

Name: _____**KEY**_____

“What Darwin Never Knew”

1. Darwin was offered a position on the **BEAGLE** whose mission was to survey the waters around South America.
2. Where did Darwin make his first important discovery? **ARGENTINA**
What did he find there? **FOSSILS** of extinct mammals.
3. The **GALAPAGOS** are home to animals found no-where else on earth. (Where Darwin made his most important discoveries.)
4. The upper **SHELL/CARAPACE, COLOR, LOWER SHELL/PLASTER** of the giant tortoises differed depending upon which island they lived.
5. The Galapagos **FINCHES** differed in the type of beak, depending on the island.
6. Darwin realized, for some reason, that species **CHANGE**.
7. Darwin studied dog breeders and how specific traits were selected. Darwin then wondered if **Natural selection** could be going on in life.
8. The pattern in nature that Darwin saw was that the creatures that survived were those best adapted to the specific **ENVIRONMENT** in which they lived.
9. The Galapagos finches have different beaks because the finches used their beaks as **TOOLS**.
10. Darwin realized that **VARIATION** was the start of change in nature.
11. Over many generations, tiny variations allow the fit to get fitter and the unfit to vanish.
This is evolution by **NATURAL SELECTION**.
12. In 1859 Darwin published ***The Origin of Species***.
13. Many genes get translated into **PROTEINS**.
14. DNA has one other vital quality. It doesn't stay the **SAME**.
15. Without **MUTATION**, everything would stay the same, generation after generation. We can now find the genes that are responsible for evolutionary change.
16. Humans have **23,000** genes. The same numbers as a chicken and less than an ear of corn.
Many of our key genes are similar to those other animals.
17. How do you get all these differences if you have the same number of genes? The first clues are from the study of **GENETICS/EMBRYOLOGY**. They are the platform of diversity and all use the same basic genes.
18. **98** percent of DNA doesn't code for proteins.

19. A piece of DNA called a **SWITCH** is not a gene, but it turns “on” or “off” genes.
20. What is special about the body plan gene? It throws **A SWITCH** and tells the “stuff genes” what to do and when. This is how all forms of life are related, but evolved to become completely different.
21. The bones of the human inner ear have developed from fish **GILLS**.
22. Fossils show that creatures with legs appeared **365** million years ago. Before that, they were only fish.
23. Dinosaurs share a common ancestor with **BIRDS**.
FISH share a common ancestor of all four-legged forms.
24. The Archaeopteryx fossil had features of both birds and **DINOSAURS**.
25. Tiktaalik is a perfect transitional form: the body of a fish with scales, but also the bone **STRUCTURE STRUCTURE** is seen in every four-legged forms.
26. The body plan genes called **HOX** genes are found in all complex animals from 600 million year worms to humans.
27. The genes needed for arms and legs were in pre-historic fish. All they needed was a few **MUTATIONS** to change the order of what genes are turned on and off.
28. There is a **4** percentage difference in the DNA of humans and chimps.
29. The two signature organs of humankind are the **HAND/THUMB** and the **BRAIN**
30. A mutation in the human **JAW** muscle allows the skull to keep expanding into adulthood, creating a bigger space for the **BRAIN**.
31. There are **21** different mutations responsible for microcephaly.
32. A study of human and chimp DNA sequences show that the differences weren't in the actual genes, but in the **SWITCH** that direct the genes. More than half of these switches are near a gene that involves the **BRAIN**. That gene was different in 2 letters between the chimp and the chicken, but different in **18** letters when compared to humans.
33. DNA works in many different ways— through genes that make the stuff of our bodies, through **SWITCHES** that turn those genes on and off, and through sequences of the DNA that throw those switches. This shows how small differences in **DNA** can generate enormous change.