Tour of the Basics Web Quest - Answer Key
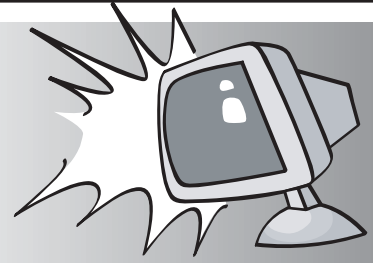
Log on to: http://gslc.genetics.utah.edu/units/basics/tour/. Explore this activity to find the answers to the questions below.

1. What is DNA?

The instructions for building parts of the cell.

2. What does "DNA" stand for?

DeoxyriboNucleic Acid

3. What is the four-letter DNA alphabet and what are the special rules by which the alphabet pieces bind together?

A, C, T, and G. A binds with T, C binds with G.

4. What is a gene?

Genes are instruction manuals for our bodies.

5. What are genes made of?

Genes are made of DNA.

6. How many genes do humans have?

Humans have 25,000 genes.

7. For what molecule do genes contain the instructions for building?

Genes contain the instructions for building proteins.

8. What is a chromosome?

Chromosomes are packages of compact DNA.

9. How many chromosomes does a human cell hold?

Each human cell holds 46 chromosomes.

10. How are the human sex chromosomes labeled?

Sex chromosomes are labeled "X" and "Y".

11. How many different kinds of proteins does one cell contain?

Each cell contains thousands of different proteins.

12. Why do scientists use computer programs to model protein structure and function?
    Proteins are very small and hard to see.

13. What provides the "blueprint" for making a protein?
    Genes provide the blueprint for making a protein.

14. What is heredity?
    The passing of traits from parent to child.

15. Why aren't children identical to either one of their parents?
    Each parent contributes one set of chromosomes to each child. The set of chromosomes is passed on randomly, so each child receives a unique combination.

16. In humans, how many chromosomes does each parent pass on to their offspring?
    Each parent passes on 23 chromosomes to their offspring.

17. Does the second baby in the What is Heredity? animation inherit the exact same chromosomes as the first? Do both babies have a complete set?
    No, the second baby's chromosomes are different from the first baby's. Yes, both babies have a complete set.

18. What is a trait?
    A trait is a notable feature or quality in a person.

19. List the types of traits that exist.
    There are: physical traits, behavioral traits, and predispositions to medical conditions.

20. Give an example of how an environmental factor can influence a trait.
    Answers may include one of the following: exposure to sun or hair dyes can change hair color, you can train retrievers to roll over and play dead instead of fetch, eating healthy foods and exercising can decrease the risk of heart disease.

21. Briefly explain how the Hitchhiker's Thumb trait is determined using the following words: allele, dominant, recessive, homozygous, heterozygous. You may draw pictures if you wish.

    Answers will vary. Example answer:
    If two dominant alleles are inherited, the person is homozygous and will have a hitchhikers thumb. If two recessive alleles are inherited, the person is homozygous and will have a straight thumb. If a person is heterozygous, one dominant and one recessive allele are inherited and that person will have a hitchhiker's thumb.