**Pre-AP Cell Division Test Review**

*Refer to the following questions and vocabulary to help you to review for the test.*

* Required vocabulary: spindle, centrioles, synapsis, tetrad, homologous chromosomes, furrow, cell plate, cyclins, tumor, malignant, benign, crossing over, haploid/ diploid, somatic, gametes, sperm, ovum, egg, fertilization, zygote, genetic variation, sex chromosomes, autosomes, “n”, “2n”, chromosome, chromatin, chromatid, cleavage furrow, spermatogenesis, oogenesis, nondisjunction, and gene
* Why do cells divide in unicellular organisms?
* Why do cells divide in multicellular organisms?
* State 3 differences between asexual and sexual reproduction.
	+ Give an example of an organism that engages in each.
	+ What is an advantage of sexual reproduction?
	+ What is an advantage of asexual reproduction?
* What is cell division?
	+ What are the 3 types?
	+ How do they differ?
	+ Give an example of an organism that engages in each.
* What is binary fission?
	+ Which organism relies on this?
	+ How does the daughter cell compare to the parent cell?
	+ What type of reproduction is it- sexual or asexual?
		- Why?
* What are chromosomes made of?
	+ How many are present in the human cell?
	+ When do they first become visible in the cell?
	+ When not visible, DNA is in the form of?
	+ Draw a chromosome and label all the parts.
	+ How many chromosomes are present in a somatic cell?
		- Is a somatic cell 2*n* or *n*?
	+ How many chromosomes are present in a gamete?
		- Is a gamete 2*n* or *n*?
* What is the cell cycle?
	+ What are the types of organisms that engage in the cell cycle?
	+ What are the 2 major steps?
	+ How many total phases are there?
	+ Cells spend most of their time in which of the 2 basic phases?
	+ What is the sequence of the phases?
	+ What is Interphase?
		- At this point, DNA is in the form of what (or named what)?
		- What are the phases that make up Interphase and what happens during each?
		- During which phase is there double the amount of genetic material?
	+ How is mitosis different from Interphase?
	+ What are the phases in mitosis?
		- Draw each and label the structures- nuclear membrane, centrioles, chromatid, centromere, and spindles.
			* Which organelle is missing in plant cells?
		- Which phase of mitosis is the longest?
		- Which phase of mitosis is the shortest?
		- Which phase is the first time that chromosomes become visible?
		- Which phase represents the end of mitosis?
	+ What happens during cytokinesis?
		- How is cytokinesis different in animal and plant cells? State 2 reasons.
		- How does the daughter cell compare to the parent cell?
		- How many chromosomes are present in each cell?
			* Are cells diploid or haploid?
		- How many total cells are produced?
* How is cell division controlled?
	+ What happens when a cell comes in contact with another cell?
	+ Why do cancer cells continue growing even though they touch another cell?
	+ What is the name of the gene that is defective in cancer cells?
* How does the environment (internal and external) affect cells?
* What is a mutagen?
	+ Give examples of 3 mutagens.
	+ How does a benign tumor differ from a malignant tumor?
	+ What are the 2 basic treatments for cancer?
	+ How do these treatments differ and which is most effective?
* What is cell differentiation/ specialization?
	+ What are stem cells?
	+ How does the DNA in various specialized cells in a human compare? Is it the same or different?
	+ What determines whether a cell will become specialized?
* What is meiosis?
	+ Is this an example of a process used by organisms that engage in sexual or asexual reproduction?
	+ How many total cells are produced from meiosis?
	+ What types of cells are produced- somatic or gametes?
	+ Where does meiosis occur in a human male and female?
	+ In humans, how many chromosomes are in each?
		- Is each cell diploid or haploid?
	+ Are chromosomes in pairs in the gametes at the end of meiosis?
	+ How does the genetic information in each cell compare?
* What are the main stages in Meiosis?
	+ Which stage is similar to Mitosis?
		- Why?
	+ State all the stages in meiosis.
		- What happens during each stage?
* What are homologous chromosomes?
	+ What is a tetrad?
	+ What is synapsis?
	+ How many chromatids are in a tetrad?
	+ What is crossing over?
		- What is the result of crossing over on genetic variation?
	+ What happens to the genetic information in crossing over?
	+ During which stage of meiosis does crossing over take place?
	+ How many egg cells are produced at the end of meiosis?
		- What is the term for the process that produces egg cells (ova)?
	+ How many sperm cells are produced at the end of meiosis?
		- What is the term for the process that produces sperm cells?
* How does meiosis differ from mitosis? State 3 ways.
* For a mutation to be passed on to offspring, the mutation must be present in which type of cell- somatic or gamete?
* What happens when sperm and ova meet?
	+ What happens to the number of chromosomes during this process?
* Do genes or chromosomes sort independently?
* What is nondisjunction?
	+ What is the effect?
	+ How does the presence of an extra or one less chromosome affect protein synthesis?