Prenatal development

Genetics

1. *Describe DNA*
   DNA stands for deoxyribonucleic acid. DNA is found in the nucleus of cells, and contains genes. Genes carry genetic information used for creating proteins and enzymes that make up features of our body, i.e. they are the instructions for our height, internal organs, and brain size etc. The 'instructions' are RNA, and are copied over and over.

2. *Describe how characteristics are inherited from our biological mother and father.*
   We have 46 chromosomes, 23 inherited from our mother (22 autosomes, and one sex (X) chromosome), and 23 from our father (22 autosomes, and one sex (X or Y) chromosome). These chromosomes contain genes (instructions) for our features. Each variation of a gene is called an 'allele'. In the example of hair type, a mother may pass on a curly hair gene, and a father a straight hair gene. The child then contains the genotype of straight and curly hair, but presents the phenotype of curly hair, as that is the dominant gene.

3. *Describe the following types of inheritance:*
   i. *Dominant & Recessive*
      Dominant: Needs only one copy of the gene for the trait to be expressed (and can be from either parent).
      Recessive: Needs two copies of the gene for the trait to be expressed (one from mother, and one from father).
   ii. *Co-dominant genes*
      Co-dominant genes: When two genes are of equal dominance, they will both be expressed in the phenotype. For example, blood groups A and B are equal, therefore resulting children would present with the blood type AB.

3. *Understand the difference between Genotype & Phenotype*
   Genotype: The genotype refers to the genes carried by a person, regardless of what is expressed. For example, the genotype may contain straight and curly hair genes, both of which can be passed onto subsequent children.
   Phenotype: The expression of the genes, i.e. what is observable. For example, a person may have the genes for curly and straight hair, but only the dominant gene, curly hair, is expressed.

Prenatal Development & Teratogenic influences

4. *Describe the three prenatal periods.*
   Germinal period: The zygote undergoes rapid cell production, so by the time it reaches the uterus, it consists of hundreds of cells, and is called a blastocyst.
   The blastocyst has two layers: the trophoblast (outer) and the embryonic disc. The trophoblast layer protects and nourishes the embryonic disc which has 3 sublayers. These are the ectoderm (which will form the nervous system, skin and hair), the mesoderm (which will form muscles, bones, circulatory system and other internal organs), and the endoderm (which will form the digestive system, lungs, urinary tract and glands). Implantation then occurs.
   An inner membrane, called the amnion, forms a watertight sac with amniotic fluid to protect the developing organism. An outer membrane, called the chorion, forms around the amnion to form the foetal part of the placenta. The placenta and embryo become linked by the umbilical cord, made by a membrane called the allantois.