Biology 003 Tutorial Worksheets

Tutorial #2: "Heredity and Life Cycles"
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1.) Define the following terms

    allele -

    alternation of generations -

    asexual reproduction -

    autosomes -

    chiasmata -

    chromosome -

    clone -

    crossing over -

    diploid cell -

    fertilization -

    fission -

    gamete -

    gametophyte -

    genes -

    haploid cell -

    homologous chromosomes -

    independent assortment -

    karyotype -

    life cycle -

    locus -

meiosis -

recombination -

sex chromosomes -

sexual reproduction -

somatic cell -

spore -

sporophyte -

syngamy -

zygote –

2.) Compare and contrast asexual and sexual reproduction.

<u>Asexual</u>   <u>Sexual</u>

3.) What is a major advantage of sexual reproduction?

4.) Chromosomes, genes, and alleles are sometimes confused. Draw a pair of homologous chromosomes complete with labels that will distinguish between genes and alleles.

5.) As an example of a typical animal life cycle, draw out the human life cycle beginning with the two different types of gametes. Use correct terms and label whether the cells at the different stages are haploid or diploid.

6.) Explain in your own words the concept of alternation of generations (this will become important during our discussion of fungal, protist, and plant biology). Make sure to explain sporophyte and gametophyte stages and a brief explanation of their role in reproduction.

7.) Explain the two sources of genetic variation during meiosis.

8.) Diagram meiosis: Start with a cell with 3 pairs of homologous chromosomes that can be distinguished (try using color to distinguish the different pairs). In the diagram make sure to follow and show the Law of Independent Assortment and the Law of Segregation. Calculate how many potential configurations are possible for this cell. Use one pair of chromosomes to show crossing over. Make sure to include the following labels: Meiosis I, Meiosis II, Genes, Alleles, Replication, Parent Cells, Daughter Cells, Gametes, Homologous Chromosomes, Sister Chromatids, Non-sister Chromatids, Prophase I, Metaphase I, Metaphase II, Diploid, Haploid, Crossing Over, Law of Independent Assortment, Law of Segregation, Chiasmata, and Centromere.