Dr. Nedwidek Hon BIO Reproduction, Development, STDs REVISED: March 5-7, 2008

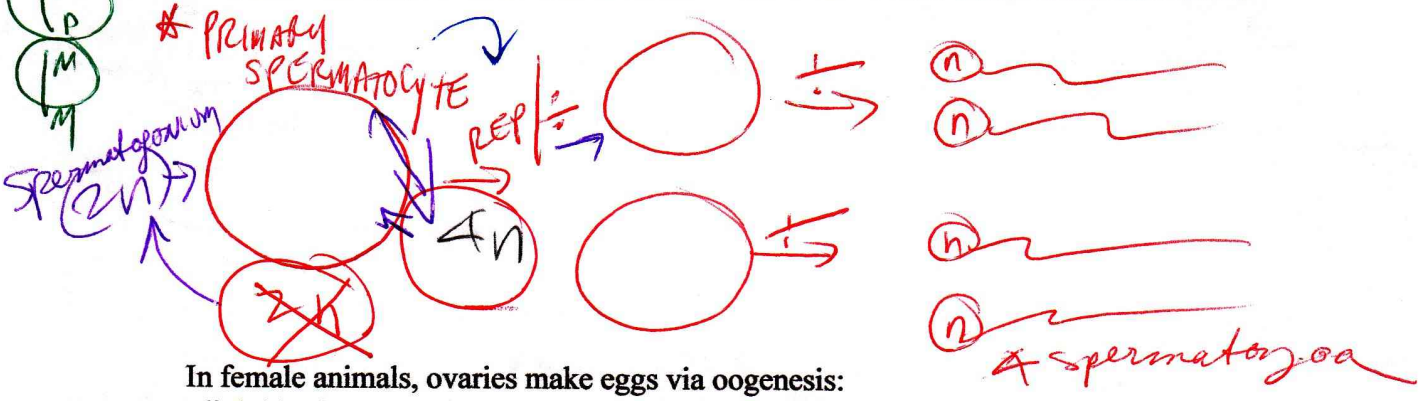
Aim 1: How do animals and humans reproduce?

3/5

DN: We previously examined mitosis and meiosis verbally and visually. What happened to each paternal "brother" chromatid and maternal "sister" chromatid at the end of mitosis versus meiosis. Distinguish between homologs and sister chromatids.
We have 23 chromosomes in sex cells. Assuming crossovers do take place and all essential genes are represented, how many shuffle combinations are possible for the event that generates every human sex cell? Please hand in HW 7.

Some notes about the genetic outcomes of meiosis. Recombination refers to both crossover events and different pairing of maternal and paternal homologs in the gametes. All sex cells originate from a 2n primary germ cell that ultimately yields 4 x 1n sex cells. Mutations can also introduce change in meiosis (but are basically the only way to introduce change in mitosis). Spontaneous mutations at some low frequency cannot be avoided; they are harmful, innocuous, or helpful, but most are innocuous.

Gametogenesis:
In male animals, the testes make sperm via spermatogenesis:
-diploid primary spermatocytes give rise to spermatozoa cells (haploid).
-4 spermatids (1n) are made per meiotic event. Draw events below from class notes:



In female animals, ovaries make eggs via oogenesis:
-diploid primary oocytes give rise to three polar bodies plus an oocyte or egg, all haploid.
-only the egg can undergo fertilization. Draw the events below: