

**DIPLOMA IN ELEMENTARY EDUCATION  
(D.El.Ed.)**

**Course-506  
Understanding Children in Inclusive  
Context**

**Block -1  
Child Growth and Development : Basics**



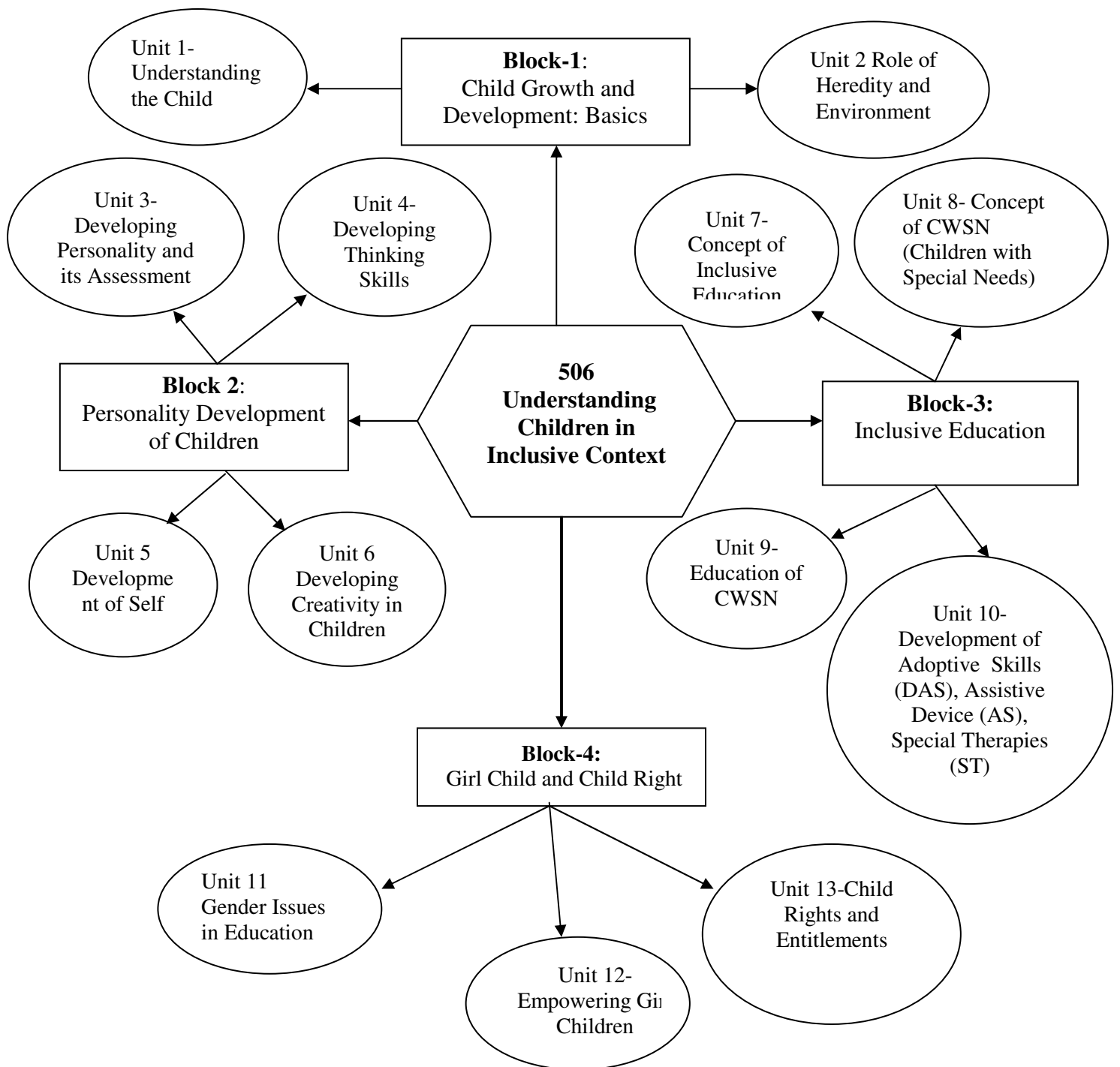
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# Course Concept Map for Course-506 “Understanding Children in Inclusive Context”



### Credit Points (8=6+2)

Block	Unit	Name of Unit	Theory Study Hours		Practical Study
			Content	Activity	
<b>Block-1:</b> Child Growth and Development: Basics	<b>U1</b>	Understanding the Child	6	3	<ul style="list-style-type: none"> <li>• Identification of factors affecting growth &amp; development of your school children</li> </ul>
	<b>U2</b>	Role of Heredity and Environment	6	3	<ul style="list-style-type: none"> <li>• Prepare a list of Hereditary influence on the learners of your class</li> <li>• Find out the characteristics about the impact of environment on the siblings from a family in your school</li> </ul>
<b>Block 2:</b> Personality Development of Children	<b>U3</b>	Developing Personality and its Assessment	8	4	<ul style="list-style-type: none"> <li>• Trace the differences in personality characteristics among the learners of your class</li> </ul>
	<b>U4</b>	Developing Thinking Skills	8	4	<ul style="list-style-type: none"> <li>• Identification of steps taken to develop questioning skill in your learner</li> </ul>
	<b>U5</b>	Development of Self	10	5	<ul style="list-style-type: none"> <li>• Identification of classroom condition of developing self-concept</li> </ul>
	<b>U6</b>	Developing Creativity in Children	9	7	<ul style="list-style-type: none"> <li>• Listing the situation created by you as a teacher in your class for fastening creativity</li> </ul>
<b>Block-3:</b> Inclusive Education	<b>U7</b>	Concept of Inclusive Education	6	3	<ul style="list-style-type: none"> <li>• Listing the factors affecting inclusive education in your school</li> </ul>
	<b>U8</b>	Concept of CWSN (Children with Special Needs)	7	4	<ul style="list-style-type: none"> <li>• Identification of learning requirement of CWSN in your school</li> </ul>
	<b>U9</b>	Education of CWSN	9	6	<ul style="list-style-type: none"> <li>• Preparation of action plan of home-based education</li> </ul>
	<b>U10</b>	Development of Adaptive Skills (DAS), Assistive Device (AS), Special Therapies (ST)	9	3	<ul style="list-style-type: none"> <li>• Seminar on special therapies regarding any impairment experienced in your school</li> </ul>

<b>Block-4:</b> Girl Child and Child Right	<b>U11</b>	Gender Discrimination	9	6	<ul style="list-style-type: none"> <li>• Identification of roles of your school on gender issues</li> </ul>
	<b>U12</b>	Empowering Girl Children	9	6	<ul style="list-style-type: none"> <li>• Listing our your role to develop life skills in girls of your school</li> </ul>
	<b>U13</b>	Child Rights and Entitlements	9	6	<ul style="list-style-type: none"> <li>• Listing out violation of child rights in your schools &amp; the locality</li> </ul>
		Tutoring	15		
			120	60	60
<b>Grand Total</b>			<b>120+60+60=240 hrs.</b>		

# **Block -1**

## **Child Growth and Development: Basics**

### ***Block Units***

*Unit 1 Understanding the Child*

*Unit 2 Heredity and Environment*

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# **BLOCK INTRODUCTION**

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You as a learner will study course 506: Understanding children in inclusive context. This course is divided into four blocks. This course will empower you to understand the nature and need of the children so that you can make teaching learning process effective. You can understand individual differences among children and create a child friendly environment. You can discuss the need for protection of child rights and entitlements of children. This discussion will make you more sensitive towards socio-cultural context of children.

## **Block 1 : Basics of child growth and development**

You as a learner will study Block 1: Basics of child Growth and development. This block is divided into two units regarding understanding the child and Heredity & environment. Each units divided into sections and subsections.

### **Unit 1 : Understanding the child**

After going through this unit you can understand the meaning of growth and development and describe the principals of growth and development. You can enlist the various factors responsible for growth and development. You can discuss different stages of growth and development explain the role of the teacher.

### **Unit 2 : Heredity and Environment**

This unit will help you to understand the meaning of heredity and environment. You will be able to discuss the mechanisms of heredity. You can enlist the various factors associated with environment. You will be able to know the relative role of heredity and environment and discuss their educational implications.

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2.	Unit 2: Heredity and Environment	28

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# UNIT 1 UNDERSTANDING THE CHILD

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Notes

## Structure

- 1.0 Introduction
- 1.1 Learning Objectives
- 1.2 Difference between Growth and Development
- 1.3 Principles of Growth and Development
- 1.4 Relationship between Growth and Development
- 1.5 Factors influencing Growth and Development
- 1.6 Stages of Growth and Development
  - 1.6.1 Stages of Growth from Infancy to Childhood and Their Implications
  - 1.6.2 Implications of Stages of Development for Teaching And Learning Process
- 1.7 Role of Teachers in The Growth And Development of Children
- 1.8 Let Us Sum Up
- 1.9 Answer to Check your Progress
- 1.10 Suggested Readings and References
- 1.11 Unit-End Exercises

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## 1.0 INTRODUCTION

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It is only with knowledge of growth and development of children that it is possible for the teacher to properly diagnose and guide a child so that he/she can grow up to be a citizen who understands his/her rights and responsibilities. It may be said that the child's environment begins to influence him/her as soon as s/he is born. The influence of the environment increases as the child's abilities mature. The teachers must have a thorough grasp of the nature of human growth and the principles of human growth and gear the educational endeavour to this understanding. It is obvious that to fulfill this aim of education, the teacher should have a fairly intimate knowledge and appreciation of the meaning of human development from conception to adulthood and old age. The first few years of the child's life and growth are the most significant for understanding the later developments in children. As we shall see in this unit, growth is a continuous process from conception to death. So the teacher must understand at what point in the growth of a child and in what ways the formal and informal situations and





techniques will help the child to attain full maturity. A teacher has to deal with children of different socio- economic and cultural background and who have a wide variety of individual difference among themselves at different age levels. This unit also provides a basic understanding of the principles of growth and development and the characteristics which emerge at different age levels in various developmental dimensions to provide effective guidance for the harmonious development of children. A child's constantly changing behaviour due to interaction with the surrounding, is to be understood by prospective teacher.

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## 1.1 LEARNING OBJECTIVES

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After reading this unit you will be able to :

- differentiate between growth and development
- list and describe the principles of growth and development
- relate growth with development
- list the factors responsible for growth and development
- identify the physical, mental, emotional, social and moral characteristics of children in their different stages of growth and development
- explain the role of the teacher in the growth and development of children.

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## 1.2 DIFFERENCE BETWEEN GROWTH AND DEVELOPMENT

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Development occurs when there is orderly and progressive changes in a human being due to maturation and experience while growth refers to structural and physiological changes, development is concerned with growth as well as those changes in behaviour which result from environmental situation. Development is thus a more inclusive term which has another element called 'maturation'. Growth is a ceaseless change measurable in terms of weight, height and size. Though growth and development are used interchangeably to denote the changes, these two terms must be distinctly used as explained below.

S.No	Growth	Development
1	Increase in size (height, weight and length) which brings in quantitative changes is called growth.	Changes are form and shape which brings in qualitative changes in function or character is called development.
2	Growth refers to physical changes.	Development refers to the overall changes including the physical changes.
3	A part of development is growth.	Development addresses changes as a whole.



4	Growth stops with maturity.	Development continues throughout the span of life
5	Physical changes or growth is observable and also measurable.	Qualitative changes or development is not totally observable and measurable.
6	Growth may or may not bring in development.	Due to development there may be an improvement in the functioning of the different organs of an individual but development does not mean growth.

Due to development there may be an improvement in the functioning of the different organs of an individual but development does not mean growth.



**Check Your Progress 1**

Is growth different from development? If yes, how? Write in about 50 words

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**1.3 PRINCIPLES OF GROWTH AND DEVELOPMENT**

Growth is an active dynamic process involving ceaseless change. The present experience, which children have, determines the nature and course of subsequent experiences. The normal child is a growing being. Just as s/he gains in height and weight as s/he grows, s/he also gains in her/his movements, perception, emotional control, social adjustment, languages, and such other aspects of psychological and social development. We have given below nine principles of growth and development which you can analyse and see if these are application to children around you.

**1. Development follows a pattern**

Prenatal (before birth) and postnatal (after birth) development of human beings follows a pattern or a general sequence. Physical development, motor or language development and intellectual development take place in definite sequences.

**2. Principle of development direction**

The direction of development is ‘cephalo – caudal’ as well as ‘proximodistal’ direction. The direction of development is from head to limbs i.e, in longitudinal axis called ‘cephalo-caudal’ and from the centre to the periphery called ‘proximodistal’ .The child gains control over its



head first, then arms and legs. Likewise, the child learns to control large muscles first and does finer movements with smaller muscles.

This means, the child develops the ability to control arms first and only then can control fingers and so on.

### **3. Continuous Development**

The process of development is continuous starting from the conception through birth to lifelong, i.e., from womb to tomb.

### **4. Rate of growth and development is not uniform**

Though development is continuous, the rate of growth and development is not uniform. Rapid changes occur in early years and slow down in later years of life. During adolescence again there is a sudden rise in growth and development, which slows down in later age of life.

### **5. Principle of individual difference**

With respect to development, the rate and quality of development in various dimensions differ from person to person. There is a difference in the growth rate between boys and girls. Girls mature earlier in comparison to boys. For eg, girls appear taller and well developed than boys of their same age.

### **6. Development proceeds from general to specific responses**

Responses are first general before they become specific almost in all dimensions of development. In case of language development, the child before saying different words, letters, babble different sounds similarly it sees large objects before seeing small objects. It means general ability precedes the specific activity in all the phases of child's development.

### **7. Principle of integration**

By proceeding from general responses to specific response again, these specific response are integrated from the whole it means there is a movement from whole to parts and again from parts to whole .

### **8. Principle of interrelationship**

Development in various aspects of the child is interdependent due to interrelationships. Development of one dimension in social aspect influences emotional development; and, in effect, all the dimensions of development relate with or influence each other.

### **9. Predictability**

The rate of growth and development of each child gives scope to predict the future development either physically or intellectually.



Notes



**Check your progress 2**

Write down the principles that growth and development follow.

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### 1.4 RELATIONSHIP BETWEEN GROWTH AND DEVELOPMENT

It may now be useful to consider the relationship between the two terms: ‘growth’ and ‘development’. In scientific literature, these two terms are used interchangeably. Growth is the cellular multiplication, like growth in height, weight, intelligence etc. On the other hand, development is the organization of all the parts which growth and differentiation have produced. In other words, growth may be referred to describe the changes which take place in particular aspects of the body and behaviour, while the term development may be used with reference to the child as a whole. As regards the definition of the term growth, some consider that growth is a process which takes place without any direction or control by the individual. Growth depends upon both maturation as well as learning. Maturation refers to the changes in the muscles and the nervous system as a result of time; and learning refers to the action of appropriate environmental forces operating on the individual. As a matter of fact, total development is a sequential pattern of change which involves a multitude of growth processes depending on maturation as well as factors in the environment. All growth processes are affected by the conditions under which the child acts and reacts to the environment. Some of these growth processes like learning to walk or learning to speak take a relatively short period of time. But others require much longer time. It is only when we are comparing an earlier behavior with the present behavior that we are able to see that growth has occurred.



**Check Your Progress 3**

How do you relate growth with development? Write in 50 words.

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## 1.5 FACTORS INFLUENCING GROWTH AND DEVELOPMENT

Right from conception, the beginning of life in a mother's womb, the growth and development of human beings is influenced by a variety of factors categorized broadly as internal and external. Let us discuss these factors as follows.

### Internal Factors

All those factors which lie within the individual are called internal factors.

These factors include:

1. Heredity factors
2. Biological or constitutional factors
3. Intelligence
4. Emotional factors
5. Social nature

Let us discuss the influence of these internal factors on the growth and development of children.

1. **Heredity factors:** the heredity factors play their part at the time of conception in the mother's womb. What is transferred to the offspring from its immediate parents in the form of genes and chromosomes at this time constitutes the hereditary contribution. This contribution is the real starting point and basis for all the growth and development that take place later in the life of the child. The height, weight, colour of the eyes and the skin, the characteristics of the hair, are all decided by these hereditary influences. The physical structure, nervous system and other things related to one's constitutional make-up, body chemistry and physical development are, to a great extent, decided by hereditary factors.
2. **Biological and constitutional factors:** A child's constitutional make-up somatic structure, physique and body chemistry influence his/her growth and development throughout his/her life. This can be substantiated in the following manner;
  1. A child who is physically weak or have internal deformities cannot be expected to achieve satisfactory results in terms of his normal physical growth and development. He/she usually suffers from illness which not only hampers his/her physical growth but also affect his/her development in other spheres – mental, social and emotional.
  2. The nervous system which controls the body movement, affects the growth and development of a child in cognitive spheres.



3. The endocrine or ductless glands are potent factors affecting the growth and development of an individual from his birth. The chemistry of the body is governed by these glands. Each of these glands secretes its own chemicals known as hormones. These hormones reach the blood stream, and get circulated throughout the body. They influence all those tissues on which depend the function of body system, emotional actions and even thoughts and, therefore, the functioning of the ductless glands exercises a great influence on various aspects – physical, social, mental, emotional and moral- of a person’s growth and development. For a balanced growth and development, the normal functioning of these glands is essential. In case there is over activity (hyperactivity) or under activity (hypo-activity) of these glands, it results in serious abnormality in growth and development.
4. **Intelligence:** Intelligence- as the ability to learn, adjust and take right decision at right time- has a significant role in the overall growth and development of child. It affects his/her social behaviour, moral judgment and emotional growth. An intelligent person is said to exercise reasonable control over his/her emotions, and is found to carry on well with his/her personal and social adjustment. Thus, the physical, social, emotional, moral and language development of a child is greatly influenced and controlled by the level of his intelligence.
5. **Emotional factors:** Emotional factors, e.g. emotional adjustability and maturity, play a big role in influencing a person’s overall growth and development. A child who is found to be overwhelmed by negative emotions like fear, anger, jealousy, etc. is adversely affected in his physical, mental, social, and moral and language development. If a person cannot exercise a reasonable control over his/her emotions, he/she is sure to suffer in terms of his/her growth and development.
6. **Social nature:** A person’s socialization helps him/her in achieving adjustment and advancement in other aspects of his growth and development. He/she may learn from his/her environment, more by means of his/her social nature, which may prove to be a boon to him/her for his/her proper growth and development.

### External factors

The factors lying outside the individual in his/her environment are said to be the external factors influencing his/her growth and development. These factors begin their role of influencing the growth and development just immediately after a baby is conceived. These may include the following.

1. **Environment in the womb of the mother:** What is available to the child for his/her nourishment in the mother’s womb from the time of conception till his/her birth is quite important from the angle of his growth and development. A few factors associated with this period may be cited as below:



## Notes

- a. The physical and mental health of the mother during pregnancy.
- b. Single child or multiple children getting nourished in the womb.
- c. The quality and quantity of nutrition received by the embryo within the womb of the mother.
- d. Whether or not the embryo has been subjected to harmful radiation or rays, etc.
- e. Normal or abnormal delivery.
- f. Any damage or accident to the baby in the womb.



**2. Environment available after birth:** Whatever a child gets from different conditions and forces of his/her environment after his/her birth influence his/her growth and development in many ways. These may be described as follows :

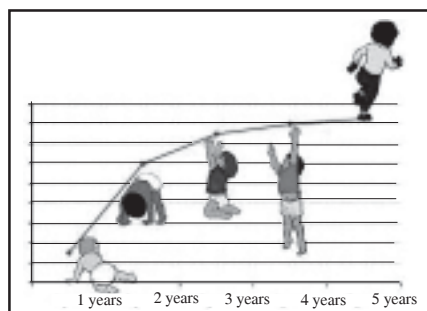
- a. Accidents and incidents in life: The growth and development of an individual is greatly influenced by the good and bad incidents and accidents which s/he happens to meet in his life time. Sometimes, a small injury or an incident may change the entire development course of his life. For example if a child's nervous system is damaged in an accident, it will hamper his/her mental development and in turn it will affect his/her development in other spheres – social, emotional, moral and physical.
- b. The quality of physical environment, medical care and nourishment. A child's growth and development is greatly influenced by the quality of his/her physical environment and medical care and nourishment available to him/her for his living and working. These include open space, balanced diet, good living and working conditions and proper medical care. He/she will achieve the heights of his/her growth and development based on the proper availability of these things.
- c. What a child gets from this social and cultural environment for the growth and development of his potentials, influences the entire course of his/her development of his/her sense, he develops and becomes what s/he is permitted to and desired by these social and cultural forces. A few of such conditions are pointed out below:
  1. Parental and family care received by a child.
  2. The economic and social status of the parents and the family.



3. The quality of the neighborhood and surrounding environment.
4. The quality of schooling received by a child
5. The quality of peer group relationships and company of a child.
6. The quality of treatment made available to a child and his family with regard to his caste, religion, nationality or citizenship.
7. The quality of educational and vocational facilities and opportunities available to a child.
8. The quality of the government, laws and organization of the society to which a child belongs.
9. The quality of the power and status enjoyed by the country to which a child belongs.



### Check Your Progress 6



Elaborate on two major factors affecting growth and development in children in about 75 words.

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## 1.6 STAGES OF GROWTH AND DEVELOPMENT

The stages of growth and development are discussed in two sub-section one on styles and their implications, and the other are their implications for teaching and learning.

### 1.6.1 STAGES OF GROWTH FROM INFANCY TO CHILDHOOD AND THEIR IMPLICATIONS

Following are the major stages of development

- i) Birth to 2 years: infancy.





- ii) 2 years to 6 years early childhood.
- iii) 6 years to 12 years: later childhood.
- iv) 12 years to 19 years: adolescence.

Let's discuss the stages in detail:

### **i) Infancy : Birth to 2 years**

#### **Physical development:**

In infancy, a baby develops extremely rapidly in various ways. Babies use their senses to learn to interact with the environment around them and their bodies grow stronger and mature. One way babies learn to use their bodies is by learning to achieve large physical tasks, or gross motor skills, such as crawling and walking. An infant goes through a series of physical milestones that build off each other to help him learn successively more difficult and complex actions. Typically, the development of major physical skills follows a pattern that starts with holding up the head, leads to rolling over, sitting up, crawling and standing and finally culminates in walking. Lifting of the head and pushing up on his arms develop during months 2 to 3 of a baby's life. Rolling over occurs around month 4, and by month 6, most babies can sit up unassisted. Crawling occurs between months 7 and 10, and sometime after 10 months, a baby will learn to stand and take his first steps. Just after birth, a baby has little to no control over his neck muscles. Before any other physical skills can be mastered, he must learn to lift and hold up his head. Arm and leg development often come naturally to a baby as he stretches and pushes with his limbs. Fine motor skills are just as important as the large muscle development that babies go through. Infants often can first grasp a toy at around 4 to 5 months of age. Between 9 and 12 months, the infant's pincer grasp develops, which is the ability to hold something between his first two fingers instead of just with his whole hand. In the second year of life, toddlers continue to become more mobile and more agile. Around 15 months, babies begin to climb stairs, high chairs, and furniture, but they will not yet be able to get back down once they reach the top. By 18 months, toddlers' balance becomes more stable as they can move more easily on their feet around objects and begin walking backwards, sideways, in circles, and even running. Near the end of their second year, toddlers begin to develop complex gross motor skills such as throwing objects for distance and kicking. By 24 months, they can jump in place and balance they can jump in place and balance on one foot for a short period and may begin peddling their first tricycle. At the end of the second year, toddlers are very mobile and can run and walk quickly from one place to another.

#### **Language development:**

When infants are first born, they do most of their communication through crying. They cry to tell caregivers they are hungry, tired, or uncomfortable; have a dirty



diaper; are in pain; or just want some attention and affection. However, infants are already learning about spoken language from birth. As their caregivers talk to them in their field of vision, 8-10 inches from their face, they will copy the mouth movements the caregivers are making. Around age 2 to 3 months, infants begin cooing and making soft, exaggerated vowel sounds to show pleasure or excitement. Around 3 to 4 months, babies will add more verbal sounds and start to make the consonant sounds of b, k, m, g, and p. By 4 months, babies will begin to put vowel sounds and consonant sounds together to form nonsense words such as “gaga” and “ahpoo” as they start to experiment with how sounds can be linked together. As well around this age, infants can blow through their lips and may blow bubbles to practice using and controlling their lips and mouths. By 5 months, babies learn the musical sound and speech patterns of their caregiver’s native language, which is the language they hear the most. Around age 6 months, they begin to babble. By 7 months, babies begin taking turns “speaking” with others instead of talking at the same time as others do. Meanwhile, babies will also try to imitate sounds caregivers make, especially animal sounds such as “moo” (English for the cow’s sound). By around age 8 months, babies begin to connect sounds they and their caregivers make to actual ideas and thoughts that can be universally understood. For example, when a baby hears the word “milk,” she knows she’ll be getting her bottle soon; when she says “bub,” she’ll get her beloved stuffed bear. Near the end of their first year of life, babies begin to put together all the language lessons they’ve learned so far. Between the ages of 9 to 12 months, babies begin to say their first real words, such as “mama” and “dada.” During this period, they may slowly add a few more words to their vocabulary. By age 12 months, some babies may have as few as a 2-3 words in their expressive vocabulary, while others may have a dozen. As toddlers enter their second year, their ability to use language becomes more obvious. They continue to acquire words and to increase the number of words they understand. They learn words that are significant or important to them, such as the names of favorite toys and people. During the last half of the second year, toddlers’ ability to use language becomes even more sophisticated. Between ages 18 to 24 months, toddlers begin putting 2 to 3 words together to form simple phrases, called telegraphic speech. Toddlers may know somewhere around 50 words by 20 months and over a hundred words by 24 months.

**Cognitive development:**

Babies are not only growing physically during the first 2 years of life, but also cognitively (mentally). While physical growth and change is easily observed and measured in precise terms such as in inches and pounds, cognitive change and development is a little harder to determine as clearly. Therefore, much about what experts know about mental and cognitive development is based on the careful observation of developmental theorists and their theories, such as Piaget’s



theory of cognitive development and Erickson's psychosocial stages. According to Piaget, newborns interact with their environment entirely through reflexive behaviors. They do not think about what they're going to do, but rather follow their instincts and involuntary reactions to get what they need: food, air, and attention. Piaget believed that as babies begin to grow and learn about their environment through their senses, they begin to engage in intentional, goal-directed behaviors. In other words, they begin to think about what they want to accomplish, how to accomplish it, and then they do it. This is also when infants develop object permanence, which is the ability to understand that something still exists even if it can't be seen. These two milestones, goal-directed behavior and object permanence, are the highlights and major accomplishments of infant cognitive development.

### **Emotional/Social development:**

Babies can feel interest, distress, disgust, and happiness from birth, and can communicate these through facial expressions and body posture. Infants begin showing a spontaneous "social smile" around age 2 to 3 months, and begin to laugh spontaneously around age 4 months. In addition, between ages 2 and 6 months, infants express other feelings such as anger, sadness, surprise, and fear. Between ages 5 and 6 months, babies begin to exhibit stranger anxiety. Later, around 6 months, babies begin to mimic the emotions and expressions they see in others. At 8 to 10 months, babies start to experience separation anxiety when separated from their primary caregivers. Around 9 months babies first frown to show displeasure or sadness. Between ages 9 to 10 months babies become highly emotional. They go from intense happiness to intense sadness/frustration/anger quickly. This emotional instability evens out as babies develop rudimentary strategies for regulating their emotions around age 11 months. Babies' understanding of others' emotions grows as well. Around age 12 months, babies become aware of not only other peoples' expressions but also their actual emotional states, especially distress. It's interesting to note some babies begin to exhibit jealousy at the end of this first year, around age 12 months. As toddlers move into the end of the second year, they continue to build on the emotional progress they have already made. Between the ages of 13 and 18 months, separation anxiety may subside as object permanence develops, and they understand their caretaker isn't gone even when they can't see them. This is also the point during which babies may also use transitional objects such as stuffed animals or blankets to soothe and comfort themselves when the caretaker is not there. Toddlers usually enter another emotionally rocky time between the ages of 15 to 18 months. During this time, they can be fretful and easily frustrated, and may throw temper tantrums to demonstrate this emotionality. Toddlers around age 21 months, and become less fretful and more relaxed. Also during this time, toddlers may show signs of self-consciousness when doing certain tasks or trying new situations, looking for caretaker approval. By age 2, toddlers can show a wide range of emotions and are becoming better at regulating and coping with



their emotions. In fact, by this age, toddlers can even fake some emotions in order to get what they want. They know that if they fall and show behaviors of being hurt (even if they aren't hurt), they will get attention. However, they will often still become upset at situations that disrupt their sense of control or alter their normal routine. Also around their second birthday, genuine empathy appears. They become capable of recognizing when they've hurt someone somehow, and capable of apologizing.

**ii) Early Childhood (2 years to 6 years)**

1. **Physical development:** Growth in physical dimension during the period of 2 to 6 years of age is not as accelerated as that experienced in infancy. The child begins to assume the body proportions of an adult. Growth of legs is rapid and the legs represent about half of one's total height. The growth of the head is slow and the growth of the trunk is intermediate. Generally the weight of a three-year-old male child is about 33 pounds and is 38 inches tall. The girls are a bit lighter and shorter. By age of the five years, the average height of boys is 43 inches and the average weight is 43 pounds. The height and weight are affected by a number of variables such as height of parents, nutrition, and illness etc. In addition to size and weight, the child undergoes other physical and physiological changes. The muscles develop at a very rapid speed. Larger muscles are far better developed than the small and fine ones. Physiological changes occur in respiration the heart rate slows down, and the blood pressure goes up steadily. The brain develops 90% of its adult weight. The nerve fibers in the brain areas come close to maturity level by the end of preschool period.
2. **Perceptual development:** The child in early childhood develops a variety of motor skills which are repeated later. Self-feeding, self-dressing, bathing, brushing the hair, playing with toys, use of pencil, jumping, hopping etc. develop at the age of 5 to 6 years. The perceptual development begins from mass movements to differentiation and integration. Following is the table of norms for children from 2 years to 5 years of age.

**Development Norms**

Motor	2 years	3 years	4 and 5 years
Development	Walks without help, jumps, runs	Skips, hops	Free and active movements responds to music
Fine motor Coordination	Copying	Can match Shapes, sees Similarities and differences	Can name colours.
Perceptual	Identifies self, matches colours	Can fit nets. Boxes	Matches shapes and colours, distinguishes names.



## Notes

## Understanding the Child

Vocalization	200 words, uses few words.	900 words. Follows commands.	Can repeat 4 digits 2000 to 3000 words. can define formation words
Adaptive behaviour	Bowel control.	Builds blocks. Can draw a man.	4 digits, draws body with details



3. **Language development:** The language development of the infant begins from the birth's cry. The ten-month-old child is able to use one word but by the end of the first year, his/her vocabulary increases to 3 or 4 words. Good home environment and early childhood training help in the development of vocabulary. The following table shows the development of vocabulary:

Age in years	Vocabulary	Age in years	Vocabulary
1 Year	3	4 Years	1560
2 Years	272	6 Years	2562
3 Years	896		

4. **Intellectual development:** The intellectual development of the child is accelerated after the age of two because now s/he begins to explore her/his social environment and acquires new experiences. Following are the major characteristics of intellectual development:
- The child begins to form concepts of physical and social reality.
  - By the age of six the child develops perception of size, shape, colour, time and distance, etc.
  - The memory increases at a very rapid speed. The child can learn by rote memorization.
  - Creativity develops in children and imagination begins to grow.
  - Thinking and reasoning develop in relation to concrete material.
  - The span of attention increases from seven minutes to twenty minutes and interest in exploring the environment increases.



(g) The child is now able to use symbols in language, draw symbolic play and engage in problem solving.

(h) The child start asking questions about his/her environment.

**5. Social development:** A child is born in a social environment where his/her personality development is shaped in accordance with the norm of the society:

(a) The sense of trust and mistrust develops in children themselves and their environment.

(b) The feeling of autonomy develops in children. They begin to explore their environment independently.

(c) The social environment expands beyond home.

(d) Children of both sexes play together without any discrimination. They actively participate in group, games in which physical energy is used such as hide and seek.

(e) They learn to cooperate with others and make friends on shared interests and similar personality traits.

(f) Children take interest in fairy tales and animal stories.

(g) Negativism increases between the years three to six. It is a product of social situations. It is said that the more the child is frustrated by adult interference, the more negativistic his behaviour will be.

(h) Girls are more dominating than boys in play situations.

(i) The child seeks social approval of his action.

**6. Emotional development:** Emotions play an important role in life and contribute in the personal and social adjustment of the individual provided they are directed into wholesome expression. Emotions have the following effects on the developing individual:

a) Emotions give us energy to face a particular situation in life.

b) They work as motivators of our behaviour.

c) Emotions add pleasure to everyday experiences in life.

e) They influence adjustment in the society.

f) Highly emotional conditions disturb mental equilibrium; reasoning and thinking are disrupted.

g) Emotions serve as a media of communication between individuals and guide the individual to modify in order to conform to the social standards.

h) Emotional deprivation leads to personality maladjustment.



The following emotional characteristics develop in children:

- a) Emotions are frequent.
- b) They are expressed in relation to the concrete objects.
- c) They are temporary. It means that the child shifts his emotions very rapidly. As for example, a child of 3 years who is weeping, if given a toffee, will become happy.
- d) Emotional expressions in early childhood are intense irrespective of the intensity of the stimulus.
- e) Children fail to hide their emotions but express them indirectly through different activities as crying, nail-biting, thumb-sucking and speech difficulties.
- f) Emotions change in strength. Emotions which were very strong at a certain age become weak as the child grows while others which were weak become stronger. This change may be due to change in drive strength, child's intellectual development and changes in interest and values.

### iii) Later Childhood (6 years to 12 years)

Later childhood is an important phase of life. This is a period when children often begin to behave in the most awful way. The parents and teachers are annoyed with children and vice-versa. It is a period which requires proper guidance and counseling by parents and teachers for the adequate adjustment of children in the society. The years from 8 to 12 years constitute the unique period of human life. The brain acquires nearly its adult size and weight, health is almost at its best, activity is greater and more varied than ever before or than it will ever be again and there is peculiar endurance, vitality, and resistance to fatigue. The child develops a life of his own outside home circle and its natural interests are never so independent of adult influence.

1. **Physical development:** There is slow increase in weight and height during late childhood. Girls are ahead of boys by two years. Changes are shown in all general proportions of the body. Children are free from diseases at this age. Physiologically, the girls at the age of 11 are fully a year ahead of the boys. Shedding of milk teeth and growth of permanent teeth changes the appearance of mouth; flattening of forehead, sharpening of the nose, broadening of the chest, and motor skills develop through play. Following are the marked changes.
  - a) Increased manual dexterity ;
  - b) Increased strength ;
  - c) Increased resistance to fatigue ; and



- d) Accuracy and endurance increase in relation to games.

There is organic need for strenuous physical activity. Skeletal muscles develop and require exercise. The nine to eleven years olds dash breathlessly from place to place, never walk when they can run, never run when they can jump or do something more strenuous.

**2. Intellectual development :** The following changes in the intellectual development occur during the period – six years to twelve years of age.

- a) The child begins to make clear distinction between him/herself and the outer world. He/she seeks reality in his/her environment.
- b) The concept of natural laws becomes almost fully developed by 12 years of age.
- c) It is the time for eager absorption of information and ready accumulation of ideas. Learning and memory become more efficient because the child enters formal schooling.
- d) The capacity for logical thinking increases, and the child becomes increasingly efficient in selecting, developing and applying cognitive operations in relation to concrete objects.
- e) Interest in science stories and mechanical operations reaches its height at this age.
- f) Courage and loyalty increase. Children show courage in doing things.
- g) Imaginative plays are given preference over other plays.
- h) The use of reading of factual material, scientific and mathematical information and fiction, with a realistic theme increases.
- i) Use of casual relationship in thinking about physical, mechanical and natural phenomena in the environment increases.
- j) Early imaginative fears disappear by the age of 12.
- k) High ability to generalize is shown by children often to twelve years of age. Children are more concerned with immediate cause –and – effect relationship and current happenings.
- i) The mind of the child during this period has a better general understanding of problems. He/she can rationally analyse a problem, and is able to deal with the environment in a flexible, efficient and symbolic manner. They have in their disposal a set of operations or rules that are logical although concrete.

**3. Emotional development:** Emotions are very important for life. Without emotions life becomes monotonous and dull. They change with the age of





the child. Following are the characteristics of emotional changes during this period:

- a) Early pattern of emotional expression changes. By the end of late childhood the child learns to control his/her emotional expression in social situations.
- b) The emotional responses of the child become less diffuse, random and undifferentiated.
- c) Emotions are expressed even in the absence of concrete objects.
- d) Emotions are most contagious during childhood, because children are highly suggestible and dependable on others.
- e) Early childhood fears of animals, high places and noise disappear and fear of supernatural, imaginary creatures, fear of failing, being ridiculed and being different appear.
- f) Anger is caused by thwarting, teasing making unfavourable comparisons with other children, interruption of activities in progress, ridicule by peers or elders, and negligence, etc.
- g) Parental favouritism causes jealousy in childhood.
- h) Girls are more jealous than boys in their classes because of preferential treatment given to boys.
- i) Joy, pleasure, love, curiosity, grief and affection appear in childhood.

**4. Social development:** The process of socialization confines to home and neighbourhood environment in early childhood but as the child enters school his social circle widens. Following are the major changes:

- (a) It is the period when children form peer group of their own sex and remain outside the home. Peer group becomes an important agent of socialization.
- (b) It is the period of peak unruliness in school and home.
- (c) Complaints of disobedience are the highest in percentage during this period.
- (d) Children reject adult standards, and their circle of friends widens.
- (e) Delinquency is more during this period than in adolescence.
- (f) Sex difference becomes sharp. Girls play with girls and boys play with boys. There is sex difference in play activities. Girls become more antagonistic towards boys.



- (g) Boys are more rebellious than girls and their groups are more organized than the groups of girls.
- (h) Children take interest in group games. Boys and girls form their own groups. Group consciousness develops and the child becomes less selfish, self-centered and aggressive but more cooperative and outgoing.
- (i) Social consciousness develops very rapidly. It is called “gang age” period when the child associates himself with the peer group of the same age who feel and act together. The child shows great loyalty to his gang, he conforms to the stand of his gang.

***Educational implications***

1. Proper environment should be provided in school and they should be encouraged to express their feelings.
2. Security and independence should be given in home and school.
3. Provide opportunities to participate in games, cultural activities and picnic, etc.
4. Do not compare boys with girls.
5. Be democratic in your outlook while dealing with children.
6. Provide opportunities for boys to have more association with men during childhood.
7. When children show emotional outbursts, treat them calmly and intelligently.
8. Respect the individuality of the growing child and express faith in children.
9. Reinforce the desirable behaviour of children.
10. Remember that children are members of a peer society which has great influence on their personality.
11. Out-of-family experiences should be provided for children in the local community.
12. The immature and inadequate forms of expressing independence may be considered a desirable step in the direction of self-reliance.
13. The gang membership of children during this period should not be resented by parents and teachers because it provides them opportunity for self-expression, escape from over-solitude, feeling of importance and security.
14. Interest in crafts and hobbies should be developed.
15. Opportunities should be provided for experimentation.
16. Reading should be encouraged by providing literature.
17. School should provide experience of local environment.



18. Skills should be developed in games and manual activities. Girls and boys should be given different types of instructions.
19. Emotions should be properly trained. Emotional energy should be properly directed in useful and socially approved channels.

### Development of motor skills and knowledge

In a broad way we can distinguish between motor skills and symbolic skills. Motor skills are those which involve the direct symbolic skills and the direct movement of the body and its parts. There is considerable individual variation. Some people can acquire a new motor skill easily while others attain only a moderate degree of it. There are also variations with respect to physical strength and quickness. Symbolic skills include language, numbers and drawing. By means of these symbolic skills man is able to short-circuit the physical trial and error process and solve problems more quickly and easily. With his spoken and written symbols he can transmit experience to others. That is why it is asserted that symbols constitute the greatest invention of man. Even with respect to the acquisition of symbolic skills there are individual differences. For instance, some people can use symbols easily and fluently while others speak slowly and with hesitation. Some have great knowledge while others have very little. There are also individual differences with respect to the ability to think. Through thinking human beings can anticipate situations and prepare for further possibilities so that they can control themselves, the external world, as well as the other human beings more effectively. We shall try to understand how these motor skills as well as symbolic skills are acquired, and what their course of development is.

The following developments in motor skills take place:

#### (a) Locomotor and Manipulatory skills

In a broad way we may classify motor skills into locomotor and manipulatory skills. The locomotor skills involve such activities as walking, running, climbing. The manipulatory skills involve the handling of objects with dexterity. Motor skills are very important at all ages. The new born child is cribbed and confined. He/she extends his/her



activities when s/he is capable of touching objects around him/her with his/her hands and feet. When s/he starts crawling his world extends a little more. That is why in certain Indian homes when the child creeps and crosses the threshold it is celebrated as a great event in his/her growth. When s/he learns to walk, his area of activity widens still more and the parents have to be very careful about the



various objects in the house which may upset and break and thus expose him/herself to the danger of being hurt. But his/her parents know that obstructions are of no avail because the infant is so active that he seeks out new objects and new experiences. Skills involve movements of the body by the action of the striated musculature. Several motor skills are involved in the educational process, In athletics and games in arts and crafts, in speaking reading and writing – in all these motor skills are involved.

### **(b) Growth in motor abilities**

The child exhibits three types of motor responses:

- (a) random, generalized activities or mass responses involving the whole child
- (b) specific reactions like the sucking –reflex, grasping, babinski etc., and
- (c) complex behaviour patterns involving the coordination of several reflexes like the startle response.

One of the most important stages on the growth in motor abilities is the development of eye-hand coordination involved in reaching and grasping objects. By the time the infant is 7 to 8 months old s/he no longer depends upon random movements to grasp his/her rattle or other objects. The most important are the object-vision phase where there is an interaction of the visual and the motor activities, and the manipulative phase where the child reaches and holds the object.

Next there is the development of locomotor skills. There is an increase in ability from year to year. Manual skills such as ball throwing, catching and bouncing are dependent on the co-ordination of the eyes, arms and hands. The speed of reaction to auditory stimulus improves with age. There is a reduction of useless movements as well as a decrease in the bodily tension with increase in age. Thus, by the time the child comes to the elementary school at six years he is already in possession of many locomotor as well as manual skills, in the early school years there is an increase in smoothness and efficiency in the execution of the activities.

### **(c) Some aspects of the learning of skills**

Learning a motor skill involves both the central nervous system and the skeletal muscles and also autonomous nervous system together with the visceral muscles. The skeletal action is quick, specific and limited, does not persist. On the other hand, the vasomotor or smooth muscle reaction is relatively slower and persists longer it is also diffused and widespread, that is why we cannot localize our feelings nor can we describe them accurately. It involves the increase of hear. Learning of skills involves a change from smooth muscle reaction to skeletal muscle reaction. In the early stages of learning a child may feel tense because s/he is frightened by the new situation or they may be angry that s/he is put into a new situation and so he feels embarrassed. The purpose of tension is to mobilize



the resources of the child and make energy available for activity in order to meet the new situation. Consequently, the child reacts with lack of organisation. On the other hand, after many repetitions there is smooth, easy and balanced function with slight internal involvements.

Motivation is very necessary for the learning of any skill. An optimum level of motivation must be established and maintained in order to ensure effective learning.. There is also the factor of transfer. A person who has learnt a wide variety of skills is able to learn new skills with greater ease. Special training before this period has little or no long-term effect. Complexity of the skill also influences the rate of the learning as well as the final level of proficiency. The learner should be given optimum quality and amount of information about his performance. It has also been found that “mental practice” can help a great deal in the learning of a skill. If the learner imagines and pictures to himself the various movements it helps him. Forgetting the skills can be minimized by over-learning and by providing brief periods of practice periodically. Films are very effective in teaching more complex skills.

### **Moral development**

Moral development is one of the most important developmental dimensions of human beings. It is often referred to as the character development. Moral behaviour or character is to be considered as an essential quality of the total personality of the individual. Human beings are neither moral nor immoral by birth. Their character is moulded at the hands of the parents, other relatives, neighbors, class and school mates, other pals, peers and the members of the larger society.

The development of character is dependent is on the following factors:

1. biological make-up of the individual ;
2. the physical environment;
3. the social influences ;
4. the cultural legacy ;
5. the physical and mental health ;
6. The rules and regulations of the community ;
7. the socio –economic status ;
8. wholesome and worth –while experiences ;
9. conscious training and
10. sanctions and punishment given by elder members.

### **Characteristic features of moral development**

The characteristic features of moral development stage- wise are enumerated below:



Notes

### Infancy

- At the time of birth the child is born neither moral nor immoral.
- He/she is born with the capacity for growth through maturation and experience.
- Attainment of requisite maturity is essential before the child can display certain types of conduct.
- Patterns of conduct are learnt at home as the result of the internalization of sanctions and punishments provided by the parents leading to the development of moral self or conscience.
- In the pre- school stage, the teachers help children develop desirable conduct through approval and disapproval of the behaviour and by providing worth while living experiences.
- Through the principle of pleasure and pain, the child comes to know of the acceptances and expectances of the society at large.

### Childhood

- During this period, the peer group plays a prominent role in developing the moral behaviour of children through the disciplinary procedures they follow.
- The children’s contact widens to the secondary group and the rewards and punishments given by the parents, teachers and other societal members help to strengthen the moral self further.
- During these two periods the children come to conform with the social and cultural norms, mores and code, rather uncritically.
- Mere memorization of a number of Scriptural passages does not help in the development of desirable behaviour, but they should be comprehended and internalized.
- Honesty, truthfulness, trustworthiness, etc., become meaningful in due course, a
- The power of inhibition and ability for self- direction towards self chosen ends begin to develop.



#### Check Your Progress 4

Briefly enumerate the major stages of development in childhood. Write in about 100 words.

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## 1.6.2 IMPLICATIONS OF STAGES OF DEVELOPMENT FOR TEACHING AND LEARNING PROCESS

The knowledge of growth and development and the principle of development are useful to teachers. Examine the following and see if these are helpful to your teaching in the class:

1. It helps teachers to match their teaching modes and level of teaching to the level of development of children. They can effectively convey the subject matter to children.
2. They can be thoughtful about the limits of expectations from children. The activities can be suitable to their age. They know what to expect and when to expect from them.
3. They can be more realistic in their understanding of children by realizing the necessity of maturity to learn certain aspects
4. They can plan the learning procedure according to the developmental patterns i.e., from specific to general and general to specific.
5. The principle of interrelation and interdependence of various aspects helps is the harmonious development of the child.
6. Uniformity of pattern makes everybody ready to receive the development.
7. Knowing the role of environment they can pay sufficient attention to the environmental conditions in bringing up the children.
8. Development is a continuous and non-stop process at all periods and stages of human life. Therefore, we should never give up our efforts to achieve perfection in terms of development in the different dimensions of our personality.
9. The principle and knowledge of individual differences reminds us to understand the wide individual differences that surface at all periods of growth and development among children. Each child should be helped along the developmental process within the sphere of his own strengths and limitations.
10. The principles related to growth and development suggest a pattern or trend for the advancement of children on the developmental path. This knowledge can help us know as to what can be expected in terms of the proper growth and development at a particular developmental stage and we can then plan accordingly to achieve it by organizing environmental experiences.



### Check Your Progress 5

Will the knowledge of growth and development of a child help teachers in organizing their teaching better? Write in about 100 words.



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## 1.7 ROLE OF TEACHER IN GROWTH AND DEVELOPMENT OF CHILDREN

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A teacher has to deal with children of different socio- economic and cultural background who have a wide variety of individual difference among themselves at different age levels. The teacher as an agent of the society is responsible to bring desirable changes the in behaviour of children so that they may shoulder the responsibilities of a good citizen to accelerate the process of national development. The other reason to study development is it continuity from the past to the present and present can be understood in terms of its past history. Prior to joining school, a child accumulates enormous experiences in his/her home and neighborhood environment which are very useful to start formal education in or effective way. Individual differences among children play an important role in education. The teacher must know the potentialities and capacities of each and every child of his/her class so that he may exploit them to the maximum for the benefit of the individual and the society. The teacher must know the basic principles of growth and development and the characteristics which emerge at different age –levels in various developmental dimensions to provide effective guidance for the harmonious development of children. A child’s constantly changing behavior due to interaction with the surrounding, is to be understood by prospective teacher.

A good teacher contributes to a child’s life today and for all his/her future life, thus:

1. Meets the needs of the child for security through teacher’s affection, understanding and consideration and through the accepted place of the family in the community its unity and its economic stability
2. Meets the needs of the child for accomplishment through opportunities for work, with enough success to encourage endeavour, through opportunities for helpful service to others, through freedom from interference with natural desires for achievement.
3. Provides early social training through experience with other children under supervision, through vocational guidance, through training in manners and morals, through help in learning to live in harmony with aims and objectives of other people.
4. Provides opportunities for mental development through encouragement to





Notes

do for him/herself through answering questions, through giving him/her space and material for play.

- 5. The ideal teacher would provide for a child a friendly and hospitable environment for the development of his/her emotions and abilities and secure relationship in a group of dignified social status where in he was loved, protected and encouraged.



**Check Your Progress 7**

How can the teacher help a child to grow and develop normally? Write in about 100 words.

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**1.8 LET US SUM UP**

A child grows and develops into an adult. Growth is the change in height and weight, whereas development is the change in function and character. Heredity and environment affect growth and development .The different stages of development are infancy, early childhood, later childhood, and adolescence. During these stages a child develops physically, mentally, emotionally and morally. A teacher should understand the characteristics of children during these stages and nurture them to grow and develop normally by love, affection, encouragement and developing suitable methods of teaching keeping in mind the diverse and individual needs of children.

**1.9 ANSWER TO CHECK YOUR PROGRESS**

**Check Your Progress 1**

Yes growth is different from development..Growth is size height, weight and length whereas development is changes in form, shape bringing qualitative change in function or character.

**Check Your Progress 2**

The principles of pattern, developmental direction, continuity, uniformity, individual difference, proceeds from general to specific response, integration, inter-relationship, predictability.



### Check Your Progress 3

Growth is the cellular multiplication, like growth in height, weight, etc., development is the organization of all the parts which growth has produced.

### Check Your Progress 4

The major stages of development are: birth to 2 years- infancy, 2 years to 6 years-early childhood, 6 years to 12 years- later childhood and 12 years to 19 years-adolescence

### Check your progress 5

Understand the individual difference at different stages of growth and development

### Check your progress 6

Internal and external factors

### Check your progress 7

A teacher can help a child by understanding and caring, showering love and affection, catering to the needs of the children.

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## 1.10 SUGGESTED READINGS AND REFERENCES

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- Wood, Chip (2007) *Yardsticks: Children in the Classroom Ages 4-14 : A Resource for Parents and Teachers* , Northeast Foundation for Children, Inc., Turners Falls MA
- Junn, Ellen and Boyatzs, Chris (2007) *Annual Editions: Child Growth and Development 08/09 [Paperback]*, Dushkin Pub. Group, Nashua, NH, United States

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## 1.11 UNIT END EXERCISES

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1. Define growth and development.
2. Explain the principles of growth and development.
3. List any two characteristics of emotions and intellectual development during early childhood.
4. Discuss the major factors having an impact on growth and development of a child.
5. How can the teacher help in the growth and development of a child?



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## UNIT 2 HEREDITY AND ENVIRONMENT

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### Structure

- 2.0 *Introduction*
- 2.1 *Learning Objectives*
- 2.2 *Meaning of Heredity*
- 2.3 *Meaning of Environment*
- 2.4 *Arguments in favour of Heredity*
- 2.5 *Arguments in favour of Environment*
- 2.6 *Relative Significance of Heredity and Environment*
- 2.7 *Educational Implication*
- 2.8 *Let Us Sum Up*
- 2.9 *Answers to Check Your Progress*
- 2.10 *Suggested Readings and References*
- 2.11 *Abbreviations/Glossary*
- 2.12 *Unit-End Exercises*

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### 2.0 INTRODUCTION

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As teachers working at the school level, you must have noticed that the learner learns concepts differently. Some of the learners learn concepts quickly and others slowly. For example, take the case of drawing of a diagram of a flower or a plant. Why do you think there is some kind of variation in learning? Further, you might have observed certain variations in their handwriting or scholastic achievement in school subjects. What may be the reasons for such varied responses? It may be difficult to give an acceptable answer. As an answer to this question there are two obvious causes. They are

- i) Heredity and
- ii) Environment

In the first unit on '**Understanding the Child**', a detailed coverage has been made with respect factors influencing growth and development. This unit shall focus move on the role of heredity and environment. Heredity is discussed as an internal factor and environment as an external factor. Besides these, you will also learn about the educational implications of heredity and environment to



better organize your teaching and facilitate students' learning.

## 2.1 LEARNING OBJECTIVES

After reading this unit, you will be able to:

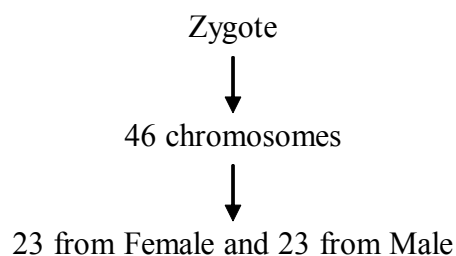
- ❖ define the concept of heredity .
- ❖ understand the mechanisms of heredity.
- ❖ describe the concept of environment and factors associated with environment.
- ❖ analyse heredity and environment as causal factors for individual differences in learning.
- ❖ underline the relative significance of heredity and environment in teaching-learning

## 2.2 MEANING OF HEREDITY

Heredity is the sum total of the traits potentially present in the fertilized ovum. All the qualities that a child has inherited from the parents is called heredity. After knowing the meaning one must know about the mechanism of heredity. How is child biologically born? Life starts as a single cell.

Conception time

The union of male and female germ cells causes fertilization of the ovum. The fertilized egg is known as zygote.



Each chromosome contains about 40 to 100 genes. The genes are responsible for the development of particular traits. In the words of Peterson Heredity may be defined as “what gets from his ancestral stock through his parents”. Douglas and Holland says “Heredity consists of all the structures, physical characteristics, functions or capacities derived from parents and other ancestors”. F.L. Ruch considers the heredity as the totality of biologically transmitted factors that influence the structure of the body.

Let's go through a short case study to appreciate the above definitions of factors associated with learning.



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**A Case study on Heredity**

Frleture is a great mathematician and piano player and his wife Meghana is an internationally popular Hindustani classical singer. They have two children. The son Aryan who is 15 years old, is very much interested in the study of Science and Maths. He is also interested in instrumental music. He has already won several national level championships in music. They have a daughter Christina who is 12 years old. She is very much interested in music and English literature. Both the children are excellent in school studies that score above 95% in all their school subjects.

With the help of the above case study, answer the following questions before proceeding with your further study

- Q1. The most dominate hereditary quality that you find in the children is- (Tick the correct answer)
- a) Creativity
  - b) Positive attitude for learning skill based subjects
  - c) Challenging attitude
  - d) Variation in the attitude
- Q2. What are the contributing factors for the children to develop love for the study of science and music?

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**2.3 MEANING OF ENVIRONMENT**

Environment means the totality of the stimuli that impinge on the organism from without whatever found around the individual may be called by the term environment. According to Anastaxi “The environment is everything that affects the individual except his genes”. Douglas and Holland “the term environment is the aggregate of all the external forces, influences and conditions, which affect the life, nature, behavior, the growth, and development and maturation of living organisms”. Environment consists of various types of forces like physical, social, moral, economical, political cultural and emotional forces. A favorable environment caters to the development of native abilities of a child.

According to Gilbert “environment is anything immediately surrounding an object and exerting a direct influence on it”.

The term mental environment means the atmosphere necessary for the mental development of a person. If the library, laboratory, curricular and co-curricular



activities are properly organized, the child would achieve the desired intellectual development. Therefore, teachers should try to provide best mental environment, workshop, museum, clubs, associations, debate, symposia etc., must be encouraged.

## 2.4 ARGUMENTS IN FAVOUR OF HEREDITY

Kinds of twins: There are two kinds of twins i) identical and ii) fraternal twins.

Identical twins develop from one ovum's. Fraternal twins arise from germination of two separate ova. Identical twins resemble each other and are always of same sex while the fraternal twins mostly just brothers and sisters at the same time.

Thorndike, Newman, Freeman, David Winfield and many others have made studies on twins and they come to the conclusion that heredity is an important factor in causing individual difference. Another study was conducted by David Winfield and the following conclusions were drawn.

<i>Sl. No</i>	<i>Description</i>	<i>Co efficient of Correlation(r) on IQ between them</i>
1	Identical twins	0.90
2	Fraternal twins	0.70
3	Siblings	0.50
4	Parents and children	0.31
5	Unrelated children	0.30

All the above studies point out that the heredity is an important factor in the life of an individual. Identical twins reared apart since infancy differ somewhat more than identical twins reared together. But still they remain more alike than the fraternal twins either reared apart or together. Fraternal twins are more alike in intelligence than ordinary siblings. It means that closer the relationship, the higher is the correlation of score on intelligence.

## 2.5 ARGUMENTS IN FAVOUR OF ENVIRONMENT

Freeman has proved that 71 children who were removed from a poor environment and placed in a good environment showed an increase in Benet's mental rating upto 10 points. This justifies the role of environment in the life of an individual.

**Study of James –Reace:** There were two twins reared in a hill and a village respectively when their intelligence was marked, the difference of 19 points was found, this is clearly an indication of environmental effect on intelligence. Now: Is the characteristics of the child and individual differences are due to a) heredity b) environment c) or both?



Notes

If so, to what extent, what is the relative role of heredity and environment in the development of the child and in causing individual differences? That is, both heredity and environment are equally responsible for the development of child and in causing individual difference.

**A case study on Environment**

Anil and Sunil are the students of 10th standard. They are studying in King George School, New Delhi. Both the students are from a leading business family. They have the ambition to do their MBA from Harvard University USA. Their parents have advised them to study commerce and accountancy and establish their own business. They also have keen interest in business studies. Both have written some articles in magazine on economic reforms in India and

Also made presentation in their School subjects.

With the help of the above case study answers the following questions briefly:

- 1) What are the dominant qualities of the students?

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- 2) How did the students get such qualities?

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- 3) How do you justify that the children have strong career goals?

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- 4) What are the factors that influence their career goals?

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## 2.6 RELATIVE SIGNIFICANCE OF HEREDITY AND ENVIRONMENT

Heredity is defined as the totality of bio-logically transmitted factors that influence the structure of the body and environment is the totality of conditions that serve to stimulate behavior or act to bring about modification of behavior. Both heredity and environment are important in the life of an individual; both are the determinants of development. According to ROSS, the action of these factors in determining the level of an individual's biological, psychological and social development is sometimes expressed in the following formula:

$$H \times E \times T = DL$$

i.e.

Heredity X Environment X Time = Development level of an individual personality.

This formula implies the fact that it is meaningless to speak of either heredity or environment, acting alone. Both are necessary for the development that takes place in an individual.

Heredity works only in some sort of environment. Without environment, it is useless and environment without heredity means nothing. It means both are very important in the life of the individual. Heredity gives us the body, structure, complexion or features etc, and the environment provides the opportunities to develop them.

**Landis** and **Landis** remarked that “heredity gives us capacities to be developed but opportunities for the development of these capacities must come from the environment”.

According to **Woodworth**, both are equally essential in the growth and development of the child.

Individual is the result of multiplication between heredity and environment. Individual is represented by the area of a rectangle, where as heredity is the base and environment is the height. Area of rectangle does not depend merely upon the base or height, it depends on both. Similarly, individual is a result of heredity and environment. The development of hereditary potentialities is a matter of environment.

$$\triangle A = b \times h$$

Heredity and environment cannot act in isolation. Every individual possess heredity, these traits develop on an environment for their nourishment

**Murphy** has rightly pointed out, “heredity is known only by the liberation of





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heredity potentials through specific environmental forces and what is liberated is as much as function of the environing pressures as it is of the latent or potential deposition". The following figure explains both the views as below:

Upper limits are provided by heredity and environment cannot go beyond those limits. But it helps in the maximum development of raw materials given by heredity. Heredity supplies the raw material, culture supplies the designs while family is the craftsman, because it is the parents who carry the culture of the society to the child.

**Maclver and Page state** "every phenomena of life is the product of both heredity and environment, each is as necessary to the result as the other. Neither can ever be eliminated and neither can ever be isolated". Further the relative importance can be highlighted through the following illustrations:

1. Seeds (heredity) x Soil = Yield
2. Capital x Investment = Revenue

## 2.7 EDUCATIONAL IMPLICATION

The knowledge of relative role of heredity and environment is very important on the part of the teacher so that he can help his students In learning concepts better. The knowledge of both the factors will help the teacher in finding out the individual differences among his students in learning either Mathematics or English as well as in adjusting his teaching methods and techniques accordingly, like project method and communicative teaching techniques.

The teacher must plan to provide better education and better environment. By providing computer laboratory and adequate library facilities in each subject. He should study the child, his/her abilities as well as his environment and he/she must prepare scheme for the development. In this context, Sorenson has rightly remarked that to the teacher, knowledge, relative effect of the forces of heredity and environment on human development and their inter-relationship is of great significance. The high degree of scholastic achievement depends upon the school climate.

The school should aim at providing enriched programmed of curricular and co – curricular activities for the children like quiz and literary competition. They may have better educational, vocational, personal guidance and counseling and personality development programs. If their heredity and environment are known. The knowledge of heredity and environment is very much essential for a teacher in dealing with all kinds of exceptional children including gifted, normal, below average, and problem children, and first generation learners including educationally backward children.



**Notes**

1. **The background of the learner:** previous knowledge, intelligence, family background, lack of interest, aptitude and attitude play an important role. Some students who lag behind in some do better in the other area of achievement. Hence teacher must provide a congenial atmosphere for the students and treat them equally. The teacher must motivate them to adjust with the environment.
2. There are individuals who deviate from the norms of group due to many factors. Hence the classroom teacher should try to have the desired knowledge of the abilities, capacity, interests, and attitudes, aptitudes and other personality traits of his/her pupils and in the light of this knowledge he/she should render individual guidance for the maximum utilization of their potentialities.
3. Different methods of teaching must be adopted in the classroom. This helps in catering to the needs of different individuals according to their interest and understanding level.
4. The school must be the place for personality development. The school should organized programmes on leadership group dynamics, keeping background the heredity and environment of the learner.
5. Every school must have a guidance and counseling centre.



**Check Your Progress-1**

1) What is heredity?

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2) What is environment?

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3) What are the factors of the heredity?

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- 4) What are the factors of the environment?  
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- 5) How do you say that the heredity is more important than environment?  
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- 6) What are the arguments in favor of environment?  
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- 7) What is the relative importance study of Heredity and Environment?  
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- 8) Explain the Educational implications of the study of Heredity & Environment?  
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### 2.8 LET US SUM UP

Education is vitally linked to growth and development of children. Education aims at fullest possible bringing out of all the potentialities of children. It is said that a child is born with some natural traits and it is power of the education to foster proper growth in the special environment. Growth is the product of the Intraction of the organism and its environment. Haeditarians claim that Heredity is all important as it decides and set everything about the personality of an individual. Heredity it considered as the sum total of Inborn Individual traits. Envi-ronment includes all those forces which act upon the individual. After concep-tion, Row the child develop, is the outcome of the interaction between his hered-

ity characteristics and the environment. Experiments shows that each trait requires both heredity and environment for its development.

Heredity and Environment both are equally important and work hand in hand, both are essential to achievement. In othe word, we can say that Heredity and environment are complementary both are aspects of same phenomenon.



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## 2.9 ANSWER TO CHECK YOUR PROGRESS

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- 1) Heredity is a process through which the cells carry the physical and mental traits from parents to its off springs.
- 2) The surroundings from which an individual receivers stimulus for his /her growth and activities which include, physical, mental and emotional aspects.
- 3) The factors of heredity are genes, physical appearance, height, weight, skin complexion, and all reflexes.
- 4) The environment factors include all that we see and hear around us. It has physical, cultural and social aspects of environment.
- 5) It is natural that a tiger gives birth to a tiger cub and it cannot give birth to an elephant cub. The progeny naturally inherits all the dominant qualities of the parents. For example: children are born dwarfs due to dwarf parents
- 6) The environment certainly influences the behavioral aspects of an individual. For example: the twins who are reared separately tend to acquire qualities of foster parents eg. Language acquisition depends on the environment. A child born to illiterate parents can learn ten different languages before he / she reaches 10 years.
- 7) The role of heredity and environment in an individual's growth is unique and they are like the sides of the same coin. An individual is the product of both heredity and environment. The degree of influence of either heredity factors or environmental factors may vary depending upon the child rearing practices of parents. The illustration such as Seed and Soil = Yield, and Capital and Investment = Revenue, are given to high light the relative significance of them.
- 8) Educational implications of the study of heredity and environment are as follows the study of heredity and environment enables the teachers to understand the causal factors of individual differences and offer classroom instructions to minimize the variations in learning and provide equal opportunities in classroom teaching. Teacher can adopt imitable methodology, use apt teaching aids and motivate the learners to a large extent.



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## 2.10 SUGGESTED READINGS AND REFERENCES

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## 2.11 ABBREVIATIONS/GLOSSARY

Heredity	:	The physical and psychological qualities that the child inherits from its parents.
Environment	:	The surroundings in which a child / an individual is brought up of includes all the support that the child gets from the external world.
Attitude	:	It is a state of mind which reflects likes and dislikes of the learner
Aptitude	:	A natural ability or a skill
Chromosomes	:	Cells that carry genetic information given from parents to its young ones.
Maturation	:	Growth or maturity or a process of becoming Matured
Intelligence	:	It is an ability or capacity to carry out any activity or human ability e.g. thinking meaningfully
Impinge	:	To have a negative impact
Correlation	:	To have a mutual relationship
Exceptional	:	Children with rare abilities and skills
Zygote	:	A union of eggs and sperms
Identical twins	:	Similar in every detail or close resemblance between two children.
Fraternal twins	:	Two brothers look alike.

## 2.12 UNIT-END EXERCISES

1. Discuss relative significances of heredity and Environment.
2. Discuss the Educational Implications of Heredity and Environment.