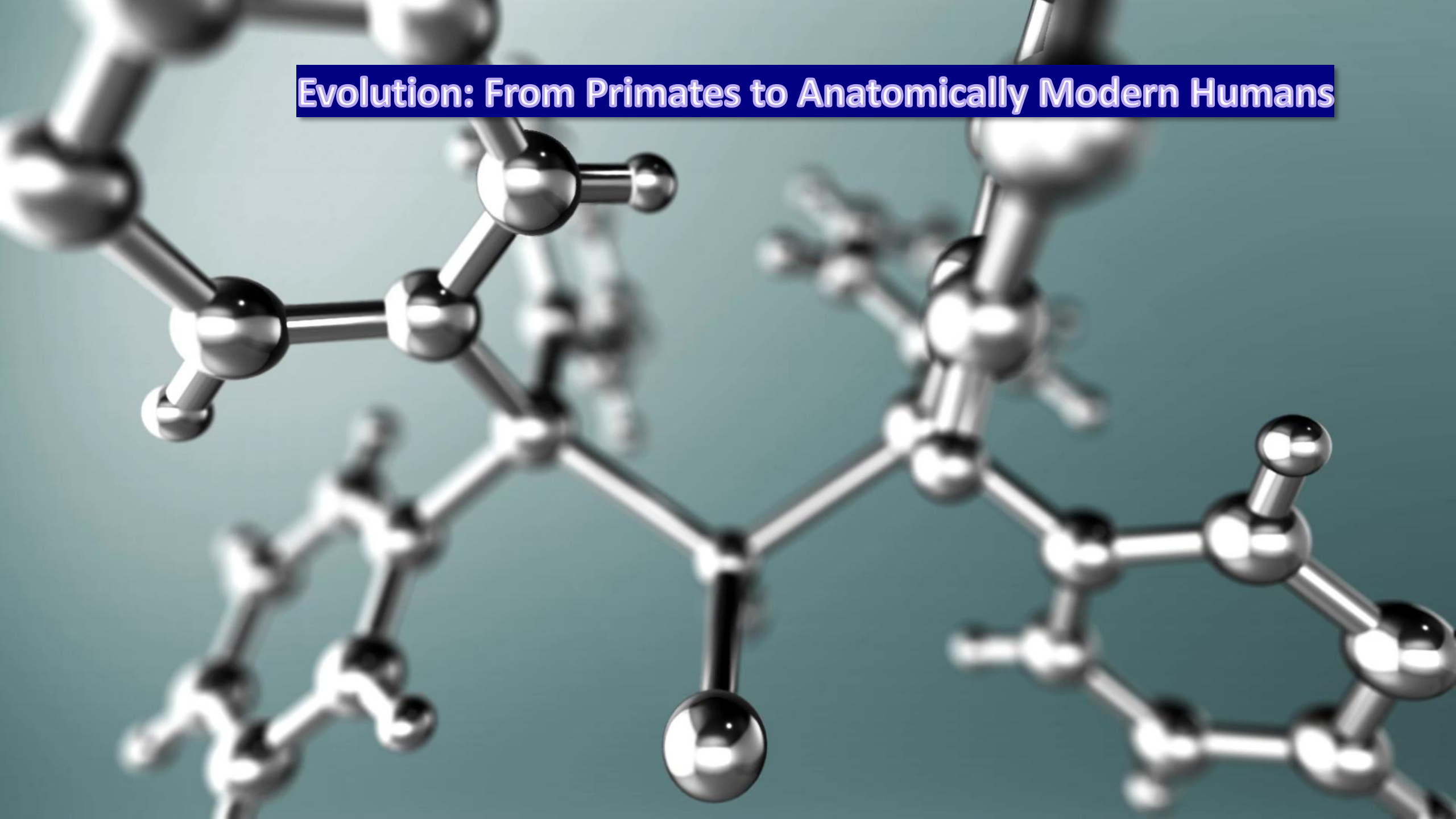


Biological Anthropology



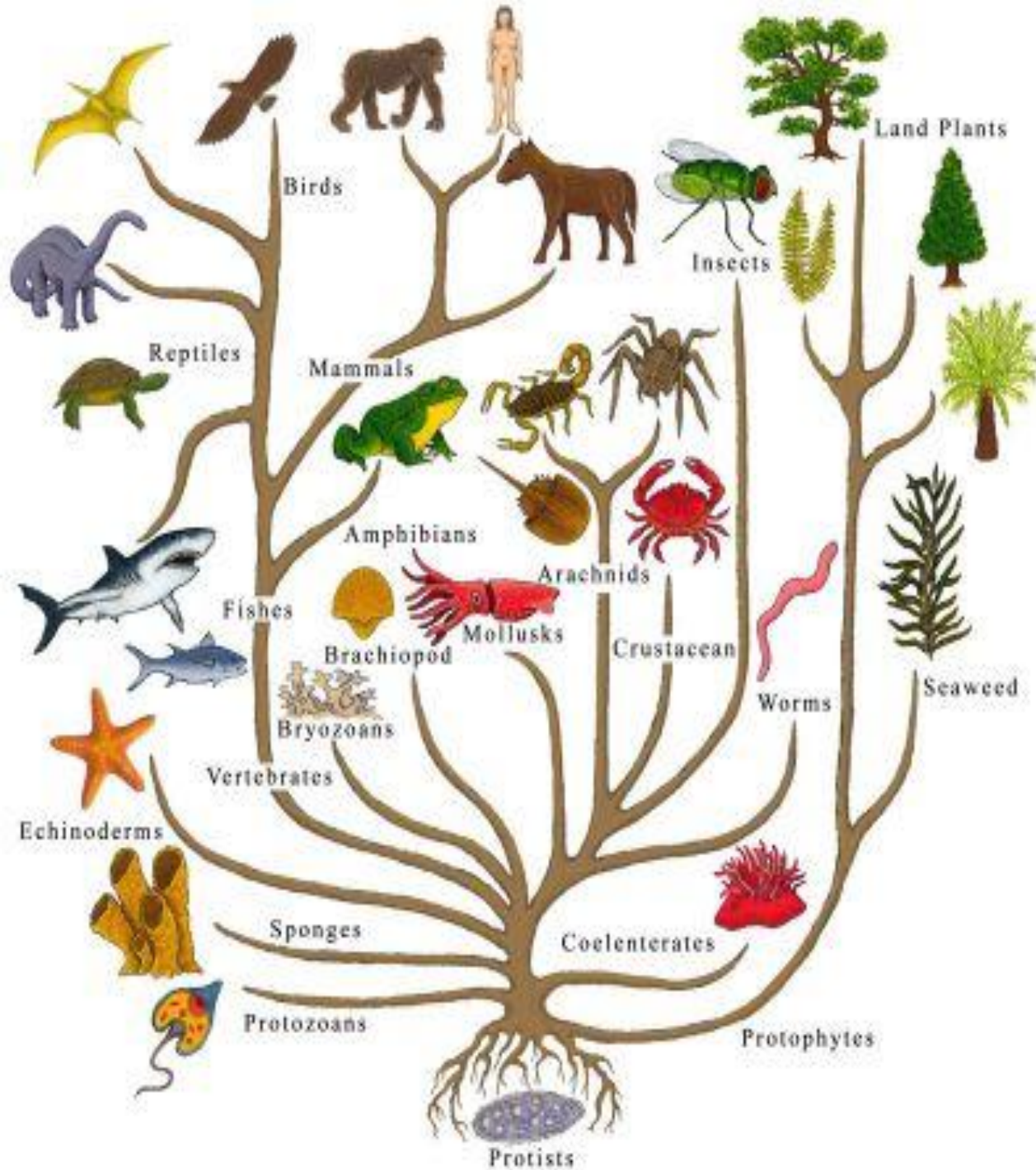
Evolution: From Primates
to
Anatomically Modern Humans

Evolution: From Primates to Anatomically Modern Humans



Class Questions

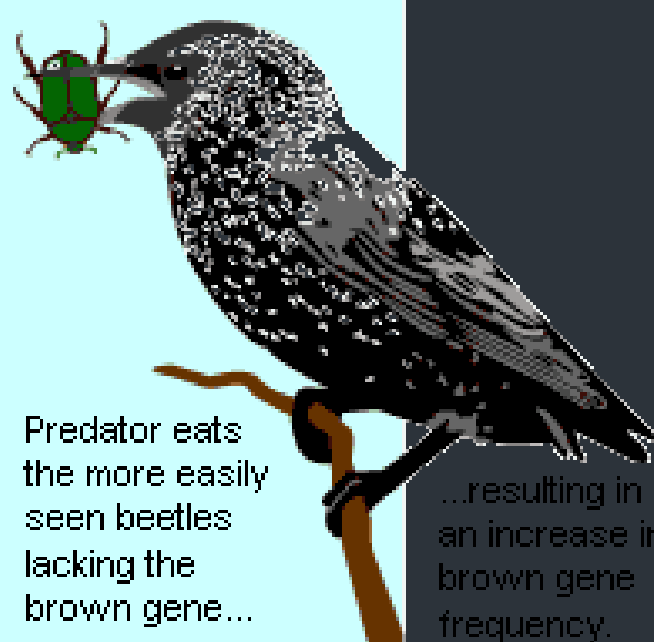
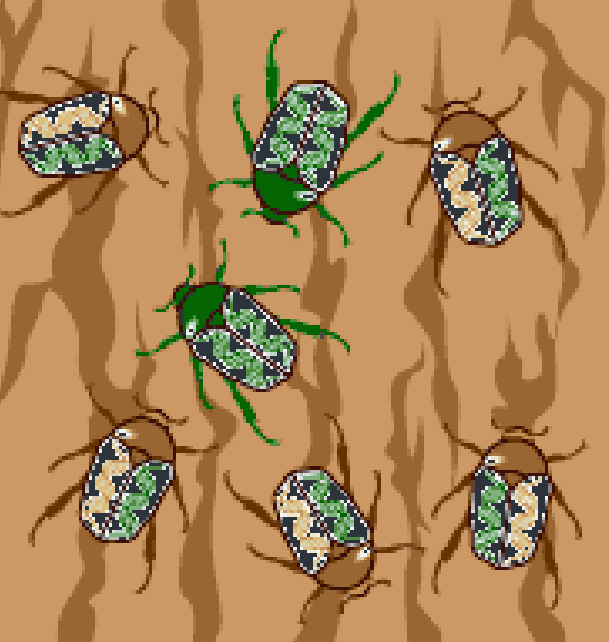
- What groups of animals are included in the category of 'primate'?
- What evolutionary connections exist between humans and other primates, such as apes?
- What traits of modern humans developed through evolutionary processes?
- What is convergent evolution? What does it aim to produce?
- What is the difference between evolutionary traits considered homologies versus analogies?



Species: “Group of related organisms whose members can interbreed to produce offspring that can live and reproduce”

Speciation: “the formation of new species”
(85)

Macro-evolution

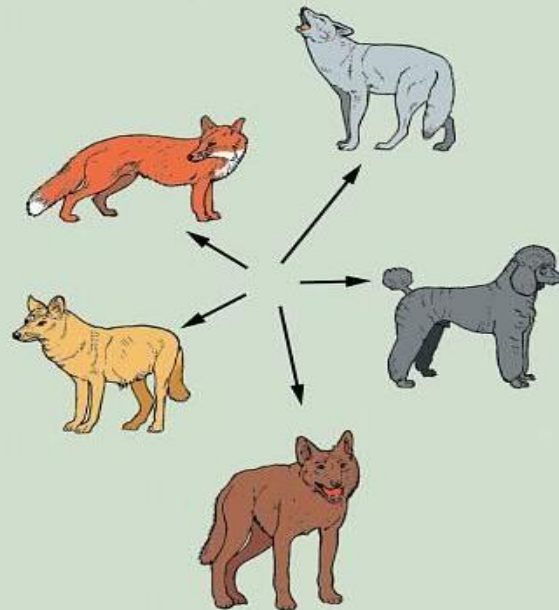
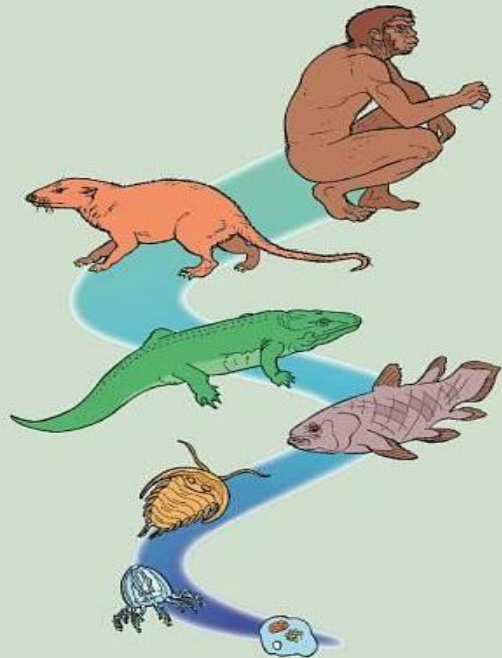


Predator eats
the more easily
seen beetles
lacking the
brown gene...

...resulting in
an increase in
brown gene
frequency.

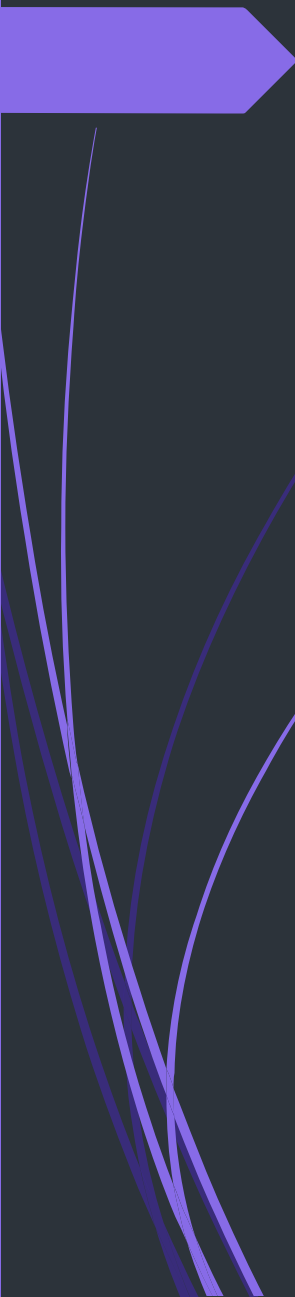
MACROEVOLUTION

MICROEVOLUTION



Microevolution: evolutionary shifts in a single species that occur over a few generations / during a relatively short time span.

Micro-evolution



544-245 MYA	• Paleozoic [Fishes, amphibians, reptiles]
245-65 MYA	• Mesozoic [Dinosaurs, Reptiles]
65 MYA	• Current: Cenozoic – [Birds, Mammals, flowering plants, forests]. Adaptation of manual dexterity for hominids
33 MYA	• First hominin tool use [carrying things – bipedal locomotion]
30 MYA	• Old World Monkeys/Hominoid speciation / ancestor split
16-14 MYA	• Lesser/great apes split
11-10 MYA	• Orangatans/Apes and humans split
7-6 MYA	• Split in hominin lineage / split between early human species
1.8-2.6 MYA	• Oldowan Pebble Tools
130,000-28,000 MYA	• Neanderthals subspecies



Non-Human Primates

What groups of animals are included in the category of 'primate'?

Taxonomy

System of Classification of living organisms; Includes the description, identification, nomenclature, and classification.

Classification of *Homo sapiens* within the order Primates

species
sapiens

contained forms:
modern humans

genus
Homo

modern and
archaic humans

family
Hominidae

humans and
great apes

superfamily
Hominoidea

humans and
all apes
(great apes
and gibbons)

infraorder
Simiiformes

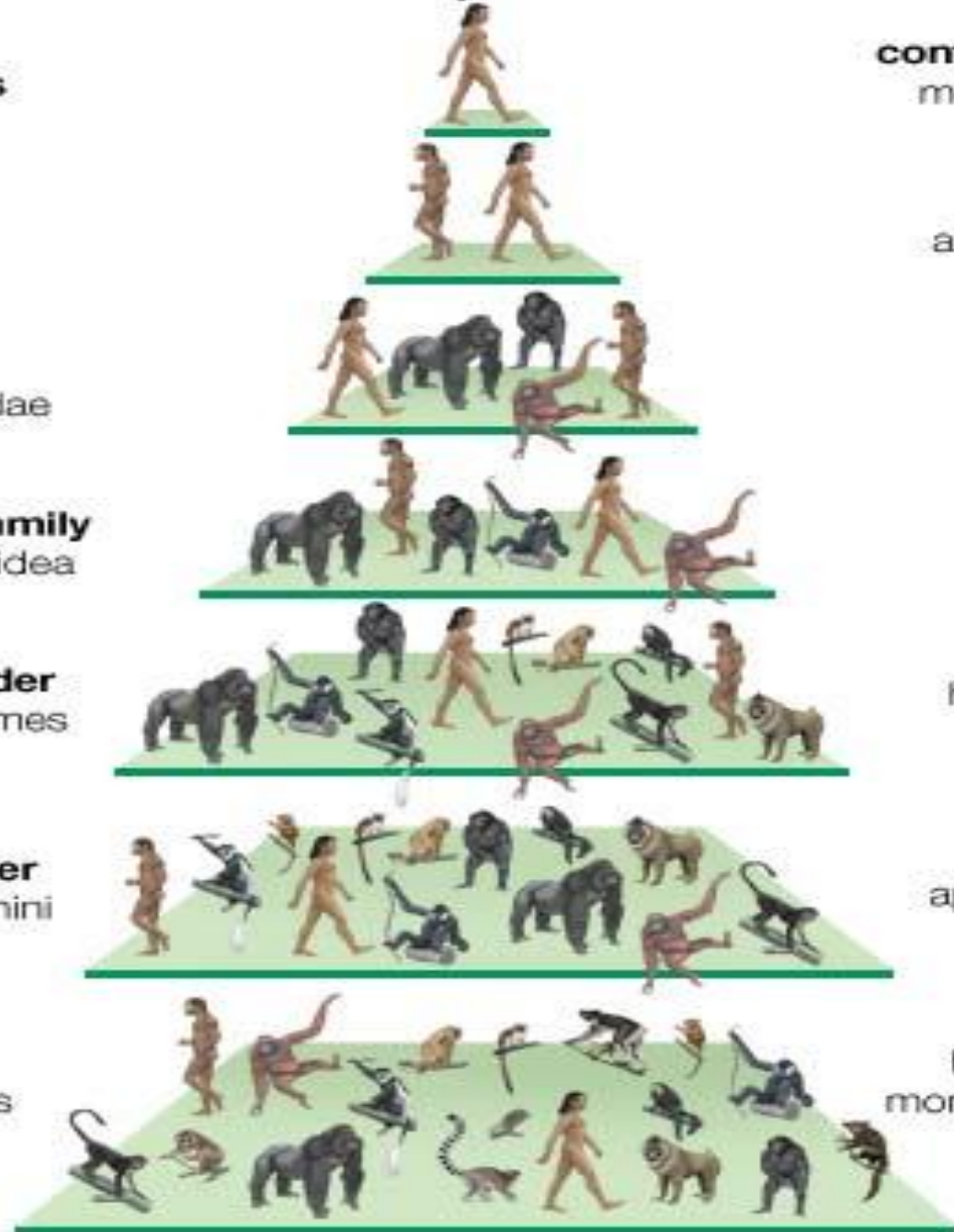
humans, apes,
and monkeys

suborder
Haplorrhini

humans,
apes, monkeys,
and tarsiers

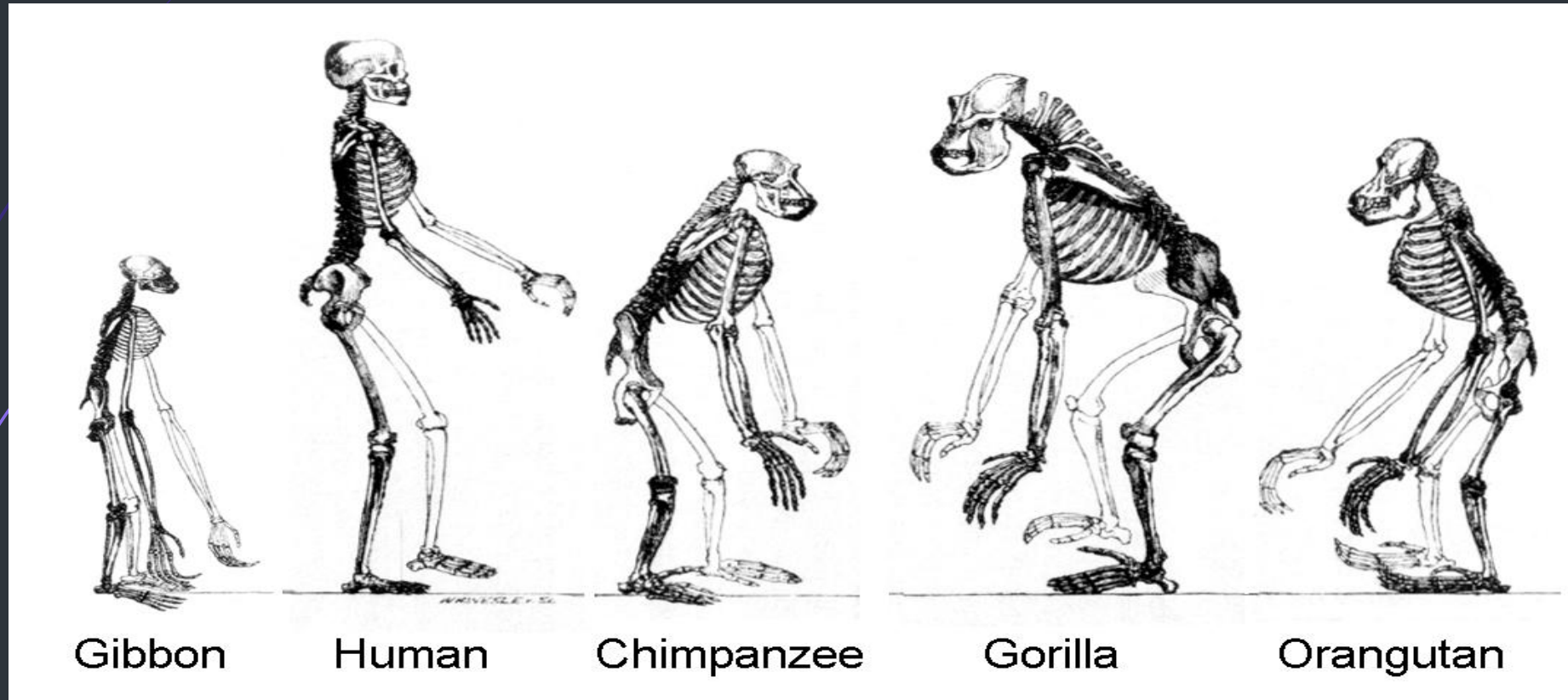
order
Primates

humans, apes,
monkeys, tarsiers,
lemurs, and
lorises



Class Questions

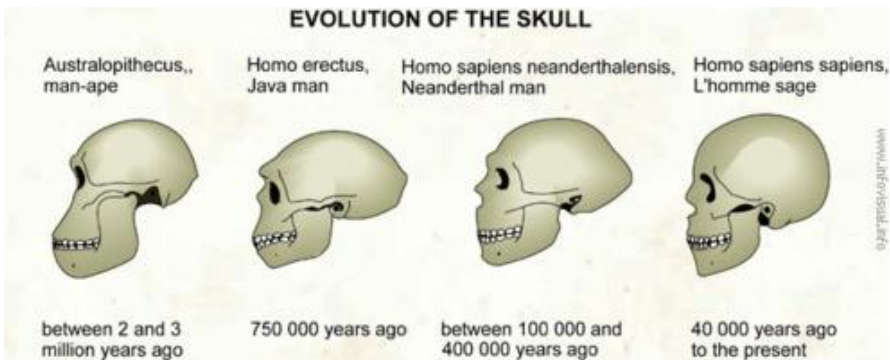
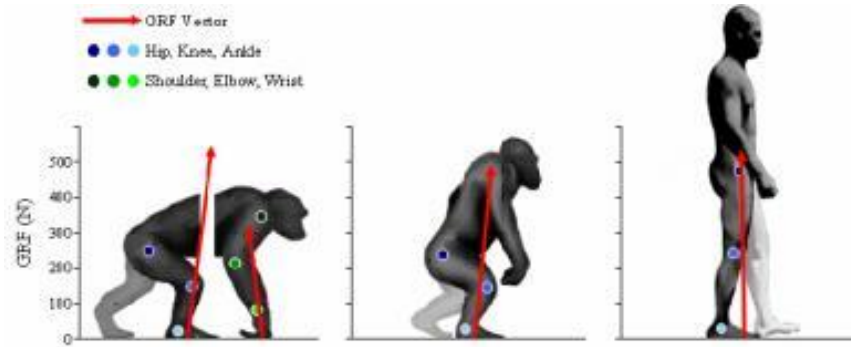
What evolutionary connections exist between humans and other primates, such as apes?



The Hominid Family

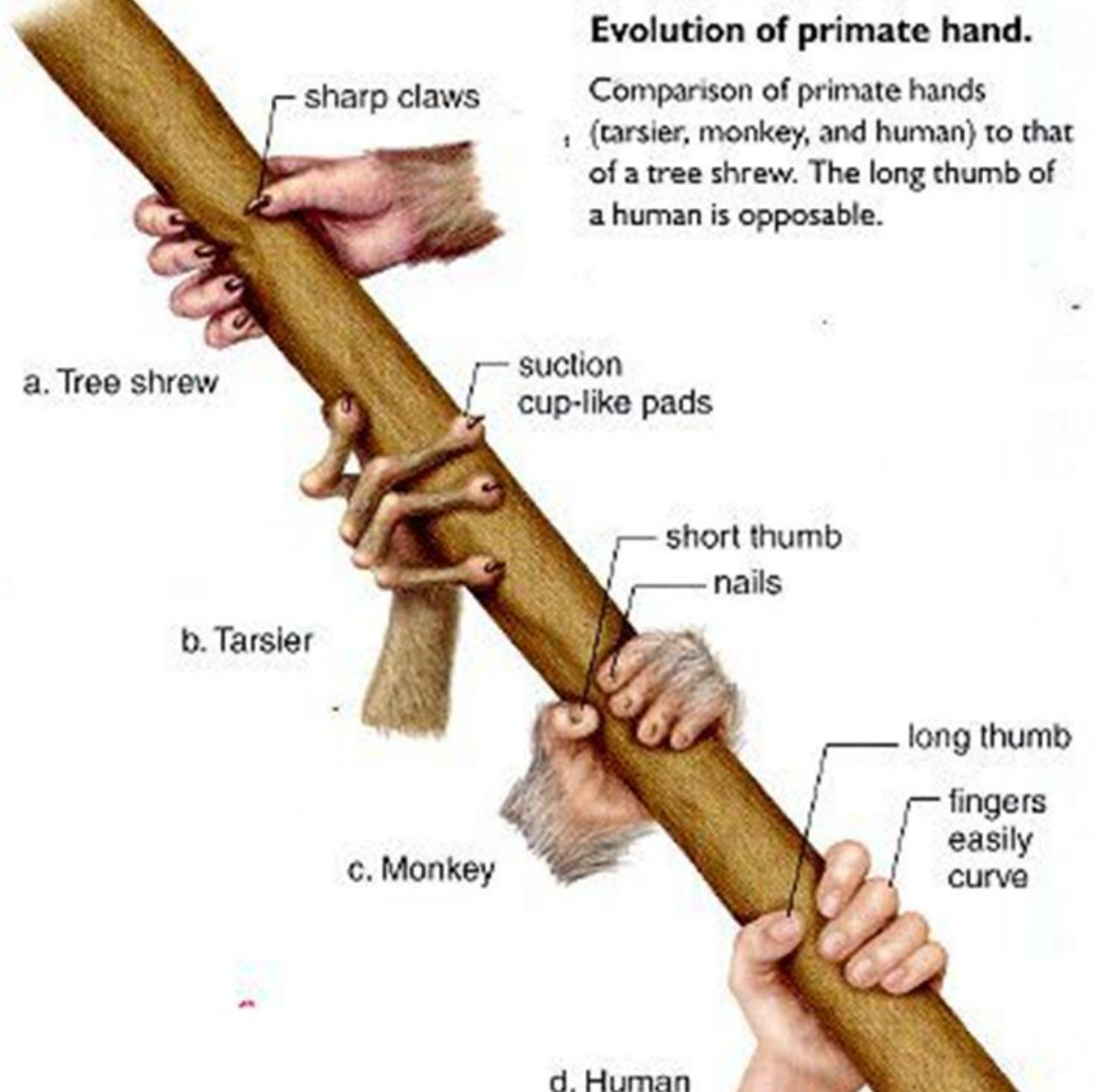
Hominin: Excludes Orangutans

What traits, characteristic of man [homosapien], developed through evolutionary processes?



- Grasping
- Nose to Hand
- Smell to Sight
- Brain Complexity
- Parental Investment
- Social Behavior

Primate Adaptation: Grasping





Primate Adaptations: Smell to Sight





Primate Adaptations: Nose to Hand [Tactile]





Figure 1. The proposed research model.

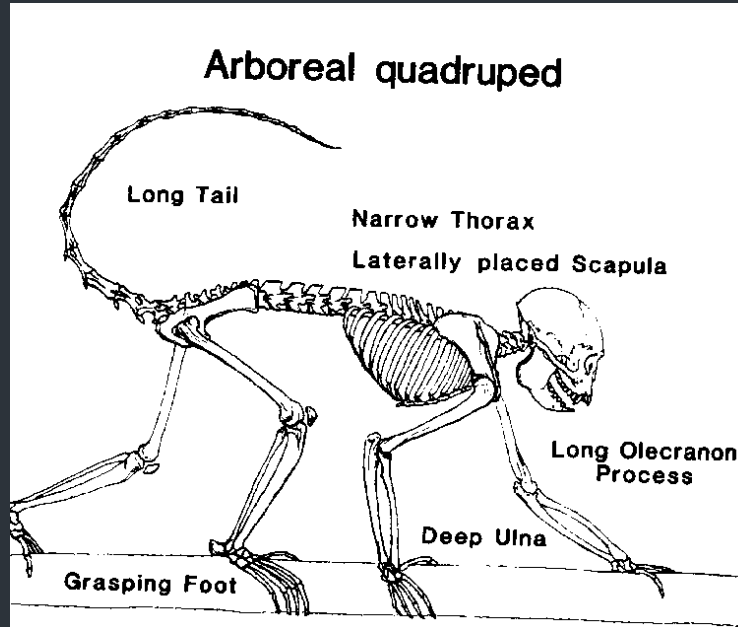


Primate Adaptations: Parental investment

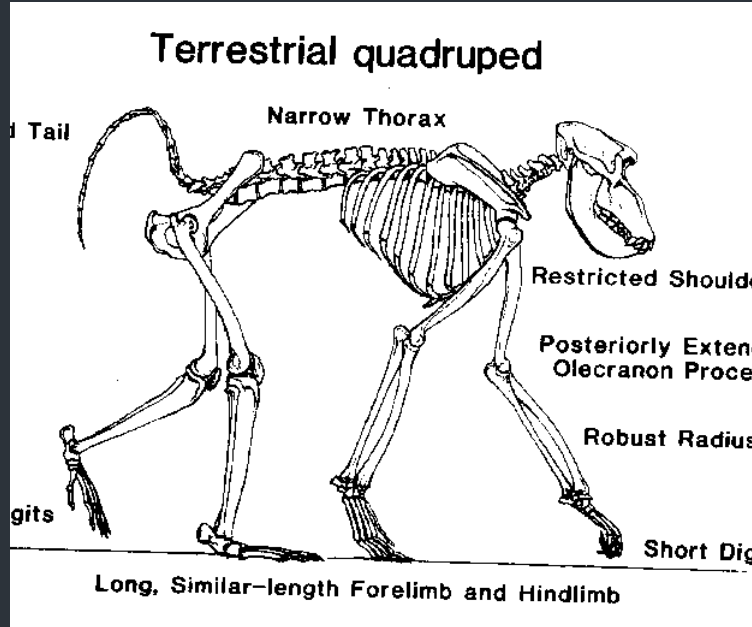
Primate Adaptations: Social Behavior



species members live together; supports extended care of youth



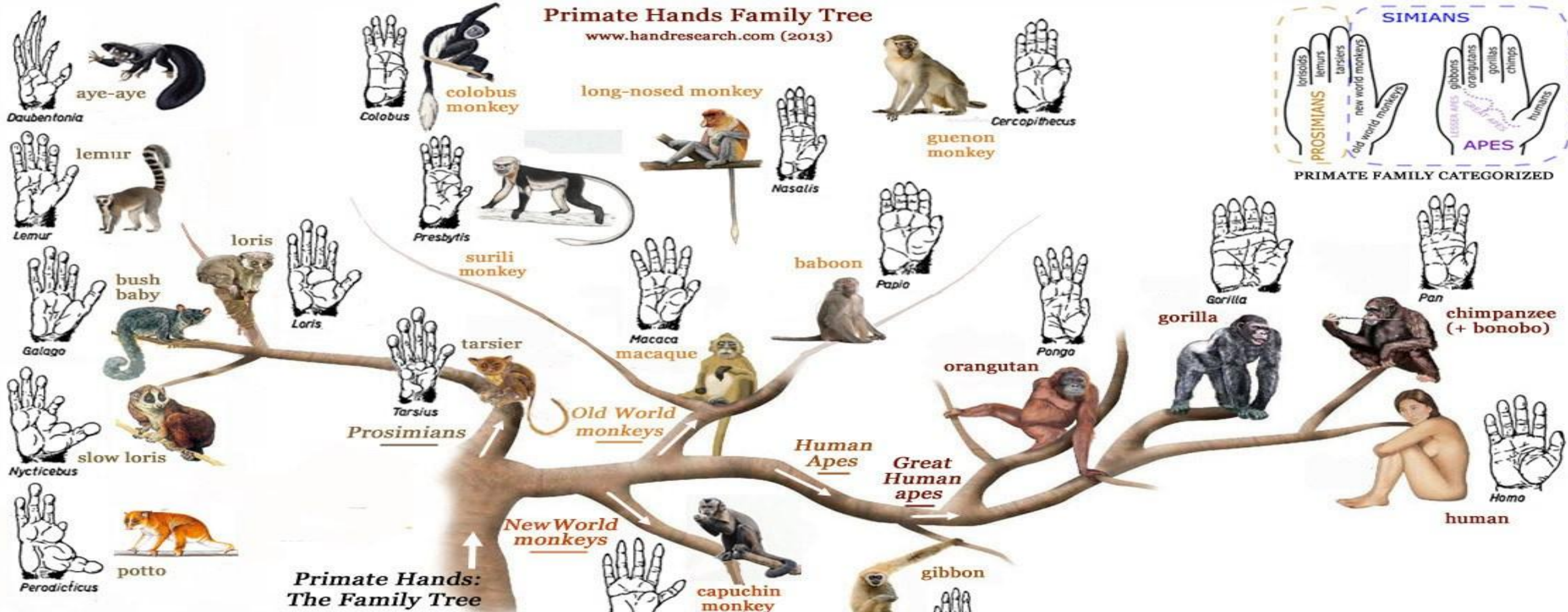
Arboreal Primates



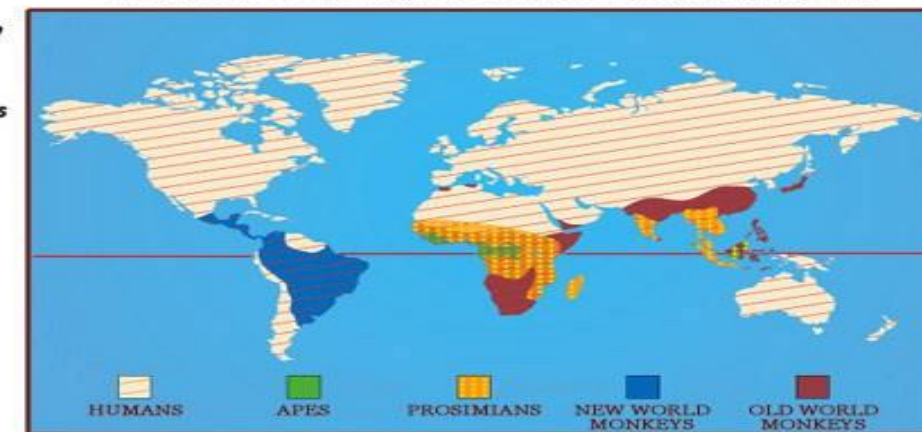
Terrestrial Primates

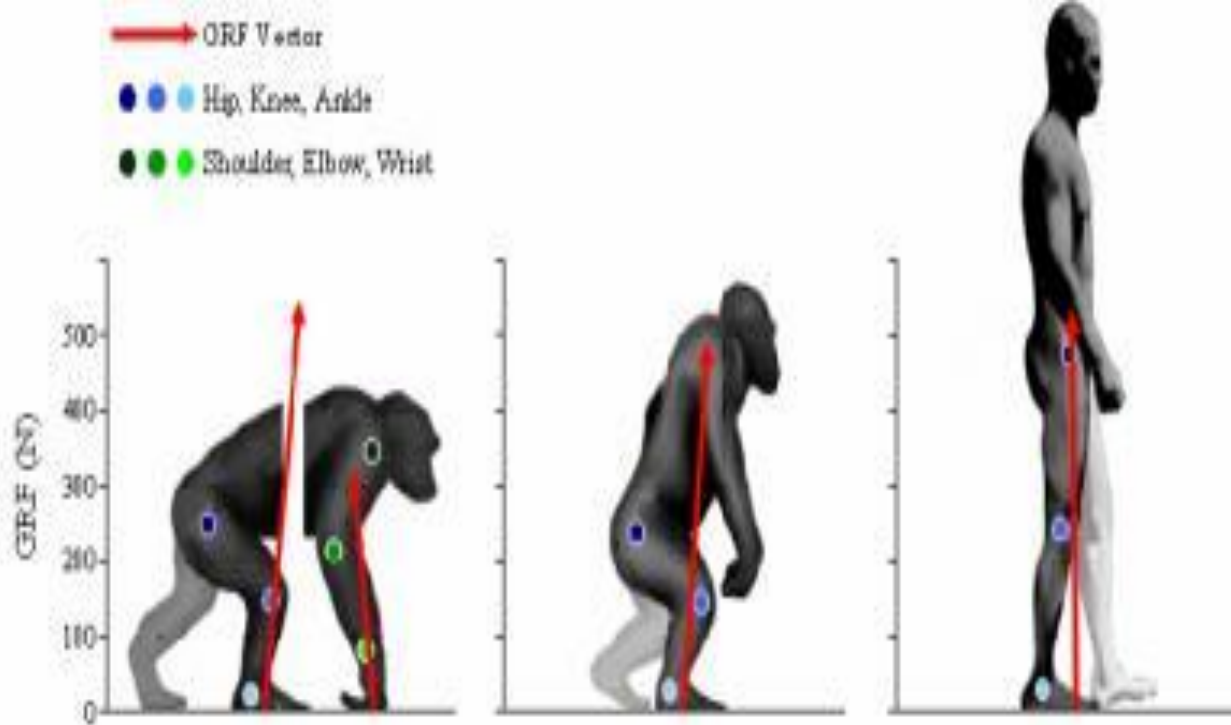
Primate Hands Family Tree

www.handresearch.com (2013)



PRIMATE FAMILY DISTRIBUTED AROUND THE WORLD





EVOLUTION OF THE SKULL

Australopithecus,
man-ape

Homo erectus,
Java man

Homo sapiens neanderthalensis,
Neanderthal man

Homo sapiens sapiens,
L'homme sage



between 2 and 3
million years ago

750 000 years ago

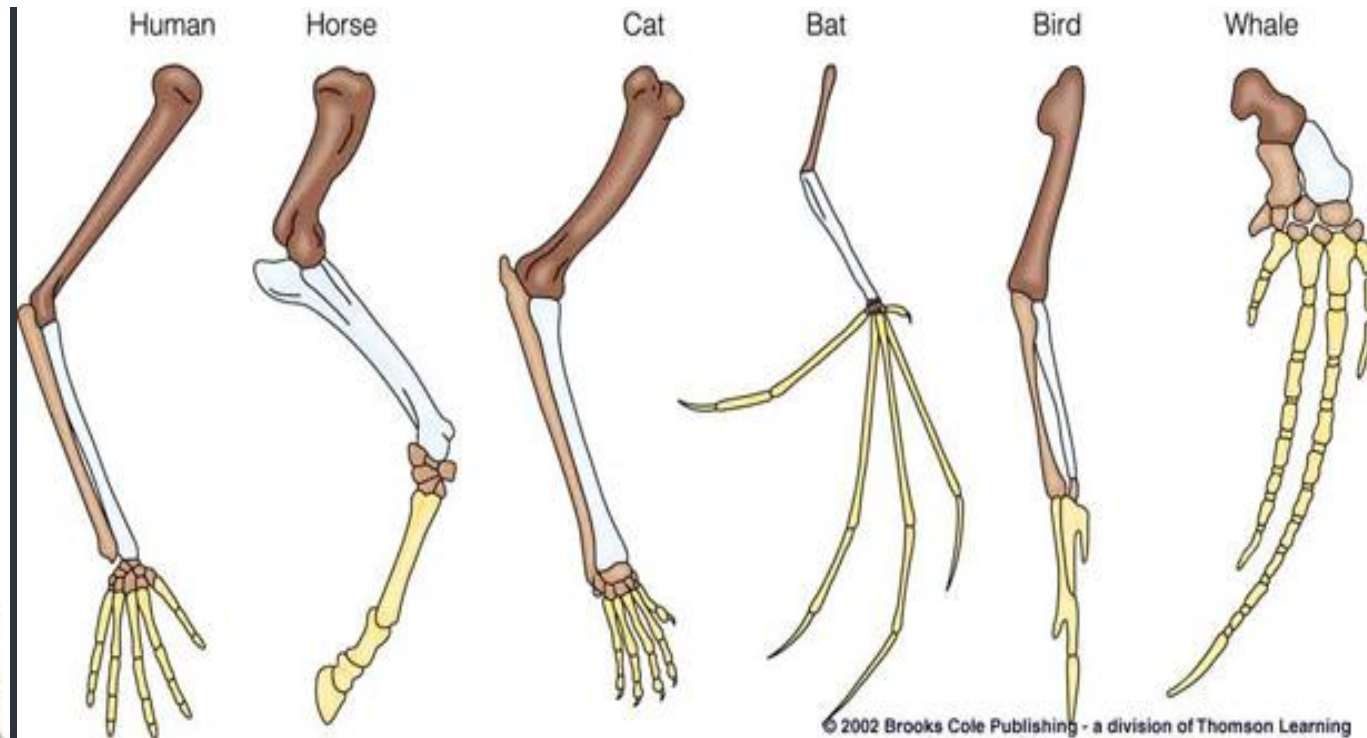
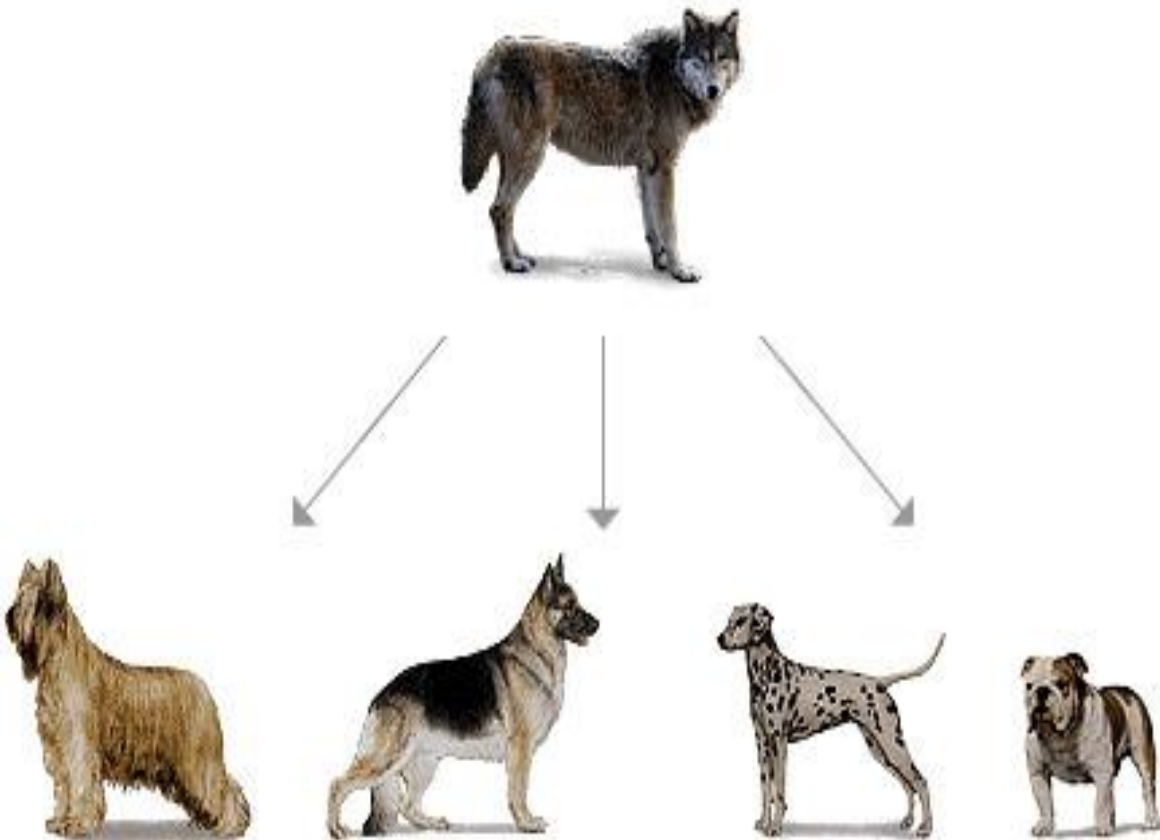
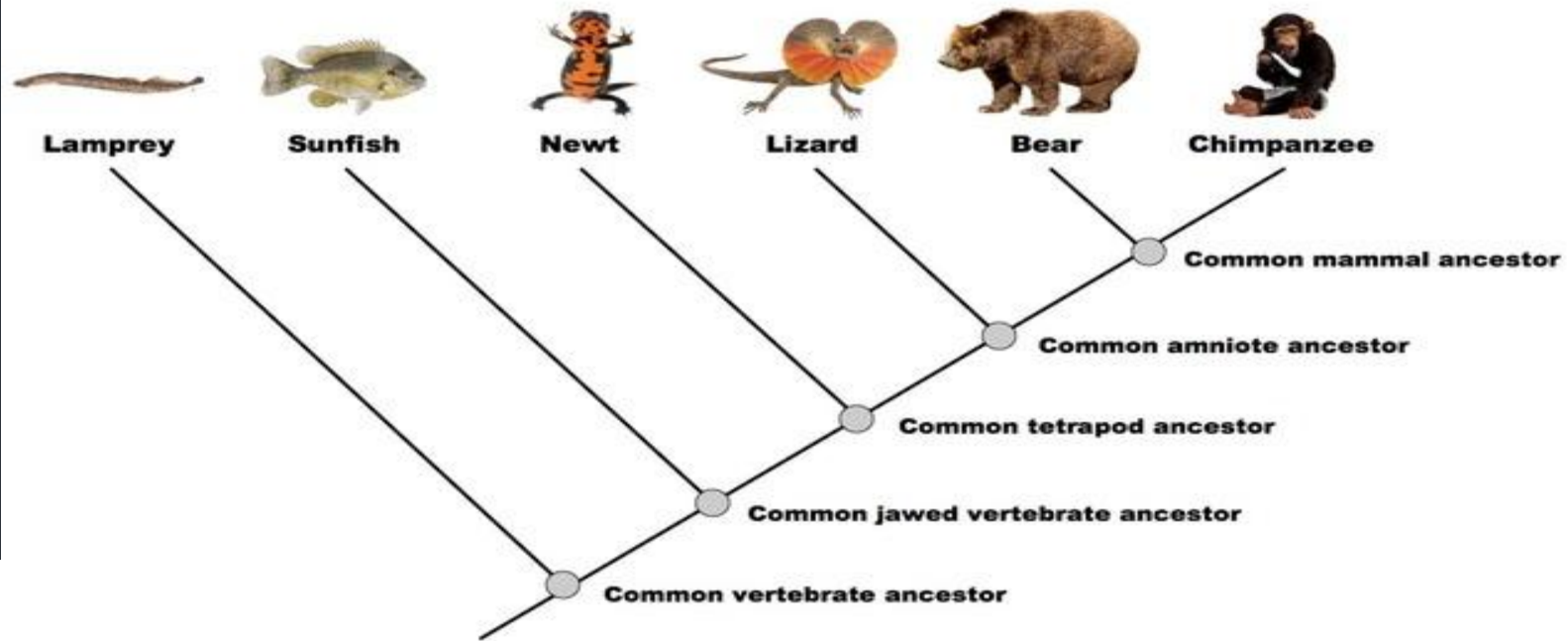
between 100 000 and
400 000 years ago

40 000 years ago
to the present

Class Question:

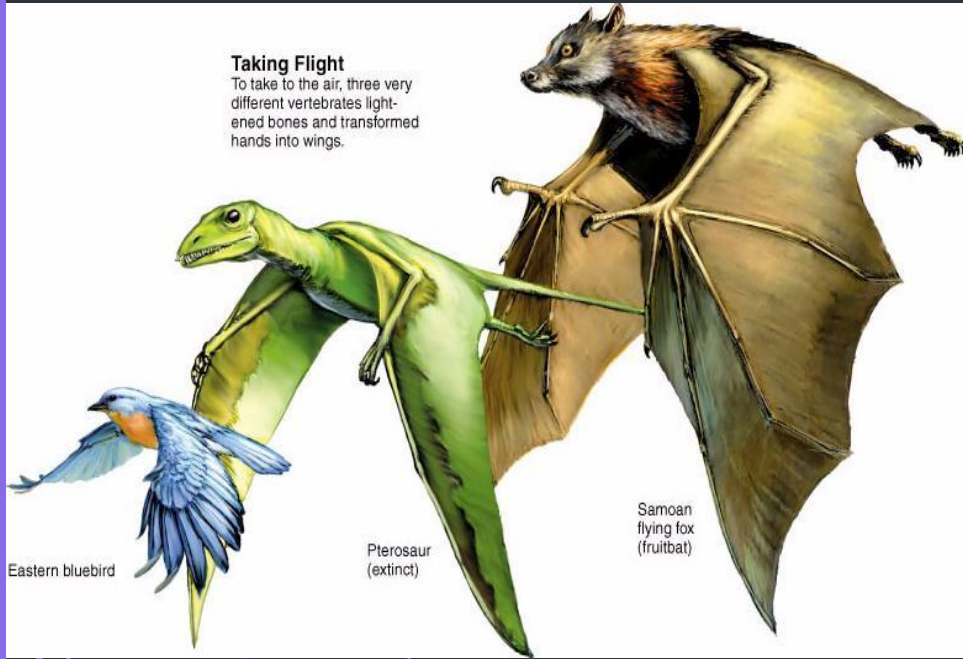
What traits of modern humans developed through evolutionary processes?

Divergent Evolution [Speciation]



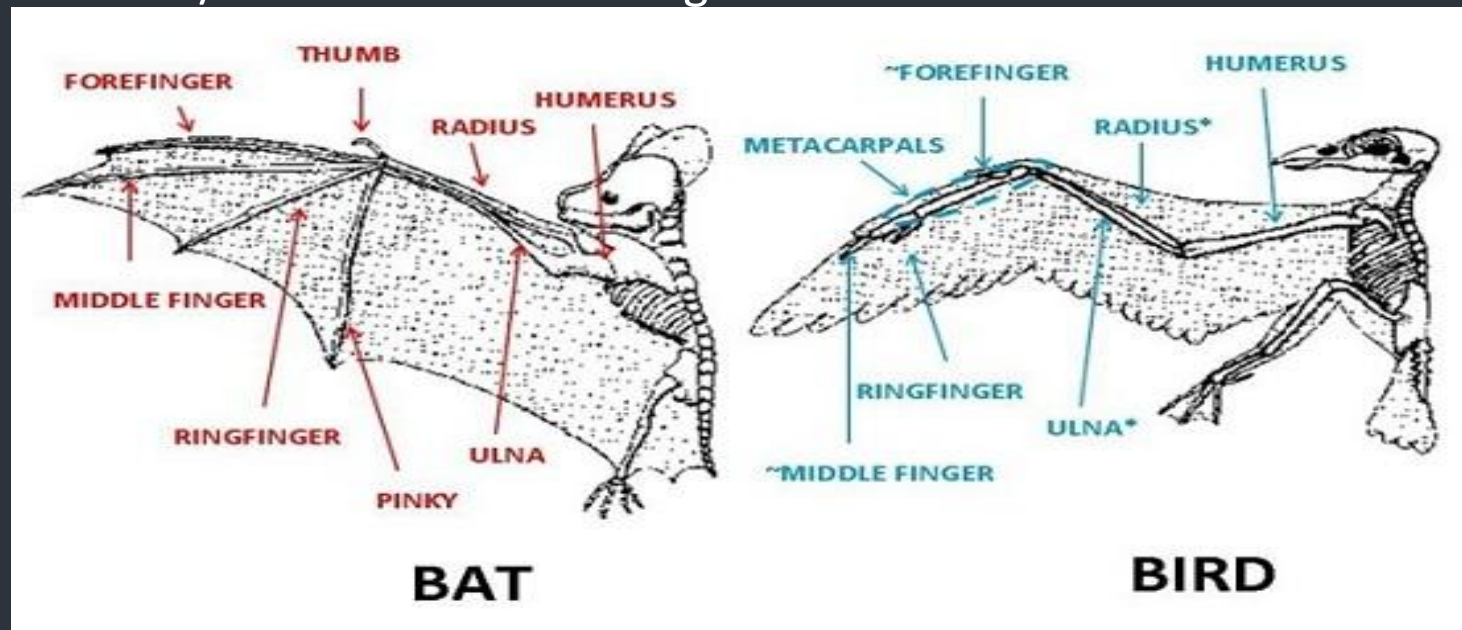
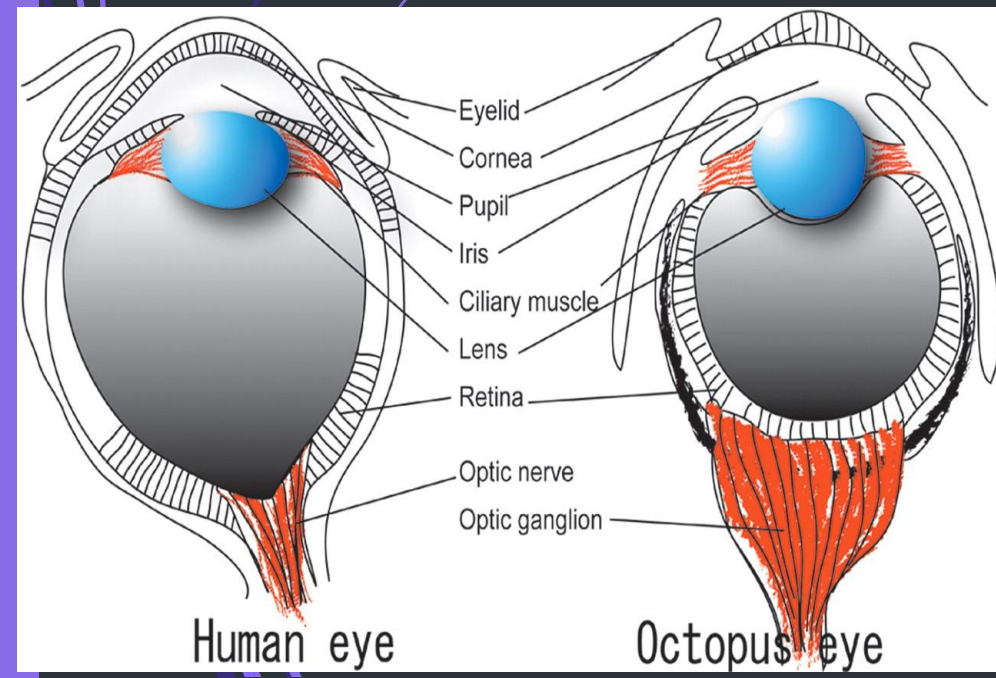
Taking Flight

To take to the air, three very different vertebrates lightened bones and transformed hands into wings.



Convergent Evolution Analogies

- ▶ Similar selective/environmental pressures produce similar adaptive traits in unrelated organisms.
- ▶ Analogies- similar traits develop in a species without a common ancestor due to environmental pressures; leads to/mechanism of convergent evolution.



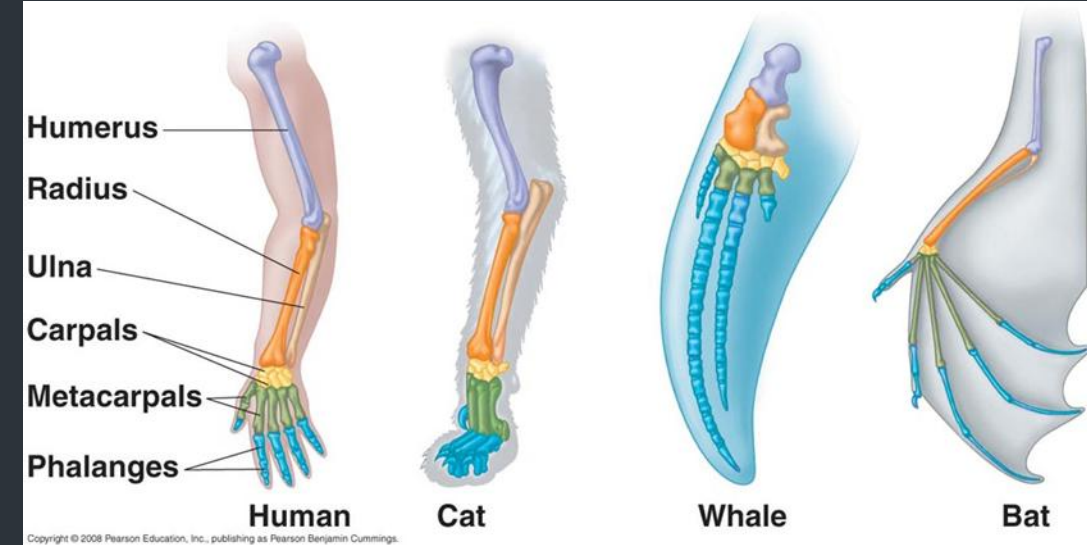
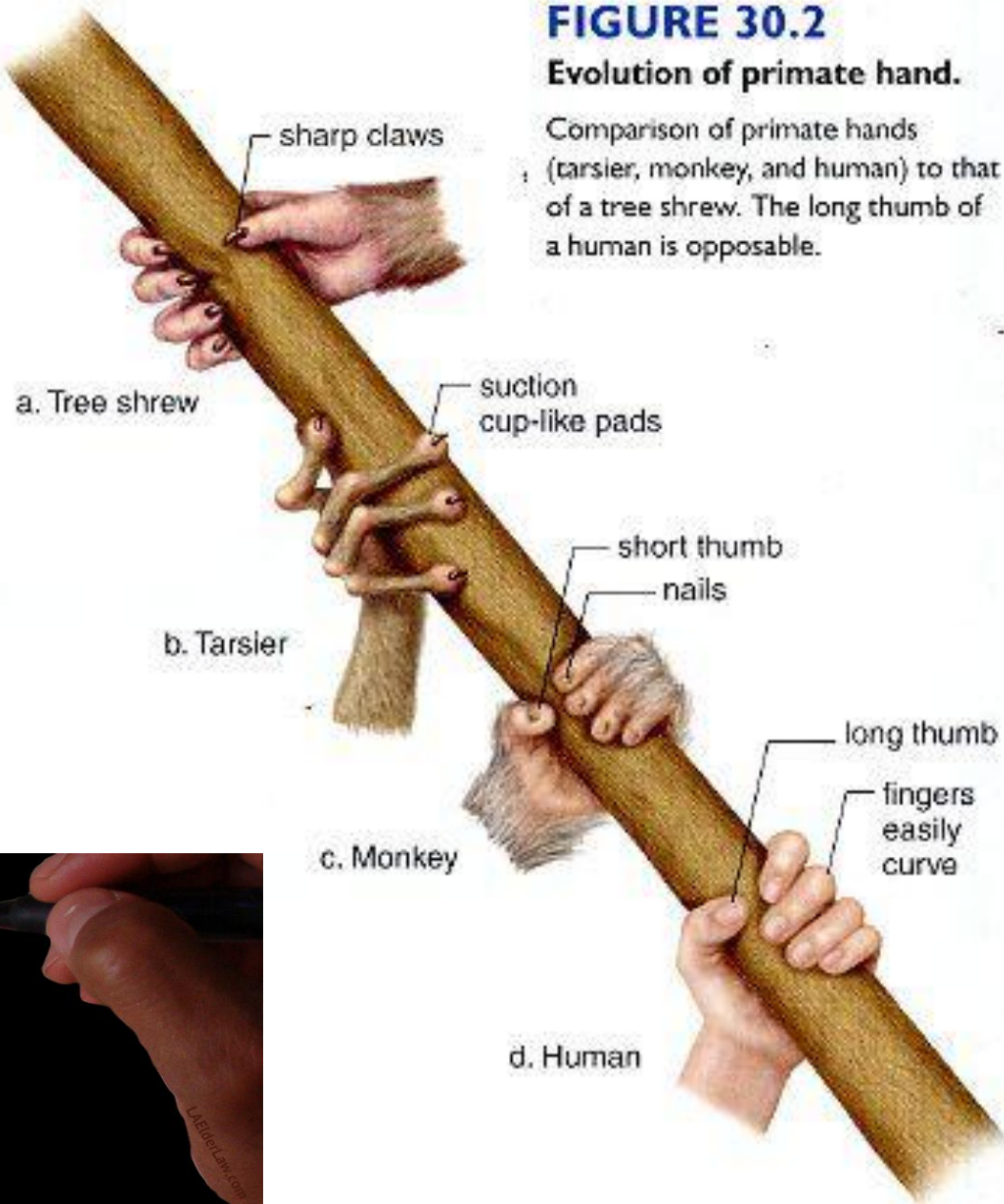
Homologies

Traits jointly inherited by two different species from a common ancestor

FIGURE 30.2

Evolution of primate hand.

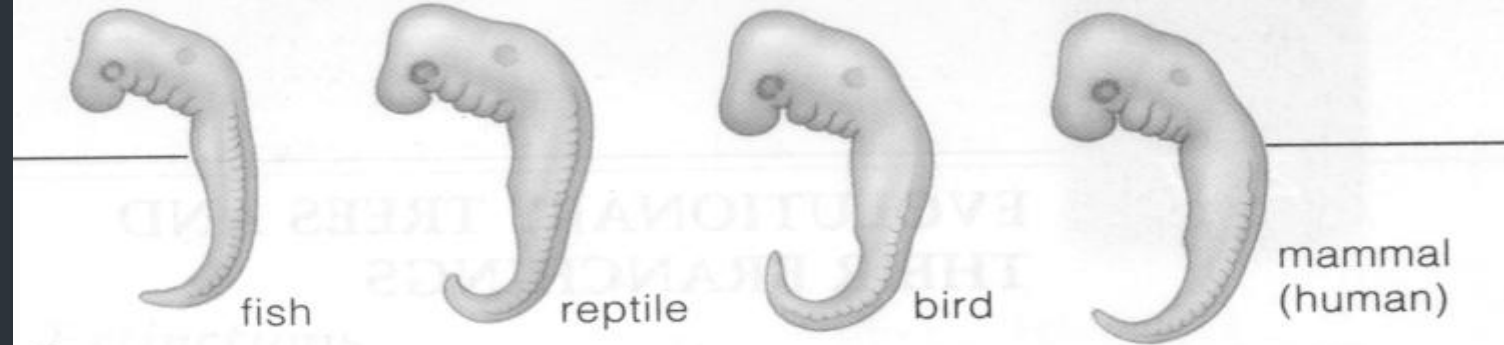
Comparison of primate hands (tarsier, monkey, and human) to that of a tree shrew. The long thumb of a human is opposable.



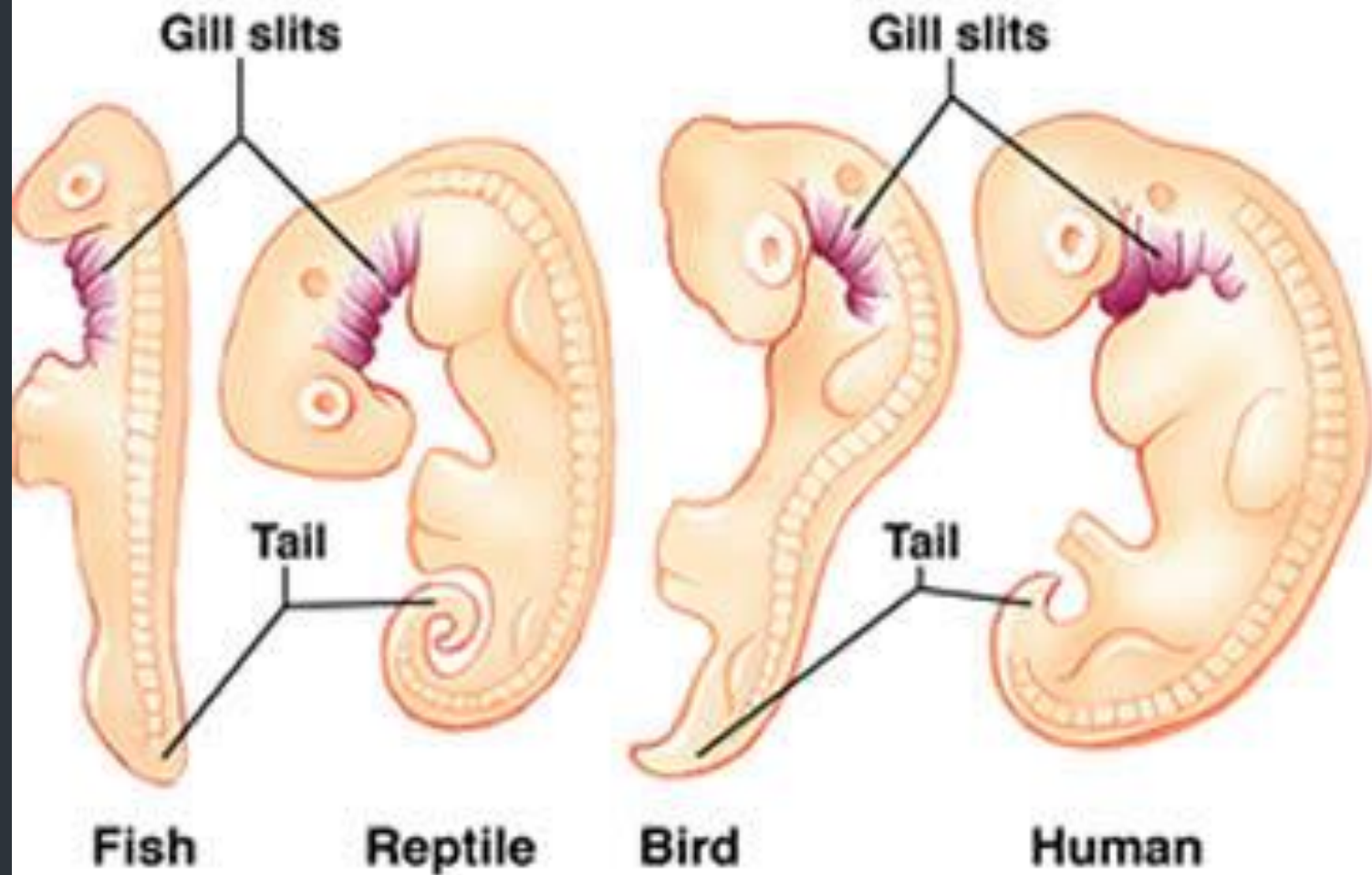
Comparison of Primate Hands

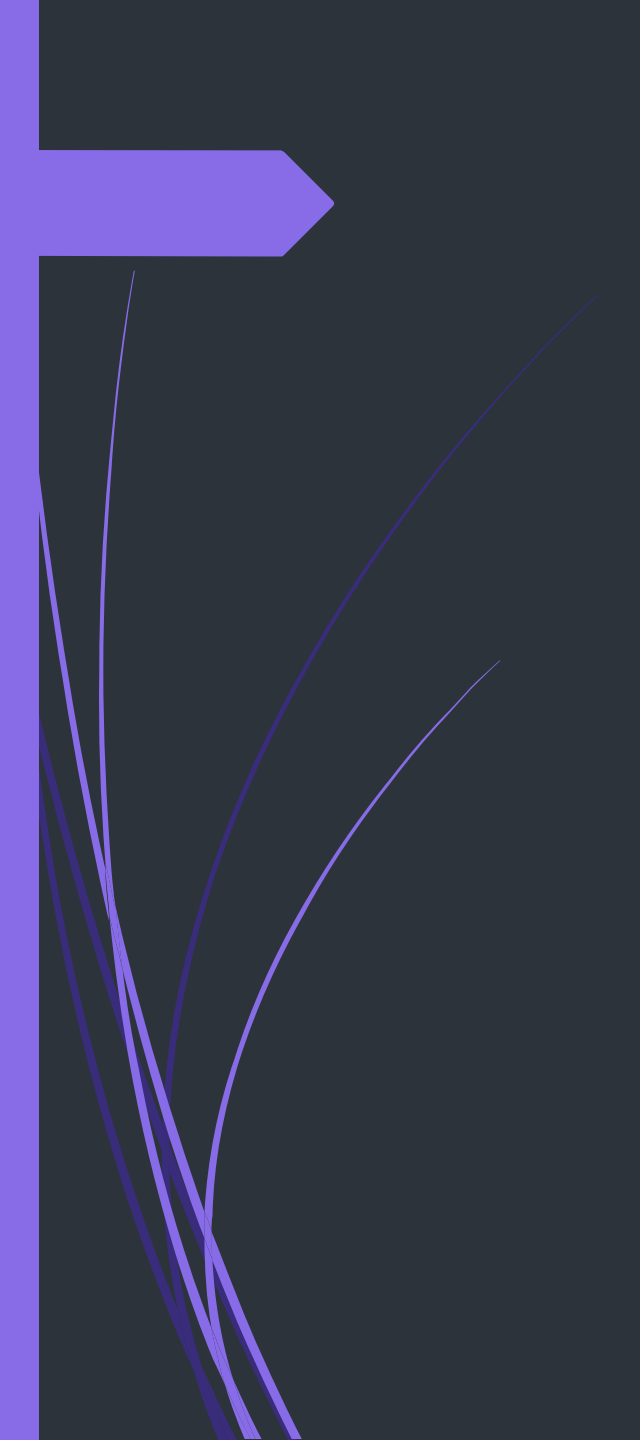


Homologies



Embryos and Evolutionary History





- ▶ <https://www.youtube.com/watch?v=hBQe-mQeto4>

- ▶ selfish ape 12 min?-16minon – 22?-28on

Nova – first primates -skeletal evidence

https://www.youtube.com/watch?v=W_X5ciqtbG0

first primates:

- ▶ <https://www.youtube.com/watch?v=aEgZirA7QG0>

- ▶ <http://humanorigins.si.edu/evidence/behavior/primate-behavior>