Reproduction

I. Definitions
   A. Reproduction
      - asexual
      - sexual
   B. Fertilization
   C. Germination
   D. Growth

II. Life Cycles
   A. Cell
   B. Asexual
      - Mitosis
      - Fission
      - Fragmentation & Regeneration
      - Budding
   C. Sexual

III. Plant Reproduction
   A. Plant Reproductive Structures (flower)
      1. Stamen (male)
         - anther
         - filament
      2. Carpel (female)
         - stigma
         - style
         - ovary
   B. Pollination & Fertilization
   C. Seed & Fruit Formation
   D. Germination & Growth

IV. Human (Animal) Reproduction
   A. Reproductive Structures
      1. Male Gonads = testis (primary reproductive structures)
         a. Spermatogonia - gamete forming cells – sperm
         b. Sertoli Cells - form tubule wall, sustain sperm
         c. Leydig Cells - outside tubule, produce sex hormone - testosterone
         d. Spermatogenesis (formation of sperm)

      *mitosis*  *meiosis I*  *meiosis II*  *maturation*

      spermatogonia $$\rightarrow$$ 1° spermatocyte $$\rightarrow$$ 2° spermatocyte $$\rightarrow$$ spermatid $$\rightarrow$$ sperm
2. Male Secondary Reproductive Structures
   a. Scrotum
   b. Epididymis
   c. Vas Deferens
   d. Secretory Glands
      i. seminal vesicles
      ii. prostate gland
      iii. bulbourethral gland
   e. Penis

3. Female Gonads = Ovaries (primary reproductive structures)
   a. Oogonia – gamete forming cell - “egg”
   b. Follicular Cells - form follicle, produce sex hormones – estrogen & progesterone
      a. Oogenesis (formation of “egg” cells)
         \[\text{mitosis} \rightarrow \text{meiosis I} \rightarrow \text{meiosis II} \rightarrow \text{fertilization}\]
         oogonia \[\rightarrow \text{1° oocyte} \rightarrow \text{2° oocyte (“egg”)} \rightarrow \text{ovum} \rightarrow \text{zygote}\]
   b. Female Reproductive Cycle (menstrual cycle)

4. Female Secondary Reproductive Structures
   a. Uterine Tubes (aka fallopian tubes or oviducts)
   b. Uterus (and cervix)
   c. Vagina
   d. External Genitalia (labia & vestibule)
   e. Clitoris
   f. Mammary Glands (within breasts)

B. Development
   1. Fertilization
   2. Embryonic Development
   3. Pregnancy & Birth (parturition)

V. Reproductive Health (Contraception / Sexually Transmitted Diseases (STD’s))
   A. Contraception (Birth Control)
      1. Prevention of Gamete Release
      2. Prevention of Fertilization
      3. Prevention of Implantation

   B. Sexually Transmitted Diseases (STD’s)
      1. Bacterial
      2. Viral (no cure)
      3. Protozoan
      4. Fungal

VI. Additional Selected Key Terms (FYI)
   diploid    endometrium    estrogen    fertilization    gamete
   gametophyte gonad        haploid    implantation    oocyte
   ovule      ovulation     ovum       progesterone    secondary sexual trait
   spore      sporophyte    testosterone  zygote

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Study Questions – Reproduction

1. Compare and contrast sexual and asexual reproduction.
2. What two events must always occur for sexual reproduction to be completed?
3. What is fertilization? What is the significance of fertilization?
4. What is germination?
5. How is “growth” similar to reproduction? How is it different?
6. Describe all of the phases of the mitotic cell life cycle.
7. What are some examples of asexual modes of reproduction? What is the advantage to the organisms that reproduce asexually?
8. Diagram a reproductive life cycle. Describe what is occurring at each stage of the cycle.
9. Draw a picture of a flower and label all of the structures. What is the function of each structure?
10. Describe the different ways in which flowers may be pollinated.
11. Describe the process of fertilization and the flower structures involved.
12. Seeds and fruits develop from flowers. Describe which flower structures develop into each of the structures of the seed and/or fruit.
13. Describe the steps of spermatogenesis and name the developing cells at each stage. Where and when does this occur?
14. What are the functions of the Sertoli and Leydig cells?
15. Describe the transmission of sperm from the testis to the outside. Identify all of the structures that sperm will pass through, all associated structures and the function of each.
16. Describe the steps of oogenesis and name the developing cells at each stage. Where and when does this occur?
17. Describe the female reproductive cycle:
   a. Describe the pituitary and ovarian hormones that regulate the menstrual cycle.
   b. Describe the changes in the follicle during the menstrual cycle.
   c. Describe the changes in the uterus during the menstrual cycle.
18. Describe the transmission of ovulated “egg” from the ovary to the uterus and then to the outside. Identify all of the structures that sperm will pass through, all associated structures and the function of each.
19. Where does fertilization typically occur? Where does implantation occur?
20. What prevents menstruation if fertilization has occurred?
21. Describe the different categories of contraception. Which are most effective? Which will also reduce the chance of contracting a sexually transmitted disease.
22. Describe the different categories of sexually transmitted diseases. What is unique about viral sexually transmitted disease’s?
23. Why are sexually transmitted disease’s such a significant health concern?

“It is not birth, marriage, or death, but gastrulation which is truly the most important time in your life.”
Lewis Wolpert

“I believe it is better to tell the truth than to lie…and I believe that it is better to know than to be ignorant.”
Henry Louis Mencken