Name: Period:

**The Biology of Prenatal Development**

1. Pregnancy in humans normally lasts approximately \_\_\_\_\_\_\_\_ weeks as measured from the time of fertilization, or conception, until birth.
2. During the first \_\_\_\_\_\_\_\_ weeks following fertilization, the developing human is called an embryo, which means "growing \_\_\_\_\_\_\_\_." This time, called the embryonic period, is characterized by the formation of most major body systems.
3. From the completion of 8 weeks until the end of pregnancy, "the developing human is called a \_\_\_\_\_\_\_\_," which means "unborn offspring."
4. A woman's reproductive cell is commonly called an \_\_\_\_\_\_\_\_ but the correct term is oocyte.
5. The resulting single-celled embryo is called a zygote, meaning "yoked or \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ ."
6. \_\_\_\_\_\_\_\_ molecules resemble a twisted ladder known as a double helix.
7. If laid end-to-end, the DNA in a single human cell measures \_\_\_\_\_\_\_\_ feet or 1 meter.
8. Approximately \_\_\_\_\_\_\_\_ hours after fertilization, the zygote completes its first cell division. Through the process of \_\_\_\_\_\_\_\_, one cell splits into two, two into four, and so on.
9. The cells inside the blastocyst are called the inner cell mass and give rise to the\_\_\_\_\_\_\_\_, body, and other structures vital to the developing human.
10. Cells from the growing embryo begin to produce a hormone called human chorionic gonadotropin, or\_\_\_\_\_\_\_\_, the substance detected by most pregnancy tests.
11. The \_\_\_\_\_\_\_\_ delivers maternal oxygen, nutrients, hormones, and medications to the developing human; removes all waste products; and prevents maternal blood from mixing with the blood of the embryo and fetus.
12. By approximately \_\_\_\_\_\_\_\_ weeks, the epiblast has formed 3 specialized tissues, or germ layers, called ectoderm, endoderm, and mesoderm.   
     a. \_\_\_\_\_\_\_\_ gives rise to numerous structures including the brain, spinal cord, nerves, skin, nails, and hair.   
      
    b. \_\_\_\_\_\_\_\_ produces the lining of the respiratory system and digestive tract, and generates portions of major organs such as the liver and pancreas.   
      
    c. \_\_\_\_\_\_\_\_ forms the heart, kidneys, bones, cartilage, muscles, blood cells, and other structures.
13. The\_\_\_\_\_\_\_\_ begins beating 3 weeks and 1 day following fertilization.
14. The heart will beat approximately \_\_\_\_\_\_\_\_ million times before birth and over 3.2 billion times over the course of an 80-year lifespan.
15. Upper and lower limb development begins with the appearance of the limb buds by\_\_\_\_\_\_\_\_ weeks.
16. The \_\_\_\_\_\_\_\_ is transparent at this point because it is only one cell thick.
17. The permanent\_\_\_\_\_\_\_\_ appear by 5 weeks.
18. Also by \_\_\_\_\_\_\_\_ weeks, the embryo develops hand plates, and cartilage formation begins by 5 1/2 weeks.
19. The external \_\_\_\_\_\_\_\_ is beginning to take shape.
20. By 6 1/2 weeks, the \_\_\_\_\_\_\_\_ are distinct, the \_\_\_\_\_\_\_\_ are beginning to separate, and hand movement can be seen.
21. \_\_\_\_\_\_\_\_ formation, called ossification, begins within the clavicle, or collar bone, and the bones of the upper and lower jaw.
22. By 7 1/2 weeks, the pigmented retina of the \_\_\_\_\_\_\_\_ is easily seen and the eyelids are beginning a period of rapid growth.
23. The hands can now come \_\_\_\_\_\_\_\_, as can the feet.   
    \_\_\_\_\_\_\_\_ joints are also present.
24. By 8 weeks the epidermis, or \_\_\_\_\_\_\_\_ skin, becomes a multi-layered membrane, losing much of its transparency.
25. The embryo now possesses more than \_\_\_\_\_\_\_\_ of the structures found in adults.
26. By 9 weeks, \_\_\_\_\_\_\_\_ sucking begins and the fetus can swallow amniotic fluid.
27. The fetus can also \_\_\_\_\_\_\_\_ an object, move the \_\_\_\_\_\_\_\_ forward and back, open and close the\_\_\_\_\_\_\_\_, move the tongue, sigh, and \_\_\_\_\_\_\_\_.
28. By 10 weeks, stimulation of the upper eyelid causes a downward rolling of the eye. The fetus \_\_\_\_\_\_\_\_ and often opens and closes the mouth.
29. \_\_\_\_\_\_\_\_ and toenails begin to develop.
30. By 11 weeks the \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ are completely formed. As with every other body part, their appearance will change at each stage of the human life cycle.
31. \_\_\_\_\_\_\_\_ weeks marks the end of the first third, or \_\_\_\_\_\_\_\_, of pregnancy.
32. In contrast to the withdrawal response seen earlier, stimulation near the mouth now evokes a turning toward the stimulus and an opening of the mouth. This response is called the "\_\_\_\_\_\_\_\_ reflex" and it persists after birth, helping the newborn find his or her mother's nipple during breastfeeding.
33. Although movement begins in the 6-week embryo, a pregnant woman first senses fetal movement between 14 and 18 weeks. Traditionally, this event has been called \_\_\_\_\_\_\_\_
34. A protective white substance, called vernix caseosa, now covers the fetus. Vernix \_\_\_\_\_\_\_\_ the skin from the irritating effects of amniotic fluid
35. By 20 weeks the cochlea, which is the organ of \_\_\_\_\_\_\_\_, has reached adult size within the fully developed inner ear. From now on, the fetus will respond to a growing range of sounds
36. \_\_\_\_\_\_\_\_ begins to grow on the scalp.   
    All \_\_\_\_\_\_\_\_ layers and structures are present, including hair follicles and glands.
37. By 21 to 22 weeks after fertilization, the \_\_\_\_\_\_\_\_ gain some ability to breathe air. This is considered the age of viability because survival outside the womb becomes \_\_\_\_\_\_\_\_ for some fetuses
38. During the third trimester of pregnancy, rapid brain growth consumes more than \_\_\_\_\_\_\_\_ of the energy used by the fetus. Brain weight increases between 400 and 500%.
39. By 26 weeks the eyes produce \_\_\_\_\_\_\_\_.   
    The pupils respond to \_\_\_\_\_\_\_\_ as early as 27 weeks. This response regulates the amount of light reaching the retina throughout life.
40. The fetus appears less wrinkled as additional \_\_\_\_\_\_\_\_ deposits form beneath the skin. Fat plays a vital role in maintaining body temperature and storing energy after birth.
41. By 28 weeks the fetus can distinguish between \_\_\_\_\_\_\_\_ - and \_\_\_\_\_\_\_\_ -pitched sounds
42. By 30 weeks, \_\_\_\_\_\_\_\_ movements are more common and occur 30 to 40% of the time in an average fetus.
43. By approximately \_\_\_\_\_\_\_\_ weeks, true alveoli, or air "pocket" cells, begin developing in the lungs. They will continue to form until \_\_\_\_\_\_\_\_ years after birth.
44. At 35 weeks the fetus has a \_\_\_\_\_\_\_\_ hand grasp.
45. \_\_\_\_\_\_\_\_ is marked by powerful contractions of the uterus, resulting in childbirth.