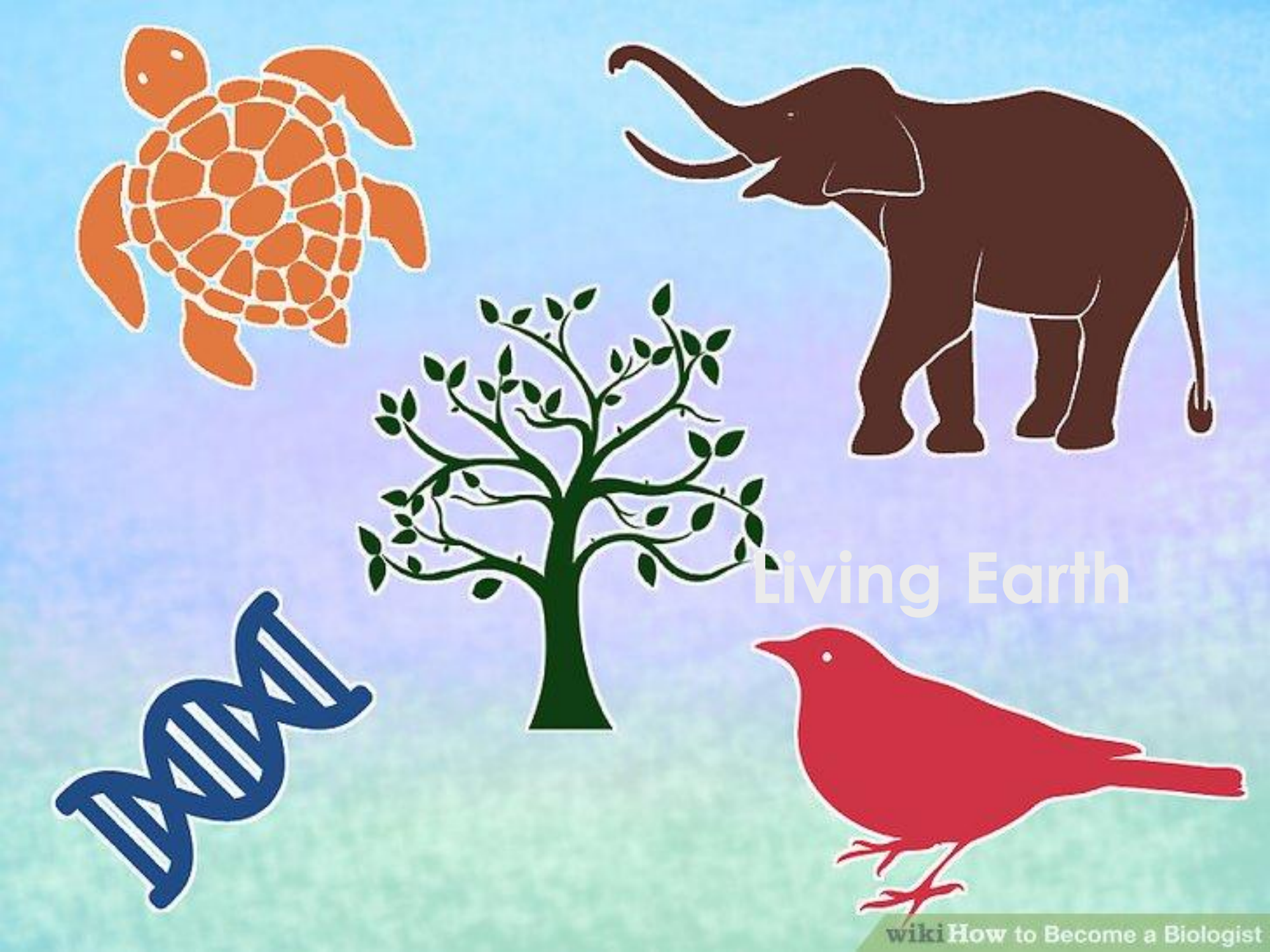


Sources for this unit

- Homologous/Analogous/Vestigial Worksheet
- https://www.tamdistrict.org/cms/lib8/CA01000875/Centricity/Domain/654/Homologous%20Analogous%20Vestigial%20Activity%20GP13.pdf

Notebook Setup

Notebook Requirements:

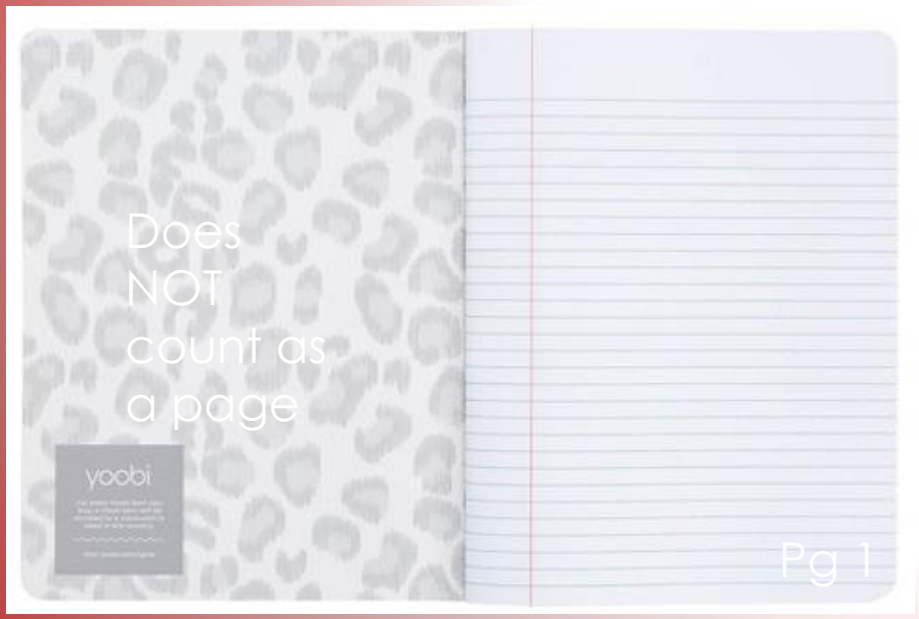
- College Rule
- Composition Notebook

- If you do NOT have a notebook, take notes on what needs to be put on each page, and do the Set-up for Homework.

First! Let's number the pages

Page 1 starts on the
page

bering, where all of
mbers are on the
numbers are on the



On to page 1!

Write this down and fill it out on the TOP HALF of Page 1

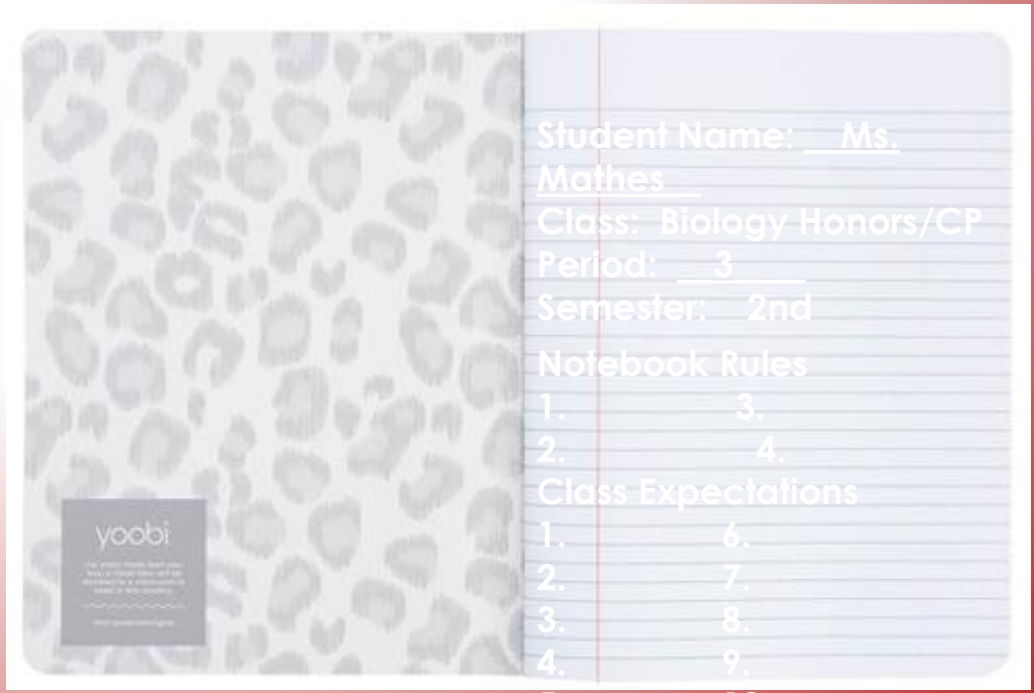
Student Name: ____

Class: Biology (w

Period: _____

Semester: 2nd

Notebook Rules:



Notebook Rules

1. DON'T tear out any pages
2. Stay on the page numbers with the class
3. If you run out of room, get an extension page
4. Keep it clean, organized, and scientific!

Class Expectations

1. Be respectful
2. Clean up all messes and throw away trash
3. Return all classroom supplies where they belong
4. Be responsible
5. Come prepared
6. Everyone will do their share of work in groups
7. Be kind to each other
8. Complete all assignments by the due dates
9. Have all stamps done 2 days BEFORE the test

NB pg 2

Table of Contents Evolution

Page	Title	Points
1	Notebook Info	/10
2	Table of Contents	/10
3	Table of Contents	/10
4	Digital Work	/10
5	Digital Work	/10
6	DSJ	/10
7	Digital Techbook Safari	/10

Discovery EDUCATION | SCIENCE TECHBOOK.

Going on Safari: Student Structured Exploration with Techbook

Section of Techbook	What did you find?	What did you like?	What questions do you have?
Engage			
Explore			
Explain			
Elaborate			
Evaluate			

DSJ

Daily Science Journal

NB Page 6

Wednesday-

Now that you know how this class is going to run, what are you going to do different this semester? What's the best information you can take from last semester and

DSJ

Daily Science Journal

NB Page 6

Thursday-

What are you first impressions of the digital book and activities?

DSJ

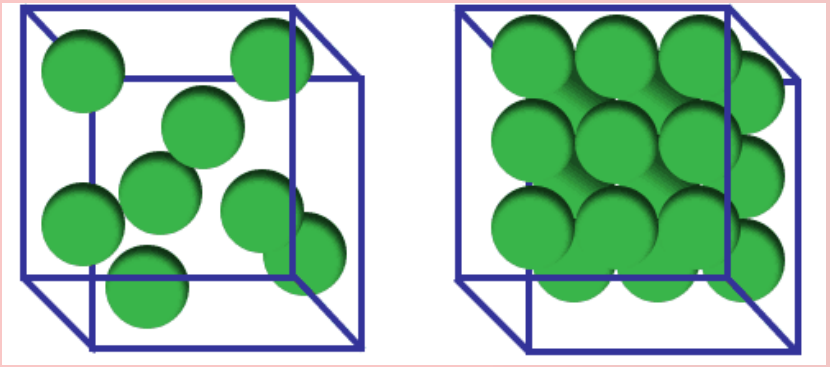
Daily Science Journal

NB Page 6

Friday-

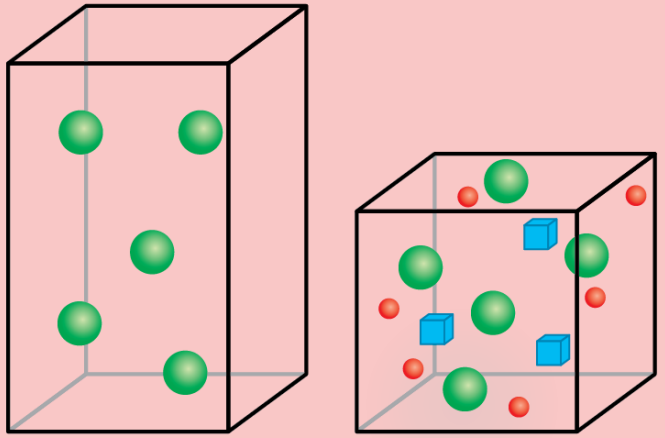
Which box has a higher density, A or B?

A



B

Which one has a higher density, C or D?



DSJ

Daily Science Journal

NB Page 6

Tuesday-

How do you think plate tectonics are used as evidence to show how Earth has evolved over time?

Daily Science Journal

NB Page 6

DSJ

Wednesday-

What would ocean fossils on land tell you about Earth's history?

NB 10

Relative Dating

Superposition

Original Horizonatity

Lateral Continuity

Cross-Cutting

NB 11

Relative Dating

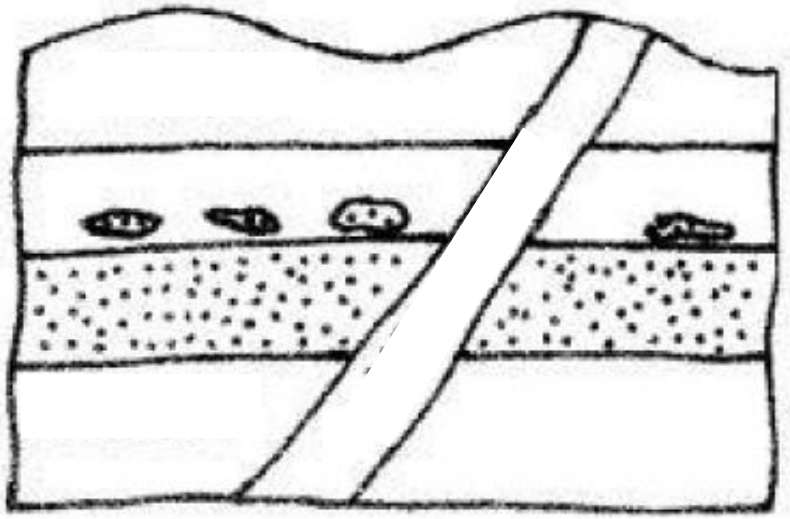
Relative Dating:

Catastrophism

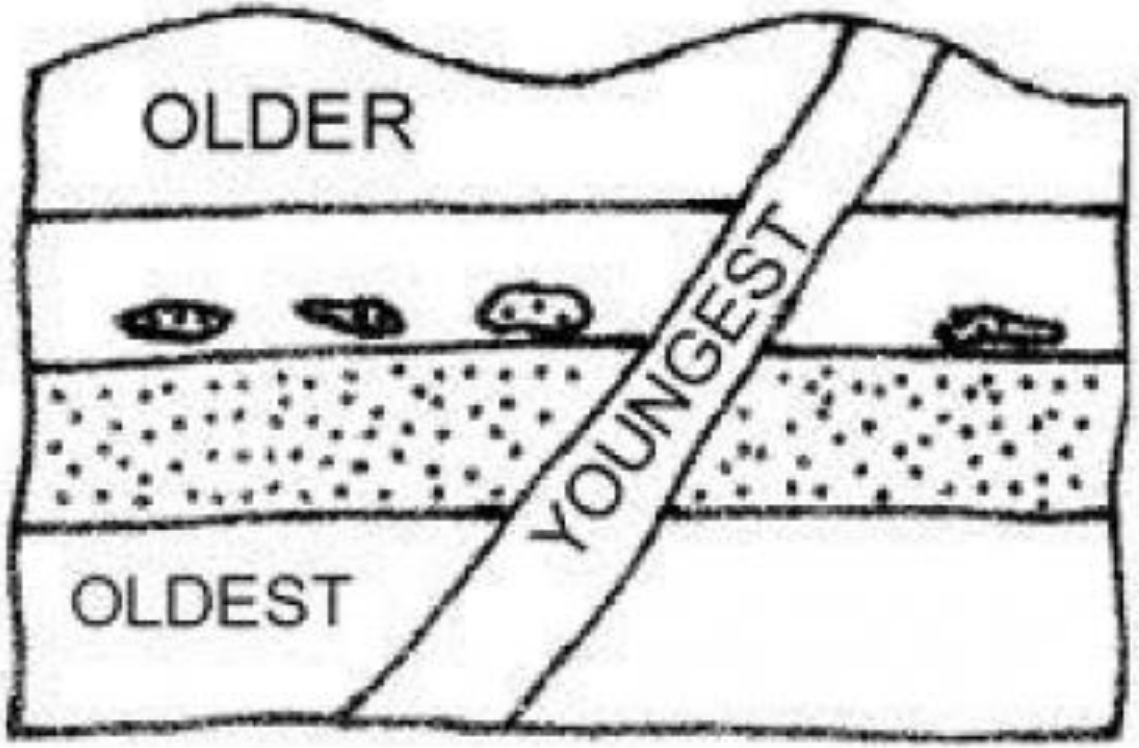
Uniformatarianism

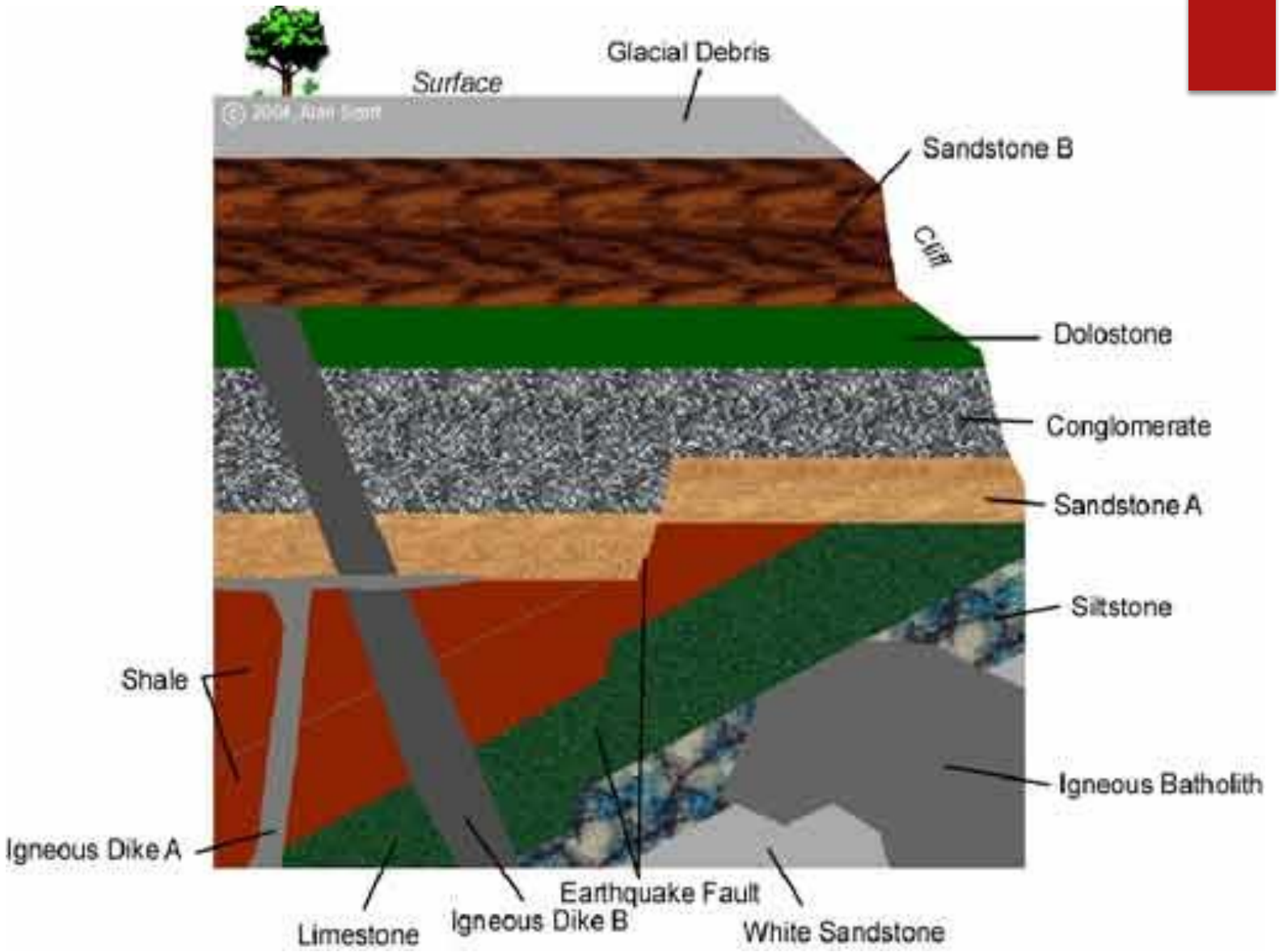
Relative Dating

- **The science of determining the relative order of past events (i.e., the age of an object in comparison to another), without necessarily determining their absolute age (i.e. estimated age).**



Relative Dating




Surface
Glacial Debris
Sandstone B
Cliff
Dolostone
Conglomerate
Sandstone A
Siltstone
Shale
Igneous Batholith
Igneous Dike A
Limestone
Igneous Dike B
Earthquake Fault
White Sandstone

Jig-Saw Teaching

1. **Superposition**
2. **Original Horizontality**
3. **Lateral Continuity**
4. **Cross-cutting Relationships**

- **Each poster:**
  - **Draw a picture, color and label**
  - **BULLETS ONLY, no sentences**
  - **Be prepared to teach it to the groups**

Daily Science Journal

NB Page 6

DSJ- **Thursday**

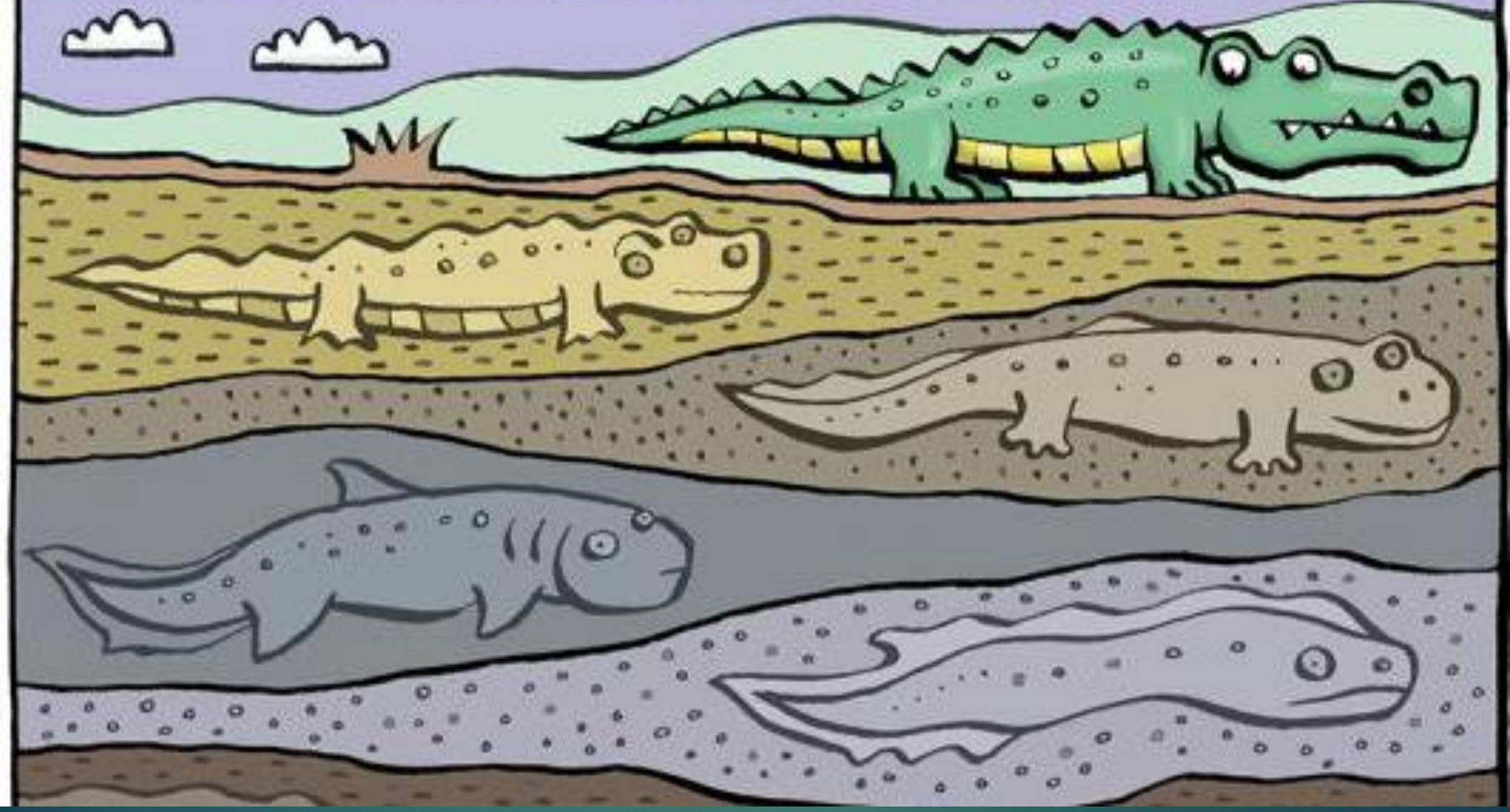
How is relative dating different than absolute dating?

Daily Science Journal

NB Page 14

DSJ- **Tuesday**

Why do we study fossils?



Create and write a story (6-8 sentences) to explain this image. Be prepared to share it out

NB Page 12

Animal Fossil Changes

Current Day

100,000 y.a.

NB Page 13

Fossil Notes

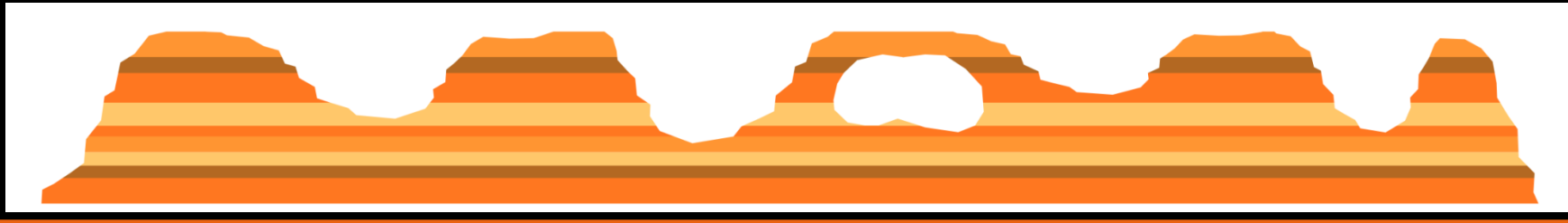
Overview of the Geology (reading)

1. Geology is the science of the lithosphere, including the Earth's physical structure and substance, its history, and the processes.

2. Geology provides tools to determine the relative and absolute ages of rocks found in a given location.

3. Geologists are able to chronicle the geological history of the Earth as a whole, and also to demonstrate the age of the Earth.

4. Geology provides the primary evidence for plate tectonics, the evolutionary history of life, and the Earth's past climates.



NB Page 13

Geology (write)

Geological evidence indicates Earth is at least 4 bill.yrs old.

Enough time for evolutionary changes to occur among organisms.

Relative and Radioactive are used to determine the age of geological formations.

NB Page 13

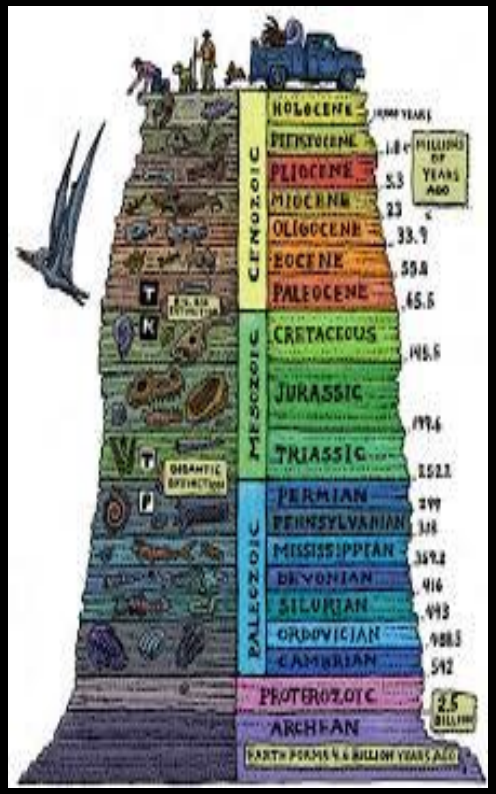
Overview of the Fossil Record

1. A rich record of fossils (thousands!)show clear evolutionary paths.

2. This includes fossils of extinct ancestral species "transitional" fossils showing crucial changes in form, such as water-based animals evolving to live on land; and many human ancestral species.

3. Fossils found in the bottom layers of the earth's sediment are the oldest.

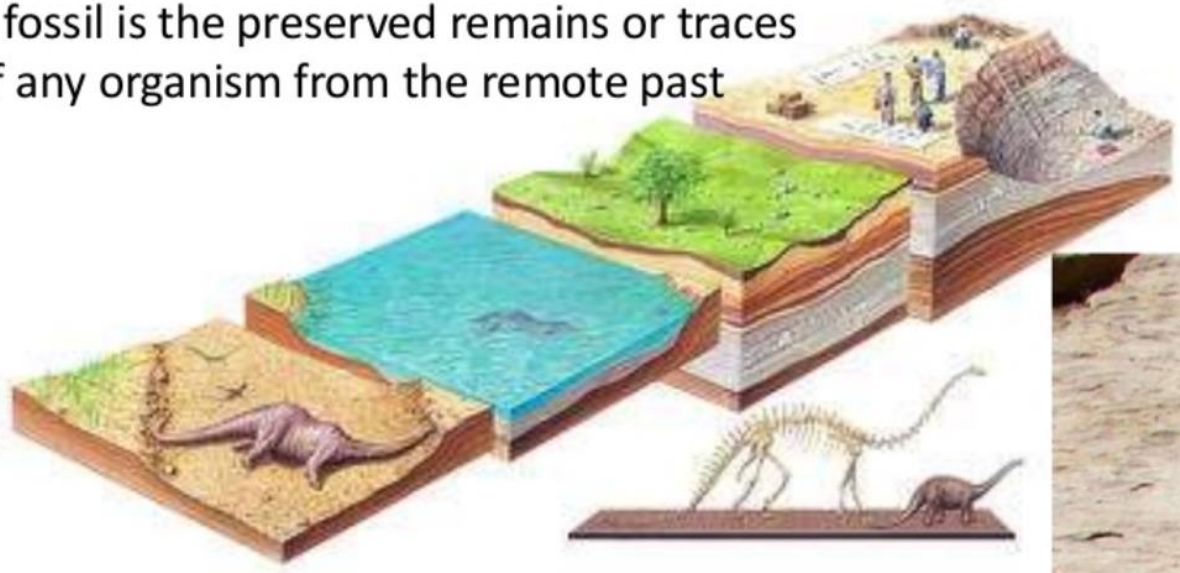
4. Organisms are found in the following order:
- modern organisms
- mammals
- reptiles
- amphibians
- fishes
- invertebrates
- Trilobites
- simple multicell-ular organisms
- eukaryotes
- prokaryotes



5. The Fossil Record can account for many apparent gaps because organisms need to die under the right conditions to be preserved and protected from scavengers that might eat them.

5.1.U2 The fossil record provides evidence for evolution.

A fossil is the preserved remains or traces of any organism from the remote past



http://www.gridclub.com/subscribers/info/fact_gadget_2009/images/pl1co1f1.jpg

Fossil evidence may be one of two types:

2. Indirect (trace fossils) such as footprints, tooth marks, tracks, burrows, etc.

http://commons.wikimedia.org/wiki/File:First_Dinosaur_Tracks_from_the_Arabian_Peninsula.jpg

1. Direct (body fossils) such as bones, teeth, shells, leaves, etc.

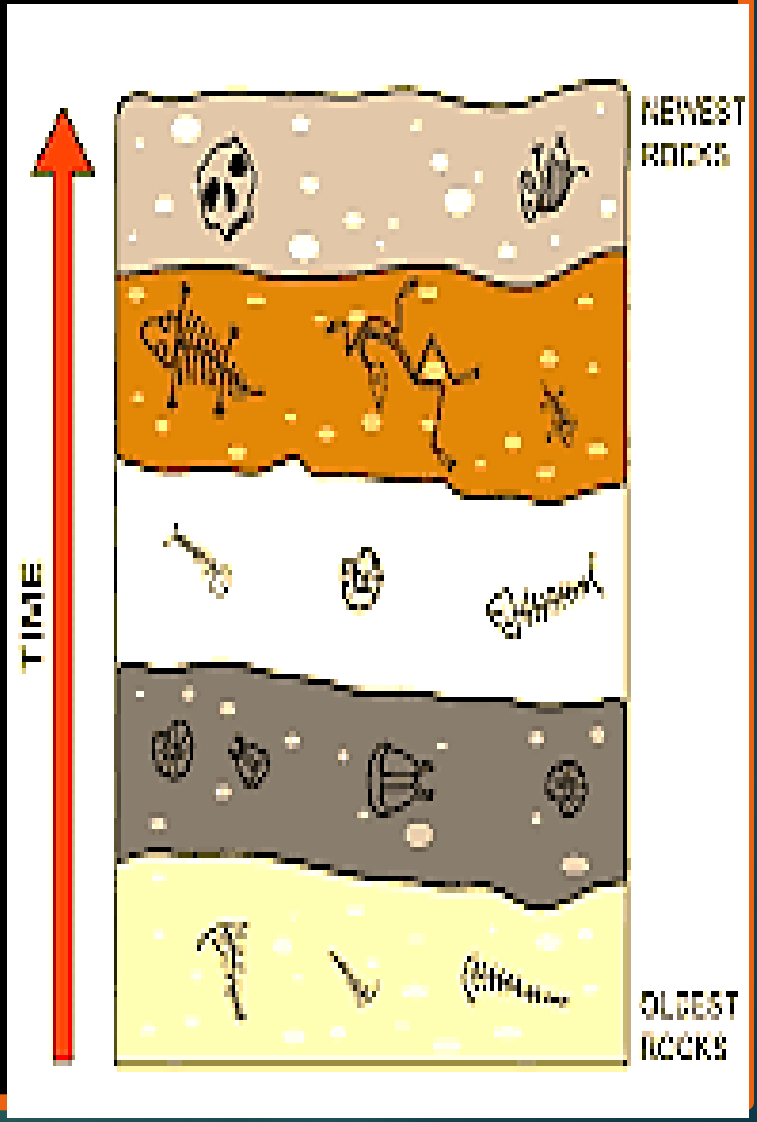
http://commons.wikimedia.org/wiki/File:Knightia_eocaena_FBNM.JPG|

NB Page 13

Fossil Record

Fossils are the remains or imprints of past life. As you dig deeper into the earth, the fossils are older.

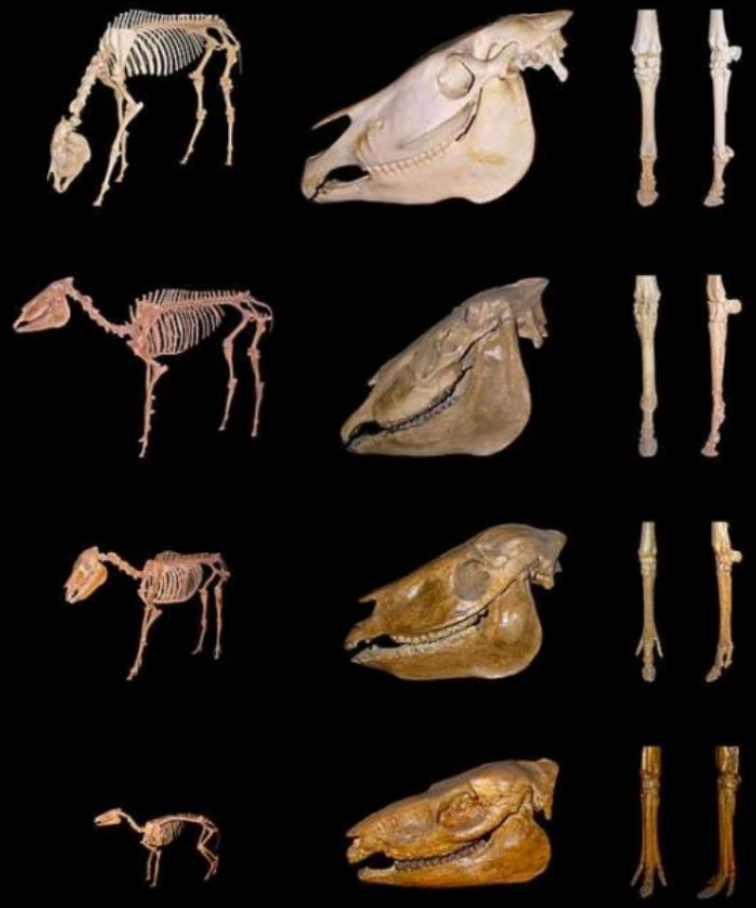
Carbon 14 dating is a type of radiometric dating used to determine the age of ancient artifacts.



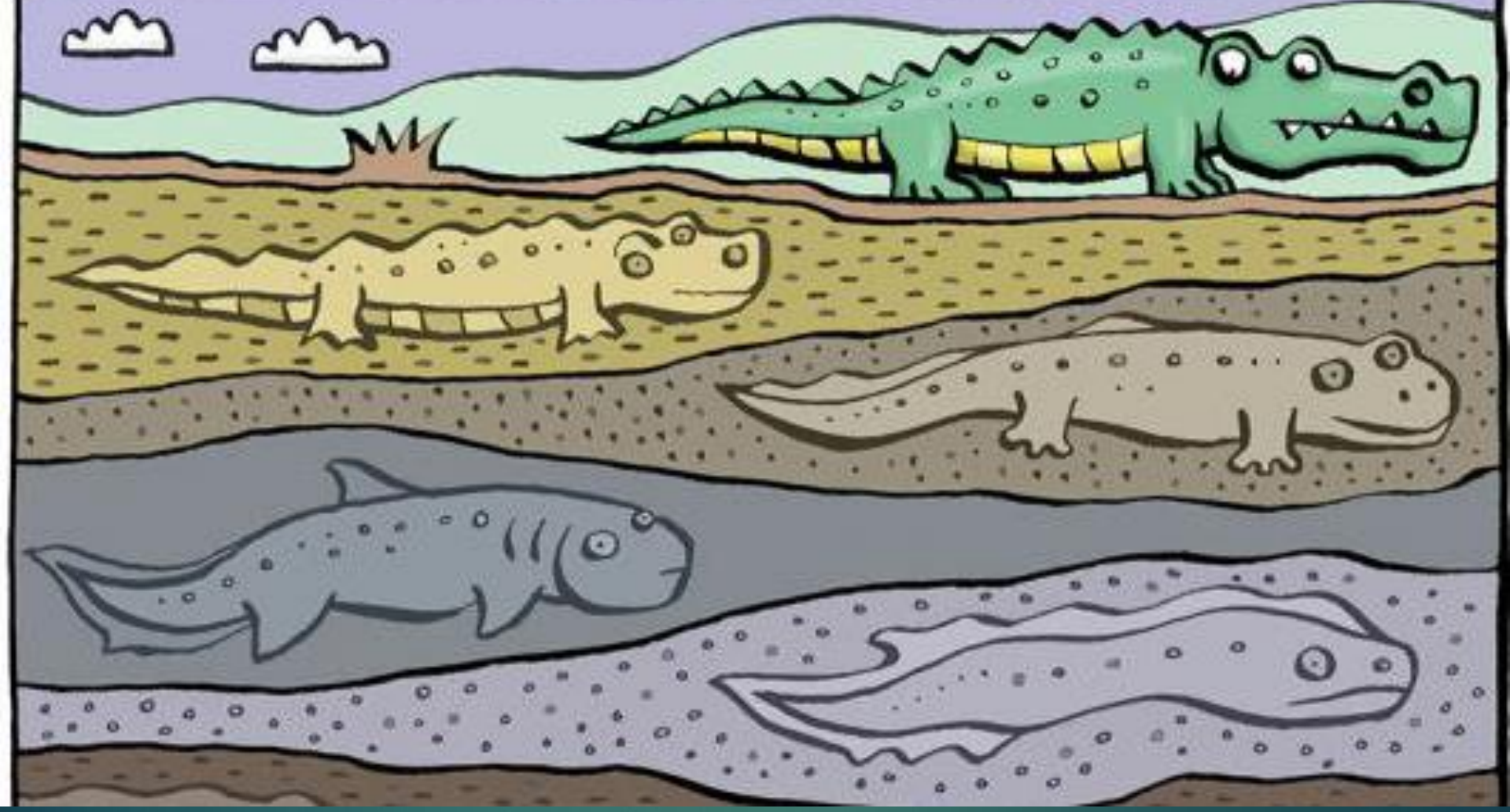
5.1.U2 The fossil record provides evidence for evolution.

The fossil record clearly shows changes (in characteristics) of organisms

Fossils show a chronological (time) sequence in which characteristics appear and develop in complexity



http://commons.wikimedia.org/wiki/File:Equine_evolution.jpg



Draw your animal sequence similar to this

Your pictures need to be colored!

Fossilized Animal

1. Pick your favorite animal
2. Draw your animal towards the top of page 12
3. Think about your animal and what it would have looked like 100,000 years ago.
4. What do you think would have been different?
5. On the bottom of page 12, draw what you think your animal would have looked liked, but make it look like a fossil (add some different things to it…like maybe it had a horn, or 6 legs.
6. Model the same evolution of your animal like from the cartoon and have it change slightly over time to your current day animal. Create at least 4 different changes/layers in your fossil record.

Daily Science Journal

NB Page 14

DSJ- **Wednesday**

What comes to mind when I say “tree of life”

NB Page 14

DSJ

NB Page 15

Common Ancestors

Quickwrite/Ideas

Common Ancestor thoughts?

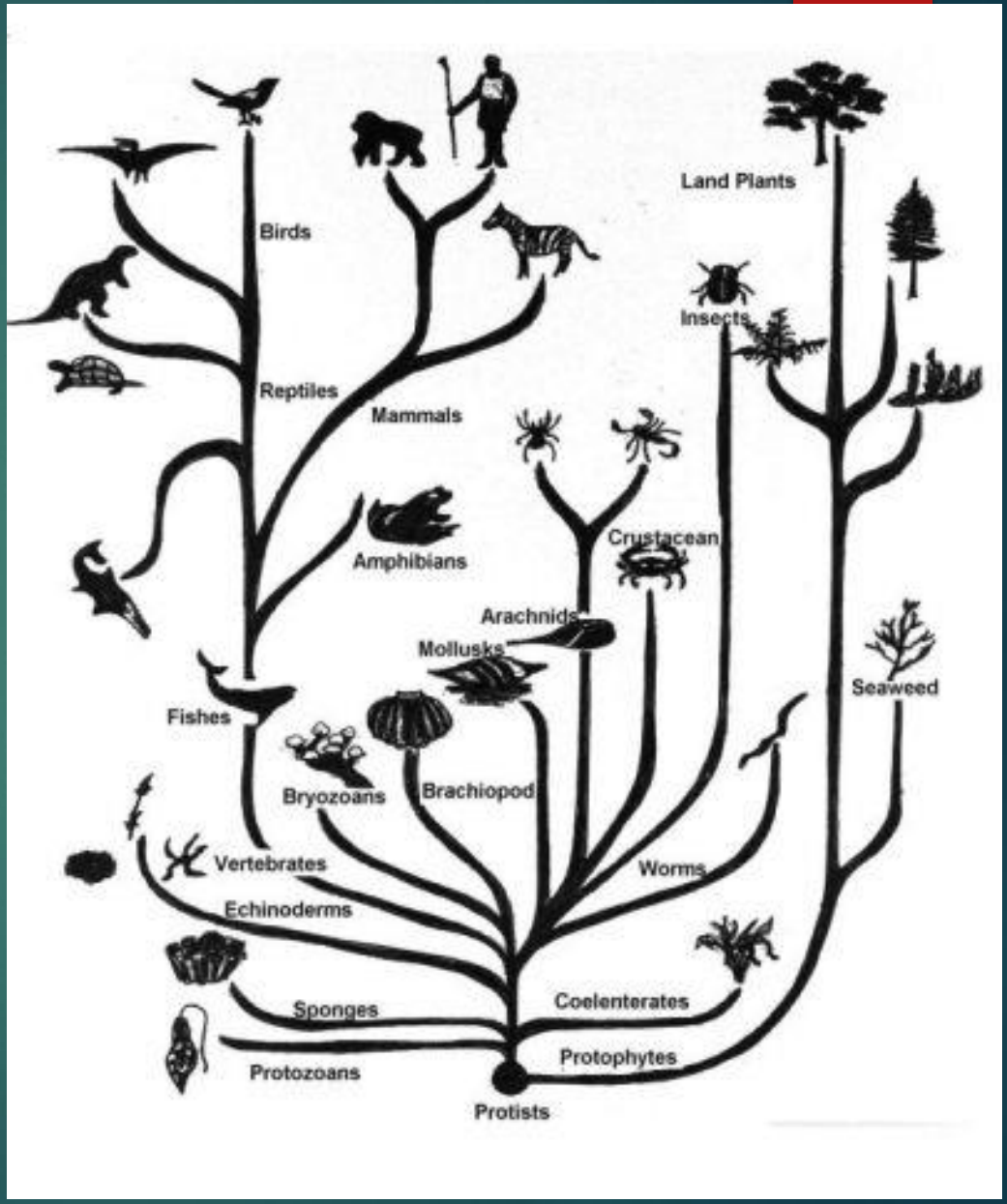
Common Ancestor

Speciation:

Speciation Drawing:

What is happening in this image?

Spend 3 minutes discussing this with your table group. Be prepared to share out your ideas



Things to think about…

Where did life start?

How do you know?

What does all life have in common? Where does everything come from?

What are a few examples of the last organisms to evolve? How did you know?

Wh
a
re

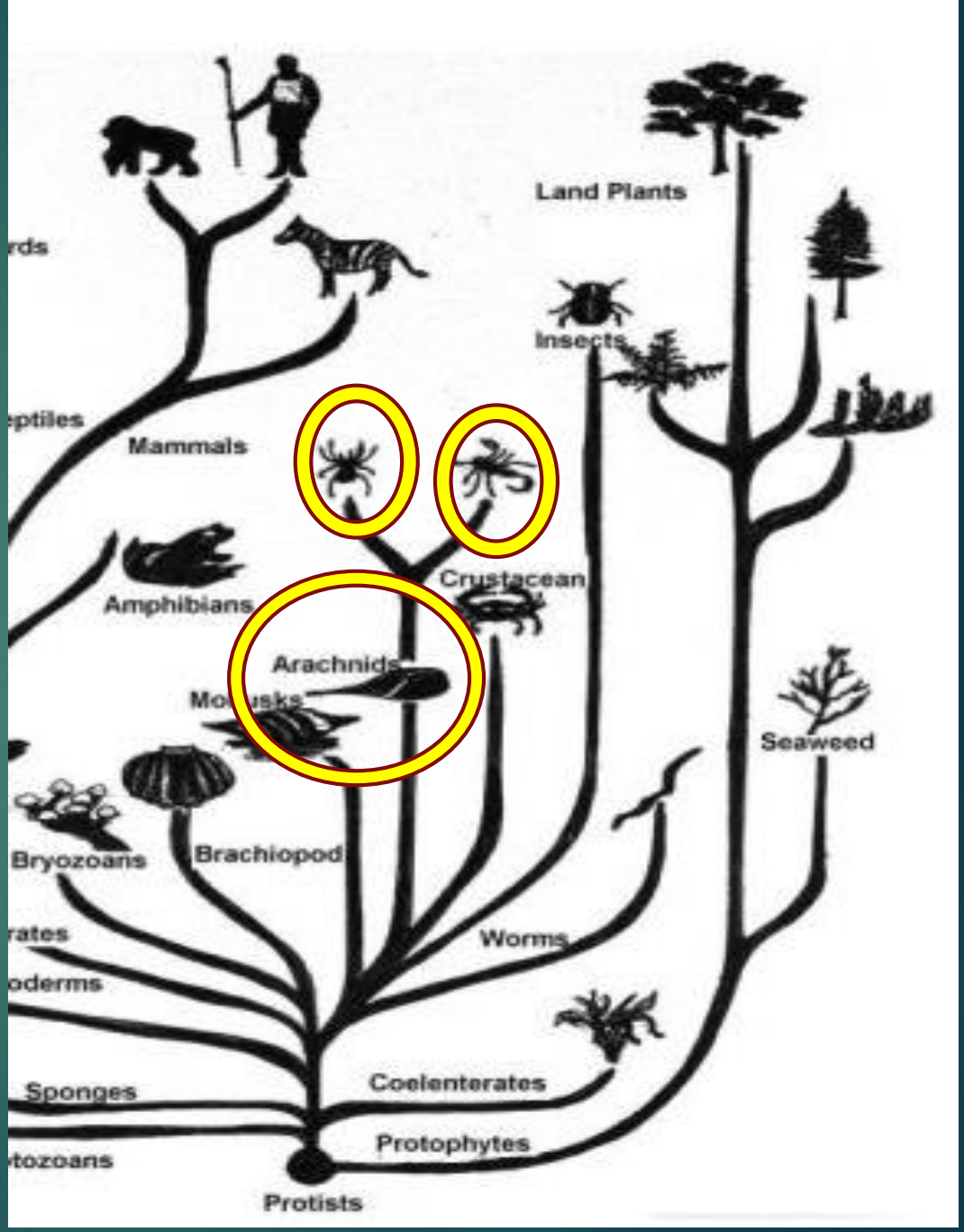
This is what we call a **Common Ancestor**

In your own words…

What is a Common Ancestor?

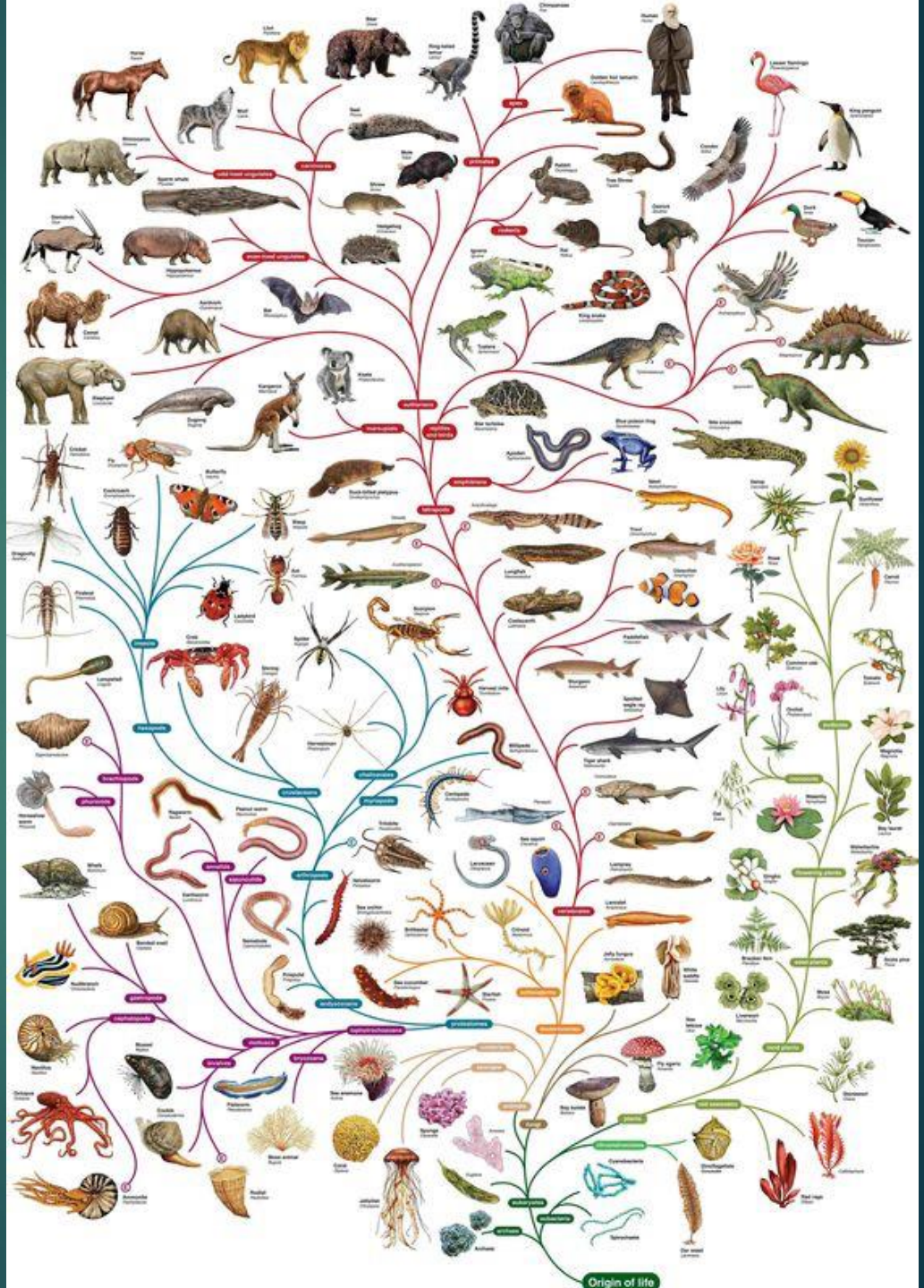
Common Ancestor:

an ancestor that two or more descendants have in common



Phylogenetic Tree

What is a common ancestor of…

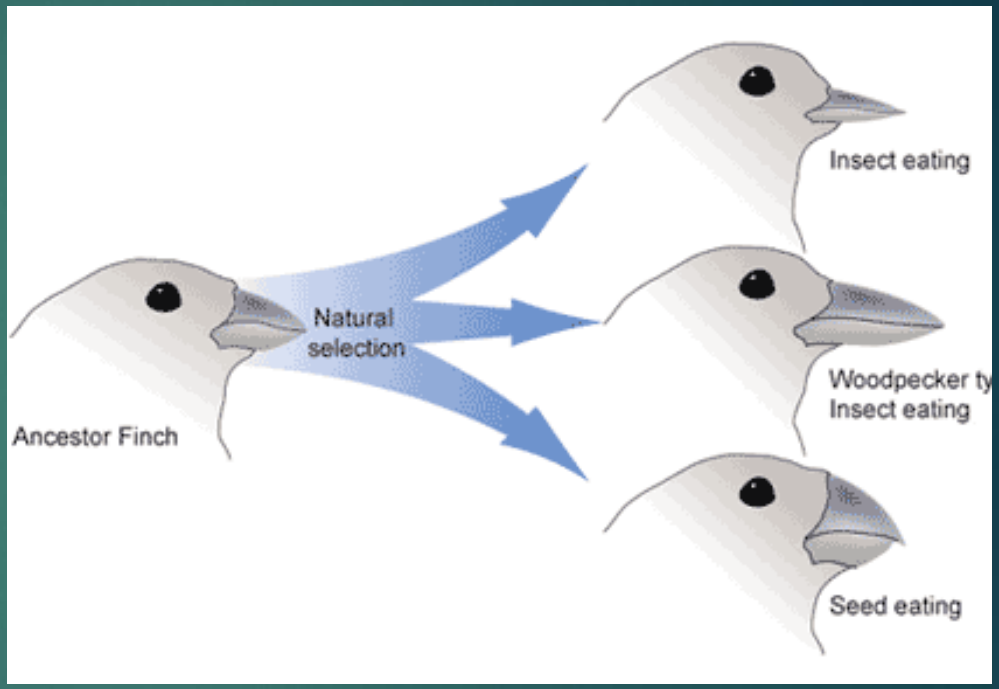


How does this happen?!?

Speciation and Common Descent

What is happening ?

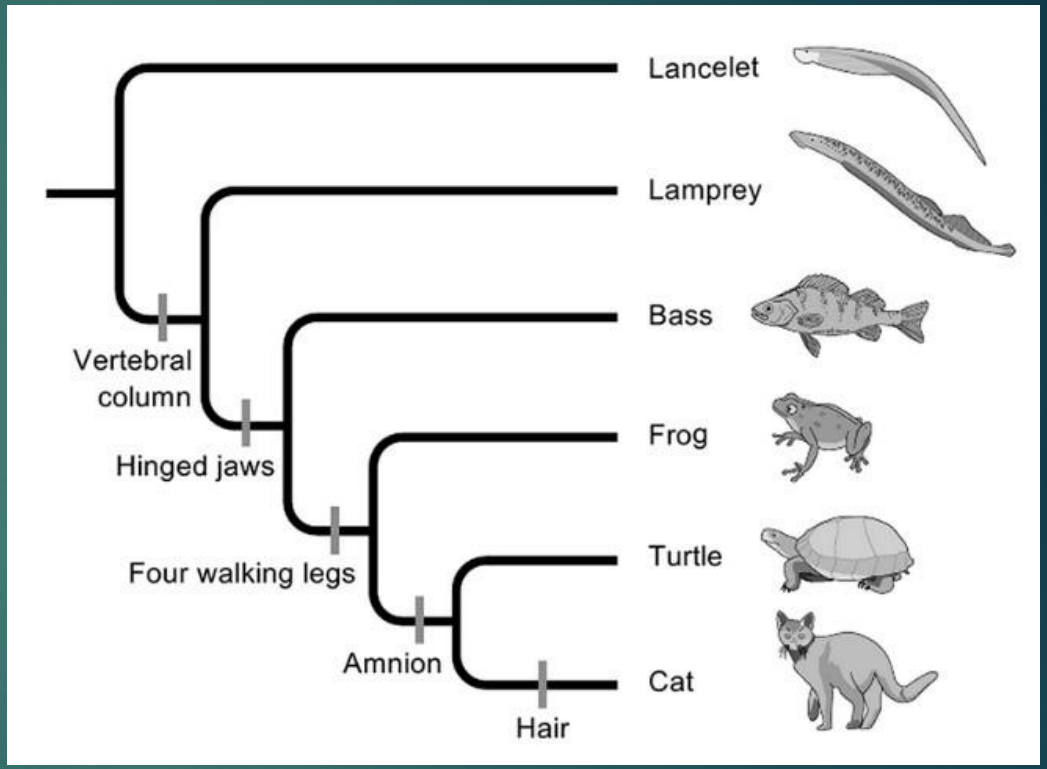
Can you think of what would cause this? (more to come on this later)



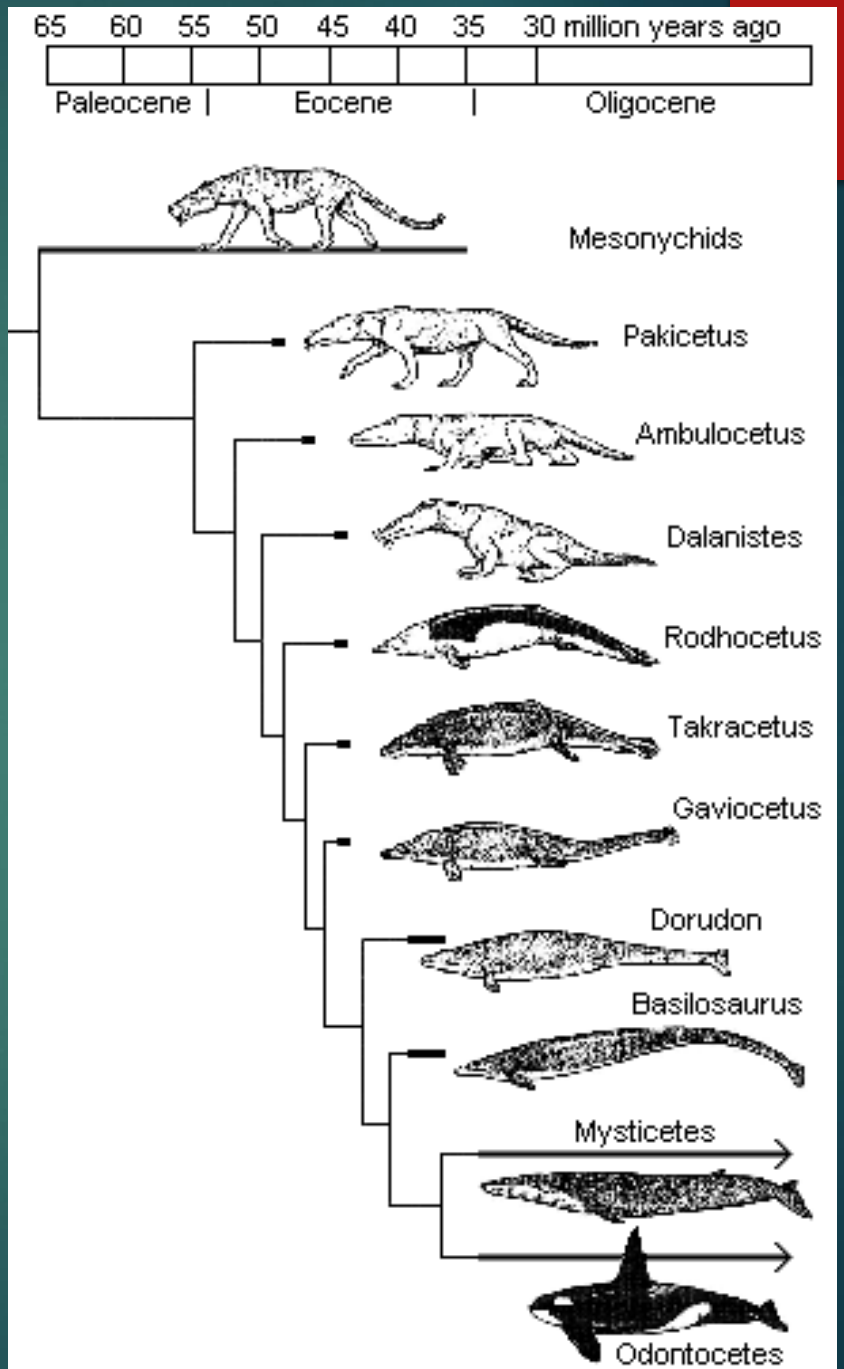
Speciation: Formation of new species

Common Descent: All species-living and extinct-are united by descent from ancient common ancestors

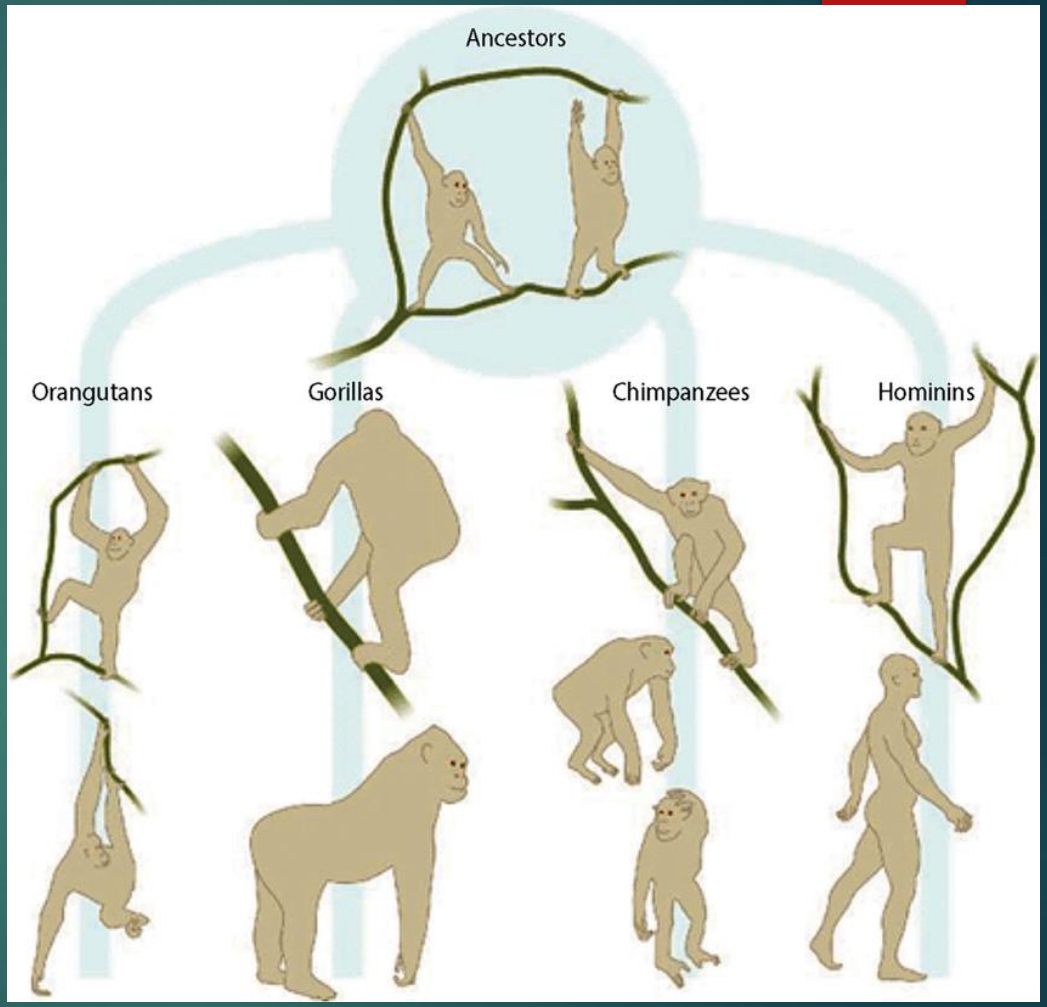
Other Types of Ways to Organize Life Cladograms



Cladograms


65
60
55
50
45
40
35
30 million years ago
Paleocene
Eocene
Oligocene
Mesonychids
Pakicetus
Ambulocetus
Dalanistes
Rodhocetus
Takracetus
Gaviocetus
Dorudon
Basilosaurus
Mysticetes
Odontocetes

And us…



Daily Science Journal

NB Page 14

DSJ- **Thursday**

What kind of evidence would you need to 'know' that we have common ancestors?

Daily Science Journal

NB Page 14

DSJ- **Friday**

Refresher: What is a population of animals?

Fossil Dig Lab

NB Page 16

Background: Make up a story of your dig. Where are you? What are you looking for? What are you hoping to discover?

Notes on your initial dig: Write down what you're finding in the dig, take notes on where you found different things, etc. What do you notice about the different textures?

Draw everything that you found. Make up a story as to what you think it is.

Draw a profile of your dig. Replicate what your cookie looked like from the bottom up. Color.

NB Page 17

Questions:

1. What did you find? (make each piece of candy= something, like a bowl, etc)
2. Do you think this would be similar to a real dig? Explain.
3. What do you think would be different? Explain
4. What was most challenging?
5. In complete sentences, relative date everything that you found. For example, you might say

"The bowl was older than the skeleton, but younger than the bow and arrow

Daily Science Journal

NB Page 14

DSJ- **Monday**

What does the prefix 'homo' mean for scientific naming?

Ex:

Homosapien

Homologous structures

Look up the Greek prefix specifically !

NB Page 18

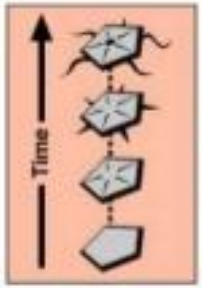
Homologous Structures

NB Page 19

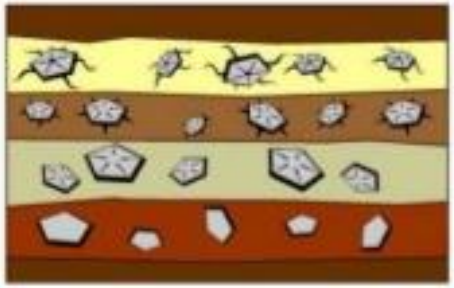
Analogous Structures

Evidence for Evolution

Fossil record

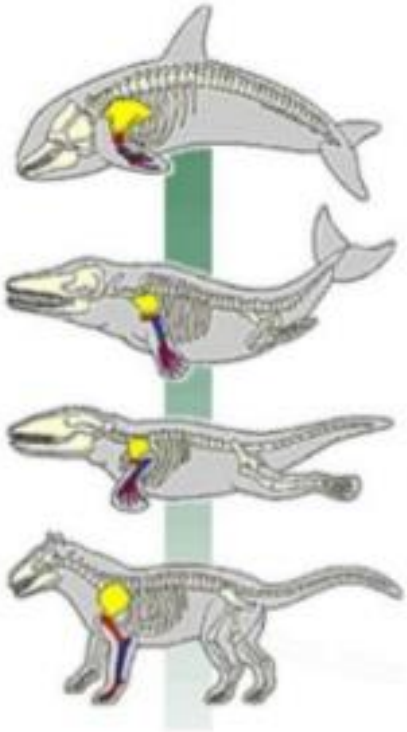


Gradual lineage evolution



Rock strata with fossils

Homologous structures



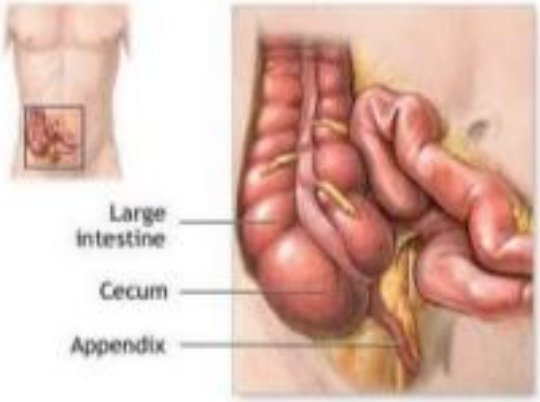
http://evolution.berkeley.edu/evosite/evo101/VIIAPacevolution.shtml

Selective breeding

http://www.bbc.co.uk/schools/ks3bitesize/science/images/bio_dogs.gif

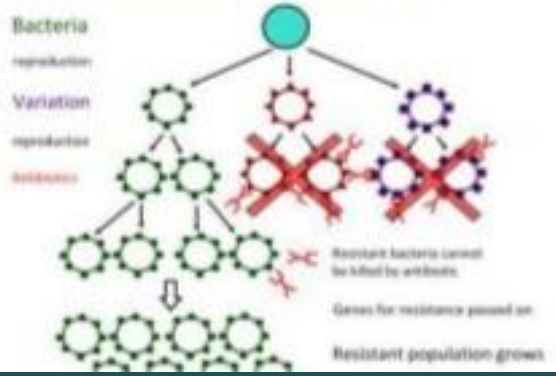
Comparative DNA

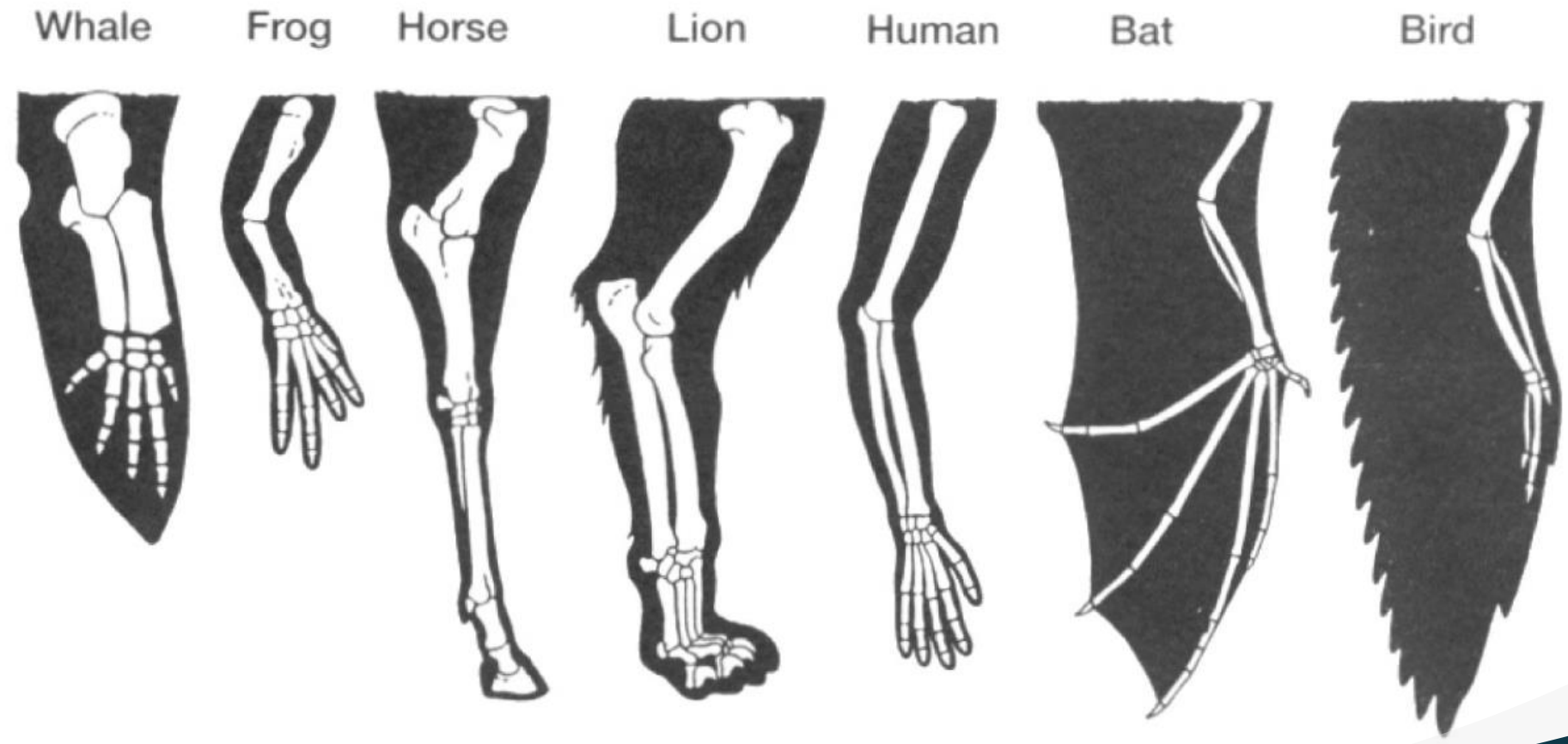
Vestigial structures



http://www.nlm.nih.gov/MEDLINEPLUS/ency/imagepages/1128.htm

Observable changes

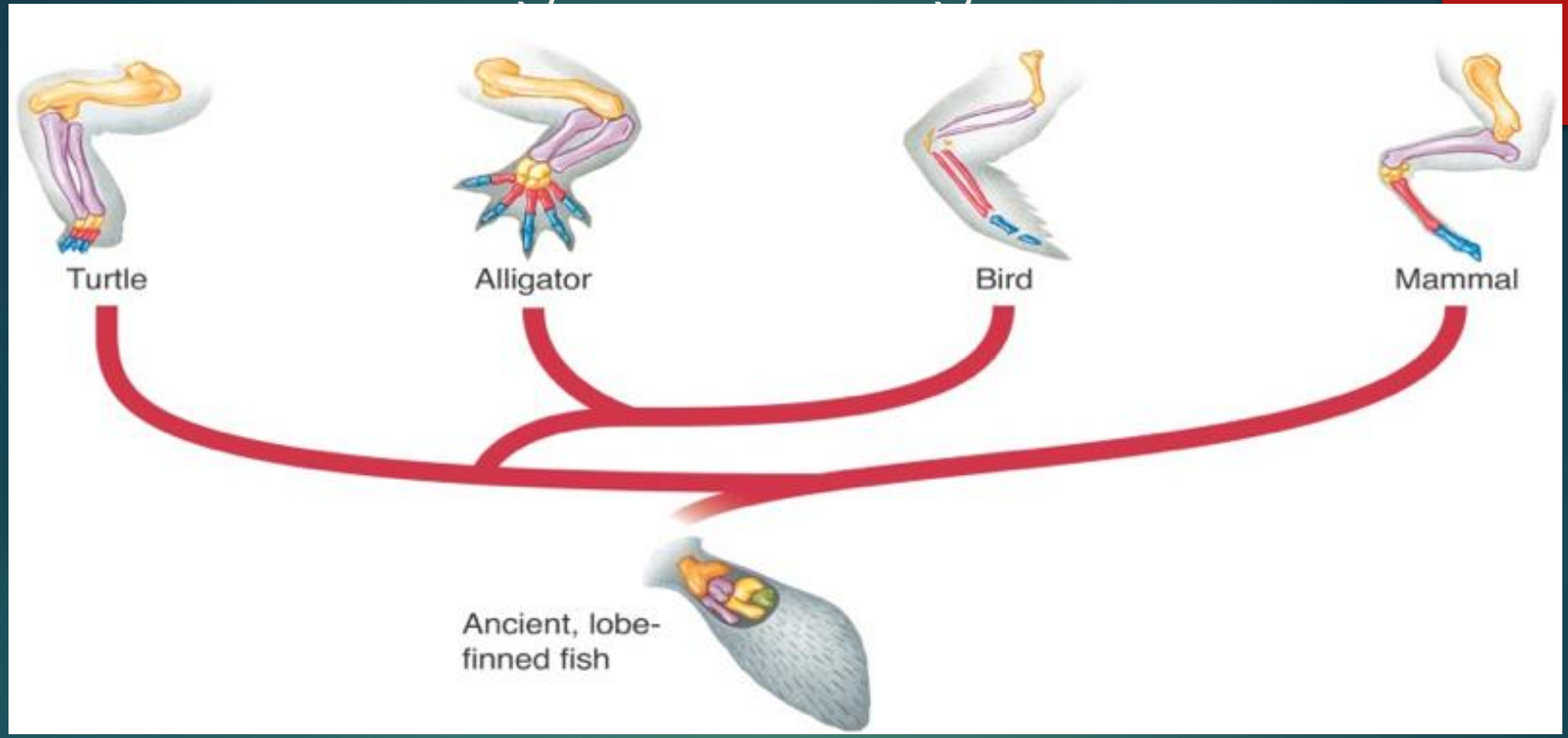




What do these have in common? Or rather, what is the ‘same’

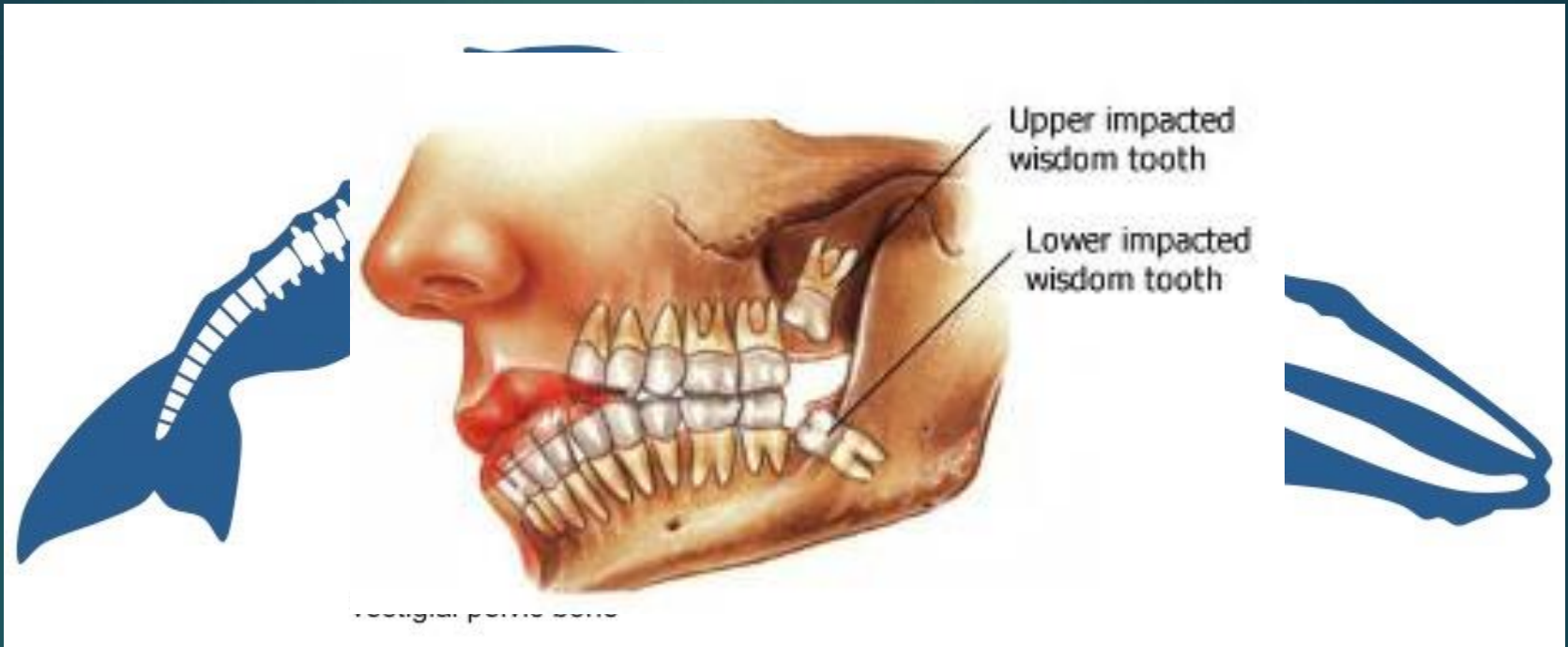
Do they use the same structures for the same reasons?

NB Pg 18 Homologous



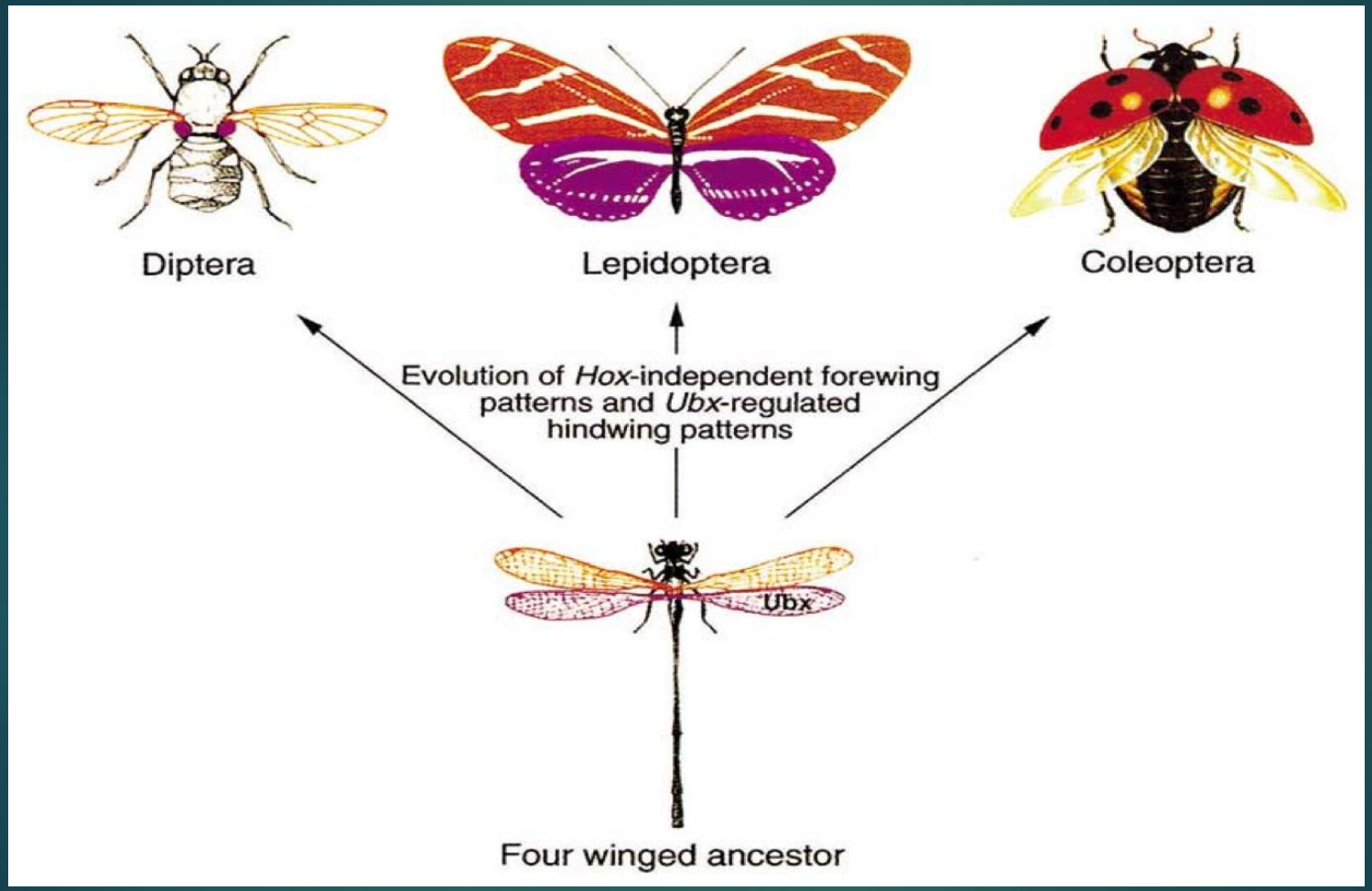
- Homologous structures have <u>similar</u> forms and develop from the same embryonic tissues.
- They provide strong evidence that organisms have descended, with modifications, from <u>common ancestors.</u>
- Although Homologous structures are made from the same tissue and are the same structure, they may be used for different purposes.

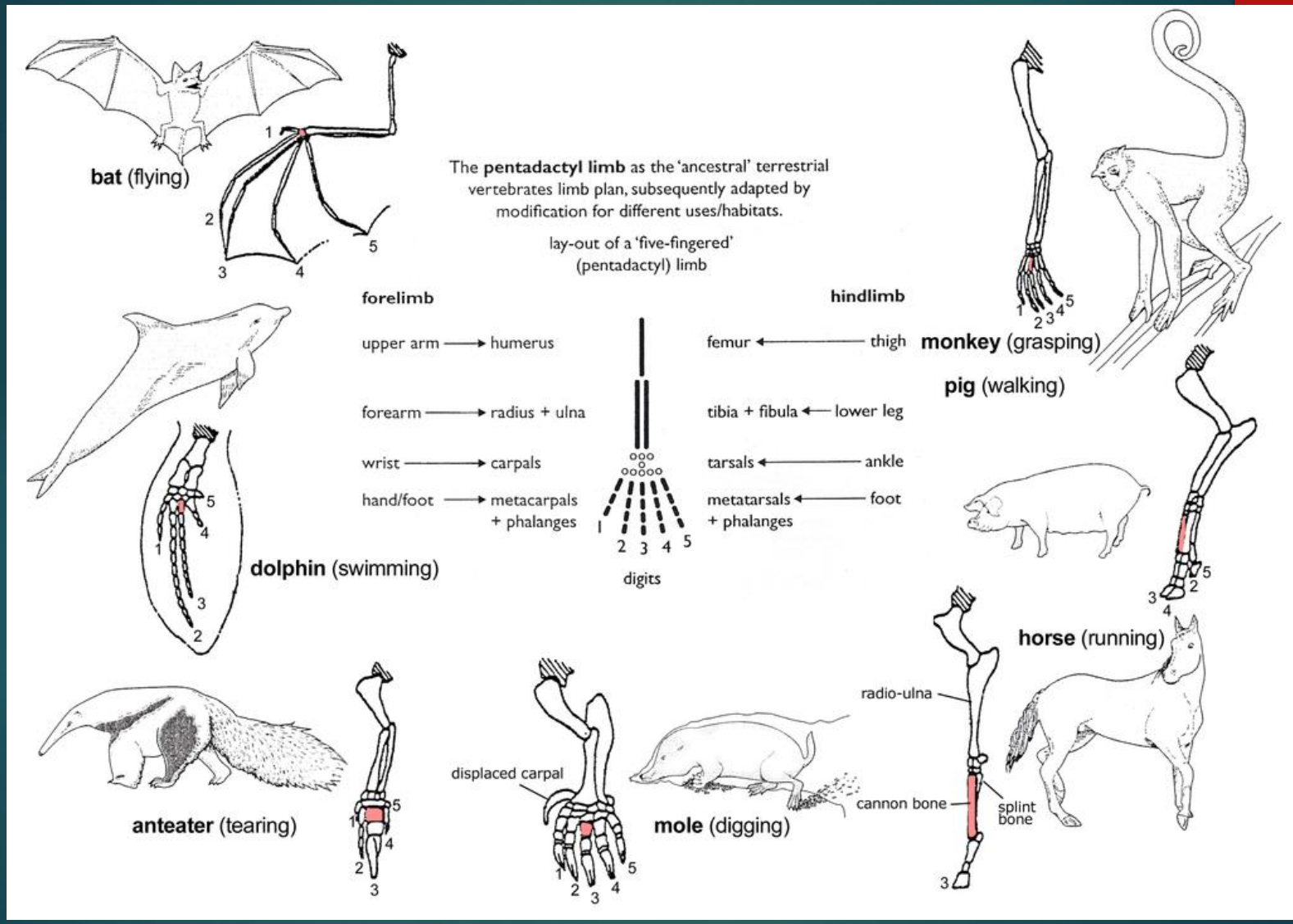
NB Page 18- Homologous Structures

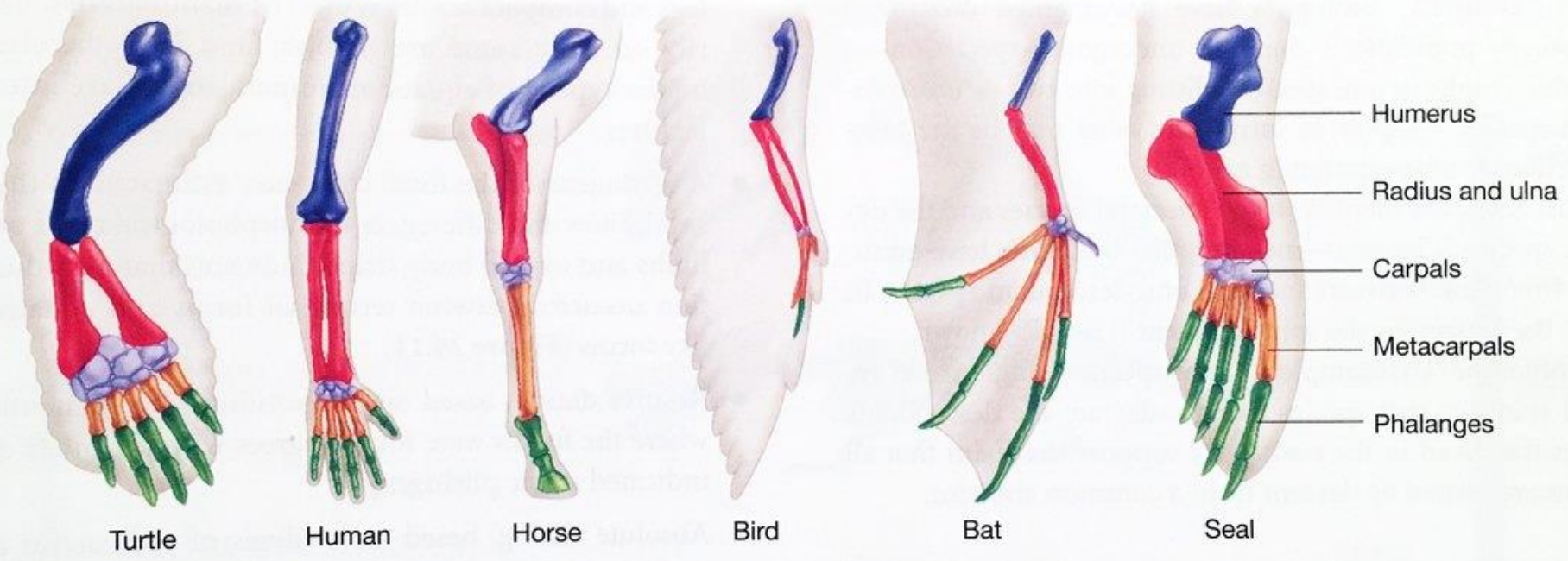


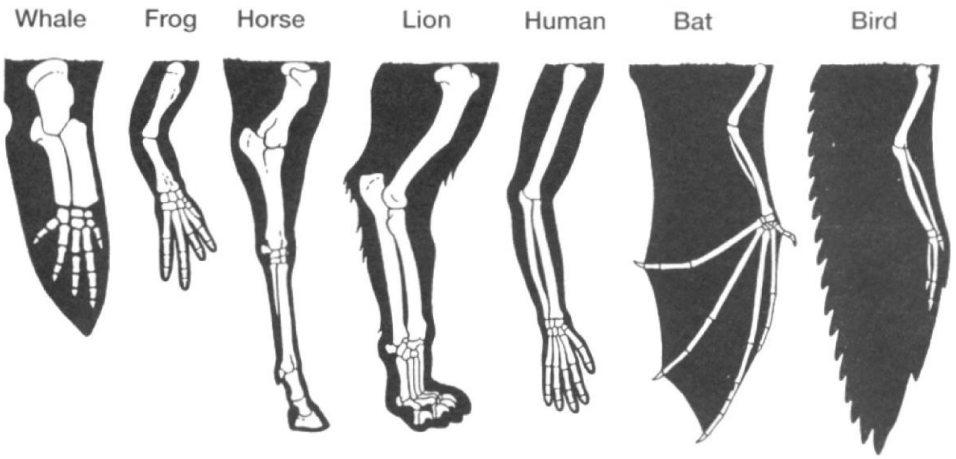
- Some homologous structures no longer serve important functions in descendants. This is what we call Vestigial Structures

Homologous Structures




bat (flying)
The pentadactyl limb as the 'ancestral' terrestrial vertebrates limb plan, subsequently adapted by modification for different uses/habitats.
lay-out of a 'five-fingered' (pentadactyl) limb
forelimb
hindlimb
upper arm → humerus
femur ← thigh
forearm → radius + ulna
tibia + fibula ← lower leg
wrist → carpals
tarsals ← ankle
hand/foot → metacarpals + phalanges
metatarsals ← foot + phalanges
digits
monkey (grasping)
pig (walking)
dolphin (swimming)
horse (running)
radio-ulna
cannon bone
splint bone
anteater (tearing)
displaced carpal
mole (digging)


Humerus
Radius and ulna
Carpals
Metacarpals
Phalanges
Turtle
Human
Horse
Bird
Bat
Seal



Key:

- ☐ Humerus
- ☐ Radius
- ☐ Ulna
- ☐ Carpals
- ☐ Metacarpals
- ☐ Phalanges

Whale Frog Horse Lion Human Bat Bird

Key:
Humerus
Radius
Ulna
Carpals
Metacarpals
Phalanges

Whale Frog Horse Lion Human Bat Bird

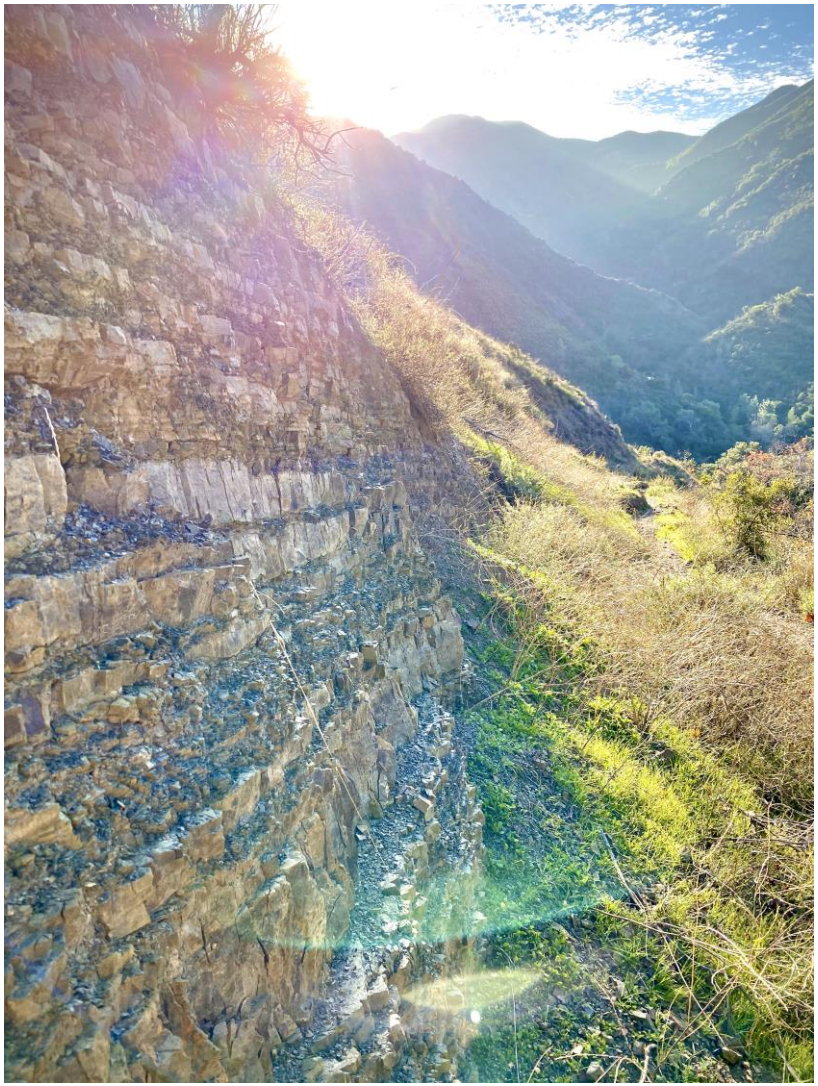
Key:
Humerus
Radius
Ulna
Carpals
Metacarpals
Phalanges

Whale Frog Horse Lion Human Bat Bird

Key:
Humerus
Radius
Ulna
Carpals
Metacarpals
Phalanges


Maple Springs
TRAILHEAD
CLEVELAND
National Forest


Maple Springs
TRAILHEA
CLEVELAND
National Forest



Daily Science Journal

NB Page 14

DSJ- **Tuesday**

Are homologous structures evidence of evolution? Explain.

Analogous Structures

What is an analogy?

a comparison of two otherwise unlike things based on resemblance of a particular aspect

"as light as a feather"

"busy as a bee"

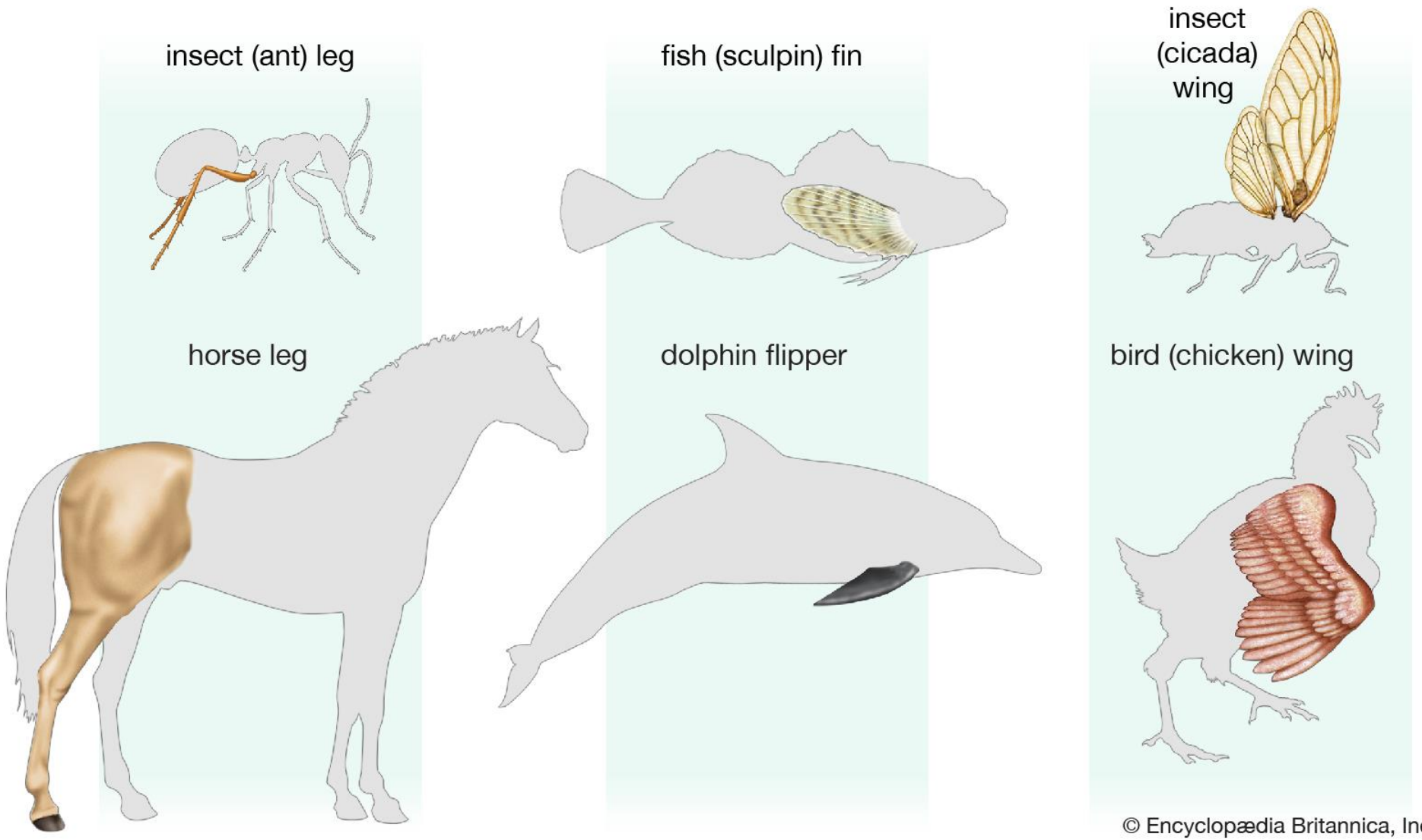
What does this really mean?

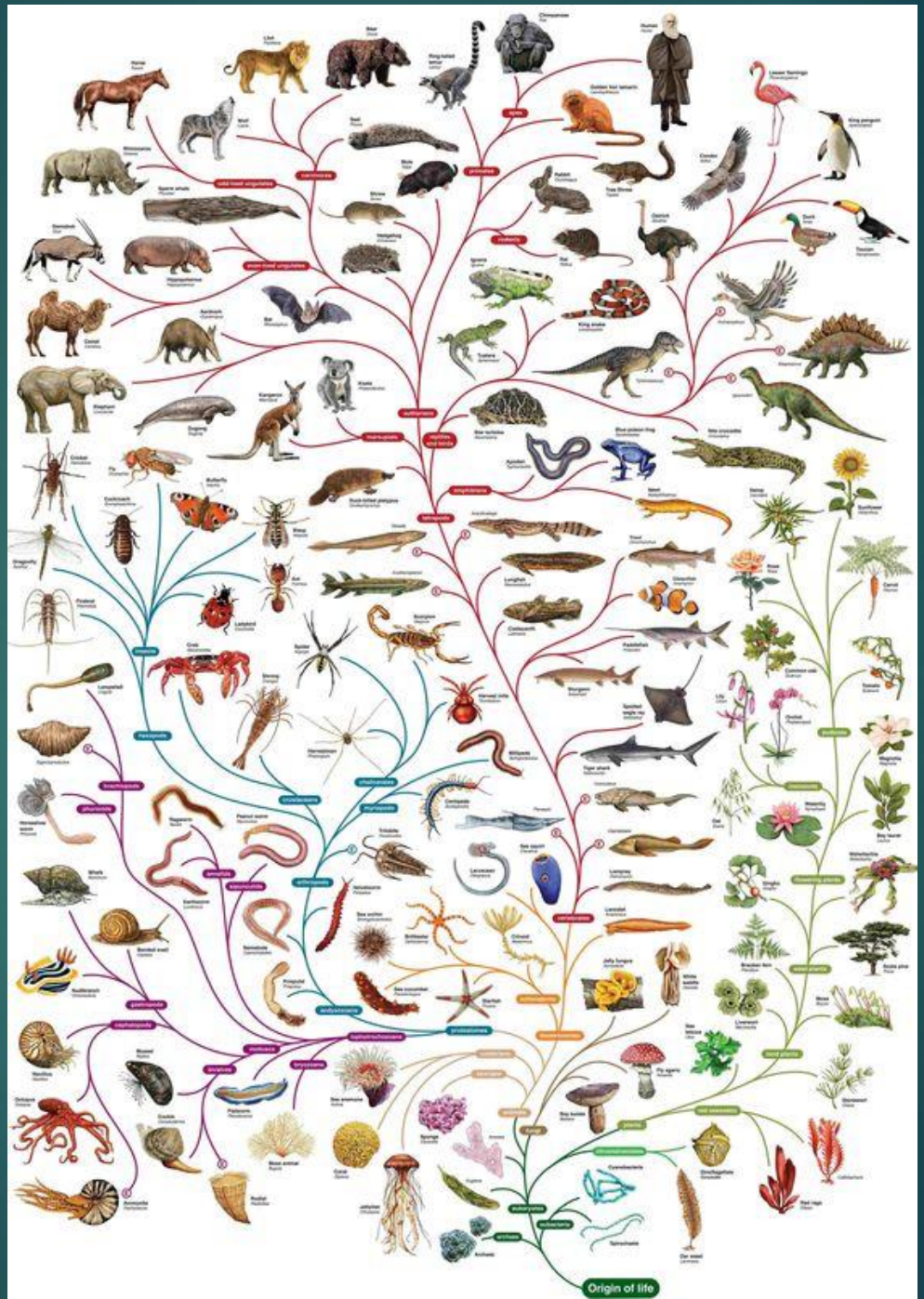
They're kind of the same, but not really

So in organisms with analogous structures, they have the same function, but NOT the same structure.

Analogous Structures

Comparison of analogous structures




Origin of life

Quickwrite

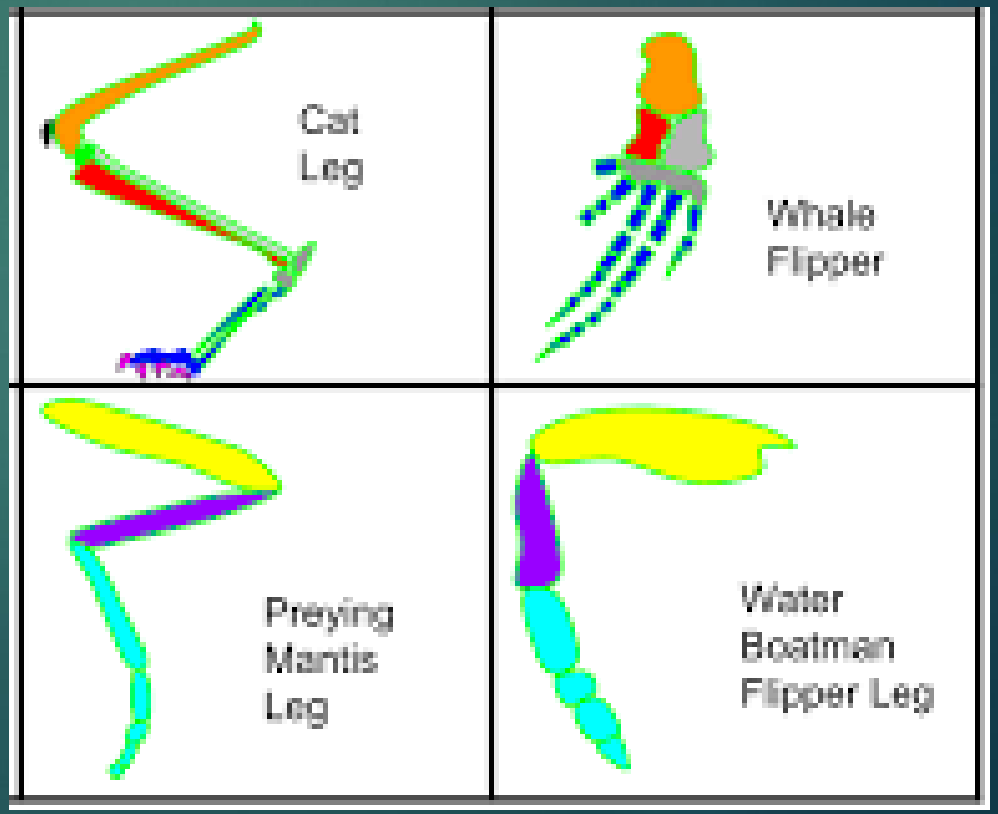
- What would cause two totally different structures to have the same function?
- Now, draw two examples of Analogous Structures (total of 4 organisms)

Daily Science Journal

NB Page 14

DSJ- **Wednesday**

Which two animal parts represents Homologous Structures? Which two animal parts represents Analogous structures?



Let's See How You Did!

	The REAL Identity of Embryos						
		Fish	Turtle	Salamander	Human	Chicken	Rabbit
Stage 1	"A" Card Number	1A	2A	3A	4A	6A	5A
Stage 2	"B" Card Number	5B	1B	4B	6B	3B	2B
Stage 3	"C" Card Number	6C	3C	2C	5C	1C	4C

Daily Science Journal

NB Page 14

DSJ-

Get a half sheet of paper, number 1-10

Title it Common Ancestor Quiz B

NB Page 22

Embryonic Development

Fun facts:

Evidence for Evolution

NB Page 23

Quiz page

When I pass your quiz back, it will go here!

Now that we've done the activity…

What do you think embryology has to do with evolution?

The Facts of Embryology: NB Page 22

- There is usually a difference in form between embryo and adult.
- Structures that are repeated (e.g., segments, limbs) are similar in the embryo, but specialize and diverge in the adult.

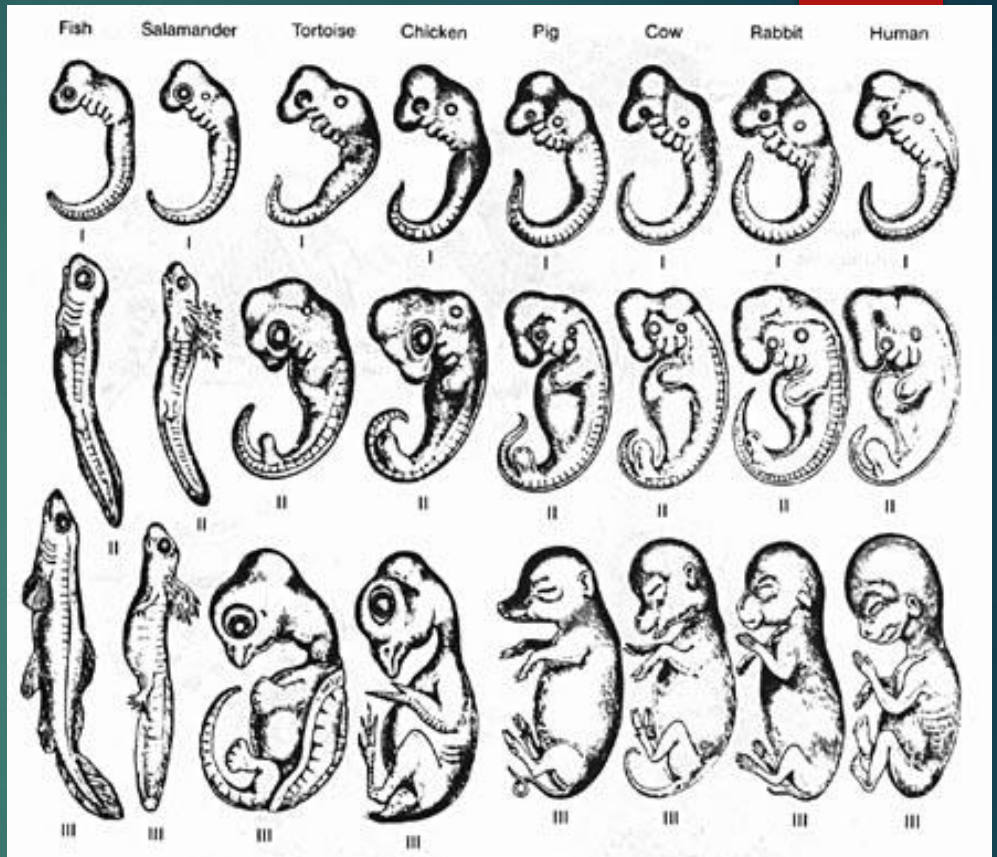
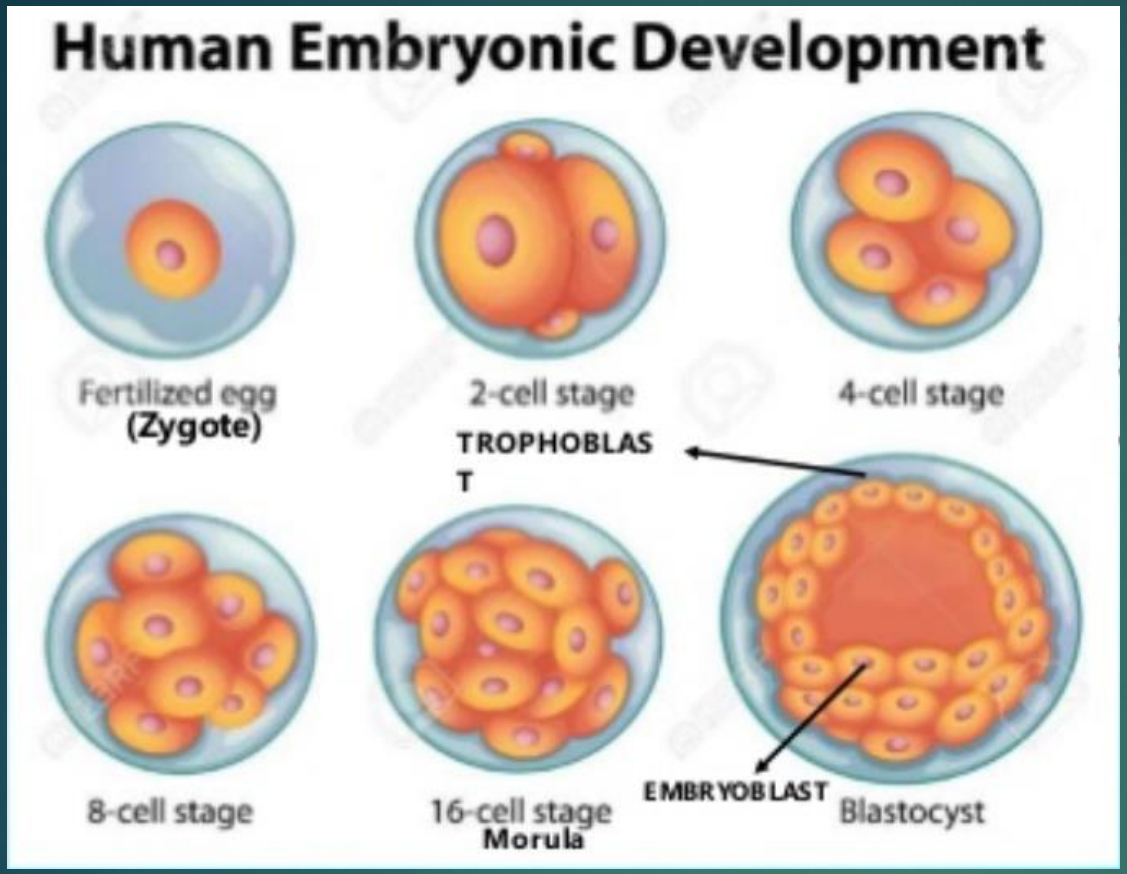


Figure 3–10

A series of embryos of different vertebrates at comparable stages of development. The earlier the stage of development, the more strikingly similar are the different groups. Note that each of the embryos begins with a similar number of gill arches (pouches below the head) and a similar vertebral column. In later stages of development, these and other structures are modified to yield the various different forms. (The embryos in the different groups have been scaled to the same approximate size so that comparisons can be made between them.) (From Romanes, adapted from Haeckel.)



Principles of Embryology

READ ONLY

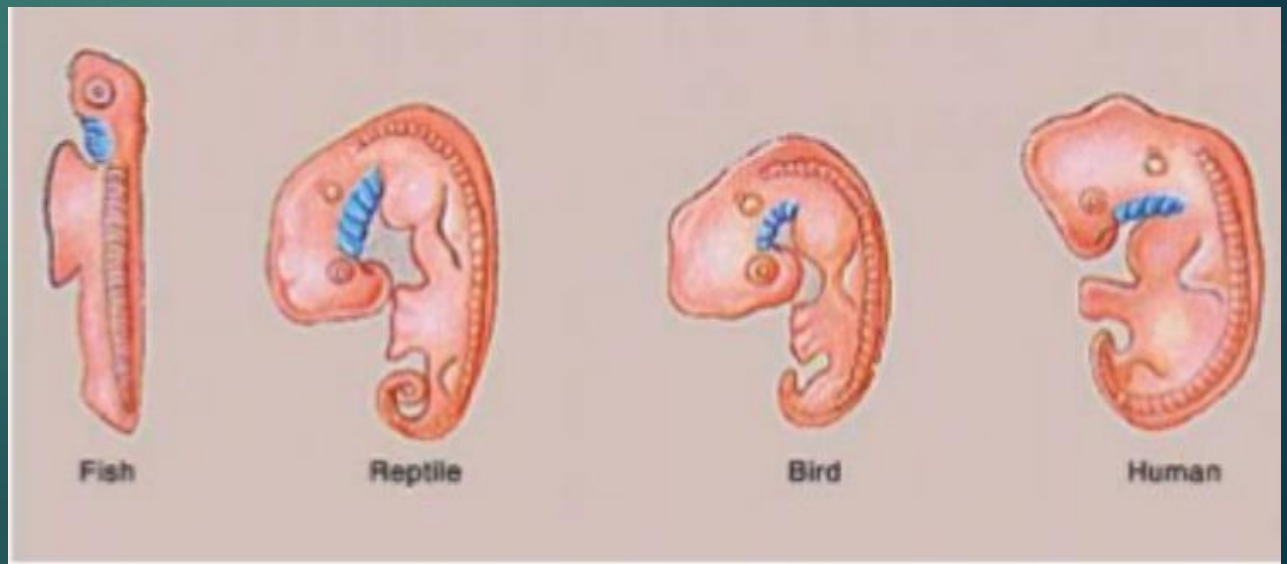
Adult variations appear at a rather late stage in development

In larger, evolving groups, for example, the forelimbs might be legs in an ancestral species, but would be modified as flippers, arms, wings, etc. at a late stage in development; but the pattern in the embryonic stage would remain similar if not unchanged.

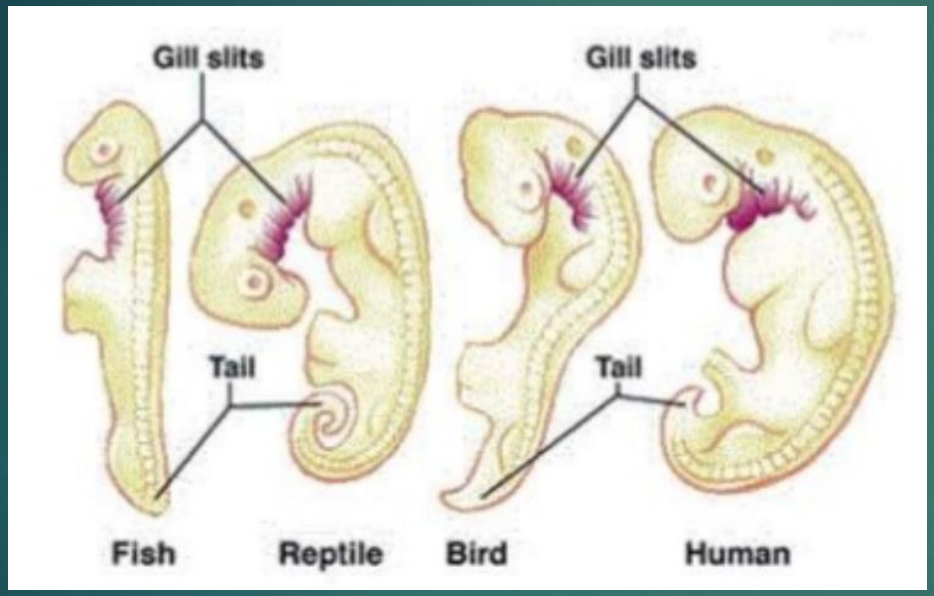
NB Page 22

Embryonic Evidence of Evolution

- Comparing embryonic development of different animals helps determine evolutionary relationships in nature
- Closely related species have similar embryological development
- Structures appear in the embryonic stages that serve no purpose and are not present in the adult



NB Page 22



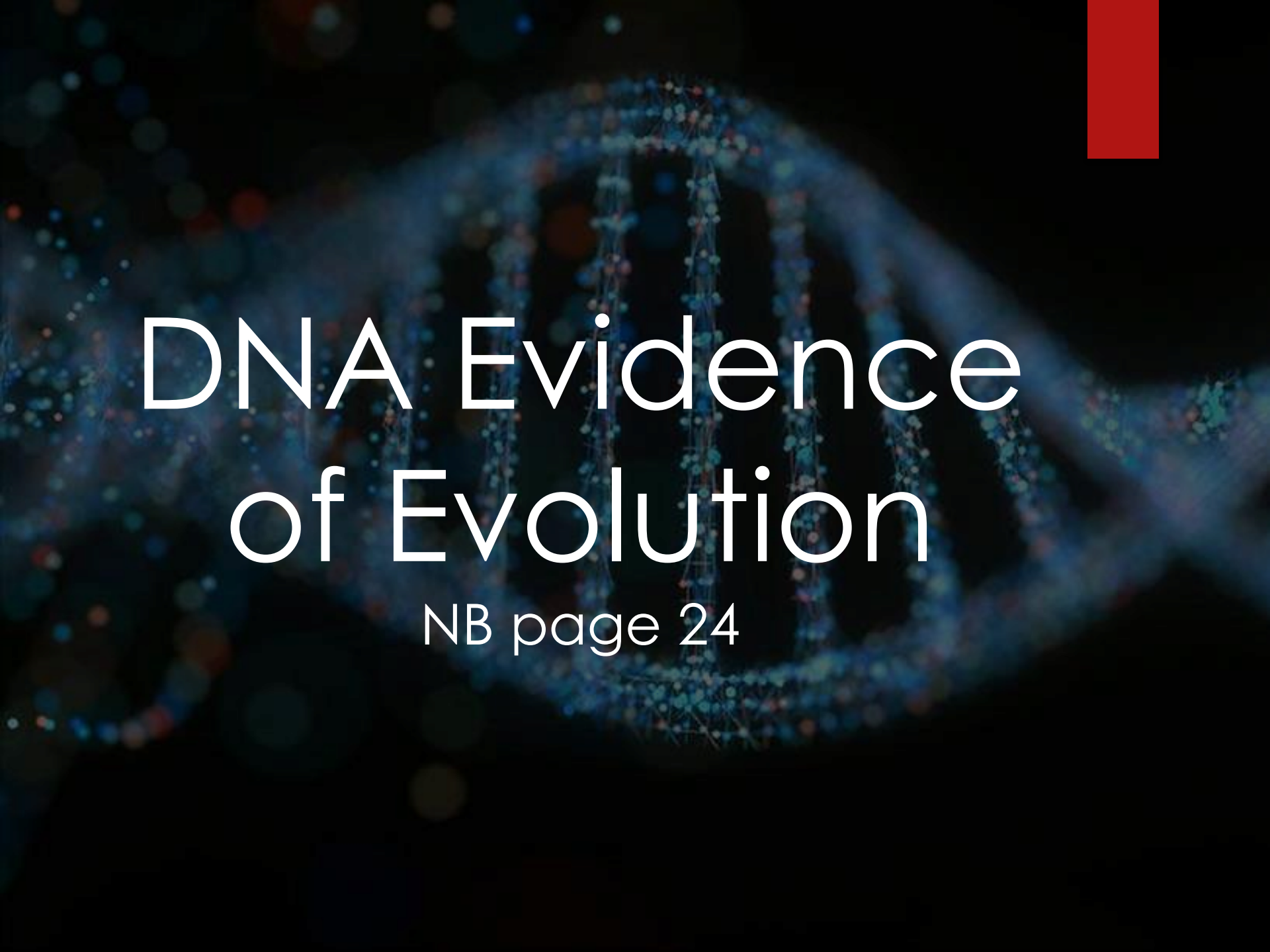
- Example: Vertebrate Embryos
- All have gills which eventually become ear canals
- All have tails/tailbones
- All pass stages which represent larval fish

Daily Science Journal

NB Page 14

DSJ- **Friday**

Why do you think all of the embryos that share a common ancestor look so similar?



DNA Evidence of Evolution

NB page 24

NB Page 24

DNA as Evidence of Evolution

DNA

DNA as Evidence

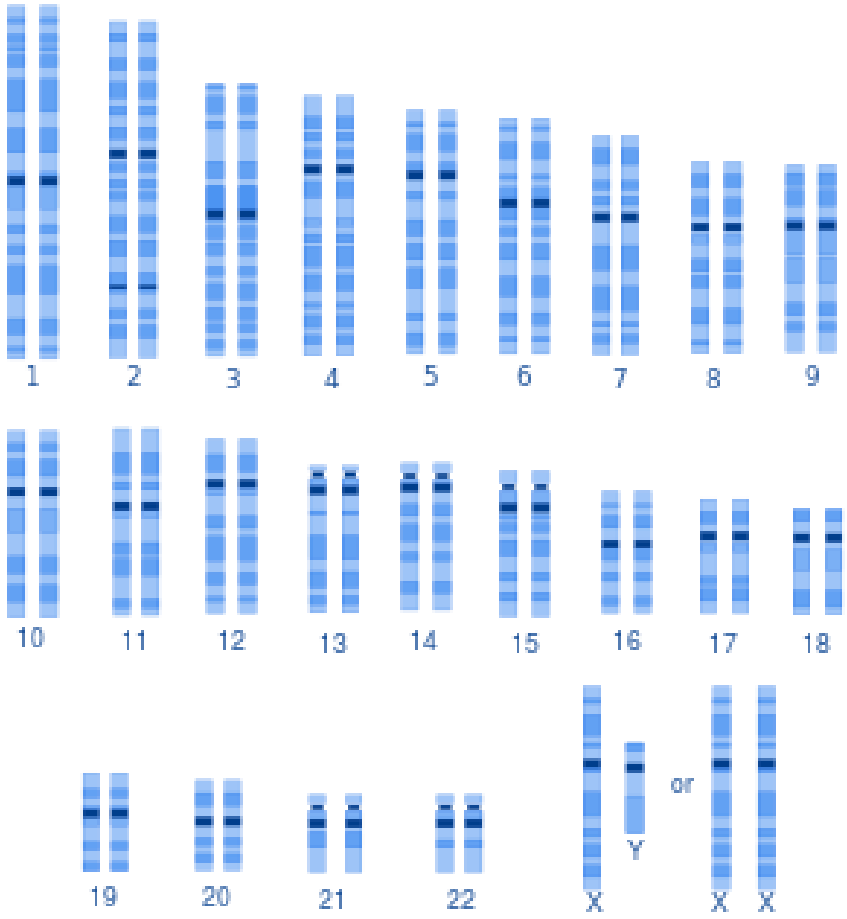
DNA % Similarity

Human	Chimp
Cat	Mouse
Fly	Chicken

Quickwrite:

DNA (write)

- DNA is our instructional manual for life
- It stores all of the information needed to build and maintain our selves
- All organisms have DNA, from single celled bacteria to complex animals like us
- Humans have 46 chromosomes, 23 come from mom, 23 from dad.



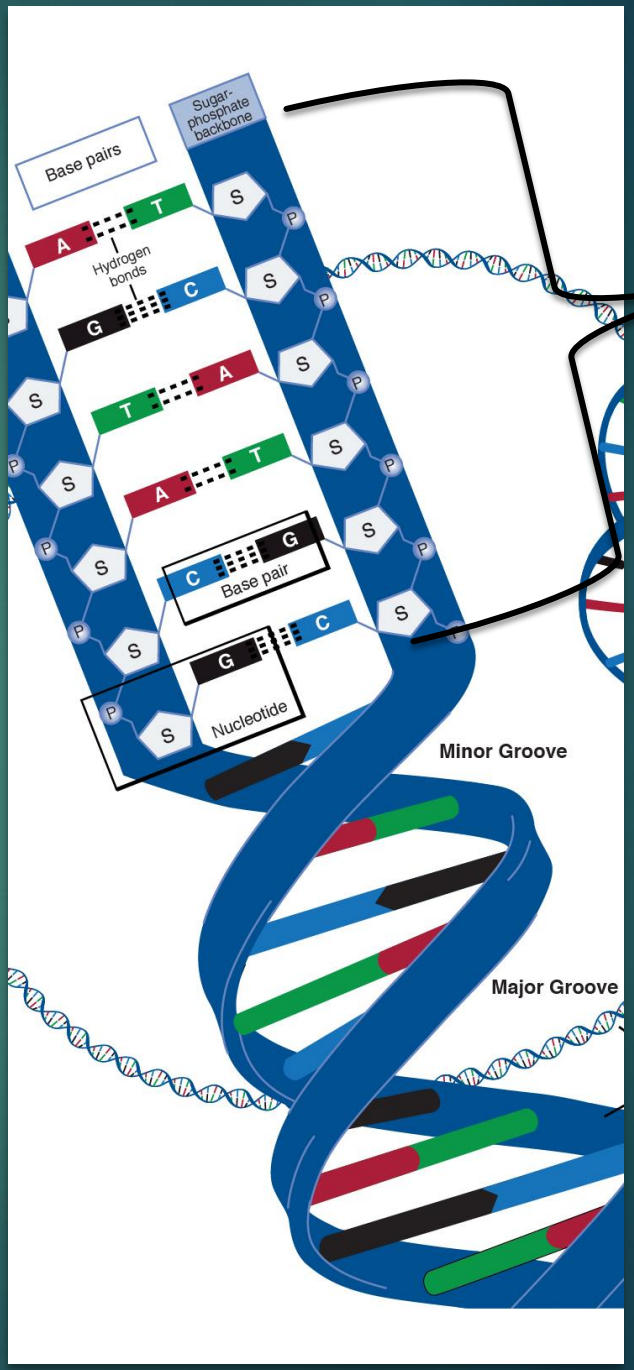
DNA
(copy and draw)

DNA is made up of base pairs

Base pairs = letters used for spelling when you're texting

A chunk of the DNA(called Genes) = a paragraph.

Multiple paragraphs tell a story. This message could be your eye color, hair color, height, etc



DNA as evidence (write bold)

Would you expect our DNA to be similar to that of our common ancestors? Why or why not?

Turns out **we share A LOT of DNA with our common ancestors**

Give some **examples of how we know DNA codes for similarities between common decedents**

Homologous Structures

Embryology

Things we share DNA with

What percentage of DNA do we share with other humans?

99.9%

a printed version of your entire genetic code would occupy some 262,000 pages, or 175 large books. Of those pages, just about 500 would be unique to us

Things we share DNA with

What percentage of DNA do we share with chimpanzees?

96%

Things we share DNA with

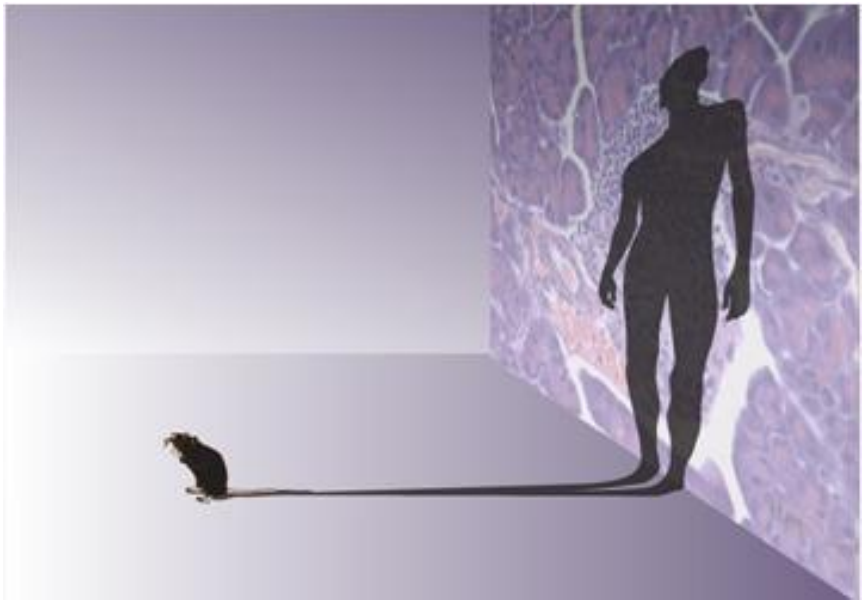
What percentage of DNA do we share with cat?

90%

Things we share DNA with

What percentage of DNA do we share with mouse?

85%



Things we share DNA with

What percentage of DNA do we share with a fly?

61%

Things we share DNA with

What percentage of DNA do we share with a chicken?

60%

Things we share DNA with

What percentage of DNA do we share with a banana?

60%

Quickwrite

How is DNA used as evidence for evolution?

Daily Science Journal

NB Page 14

DSJ- **Monday**

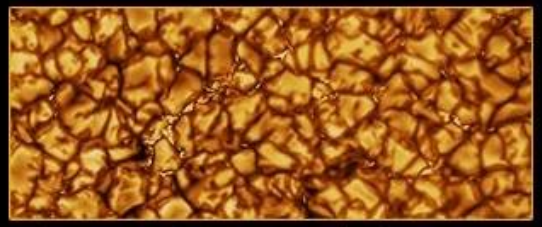
So far we've gone over Homologous and vestigial structures, DNA, and Fossil evidence for evolution.

How has the evidence been so far? Is there anything else you'd like to see as evidence of evolution?

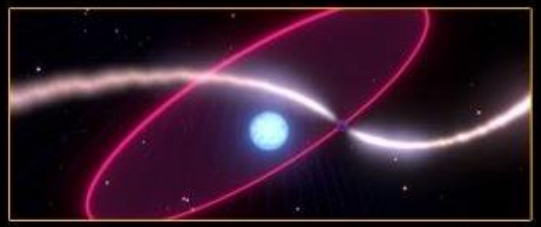
Scientists grew mini snake venom glands in the lab, to help create antivenom without having to milk live snakes.

A new technique can turn any carbon based rubbish into useful graphene - a huge step towards a circular economy.

Citizen scientists helped identify a previously undocumeted type of aurora in the northern sky called 'the dunes'.



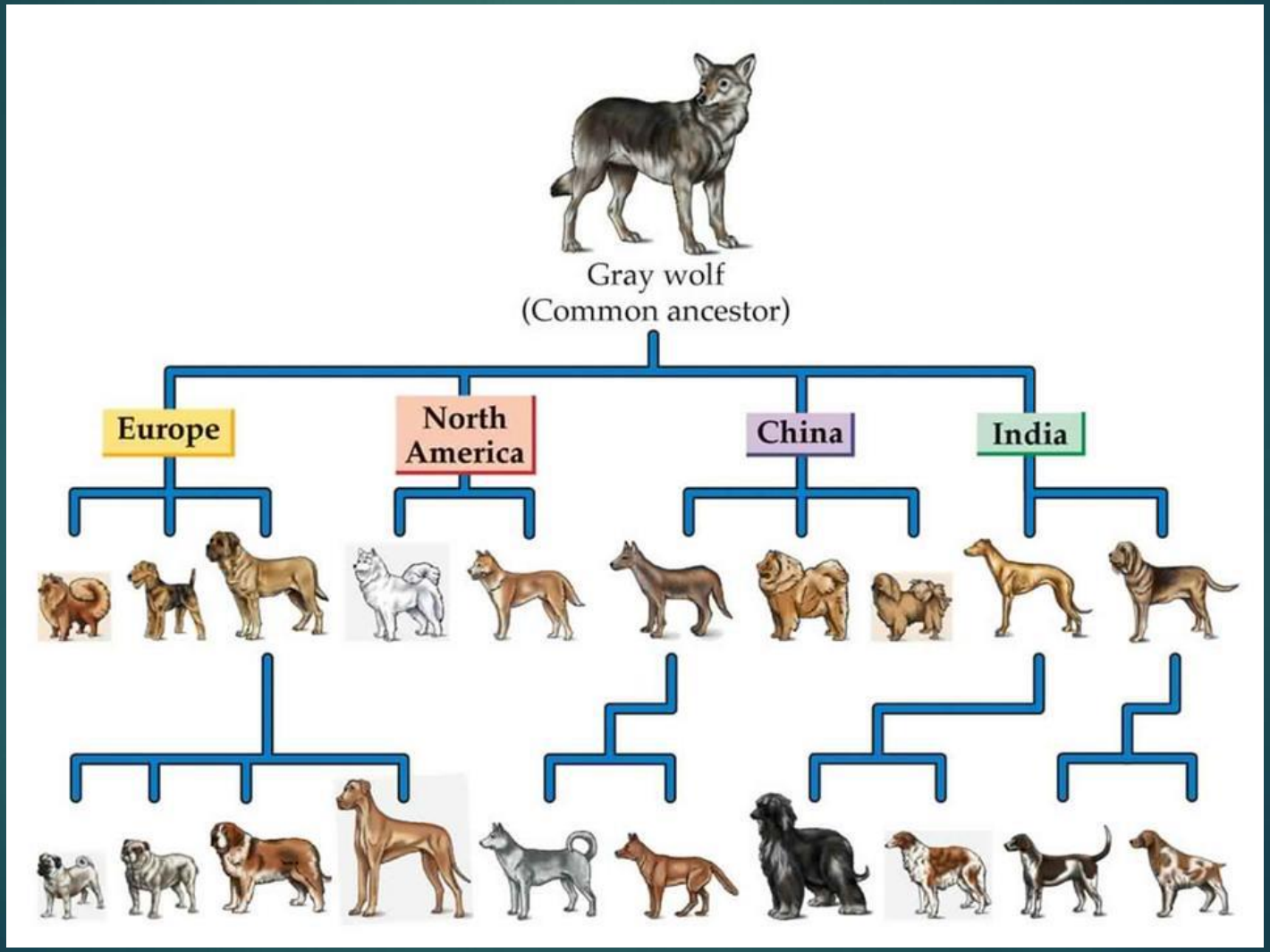
The most high-resolution footage ever taken of our Sun revealed massive convection granules on its surface.



Astronomers caught a star in the act of dragging space-time itself, thanks to insane rotation speeds.

Scientists pinpointed the genes behind the unique regeneration powers of axolotls. They can even regrow parts of their brains!

How did we take a wolf and get to these current day dogs?



NB Page 28

Artificial Selection

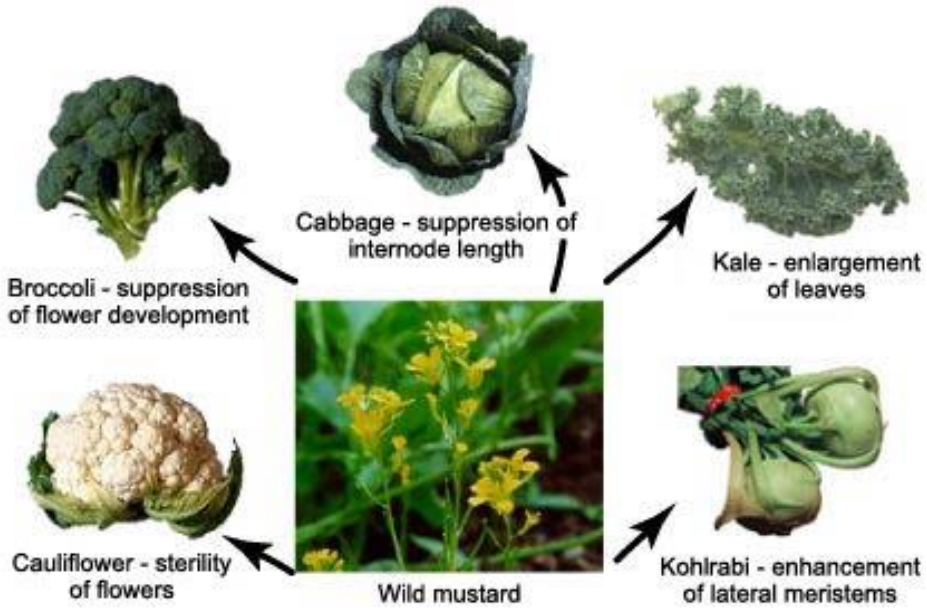
Model

NB Page 29

Natural Selection

Artificial Selection

NB Page 28



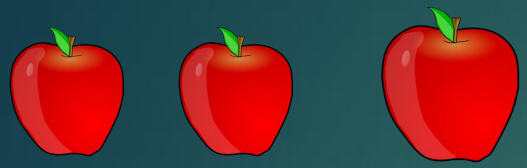
Artificial Selection – selective breeding of plants and animals by humans to get desired traits

This is true for almost, if not all, of the foods we eat now.

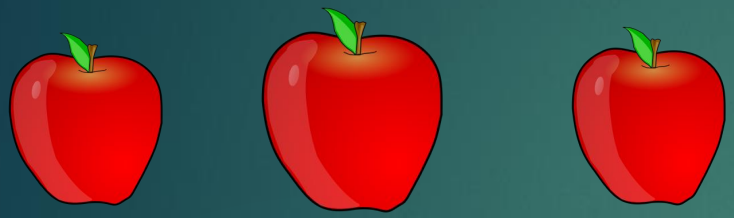
Examples: Corn, carrots, lettuce, beef, chicken, turkey, etc.

It takes MANY generations to get desired traits, and we continually modifying.

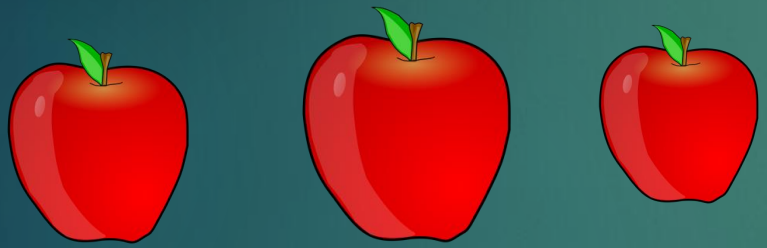
Artificial selection gave Darwin a way to model the process of Natural Selection



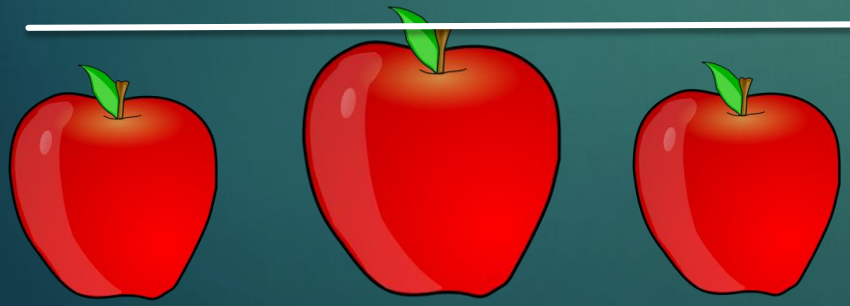
Generation 1, pick the best apples. Take only their seeds and plant for the next year's harvest.



Generation 2, pick the best apples. Take only their seeds and plant for the next year's harvest.



Generation 3, pick the best apples. Take only their seeds and plant for the next year's harvest.



Generation 4, pick the best apples. Take only their seeds and plant for the next year's harvest.

Quietly count!

1. How many moths are on this slide?
2. Which moths will most likely be eaten first, and why?

NB Page 29

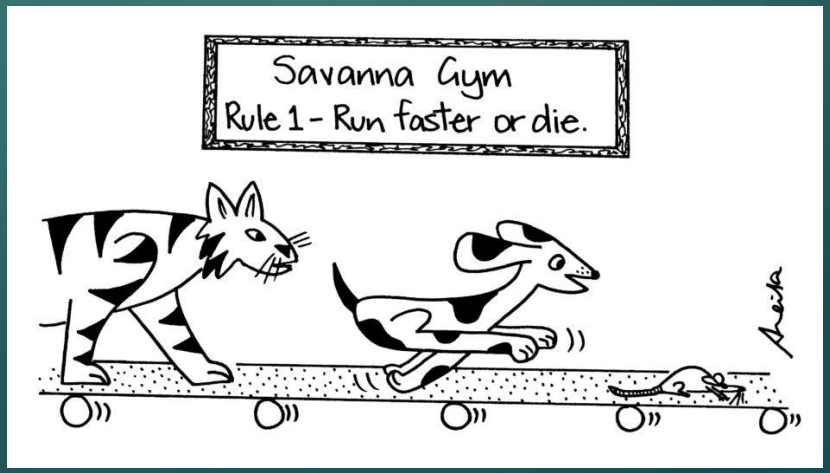
Survival of the Fittest AKA NATURAL SELECTION

- **Ability to survive and reproduce in a specific environment is called <u>fitness</u>**
  - **Fitness depends upon how well an organism is suited for its environment**

NB Page 29

Survival of the Fittest AKA NATURAL SELECTION

- **Darwin referred to "survival of the fittest" as Natural Selection**
- **Survival means more than just staying alive. It means reproducing and passing adaptations on to the next generation**
- Favorable characteristics are inherited over several generations.



Natural Selection

<u>Natural Selection</u> – the process by which traits become more or less frequent in a population, depending on the advantage or disadvantage they offer for survival and reproduction.

- Organisms of the same species exhibit variations (faster, thicker fur, bigger horns, etc…all traits that resulted from mutations)

Daily Science Journal

NB Page 14

DSJ- **Thursday**

What's the difference between artificial selection and natural selection?

Natural Selection

From his observations, Darwin realized that most organisms that are born, fail to reproduce.

- Only organisms with characteristics that help them survive live long enough to breed
- Those favorable traits are passed on to offspring
- Differences from parent to offspring can be small, but build up over time
- Through these changes, species become better adapted
- Natural Selection is a continuous process

- The better adapted to conditions an organism is, the more likely it is to reproduce and pass on those traits

DSJ
NB Page 14

Friday:

Why are only the advantageous traits passed on to future generations most of the time?

Natural Selection, Artificial Selection, and Embryology Quiz

#1

A rancher wants to investigate the use of artificial selection in his cattle herd. Which of these options is an example of artificial selection?

A. Breed a cow that produces large quantities of milk with a bull that comes from a line of cattle with long lifespans.

B. Trace the family tree of a chicken that lays many eggs back through several generations.

C. Separate a population of rabbits and monitor any trait changes over the next few generations.

D. Choose one individual in a population of sheep to favor with food and shelter and see if it mates more.

#2

Which statement about the members of a population that live long enough to reproduce is consistent with the theory of natural selection?

A. They pass on everything they learn about survival to their offspring.

B. They tend to produce fewer offspring than others in the population.

C. They are the ones that are best adapted to survive in their environment.

D. They will create unfavorable changes in the species.

#3

The environment selects favorable traits for survival.

A. Geological selection

B. Artificial selection

C. Natural selection

D. Evolutionary selection

#4

Individuals best suited to their environment survive and reproduce most successfully:

A. Populations

B. Species

C. Founders

D. Survival of the fittest

#5

The main difference between natural selection and artificial selection is...

A. Artificial selection is when humans select which traits to be passed down, where natural selection is when the environment dictates the favorable characteristics

B. Artificial selection requires a lab, where natural selection does not

C. Natural selection has a choice, where artificial selection does not.

D. Artificial selection and Natural selection are actually the same thing.

#6

The population of mice shifted more to black mice from light brown on the lava rocks because:

A. They population knew that having black fur was best, so they only mated with other black mice

B. A random mutation caused the mice to be black, and because that was best suited for that environment, they were able to reproduce and pass on their genes for black hair

C. The light brown mice preferred the light sand, so they left the area leaving mostly black fur mice

D. The black fur mice had a small mutation, but the light brown should change back soon.

#7

True (A) or False (B)

Mutations are random, Natural Selection is not

#8

Embryos of many different types of animals all look the same is strong evidence showing that

A. We share a recent common ancestor

B. It's just a coincidence we all look similar

C. We all evolved from birds.

D. Turns out we aren't all that similar as embryos

#9

Some common features seen between all vertebrate embryos include in our activity:

A. 4 eyes, flippers, gills, and no bones

B. 4 eyes, fins, tail, and shell

C. Ears, 2 eyes, 5 fingers, five toes.

D. Gill slits, tail/tailbone, resemble a larval fish at some point in the beginning.

#10

One reason we share many characteristics with other animals is because:

A. Random chance. Pure coincidence.

B. Our DNA is very similar to a lot of organisms

C. We all evolved from trees.

D. Because cats.

EC 11

Darwin's theory that all species alive today are descendants of a common ancestor is known as

A. Common Descent
B. Speciation
C. Evolutionary Descent
D. Primary Descent

EC #12

Our tailbone is an example of:

A. A vestigial structure
B. Homologous structure
C. Analogous structure
D. Both a and b

EC #13

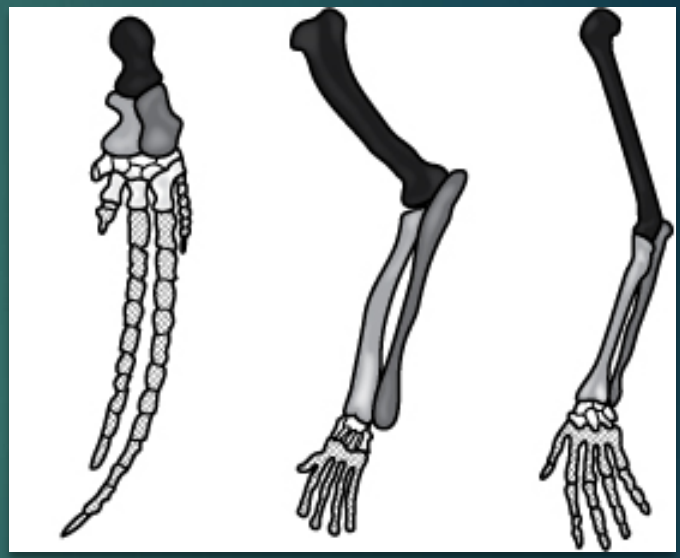
When unrelated animals evolve to have similar functions, such as a bird and a butterfly both having wings to fly, but the wings are built differently:

A. Vestigial structures
B. Homologous structures
C. Analogous structures
D. Adaptive radiation

EC #14

The diagram compares the forelimb anatomy of several animals. What did scientists infer by comparing the forelimb anatomy of these animals?

A. All of these animals are mammals.
B. All of these animals descended from a common ancestor.
C. All of these animals are in the same family of organisms.
D. All of these animals will evolve toward the same species.



NB Page 25 DSJ

Tuesday:

What was the most interesting part of the dissection for you?!?

NB Page 25 DSJ

Wednesday:

How is the background writing going? Which part of the paper are you most worried about?

NB Page 25 DSJ

Thursday:

What is natural selection?
How does it differ from artificial selection?

NB pg 32

Table of Contents Evolution #2

Page	Title	Points
32	TOC Evolution #2	/10
33	Anole Data Nugget	/10
		/10
		/10
		/10
		/10
		/10

NB Page 25 DSJ

Friday:

What do you think ‘microevolution’ is referring to?

NB Page 25 DSJ

Monday:

Do you think it's important for mating to be random in a population? Why or why not?

NB Page 34

Speciation

Speciation:

Parapatric

Sympatric

Allopatric

NB Page 35

Types of Natural Selection

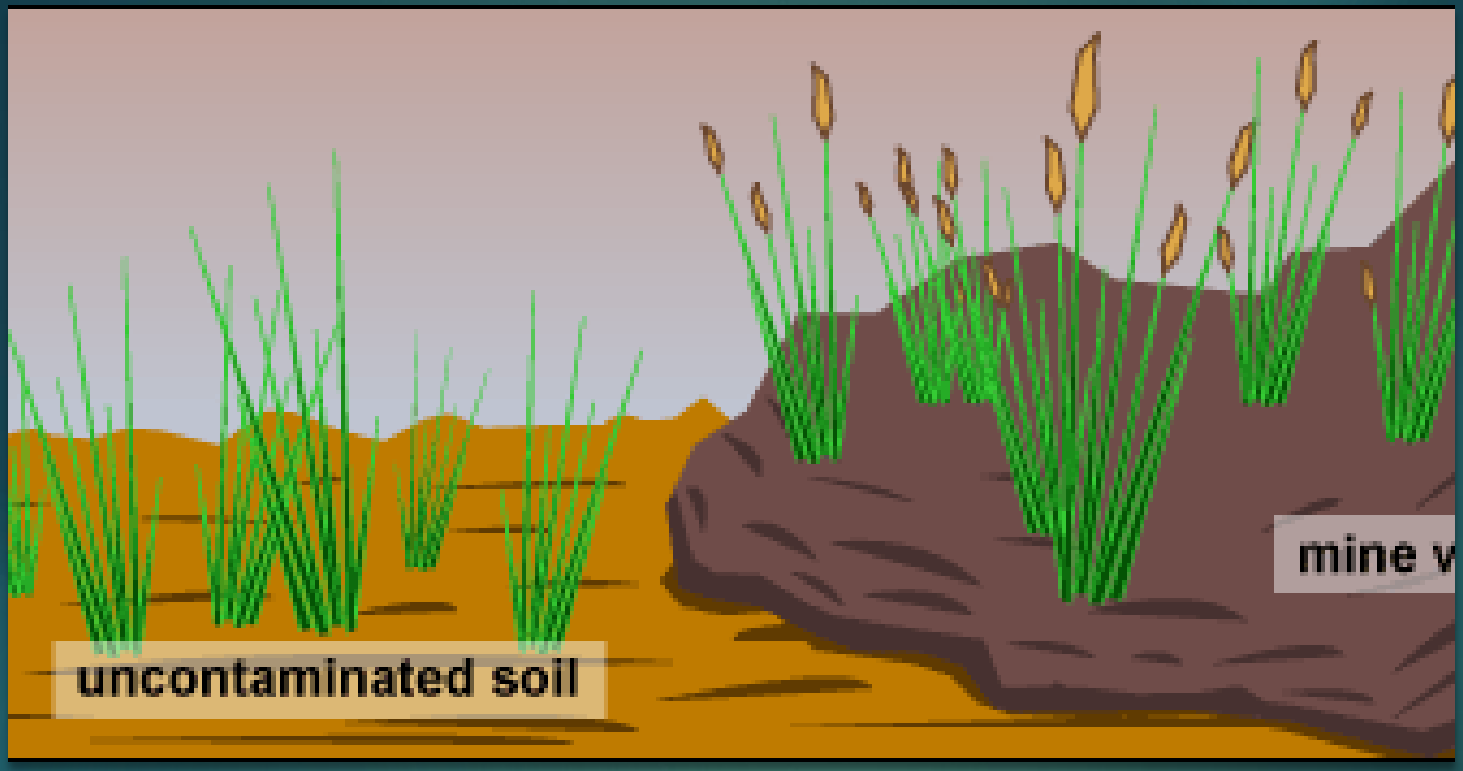
Phenotype

Allele

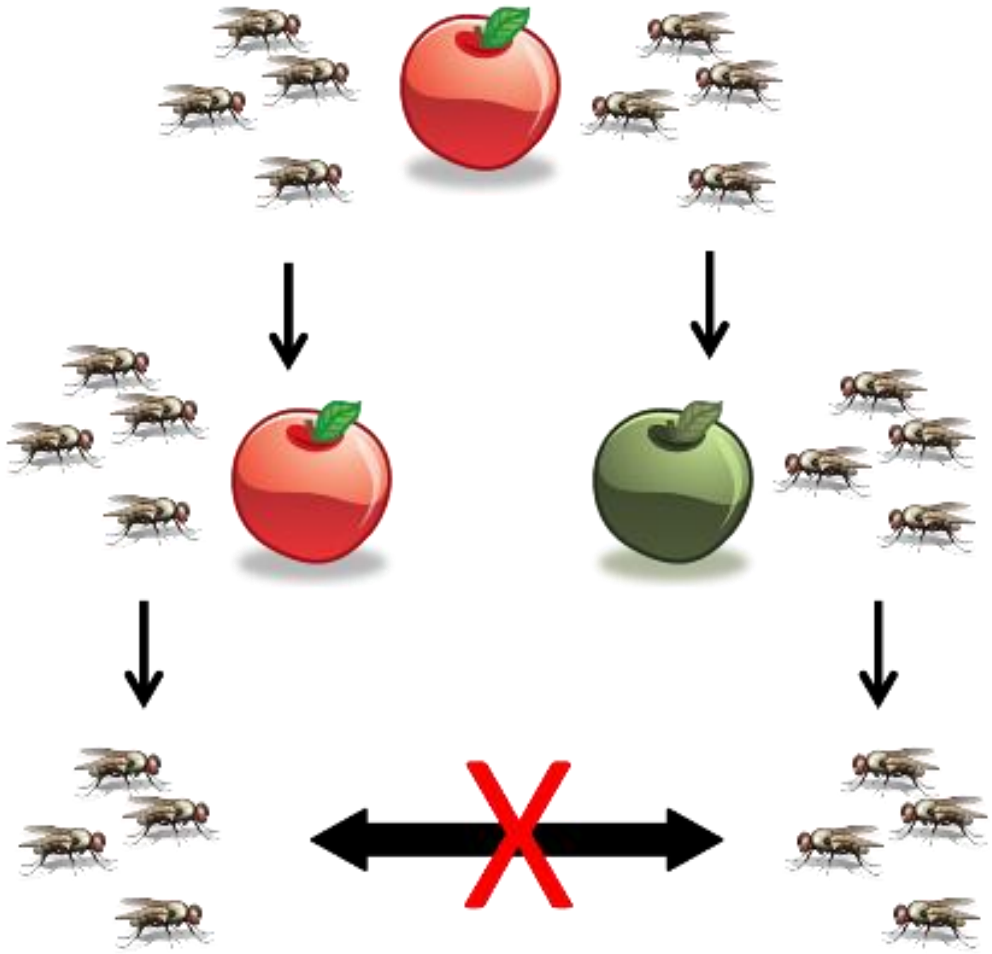
Directional Selection

Disruptive Selection

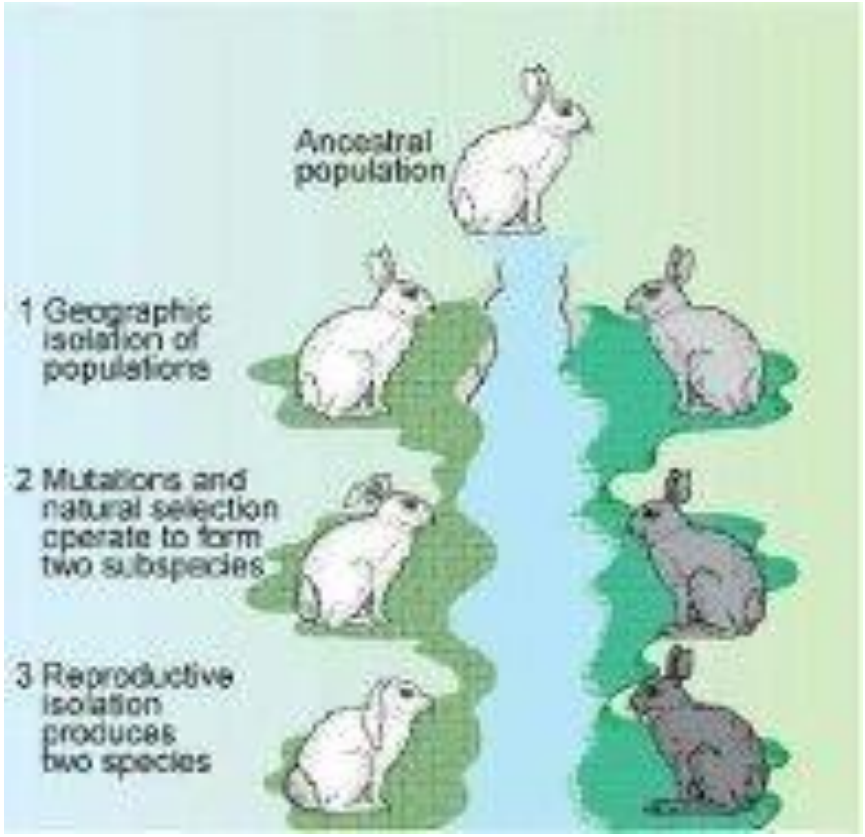
Stabilizing Selection



Parapatric Speciation



Sympatric Speciation

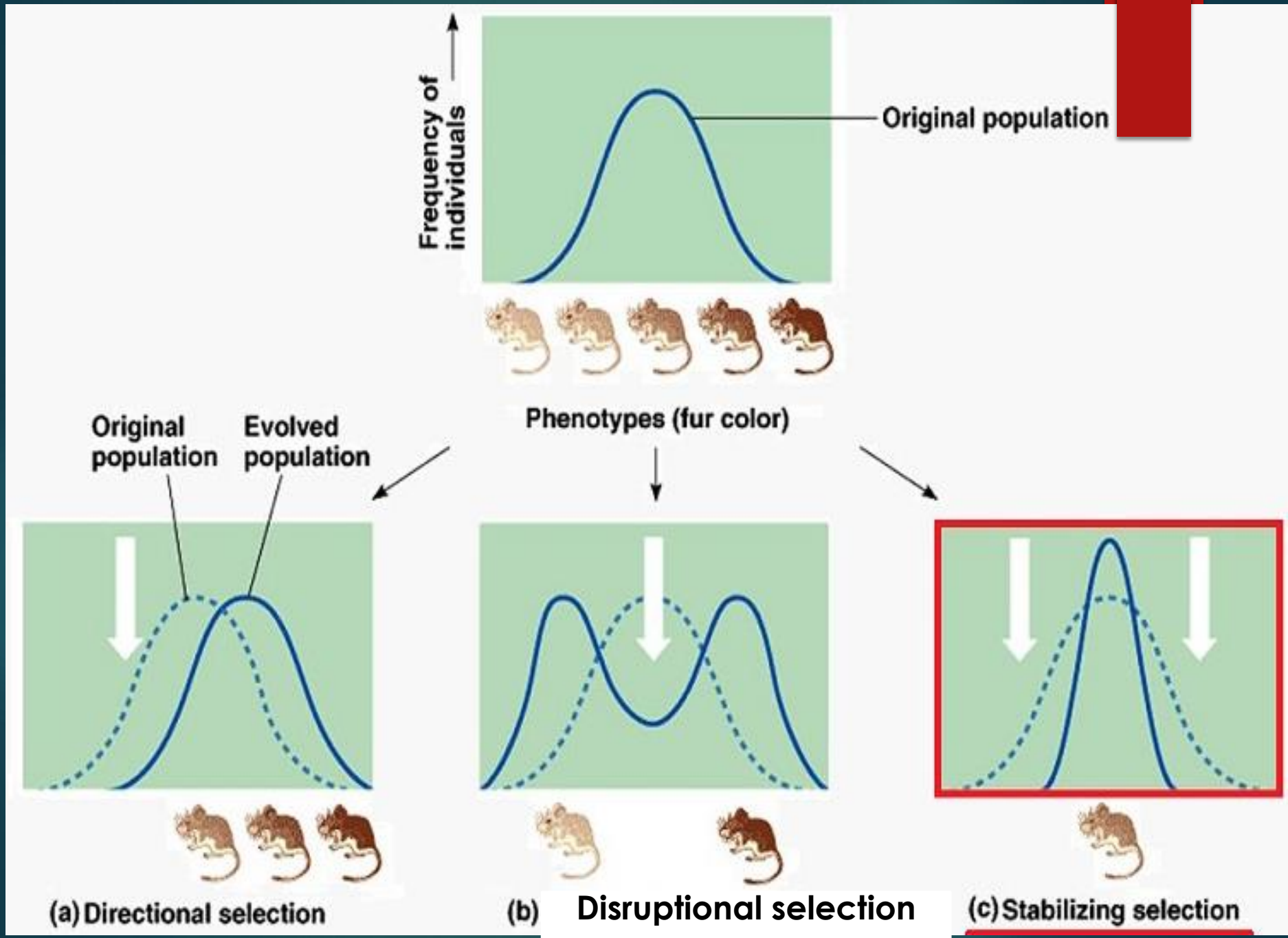


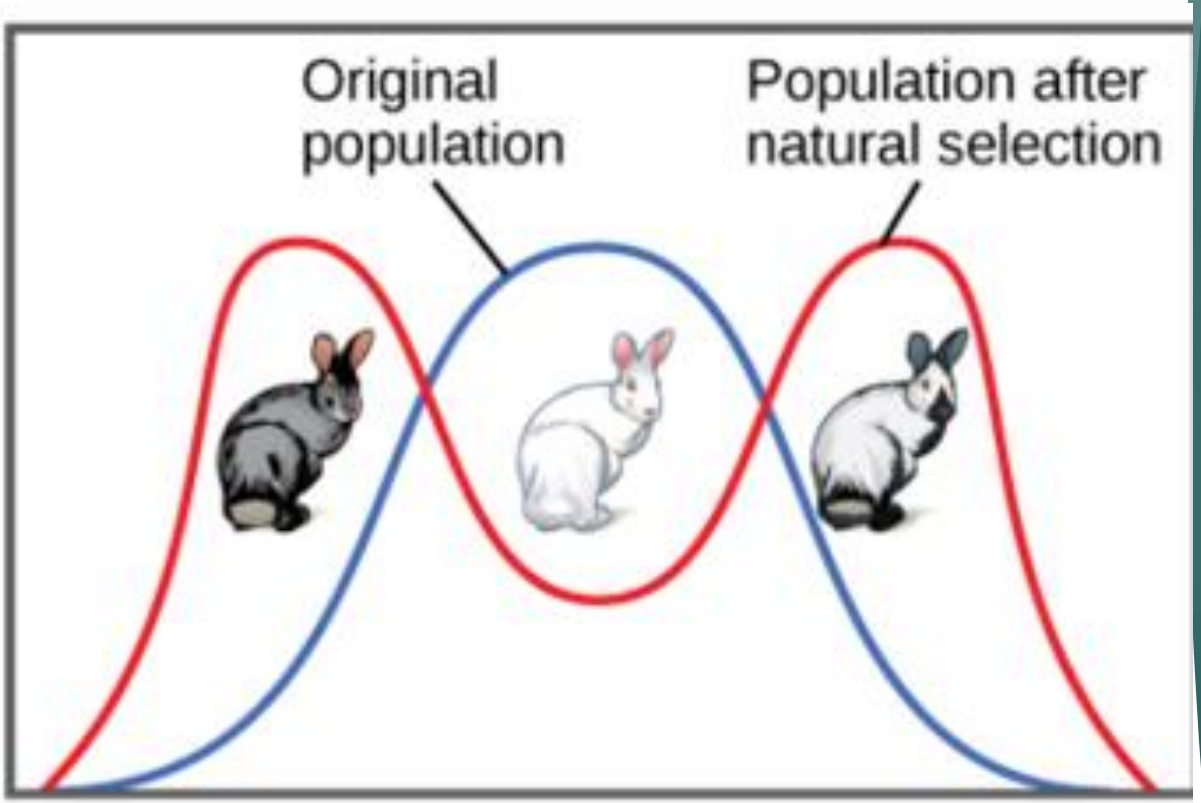
Allopatric Speciation

NB Page 25 DSJ

Wednesday:

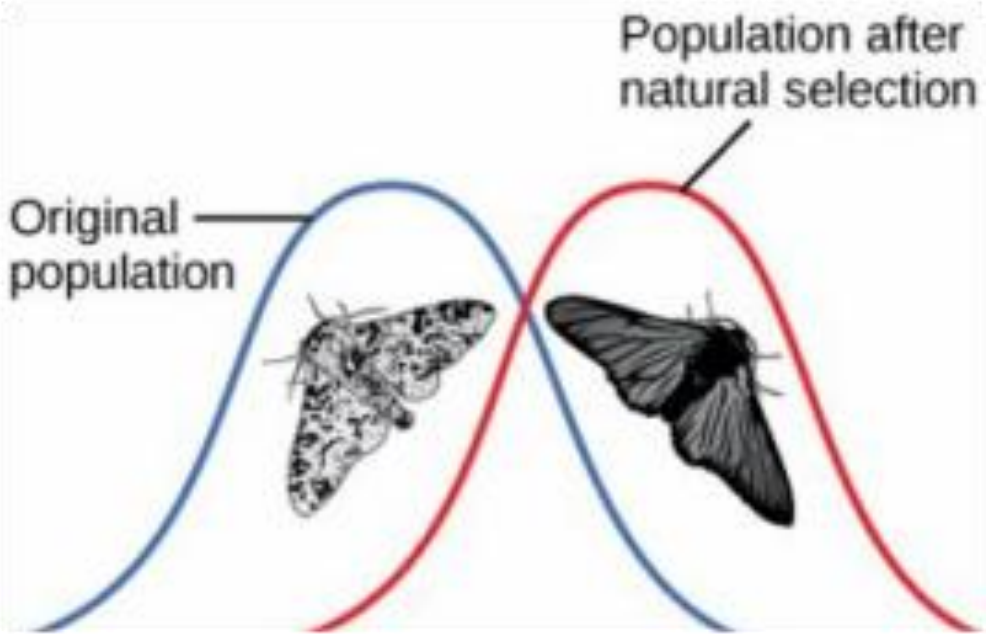
Describe an allele


Frequency of individuals
Original population
Phenotypes (fur color)
Original population
Evolved population
(a) Directional selection
(b) Disruptional selection
(c) Stabilizing selection



Disruptional Selection

Stabilizing Selection



Directional Selection

Scenario Questions
NB Pg 36

- Tape/Glue the paper in
- Answer the questions
- For each one, write at least one sentence telling me how you knew what it was.

Evolution Terms

- Phenotype- The physical outcome from genes
- Allele- The physical outcome (phenotype) from genes where there are at least two options (i.e. brown pocket mice vs black pocket mice)
- Parapatric speciation- Two new species form due to a change in the environmental conditions. A species of grass gets split into two different species when half of the field floods. A mutation allows some of the grasses to do better in the mud, but regular grass doesn't do well. They live next to eachother, but are now different.
- Sympatric speciation- speciation that occurs in the same area due to behavioral changes, i.e. part of the population prefers flowers over barriers, and the flower eaters tend to only mate with the flower eaters.
- Allopatric speciation- When a physical border splits up a population and the lack of being able to mate creates new species over time.
- Speciation- The formation of a new species in the process of evolution
- Directional selection-A single beneficial trait that is favored in a population pushing the allele to show up the most via natural selection.
- Disruptive selection- Occurs when there are extreme phenotypes that are favored, but the 'normal' phenotypes fade out
- Stabilizing selection- When the 'normal' phenotypes are the most common and beneficial, so the extremes die out.

NB Page 25 DSJ

Thursday:

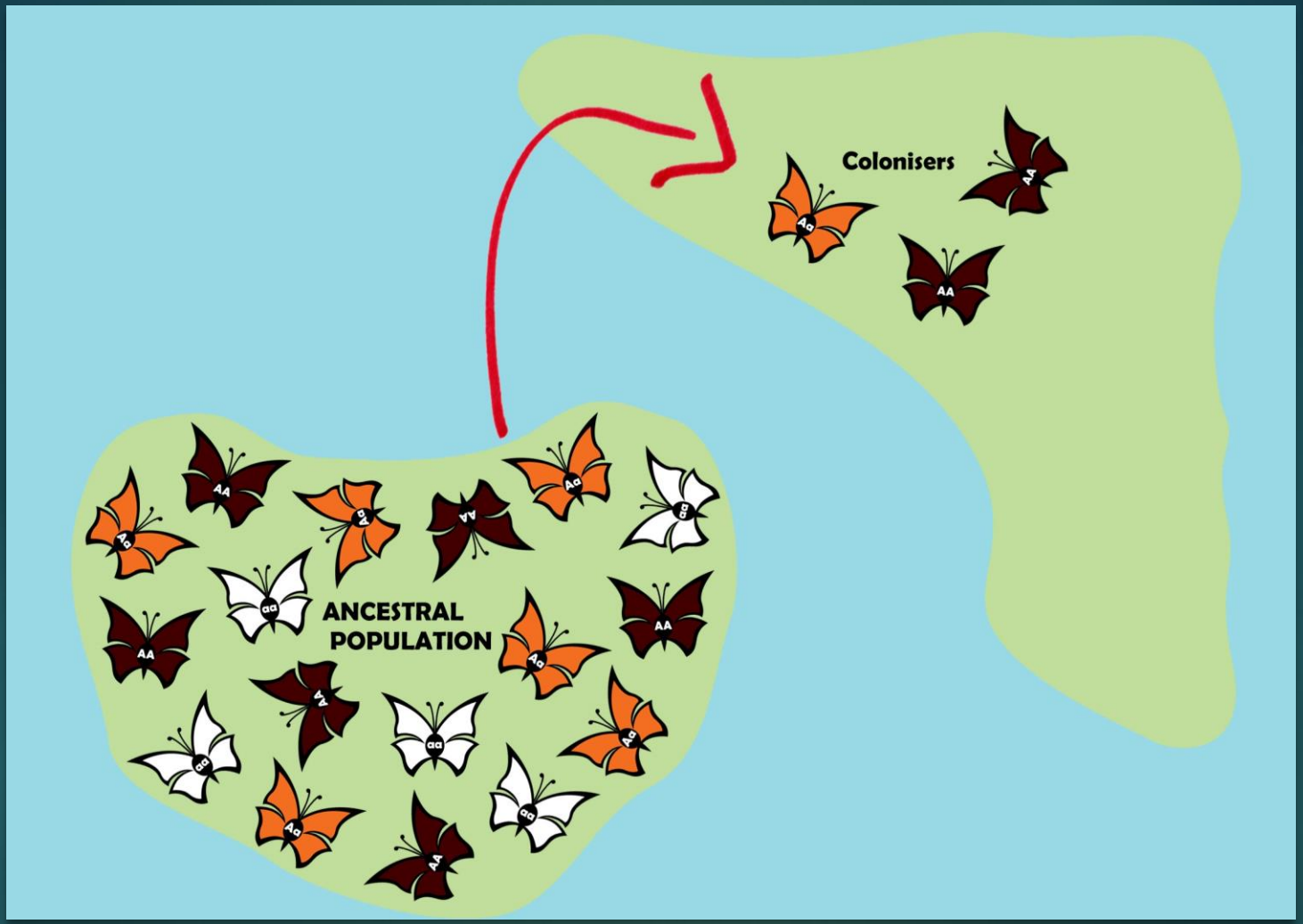
Why is sexual reproduction important for evolution?

NB Page 25 DSJ

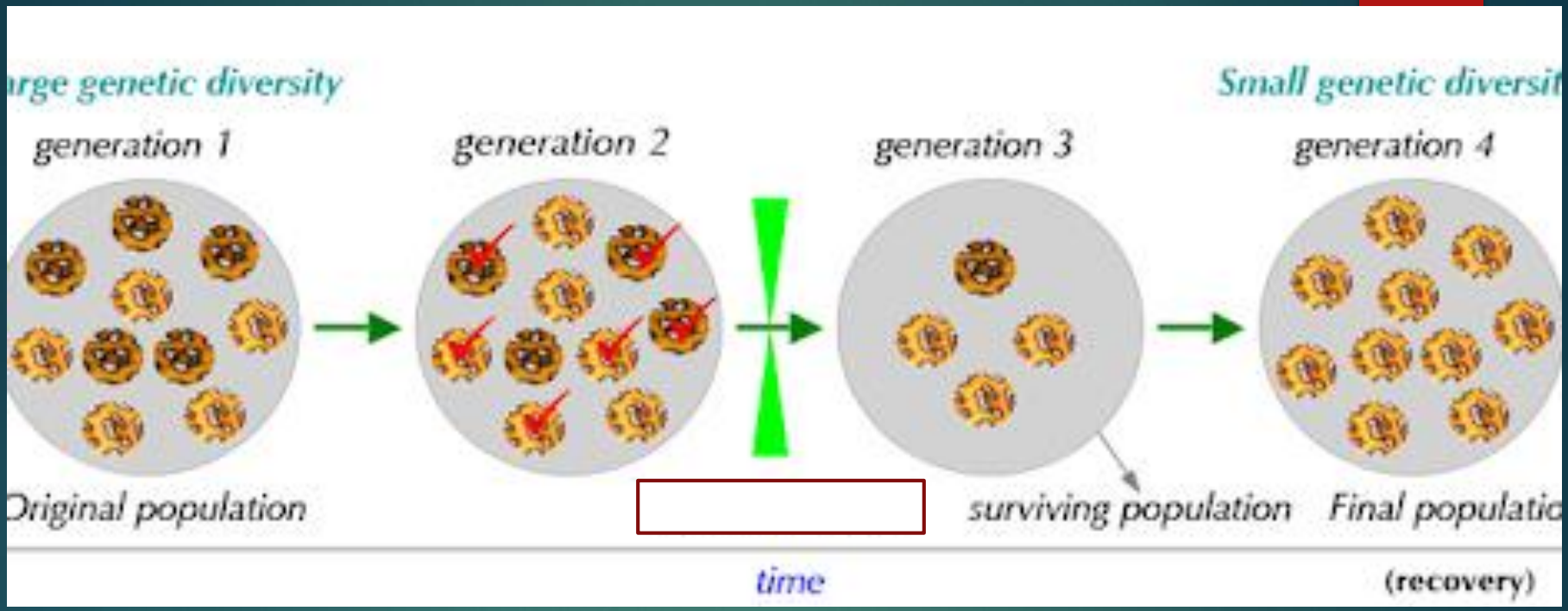
Friday:

Which reproduction offers more opportunities for genetic variation:

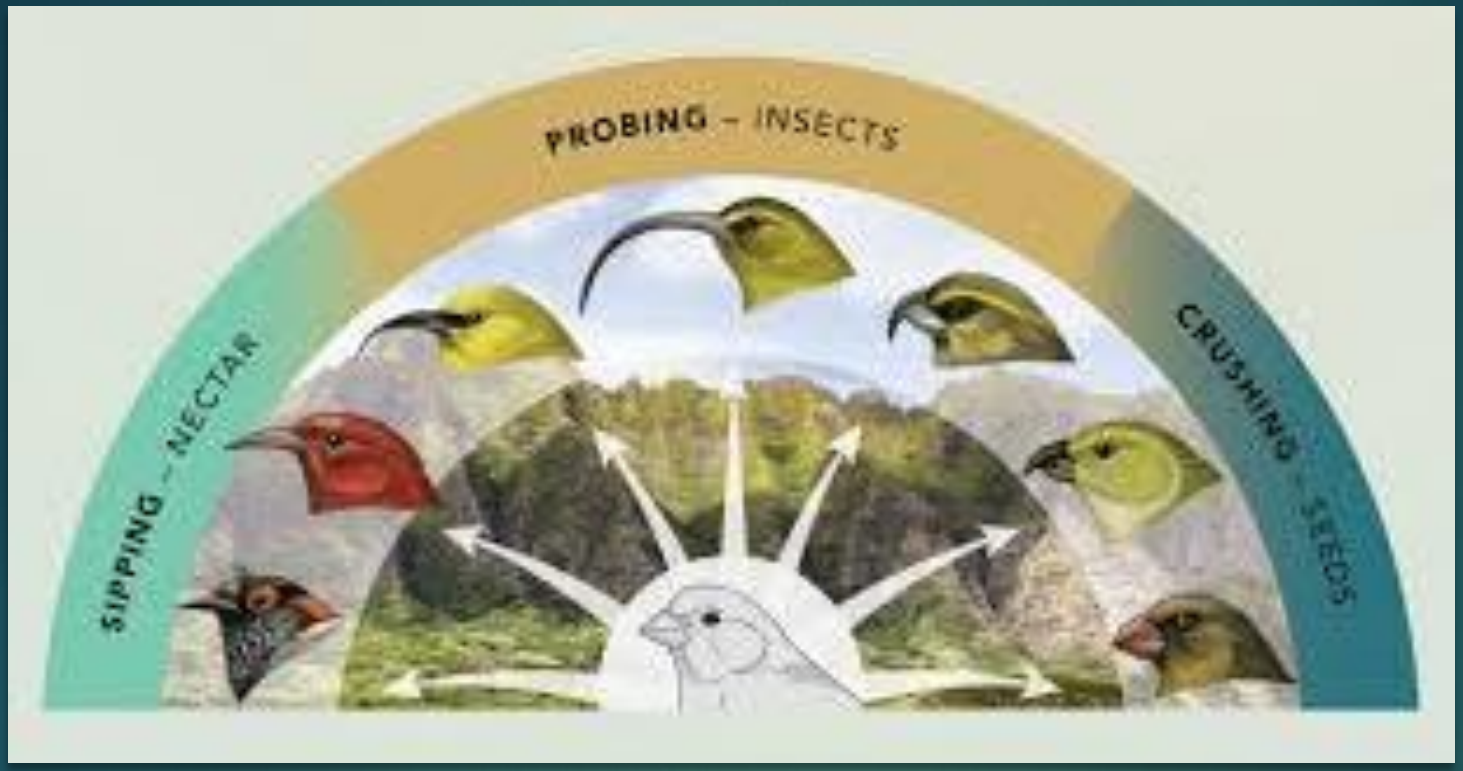
Sexual or Asexual? Explain.



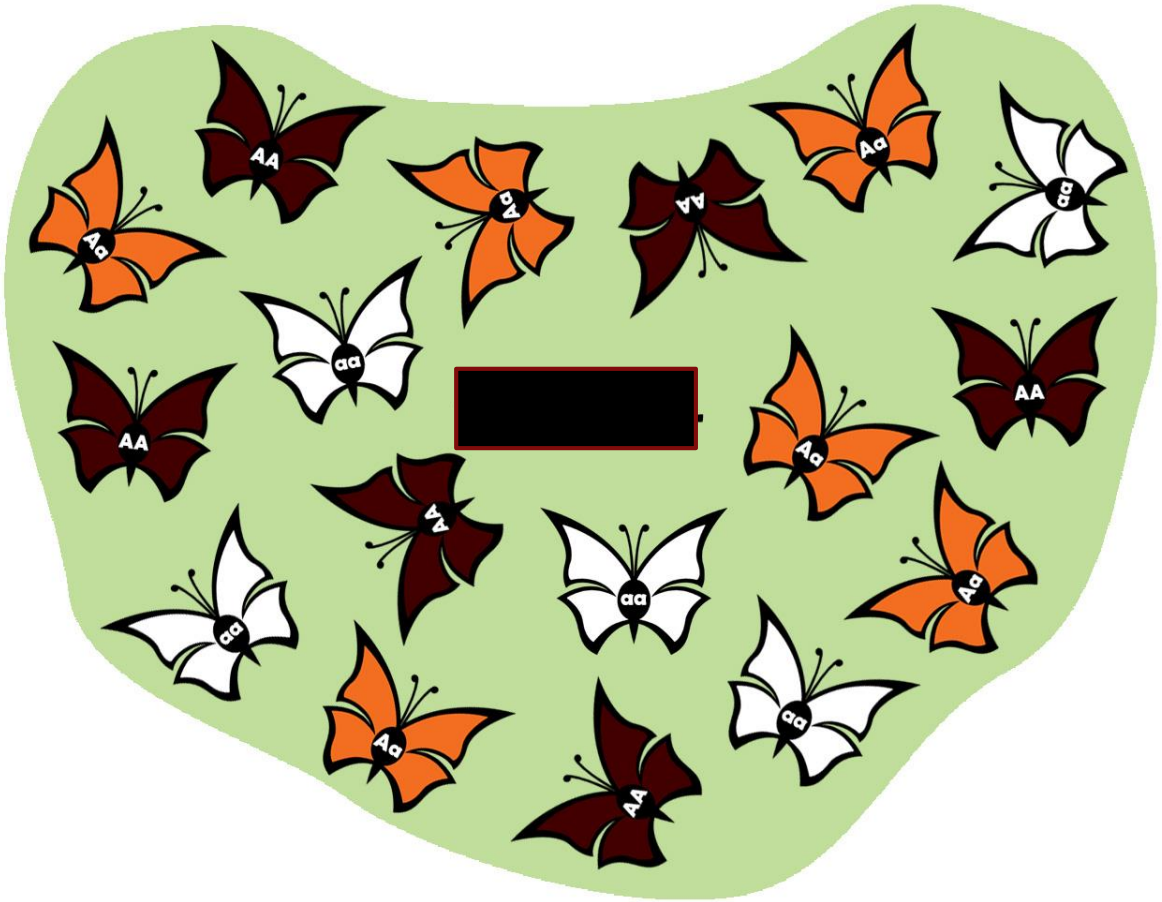
Founders Effect



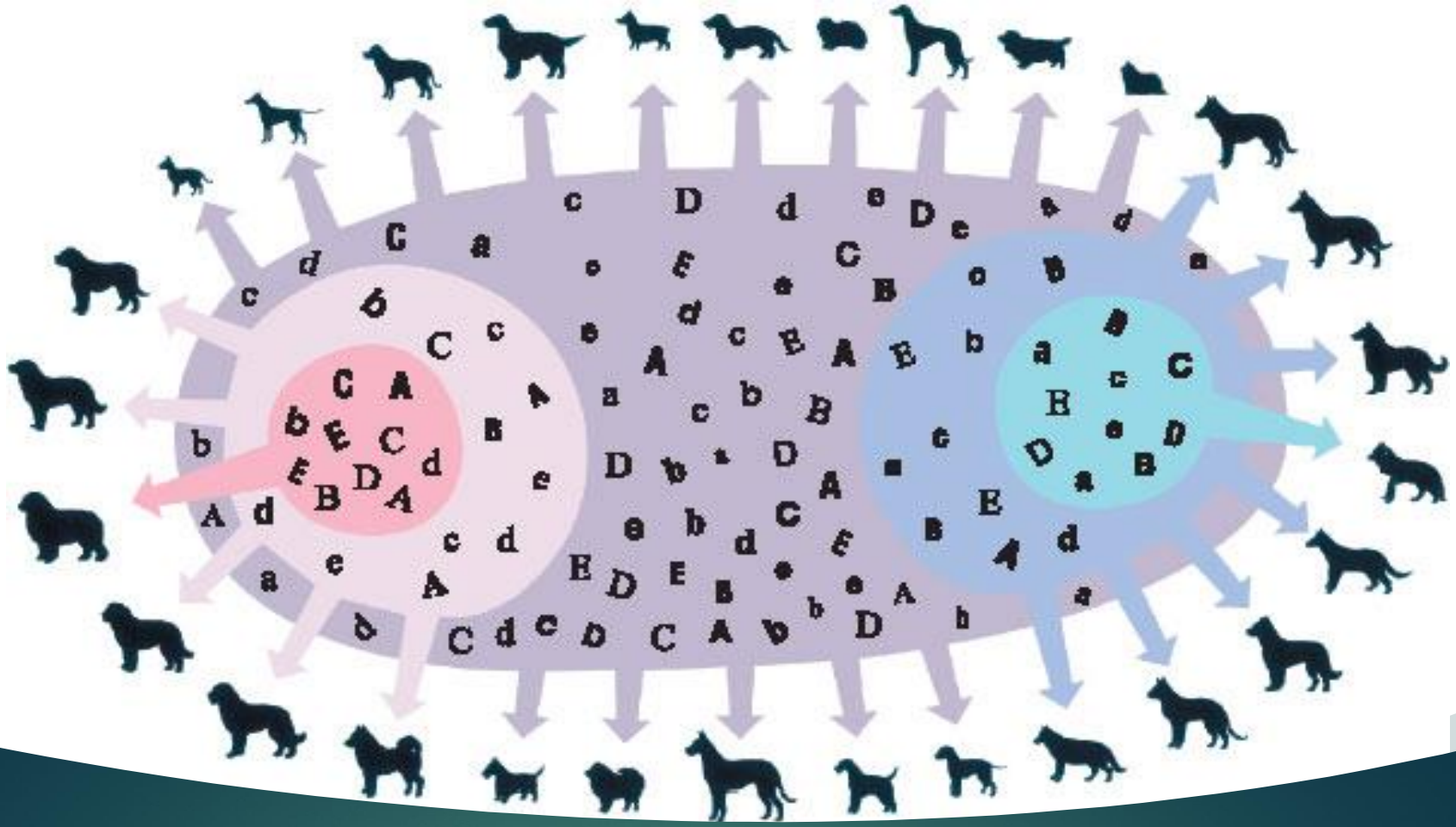
Bottleneck Effect



Adaptive Radiation



Gene Pool NB pg

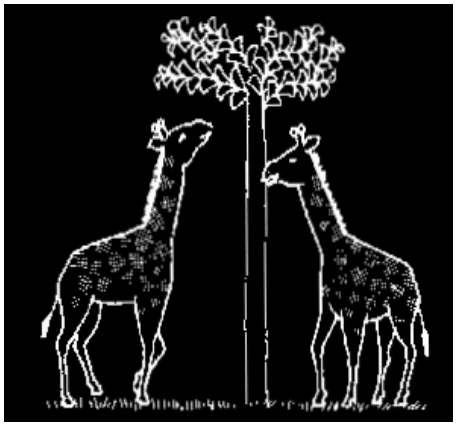


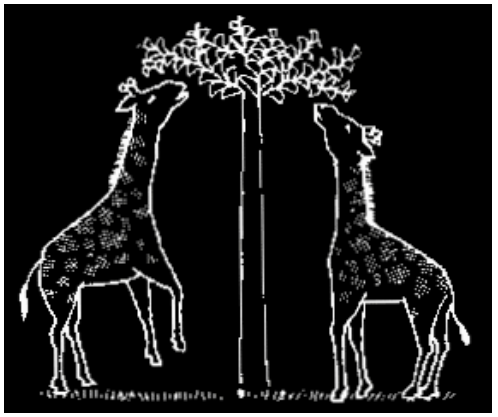
Gene Pool

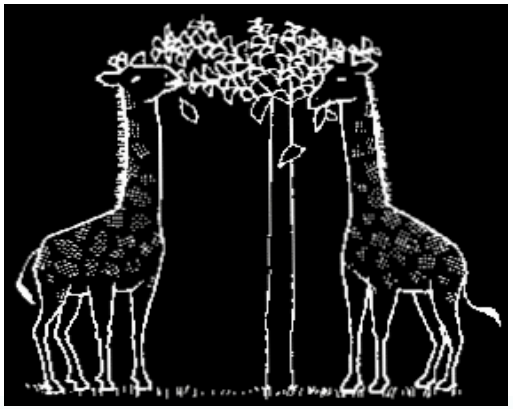
Lamarck vs. Darwin

Lamark's Use/Disuse Hypothesis

1. The ancestors of Giraffes had short necks but had a habit of eating off of tall trees.
2. As they reached upwards their necks became longer
3. They passed the trait for long necks to their offspring.







Lamarck vs. Darwin NB Pg 39

Lamark's Use/Disuse Hypothesis

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How does Lamarck's hypothesis differ from Darwin's on Natural Selection?

Who is right?

Lamarck vs Darwin

Lamark's Use/Disuse Hypothesis

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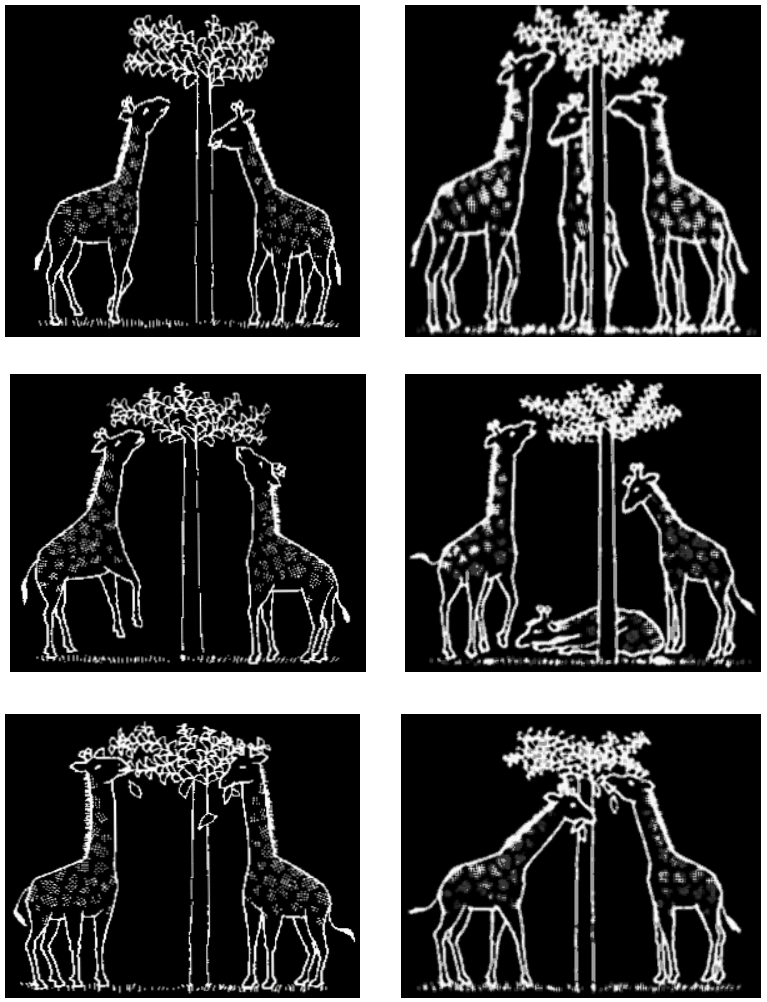

1. The ancestors of Giraffes had short necks, but occasionally some Giraffes had necks slightly longer than the others (Variation)
2. Those Giraffes with slightly longer necks survived and reproduced. (fittest)
3. Only the Giraffes with slightly longer necks survived and produced offspring with similar advantage.

NB Page 39 DSJ

Monday

Agree or disagree:

Natural selection acts on populations, where evolution acts on individuals