

## **Human Genome Project**

**By Sharon Fabian**

<sup>1</sup> The Human Genome Project had big goals. Scientists running the project hoped to identify all of the genes in human DNA and to determine the sequence of the three billion chemical bases that the genes are made of. Not too long ago people would have said that those goals were impossible to meet.

<sup>2</sup> Then in 2003 an announcement was made. Scientists announced that the goals of the Human Genome Project had been met - years ahead of schedule!

<sup>3</sup> The human genome is the series of chemical bases that make up our DNA. That DNA makes up our genes. Genes are basic units of heredity. They are in every one of our cells, and they determine what traits we inherit from our ancestors. They also determine how likely it is that we will inherit certain medical conditions.

<sup>4</sup> It was hoped that if the entire human genome could be mapped out, a database could be established for use by doctors and researchers.

<sup>5</sup> For the Human Genome Project, scientists studied cells from several people who were all anonymous volunteers. Since there are small differences among the genes of different people, they would have to combine the results from all of the people studied. The scientists took tiny bits of genetic materials from each of the cells. They looked for patterns in the chemicals. They logged all of their information into a huge computer program. Bit by bit, they completed their database.

<sup>6</sup> The project would never have been possible without computers. The pieces of information that the scientists logged in numbered in the billions. Just one list of the three billion chemical bases in human DNA could fill up a stack of books as tall as a skyscraper.

<sup>7</sup> Before the project was even completed, the scientists were already thinking of follow-up experiments and practical applications. In the future, they hoped to look into the genomes of animals, plants, and even microscopic creatures.

<sup>8</sup> Doctors especially wanted to look into ways that the information could be used to treat diseases. If they knew that certain genes were associated with particular diseases, then they could warn people of risks they might face. The genetic information could help doctors to diagnose diseases, too. There might even be new therapies and new drugs thanks to this information. They hoped to learn more about certain widespread diseases such as cancer and Alzheimer's disease.

<sup>9</sup> Doctors weren't the only ones who were enthusiastic about the new data. Farmers hoped to discover ways to keep their animals healthier. They also hoped to find new varieties of crops that were more resistant to diseases and insects.

<sup>10</sup> Genetic information could even be used in the field of forensics. It could be used to identify criminals or to clear wrongly accused suspects.

<sup>11</sup> Environmentalists thought the information would be useful in identifying endangered species. It might provide useful knowledge to the producers of new biofuels.

<sup>12</sup> The announcement that the project was completed also stirred up new controversies over the uses of genetic information. Who should have access to the information? Should insurance companies be allowed to use the information to set health insurance rates? What about genetically modified foods? And, the big question, what about cloning?

<sup>13</sup> People will be debating these questions for years to come. In the meantime, scientists will continue to learn more and more about the human genome. They may study the mouse genome and maybe even the rose bush genome. And hopefully, people in many fields will find ways to put lots of that information to good use.

<p>1. One goal of the Human Genome Project was to determine the sequence of ____.</p> <p><input type="radio"/> A The genes in one chemical element</p> <p><input type="radio"/> B The chemical bases that human genes are made of</p> <p><input type="radio"/> C The chemical elements in the human body</p> <p><input type="radio"/> D The chemical elements in the periodic table</p>	<p>2. The goals of the Human Genome Project were ____.</p> <p><input type="radio"/> A Met ahead of schedule</p> <p><input type="radio"/> B Met on schedule</p> <p><input type="radio"/> C Never met</p> <p><input type="radio"/> D Finally met many years after the deadline</p>
<p>3. Genes are ____.</p> <p><input type="radio"/> A Only found in humans</p> <p><input type="radio"/> B Basic units of heredity</p> <p><input type="radio"/> C Chemical elements</p> <p><input type="radio"/> D Very rare</p>	<p>4. In order to map out the human genome, scientists studied ____.</p> <p><input type="radio"/> A Many cells from one person</p> <p><input type="radio"/> B One cell</p> <p><input type="radio"/> C Cells from millions of people</p> <p><input type="radio"/> D Cells from several people</p>
<p>5. Scientists looked for ____ in the chemicals of the cells they studied.</p> <p><input type="radio"/> A Errors</p> <p><input type="radio"/> B Carbon</p> <p><input type="radio"/> C Water</p> <p><input type="radio"/> D Patterns</p>	<p>6. Information learned through the Human Genome Project may help ____.</p> <p><input type="radio"/> A Doctors</p> <p><input type="radio"/> B Farmers</p> <p><input type="radio"/> C Forensic scientists</p> <p><input type="radio"/> D All of the above</p>

<p>7. The results of the Human Genome Project stirred up controversy about _____.</p> <p><input type="radio"/> A Cloning</p> <p><input type="radio"/> B Genetically modified foods</p> <p><input type="radio"/> C Insurance company practices</p> <p><input type="radio"/> D All of the above</p>	<p>8. Future studies of genomes could provide information about _____.</p> <p><input type="radio"/> A Living things</p> <p><input type="radio"/> B Animals only</p> <p><input type="radio"/> C Plants only</p> <p><input type="radio"/> D Living and non-living things</p>
---	--

determine	anonymous	warn	chemical
database	identify	continue	chemicals
genomes	particular	biofuels	knowledge
identifying	resistant	inherit	follow-up
access			

**Directions:** Fill in each blank with the word that best completes the reading comprehension.

The Human Genome Project had big goals. Scientists running the project hoped to identify all of the genes in human DNA and to determine the sequence of the three billion (1) \_\_\_\_\_ bases that the genes are made of. Not too long ago people would have said that those goals were impossible to meet.

Then in 2003 an announcement was made. Scientists announced that the goals of the Human Genome Project had been met - years ahead of schedule!

The human genome is the series of chemical bases that make up our DNA. That DNA makes up our genes. Genes are basic units of heredity. They are in every one of our cells, and they determine what traits we (2) \_\_\_\_\_ from our ancestors. They also (3) \_\_\_\_\_ how likely it is that we will inherit certain medical conditions.

It was hoped that if the entire human genome could be mapped out, a database could be established for use by doctors and researchers.

For the Human Genome Project, scientists studied cells from several people who were all (4) \_\_\_\_\_ volunteers. Since there are small differences among the genes of different people, they would have to combine the results from all of the people studied. The scientists took tiny bits of genetic materials from each of the cells. They looked for patterns in the (5) \_\_\_\_\_. They logged all of their information into a huge computer program. Bit by bit, they completed their (6) \_\_\_\_\_.

The project would never have been possible without computers. The pieces of information that the scientists logged in numbered in the billions. Just one list of the three billion chemical bases in human DNA could fill up a stack of books as tall as a skyscraper.

Before the project was even completed, the scientists were already thinking of (7) \_\_\_\_\_ experiments and practical applications. In the future, they hoped to look into the (8) \_\_\_\_\_ of animals, plants, and even microscopic creatures.

Doctors especially wanted to look into ways that the information could be used to treat diseases. If they knew that certain genes were associated with (9) \_\_\_\_\_ diseases, then they could (10) \_\_\_\_\_ people of risks they might face. The genetic information could help doctors to diagnose diseases, too. There might even be new therapies and new drugs thanks to this information. They hoped to learn more about certain widespread diseases such as cancer and Alzheimer's disease.

Doctors weren't the only ones who were enthusiastic about the new data. Farmers hoped to discover ways to keep their animals healthier. They also hoped to find new varieties of crops that were more (11) \_\_\_\_\_ to diseases and insects.

Genetic information could even be used in the field of forensics. It could be used to (12) \_\_\_\_\_ criminals or to clear wrongly accused suspects.







