Transcript
11-DNA

A few introductory words of explanation about this transcript.

This transcript includes the words sent to the narrator for inclusion in the latest version of the associated video. Occasionally, the narrator changes a few words on the fly in order to improve the flow. It is written in a manner that suggests to the narrator where emphasis and pauses might go, so it is not intended to be grammatically correct.

The Scene numbers are left in this transcript although they are not necessarily observable by watching the video.

There will also be occasional passages in blue that are NOT in the video but that might be useful corollary information.

There may be occasional figures that suggest what might be on the screen at that time.

320 Biology

On our own planet, and perhaps countless others - life arose.

The DNA molecule, which is the basis of all organic life on Earth, is more intricate by far than any spiral galaxy – because the structure of DNA contains something new - something that was missing from inanimate matter before the origin of life – it contains information. The DNA molecule encodes not only the information necessary to make copies of itself, but the information necessary to construct an entire organism. The blueprints for an ant or a dolphin or a bullfrog or a person... all of this information is somehow built into the structure of an organism's DNA in a molecular code billions of letters long.

160. Chromosomes
Each of your chromosomes is a single continuous strand of DNA – one enormous molecule. And as that molecule winds or unwinds, each chromosome can vary in shape from a stringy, open formation if it is performing a task to a remarkably tightly packed mass if the cell is preparing to subdivide.

This winding is so efficient that it packs 3 feet of DNA helix into a cell nucleus…The helix is 3.4 angstroms per step

This particular clump of DNA is chromosome 17 magnified some 50,000 times. And as we zoom in, you can begin to make out the rungs on the ladder. Each of these rungs is just one of the 3 billion letters that make up the book of our instruction manual.

165. DNA Structure

These steps of the DNA ladder are composed of just four different molecules – adenine, thymine, cytosine, and guanine, and it is common to refer to them by their initials … A and T and C and G. There are two of these base molecules for each step on the ladder, and it is always either A and T together or G and C together, so if you know one side of the step on the ladder, you automatically know the other side as well. Step-by-step and 3 billion letters long, THIS is the formula for a human being.

The existence of this tiny code, written molecule-by-molecule inside each of our cells is a remarkable discovery all by itself. But Scientists have now READ that code –examined it letter by letter and written it down.