HUMAN GENOME PROJECT (HGP)

1. **What do you know about HGP?**

   What were its goals?

   When did the project start?

   How long did it take to finish the project?

   How successful were the researchers?

   How many bases does the human genome consist of?

   What were the early days of the HGP? (use the verb 'it used to be' to explain it)

   What was a milestone in the whole process?

2. **Watch the video Cracking the Code of Life** (Section 2: Getting the Letters Out) **to get some answers.**
   http://www.pbs.org/wgbh/nova/genome/program.html

3. **What were the HGP goals? Complete the verbs from the list.**

   store, identify, determine, address, transfer, improve

   - _____ all the approximately 20,000-25,000 genes in human DNA,
   - _____ the sequences of the 3 billion chemical base pairs that make up human DNA,
   - _____ this information in databases,
   - _____ tools for data analysis,
   - _____ related technologies to the private sector, and
   - _____ the ethical, legal, and social issues (ELSI) that may arise from the project.

Based on: http://www.ornl.gov/sci/techresources/Human_Genome/home.shtml

4. Complete the gaps with suitable words. The words at the bottom of page 4 can help you. However, you should use a suitable form.

The Human Genome Project (HGP) is an international 13-year effort formally begun in October 1990. The project was planned to last 15 years, but rapid _____ advances accelerated the completion to 2003. Project goals were to _____ the complete sequence of the _____ DNA subunits (bases), _____ all human genes, and make them accessible for further biological study. As part of the HGP, parallel _____ was done for selected model _____ such as the bacterium *E. coli* to help develop the technology and interpret human _____ function. The Department of Energy's Human Genome Program and the National Institutes of Health's National Human Genome Research Institute (NHGRI) together sponsored the U.S. Human Genome Project.

Based on: http://www.ornl.gov/sci/techresources/Human_Genome/faq/faqs1.shtml

5. What are the comparative genome sizes of humans and other organisms being studied? Complete the organisms into the table.

H. influenzae
(**bacteria**)

Arabidopsis thaliana
(**plant**)

Caenorhabditis elegans
(**roundworm**)

Homo sapiens
(**human**)

Mus musculus
(**mouse**)

Saccharomyces cerevisiae
(**yeast**)

Drosophila melanogaster
(**fruit fly**)

Escherichia coli
(**bacteria**)

organism	**estimated size (base pairs)**	**estimated gene number**	**average gene density**	**chromosome number**
	3.2 billion	~25,000	1 gene per 100,000 bases	46
	2.6 billion	~25,000	1 gene per 100,000 bases	40
	137 million	13,000	1 gene per 9,000 bases	8
	100 million	25,000	1 gene per 4000 bases	10
	97 million	19,000	1 gene per 5000 bases	12
	12.1 million	6000	1 gene per 2000 bases	32
	4.6 million	3200	1 gene per 1400 bases	1
	1.8 million	1700	1 gene per 1000 bases	1

Based on: http://www.ornl.gov/sci/techresources/Human_Genome/faq/compgen.shtml

6. Put the words in order to create a meaningful sentence.

The	Sequencing	of	only	a	35,000
Genome	reduce	-coding	protein	number	species.
International	human	20,000	Consortium	for	number
the	Human	genes	estimated	surprisingly	
from	to	-25,000,	low	our	

7. Watch the video and complete the information on HGP. (Introduction)
http://www.genome.gov/25019885

ad 4) identification, three, billion, gene, sequence, determination, technology, organism