

Study Guide – Answer Key

Reproductive System

1. Distinguish between a gamete and a gonad using specific examples from the male and female systems.

Gonads are the organs of the reproductive system that produce the gametes (haploid sex cells)

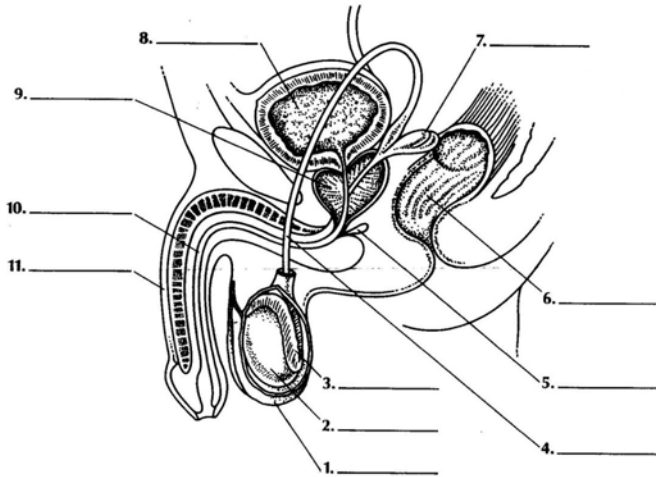
Male gonads are the testes that produce sperm which are the male gametes

Female gonads are the ovaries that produce eggs which are the female gametes

2. Label parts of male reproductive system.

Look at the one in the chapter booklet, notes and textbook page 439 diagnostic question #21

See the answer key at the end



3. Describe the path of sperm testes to urethra.

Seminiferous tubules → epididymis → vas deferens → ejaculatory duct → urethra → urethral opening

4. Name the three glands and describe their contribution to the composition of seminal fluid.

Seminal vesicles: fructose to provide nourishment (energy) to sperm

Prostate gland: alkaline fluid to protect sperm from acidic nature of vagina

Bulbourethral (Cowper's) glands: viscous fluid to aid swimming and lubrication

5. What two things are found within a testis? Give the function of each.

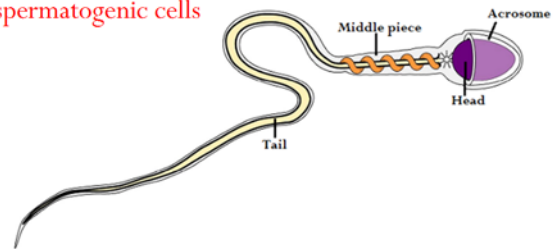
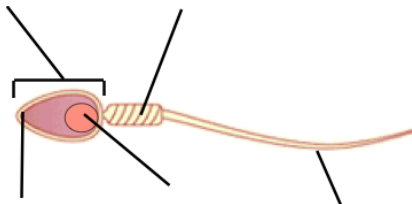
Seminiferous tubules – production of sperm (spermatogenesis)

Epididymis – area where sperm mature and are stored until needed

Interstitial cells – production of testosterone (and other androgens)

Sertoli cells (sustentacular cells) – support, nourish and regulate the spermatogenic cells

6. Draw and label a sperm. State the function of each part.



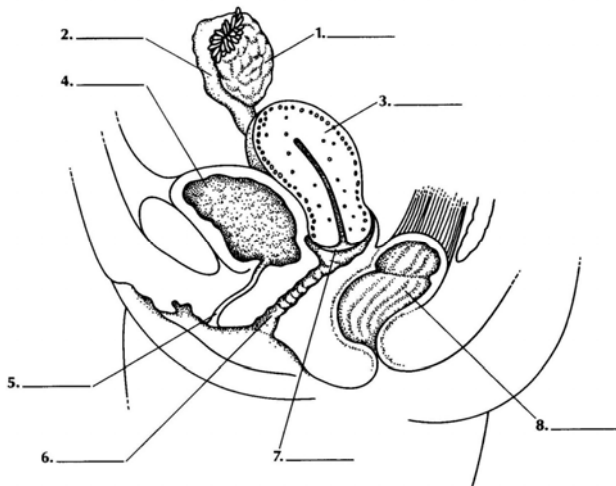
Acrosome – protects head, contains enzymes to aid in penetrating the egg, helps guide the sperm to the egg

Head – contains 23 chromosomes

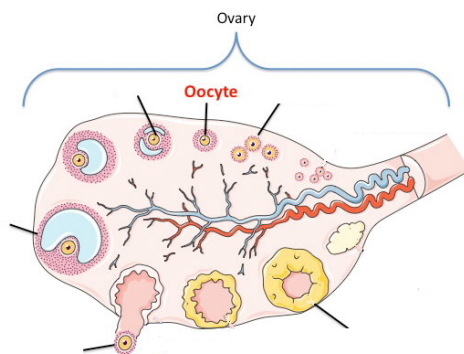
Middle piece – energy production (lots of mitochondria)

Tail – allows sperm to swim

7. How ...
- many sperm are produced per ejaculation? **250-400 million**
 - many chromosomes are found in a sperm head? **23**
 - long can a sperm potentially live for in the female genital tract? **no more than 48 hours**
8. Describe the relationship between the hypothalamus and the pituitary gland in regards to reproductive hormones.
Hypothalamus produces gonadotropin releasing hormone (GnRH) which targets the anterior pituitary and triggers the release of follicle stimulating hormone (FSH) and luteinizing hormone (LH). In males, LH is also known as interstitial cell-stimulating hormone (ICSH).
9. Name three functions of testosterone unique to men.
- **Enlargement of larynx (deepening of voice)**
 - **Longer legs and broader shoulders (increased skeletal muscle)**
 - **Increased aggression and sex drive**
10. Label parts of female reproductive system.
 Look at the one in the chapter booklet, notes and textbook page 439 diagnostic question #22
 See the answer key at the end



11. Describe where an oocyte is produced and how it is transported to the uterus.
An oocyte is contained within a follicle in the ovary. Once released from the ovary during ovulation, the oocyte is swept into the oviduct by the action of the fimbria and cilia within the oviduct. The oocyte is propelled down the oviduct due to ciliary movement as well as tubular muscle contractions.
12. Label a diagram of ovary (primary follicle, secondary follicle, vesicular follicle, ovulation, corpus luteum).
 See answer key at the end



13. Assuming that fertilization has not occurred, describe the route that ova take through the female body.
Ovary → Oviduct → Uterus → Cervix → Vagina

14. Name the phases of the ovarian cycle and uterine cycle.

Ovarian Cycle: follicular phase, luteal phase

Uterine Cycle: proliferative phase, secretory phase

15. Summarize the events that occur during the two phases of the ovarian cycle.

Follicular Phase: development and maturation of the follicle promoted by FSH, ending in ovulation

- Production of estrogen and some progesterone

Luteal Phase: transformation of follicle to corpus luteum, then degeneration of corpus luteum, ending in menstruation

- Production of progesterone and some estrogen

16. Distinguish between the proliferative phase and the secretory phase of the uterine cycle and the hormones that promote each.

Proliferative phase: increased production of **estrogen** by the developing follicle lead to the thickening of the endometrium. Endometrium also becomes more vascular and glandular.

Secretory phase: increased production of **progesterone** by the corpus luteum further thickens the endometrium in preparation of a fertilized egg. Uterine glands also mature, secreting thick mucus.

17. Name three functions of estrogen unique to women.

- Development of breasts
- Widening of hips / pelvis
- Accumulation of fat under the skin

18. Name one role of each of the following in relation to a female's reproduction system: hypothalamus, anterior pituitary, posterior pituitary.

Hypothalamus: production of gonadotropin releasing hormone (GnRH)

Anterior Pituitary: production of follicle stimulating hormone (FSH) and luteinizing hormone (LH)

Posterior Pituitary: production of oxytocin (only during child birth)

19. Describe the effects of hormonal secretion from the placenta.

To shut down anterior pituitary so no more follicle mature as well as to prevent menstruation from occurring by maintaining levels of progesterone and estrogen.

20. What regulates the secretion of oxytocin?

Pressure on and stretching of the cervix.

21. Describe the mechanisms of labour. Include the terms: cervix, positive feedback, oxytocin, and contraction.

Once contractions begin, the fetus pushes down on the cervix and begins to stretch it. This causes the release of oxytocin which causes contractions of the uterus. Labour is a positive feedback system since the added uterine contractions cause the fetus to push down harder on the cervix which leading to more oxytocin being released and contractions become more frequent and more intense. The feedback loop is ended once the cervix has dilated sufficiently (~10 cm) and the baby is born so there is no more pressure on the cervix.

22. Complete the table by naming the source of, the target, and effect of the hormones named in the first column. (selected from the worksheet completed in class)

Hormone	Source	Target	Effect
Gonadotropin Releasing Hormone (GnRH)	Hypothalamus	Anterior Pituitary	Causes anterior pituitary to release its hormones
Follicle Stimulating Hormone (FSH)	Anterior Pituitary	Follicle (F) Testes (M)	Stimulates follicle to produce estrogen (F) Stimulates sperm production (M)
Luteinizing Hormone (LH) or Interstitial Cell Stimulating Hormone (ICSH)	Anterior Pituitary	Corpus luteum (F) Testes (M)	Stimulates corpus luteum to produce progesterone (F) Stimulates production of testosterone (M)
Human Chorionic Gonadotropin (HCG)	Placenta	Corpus luteum	Prevents degradation of corpus luteum during early stages of pregnancy (which prevents menstruation from occurring)
Oxytocin	Posterior Pituitary	Uterus	Contractions of the uterus, leading to childbirth
Testosterone	Interstitial Cells	Gonads & gametes (mainly) Entire body	Development of reproductive system and secondary effects associated with males
Estrogen	Follicle (lots) and corpus luteum (a little bit)	Gonads & gametes (mainly) Entire body	Development of reproductive system and secondary effects associated with females

23. Compare and contrast sperm and ova in the following FOUR ways: site of production, ability to move, number produced, comparative size.

	Sperm	Ova (egg)
Site of Production	Seminiferous tubules	Ovary
Ability to Move	Swim using tail (flagella)	Moves due to cilia lining the oviduct
Number Produced	400 million per ejaculation	1 per month (~400 total in lifetime)
Comparative Size	Small	Large

24. Compare and contrast each of the following: ejaculation and ovulation, follicle and corpus luteum.

Ejaculation and ovulation: both refer to the release of gametes, but ejaculation is the release of sperm from the male body (external) and ovulation is release of egg from the female ovary (internal)

Follicle and corpus luteum: are both found in the female ovary, but the follicle is what develops the ova (before ovulation) and the corpus luteum is formed from the remains of the follicle (after ovulation)

25. Name the primary function of testosterone and estrogen.

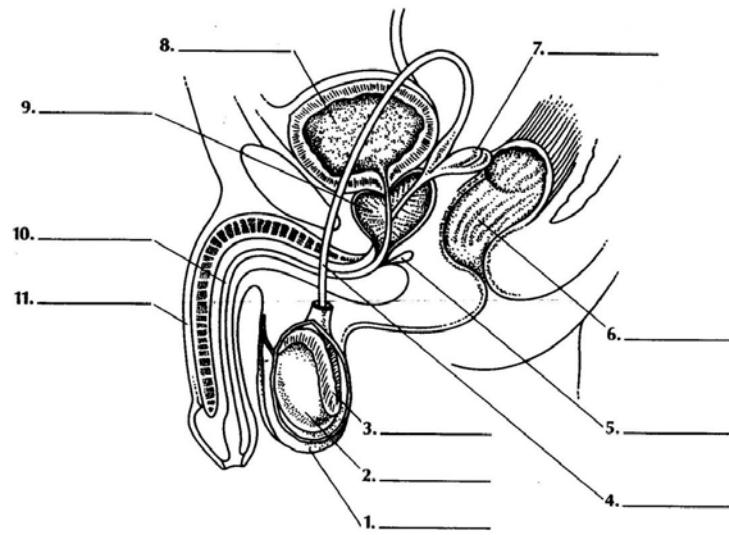
These are the main sex hormones that lead to the development and maturation of the gonads (e.g. testes or ovaries) as well as the gametes (e.g. sperm or egg)

26. Explain how males and females differ in the specialization of their genital tract for reproduction versus urination.

For males, the urethra is part of both the urinary and reproductive systems, carrying either urine or semen.

For females, the systems are completely separate.

1. Scrotum
2. Testis
3. Epididymis
4. Vas deferens
5. Bulbourethral gland
6. Rectum
7. Seminal vesicles
8. Urinary bladder
9. Prostate gland
10. Urethra
11. Penis



1. Ovary
2. Oviduct
3. Uterus
4. Urinary bladder
5. Urethra
6. Vagina
7. Cervix
8. Rectum

