

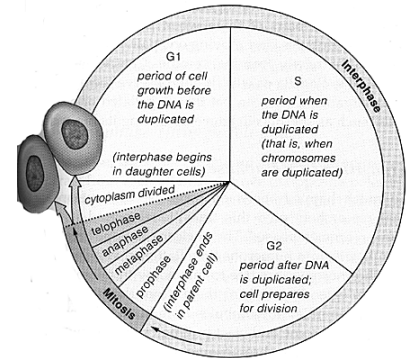
EOC Review Part 4

Continuity of Life

Cell Cycle

Look at the diagram of the cell cycle. When does the duplication of DNA occur? What is this phase called?

Interphase (S phase - synthesis)



What do G1 and G2 represent?

G1 = duplication of organelles and molecules needed for cell division

G2 = check for errors

Does mitosis include cytokinesis (division of the cytoplasm)?

no

What is cancer?

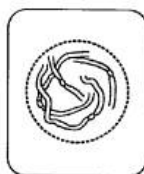
Cells that divide uncontrollably and infiltrate surrounding tissues.

Compare the characteristics between mitosis and meiosis:

	MITOSIS	MEIOSIS
Type of reproduction (asexual or sexual)?	Asexual	Sexual
Chromosome number of parent cell (1N=haploid or 2N=diploid)	2N	2N
Chromosome number of daughter cells (1N=haploid or 2N=diploid)	2N	1N
Number of cell divisions	1 division	2 divisions
Number of cells produced	2	4
When does replication happen?	Interphase	Interphase



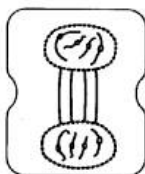
A



B



C



D



E

Put the following stages of the cell cycle (mitosis) in order, then name them.

B (Interphase), C (Prophase), E (Metaphase), A (Anaphase), D (Telophase)

How many chromosomes do humans have in...

Body cells? **46 (23 pairs)**

Sex cells? **23**

What does diploid mean? What does haploid mean?

Diploid = Having two copies of every gene/chromosome; haploid = having one copy

During meiosis, when does crossing over take place?

Prophase I

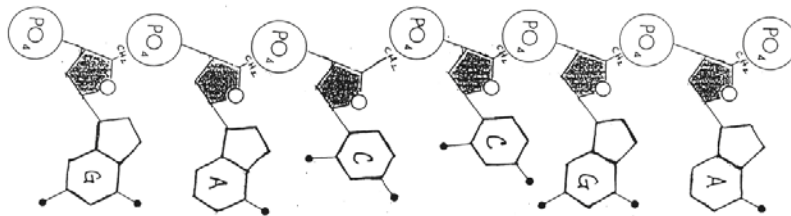
DNA and Protein Synthesis

Describe the structure of the DNA molecule (its shape, what it's made of).

Double helix with a backbone alternating between sugar (deoxyribose) and phosphate. The nitrogenous bases (A,T,G,C) on the two strands are bound to one another via hydrogen bonds (A w/ T; G w/ C).

For the single DNA strand below, what do the black pentagons represent?

Deoxyribose



What kinds of bonds hold the complementary bases together?

Hydrogen bonds

Why is it important that these bonds be weak?

They need to be broken for replication and transcription

For the above DNA strand, write the complementary DNA nucleotide sequence.

CTGGCT

If the DNA strand above undergoes transcription, what will the sequence of the mRNA be?

CUGGCU

What is a codon?

3 mRNA bases that code for a specific amino acid

Compare RNA and DNA in the following table.

	RNA	DNA
Sugar	Ribose	Deoxyribose
Bases	A U G C	A T G C
Strands	Single stranded	Double stranded
Location in cell	Nucleus and cytoplasm	Nucleus
Function(s)	mRNA- carry the genetic code to the ribosome; tRNA - carry amino acids to ribosome rRNA - read code and connect amino acids in order	Store genetic information; passed from generation to generation

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

Peptide bonds (covalent)

What happens to DNA when a mutation occurs?

The code is changed (different bases are in the DNA strand)

How does this affect the mRNA?

Bases in mRNA will be different

How can this affect translation?

This may mean a different amino acid is in the protein strand

How does this affect the structure and shape of the resulting protein?

This may change the shape of the protein so that it doesn't function properly