**AP BIOLOGY (WHEATLEY)**

**MAKING NEW CELLS AND ORGANISMS UNIT GUIDE 2015**

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| **MONDAY** | **TUESDAY** | **WEDNESDAY** | **THURSDAY** | **FRIDAY** |
| **2/29**  \*Mitosis webquest - **due**  **at the end of the**  **period** | **3/1**  \*Mitosis lab – **due at the**  **end of the period** | **3/2**  \*Cell cycle regulation  POGIL | **3/3**  \*Cell cycle regulation  POGIL | **3/4**  \*Cancer part 1 |
| **3/7**  \*Cancer part 2 **– both**  **parts are due 3/8** | **3/8**  \*Meisois webquest **– due**  **at the end of the**  **period** | **3/9**  \*Meiosis POGIL | **3/10**  \*Pipecleaner babies –  **due 3/11** | **3/11**  \*Animal Development |
| **3/21**  \*Plant reproduction | **3/22**  \*Inheritance POGIL | **3/23**  \*Mendelian genetics  practice – **due at the**  **end of the period** | **3/24**  \*Non-Mendelian genetics  practice – **due at the**  **end of the period** | **3/25**  **NO SCHOOL** |
| **3/28**  \*Chi-square lab – **due at**  **the end of the period** | **3/29**  \*Karyotyping activity –  **due at the end of the**  **period** | **3/30**  \*Genetic counseling  activity | **4/1**  **REVIEW FOR TEST** | **4/2**  **MAKING NEW CELLS AND ORGANISMS TEST** |

Supplemental Resources:

1. Bozeman Science Videos
   1. Mitosis
   2. Meiosis
   3. Cell cycle, mitosis and meiosis
   4. Development: timing and coordination
   5. Animal development
   6. Plants
2. Crash Course Videos
   1. Mitosis: splitting up is tough
   2. Meiosis: where the sex starts
   3. The sex lives of nonvascular plants: alternation of generations
   4. The plants and the bees: plant reproduction

Reading: Read Chapters 8, 9, and 27 and answer the prompts below.

A. Connections Between Cell Division and Reproduction

8.1 Compare the parent-offspring relationship in asexual and sexual reproduction.

8.1 Explain why cell division is essential for prokaryotic and eukaryotic life.

8.2 Explain how daughter prokaryotic chromosomes are separated from each other during binary fission.

B. The Eukaryotic Cell Cycle and Mitosis

8.3 Compare the structure of prokaryotic and eukaryotic chromosomes.

8.4 Describe the stages of the cell cycle. Identify when DNA is replicated, chromosomes are sorted, and two new cells are formed.

8.5 List the phases of mitosis and describe the events characteristic of each phase. Recognize the phases of mitosis from diagrams and micrographs.

8.6 Compare cytokinesis in animal and plant cells.

8.7–8.8 Explain how anchorage, cell density, and chemical growth factors control cell division.

8.9 Explain how cancerous cells are different from healthy cells. Distinguish   
between benign and malignant tumors, and explain the strategies behind some common cancer treatments.

8.10 Describe the functions of mitosis.

C. Meiosis and Crossing Over

8.11 Explain how chromosomes are paired. Distinguish between autosomes and sex chromosomes.

8.12 Distinguish between somatic cells and gametes and between diploid cells and haploid cells.

8.12 Explain why sexual reproduction requires meiosis.

8.13 List the phases of meiosis I and meiosis II and describe the events characteristic of each phase. Recognize the phases of meiosis from diagrams and micrographs.

8.14 Describe the similarities and differences between mitosis and meiosis. Explain how the result of meiosis differs from the result of mitosis.

8.15–8.17 Explain how independent orientation of chromosomes at metaphase I, random fertilization, and crossing over contribute to genetic variation in sexually reproducing organisms.

D. Alterations of Chromosome Number and Structure

8.18 Explain how and why karyotyping is performed.

8.19 Describe the causes and symptoms of Down syndrome.

8.20 Define nondisjunction, explain how it can occur, and describe what can result.

8.21 Describe the consequences of abnormal numbers of sex chromosomes.

8.22 Explain how new species form from errors in cell division.

8.23 Describe the main types of chromosomal changes. Explain why cancer is not usually inherited.

E. Asexual and Sexual Reproduction

27.1–27.2 Compare the types, advantages, and disadvantages of asexual and sexual   
reproduction.

F. Principles of Embryonic Development

27.9 Relate the structure of sperm to its role in fertilization. Describe the mechanisms that prevent more than one sperm from fertilizing an egg and that prevent hybridization between different species.

27.10 Describe the process and results of cleavage. Explain how identical and   
nonidentical twins form.

27.11 Describe the process of gastrulation and the resulting arrangement of the   
embryo.

27.12 Explain how organs form after the development of a gastrula.

27.13 Explain how changes in cell shape, induction, cell migration, and apoptosis   
contribute to development.

G. **Mendel’s Laws**

9.2 Explain why Mendel’s decision to work with peas was a good choice. Define and distinguish between true-breeding organisms, hybrids, the P generation, the F1 generation, and the F2 generation.

9.3 Define and distinguish between the following pairs of terms: homozygous and heterozygous; dominant allele and recessive allele; genotype and phenotype. Also, define a monohybrid cross and a Punnett square.

9.3 Explain how Mendel’s law of segregation describes the inheritance of a single characteristic.

9.4 Describe the genetic relationships between homologous chromosomes.

9.5 Explain how Mendel’s law of independent assortment applies to a dihybrid cross. Illustrate this law with examples from Labrador retrievers and Mendel’s work with peas.

9.6 Explain how a testcross is performed to determine the genotype of an organism.

9.7 Explain how and when the rule of multiplication and the rule of addition can be used to determine the probability of an event. Explain why Mendel was wise to use large sample sizes in his studies.

9.8 Explain how family pedigrees can help determine the inheritance of many   
human traits.

9.9 Explain how recessive and dominant disorders are inherited. Provide examples of each.

9.10 Compare the health risks, advantages, and disadvantages of the following forms of fetal testing: amniocentesis, chorionic villus sampling, and ultrasound imaging. Describe the ethical dilemmas created by advances in biotechnology   
discussed in this chapter.

Variations on Mendel’s Laws

9.11–9.15 Describe the inheritance patterns of incomplete dominance, multiple alleles, codominance, pleiotropy, and polygenic inheritance. Provide an example of each.

9.13 Explain how the sickle-cell allele can be adaptive.

9.14–9.15 Explain why human skin coloration is not sufficiently explained by polygenic inheritance.

The Chromosomal Basis of Inheritance

9.16 Define the chromosome theory of inheritance. Explain the chromosomal basis of the laws of segregation and independent assortment.

9.17 Explain how linked genes are inherited differently from nonlinked genes.

Sex Chromosomes and Sex-Linked Genes

9.21–9.22 Describe patterns of sex-linked inheritance, noting examples in fruit flies and humans.

9.22 Explain why sex-linked disorders are expressed more frequently in men than in women.