

Evidence for Evolution

1-geology & geologic timescale

tells **age of earth 4.6 bill yrs**----->gives enough time to go

from unicellular life to multicellular life to great diversity
sediments are laid down in layers by wind, water, etc

lowest layers at bottom are oldest, contain simplest
organisms

higher layers are more recent, contain more complex
organisms

can date rock layers, thus fossils in rock can be dated
one of strongest supports of evolution is **consistency of
fossil record around the world**

so, how does geology support the Theory of Evolution?

2-paleontology: study of fossils

fossil: remains of once living organisms

impressions in rocks, bones, fossilized bones

mostly hard body parts, however soft parts sometimes

remain: insects in amber, frozen in ice, LaBrea tar pits
mummification

whale video *Evolution* DVD

tetrapods *Evolution* DVD

why is fossil record incomplete?

must have right conditions to preserve organisms

it is hard to find remains of soft body parts

how do fossils support the The Theory of Evolution?

Evidence of Evolution

3-Natural Selection in Action

peppered moth population of 1850s England

2 forms of peppered moth in pop: white or black

before 1850s, white form was dominant

white form landed on gray tree bark----->camouflaged

black form landed on gray tree bark----->eaten by birds

pop was 95% white, 5% black

1850s Industrial Revolution: factories produced coal smoke

pollution began turning trees black

environment changed, selective pressures changed

now white moths were eaten, black survived

w/in 50 yrs, pop changed fr. 95% white to 95% black

AIDS Evolution DVD

how does this support The Theory of Evolution?

Evidence for Evolution

4-Artificial Selection

humans select which traits are desirable & which are not
humans do selective breeding w/animals
we have created the breeds of dogs, cats, cattle,
horses...

how does this support the Theory of Evolution?

5-Comparative Anatomy

homologous structures of vertebrates
forelimbs of human, cat, bird, bat, whale, fish,
amphibians
other structures: eye *Evolution* DVD

how does this support the Theory of Evolution?

6-Comparative Biochemistry

chemical makeup of proteins, blood, enzymes, etc.
sheep & cow insulin

how does this support the Theory of Evolution?

7-comparative embryology

in vertebrates, from fertilized egg----->certain stage of embryonic development, all embryos look the same
all vertebrates: fish, amphibians, reptiles, birds, mammals show gill slits (pharyngeal pouches), a tail, a dorsal nerve cord with brain & eyes at anterior end, and a notochord (becomes vertebral column)

how does this support the Theory of Evolution?

8-molecular biology

today this is the strongest evidence of evolution
includes genetics: all life is DNA based

DNA is genetic material, the structure of DNA is the same in all organisms, composed of the 4 same bases: A, T, C, G

the number of genes, the way the bases are arranged determine the differences

regulator genes from *Evolution* DVD