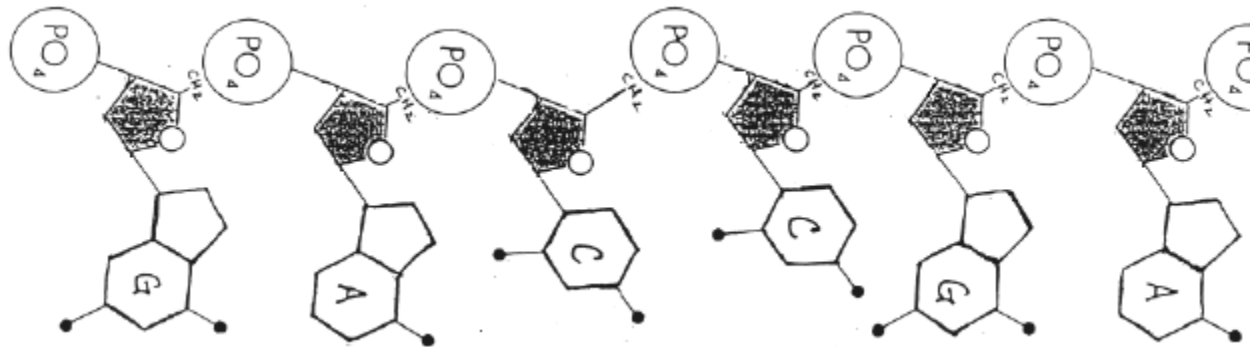


- Below is a strand of DNA. DNA in the cells exists as a double helix – what needs to be added to make it a double helix? Give the complementary nucleotide sequence.



- Describe the structure of DNA. What are the black pentagons?
- What are the nitrogen bases?
- What weak bonds hold the complementary bases together?
- If the strand of DNA above undergoes transcription, what will the sequence of mRNA be?
- After translation, what would the amino acid sequence be? (Use your codon chart found in your notes)
- What is a codon?

- Compare RNA and DNA in the following table

	RNA	DNA
Sugars		
Ribose		
Strands		
Where in the cell		
Function		

- What kind of bonds hold the amino acids together in the protein that is formed?

- What are the three types of RNA and what are their functions?

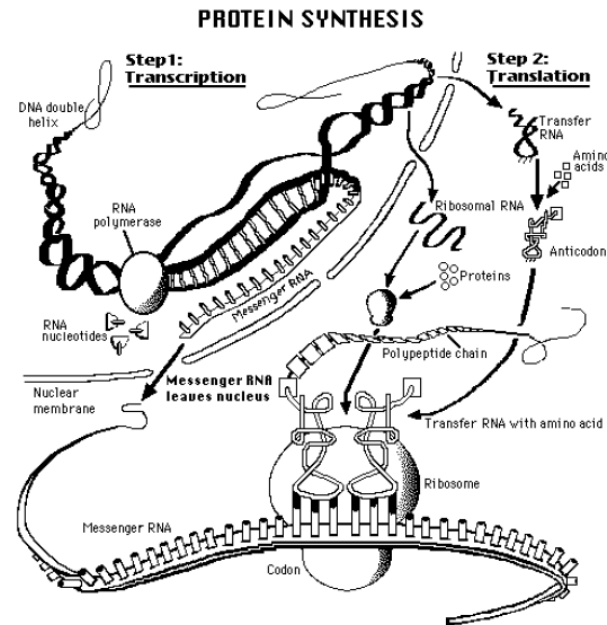
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- Describe the process of DNA replication.

- How many pieces of DNA are made?

- What does semi-conservative mean?

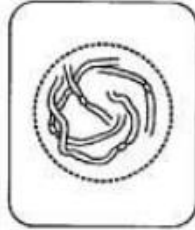
14. What is transcription?
15. What is translation?
16. What happens to DNA when a mutation occurs?
17. How does this affect the mRNA?
18. How can this affect translation?
19. How does this affect the structure and shape of the resulting protein?
20. Look at the diagram of the cell cycle in your notes.  
When does the replication of DNA occur? (What is this phase called?)
21. What are G1, S, and G2 all part of?
22. What stage does the cell spend most of its life in?  
What does the cell do during this time?
23. Does mitosis include cytokinesis (division of the cytoplasm)?
24. What is cancer? What are some causes of cancer?
25. Complete the following chart about Mitosis and Meiosis



	Mitosis	Meiosis
Type of reproduction (asexual or sexual)		
Chromosome number of mother cell (1N=haploid or 2N=diploid)		
Chromosome number of daughter cell (1N=haploid or 2N=diploid)		
Number of cell divisions		
Number of cells produced		
When does replication happen?		
<b>SOURCES OF VARIATION</b>		
Crossing Over		
Random Assortment of chromosomes		
Gene mutations		
Nondisjunction		
Fertilization		



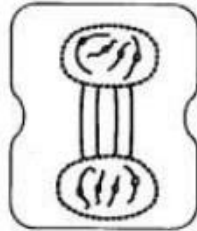
**A**



**B**



**C**



**D**



**E**

26. Put the stages of mitosis in order, then name them....

1<sup>st</sup>: \_\_\_\_\_ called \_\_\_\_\_  
 2<sup>nd</sup>: \_\_\_\_\_ called \_\_\_\_\_  
 3<sup>rd</sup>: \_\_\_\_\_ called \_\_\_\_\_  
 4<sup>th</sup>: \_\_\_\_\_ called \_\_\_\_\_

27. How many chromosomes do humans have in their...Body cells?  
 \_\_\_\_\_ Sex cells?  
 \_\_\_\_\_

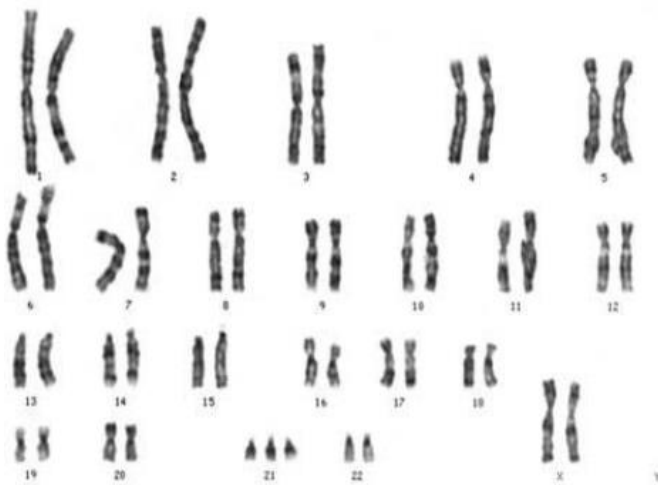
28. What does diploid mean?  
 29. What does haploid mean?  
 30. When does crossing over occur during Meiosis?

31. What is the major focus of Meiosis I?  
 32. What does it mean when a trait is dominant?  
 33. What does it mean when a trait is recessive?  
 34. In the Punnett square T= tall and t = short. What is the genotype of the parents?  
 35. What is the phenotype of the parents?  
 36. What are the genotypes and phenotypes of the offspring?  
 37. What is the genotypic ratio of the offspring?  
 38. What is the phenotypic ratio of the offspring?  
 39. What environmental factors might affect the expression of these genes for height?

	T	t
T	TT	Tt
t	Tt	tt

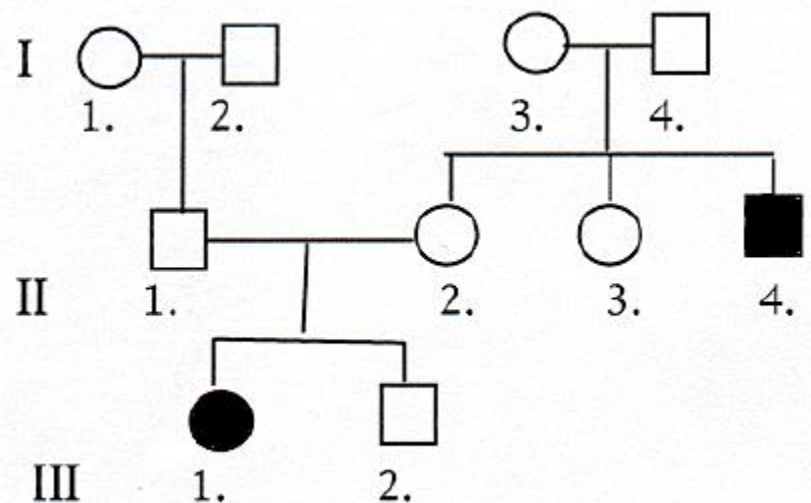
40. What does it mean if a trait is codominant?  
 41. Some genes experience incomplete dominance. Cross a pure breeding red flower (RR) with a pure breeding white flower (WW). Give the genotypes and phenotypes of the offspring.  
 42. If a woman with Type A blood has a child with a man with Type B blood and their first child has Type O blood, give the genotype of the woman and the man and do the cross. (Alleles are I<sup>A</sup>, I<sup>B</sup>, and i)  
 43. What are the odds that they will have a child with Type O blood again?  
 44. What are the odds that they will have a child with homozygous Type A?  
 45. What are the odds that they will have a child with Type AB?  
 46. A blood test is done to see if one of three men is the father of a child. The child has type O blood, the mother has type A blood. Man #1 has type AB blood, Man #2 has type A blood, Man #3 has type O blood. Are there any men that can be ruled out as the father? Explain.

47. What does it mean to have **multiple alleles**?
48. What does polygenic traits mean?
49. What are the sex chromosomes in males? Females?
50. **Colorblindness & hemophilia** are sex-linked traits. What chromosome location (#) are these genes found?
51. Cross a female who is a carrier for hemophilia with a normal male.
52. What are the odds that they will have a child with hemophilia?
53. What are the odds that they will have a daughter with hemophilia?
54. What are the odds that they will have a daughter who is a carrier for hemophilia?
55. Why are males more likely to show this type of disorder? (Who (mother/father) is likely to give them the bad gene?)



56. What is the gender of the person whose karyotype is shown to the left?
57. What is the disorder that this person has?
58. What is your evidence?
59. What are some of the characteristics of this type of disorder?

60. What is the inheritance pattern shown by this pedigree?
61. How do you know?
62. Using A,a, what is the genotype of person II4?
63. What is the genotype of person I3?
64. Explain Mendel's Law of Segregation of Alleles.
65. Explain Mendel's Law of Independent Assortment.
66. How does meiosis lead to segregation and independent assortment?



67. A brown mink crossed with a silver-blue mink produced all brown offspring. When these F<sub>1</sub> mink were crossed among themselves they produced 47 brown animals and 15 silver-blue animals (F<sub>2</sub> generation). Determine all the genotypes and phenotypes, and their relative ratios, in the F<sub>1</sub> and F<sub>2</sub> generations.