

# Heredity

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1. What is meant by the term “heredity”?
2. Draw a picture of an animal cell and label the following parts:  
cell membrane, cytoplasm, nucleus, nuclear membrane, ribosomes
3.
  - a. What is a chromosome and where are they located?
  - b. What is a gene and where is it found?
4.
  - a. What is meant by the term “allele”?
  - b. How does a dominant allele differ from a recessive allele?
  - c. Determine which allele you have of the following genetic traits:  
widow’s peak, free earlobe, dimples, curved Thumb, bent pinky, digit hair,  
rolling tongue, second toe longer.
  - d. Using a punnet square, predict the ratio of offspring produced from these  
monohybrid crosses: TT (tall) crossed with tt (short), Tt (tall) crossed with Tt  
(tall), Tt (tall) crossed with tt (short)
5.
  - a. What does the process of mitosis accomplish?
  - b. Draw a sequence of cells that shows the process of mitosis including:  
prophase, metaphase, anaphase and telophase.
  - c. Briefly explain how the DNA in the chromosomes is copied during this  
process.
6.
  - a. What does the process of meiosis accomplish and how does it differ from  
mitosis?
  - b. Draw a sequence of cells that shows the process of meiosis including:  
prophase I & II, metaphase I & II, anaphase I & II and telophase I & II.
  - c. Do the cells resulting from meiosis remain haploid? Explain.
7. Describe how DNA encodes the specific proteins that result in genetic traits.  
Demonstrate your knowledge of this process by using diagrams or paper models.
8. What is a mutation? Using the diagrams or models created in question 7 to  
illustrate the effect of a mutation on the genetic trait.
9. Know at least five genetic disorders and tell a story about a famous person or  
someone that you know who has had one of these disorders.
10. Is biological heredity the only factor contributing to your character, i.e., what makes  
you who you are?
11. Find three statements from Ellen Whites writings that relate to the previous question.

## Skill Level 3

**Original Honor 2006**

### References:

- <http://www.msif.org/en/> - “Multiple Sclerosis International Federation” “the world of Ms”
- <http://k12science.ati.stevens-tech.edu/curriculum/genproj/traits.html> - “Human Genetics”
- <http://www.familytreemagazine.com/articles/oct00/genetic.html> -- “Common Genetically Inherited Diseases”
- <http://www.diabetes.org/homepage.jsp> - American Diabetes Association, Basic Diabetes Info
- <http://www.apdaparkinson.org/user/index.asp> - “Basic Information about Parkinson’s” American Parkinson Disease Association, Inc.
- <http://www.tsa-usa.org/> - “What is TS”
- <http://www.cancer.org/docroot/home/index.asp> - “Detailed Guide: What is Cancer?”

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