**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?