Human Biology Topics

1) **Char. of Life**
2) **Char. of Humans**
3) **Science**
4) **Science & Society**
5) **Levels of Organization**

Char. of Life

1) **Organized**
2) **Acquire materials and energy**
3) **Homeostasis**
4) **Respond to stimuli**
5) **Reproduce and grow**
6) **Evolve**

***Review & summarize**

Char. of Humans

A) Biological:
1) Bi-pedal (2 legs)
2) Opposable thumbs
3) Large brain
4) Complex language

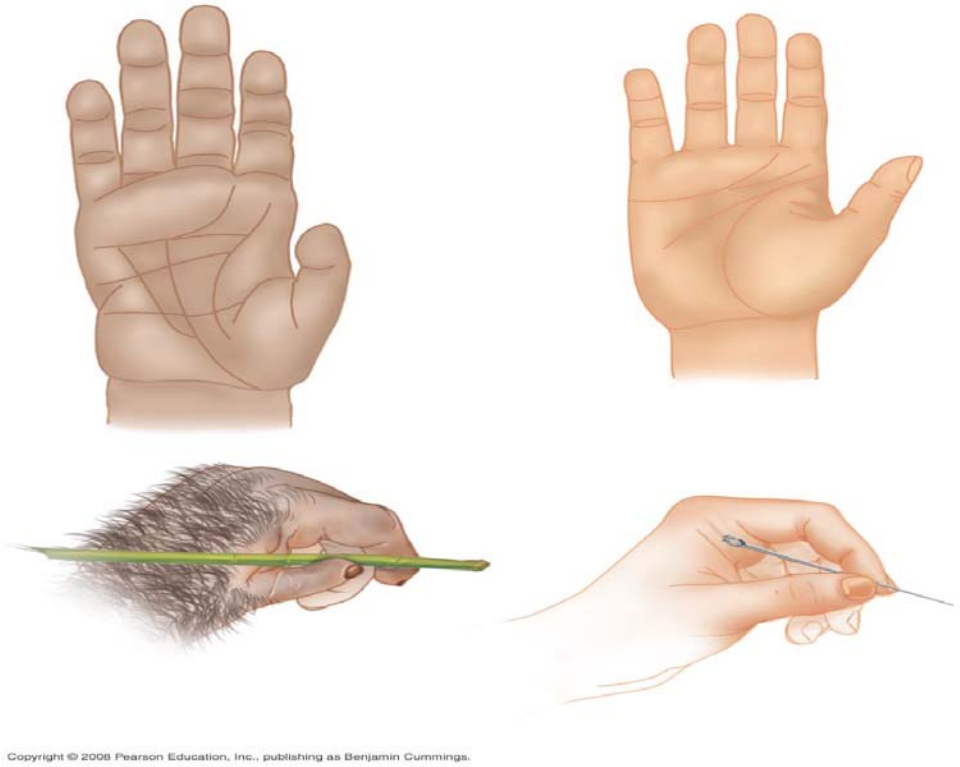
B) Social & Ecological:
1) Related to other organisms
2) Cultural heritage
3) Members of biosphere
4) Threaten biosphere

***Review & summarize**

Opposable Thumb

How important is the ability to hold small objects?

Difference between the grasp of chimp and human?



Scientific Method (2)

1) **Observe & generalize**
2) **Formulate a hypothesis**
3) **Make a testable prediction**
4) **Experiment & observe**
5) **Conclusion**
6) **Modify hypothesis & repeat steps 3 - 5**
7) **Share your discoveries (publish)**
8) **Develop a theory**

*** #3 & 7 added**

Controlled Experiment (2)

a) State hypothesis
- select a large number of subjects
- randomly divide the subject into groups

b) Perform experiment
- treat the groups equally in all ways but one

c) Collect data
- observe or make measurements

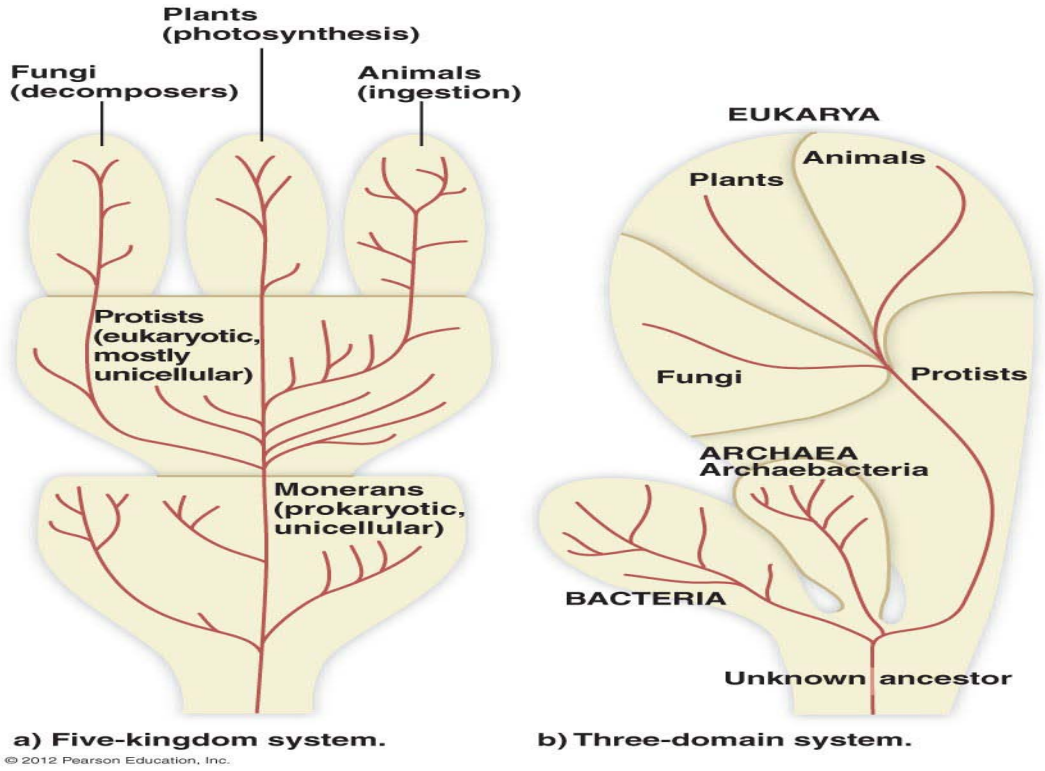
d) Conclude
- compare results w/ statistics
- evaluate the validity of the hypothesis

Scientific Knowledge

= system of organized, reliable information

Q: How are all living organisms connected?

A: Linean classification



Linean Classif.

Prokaryotes

1) Monera
   - bacteria (uni-cellular)

Eukaryotes

a) uni-cellular & simple multi-cellular
   1) Protista (uni-cellular)
      - protozoa, algae, slime molds

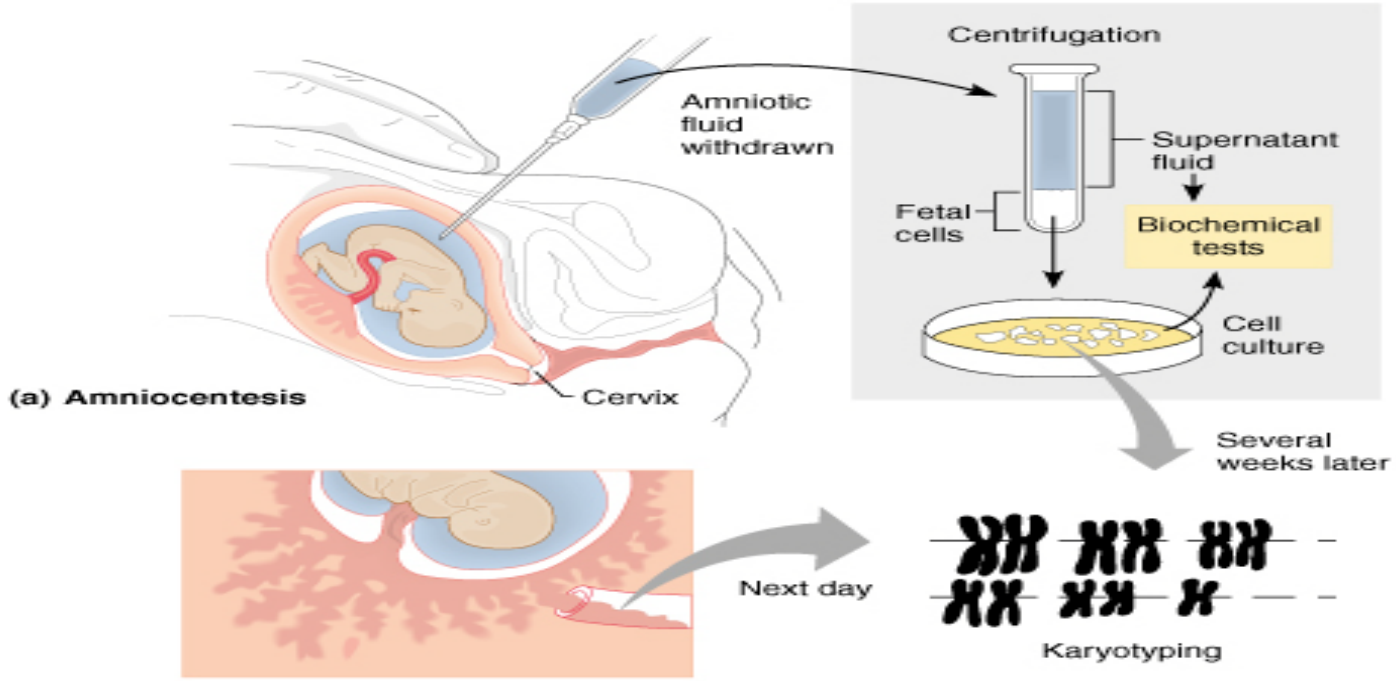
b) complex multi-cellular
   1) Animalia (ingestion)
   2) Plantae (photosynthesis)
   3) Fungi (decomposers)

Science & Society

How does science affect society?

+: Improve human condition, eg predict diseases

- : Degrade the environment, eg global warming



Technology - Benefits & Risks

1) genetic modification (GM)
+ GM bacteria to produce insulin
? GM food crops: ? effect on humans & environment
2) petroleum fuel
+ car transportation for people
- global warming, polar bear extinct

a.

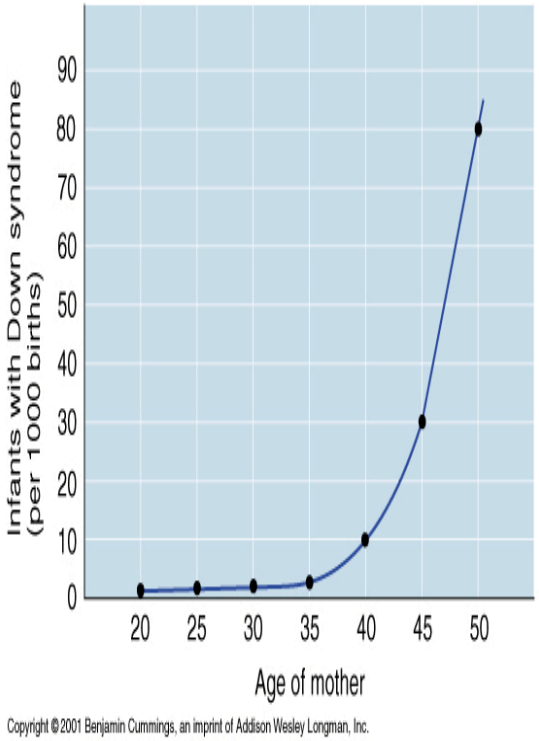
b.

a: © Comstock Images/Getty RF; b: © Photo by Ron Nichols, USDA Natural Resources Conservation Service

Proper Scientific Study

1) suspicious data
   - anecdotes, testimonies
2) design of experiment (methodology)
   - very important, validates data
3) conclusions
   - not final, interpretations of data,
4) graphs
   - best way to present scientific data
5) statistics
   - correlate cause and effect
   - eg "standard error"
   = how uncertain the data is

Down's Syndrome



1st Level: Biological

1) **chemicals - eg protein**

-> **cells - eg muscle cell**

-> **tissue - eg muscle**

-> **organ - eg stomach**

-> **organ systems - eg digestive system**

-> **organism - eg human organism**

2nd Level: Social

2) organism - eg human organism

-> population eg human population
(group of indiv. of same species living in the same area)

-> community eg bay area
(several populations of different species living in the same area)

3rd Level: Ecological

3) community eg bay area

-> ecosystem eg rain forest
(all organisms in given area
plus nonliving matter and energy)

-> biosphere eg earth
(all ecosystems combined)