Darwin PowerPoint Notes

Charles Darwin used reasoning in reaching his conclusion that natural selection is the mechanism of evolution.

Darwin Travels to Galapágos Islands
In 1831, the research ship __________________ left England for a five-year cruise around the world. On the ship was a young man named ______________________________ (1809–1882). During the trip, Darwin collected thousands of plant and animal __________________________. He was amazed at the ______________________ of life he encountered. Darwin wrote down his observations and collected __________________________ about evolution. That evidence led him to propose a theory about how evolution works called ______________________________. The Beagle sailed to the Galapágos Islands located 965 km west of Ecuador.

Darwin’s Finches
There, Darwin observed that the ______________________ were different than those found on the mainland. He also noted differences in finches from island to island. One difference he found was in the shape of their _____________. The shape of finch beaks appeared to differ with the type of ______________________eaten. Darwin concluded that finch beaks were ______________________ for the type of food they ate. Darwin hypothesized that an ______________________ species of finch from the mainland somehow ended up on the Galapagos Islands. The finches of that species scattered to different environments. There, they had to adapt to different conditions. Over many generations, they evolved adaptations that allowed them to get enough food to ____________________ and reproduce. Each group of finches became _______________________ from the other groups. Eventually, each group became a different _____________________.

Darwin Theorizes about How the Adaptations Evolved
When Darwin returned to England from his voyage, he began to develop a ______________________ about how the adaptations evolved. From ______________________, Darwin learned that Earth was formed very slowly over a long period of time. Its surface also changed slowly over time through natural processes like sedimentation and erosion. Darwin reasoned that populations of organisms ______________________ slowly as their environment slowly changed. If the environment changes rapidly from an event like a flood, an earthquake, or a volcanic eruption, a species could become extinct (all members die off completely). Darwin used ______________________ as evidence that different species evolve over a long period of time. He found fossils of species that lived a few million years ago that resembled living species. For example, the glyptodon, an extinct mammal, resembled the armadillo, an organism Darwin knew as a living species. In Darwin’s time, animal and plant breeders used ______________________ breeding to produce organisms with the traits they desired. In wild animals and plants, Darwin observed that traits were selected by the environment. He called this process ______________________. Mimicry of leaves by insects, such as this katydid, is an adaptation for evading predators. He hypothesized that natural selection took ______________________ than selective breeding, which he called artificial selection, because it happened by chance.
On the Origin of Species by Means of Natural Selection

In ________________, Darwin published the results of his study in a book called On the Origin of Species by Means of Natural Selection. Based on his research and evidence, Darwin concluded that:

1. Organisms ________________ over time.
2. All organisms are descended from ________________ ________________ by a process of branching.
3. Evolution is ________________, taking place over a long time.
4. The mechanism of evolution is ________________ ________________.

What is natural selection?
Natural selection is the process by which organisms with ________________ ________________ survive and reproduce at a higher rate than organisms with less-favorable adaptations. Darwin based his ideas about natural selection, in part, on the work of British professor ________________ (1766–1834). In 1798, Malthus published his Essay on Population. In that essay, he argued that humans have a tendency to grow faster than their food supply. This causes food shortages and a “struggle for ________________.” Darwin’s observations in the Galapagos Islands led him to apply Malthus’ ideas to animals and plants. Darwin proposed that environmental variables affect the ________________ of a population. Variables include ________________ , food supply, ________________ , and climate. He reasoned that if a species produces too many ________________ and only a certain number survive, the survivors must be better adapted to their environment than those that die. Darwin concluded that offspring of the survivors would ________________ the favorable adaptations. Organisms with unfavorable adaptations die before they can pass them on to offspring. Darwin proposed that natural selection is the process for ________________.

The process of natural selection is summarized in these steps:

Step 1. Populations over-reproduce.
All organisms produce more offspring than can ________________ to adulthood and reproduce. This means that many of those offspring will ________________ without reproducing. Survivors that are able to reproduce pass their ________________ on to their offspring.

Step 2. Individuals in a population vary.
There is ________________ variation in traits among individuals in a population of a species. The variations each individual possesses happen by ________________. Those variations are ________________.

Step 3. Favorable adaptations are selected.
The changing environment causes a selection of favorable ________________ (adaptations). Adaptations that fit well with the environment are passed on to ________________ in greater numbers than adaptations that do not fit well.

Step 4. Favorable adaptations accumulate.
Favorable adaptations accumulate over many _________________. This may lead to new ________________.