

### Teacher's Guide for "Heredity"

CT State Standards	National Science Standards
<p><b>C. 27 Describe how genetic information is organized in genes on chromosomes, and explain sex determination in humans</b></p>	<p><b>Reproduction and Heredity</b></p> <ul style="list-style-type: none"> <li>• Every organism requires a set of instructions for specifying its traits. Heredity is the passage of these instructions from one generation to another</li> <li>• Hereditary information is contained in genes, located in the chromosomes of each cell.</li> </ul>

#### I. Vocabulary Covered in "Heredity"

1. Heredity – the passing of traits from parents to offspring
2. Pedigree – a diagram which is used to map out genetic relationships within a family line
3. Chromosomes – an organized structure of DNA that contains genes
4. DNA – deoxyribonucleic acid – found in nucleus of cells which contains hereditary material
5. Base pairs – DNA consists of 4 base pairs adenine (A), Thymine (T), Cytosine (C) C, and Guanine (G)
6. Genes – located on DNA, they determine physical traits
7. Traits – a characteristic of an organism such as eye color, hair color, plant height, pea pod color, etc.

#### II. Understanding Genetic Principles Within the Song

##### A. Heredity (The refrain and verse 1)

1. Heredity is the passing of traits from parents to offspring. All genes are inherited in pairs. It is these genes that control the expression of traits in offspring. The song uses examples such as eye color, freckles, and tongue folding.
2. The song mentions "map it on your pedigree." Pedigree diagrams can be used to map out a family's genetic conditions such as color blindness etc.

Extensions: You could go on to discuss dominant versus recessive traits in organisms and teach how to make predictions using Punnett squares.

##### B. DNA (Verse 2)

1. The song states that DNA consists of 4 base pairs: A, T, C, and G. It also discusses that A always pairs with T and C always pairs with G. That is the rules for DNA base pairing
2. It is the base pairs that create the genetic code consisting of genes that have control the expression for particular traits.

Student Worksheet for "Heredity"

Part I. Define the following terms using your own words:

- 1. Heredity \_\_\_\_\_
- 2. DNA \_\_\_\_\_
- 3. Chromosomes \_\_\_\_\_
- 4. Genes \_\_\_\_\_
- 5. Traits \_\_\_\_\_
- 6. Pedigree \_\_\_\_\_
- 7. Base pairs \_\_\_\_\_

Part II. Answer the following short answer questions to the best of your ability.

- 1. Discuss how you think the principles of heredity have worked in your family. Make sure you give examples of traits that you or your siblings may have inherited from your parents.

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- 2. A scientist has discovered a new genetic sequence that controls fur color in hamsters but is having a hard time figuring out what the matching base pairs are.

A. What are the base pairing rules?

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\_\_\_\_\_

B. Complete the following sequence using your base pairing knowledge:

- T \_\_\_\_\_
- T \_\_\_\_\_
- C \_\_\_\_\_
- G \_\_\_\_\_
- G \_\_\_\_\_
- C \_\_\_\_\_
- A \_\_\_\_\_
- T \_\_\_\_\_
- G \_\_\_\_\_
- A \_\_\_\_\_