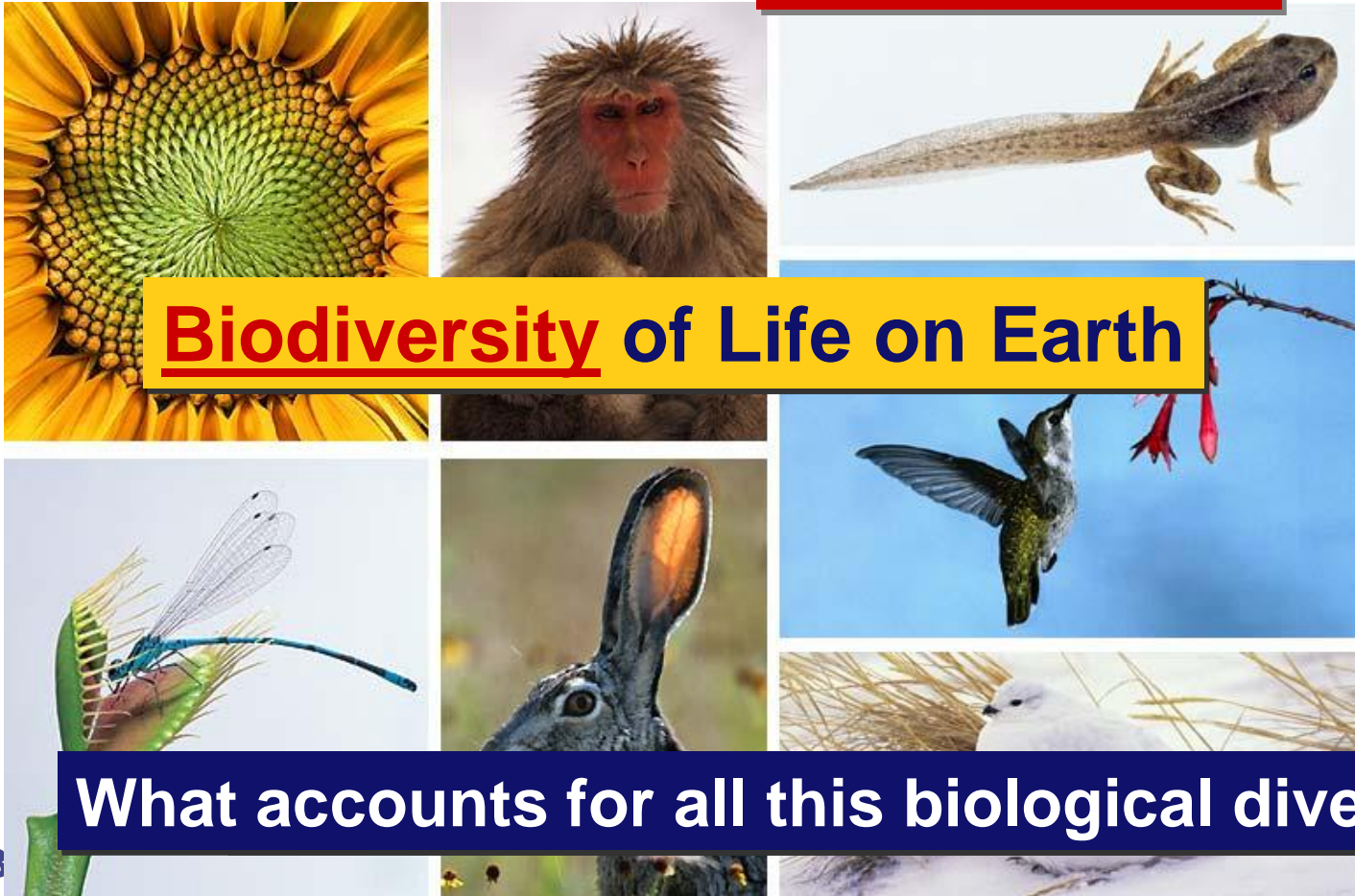
■ Evolution

- ◆ changes in living organisms over time
- ◆ explains how modern organisms have descended from ancient organisms



What do we know?

- There are many different creatures on Earth
- How do we know this? **OBSERVATION**



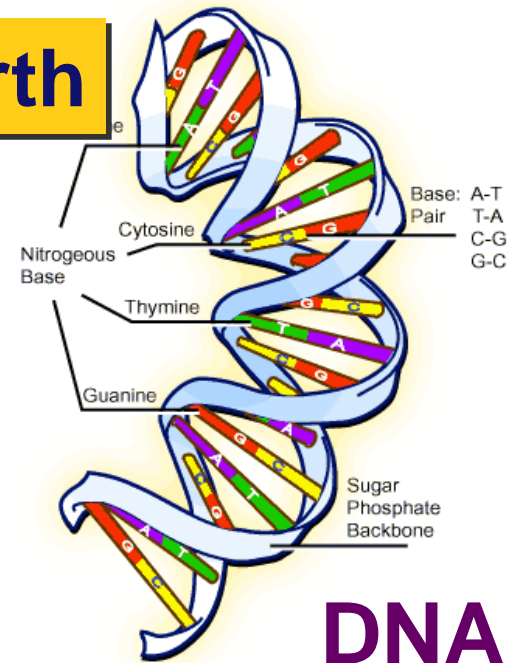
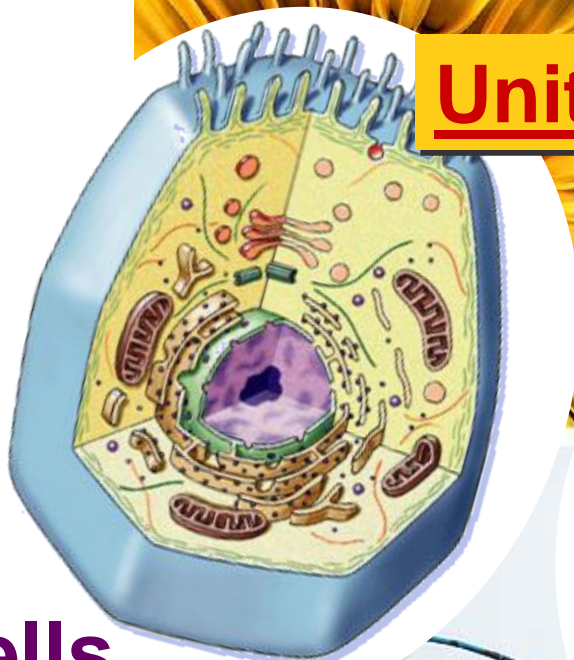
Biodiversity of Life on Earth

What accounts for all this biological diversity?

What do we know?

- All creatures have common characteristics
- How do we know this? **OBSERVATION**

Unity of Life on Earth

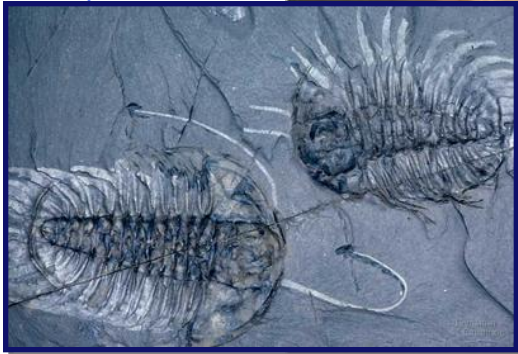


cells

How could all of life have the same basic features?

What do we know?

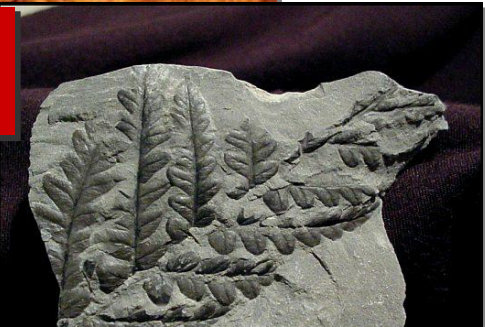
- The Earth is very old
- How do we know this?



TESTING & OBSERVATION

**Radioactive Dating
of the Rocks**

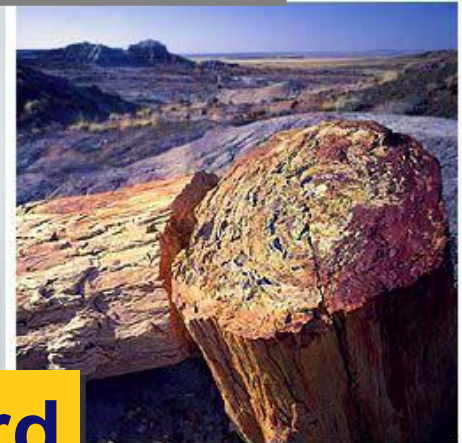
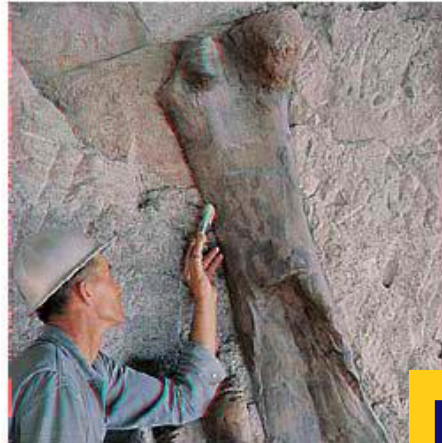
Life is very old!



What's happened to life during those billions of years?

What do we know?

- Creatures have changed over time
- How do we know this? **OBSERVATION**



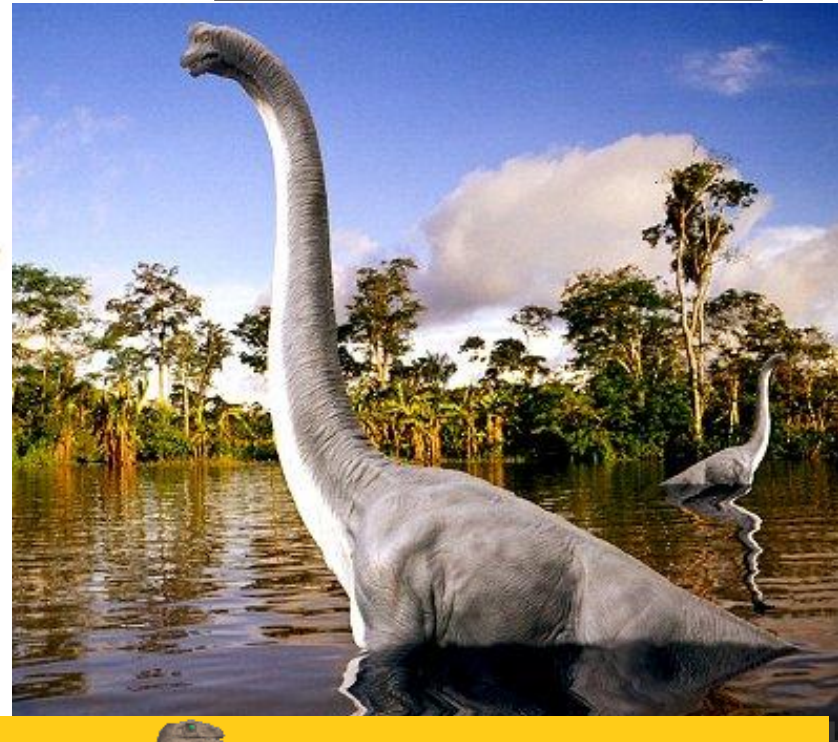
Fossil Record



What has the fossil record shown us?

- Many creatures that lived in the past don't exist today

OBSERVATION

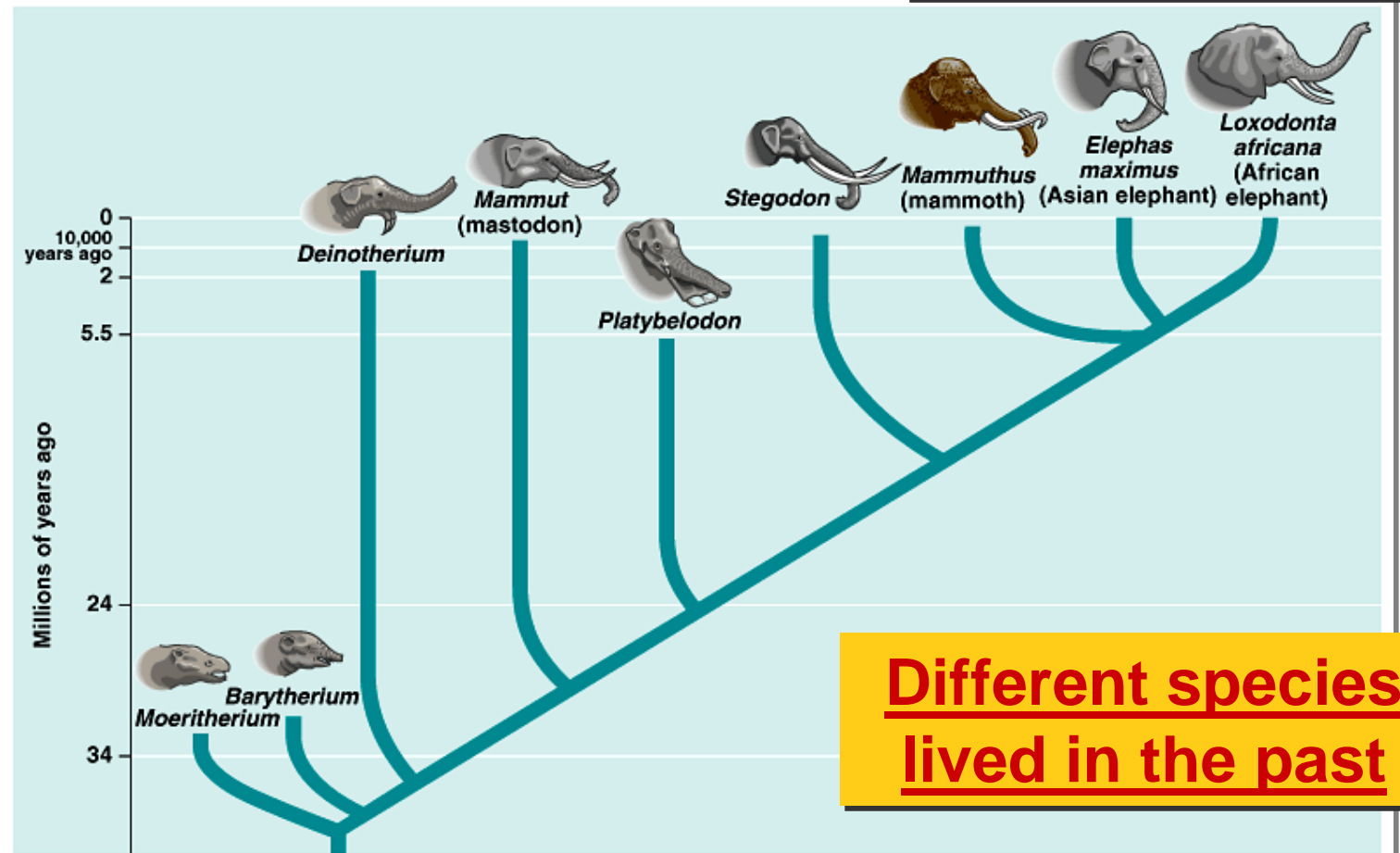


Origin of
new species

What has the fossil record shown us?

- The creatures alive today haven't always been around

OBSERVATION

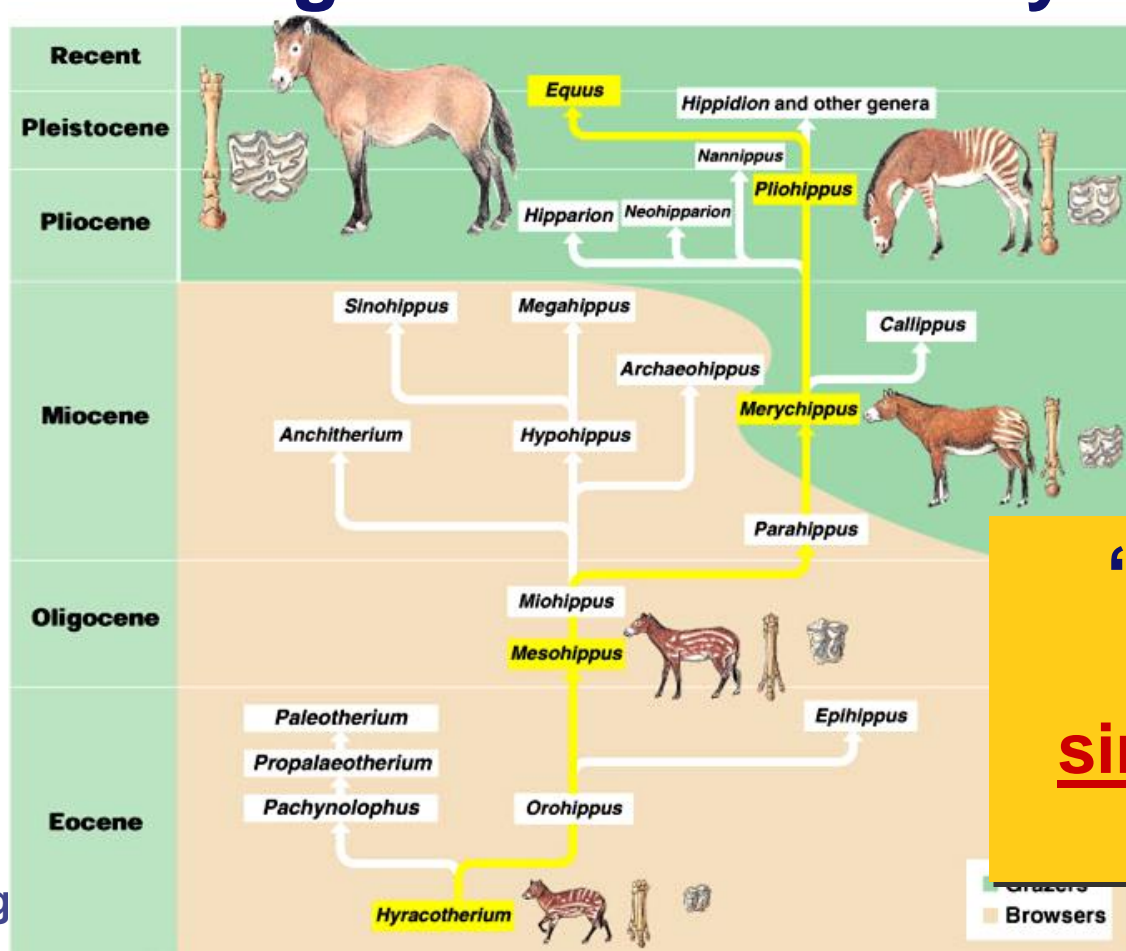


**Different species
lived in the past**

What has the fossil record shown us?

- Many creatures in the past looked like living ones we see today

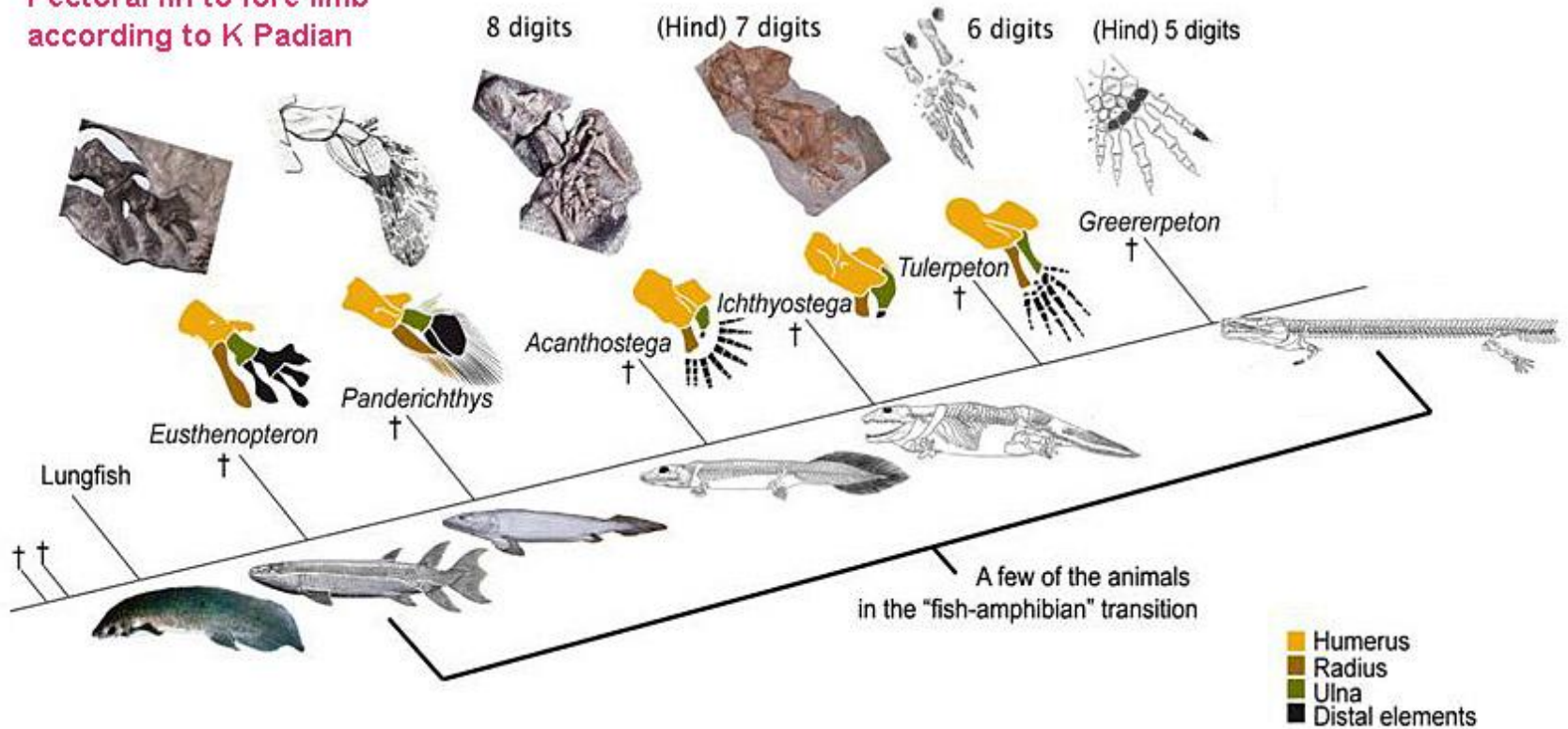
OBSERVATION

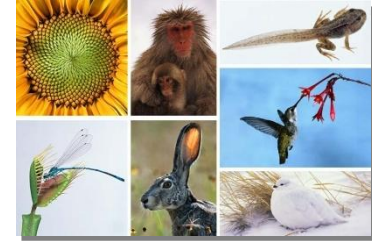


“Family Tree”
Relatives with similar, but not the same traits

More evidence from the fossil record

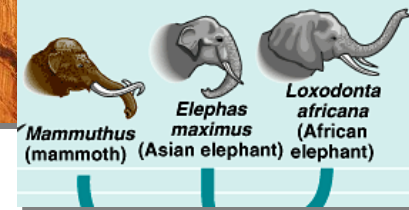
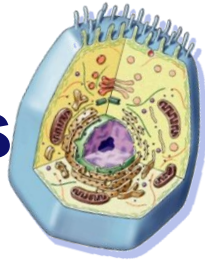
Pectoral fin to fore limb
according to K Padian





Quick review, so far....

- Many different species alive today
- All life shares common characteristics
- The Earth is very old
- Life is very old
- Life has changed over time
- The changes have been little changes over long periods of time



Evolution

But how does this work?

What do we know?

- Populations are a mix of different individuals
- How do we know this? **OBSERVATION**

OBSERVATION

Variation



What do we know?

- Organisms have more offspring than the environment can support
- Not everybody survives
- How do we know this?

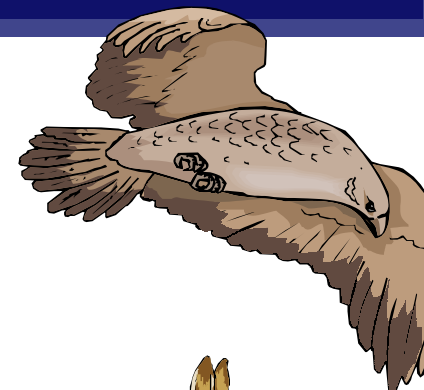
OBSERVATION

Over-production



Competition





How does that work?

Variation

Over-Production & Competition

Adaptation

Nature selects the ones that “fit” the environment better ... survive & reproduce

Natural Selection

What determines survival?

■ Natural Selection

◆ traits that help individuals survive

- survive predators
- survive disease
- compete for food
- compete for territory



Adaptations

◆ traits that help individuals reproduce

- attracting a mate
- compete for nesting sites
- successfully raise young

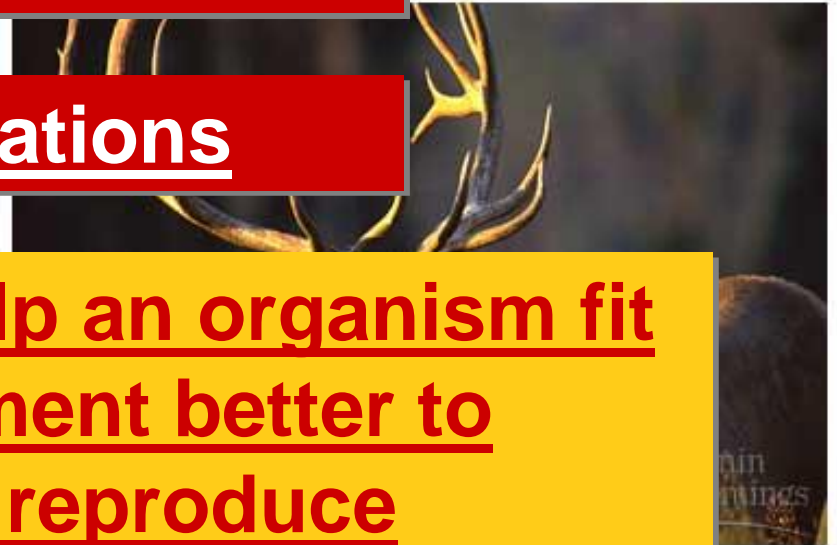


Survival & Reproduction of the Fittest

Survival & Reproduction of the fittest



...the fittest!

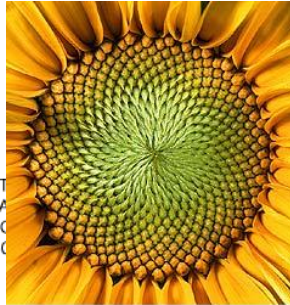
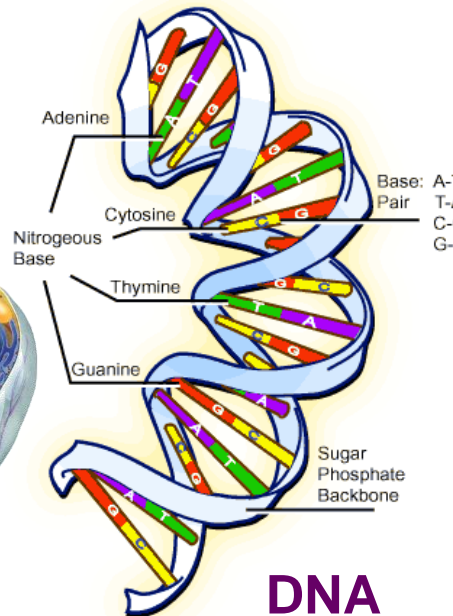
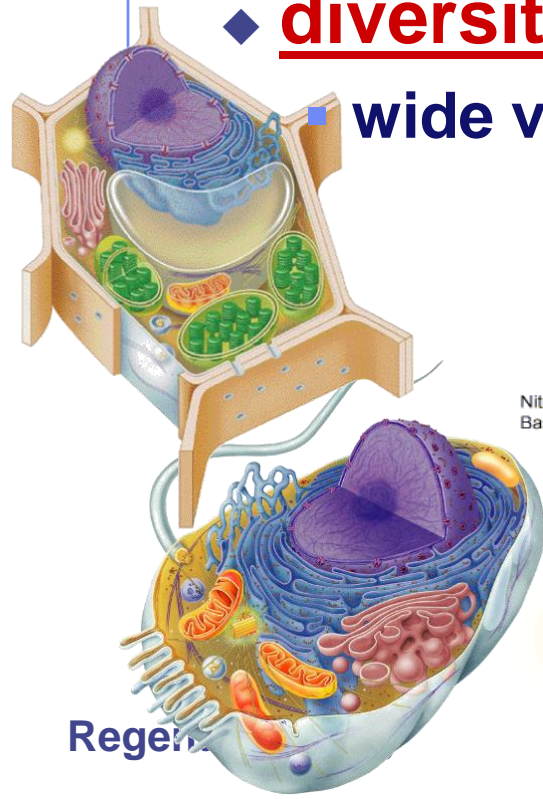


Adaptations

**the traits that help an organism fit
the environment better to
survive & reproduce**

Evolution explains Unity & Diversity

- **Only evolution explains both**
 - ◆ **unity of life**
 - similarities between all living things
 - ◆ **diversity of life**
 - wide variety of different creatures on Earth



Survival & reproduction of the fittest bug...



**Don't be a Dodo...
Ask Questions!!**

