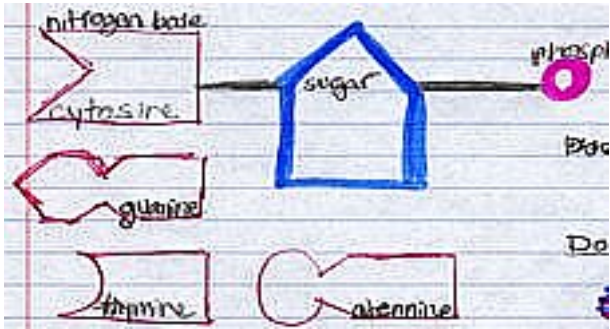

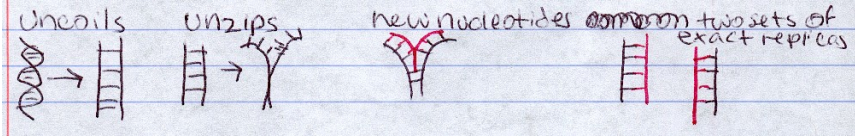
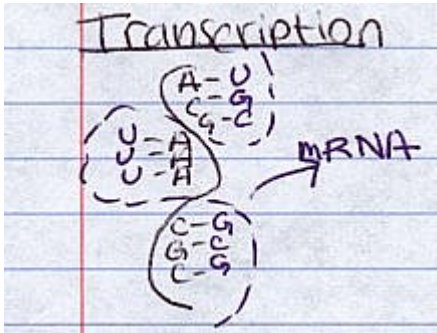
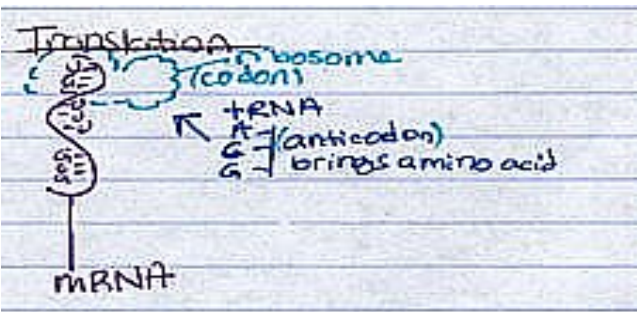


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<p>What are nucleic acids?</p>	<p>The largest organic molecules. "Master organisms," they are in control of cell functions. They are found in all living organisms, and they are two types of them- DNA and RNA. They are made up of four nucleotides.</p>	
<p>Compare DNA to RNA.</p>	<p>Deoxyribonucleic acid</p>	<p>Ribonucleic acid</p>
	<p>Double helix</p>	<p>Alpha helix</p>
	<p>Sugar base- deoxyribose</p>	<p>Sugar base- ribose</p>
	<p>A-T C-G</p>	<p>A-U C-G</p>
<p>What is the structure of a nucleotide?</p>	<p>A nitrogen base (ATCG/AUCG) connected to a sugar and a phosphate.</p> 	
<p>What is the structure of a DNA molecule?</p>		<p>A twisted ladder/double helix. The uprights are made up of phosphates bonded to sugars, and the nitrogen bases (A-T, C-G) are held together by hydrogen bonds.</p>
<p>What is DNA responsible for? What can DNA do?</p>	<ol style="list-style-type: none"> 1. One's characteristics 2. One's heredity 3. All cellular activities 4. Make copies of itself 5. Be passed from one cell to the next 6. Be incorporated into another DNA molecule 	
<p>Why does DNA replication occur?</p>	<p>So each daughter cells has a complete set of DNA.</p>	
<p>How does DNA replication occur?</p>	 <p>DNA uncoils and unzips. Each side is used as a template, and new</p>	

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	<p>nucleotides come in, from food, to complete each side.</p>
<p>What is the purpose of RNA?</p>	<p>RNA is used in protein synthesis, which happens in the nucleus. DNA is too large to escape the nuclear pores, so it sends out single-stranded RNA as messengers.</p>
<p>What is transcription?</p>	<p>DNA is uncoiled but not flattened. Complementary (opposite) strands of RNA are formed. DNA recoils and RNA leaves the nucleus via the pores.</p> 
<p>What is translation?</p>	<p>There are 20 amino acids, each represented by 3-nucleotide “words,” called codons. There are 61 words, and some amino acids have up to 6 synonyms. Three codons signify “stop”. During translation, the ribosomes read the RNA. They latch on to the mRNA, codon by codon. tRNA, the anti-codon, brings amino acids. It bonds onto the mRNA codon to ascertain that the order is correct, and then bonds the approved amino acids together (peptide bonds).</p> 
<p>What is a gene?</p>	<p>The information between the start and stop codons.</p>

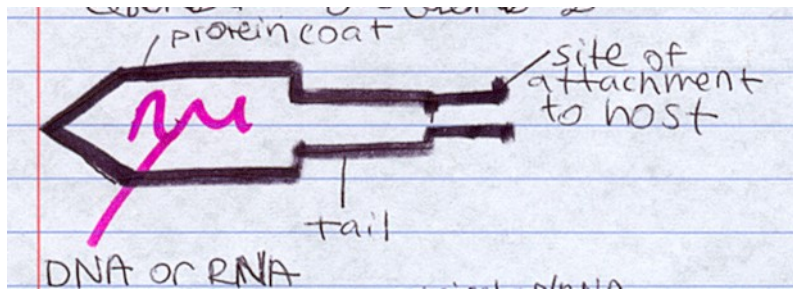
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<p>What is the “One Gene, One Polypeptide” hypothesis?</p>	<table border="1" data-bbox="613 306 1464 556"> <tr> <td>Gene 1</td> <td>Gene 2</td> <td>Gene 3</td> </tr> <tr> <td>mRNA 1</td> <td>mRNA 2</td> <td>mRNA 3</td> </tr> <tr> <td>Enzyme 1</td> <td>Enzyme 2</td> <td>Enzyme 3</td> </tr> <tr> <td>converts substance A->B</td> <td>converts substance B->C</td> <td>converts substance C>D</td> </tr> <tr> <td></td> <td></td> <td>final protein</td> </tr> </table> <p>According to this hypothesis, all cellular functions are controlled by genes, and all problems can be attributed to genes. If, for example, there was a mutation in gene 2, then substance B would not be converted correctly to substance C, and the cell would have a problem.</p>	Gene 1	Gene 2	Gene 3	mRNA 1	mRNA 2	mRNA 3	Enzyme 1	Enzyme 2	Enzyme 3	converts substance A->B	converts substance B->C	converts substance C>D			final protein
Gene 1	Gene 2	Gene 3														
mRNA 1	mRNA 2	mRNA 3														
Enzyme 1	Enzyme 2	Enzyme 3														
converts substance A->B	converts substance B->C	converts substance C>D														
		final protein														
<p>What is a a mutation?</p>	<p>When something goes wrong in DNA replication.</p>															
<p>What is a chromosome mutation?</p>	<p>Chromosome: a structure that houses DNA</p> <ol style="list-style-type: none"> 1. Duplication- too many chromosomes 2. Deletion- too few chromosomes; parts missing 3. Inversion- DNA breaks off, turns around, and reconnects 															
<p>What is a gene mutation?</p>	<ol style="list-style-type: none"> 1. Duplication/addition- results in “frame shift”- triplets move over 2. Substitution (A/A/T-A/C/T) 3. Inversion (A/T/G-G/T/A) 4. Deletion- results in “frame shift” 															
<p>What causes mutations? (Mutagen- causes mutation)</p>	<ol style="list-style-type: none"> 1. Chemicals 2. Radiation <ul style="list-style-type: none"> ● X-rays ● UV rays <ul style="list-style-type: none"> ○ Causes skin cancers <ul style="list-style-type: none"> ■ Basil cell ■ Squamous cell ■ Melanoma 3. Heat 															
<p>What are the characteristics of viruses?</p>	<p>Noncellular Have no parts Don't use energy No normal cell processes Reproduce, but not alone Made up of proteins and nucleic acids (only one type) Alive Parasitic to bacteria, plants, and animals</p>															
<p>What is symbiosis?</p>	<p>A relationship between two organisms.</p> <ol style="list-style-type: none"> 1. Mutualism- two organisms help each other 2. Commensalism- one organism benefits and the other doesn't 															

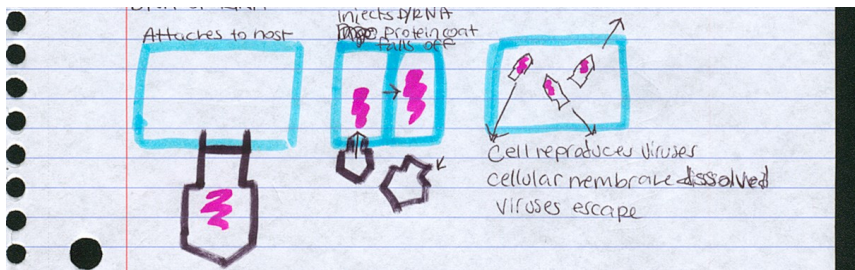
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care
3. Parasitism- host is harmed or killed

What is the structure of viruses?



How do viruses reproduce?
(Lysis)



A phage (virus) attaches to a host organism. It injects DNA (or RNA), and the protein coat falls off. The D/RNA tells the cell to reproduce viruses, and dissolves the cellular membrane from the inside; the cell bursts and they are released.

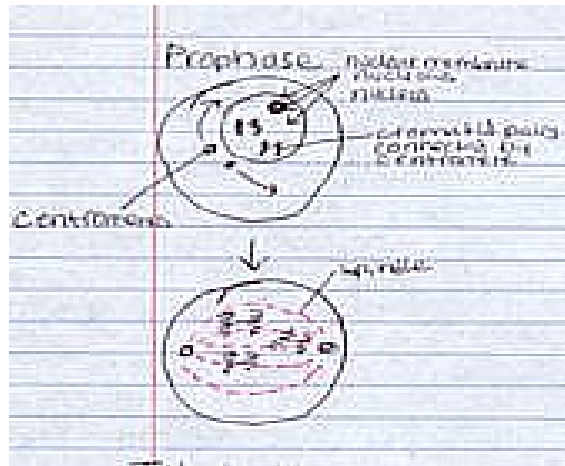
What?	Mitosis (cell division)	Meiosis
When?	Conception until "death" In individual cells, after growth.	F: From 3 months pre-natal until menopause M: From puberty until death
Why?	1. Growth 2. Repair/maintenance 3. Reproduction <ul style="list-style-type: none"> ● Unicellular organisms <ul style="list-style-type: none"> ○ Bacteria ○ Algae ○ Protozoa 	To produce gametes Egg and sperm Haploid cells (n) Monoploid cells

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	<ul style="list-style-type: none"> • Multicellular organisms <p>To increase the surface area: volume ratio of a cell.</p>	
Whom?	All cellular organisms	All sexually reproducing organisms
Where?	Everywhere (not kidneys after adulthood)	All gonads <ul style="list-style-type: none"> • Ovaries • Testes
What?	Somatic cells- body cells-diploid cells- 2n	2n cells
Diagram	<p>The diagram shows a single cell labeled '2n' at the top. An arrow labeled 'DNA replication' points down to two daughter cells, each labeled '2n'.</p>	<p>The diagram shows a 2n cell at the top. An arrow labeled 'DNA replication' points down to another 2n cell. From there, two paths emerge: 'spermatogenesis' and 'oogenesis'. Spermatogenesis leads to four sperm cells (n). Oogenesis leads to one large ovum (n) and three small polar bodies (n).</p>
What are the two parts of mitosis?		<ol style="list-style-type: none"> 1. Mitosis- separation of the nucleus- must be exact 2. Cytokinesis- separation of the cytoplasm
What is interphase?		<p>Definite nucleus and nucleolus, DNA is chromatin, DNA has been replicated.</p> <p>Divided into G₁, S (replication), and G₂ phases.</p>
What is prophase?		<ul style="list-style-type: none"> • Nucleus, nuclear membrane, nucleoli dissolves • Chromatin condenses into chromatids (replicated "sisters")

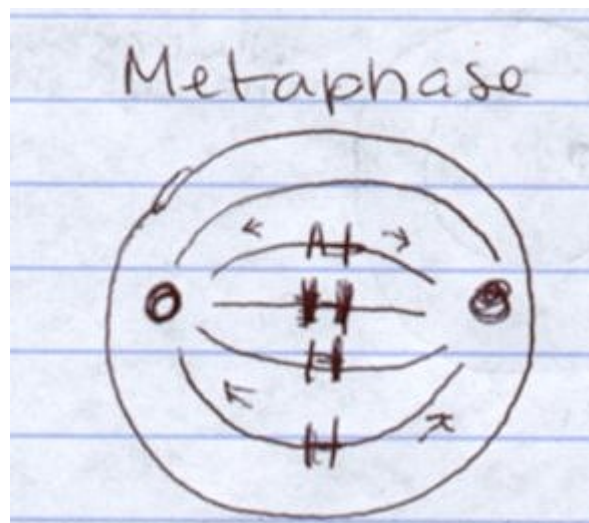
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- In animal cells, centrioles begin to migrate to poles of cell.
- The spindle apparatus forms and attaches to the centromeres.



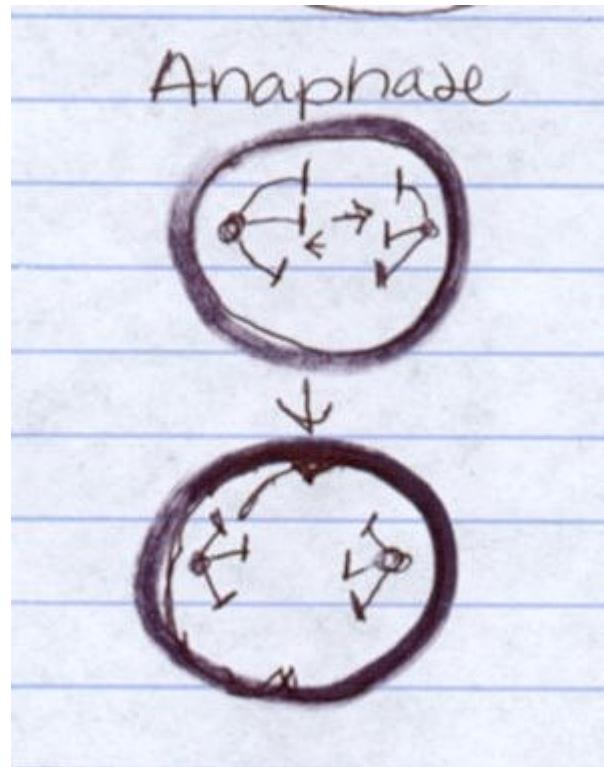
What is metaphase?

- All the chromatids line up at the equator of the cell
- Centromeres are replicated, making each chromatid a chromosome
- The centromeres attach to the spindle



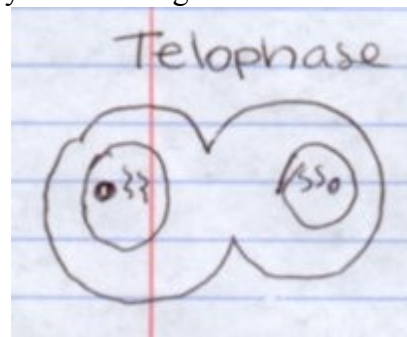
What is anaphase?

- The chromosomes are pulled apart and taken to the poles



What is telophase?

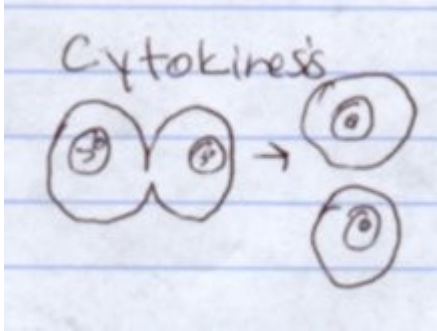
- Chromosomes are pulled to the poles and form chromatin
- Nucleus, nuclear membrane, nucleoli re-form
- Spindle disappears
- Cytokinesis begins



What is cytokinesis?

The division of the cytoplasm and organelles into two daughter cells.

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	<p>Animals- A cleavage furrow forms and the two cells are “pinched” apart. Plants- A cell plate forms between the two daughter cells</p>  <p>The diagram, titled 'Cytokinesis', shows two circular cells on the left with a narrow neck between them. An arrow points to the right, where two separate circular cells are shown, representing the final stage of cell division.</p>
<p>What is meiosis?</p>	<p>The process by which gametes are formed. Basically, the cell goes through mitosis, then divides again, this time without DNA replication.</p>
<p>What is chromatin?</p>	<p>Granular genetic material spread throughout the nucleus.</p>
<p>What is a chromatid?</p>	<p>One of two identical “sister” parts of a replicated chromosome. Chromatid pairs are held together by a centromere.</p>
<p>What are chromosomes?</p>	<p>A distinct, threadlike structure containing genetic material. This is used to pass genetic material from one generation to the next.</p>
<p>What is a diploid cell?</p>	<p>A cell that contains two sets of chromosomes, one from each parent.</p>
<p>What is a haploid cell?</p>	<p>A cell that only has a single set of chromosomes.</p>
<p>What is a monoploid cell?</p>	<p>A haploid cell.</p>