You know that life begins with the union of ovum and sperm. Observe Figure 2.1. What happens to the ovum and sperm after their union? The growth from a single microscopically small cell to a body about two hundred billion cells is phenomenal. This phase is known as the pre-natal stage. After birth till death all human beings pass through various phases known as post-natal life. The knowledge about pre-natal and post-natal life helps you to understand yourself and to develop parental skills. Let us begin this chapter with the concept of pre-natal development.

**Do you know!**

Size of ovum: one of the largest cells of the body—approximately 0.1 millimeter in diameter.

Size of sperm: one of the smallest cells of the body—approximately 0.05 millimeter in diameter.
2.1 Stages of Development Pre-natal and Post-natal

A. Pre-natal Period

Observe the video presentation on the topic ‘pre-natal period’ and prepare a brief note on the changes that go on during the pre-natal period. The following indicators can be used.

- What are the characteristic features of the pre-natal period?
- What is the significance of lunar month with regard to pregnancy?

It is customary for layman to think of pregnancy in terms of nine calendar months. But scientists use, as their measuring rod, ‘lunar months’ of 28 days each. These coincide with the periods of the female menstrual cycle. The ten lunar months of the pre-natal period may be marked off into three subdivisions. They are the period of ovum, the period of embryo and the period of foetus. The highlights of each of these developmental periods are given below.

a. Period of ovum (conception to the end of the second week)
- Practically unchanged in ‘size’ because of the lack of outside source of nourishment
- Rapid internal development
- Implantation in the uterine wall about 10 days after fertilization becoming a parasite.

b. Period of embryo (end of the second week to the end of the second lunar month)
- All important external and internal features start to develop and function
- Sex organs develop well enough to distinguish the sex of the embryo
- By the end of the period, embryo measures 1 ½ to 2 inches in length and weighs about 28.350 gms
- Growth in the head region is proportionately much greater than the rest of the body
- Accessory apparatus-placenta, umbilical cord and amniotic sac-develops.

c. Period of foetus (end of the second lunar month to birth)
- External and internal features continue growth and development
- Internal organs assume nearly adult positions by the fifth lunar month
- The nerve cells present since the third week, increase rapidly in number during the second, third and fourth months.
- Foetal activity begins in the second and third months.
Human growth processes pass through various stages. The stages in the pre-natal period are summarised in Table 2.1

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Stages of life</th>
<th>Age Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Period of the ovum</td>
<td>Conception to the end of the second week</td>
</tr>
<tr>
<td>b.</td>
<td>Period of the embryo</td>
<td>End of the second week to end of the second lunar month</td>
</tr>
<tr>
<td>c.</td>
<td>Period of the foetus</td>
<td>End of the second lunar month to birth</td>
</tr>
</tbody>
</table>

**Table 2.1 Age Span for Human Developmental Stages-Prenatal Period**

Observe Table 2.2 and prepare a note on the growth of foetus during the pre-natal period

<table>
<thead>
<tr>
<th>Period</th>
<th>Growth of Foetus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month</td>
<td>Embryo consisting of two layers of cells</td>
</tr>
<tr>
<td>2 months</td>
<td>Size of a kidney bean, constantly moving with distinct, slightly webbed fingers.</td>
</tr>
<tr>
<td>3 months</td>
<td>3 inches long and weighs nearly 28.35gms with unique fingerprints, now in place.</td>
</tr>
<tr>
<td>Period</td>
<td>Growth of Foetus</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------</td>
</tr>
<tr>
<td>4 months</td>
<td>5 inches long and weighs 141.75gms, skeleton starts hardening from cartilage to bone.</td>
</tr>
<tr>
<td>5 months</td>
<td>More than 10 inches long, eyebrows and eyelids are now in place.</td>
</tr>
<tr>
<td>6 months</td>
<td>Weighs 680g and wrinkled skin starts to smooth out</td>
</tr>
<tr>
<td>7 months</td>
<td>Weighs about 1.36 Kg and is more than 15 inches long, open and close eyes and follow light.</td>
</tr>
<tr>
<td>8 months</td>
<td>Weighs about 2.15kg, lungs are well developed</td>
</tr>
<tr>
<td>9 months</td>
<td>More than 19 inches long and weighs nearly 3kg now</td>
</tr>
</tbody>
</table>

*Table 2.2  Stages of Pre-natal Development*
B. Post-natal Period

Can you name the stages you have passed through in your life?
- ............................................................................................................

Name the stages you have to face hereafter?
- ............................................................................................................

Let us discuss the different stages of human development, of the post-natal stages of life.

The Post-natal period is a period beginning immediately after the birth of a child. The Post-natal stage which serves as a framework to study the growing child is described by different psychologists in different ways. The different stages of post-natal period are summarised as given in Table 2.3

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Stages</th>
<th>Age span</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Infancy</td>
<td>From birth to two years</td>
</tr>
<tr>
<td>b.</td>
<td>Childhood</td>
<td>From the 3rd year to 12 years</td>
</tr>
<tr>
<td>i.</td>
<td>Early childhood</td>
<td>From the 3rd year to 6 years</td>
</tr>
<tr>
<td>ii.</td>
<td>Late Childhood</td>
<td>From 7th to 12 years or in strict sense upto the onset of puberty</td>
</tr>
<tr>
<td>c.</td>
<td>Adolescence</td>
<td>From the 13th year to 19 years or in a strict sense from onset of puberty till the attainment of maturity</td>
</tr>
<tr>
<td>d.</td>
<td>Adulthood</td>
<td>From the 20th year to 60 years or in strict sense from attaining maturity to the age one ceases to produce one's own kind</td>
</tr>
<tr>
<td>e.</td>
<td>Old age or ageing</td>
<td>From 61 years or in a strict sense from the end of the reproduction capability stage till death</td>
</tr>
</tbody>
</table>

Table 2.3 Age Span for the Human developmental Stages-Post-natal Period

a. **Infancy:** Infancy is a period from 0-2 years. The child undergoes physical growth at a rapid rate, greater than he will never experience subsequently. It is interesting to know the changes that take place in the first two years. Children at this stage are very active learners. During this period the baby’s physiological
processes become operative and fairly well adjusted.

b. Childhood: Childhood is a period from 3 years to 12 years.

(i) Early childhood: The early childhood years, 3-6 years of age represent a remarkable period of physical and psychological developments. It is a period when true personality begins but physical development proceeds at a slower rate. Here children become more self sufficient, acquire language, become a part of the group, become more co-ordinated and obtain a higher degree of self control.

(ii) Late childhood: The stage of late childhood starts from the 7th year and goes on till the 12th year. You have already gone through this period. Can you list some of the characteristics of this period?

• ...............................................................

During this period, physical growth continues at a lower rate but intellectual and emotional developments are rapid and very complex as he moves from home to the outside world. He begins to acquire basic skills of formal learning and develops certain social activities. End of late childhood is also referred to as pre-adolescence period. During the greater part of late childhood, the child’s physical growth continues, but at a still slower rate until it shows a sudden spurt as the child approaches adolescence. He is more attached to his peer groups and interested in social and group activities. During this period school tasks contribute intellectual developments too.

c. Adolescence: You know some of the characteristic features of adolescent period since you belong to this period. Adolescent period follows late childhood and extends from the age of thirteen to nineteen. Very often it is called the awkward age because of awkwardness, clumsiness and accompanying self consciousness which occurs frequently. During this time physical, mental, emotional and social developments are
complete. It is considered as the last step in the long period of development which begins at the time of conception. By the end of adolescence, the individual is considered legally and socially matured. He is capable of living an independent life free from supervision and guidance.

d. **Adulthood:** It is the longest period of the life span. An individual assumes adulthood at the age from 20-60 years. During this stage physical developments are fairly complete. But psychological adjustments continue throughout the entire stage. Choosing a life partner, establishing a family, becoming a useful and productive member etc. are crucial during adulthood. His personality and achievements are determined by the kind of experiences he has had during his early years of life.

e. **Old Age:** Old age is considered as the final stage of the normal life span. During this period many physical, social, emotional and behavioural changes take place. Some men and women manifest signs which are associated with old age from their 60th age onwards. These aging years demand a higher degree of emotional adjustments. There are certain problems of adjustments such as physical and economic dependency, establishing new contacts and interests and activities to occupy increased leisure time. Psychological hazards during this stage include feelings of inferiority and inadequacy resulting from physical changes in life patterns, feeling of guilt about sitting idle and reduced income that necessitates changes in living patterns. Financial worries and ill health are common among this group.

**Let us do**

- Prepare an Album on the Life Span of Human Development.
- Based on Table 2.1 and 2.2 construct a complete table of prenatal and postnatal period.
Check your progress
1. Briefly write about adulthood.
2. Mention the general characteristic features of adolescence.
3. Specify the age at which physical developments are fairly complete.

2.2 Growth and Development
Is your height and weight at present and when you were in the 8th standard the same? Why?
• ...........................................................................................................

Growth refers to quantitative increase in size and structure. Body and its part become larger, heavier and longer.
You know that an adult and a child behave in different manner in the same situation. Why such differences?
Development refers to qualitative and quantitative changes. Hurlock (2011) defines development as a progressive series of orderly, coherent changes. Progressive signifies that the changes are directional, that they lead forward rather than backward. Orderly and coherent suggest that there is a definite relationship between the changes taking place and those that preceded or will follow them.
Even though the terms growth and development are used interchangeably, there are specific differences between them. We can sum up the differences between growth and development in the following table.

<table>
<thead>
<tr>
<th>Growth</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refers to increase in size, height, weight etc.</td>
<td>Refers to improvement in the functioning of the body process</td>
</tr>
<tr>
<td>Easily measured and observed</td>
<td>Cannot be measured easily</td>
</tr>
<tr>
<td>It is limited. Starts with birth to reach the maximum at maturity</td>
<td>A continuous unending process all through life.</td>
</tr>
<tr>
<td>Limited to specific areas</td>
<td>Concerned with various aspects and parts of body and behaviour as a whole</td>
</tr>
<tr>
<td>Quantitative change</td>
<td>Qualitative and Quantitative change</td>
</tr>
</tbody>
</table>

*Table 2.4 Difference between Growth and Development*

*Source: Premlatha Mullic 2001*
Principles of Growth and Development

How can we assess the progress of growth and development of a child?

- ............................................................................................................

Human development is governed by certain principles. Knowledge of the principles of growth and development helps us to understand children better. A person who knows these principles will be able to assess children’s development objectively. It also helps us to prepare children ahead of time for the changes that are going to take place in their life. In other words, proper child guidance is possible only with the knowledge of principles of growth and development. These principles are discussed below.

i. **There are individual differences in development**

As each child has his own characteristic rate of development, we cannot expect the same behaviour from all children of the same age. eg. Some children may grow up to 6 feet tall, while others might stop at 5 feet or in between.

ii. **Different areas develop at different rates**

As children grow, each area of development proceeds at its own rate and reach maturity in its own time period. eg. the heart, liver and digestive organs grow slowly in childhood, but rapidly during the early years of adolescence.

iii. **Development is continuous**

Development is a continuous process from the time of conception to death. It may slow down or speed up at certain times, but it never stops completely at any time. eg. Physical development is rapid during infancy and adolescent period but slows down during childhood period.

iv. **Development is sequential**

Development follows an orderly sequence, which in general is the same for most children. Each stage of development leads to the next. There are two basic sequences. First development proceeds from head to toe (Cephalo-caudal) eg. a child first controls his head, then his trunk (turns) and later his legs (stands). This order of development never changes. Secondly, development proceeds from centre of the body towards outside (proximo-distal). eg. Child catches a ball first with both his arms, then with palms and later with his fingers.

v. **Development proceeds from general to specific responses**

The early responses of the infant are very general in nature as age increases they become more specific. eg. In early stages of language development, the child uses the word ‘toy’ before he learns to call each toy by name.
vi. **Development is influenced by both heredity and environment**
Heredity plays an important part in a child’s development. This is evident as many characteristics such as colour of eyes, facial features etc. are passed through the genes from the parent to their children.

Environmental factors such as nutrition, motivation, good role model etc. play an important role in the development of child. A child who is not given opportunities to interact with others, generally turns out to be shy and introvert.

vii. **Development is due to maturation**
No development can take place unless the child’s body is strong and able to support the concerned muscles. eg. A child can hold his head only after neck muscles are strong enough to hold it.

viii. **Development is predictable**
Because the rate of development for each child is fairly constant, we can predict the rate of development to some extent. eg. Children of tall parents are generally tall.

ix. **Many forms of so-called ‘problem behaviour’ are normal behaviour of the age in which they occur.**
Each developmental age has certain undesirable forms of behaviour which are normally found at that age and are outgrown as the child passes on to the next stage of development. eg. Bed wetting during the first year of life is normal but it can become a problem behaviour during early childhood.

x. **Development involves changes**
Major changes include change in size, changes in proportion, disappearance of old features and acquisition of new features.

**Change in size:** Each year as child grows his/her height and weight changes.

**Change in proportion:** As the child grows in size changes in proportion also occur. For eg. at birth head occupies one fourth of the body length. This proportion changes and in adulthood the head occupies one eighth of the body length.

**Disappearance of old features:** Old features disappear or get modified as the child grows. Disappearance of baby hair and baby teeth are a few examples.

**Acquisition of new features:** Among the physical features getting permanent teeth, appearance of primary and secondary sex characteristics are all new features acquired in the process of growth.
Let us do

**Identify examples for each principle of growth and development and prepare a chart.**

### 2.3 Areas of Development

Using the given illustration and description prepare a note on areas of human development.

**Areas of Development**

1. Physical Development
2. Motor Development
3. Language and Speech
4. Emotional Development
5. Social Development
6. Cognitive (Intellectual)

**Illustration showing Areas of Development**

Now you are physically and emotionally independent. What were the factors that have contributed to achieve this status? List some of them.

- ............................................................................................................

Human development constitutes the development of different areas such as physical, motor, language and speech, emotional, social and cognitive developments. By the time the child reaches adulthood, the development of major areas will be completed.

**Physical development:** Physical development means changes in height and weight and associated changes in size and shape of the body. Physical development influences child’s behaviour directly by determining what they can do and indirectly by influencing their attitudes towards self and others.

**Motor development:** Motor development means the development of control over bodily movements through the co-ordinated activity of the nerve centres, the nerves and the muscles. Motor development is partially responsible for overcoming the helplessness of newborn infants.

**Language and speech development:** The thoughts and feelings can be communicated in any form of language (gestures, emotional expressions, speech or written language) but it is most commonly and most effectively done by speech. Speech is a motor-mental skill. Speech development is the ability to use meaningful
words to others and to understand the meaning of words used by others.

**Emotional development:** Emotions are complex psychological and biological responses to internal and external stimuli. Emotional development can be defined as the ability to express, control, understand and accept one’s emotions. All emotions play an important role in children’s lives through the influence they have on children’s personal and social adjustments.

**Social development:** Social development means the acquisition of the ability to behave in accordance with social expectations. The change of children into social, nonsocial or antisocial person depends mainly on learning, not on heredity.

**Cognitive or intellectual development:** Cognitive development is the sum total of sensation, perception and cognition. Sensation means sensing something through sense organs. Perception gives additional meaning to sensing. Cognition is the process of thinking and knowing. The intellectual or cognitive development helps a person to memorize, imagine, communicate, perceive and to solve problems.

**Check your progress**
1. Define
   (a) Growth and development
   (b) Emotions
   (c) Cognitive development
2. Mention any five principles of growth and development.

### 2.4 Factors Affecting Growth and Development

The factors which affect growth and development can broadly be divided into heredity and environment.

**Heredity and Environment**

We know that we resemble our parents/grandparents in most of the features like colour of the skin, hair, shape of the nose, eyes etc. Can you identify the reason?

- .................................................................

Heredity is a biological process through which the transmission of physical and social characteristics takes place from parents to offsprings. It greatly influences the different aspects of growth and development, ie. height, weight and structure of the body, colour of hair and eye, intelligence and aptitude. In short, it is the sum total of all the traits present in an individual at the time of birth. The genes in the chromosomes of the mature sperm cell and the mature ovum carries potential for physical and mental traits. The carrier of genetic determination is chromosome.
Your mother may advise you to have good friends. It is undoubtedly true that your friends have an influence on you in developing good/bad qualities. Can you list some other factors that have an influence on you.

- Environment refers to all the factors except heredity, affecting an organism starting from the moment of conception. Individual’s environment consists of the sum total of the stimulations (physical and psychological) which he receives from his conception onwards. The different types of environment are physical, social and psychological environment. Physical environment consists of all outer factors such as food, clothing, shelter, weather and climate. Social environment is constituted by the society-individuals and institutions, social laws, customs by which human behaviour is regulated. Psychological environment is rooted in the individual’s reaction with an object. One’s love, affection and fellow feeling attitude will strengthen human bonds.

**Influence of Heredity and Environment on Human Development**

Every aspect of development is influenced by both heredity and environment. Environment affects a child’s personality in many ways. A child absorbs a lot from his parents, home, surroundings, school, friends and the neighbourhood. Many traits which are important to personal adjustments may be changed by variations in environment. Heredity provides the raw materials from which a person is made. How he is moulded, and what he becomes depend chiefly on environment. Heredity and environment appear to be co-acting influence, both are essential for development. The colour of a child’s hair and eyes, his physique and strength are inherited, but these are also influenced by climate, diet and disease. Every human being is born with certain muscular and skeletal structures - it is shaped and moulded by learning and experiences. Many activities, like writing, throwing a ball, spelling a word etc. are influenced by heredity and environment. Genetic factors have been found more important than environmental factors in determining the age at which first menstruation occurs.

Can you list some other examples to show the influence of both heredity and environment on your development?

- ...

Now you know that heredity and environment are the two broad factors affecting the growth and development of a child. Can you list some specific factors that help you grow and develop?

- ...

...
Observe the illustration and compare your findings

a. **Sex:** Sex acts as an important factor of growth and development. There is difference in growth and development of boys and girls. Boys are generally taller and courageous than girls. Girls show rapid physical growth during adolescence.

b. **Nutrition:** Nutrition plays an important role in physical as well as mental development. Insufficient diet during the growing period causes the appearance of various deficiency diseases and growth retardation. This condition cannot be rectified with quality diet in later period of life. Thus growth and development of a child mainly depend on his food habit and nutrition.

c. **Glands of internal secretion:** You know that our body functions are regulated by the hormones secreted by various glands. Certain glands of internal secretion play an important role in the development of children. Thyroxin produced by the thyroid gland is essential for the physical and mental development. Deficiency during the growing years results in stunted growth (cretinism). A balance of male hormones control development of masculinity and that of female hormones control it toward femininity. At puberty, sex hormones promote the development of genital organs.

d. **Position in the family:** The position of the child within the family may influence his development more through environmental than through natural factors. The second, third or fourth child within a family generally develops more quickly than the first born, because of the fact that the younger children learn from imitating their elder brothers and sisters.

e. **Maturation and learning:** Development is a result of maturation and learning. Maturation is the natural unfolding of traits present at the time of birth. Learning comes from experiences. Learning helps the child in his physical, mental, emotional, intellectual, and language development. Knowledge and skills, habits, and attitudes of a person help to deal with people.
f. **Physical defects:** The achievements of physically defective persons are far below when compared to normal children. Why?

- Physical defects like visual, auditory defects and orthopaedic disabilities affect the normal development of children. The developmental status of a child suffering from a physical defect is usually below that of the normal child. For e.g. blind children are slower in walking, feeding or dressing themselves than children with normal vision.

g. **Emotional factors:** Children from broken homes and orphanages do not grow and develop to an optimum level. Emotional disturbances, insecurity, sibling rivalry, jealousy, loss of parents, inadequate schooling etc. have a negative effect on growth and development.

Some of these factors coming under environmental factors are hereditary or with the nature of both hereditary and environmental. With respect to hereditary factors, the most crucial category which adversely affects growth and development is the hereditary disorders. Some of them are discussed below.

**Hereditary Disorders**

Haven’t you heard about the diseases or conditions that are passed on from parent to their children? Can you list some of them?

- Hereditary disorders are those diseases which are passed on from parents to their offsprings through genes. Observe the illustration showing different types of hereditary disorders. Let us identify and know the features of such diseases.

a. **Haemophilia**

Haemophilia is a condition in which blood does not clot normally. This results in severe bleeding from minor wounds. It is always associated with a defective gene.
This disease only affects boys, rarely occurs in women but is transmitted to their sons. A female can be a carrier. Administration of clot inducing drugs and blood transfusion reduces hazards.

b. Muscular Dystrophy
Muscular dystrophy (MD) is a group of more than 30 inherited diseases. They all cause muscle weakness and muscle loss. Some forms of muscular dystrophy appear in infancy or childhood. Others may not appear until middle age or later. The different types can vary in whom they affect, which muscles they affect, and what the symptoms are. All forms of muscular dystrophy grow worse as the person’s muscles get weaker. Most people with muscular dystrophy eventually lose the ability to walk.

c. Down’s Syndrome or Trisomy 21
An inherited disorder resulting from an extra chromosomal material on pair number twenty one, which causes mental retardation and distinct physical features. Physical features are almond shape of the eye, flattened facial features, poor muscle tone, broad hands, with unusual crease of the palm.

Let us do

*Download picture of a child with Down's Syndrome and note down the characteristic features and prepare an electronic presentation*

d. Phenyl-Ketonuria [PKU]
Phenyl-ketonuria is a metabolic disorder, in which phenylalanine an amino acid in milk and high protein foods such as meat cannot be metabolised normally by the liver. As a result, phenylalanine and other metabolic products accumulate in the blood, the nervous system becomes deprived of enough nutrients and severe mental retardation occurs.

e. Gout
Gout is caused by a build-up of uric acid in the blood. Uric acid is a waste product that forms in the body every day and excreted mainly through kidneys. It forms when the body breaks down chemicals in the cells known as purines. If too much uric acid is produced or too little is excreted while urinating, the uric acid builds

---

Do you know!

Haemophilia almost occurs in males since the gene can be passed from mother to son, as son lacks a second X chromosome to make up for the defective gene. Girls, on the other hand, are likely to be carriers of haemophilia but unlikely to actually have the disorder. In order to have haemophilia, girls must have the abnormal gene on both X chromosomes - a very rare occurrence.
up and may cause the formation of tiny crystals in and around joints. They accumulate in the joints or surrounding tissue and cause pain, inflammation and swelling.

Purines can be found naturally in your body, as well as in food, such as fish, caffeine, organ meats, beef, fried foods, soda, rich sauces, shell fish and fruit juice.
f. **Sickle Cell Anaemia**

Sickle Cell Anaemia is a genetically inherited disorder in which red blood cells become sickle shaped rather than dough nut shape. Sickle shaped cells cannot transport oxygen to various parts. They live only for a short duration than normal blood cells (RBC). More over bone marrow cannot replace them. When the sickle shaped cells block small blood vessels it leads to anaemia, jaundice, low resistance to infection and susceptibility to severe pain, and damage to various organs.

g. **Diabetes**

Diabetes is a metabolic disorder in which the person has high blood glucose (blood sugar) either because insulin production is inadequate or because the body’s cells do not respond properly to insulin or both. The normal blood sugar level is 80-120 mg/dl.

h. **Myopia or Short-Sightedness**

Myopia is a very common eye condition that causes distant object appearing blurred, while close objects seen clearly. It is a refractive error of eye, a condition where the light that comes in does not directly focus on the retina but in front of it.

**Let us do**

Conduct a project on hereditary disorders found in your locality and prepare report.

**Check your progress**

1. List the factors affecting growth and development
2. Write a short note on
   - Haemophilia, Sickle cell anaemia, Phenyl ketonuria and Muscular dystrophy
3. What do you mean by heredity and environment?
Let us sum up

The pre-natal stage is the period from conception till birth. This period is divided into three sub-stages; they are the period of ovum, period of embryo and the period of foetus. The post-natal life begins at birth and ends at death. The phases of post-natal period are infancy, early and late childhood, adolescence, adulthood and old age. Infancy is the period from 0-2 years. The early childhood period is between 3-6 years, which is a remarkable period of physical and psychological developments. The stage of late childhood starts from the 7th year and goes on till the 12th year. Adolescent period follows late childhood and extends from the age of thirteen to nineteen. Adulthood is the longest period of the life span ranging from 20-60 years. Old age is considered as the final stage of the normal life span usually begins at the age of sixty.

Growth refers to quantitative increase in size and structure of the body, whereas development refers to qualitative and quantitative changes. Human development is governed by certain principles. Knowledge of the principles of growth and development helps us to understand children better. Human development constitutes the development of different areas such as physical, motor, language and speech, emotional, social and cognitive developments.

Heredity is a biological process through which the transmission of physical and social characteristics takes place from parents to offsprings. Environment refers to all the factors except heredity, affecting an organism starting from the moment of conception. Sex, nutrition, gland of internal secretion, position in the family, maturation and learning, physical defects and emotional factors are the specific factors affecting growth and development. Heredity disorders are those diseases which are passed on from parents to their offsprings through genes. Some of the heredity disorders are Haemophilia, Muscular dystrophy, Down's syndrome, Phenyl-Ketonuria, Gout, Sickle Cell Anaemia, Diabetes and Myopia.

Learning Outcomes

- Identifies different stages of development and compares the characteristic features of each stage of development.
- Compares the terms growth and development, observing the principles governing growth and development and evaluating the influence of various factors on growth and development.
- Differentiates various hereditary disorders.
Evaluation Questions
1. Name the area of development in the following instances.
   Increase in weight: .................................................................
   Ability to communicate: .............................................................
   Ability to express the emotion: ..................................................
   Ability to solve problems: ........................................................
2. Differentiate growth and development
3. Pre-natal period of a baby consists of certain sub stages. Explain.
4. Complete the Table

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of Hereditary disorder</th>
<th>Disease Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Haemophilia</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Cannot see distant objects clearly</td>
</tr>
<tr>
<td>3</td>
<td>Down's syndrome</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Blood cells become crescent shaped</td>
</tr>
</tbody>
</table>

5. 'Development involves changes.' Justify with examples.