Heredity and Cell Division
(7.3.5, 7.3.6)

Focus question : Why is it important for cells to divide to create more cells? (Don't answer this question yet.)

1. Read the following to review and learn new information.

Heredity is the passing on of features from parents to offspring by means of **genes**. Organisms **inherit** genes from their parents.

GENES

Genes are carried on **DNA**. A **gene** is a section of DNA that causes the production of protein which is the production of the animal or plant part. (Living material is built up by proteins.)

DNA, GENES, AND CHROMOSOMES

DNA

DNA (deoxyribose nucleic acid) molecules are large and complex. They carry the genetic code that determines the characteristics of a living thing.

Except for identical twins, each person's DNA is unique. This is why people can be identified using DNA fingerprinting. DNA can be cut up and separated, forming a sort of "bar code" that is different from one person to the next.

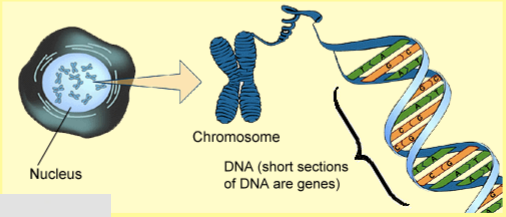
Genes

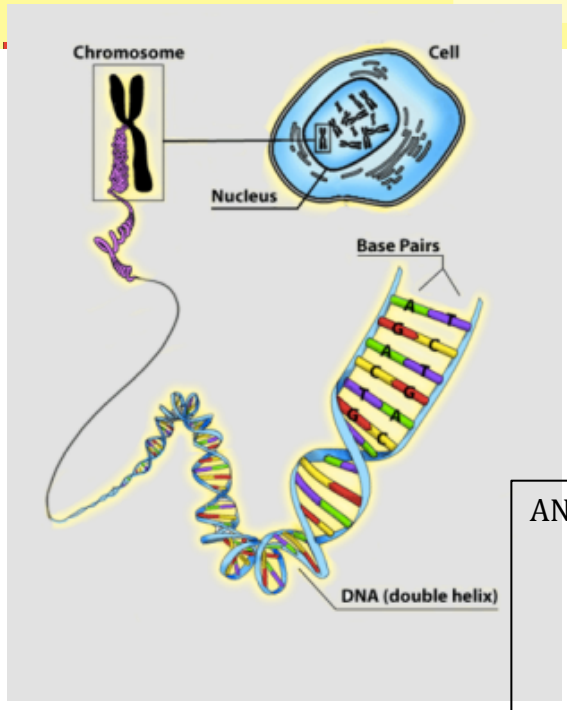
A gene is a short section of DNA. Each one codes for a specific protein by specifying the order in which amino acids must be joined together.

Chromosomes

The cell's nucleus contains chromosomes. Chromosomes are made up of protein and DNA. The protein **holds the DNA in a tightly packed shape place in the nucleus.** The DNA is very long and would not fit into the nucleus if this didn't occur. **Genes** are located on the DNA. They are placed in line. Some genes are close together and others are far apart from other genes. There are many parts of chromosome that contain no genes. In fact, about 97% of a chromosome of a human has no genes. These parts of the chromosomes between the 2 genes are called **non-coding protein sequences (**sometimes **called "junk DNA").**

The diagram shows the relationship between the cell, its nucleus, chromosomes in the nucleus and genes.





http://leavingbio.net/HEREDITY-ORDINARY%20LEVEL.htm
http://www.genomnz.co.nz/Science/Science/tabid/92/Default.asp

2. Examine the picture to the left. Using this and the information you just read answer the following:

What is the relationship between the following cell structures – nucleus, chromosomes, DNA and genes?

ANSWER:

3a. Watch the 3 videos on mitosis and meisosis. (The videos are right below where you downloaded this notes sheet.)

3b. Examine page 99 In the green "Indiana Science" textbook.(Looke for them in the front of the room.)

3c. Use the information you just learned to fill out the data table below. (You may add digital images you find on my website/the Internet, or draw your own NEATLY.)

Focus question: What happens before, during, and after mitosis?

PHASE/STEP		WHAT IS HAPPENING TO CHROMOSOMES	IMAGE/DRAWING OF PHASE/STEP
INTERPHASE			
MITOSIS	**PROPHASE**		
	METAPHASE		
	ANAPHASE		
	TELEPHASE		
	CYTOKINESIS		
And then the cell cycle starts over again with each new "daughter cell."			

Analysis questions:

4. What are the end results after ONE cell goes through mitosis?

ANSWER:

5. Why is it important for cells to divide to create more cells? Include an example.

ANSWER: