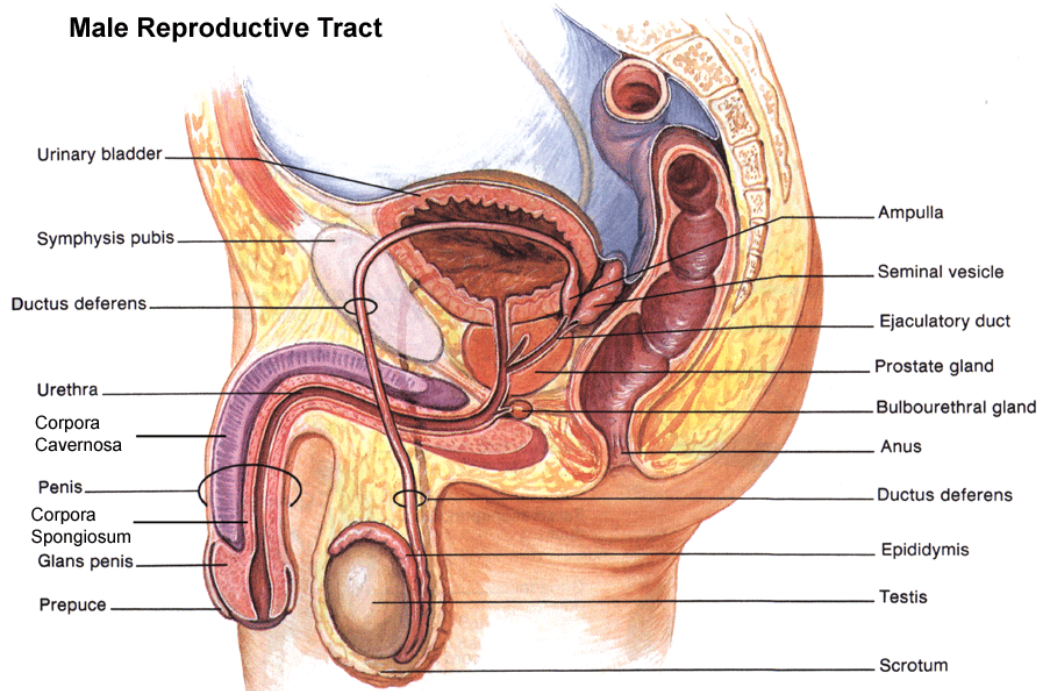


UNIT 9 ANSWER KEY

1. Label the following diagram of the male reproductive system. Provide a brief description of each structure's function below the diagram. Please be neat.



Modified from Van De Graaff, *Human Anatomy*, Wm. C. Brown: Dubuque, IA, 1988.

Testes = produce sperm and testosterone

Scrotum = hold testes away from body at a slightly lower temperature than body temperature as this is ideal for healthy sperm production

Epididymis = stores sperm as they mature

Seminal vesicle = contributes to seminal fluid

Cowper's gland/Bulbourethral gland = contributes to seminal fluid

Prostate gland = contributes to seminal fluid

Urethra = conduct sperm (and urine) out of the body)

Vas deferens = carries sperm from testes to urethra

Penis = organ of copulation

Urinary bladder = stores urine

Erectile tissue/Corpora Cavernosa = fills with blood to create an erection

2. Why does sterility result if the testes do not descend into the scrotum?  
If testes remain within body they are held at a temperature that is too high to produce healthy sperm.
3. What is spermatogenesis and where does it occur?  
= production/development of sperm and it occurs in the testes
4. Where are the interstitial cells located? What is the function of these cells?  
= also known as Leydig cells, they are adjacent to the seminiferous tubules within the testes where they produce testosterone

5. Identify the parts of a mature sperm and state the function of each part.



Head = contains DNA and the acrosomal cap that contains enzymes helps sperm to penetrate egg  
 Mid-piece = contains mitochondria to provide ATP to power flagella movement  
 Tail/Flagella = propels sperm

6. Explain how the hypothalamus and anterior pituitary gland function together to regulate sperm and testosterone production. Please explain the entire feedback loop using your own words/phrasing.

The hypothalamus release Gonadotropin Releasing Hormone (GnRH) which then causes the anterior pituitary to release Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH). FSH causes Sertoli cells of the testes to help sperm development while LH causes Interstitial (Leydig) cells of testes to release testosterone. Testosterone further stimulates Sertoli cell of testes to help sperm development. However, as testosterone levels rise they have a negative feedback effect on the hypothalamus and anterior pituitary such that the release of GnRH, LH and FSH are blocked. With these hormones blocked, less testosterone is released and testosterone levels begin to fall until they reach such levels that the negative feedback effect is lost and the cycle begins again, thus maintaining homeostasis within the male reproductive system.

7. Label the following diagram of the female reproductive system. Provide a brief description of each structure's function below the diagram. Please be neat.



Fimbriae = sweep egg into oviduct as it is released from the ovary  
 Oviduct = typical site of fertilization, conducts egg to uterus  
 Ovary = produce eggs and sex hormones (estrogen and progesterone)  
 Uterus = site where fetus develops

Cervix = entry way between vagina and uterus

Vagina = receives penis during sexual intercourse, canal where menstrual fluid exit body, canal where fetus exits body

8. Give two ways that the oviduct aids the passage of the egg towards the uterus.
  - Mucous layer lining the oviduct secretes substances that aid in egg movement
  - Peristalsis (rhythmic contractions) move egg along the oviduct toward the uterus
9. List five different effects of estrogen on the female body.
  - Stimulates breast development during puberty
  - Stimulates maturation of uterus during puberty
  - Prepares uterus to nourish a developing fetus
  - Helps maintain bone density
  - Development of secondary sex characteristics of females including breasts, wider hips, greater fat deposition, development of arm pit and pubic hair
10. Complete the following table in relation to the female reproductive cycle.

Hormone	Full Name	Source	Effects
GnRH	Gonadotropin Releasing Hormone	hypothalamus	Causes pituitary gland to release LH and FSH
FSH	Follicle Stimulating Hormone	Pituitary gland	Causes ovaries to produce a mature follicle (egg)
LH	Luteinizing Hormone	Pituitary gland	Causes ovary to release egg
Estrogen	Estrogen	ovary	Lower levels stimulate endometrium development in uterus, high levels prevent GnRH release
Progesterone	Progesterone	ovary	Stimulates endometrium development in the uterus, high levels inhibit LH release

11. The Ovarian Cycle:

- a. Identify the name given to Days 1-13 of the ovarian cycle and describe the changes in hormones and ovarian structures that occurs during this time.
  - = Follicular Phase
  - = hypothalamus releases GnRH causing anterior pituitary to release FSH and LH which causes egg maturation
- b. Identify the name of the event that occurs on Day 14 of the ovarian cycle and specifically identify how hormone levels are responsible for influencing its occurrence.
  - = Ovulation = egg released
  - = high levels of LH trigger this event

- c. Identify the name given to Days 15-28 of the ovarian cycle and describe the changes in hormones and ovarian structures that occurs during this time.
  - = Luteal Phase
  - = corpus luteum secretes estrogen and progesterone which influence the uterine cycles
  - = if pregnancy does not occur the corpus luteum disintegrates, estrogen and progesterone levels drop and menstruation (uterine cycle) occurs

## 12. The Uterine Cycle:

- a. Identify the name given to Days 1-5 of the uterine cycle and describe the changes in hormones and uterine structure that occurs during this time.
  - = Menstruation
  - = low levels of estrogen and progesterone lead to endometrium (lining of uterus) breaking down and being expelled from body
- b. Identify the name given to Days 6-13 of the uterine cycle and describe the changes in hormones and uterine structure that occurs during this time.
  - = Proliferative Phase
  - = increased production of estrogen by the maturing follicle in the ovary which results in rebuilding of the endometrium in preparation for the potential of a fertilized egg implanting
- c. Identify the name given to Days 15-28 of the uterine cycle and describe the changes in hormones and uterine structure that occurs during this time.
  - = Secretory Phase
  - = increased levels of progesterone released by the corpus luteum in the ovary causes the endometrium to double in thickness, become highly vascularized and to produce mucus such that it is ready to receive a fertilized egg (embryo)

## 13. Pregnancy and birth:

- a. Define implantation.
  - = when a fertilized egg (embryo stage) embeds itself in the endometrium of the uterus several days after the fertilization event
- b. What hormone is released from the membrane surrounding the embryo to prevent corpus luteum from degenerating?
  - = the Human Chorionic Gonadotropin hormone (HCG) which is what pregnancy tests are designed to detect
- c. Why is it important to prevent the corpus luteum from degenerating following implantation?
  - = if the corpus luteum disintegrates too early the estrogen and progesterone levels will drop causing the endometrial lining (and the implanted embryo) to be shed...effectively a miscarriage
- d. What tissues does the placenta originate from? What are the hormonal and physical functions of the placenta?
  - = maternal and fetal tissues
  - = produces HCG hormone to maintain the corpus luteum

= movement of nutrients from mother's blood to fetal blood, movement of waste from fetal blood to mother's blood

- e. Why do the levels of estrogen and progesterone remain high during pregnancy and why is this important?
  - = remain high due to maintenance of corpus luteum by HCG hormone (produced by placenta)
  - = necessary to prevent shedding of the endometrial lining and developing fetus
- f. What are the functions of the hormone oxytocin and where does it originate? Describe positive feedback as it relates to this hormone.
  - = oxytocin causes the uterus to contract which then initiates a positive feedback loop causing further release of oxytocin and further contractions and so on until the baby is delivered
  - = oxytocin also is released in response to a baby suckling and causes the mammary glands to release milk
  - = oxytocin is released from the posterior pituitary