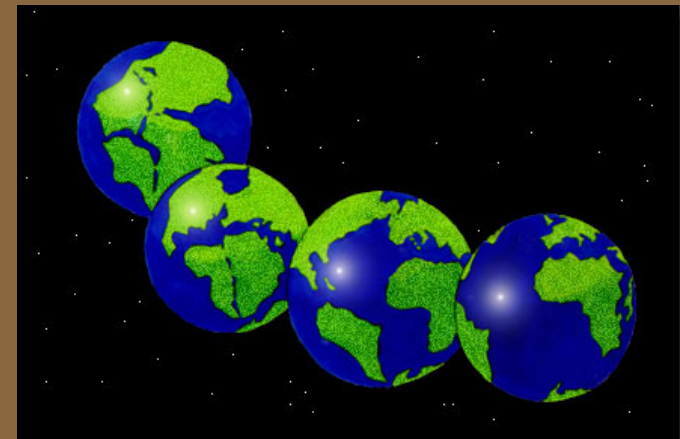




An Introduction to Earth's History

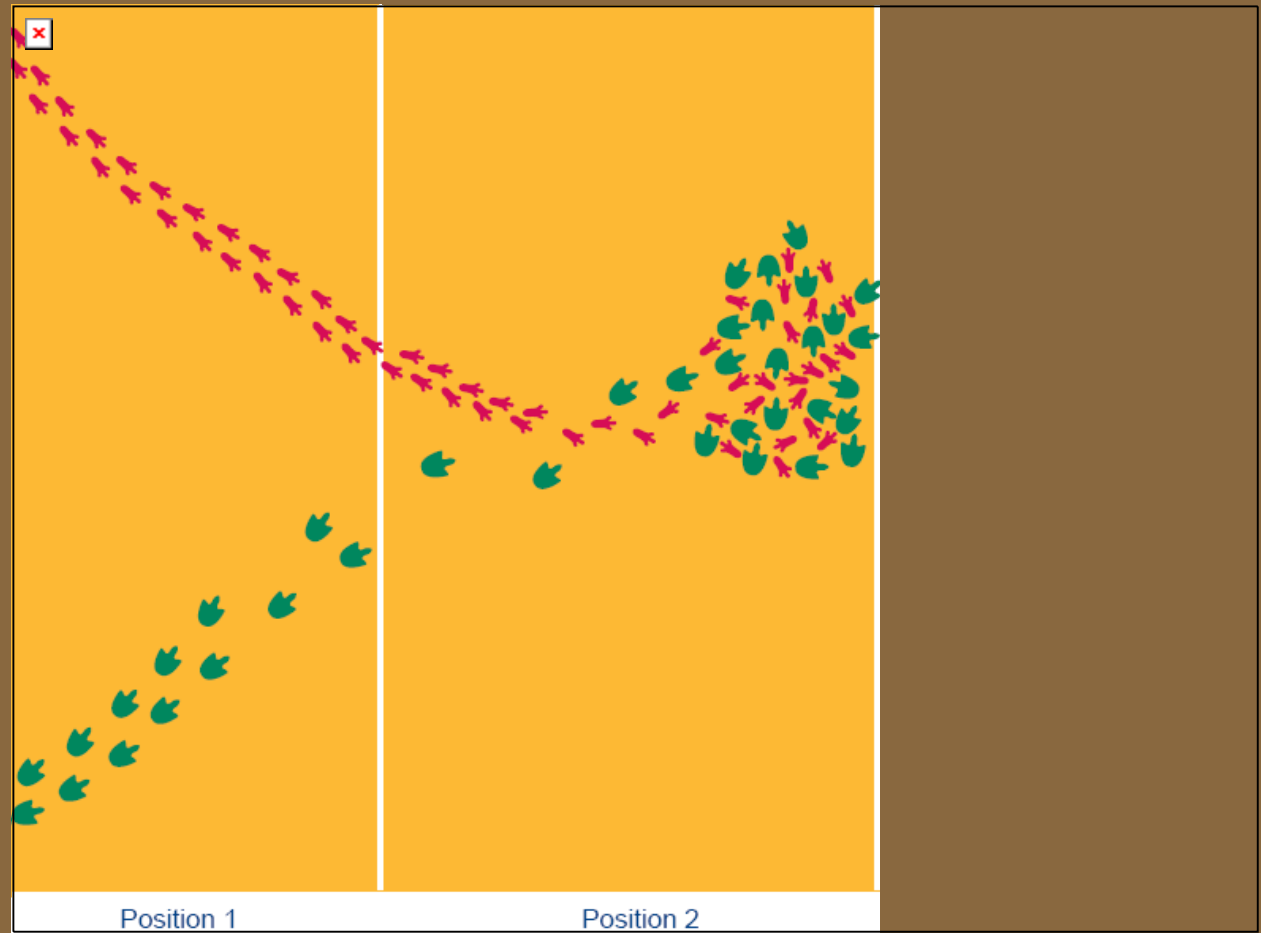
with fossils



- What observations can you make about the footprints in the diagram?
- What can you infer from the observations?



What observations can you make here?



What
inferences?

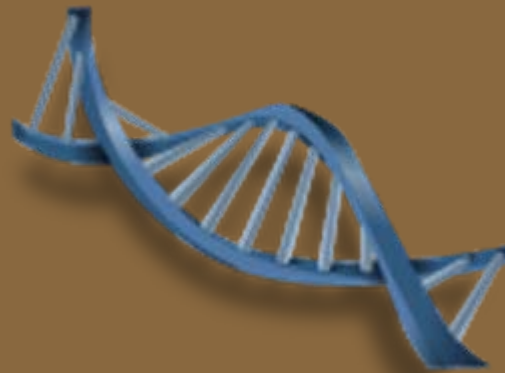


**~ 13.7
billion
years ago**



**Earth is
formed ~
4.6 billion
years ago**

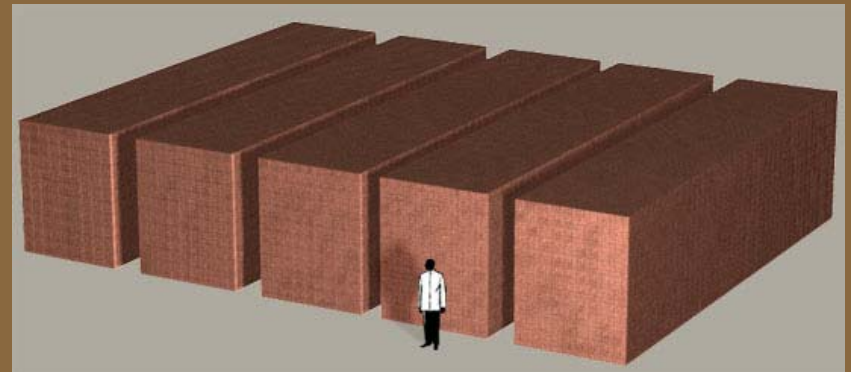
**Chemistry
of life =
DNA ~ 3.8
billion
years ago**



How big is a billion?

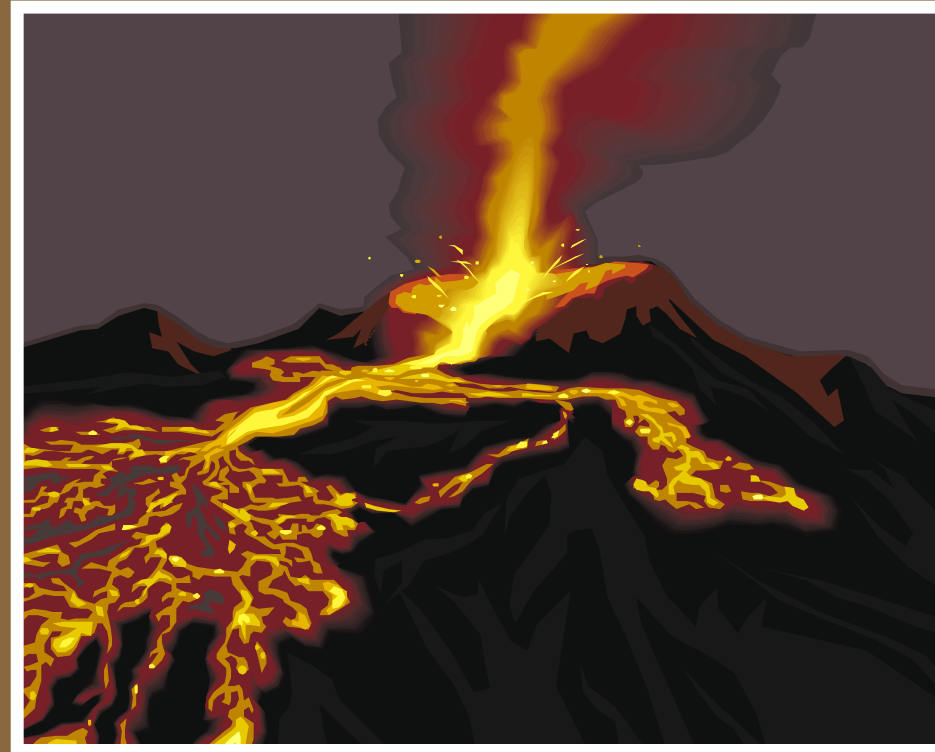
- How long would it take to count to one billion?
- Try it! Count one number per second without stopping until you reach one billion. You can stop in 31 years, 251 days, 7 hours, 46 minutes, and 40 seconds!

- 1,000,018,176 pennies



Early History of Life

- Earth was very inhospitable
 - Hot ball of rock
 - 3.9 billion years ago it cooled off
 - Violent rainstorms
 - Led to formation of oceans
 - 3.5 billion years ago – the first living organisms



Our History is in the Rock

- Oldest rocks on Earth ~ 3.9 billion years old
- They are constantly changing.
- Important source of info for life in the past

FOSSILS

Preserved remains or traces of animals, plants,
and other organisms
from our past



Trace Fossil

- Evidence of animal activities
 - Footprints
 - Burrows
 - Trails
 - Eggs
 - Nests



Above: dinosaur footprints

Left: trails from a slug-like organism

Molds

- Empty space is left in the rock after an organism dies and decays



Casts

- Minerals fill that mold and harden in the same shape as the original organism



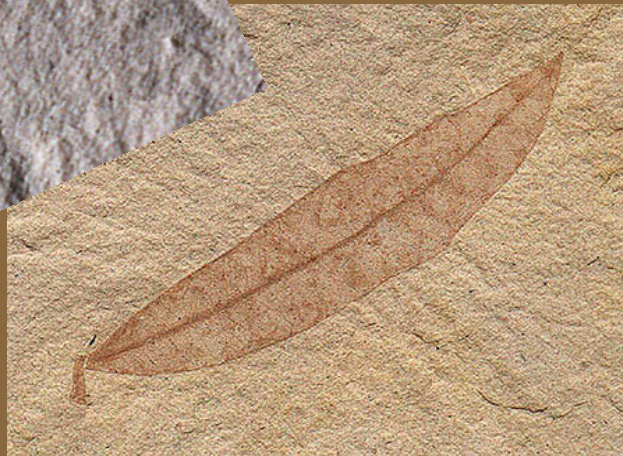
Resin Fossils

- Preserved in amber, a naturally occurring polymer excreted by particular plants



Imprints

- Thin objects fall into sediment, which harden into rock
 - Leaves
 - Feathers



More Imprints

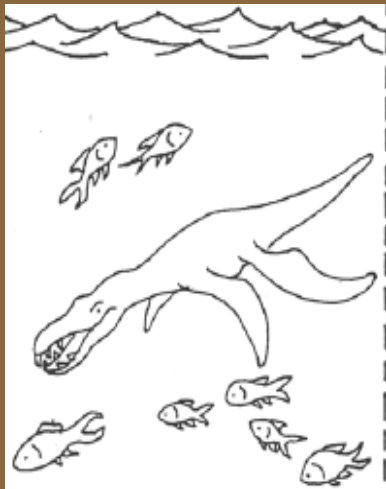
- **Rock = 200 million years old**
- **Leaf = today's Ginkgo tree**



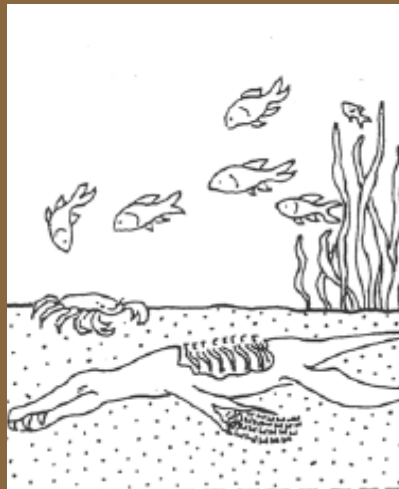
Fossilization

- Occurs in sedimentary rock

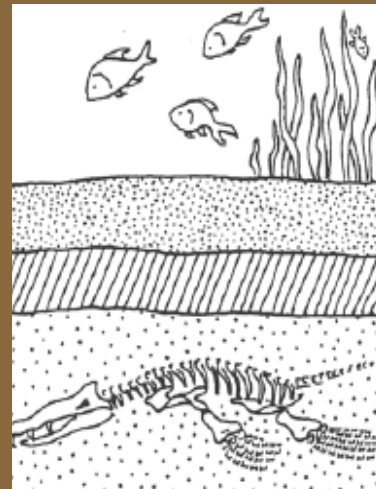
Organism
dies & falls
into
sand/mud



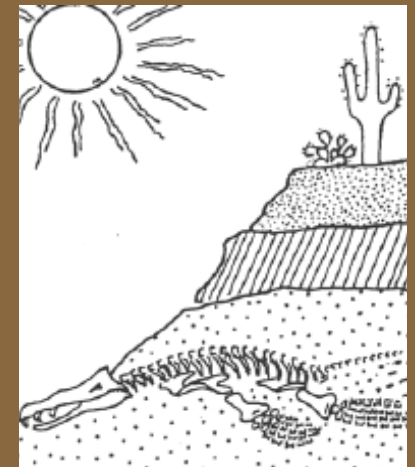
Sediments
pile on top
of carcass



Mud/sand
compresses
to form
layers



Earth
moves, as
erosion
occurs;
brings fossil
to the
surface



Paleontology

- Scientist discovers a fossil and “digs” it up
- Extracts it
- Determines its age

