

WORKSHEET: GENES AND CHROMOSOMES

Name _____ Year and Section _____ Score _____

Teacher _____ School _____ Date _____

Objectives:

- Define the terms 'Gene' and 'Chromosome'
- Identify where chromosomes are found in the body
- Describe the basic structure and features of a chromosome •

BIG IDEAS:

You can think of the DNA content of a cell as a cookbook that contains recipes describing the living organism right down to the tiniest detail. The recipes are the genes. A gene is a fragment of DNA that accounts for a specific characteristic, such as hair colour, ability to digest dairy or any other information pertaining to the organism's appearance or functioning. It is made up of a very precise sequence of nitrogenous bases (ACTGTTAGC...), the building blocks of a DNA molecule. When decoding the sequence of a particular gene (the recipe), a cell can manufacture a specific protein. A gene can have several different forms, with one or more different nitrogenous bases. These variant forms of a gene are called alleles. In the case of eye colour, for instance, you can have alleles that contain information for brown, blue, green or grey pigment.

Prepared by: Ronaliza Atiagan Marcos HS

Source: <http://sonhank.com/wp-content/uploads/2015/10/Genes-and-Chromosomes-worksheet.pdf>

<http://www.genomequebec-education-formations.com/education-concept-genes-chromosomes-en>

DNA containing our genes is located in the nucleus of the cell. It is bound to proteins to form a material known as chromatin. When a cell divides, it must start by organizing this whole mess. Chromatin then takes on a more compact form: chromosomes. Humans have 23 pairs of chromosomes; they look like 46 little rods. Cellular biologists have given each of the pairs a number. The first 22 pairs of chromosomes are called autosomes. The 23rd pair of chromosomes is different: it holds the sex chromosomes. In humans, there are two types of sex chromosomes: X and Y, which each contains information on the development of female and male genders. In females, the 23rd pair has two X chromosomes. In males, it has one X chromosome and one Y.

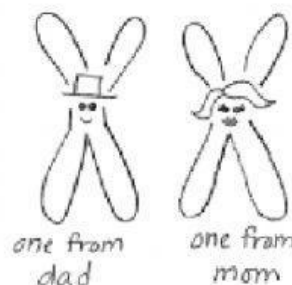
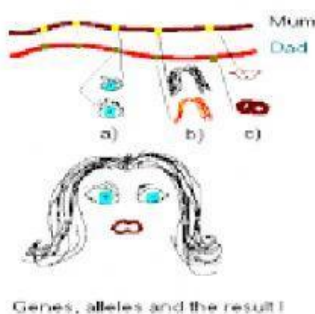
Procedure: Refer to the PowerPoint on this topic to answer the following questions:

1. What is a gene?

2. What are genes made of and what do they do?

3. Every person has two copies of each gene, one inherited from each parent. These two, almost identical genes are called _____ allele.

4. _____ alleles are forms of the same gene with small differences in their sequence of DNA bases because they come from two different people – your parents.



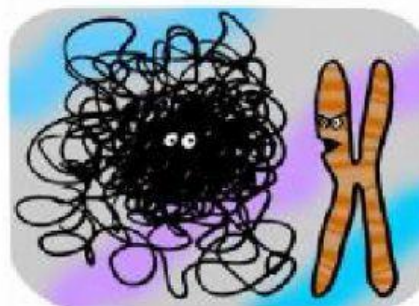
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5. The physical appearance of an organism, organisms traits such as size, shape, colour or behaviour is called a _____.

7. Phenotype describes the physical characteristics that we can see when we look at an organism, _____ type is hidden inside cells, inside the cells' nucleus, and can only be seen with a microscope.



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8. Chromosomes are thread-like structures made up of _____.

They are located inside the nucleus of animal and plant cells and can ONLY be seen under the microscope when the cells.

This can happen during: _____ and _____ . –

9. In human body cells (except gametes – egg and sperm) there are _____ chromosomes arranged in _____ pairs. 10.

Do all species have the same numbers of chromosomes in their cells? (Yes/No)

11. If each species has a different arrangement (make up) of chromosomes, how do these vary or how are they different?

12. In the diagram below fill out the missing words in the squares provided.

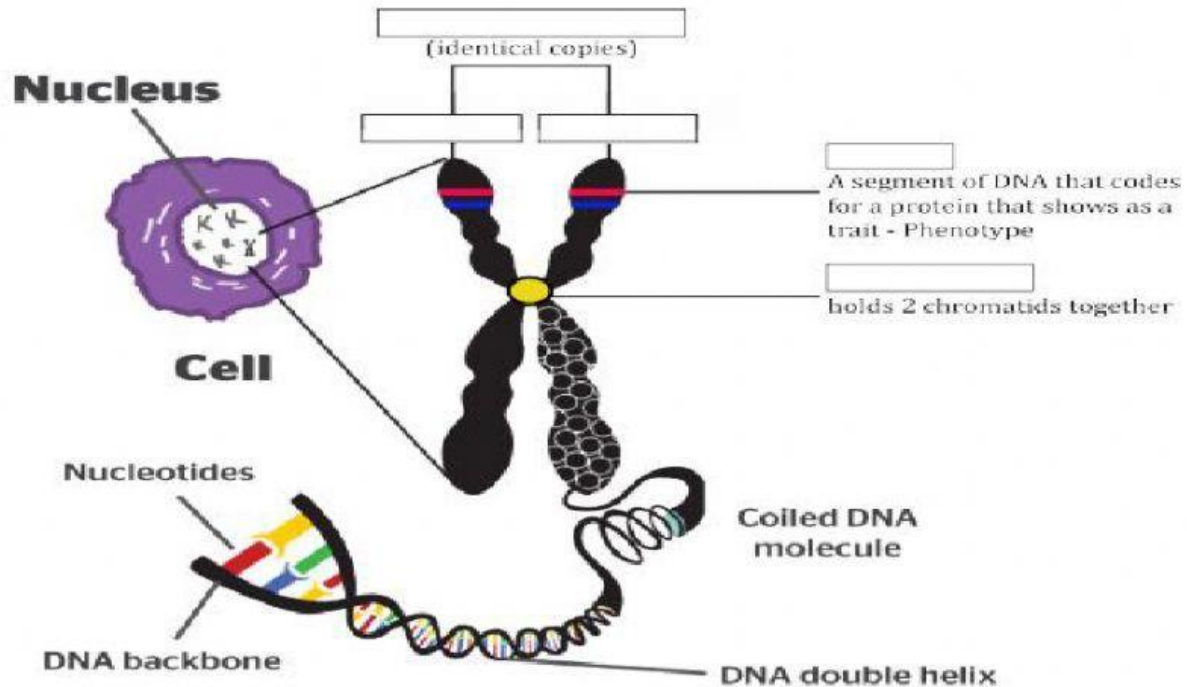


Figure: Credits to the owner (link cannot find)

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13. We already know that chromosomes come in pairs...



14. In what part of a cell would you find a chromosome?

15. All humans have pairs of non-sex chromosomes called _____, and _____ pair of sex chromosomes.

16. The combination of sex chromosomes distinguishes (tells apart) females from males. There are 2 types of sex chromosomes _____ and _____.

17. In females the sex chromosomes are the same/different (circle one). Females have _____ chromosomes.

18. In males the sex chromosomes are same/different (circle one). Males have an _____ and _____ chromosomes.

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