

## CHAPTER THREE

### Content Review

1. Meiosis is the type of cell division that produces haploid cells from a diploid parent cell. Meiosis has two rounds of cell division following the replication of the DNA. It is the means by which gametes are formed. Prophase I: Synapsis of homologous, double-stranded chromosomes occurs. Metaphase I: Homologous pairs of double-stranded chromosomes line up at the equator. Anaphase: Homologous pairs of double-stranded chromosomes separate and get pulled to the opposite ends of the cell. Telophase I: Homologous, double-stranded chromosomes arrive at opposite ends of the cell, and the cytoplasm divides by cytokinesis. Prophase II: Each of the double-stranded chromosomes scatters throughout the cytoplasm. Metaphase II: Each doublestranded chromosome lines up at the cell equator. Anaphase II: The two strands of the doublestranded chromosomes (called sister chromatids) are pulled toward opposite sides of the cell. Telophase II: Each sister chromatid (single-stranded chromosome) arrives at the opposite side of the cell, and the cytoplasm divides by cytokinesis.
2. Implantation is the burrowing of the blastocyst into the endometrium of the uterine wall. The trophoblast cells around the periphery of the blastocyst begin to invade the functional layer of the endometrium.
3. The chorion is the extraembryonic membrane that is the fetal component of the placenta, the site of exchange between the embryo and the mother.
4. After the primitive streak forms, some cells immediately move through it, and the notochord forms from the mesoderm called chordamesoderm. The notochord induces the information of the nervous system.
5. The primary germ layers form through the process of gastrulation. Some of the cells of the epiblast migrate through the primitive streak, resulting in the formation of ectoderm, mesoderm, and endoderm.
6. Two types of folding lead to the cylindrical body shape of the human embryo: cephalocaudal folding and transverse (or lateral) folding.
7. (a) Chordamesoderm forms the notochord. (b) Paraxial mesoderm forms somites, which in turn form most bone, muscle, cartilage, dermis, and connective tissues of the body. (c) Intermediate mesoderm forms most of the urinary and reproductive systems. (d) The lateral plate mesoderm forms most of the cardiovascular system. (e) Head mesenchyme forms the connective tissues and musculature of the face.
8. If cells destined to become paraxial mesoderm were destroyed, severe abnormalities in the development of most of the embryo's skeleton, musculature dermis, cartilage, and connective tissue would occur.
9. The embryo is especially susceptible to teratogens because this is the period when organogenesis occurs.
10. The embryonic period extends from the third through the eighth week after fertilization. During that time, a distinctly humanlike body is formed, and the rudiments of all major organ systems develop. The fetal period extends from the beginning of the third month to birth. During that time, the fetus continues to grow, and the complexity of the organs increases.