**EOG REVIEW for BIO/GEO EVOLUTION**

Use the following words to fill in the blanks below:  **CAST INDEX AFRICA VARIATION (2)**

**LAW OF SUPERPOSITION YOUNGER CONVECTION NATURAL SELECTION CONVERGE**

**CARBONIZED DIVERGE PRODUCERS TRANSFORM PRECAMBRIAN PHENOTYPE**

**MULTICELLULAR EARTHQUAKES OXYGEN ABSOLUTE PETRIFIED ADAPTED**

**PANGAEA DENSE MOLD IRON PRESERVED MESOZOIC ADAPTATIONS**

**RADIOACTIVE TRACE AMERICA BOTTOM EXTINCTION PALEOZOIC ISOLATION**

**SUBDUCTION ICE CORES CONTINENTAL DRIFT COMPETE CENOZOIC SPECIATION**

The center of earth is made of Fe ( \_\_\_\_\_\_\_\_), not rocks because it is more \_\_\_\_\_\_\_\_\_\_ than most rocks and it sinks.  
In undisturbed sedimentary rock layers the oldest layer is on the \_\_\_\_\_\_\_\_\_\_. This is known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Volcanic igneous intrusions, faults or cracks in the rock layers are always \_\_\_\_\_\_\_\_\_\_ than the layers that they cut through. The movement of rising hot magma from the center of the Earth and falling of cooling magma near its crust creates a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ current which causes the tectonic plates to move.

Movement of Earth’s numerous plates are responsible for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over the eons. When plates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ they can form mountains or get pushed below one another giving rise to volcanoes. This is known as S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In the middle of the ocean, new, thin crust is formed when plates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When plates move against each other, they cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and trigger tsunamis. We call these \_\_\_\_\_\_\_\_\_\_\_\_\_\_ plates.

The first 4 billion years of Earth history is known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eon. No \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ life existed. But unicellular \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, known as cyanobacteria, did so much photosynthesizing, that the Earth got lots of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ for more energetic, advanced life to evolve.

Earth’s first multicellular organisms like early plants, insects and fishes thrived from 550mya to 250mya called the \_\_\_\_\_\_\_\_\_\_\_\_ era. Reptiles like the dinosaurs took over next from 250mya to 65mya during the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ era. our current era, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, is the age of the mammals like us. This geological time scale is broken into divisions based on fossils evidence and major \_\_\_\_\_\_\_\_\_\_\_\_ events. Fossil and archaeological evidence shows man has only been here a few hundred thousand to a few million years (although how you properly define “man” is still debated in many circles). Modern man has been migrating around Earth only the last 30,000 years. \_\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_\_** are fossils of organisms that were widespread but lived for a short period which are used to relatively date rocks layers.  
  
Fill in the six types of fossils below:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The imprint of a once living thing in a rock

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The 3-D impression of a once living thing made of sedimentary rock

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ When the tissues of a once living thing has been replaced with rock-like minerals

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A well preserved tissue that is contained in tar, ice, or amber

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The film left over from a once living thing in which only the carbon outline remains

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Any evidence of a living thing that shows past activity

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are used to analyze changes in Earth’s atmosphere over time because they contain air from different periods in Earth’s history.  
  
**Similar fossils of plants and animals** were found in both South \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_ & indicate that the two landmasses were once joined together 220 mya (million years ago). We call this once-supercontinent \_\_\_\_\_\_\_\_\_\_\_\_\_\_. The amount of Carbon- 14, Uranium-238 and other unstable atoms can be measured in rocks and fossils to give scientists an exact date of ancient things. Also known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ dating, this gives us the A\_\_\_\_\_\_\_\_\_\_\_\_ age of a fossil.  
  
The **theory of bio evolution** states that V\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ among members of a species result in a higher probability that the species will undergo the process of N\_\_\_\_\_\_\_\_\_ S\_\_\_\_\_\_\_\_\_\_ if their environment changes. Regardless, organisms must \_\_\_\_\_\_\_\_\_\_ for limited resources (food, shelter, water, and space). Those who are best \_\_\_\_\_\_\_\_\_\_\_\_to their environment will survive to reproduce.

When a members of species are divided or separated from its population, it is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and the diversity of the species increases. These organisms take on new variations to better adapt to new their surroundings in order to survive. After many generations of isolation, \_\_\_\_\_\_\_\_\_\_\_\_\_ can occur; when a new species that is different from the original has emerged with better fitting traits called A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

No two zebras have the same pattern of stripes; this is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ within a species. A trait (such as eye color or hair color) that can be identified by physical means is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

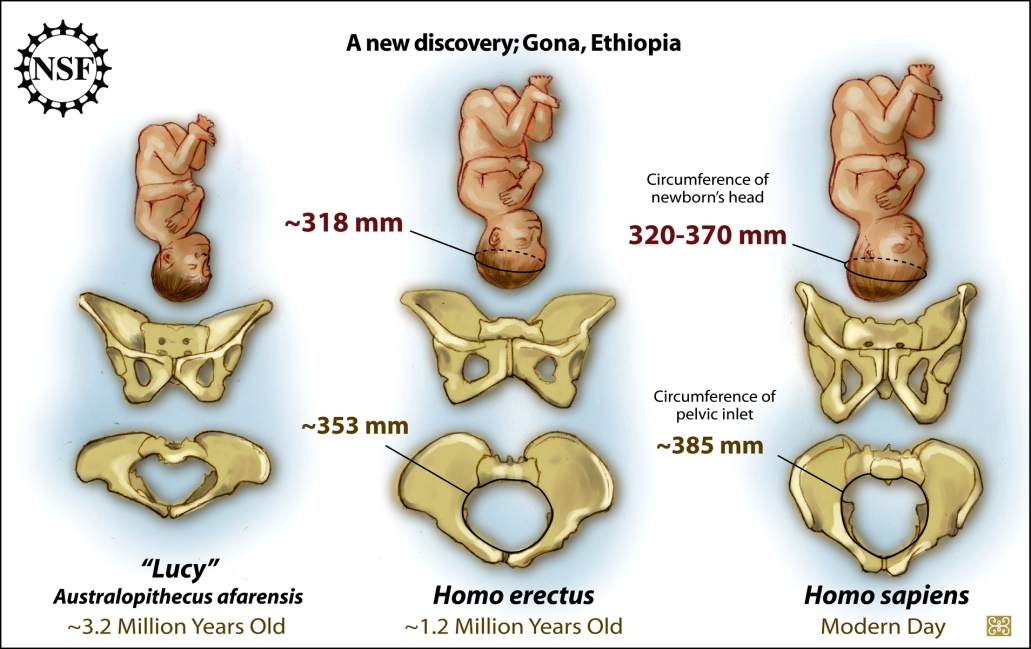
Identify below these additional pieces of evidence that all living things evolved from a common ancestor: **embryos, homologous structures, analogous structures, vestigial organs, transitional fossils, DNA evidence**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Structures** SO similar between different species (see below)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A shrunken or unused body part that is still present in an organism

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Comparing the similar genes of similar organisms

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Comparing the way so much life looks the same at the beginning

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Uncovering layers of Earth showing how a species could have evolved over a long time

**EARTH HISTORY, EVOLUTION & GENETICS**

* **ICE CORES** TRAP GASES & DUST TO TELL USOUR **AT \_ OS \_ H \_ \_ I \_ PAST.** 
  + climate history
* **2 WAYS we DATE the age of Earth:**

**RELATIVE DATING RADIOACTIVE DATING**

**LAW of SUPERPOSTION** Unstable atoms break down

(older layer on the \_ \_ \_ \_ \_ \_) **Carbon-14**

(faults are \_\_\_\_\_\_\_ than layers) **Uranium-238**

**INDEX FOSSILS:**  More **EXACT & PRECISE**

widespread/in 1 layer for fossils & rocks than relative

identifies layer across continents dating

**UNCONFORMITIES: a.k.a: A\_\_\_\_\_\_\_\_\_\_\_\_ DATING**

Gap in rock layers where erosion/

catastrophes may have occurred. **INDEX FOSSILS too!**

**(Which way gives scientists APPROXIMATE dating? \_\_\_\_\_\_\_\_\_\_\_\_\_! Something that has evolved before another creature will be above or below it in the rock layers? \_\_\_\_\_\_\_\_\_\_\_\_)**

* **Our Earth surface is made of lithospheric plates that slowly, but constantly move over our molten asthenosphere on *C\_ \_ V \_ \_ \_ \_ \_N CURRENTS.***
  + This explains \_\_\_\_\_\_\_\_\_\_\_\_\_\_ DRIFT!
    1. Plates \_\_\_\_\_\_VERGE=Mountains, volcanoes, earthquakes
    2. Plates \_\_\_\_\_\_VERGE= Spreading **ocean centers; thinnest , newest crust**
    3. Plates TRANSFORM (slide past) = earthquakes, tsunamis
* **FAULTS & EARTHQUAKES --evidence that tectonic plates \_ \_ \_ \_ constantly!**
* **Plate Tectonics can ISO\_ \_ \_ \_ an organism, so that, over time, it can evolve into another \_ \_ \_CIES.**

**(Charles \_\_\_\_\_\_\_\_\_\_ saw this in bird finches with different \_\_\_\_\_\_\_\_\_ on neighboring Galapagos Islands with different E \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ food sources)**

* **NUMBER 1 reason for extinction is E \_ \_ \_ R \_ \_ M \_ \_ \_ \_ L CHANGE!!!!**

**(EXTINCTION is C\_ \_ \_ \_ N. Most life around 1 mya are not here today. Some disappeared completely while others slowly E\_ \_ \_ \_ \_ \_ into a new, more successful species with better fitting traits called: A \_ \_ \_ \_ \_ \_ \_ \_ \_ \_)**

**(Extinction is natural and increasingly \_ \_ \_ -made!) (GEOLOGIC TIME SCALE is divided by \_ \_ \_ \_ extinctions!)**

**(The FIRST 4 billion years of Earth’s history is called the P \_ \_ C \_ \_ \_ \_ \_ \_ \_ EON & had only \_ \_ \_ cellular stuff.)**

* **HOW does NATURE PREVENT EXTINCTION? through \_ \_ N \_ \_ \_ \_ \_ \_!!!**

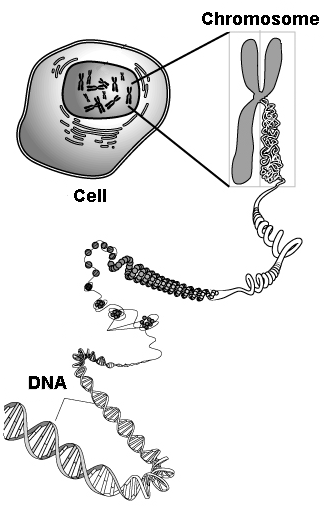
1. **GENETICS—**G\_ \_ \_ \_ equip life with all sorts of t\_ \_ \_ \_ s to survive all sorts of conditions.
2. **GENETICS---**explains how we come in all sorts of shapes and sizes (V\_ R \_ AT \_ \_ \_).
3. **GENETICS--** genetic D\_ V \_ \_ \_ ITY ensures that **someone** will be able to survive any environmental condition.

* **5 EVIDENCES of BIO EVOLUTION:**

1. **FOSSILS!!**
   1. **LAW of SUPERPOSITION --** more fossils that resemble existing species are closer to the \_\_\_\_\_.
   2. **TRANSITIONAL FOSSILS --** Fossils from rock layer to rock layers that show the slow evolutionary C \_ \_ \_ \_ \_ of a species like horses.
2. **SIMILAR BODY STRUCTURES & ANATOMIES –** so much life have similar organ systems, skeletal systems, etc. SEEN in FOSSILS of COMMON ANCESTORS!
   1. **H \_ M \_ L \_ G\_ \_S STRUCTURES have similar purpose & structure.** (like 5 fingers in human hands & whale flippers, or eyes with pupils &irises)
   2. **V \_ ST \_ \_ \_ \_ L STRUCTURES** show organs, structures or behavioral trait that an organism no longer needs but still has (wisdom teeth, appendix, baby’s grip, nictitating membranes, tailbones, etc.)
3. **DISTRIBUTION of SPECIES** –Life on Earth has 5 kingdoms which fill our planet in every environmental N \_ C \_ \_. The longer a continent has been I\_\_\_\_\_\_\_\_\_\_\_\_\_ from other continents, the more different they are from the rest.
   1. Australian Koala and Kangaroos.
4. **SIMILARITIES in DEVELOPMENT** – So much life on Earth begins as similar looking E \_ \_ \_ \_ \_ \_!
5. **NEW EVIDENCE in MOLECULAR BIOLOGY –** Comparing how much \_ \_ \_ organisms share with their closest relatives as well as other organisms.

* **What CONCEPT says that the way the world works today has been going on since the beginning of time?** (i.e. erosion, convection, water cycle, densities, gravity, electromagnetic waves, chemical reactions, magnetism, etc. have all been working this way since the beginning) **The concept of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
* **Charles Darwin** came up with his Theory of **N\_\_\_\_\_\_\_\_\_\_\_\_\_ S\_\_\_\_\_\_\_\_\_\_\_\_\_** which says that species O \_\_\_\_\_\_\_\_\_\_\_\_ with a V\_\_\_\_\_\_\_\_\_\_\_\_\_ of traits to evolve slowly over \_\_\_\_\_\_\_ generations with successful A\_\_\_\_\_\_\_\_\_\_\_\_\_\_ they got from being more successful during C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + **Survival of the “\_\_\_\_\_\_\_\_\_\_\_\_\_\_”** does NOT mean STRONGEST. It means that species more perfectly **FITS** its N \_ \_ \_ \_ in its environment.

<http://www.nap.edu/read/6024/chapter/4#21>



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **BALL TYPE** | **MASS (G)** | **VOLUME:**  **4/3 x *π* x r3** | **PREDICTED** ORDER from HIGH to LOW DENSITIES | **ACTUAL**  ORDER from  HIGH to LOW DENSITIES |
| 12” SOFTBALL |  |  |  |  |
| GOLF BALL |  |  |  |  |
| Small, spotted rubber ball |  |  |  |  |
| Ol’ collapsing glow ball |  |  |  |  |
| Rubber band ball |  |  |  |  |
| Brass ball |  |  |  |  |
| BASEBALL |  |  |  |  |
| ICEBALL |  |  |  |  |
| Small plastic marble |  |  |  |  |
| FOAM BALL |  |  |  |  |
| Glass marble |  |  |  |  |
| Lacrosse ball |  |  |  |  |
| Wood ball |  |  |  |  |
| FOIL BALL |  |  |  |  |
| Clay ball |  |  |  |  |
| blue rubber basketball |  |  |  |  |
| Small red bouncy ball |  |  |  |  |
| Mom’s 10 lbs  Bowling ball |  |  |  |  |