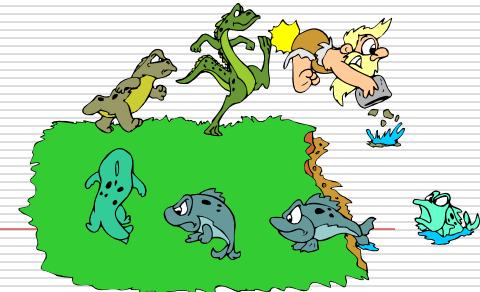


Evolution

- What - Animals and plants' hereditary features change slowly over time.
 - Punctuated equilibrium says change can happen relatively quickly, then no change for a long time. Gradualism says change happens at a slow and steady rate. Gradual, some might say.
 - A new species forms eventually.
 - A species is a group of organisms that look alike and that has babies that can have babies of their own.
 - Charles Darwin came up with theory.

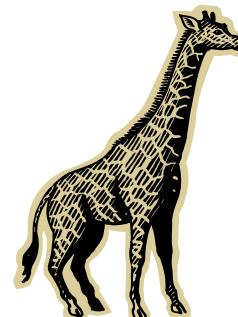


Natural Selection

- Theory by Darwin in middle 1800's
 - Lamarck, who came before Darwin was wrong when he said organisms could inherit characteristics of their parents that their parents got while they living (like big muscles from weight lifting).
-

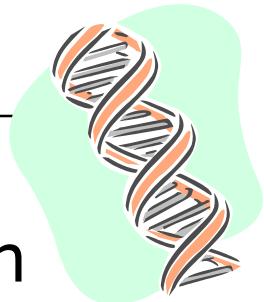
Natural Selection, cont.

- Organisms have more babies than can survive.
- All individuals of a species are different and unique. These differences are variations.
- Some inherited traits help organisms survive.
- Those with better traits live longer and have more babies.
- Those traits are passed on.



Evolution continued

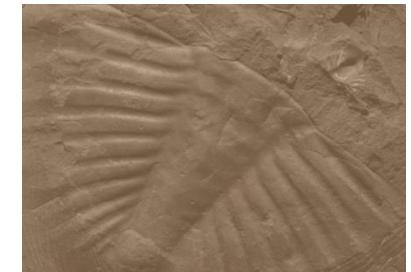
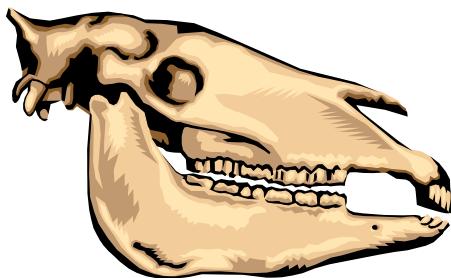
- How – Organism’s DNA might change; a “mutation”
 - If the mutation helps the organism survive, it is an adaptation.
 - Mutations can be good, bad, or neither.
 - Mutations that help an organism survive are inherited by their offspring (the babies have the same traits as the parents)
 - Species might move into an area and bring variations.



Evidence of Evolution

- Fossils – Most are found in sedimentary rock
 - Amber – pine tree sap (sticky stuff) that hardens with small animals or seeds trapped inside.
 - Frozen – When an organism gets trapped in ice
 - Imprint – The shape of organism preserved in stone.
 - Cast – An imprint fossil that has filled in, sort of like a statue.
 - Mineralized – A dead organisms cells turn into stone when replaced by minerals.

A FOSSIL IS JUST THE REMAIN OF LIFE FROM ANOTHER TIME.



Evidence of Evolution

- The fossil record is incomplete.
- Vestigial structures such as the human appendix no longer have any apparent use.
- Homologous structures like a bat wing or a porpoise flipper may be different but are similar in origin and structure.
- Embryology studies embryos to see how closely they organisms are shaped before they are born.



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- Scientists can estimate the age of a fossil by comparing the amount of a radioactive element with the amount of a nonradioactive in the fossil or surrounding rock.
- Antibiotic resistance in bacteria is an example of punctuated equilibrium.
- On the other hand, camels developed very slowly, which is an example of gradualism.



Primates

Characteristics



Opposable thumbs – helps to grab things.

Binocular vision – eyes in front of face so they can see how far things are.

Flexible shoulder – Can move arm around a lot of stuff.



Hominids

■ Main characteristics

- Walk Upright
- Bigger Brain than apes.
- Ate meat and plants



Hominids

- **Australopithecus**
 - Walked upright. Small brain (for a hominid). Human jaw and teeth
 - 3,000,000 years ago. South Africa mainly.
 - Lucy was the first fairly fossil of this type. She was found 1974, first skull was found in 1924
 - Least like modern humans.
- **Homo Habilis**
 - 1.6 million years ago. Mainly in East Africa. Discovered around 1960.
 - First hominid to use tools. That's how it got its name.
- **Neanderthal**
 - Lived in caves, and stayed together in family groups.
 - Died out about 35,000 years ago
- **Cro-Magnon**
 - Evolved into modern humans about 10,000 years ago.
 - Had art work, buried their dead
- **Homo Sapiens**
 - Us.. "Wise Human"