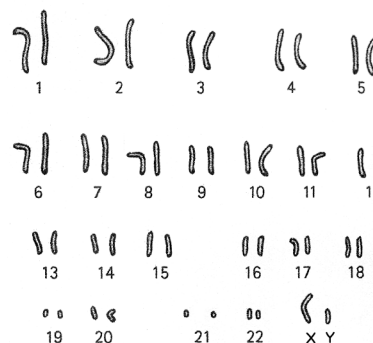
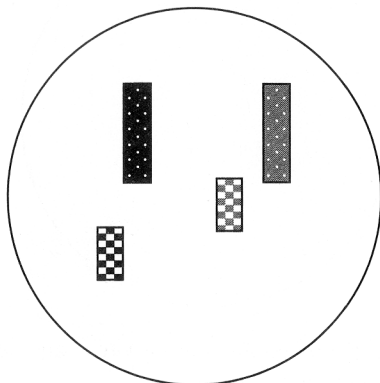


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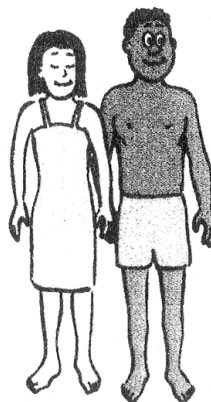
Chapter 5: DNA and Genes

Chromosomes

1. On the left are some chromosomes from a diploid cell. On the right are chromosomes from a human cell.



- How many chromosomes are in the diploid cell? _____
- After the diploid cell goes through meiosis, how many chromosomes will there be in the resulting cells? _____
- How many chromosomes are in the human cell? _____
- Two kinds of cells that are produced through meiosis in humans are _____ and _____.
- The human chromosomes above belong to one of the two people shown here. Circle the correct person.



- How do you know?

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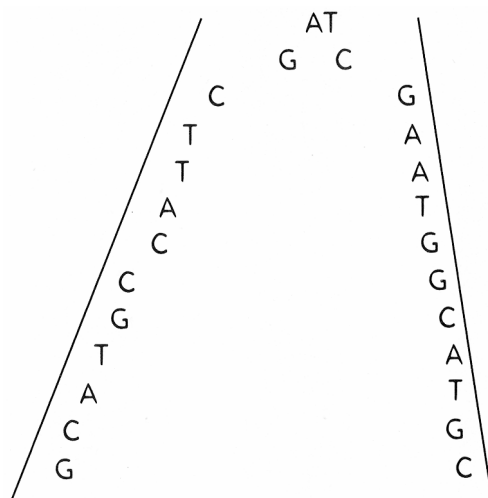
Chapter 5: DNA and Genes

DNA Replication

1. The following is a piece of DNA:

AT
GC
CG
TA
TA
AT
CG
CG
GC
TA
AT
CG
GC

The strand is unwound, so that the DNA can be replicated. Fill in the nucleotides on the new strands.



Jean's genes are mostly what make Jean Jean.

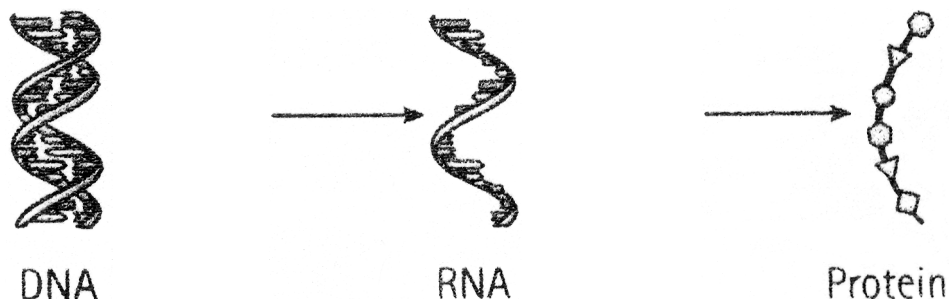


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Chapter 5: DNA and Genes

Transcription and Translation

1. The figure below shows how information from DNA is used to build a protein. Write the names of the appropriate processes above the arrows.



2. Transcription takes place in the cell's _____.

During transcription, DNA is used to make a molecule of _____.

3. If the following strand of DNA is transcribed, what are the nucleotides found on the transcript?

ATGGTCATACGTACAATG

4. Translation takes place in the cell's _____. Translation is performed by organelles called _____.

5. Divide the transcript from your answer to Question 3 into codons. Then, figure out the sequence of amino acids that is assembled in the ribosome. Use the genetic code table on the next page.

Transcript _____

Codons _____

Amino acids _____



Conceptual Biology

Chapter 5: DNA and Genes

Transcription and Translation— continued



		Second base					
		U	C	A	G		
First base U	UUU } Phenylalanine UUC } (Phe)	UCU } Serine UCC } (Ser)	UAU } Tyrosine UAC } (Tyr)	UGU } Cysteine UGC } (Cys)	U		U
	UUA } Leucine UUG } (Leu)	UCA } Serine UCG } (Ser)	UAA Stop UAG Stop	UGA Stop UGG Tryptophan (Trp)	C		C
					A		A
					G		G
First base C	CUU } Leucine CUC } (Leu)	CCU } Proline CCC } (Pro)	CAU } Histidine CAC } (His)	CGU } Arginine CGC } (Arg)	U		U
	CUA } Leucine CUG } (Leu)	CCA } Proline CCG } (Pro)	CAA } Glutamine CAG } (Gln)	CGA } Arginine CGG } (Arg)	C		C
					A		A
					G		G
First base A	AUU } Isoleucine AUC } (Ile)	ACU } Threonine ACC } (Thr)	AAU } Asparagine AAC } (Asn)	AGU } Serine AGC } (Ser)	U		U
	AUA } Isoleucine AUG Met or start	ACA } Threonine ACG } (Thr)	AAA } Lysine AAG } (Lys)	AGA } Arginine AGG } (Arg)	C		C
					A		A
					G		G
First base G	GUU } Valine GUC } (Val)	GCU } Alanine GCC } (Ala)	GAU } Aspartic GAC } acid (Asp)	GGU } Glycine GGC } (Gly)	U		U
	GUA } Valine GUG } (Val)	GCA } Alanine GCG } (Ala)	GAA } Glutamic GAG } acid (Glu)	GGA } Glycine GGG } (Gly)	C		C
					A		A
					G		G

Conceptual Biology

Chapter 5: DNA and Genes

Genetic Mutations

1. Define the following terms:

Genetic mutation _____

Point mutation _____

Nonsense mutation _____

Frameshift mutation _____

2. Translate the following mRNA sequence into amino acids. You can use the genetic code table on the back of this page.

AAU GUC CCG ACC AAA GCU

3. What point mutation in the sequence above could cause the substitution of the amino acid serine for asparagine?

4. How could a change in a single nucleotide in the sequence above result in a nonsense mutation?

5. The insertion or deletion of one or two nucleotides causes a frameshift mutation. Why doesn't the insertion or deletion of three nucleotides cause a frameshift mutation as well?

Name _____ Class _____ Date _____

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		Second base					
		U	C	A	G		
First base	U	UUU } Phenylalanine UUC } (Phe)	UCU } UCC } Serine UCA } (Ser)	UAU } Tyrosine UAC } (Tyr)	UGU } Cysteine UGC } (Cys)	U	Third base
		UUA } Leucine UUG } (Leu)	UCG }	UAA } Stop UAG } Stop	UGA } Stop UGG } Tryptophan (Trp)	C	
	C	CUU } CUC } Leucine CUA } (Leu)	CCU } CCC } Proline CCA } (Pro)	CAU } Histidine CAC } (His)	CGU } CGC } Arginine CGA } (Arg)	A	
		CUG }	CCG }	CAA } Glutamine CAG } (Gln)	CGG }	G	
First base	A	AUU } AUC } Isoleucine AUA } (Ile)	ACU } ACC } Threonine ACA } (Thr)	AAU } Asparagine AAC } (Asn)	AGU } Serine AGC } (Ser)	U	Third base
		AUG } Met or start	ACG }	AAA } Lysine AAG } (Lys)	AGA } Arginine AGG } (Arg)	C	
	G	GUU } GUC } Valine GUA } (Val)	GCU } GCC } Alanine GCA } (Ala)	GAU } Aspartic GAC } acid(Asp)	GGU } GGC } Glycine GGA } (Gly)	A	
		GUG }	GCG }	GAA } Glutamic GAG } acid (Glu)	GGG }	G	