CHILD DEVELOPMENT

Standard XI

The Coordination Committee formed by GR No. Abhyas - 2116/ (Pra. Kra. 43/16) SD-4 Dated 25.4.2016 has given approval to prescribe this textbook in its meeting held on 20.06.2019 and it has been decided to implement it from the educational year 2019-20.

Child Development

STANDARD XI

Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune 411 004

P8Y2B7

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Paper : 70 GSM Creamwove
Print Order : N/PB/2019-20/5,000
Printer : S Graphix (I) Pvt. Ltd., Thane

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Publisher
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The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens:

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā
uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians are my brothers and sisters.

I love my country, and I am proud of its rich and varied heritage. I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect, and treat everyone with courtesy.

To my country and my people, I pledge my devotion. In their well-being and prosperity alone lies my happiness.

PREFACE

Dear students,

Welcome to standard XI. We have great pleasure in offering you this textbook on Child Development based on the new syllabus. This subject may seem unfamiliar to you. It is a scientific body of knowledge, which is interdisciplinary and has relevance to subjects like Biology, Psychology, Anthropology, Cultural studies, Sociology, and Neuroscience. One of the reasons that the subject has grown in importance is due to the need to improve the lives of children today.

In this subject this year, you will get an understanding of the scope, objectives, domains, the principles that underlie development and the factors that affect the growth and development of every individual. You will realize that the emotional, social and physical development of young children has a direct effect on their overall development and on the adult, they will become. That is why understanding the need to invest in very young children is so important as to maximize their future well-being.

While studying the concepts and principles, we have given some reflective activities to ensure that you associate it to daily life. So do go through these activities very carefully. The boxes in each chapter will give you an idea of some facts related to the topic and some interesting features to enhance your knowledge.

Child Development is a vast subject and we have given only a glimpse into this evidence based study. Make use of information available by using the QR code alongside the text. This will provide you with the related audio-visual materials and some further links to deepen your understanding of the topic. It will also help you in revising the topic when you need to solve the additional exercises and qe stions.

Please do give us your feedback about what you liked in this textbook and how you would like us to add further initiatives to enrich your knowledge.

Wishing you all, the best for the study of the new textbook.

(Dr. Sunil Magr)
Director

Maharashtra State Bureau of Textbook Production
And Curriculum Research Pune

Date : 20 June, 2019

Indian solar year : 30 Jyeshtha 1941

Std XI Child Development - Competency Statements

Student will be able to

1. Define Child Development
2. Understand the objectives of Child Development
3. Comprehend the concept of growth and development
4. Know the career options of Child Development
5. List and explain the domains of development
6. Enumerate the stages of development
7. Describe the characteristics of each stage of development.
8. Distinguish between growth and development
9. Elaborate the Principles of development.
10. Know the factors influencing development
11. Describe the Importance of Maturation and Learning.
12. Understand the reprodctive system of male and female.
13. Become aware of the menstrual cycle.
14. Know the care and hygiene during menstruation
15. Define conception
16 Develop an awareness about signs and care during pregnancy
17. Clearly explain the stages of prenatal developement
18 Explain the types of birth
19. Detail the factors affecting prenatal development
20. Describe the neonatal stage and the physical appearance of a newborn
21. Discuss the various adjustment of the neonate
22. Use key terms related to neonatal reflexes
23. Know about causes and effects of prematurity
24. Understand the aspects of physical and motor development.

25. Recognize and know the changes in physical structure from birth to two years.

26 Seqe nce in motor development

27. Discriminate between fine and gross motor skills.

28 Understand the meaning and importance of Cognition

29. Determine various mental process

30. Outline the stages of cognitive development

31. State the importance of infant stimulation and early intervention.

32. Differentiate and understand language and communication

33. Explain the importance and functions of language

34. Know and describe the Pre speech forms.

35. Recognise the basic components of emotion

36 Become aware of the milestones in emotional development.

37. Understand the development of emotions and evolution of emotion in childern.

38 Get apprised of the manifestation and handling of children's emotions.

39. Understands the process of socialisation

40. Realize the impact of family and environment

41. Recognize the stages of social development during infancy

42. Recognise the need for care during infancy.

43. Understand the importance, advantages of breast feeding, weaning and supplementary feeding.

44. List the immunization schedule

45. State the importance and need for Toilet training.

46. Realize the significance of preventive care and safety

For Teachers ...

There is growing evidence about the nature and importance of Child Development that enables those who work with young children to know what they need most in order to thrive.

The objective of studying this subject is to ensure that we create a desire in students to seek more and learn more about the subject.

It is crucial to motivate learners by developing their ability to dig deeper into the subject, to think about events happening around them or with them.

In the process of learning and teaching, encouraging the students to introspect, observe, compare, discuss and share their thoughts needs to be give prime importance.

Eliciting what they know from the qe ries to assess their previous knowledge before initiating the topic to be learnt is an important consideration. You could add on and use your creativity and activities to introduce or expand the same.

Amazing, interesting facts have been incorporated to kindle and sustain student interest.

A warm, friendly informal and non judgmental attitude will ensure that students participate willingly and actively.

Consistent encouragment to ask qe stions will help students to find clarity and precision in what they learn.

Activities to recapitulate and consolidate their learning have been purposefully interspersed.

Further information, related reading and audio visual links are in the QR code.

INDEX

1 Introduction to Child Development

- Have you wondered how you grew up ?
- How did you and those around you learn to use words to communicate?
- How did you learn to walk?
- At what age did you learn to climb the stairs?
- Well!! the answer to these type of qe stions will be evident when you study the subject of Child Development.

Can you identify and list some changes and differences between yourself, a school going child and an infant?

1) ..... 2) ..... 3) ..... 4) ..... 5) .....

We will focus on the changes that take place in humans as we mature from birth to about age 19.

A child progresses from dependency on their parents/guardians to increasing independence. A child's development is strongly influenced by genetic factors (genes passed on from the parents) and events during prenatal life. It is also influenced by environmental factors and the child's capacity to grasp and learn.

W at does Child Development include?

Child Development covers a wide range of skills that a child masters over his/her life span. These relate to different areas :

- Physical growth and development –D evelopment of various parts of the body.
- Motor skills –F ine motor skills and gross motor skills.
- Sensory –A wareness of information through various senses.
- Cognition –T he ability to learn remember and solve problems.
- Speech and Language –U nderstanding and using language, reading and communication.
- Social interaction and emotions –I nteracting with others and self management.

1.1 Meaning, Definition, Objectives and Scope of Child Development

1) Meaning and Definition of Child Development

Human growth and development is a continuous and lifelong process. There are constant changes in the individual from conception to old age. Development begins at the time of conception and continues till death. The field of Human Development is a scientific study of these changes.

According to Laura Berk, "Child Development is a field of study devoted to understanding human constancy and change from conception through adolescence. Child Development is a part of a larger discipline known as Developmental Psychology, or in its interdisciplinary sense, Human Development, which includes all changes throughout the life span."

Child Development is a specialized area of study which is an integral part of Human Development. It concerns itself with **growth** and **development** of the child right from the moment of **conception** to **adolescence**.

2) Objectives of Child Development

The first eight years of life are known as the foundation age. It lays the foundation for behaviour patterns, attitudes and personality. As the need to study children arose, this evolved as a separate subject of Child Development. The objectives of studying child development are as follows :

a) To study overall development of children :

To know and understand how children develop. The students will learn the developmental patterns, developmental norms, aspects of development, needs of children and children's rights.

b) To become acquainted with developmental stages from birth to adolescent years :

The students will know the different developmental stages such as prenatal, infancy, early childhood and others. They will also study the characteristics of each of these stages.

c) To understand the various factors affecting a child's development :

Factors such as heredity, environment, stimulation, family, learning, maturation, nutrition, rest, exercise and many others have a long lasting effect on the child's development. This information will equip adults to enhance the development of the child.

d) To understand the contribution and the role of adults in Child Development :

To understand, stimulate and promote age appropriate development of children. Parents, teachers, caregivers and society play an important role in development of children. Parents and teachers, play a very significant role in order to ensure that the physical, motor, cognitive, emotional and social needs are met.

3) Scope of Child Development :

The scope of any discipline depends on depth of the studies, it's development and how well it has been related to the environment. Considering such issues, Child Development though a part of Human Development has a wide scope as a separate discipline, since it is directly dealing with human beings. Given below is the scope of Child Development:

a) Studying different stages of development :

The knowledge of this subject helps to study development from the prenatal period to adolescent years in depth. It tells us how the entire life span has been divided into smaller periods highlighting the pattern of development, characteristics of each stage, the milestones and the needs etc. This would lead to promoting further interest in studying this subject.

b) Studying various domains of development :

The different domains would include physical and motor, cognitive, language, social,moral and emotional. These are also known as aspects of development. The interrelation between these aspects will highlight the importance of normal development and related behaviour.

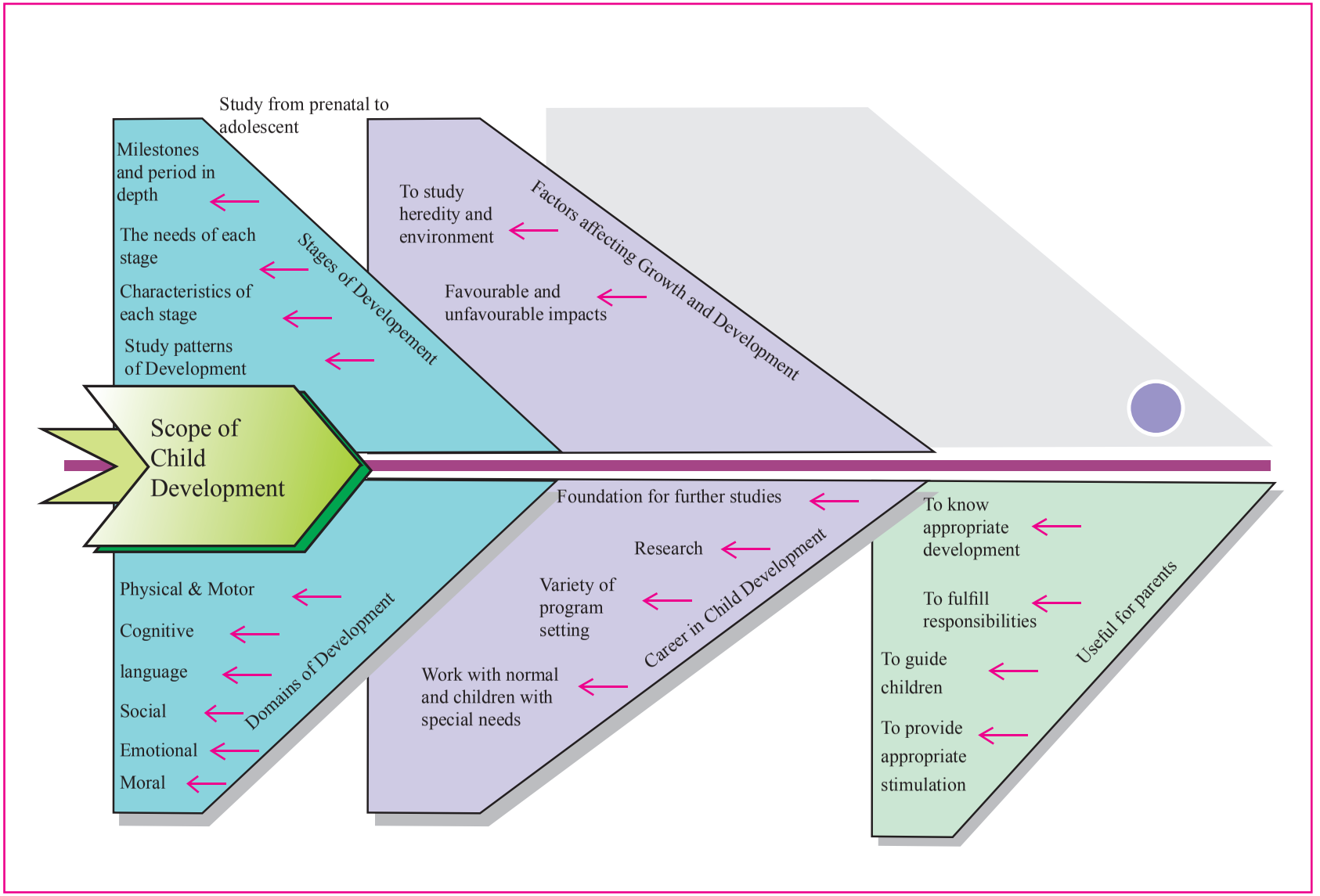


Fig. 1.1 Scope of Child Development

c) Studying the factors affecting growth and development :

Heredity and environment are the two main factors affecting a child's growth and development. This subject helps to study the favourable and unfavourable impact of heredity and environment on the development of the child. This will help us understand the contribution of these factors that makes every child uniq e.

d) To make a career in the field of Child Development / Human Development :

The basic knowledge of Child Development will be a foundation for further studies and research at a higher level. After studying various theories, experiments and new researches by various educationists, one gets an opportunity to pursue a career in this field with children as well as those with special needs. One can work as a professional in a wide range of settings and programmes for children, youth, and their families.

e) Useful for parents and would be parents :

The knowledge of Child Development is very essential for parents and would be parents. Studying the aspects of development will help in fulfilling their responsibilities as parents. They will also be able to guide their children better. The subject covers development from prenatal period to adolescence. With the awareness regarding the milestones at every stage, parents would know whether the child is developing in an appropriate manner.

f) Useful for various professionals :

The knowledge of Child Development is useful for various professionals like teachers, counselors, social workers, special educators, health care workers, early childhood educators, toy designers, Anganwadi workers, App makers, Curriculum planners, Policy makers etc.

Unscramble the underlined word to get the answer from the clue given:

- Life span divided into small units ---------- **g aets**
- Aspects of development ---------- **imaodn**
- One factor that makes the child uniqe ---------- **redyhiet**
- To be aware of appropriate development ---------- **smtioelne**

1.2 Meaning and Definition of Growth and Development

Very often the terms growth and development are used as synonyms. However both the terms have very specific and characteristically different meanings.

Let us now try to understand both these terms by doing a simple activity. Let us look at your time line and understand the same.

- What was your length when you were a baby and thereafter?
- What was your weight at each stage?
- What are the other changes that you have observed?

Definition :

Growth refers to qa ntitative changes such as growth in height, weight, etc. The term growth is used for changes that can be measured in numbers or amount, e.g. changes in size, body proportions, number of teeth.

The term **Development** means a progressive series of changes that occur as a result of maturation and learning. Development implies both qa ntitative and qa litative changes. This means that development does not consist merely of adding inches to one's height or improving one's ability. Instead, it is a complex process of integrating many structures and functions.

The term 'development' covers a much larger spectrum of changes which are both qa litative and qa ntitative. This include changes in abilities like learning to speak, changes in behaviour, interests, comprehension and other similar changes.

Reflection / Darpan

- On a blank sheet of paper place your palm and outline the same. Also do the same with a younger sibling at home / in your neighborhood . (School going boy/ girl and an infant)
- What differences do you see?
- Observe and write down the differences in the abilities.

Activity :

Look at the pictures given above. Write your observation in your own words.

Table 1.1 Difference between Growth and Development

Growth	Development
1. Growth refers to changes in particular aspects of the body.	1. Development involves organism as a whole.
2. Growth refers to change in size resulting from multiplication of cells or increase in intracellular substances.	2. Development refers to the maturation of structure and function.
3. Growth refers to qa ntitative changes e.g. increase in height and weight.	3. Development refers to both qa ntitative and qa litative changes. e.g. improvement in skills and strategies in memorizing, vocabulary.
4. Growth may not always be progressive.	4. Development is a progressive series of orderly and coherent changes.

5. Growth does not continue throughout life.	5. Development is a continuous process. It starts at conception and continues till death.
6. The changes caused by growth are measurable in units. e.g. growth in height or weight can be measured.	6 Development includes qa litative and qa ntitative changes which are not directly measurable, but can be observed from behaviour and performance.
7. Growth may or may not bring about development. e.g. a child growing in terms of weight may not show any functional improvement.	7. Development is also possible without growth. e.g. a child may not show any increase in height and weight but may show behavioural improvement or improved cognitive skills.

Activity :

a b c d

Observe each picture and write which is growth and development.

a ---------- b ---------- c ---------- d ----------

3 Domains / Aspects of Development

Growth and development occurs in different aspects of a human being. The interdisciplinary study of child development is vast. For the purpose of study and to make it more orderly and convenient it is divided into various domains / aspects. These aspects are mainly physical, motor, cognitive, language, social, emotional and moral development. We need to study all these aspects as they all are interrelated and they affect each other. The aspects of development are as follows :

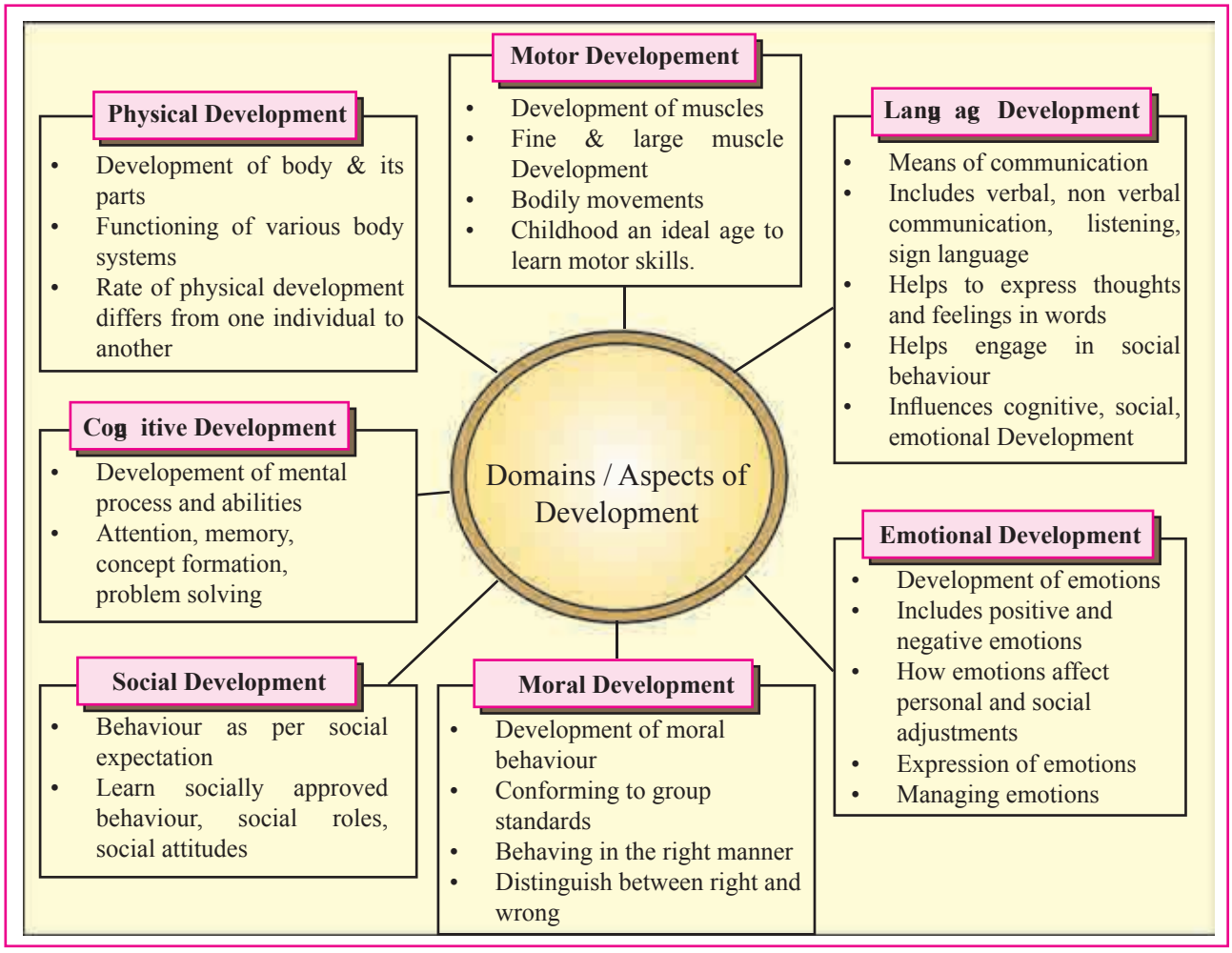


Fig re 1.2 Domains / Aspects of Development

i) Physical development :

Physical growth and development relates to the development of the body and its parts. Changes in the body size, brain development, body proportions, development of sensory capacities, functioning of various body systems are all part of physical development. It is essential to know how children develop physically as physical development influences children's behaviour both directly and indirectly. Although physical growth follow a similar pattern in children, the rate of development differs from one individual to another. It also differs from one stage to the other stage.

ii) Motor Development :

Motor development is development of muscles in the body. Children learn and acqi re various skills with the help of fine and large muscles and hence they are known as motor skills. It is the development of control over bodily movements through the co-ordinated activity of the nerve centres, the nerves and the muscles. Studies of motor development have revealed that there is a normal pattern and sequence of achieving muscle control at specific age. Childhood is referred to as the ideal age for learning skills because children's bodies are more flexible and therefore they can acquire skills easily.

iii) Cog itive development :

Cognitive development is the development of a wide variety of mental processes and abilities including development of sensory capacities, attention, memory, perception, concept formation, problem solving, imagination, creativity and the uniqe human capacity to represent the world through language.

iv) Lang ag Development :

Language is a means of communication. It helps us to express our thoughts and feelings in words. It includes different forms of communication such as verbal, nonverbal, listening, speaking, writing, sign language, expressions and gestures. Children learn to engage in social behaviour with the help of language. Language development influences cognitive, social and emotional development.

v) Emotional development :

Emotional development refers to development of emotions and how they affect personal and social adjustments. It is essential to study this aspect of development because emotions play a very important role in our life. The various aspects include positive and negative emotions, emotional expressions, managing of emotions and emotional maturity.

vi) Social development :

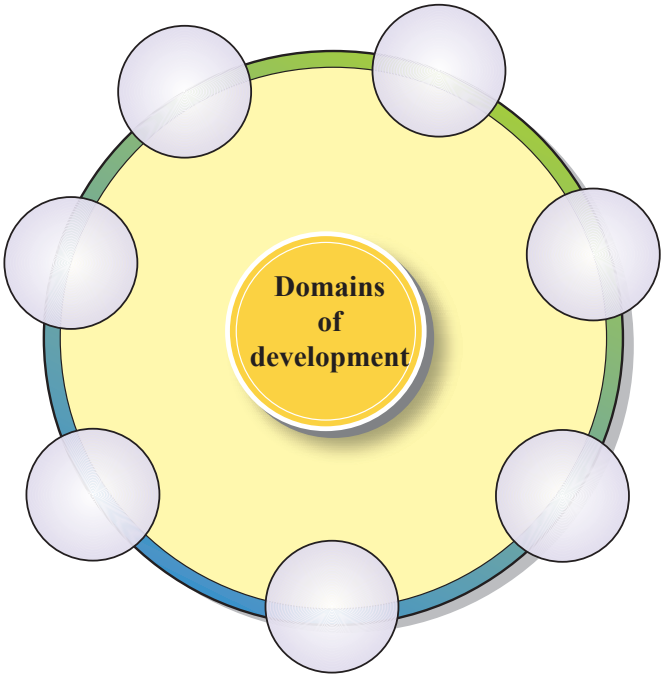
Social development means acqi sition of the ability to behave in accordance with social expectations. This is known as socialization. Becoming socialized involves processes such as learning to behave in socially approved ways, playing approved social roles and development of social attitude. Every social group has its standards of approved behaviour for its members. Children must learn these standards and behave accordingly. Children learn how to make social contacts and how to get along with people outside the home, especially children of their own age. They learn these social skills which is a part of social development.

vii) Moral development :

Moral development occurs in two distinct but interrelated phases i.e. the development of moral behaviour and development of moral concepts. It is the development of behaviour that conforms to the standards of the group with which the individual is identified. Learning to behave in the right way, distinguishing between right and wrong and development of conscience is gradually learnt.

Activity :

Fill up the domains of development and write two examples of each domain.



1.4 Stages of Development and its Characteristics

Human life span is subdivided into eight stages or periods, each of which is characterized by certain developmental and behavioural characteristics. Chronological age is the criterion used for this subdivision. This division helps us to study all phases of growth and development. Given below are the stages of human life span :

a) Prenatal period (from conception to birth) :

This is the first developmental period in the life span. This period is characterized by rapid development, during which a single cell transforms into a human baby.

b) Infancy and toddlerhood (birth to 2 years) :

Infancy is subdivided into neonatal stage (birth to 15 days), infancy (15 days to 18 months) and toddlerhood (18 to 24 months). The neonatal stage is characterized by adjustments and helplessness. As infants grow, they move towards independence acqi ring various skills. eg. walking, talking.

c) Childhood (2 to 12 years) :

(i) Early Childhood (2 to 6 years) :

This stage of childhood extends from 2 to 6 years. Children though egocentric in nature, are now more independent, active, energetic, curious and ready to explore and experiment. This period is also known as 'Preschool' period. After this stage, children are ready to go to formal school.

(ii) Late Childhood (6 to 12 years) :

This stage of childhood extends from 6 to12 years. During this stage physical growth is slow but steady. Being the school going stage, children continue mastering language, reading, arithmetic, writing, play, rules of socialization and other school skills.

d) Adolescence (12 to 19 years) :

This period is the bridge between childhood and adulthood. The beginning of this period is puberty leading to sexual maturity. Quest for identity begins, thoughts become more logical and abstract. Peer group has a greater impact. The adolescent chooses career and prepares for the world of work.

e) Young Adulthood (20 to 40 years) :

This period brings about major changes in the life span of an individual. . Long term goals are set up in fields such as career, family and society. Important goals at this stage include acqi ring an occupation and entering into intimate relationship. Life at this stage can be full of stress but also rewarding.

f) Middle Adulthood (40 to 60 Years) :

It is a period of stability. It is a time of achievement, evaluation and also known as the "empty nest". Children move away from home due to job or leave home after marriage. Retirement takes place at the end of this stage. It is also a period where the individual gives back to the society by becoming involved in community work.

g) Late Adulthood / Old age (60 years onwards) :

This period is characterised by a decline in physical functions. It is also characterised by adjustment to deteriorating health, reduced income and loss of spouse/ partner and peers.

Activity :

Place the stages of development in the correct sequence

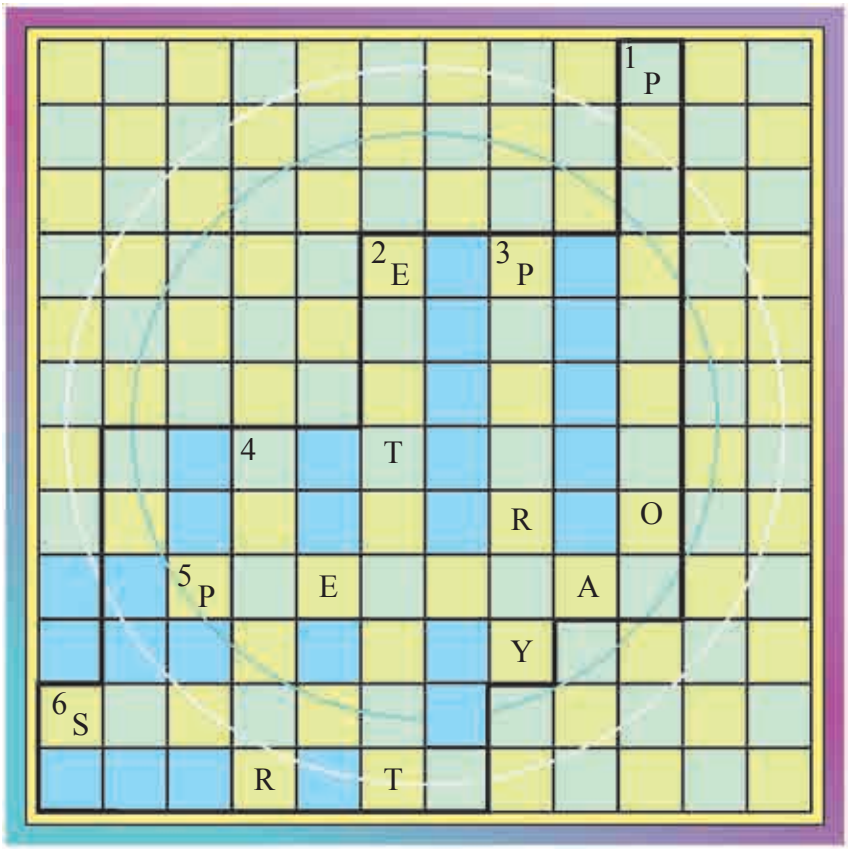
a. Adolescence b. Early childhood c. Middle adulthood d. Neonatal e. Prenatal stage

f. Late adulthood.

1. ..... 2. ..... 3. .....

4. ..... 5. ..... 6.....

Activity :



CROSSWORD on Stages of development

Across

5. Period of rapid development.

6 Young adults can view life some times as rewarding or full of .....

Down

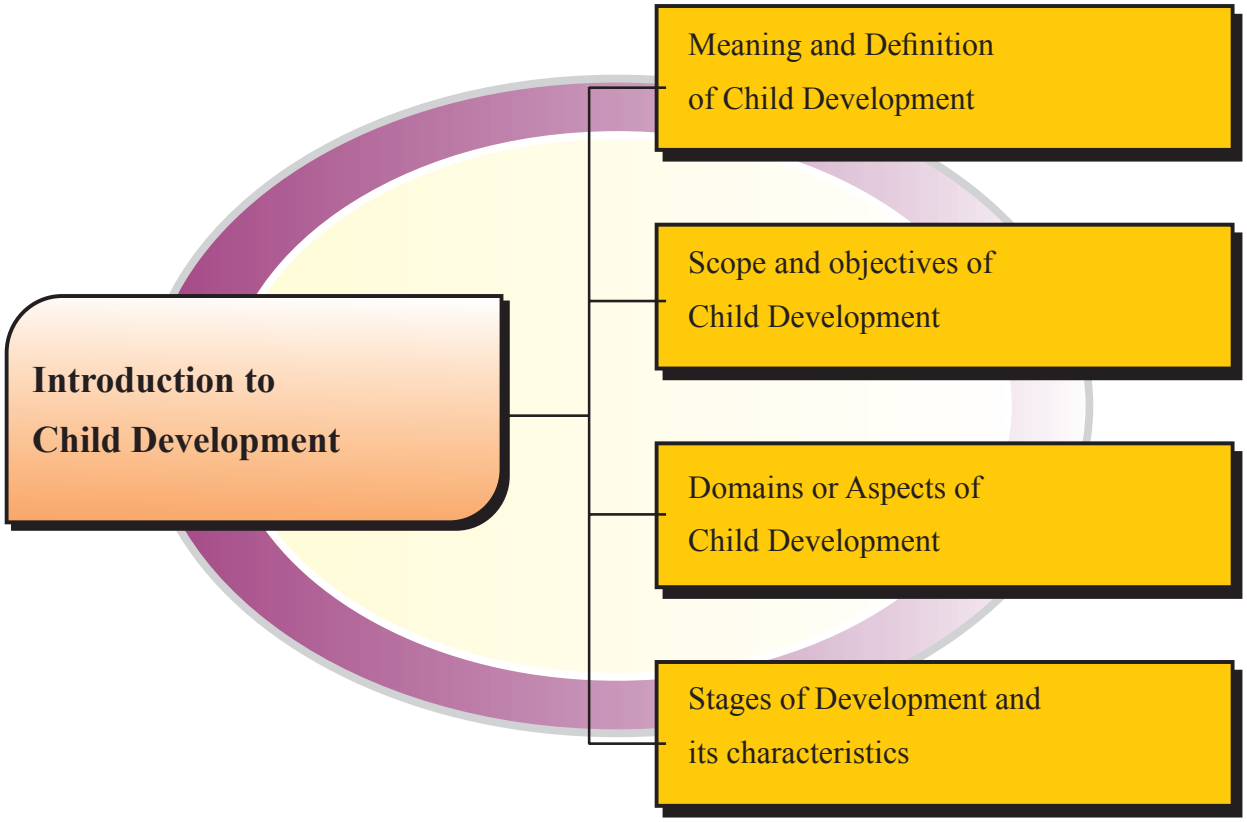
1. Early childhood is also called as this period.

4. Adolescent has to choose / decide on.

2. Middle adulthood is also called this.

3. Stage of sexual maturity.

Revise the points



Exercises

Q. 1. Select and write the most appropriate word from the given alternatives.

1. Growth refers to …….. changes.

   a) quantitative *b) qualitative*
   c) differentiative

2. The domains of development are also known as …….. of development.

   a) aspects *b) principles*
   c) scope

3. Motor development refers to development of ----------.

   a) language *b) muscle*
   c) emotion

4. Behaviour in accordance with society is …….. development.

   a) motor *b) social*
   c) moral

5. Neonatal stage is from birth to …….. days.

   a) 10 *b) 15*
   c) 20

Q. 2 Write whether the following statements are True or False with reasons.

1. Development refers to quantitative changes.
2. Learning to speak is an example of development.
3. Emotional expression is social development.
4. Childhood is subdivided into neonatal stage and infancy.
5. Neonatal period is characterized by rapid development.

Q. 3 Match the pairs :

A	B
1) Early Childhood	a) Learning right and wrong
2) Late Adulthood	b) Stimulation and encouragement
3) Moral Development	c) 2 to 6 years
4) Parents role	d) 6 to 12 years
	e) Post retirement adjustment

Q. 4 List the following

1. Domains of development
2. Stages of development

Q. 5. Fill in the box with the help of the given clue

1. Progressive series of changes that occur as a result of maturation and learning.

		V					M			T

2. It is the bridge between childhood and adulthood.

A					S				C	

Q. 6. Find the odd one out from the given clue.

Physical development :

Height, Weight, Memory, Skeleton, Teeth.

Q. 7. Give examples of the following

1. Language development
2. Motor development
3. Emotional development

Q. 8. Write the characteristics of following stages.

1. Prenatal period
2. Infancy
3. Early childhood

Q. 9. Write short notes

1. Scope of Child Development
2. Objectives of Child Development
3. Domains of Child Development
4. Stages of Child Development

Project / Self Study

- Observe your family or any other family and identify the stages of development the family members belong to and list down their characteristics.

❖ ❖ ❖

2 Principles of Development

If you have to make a cup of tea what is it that you would do?

Write down the steps in making a cup of tea.

1. .....
2. .....
3. .....
4. .....
5. .....

You must have realised from the above activity that there is a certain seqe nce while doing things.

The process of human development too follows a certain order. It proceeds in stages which are interrelated. Though the process of development follows a specific sequence and pattern, the rate of development varies at different stages for different individuals.

The knowledge of the developmental pattern enables parents and teachers to guide the child's learning and helps to prepare children ahead of time for the changes that take place in their bodies.

To understand the pattern of development, it is necessary to recognize the fundamentals of development and identify the causes of variations in development.

The fundamental facts about development are called as 'Principles of Development'.

Let us try to understand this with an exmaple.

Have you seen any child sitting at birth?

Have you heard an infant utter words during the first two months of its life?

Have you seen a baby holding a toy at birth?

So what does this tell us?

Activity :

Can you identify and write down the seqe nce from birth to walking looking at the pictures given below :

A 

B 

C 

D 

E 

F 

1. ..... 2. ..... 3. .....

4. ..... 5. ..... 6.....

Do you notice that there is an order and continuitiy in an individual's development?

2 Principles of Development :

From the above activity you have realized that development has a specific direction, it is continuous and it involves changes. Principles of development apply to all domains of development. Let's look at these in detail.

1 Development involves chang :

Development refers to changes that occur through growth and development. Growth is qa ntitative which means it refers only to physical aspects eg. increase in height and weight. Development is qa litative in nature and refers to all aspects such as physical, motor, cognitive, language, emotional, social and moral. It includes all the changes leading towards maturity.

2 Development is continuous :

Development is a process of change which continues from the moment of conception till death. As we have already studied in the definition of development earlier, it is a series of qa ntitative and qa litative changes which proceed continuously. What happens at one stage has its influence on the following stage. For example, the tooth of a baby may appear overnight but the process of this development has begun as early as the fifth foetal month. However, development proceeds at a slow pace and the teeth are ready to erupt only when the baby is about five months old.

3 Development follows a predictable pattern :

Development is specific to all and follows a predictable definite pattern. Many longitudinal studies on children demonstrate that developmental changes follow a specific pattern which is similar in all individuals. During the prenatal period a genetic seqe nce of traits appears at fixed intervals and continues during the post-natal period. Development takes place according to two laws of directional seqe nces which are as follows.

(a) Cephalocaudal sequence : Development proceeds from head to toe. The head and brain develops first followed by the neck , torso and rest of the body.

(b) Proximodistal sequence : Development proceeds from centre to extremities. The child first gains control over the spine followed by strengthening of the arms upto the fingers.

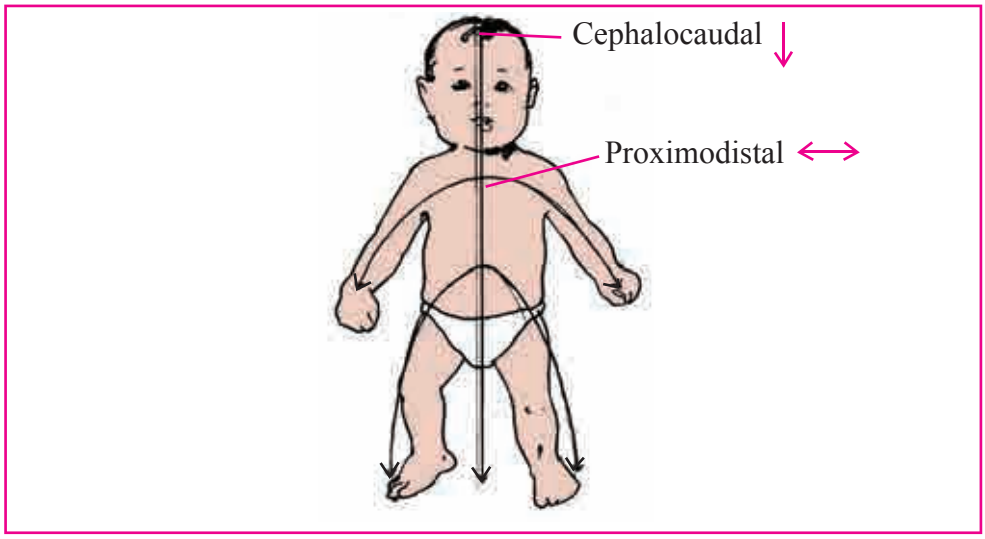


Figure 2.5 Sequence of developmental pattern

Table 2.1 Difference between Cephalocaudal and Proximodistal pattern

Cephalocaudal	Proximodistal
• Development takes place in the body from head to toe.	• Development proceeds from near to far i.e from the central axis of the body to extremities.
• In the prenatal stage improvement in structure and function come first in the head region, then in the trunk and last in the leg region.	• In the prenatal stage the arm buds lengthen and then develop into the hands and then fingers.
• In the postnatal stage, the baby is able to move the head, then the trunk region followed by rest of the body.	• In the post-natal stage, infants will first learn to move their arms. Once the motor skills for their limbs are developed then finger manipulation and other finer movements will start developing.

Activity :

Can you remember what develops first?

1. Head and Trunk
2. Arms and legs
3. Fingers and feet
4. Head and legs

4 Development proceeds from g neral to specific :

The nature of development proceeds from general (simple) to specific (complex). e.g. with respect to motor development the infant makes random body movement but is incapable of making specific movements such as reaching out for a toy. Similarly with regard to emotional behaviour, an infant approaches a strange or unknown object with some kind of general fear. Later, fears become more specific in nature. e.g. fear of strangers. The expression may take several forms such as crying, hiding or turning away.

Try this :

Identify which is general and specific in reference to motor and language development

Waving , grasping , saying 'mummum', kicking legs randomly ,crow , saying 'dudhu', picking up food, bird

5 Development proceeds at a different rate :

Development is continuous from conception till death. The rate of development varies at different stages of life, sometimes slow and sometimes rapid. Development does not occur at an even pace. The rate of development is fastest during prenatal stage i.e. a microscopic cell develops into a fully-grown foetus in a period of nine months. The rate of development varies during the postnatal stages. For example, the brain grows rapidly during early infancy, whereas maturity of the reproductive system is delayed until adolescence.

6. There are individual differences in development :

Though the pattern of development is similar to all children, yet they develop in their own way and at their own pace. This means that all the children do not reach the same point of development at the same age due to the impact of genetic and environmental influences on them. Heredity determines the potential of the child whereas environment determines the extent to which the potential is achieved. Some children start walking earlier whereas some children start walking a little later.

7 Areas of development are interrelated :

There is an interrelationship between all areas of development such as physical, social, emotional, language and cognitive. e.g. A child who has good health is likely to be socially and intellectually more active.

8. Development is a product of maturation and learning

Maturation

Maturation is the unfolding of characteristics present in the individual from birth. These characteristics develop with age to their optimum potential.

Learning

Learning refers to the changes in an individual as a result of experience and practice. Through learning children acqi re a range of skills and competence. Some learning is the outcome of imitation, identification and conditioning.

Interrelation between Maturation and Learning

Maturation and learning work together for overall development in a child. Maturation is a natural process that facilitates the process of learning. Learning becomes effective when

appropriate maturity has been attained. e.g. A child will learn to walk or talk only when he/she develops physical maturity and has opportunities to practice.

Phylog netic functions :

Creeping, crawling, sitting, walking etc are known as phylogenetic functions. These functions are acqi red with age and do not reqi re any training. They are not much influenced by the factors in the external environment.

Ontog netic Functions :

In contrast to phylogenetic functions, ontogenetic functions such as swimming, riding a bicycle or dancing are largely dependent on training. These functions are influenced more by environmental factors such as training, practice and opportunities available. Even though these skills can be acquired by training, certain level of maturation is essential without which training will be futile.

Table 2D ifference between Maturation and Learning

Maturation	Learning
• The unfolding of characteristics present in the individual from birth.	• Learning refers to the changes in the individual as a result of experience and practice.
• As a result of Maturation **Phylogenetic** functions are seen e.g. crawling, walking	• As a result of learning **Ontog netic** functions are seen e.g. swimming, cycling
• Development cannot be achieved beyond a certain limit even after learning, if there is a lack or absence of maturation	• Lack of opportunities due to poverty, parental neglect, prevents children from developing their hereditary potential.

Activity :

Classify as phylog netic and ontog netic function

a) walking, climbing, classical singing, cycling
b) playing a 'tabla' scribbling, canvas painting, coloring within a circle.
c) sitting, creeping, swimming, crawling
d) picking up finger food, smiling, dancing, grasping

2.2 Factors Influencing Growth and Development :

Each individual is uniqe . No two children of the same age are not similar in their body type, skin colour, posture and behaviour. Diversity is seen not only in physical characteristics but also in behaviour. This diversity results from interaction between biological and environmental factors which make an individual uniqe .

Activity :

Circle -the odd one out :

a) walking, climbing, talking, cycling
b) development of head, trunk, arms, legs
c) sitting, creeping, swimming, crawling
d) eating, smiling, dancing, grasping

Environmental Influence

In a similar situation, twins, siblings or children of the same age can react differently depending upon their experiences and individuality.

Following are the factors which affect Growth and Development :

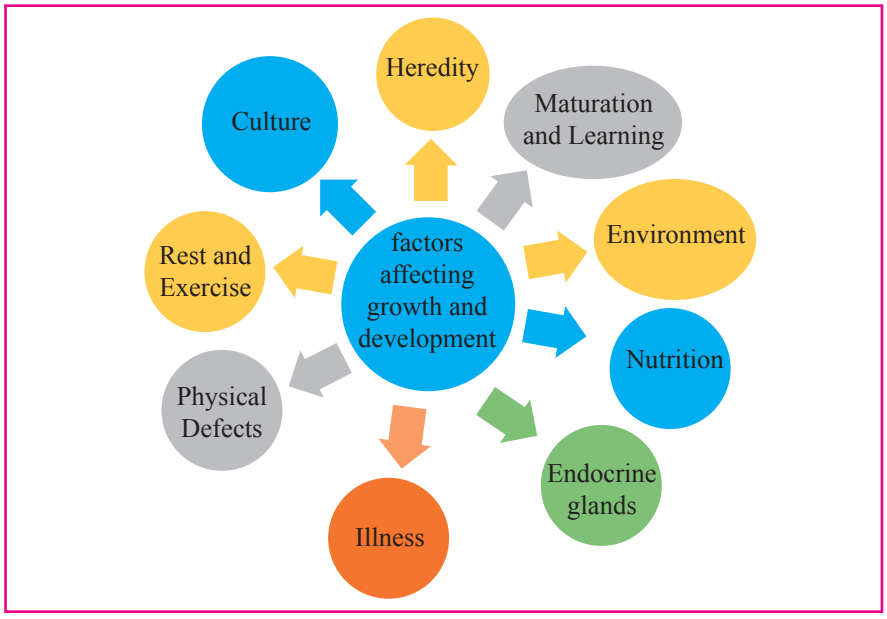


Figure 2.2 Factors affecting Growth and development

1 Heredity :

It refers to the genetic attributes inherited from the biological parents at the time of fertilization. Heredity affects development right from the prenatal stage influencing a wide range of characteristics eg. colour of skin , hair, eyes, height, health, intellect, temperament.

Chromosomes and Genes :

The ovum (female reproductive cell) and the sperm (male reproductive cell) have 23 pairs of chromosomes. Chromosomes contain smaller units of genetic material called DNA. Amongst these chromosomes, 22 chromosomes are called as **'Autosomes'** and one chromosome is called the **'Sex chromosome'**.

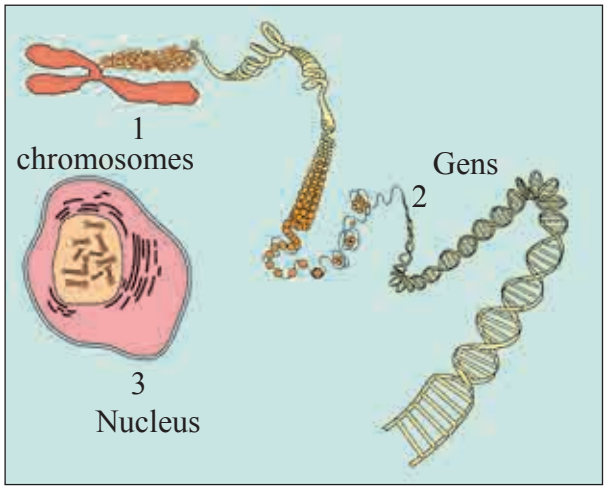


Figure 2.3 Chromosomes and genes

Each chromosome contains genes which are the functional units of heredity. Each gene has its particular place and function in inheritance.

At conception, an ovum containing 23 single chromosomes from the mother combines with a sperm containing 23 single chromosomes from the father. The two sets of genetic information combine so that the growing embryo has 23 pairs, i.e. 46 chromosomes which is a mixture of genes from both the biological parents.

Sex determination :

The sex chromosomes are referred to as **X** and **Y**, and their combination determines the sex of the foetus. Women have **X X** pair of chromosomes while men possess **XY** pair of chromosomes.

During fertilization an **X** chromosome is already present in the ovum. If it unites with **X** chromosome from the sperm then the foetus will be a female offspring. If the **X** chromosome from the ovum unites with **Y** chromosome from the sperm then the foetus will be a male offspring. So, it is clear that sex of the foetus is determined by the male chromosome.

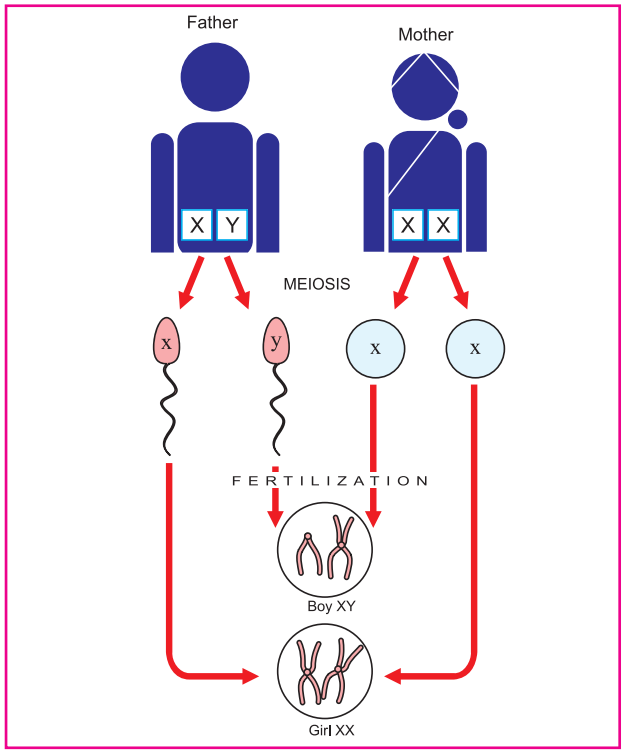


Fig re 2.8 ex Determination

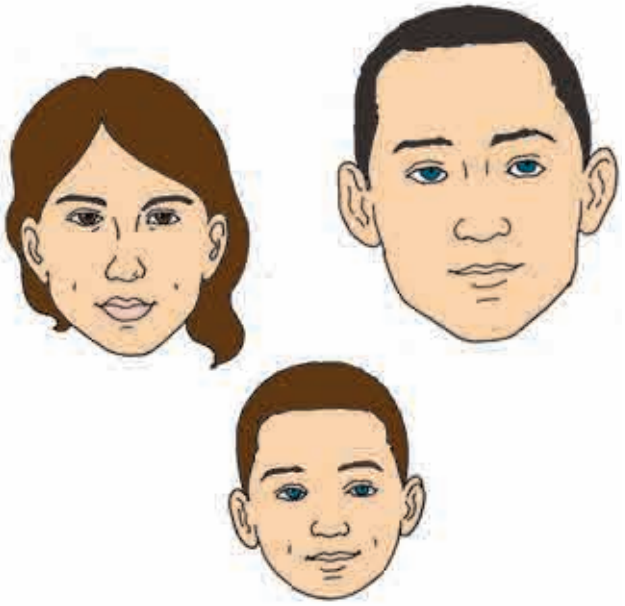
Dominant and Recessive Genes :

Just as chromosomes work in pairs similarly genes also work in pairs. These genes give us the characteristics that we inherit from our parents. In a pair, one gene is dominant other one is recessive. The dominant gene shows the characteristics in the immediate next generation whereas the recessive gene remains passive. Heredity is also responsible for some inborn genetic defects and abnormalities in an infant.

Activity :

Try and identify which g ne or trait in the child is dominant and whom has he inherited it from?

- **Eye color**
- **Dimples,**
- **Hair**
- **Shape of the face**



Reflection / Darpan

Look at yourself and identify and write which visible traits you have inherited?

2 Maturation and learning

Maturation and learning are two very important factors that influence growth and development. Both are inter-related. Children acqi re skills when they show physical and mental readiness to learn. Maturation indicates readiness to learn skills and learning leads to the acquisition of skills. e.g. A child who indicates readiness to write (maturation) will acqi re the skill with appropriate guidance and training (learning).

3 Environment :

a) Prenatal environment :

Prenatal development depends on various factors such as age, hormonal levels, diet, health, emotional state of mother, drugs, alcohol and medicines consumed by the mother during pregnancy, diseases and infection in mother during pregnancy. Presence of any of these factors affect the development of the foetus leading to developmental defects and impairments in the infant.

b) Post-natal environment :

During postnatal period, external environmental factors are more active and influential as the individual is continuously interacting with the surrounding environment.

- Environmental experiences and responses soon after birth and during early stages of life have long lasting effects on the child's self-concept, personality, behaviour, emotionality and social relationships.
- Child's home and family are the first and the most influential factors. The home environment, housing conditions, socio-economic status of the family, family size, diet, health services, parenting styles, parent's education and attitude towards children are directly related to a child's physical, social and emotional development.
- The school, teachers and peers play an important role by inculcating habits, values and attitudes in the child.
- Society at large also directly and indirectly influences child's social, religious, cultural and moral values. Social changes such as globalization, urbanization, industrialization have positive as well as negative effects on the development of a child.

Activity :

Identify the followings as prenatal and postnatal environment

- Diet of the pregnant woman .....
- Size of family .....
- Social economic condition of a prospective mother .....
- Drugs and medicine taken during pregnancy .....

4 Nutrition :

An individual's body reqi res a balanced diet for growth and development. Foods which provide nutrients like proteins, carbohydrates, fats, minerals and vitamins. in sufficient amounts are

called nutritive foods. At a younger age when the rate of development is rapid, the requirement of nutrients is also very high. The nutritional requirement should be fulfilled by balanced diet containing nutritious foods. Deficiencies of different nutrients will have various adverse effects on the body resulting in a condition known as 'malnutrition'.

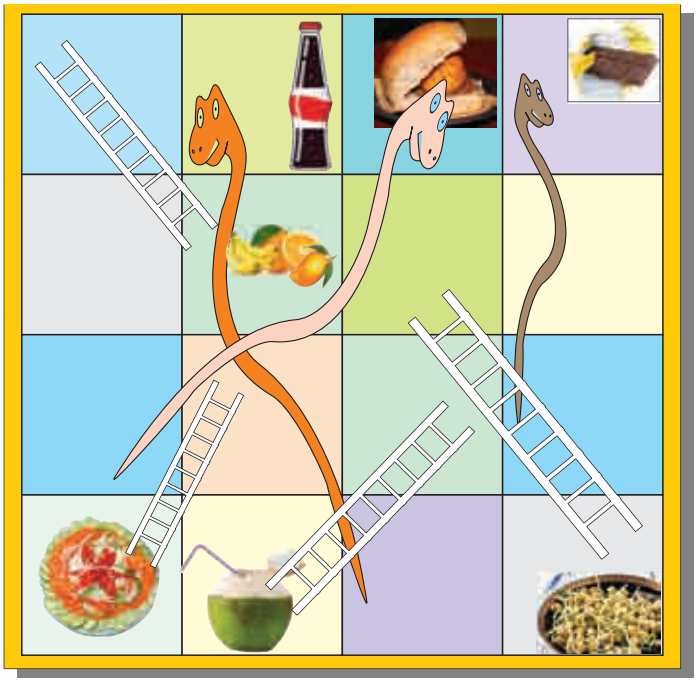
Activity :

List the foods rich in the following nutrients.

Carbohydrates, protein, Vitamin A, Vitamin B, Vitamin C, Iron, Fats

Reflection / Darpan

Play this game and write down what you learnt from it.



Activity :

1. List five health foods from your diet.
2. List down a few examples of healthy foods that you could include in your lunch box.

Malnutrition :

The term malnutrition refers to the condition in which the body does not receive adequate nutrients for proper functioning. Malnutrition may range from mild to severe and can be life-threatening. It can be due to starvation in which a person has an insufficient intake of calories, or it may be related to lack of one particular nutrient (for example, vitamin D deficiency). Malnutrition can also occur due to the individual's inability to digest or absorb nutrients from the food he/she consumes, due to certain medical conditions. Many children suffer from malnutrition due to poverty, superstitions related to eating habits, ignorance and gender bias.

Effects of malnutrition :

- Stunted physical growth
- Poor health status and stamina
- Nutritional deficiency diseases such as anaemia, skin infections, night blindness, Kwashiorkor, Marasmus.
- Negative effect on social and emotional adjustments.
- Susceptible to infections, diseases and depression
- Increases the risk of hypothermia (the inability to maintain normal body temperature)

India is facing a serious problem of malnutrition, according to the Global Nutrition Report released on November 3, 2017.

Table 2.3 Diseases predominantly found in children due to malnutrition :

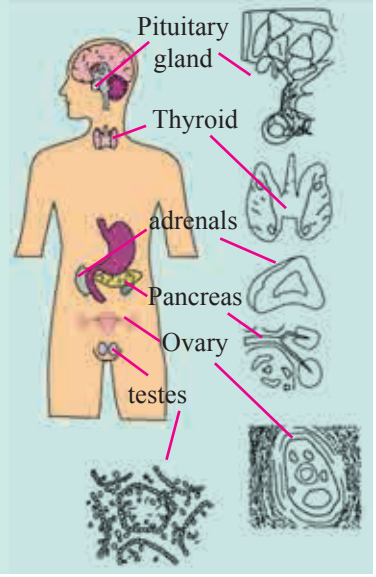
Kwashiorkor	Marasmus
Kwashiorkor is mainly caused by inadequate protein intake for a long time. The main symptoms are: • Edema (swelling usually seen in hands, arms, feet, ankle and legs caused by extra fluid trapped in body tissues) • Poor kidney functioning • Liver enlargement • Depigmentation of skin and hair • Swelling of the belly.	Marasmus (to waste away) is caused due to inadequate intake of protein and energy. Marasmus can result from a continued diet of inadequate energy and protein. The main symptoms are: • Chronic diarrhoea • Respiratory infections • Intellectual disability • Extreme wasting of the muscles • Stunted growth.

5. Endocrine Glands :

Endocrine glands are ductless glands that are situated in different parts of the body. These glands are not connected by any duct hence are called ductless. These glands secrete certain chemical substances called 'Hormones' which play a significant role in maintaining the internal balance of the body also known as 'homeostasis'. Hormones influence regular functioning of the body, growth and development, sleep and mood. The hormones are directly released in the blood stream and are circulated to specific body parts for performing various body functions.

Remember !

Endocrine glands are ductless glands that **secrete hormones** (chemical messengers) which carry **messages to particular organ or tissue** through the blood stream.
These glands control **growth, development, metabolism and reproduction.**
Endocrine glands secrete hormones in **response to external and internal stimuli.**



Glands	Hormones	Functions
Pituitary	Growth hormone	• Regulates growth • Controls the functioning of endocrine glands
Thyroid	Thyroxine	• Controls the rate of metabolism • It also brings about balance in growth
Parathyroid	Parathormone	• Regulates calcium balance of the body
Adrenal	Adrenaline	• Prepares body for emerggency
Pancreas	Insulin	• Maintains glucose level in the blood
Testes	Testosterone	• Responsible for growth and development of male reproductive system
Ovaries	Oestrogen Progesterone	• Responsible for growth and development of female reproductive system

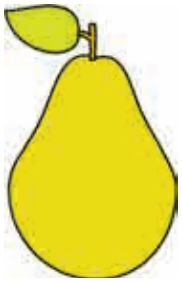
Figure 2.5 The Endocrine System in the Human Body

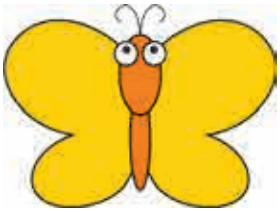
Table 2.3 Endocrine Glands

Name of the g and	Location	Hormone	Function	More (Hypersecretion)	Less (Hyposecretion)
Pituitary	Base of brain, attached to Hypothalamus	Growth hormone FSH, etc.	i) Promotes growth, ii) Reabsorbs water from kidneys, iii) Controls function of other glands, iv) Responsible for onset of maturity.	Giant structure: Abnormal growth of height	i) Pituitary dwarfism ii) seldom reaches sexual maturity, however intelligence remains unaffected
Thyroid	In the neck	Thyroxin (Protein and iodine)	Affects rate of : general growth, bone devlopment, circulation, function of reproductive organs and muscle devlopment.	Hyperthyroidism (over active enlarged thyroid) increased metabolic rate, restless, weight loss, confused.	Hypothyridsm i) Goitre-lack of iodine ii) Myxedema underactive gland, lethargy iii) Cretinism - defect of thyroxin retards growth & development of skeletal & nervous system.
Parathyroid	Lie on either side of thyroid	Parathyroid hormone	Controls use of Calcium and phosphorus	Softens bones and weakens muscle activity	i) Tetany: muscle cramps
Pancreas	Situated in the abdomen, below the stomach	Insulin	Regulates carbohydrate, secreting juices for digestion	-	Increases blood sugar resulting in Diabetes mellitus.
Adrenals	On top of kidneys	Adrenaline, Fight/Flight emergency hormone	Important role in sexual maturity, controls mineral substances, prepares body for action.	High BP, increased heart rate and glucose content in blood, reduced blood coagulation	-
Testes	On each side of scrotum	Testosterone	Produce sperm and testesterone hormone Controls development of beard, deep voice in male		-
Ovaries	One on each side of pelvis, near to outer end of uterine tubes	Oestrogen (Estrogen) and Progesterone	Produce hormones and egg cells Controls development of secondary sex characteristics, causes thickening of lining of uterus. Controls menstrual cycle, ovulation, change regarding fertilization, pregnancy, birth of baby.		-

Activity :

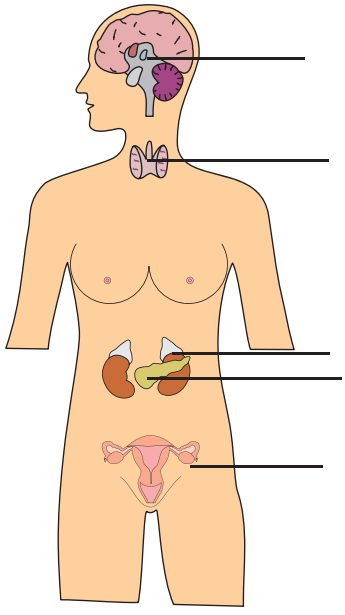
This reminds you of which part or ङ and of the body.

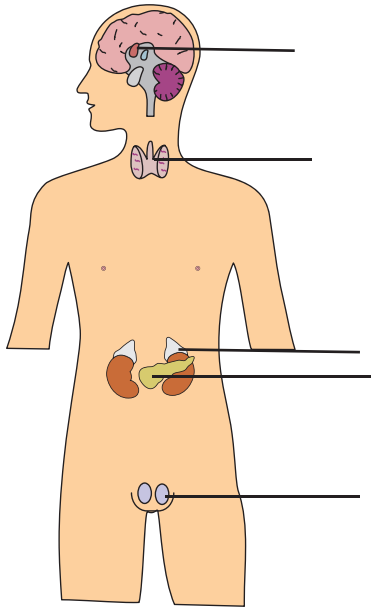




Activity :

Label the ङ ands





6. Illness :

The health status is one of the major factors influencing growth and development. Children whose health is good have a better developmental status. Certain illnesses are regarded natural at certain ages. Respiratory infections and gastrointestinal infections are common during babyhood specially when teething. Ordinary illnesses do not have any permanent effect on development but severe illnesses may stunt a child's growth. If illnesses occur at the time of rapid growth and development, the effects can be severe affecting all the areas of growth and development in the child.

7 Physical Defects :

Some defects are congenital i.e. the infant is born with these defects. They may be due to genetic defects or harmful conditions during the prenatal period. Some defects may be acqi red after birth due to severe illnesses, malnutrition, lack of immunization and accidents. Sensory defects such as loss of hearing or blindness have more serious impact on development. Similarly, orthopaedic defects also lead to long term effects on development.

Activity : List a few physical defects that you know or have seen in people

Effects of physical defects

Children suffering from such defects have less acceptance in society, lesser academic opportunities to explore and learn which affects their all-round development.

8. Rest,S leep and Exercise :

Rest and sleep are necessary for normal functioning and maintenance of body energy. Sleep helps in maintaining physio – chemical eqi librium of the body. If a child does not get adeqa te sleep and rest he / she may suffer from fatigue, lethargy, disorientation and illnesses. Exercise helps in improving appetite and functioning of other metabolic processes of the body. A child engaging in the regular exercise is generally more healthy, active and adaptive.

Table : 25 Difference between Rest and Exercise

Rest	Exercise
• Body regulates itself	• Keeps body fit and healthy
• Maintains physio-chemical equilibrium.	• Development of muscles, muscular control and co ordination
• Preserves energy for activity	• Releases pent-up energy
• Overcomes effect of toxins produced by activity or fatigue	• Eliminates toxins through sweating

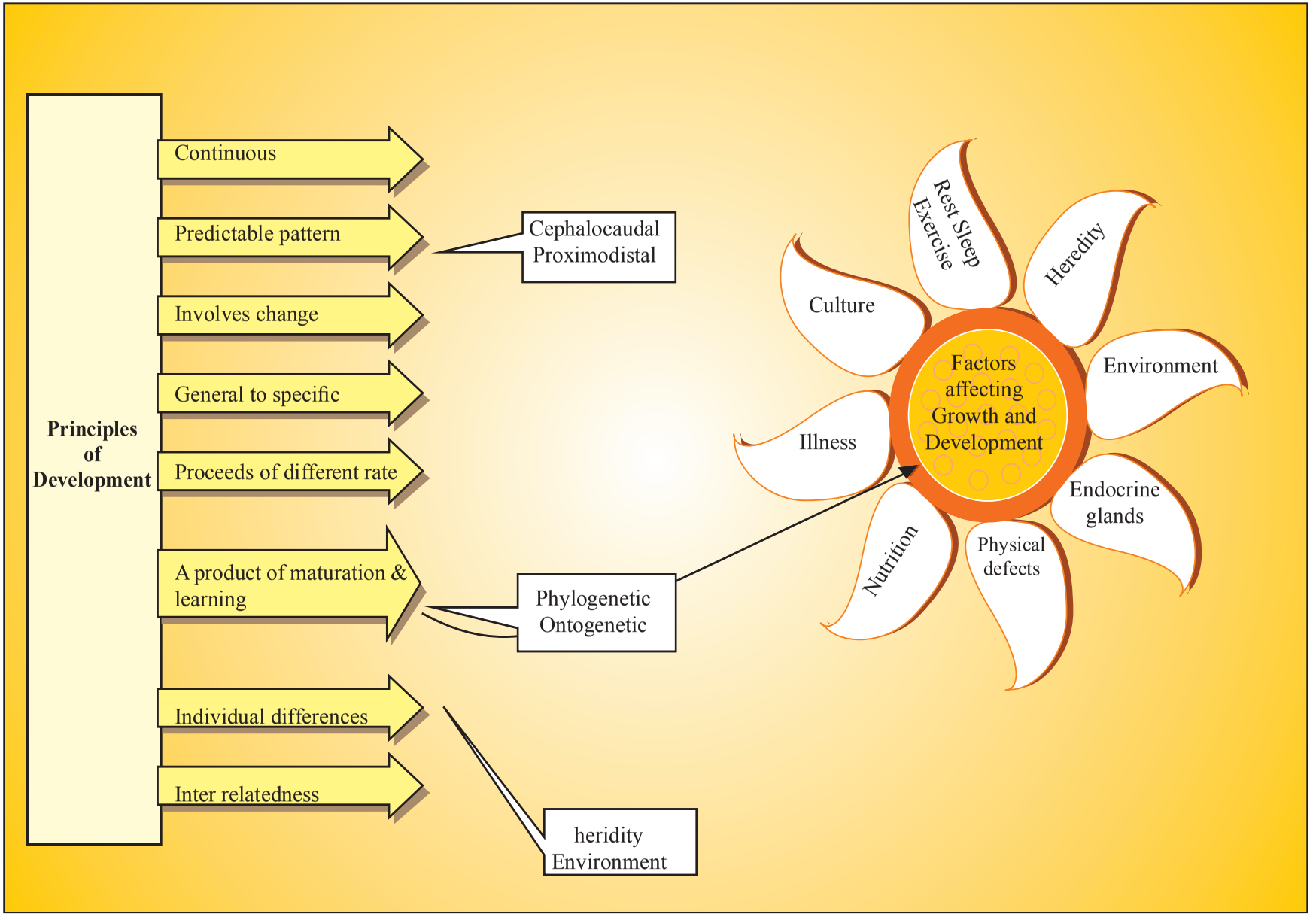
Did you know?

Study on sleep and infant memory : In the year 2015 a study or experiment was conducted by researchers from the University of Sheffield and Ruhr University Bochum, Germany. The study was conducted on 6 12 month old infants. The researchers demonstrated actions on a hand puppet. This was repeated three times with all the infants. One group of infant was allowed to nap and another group was not allowed to nap. Infants who napped right after the demo were better at recalling than infants who hadn't napped. The findings of this study suggests that the time for optimal learning of new information is just before sleep.

This associates with the research findings that adults too consolidate memories as they sleep.

9. Culture :

The term Culture broadly includes family environment, surrounding social environment,religion and value system. There are various cultural patterns all over the world. Culture varies with geographical location, socio-economic status, race and religion. The cultural patterns influence the child rearing practices followed by parents. Culture also has an impact on the values, experiences and opportunities available for children.



Revise the points

Exercises

Q. 1 Select and write the most apropriate word from the given alternatives.

1. In Cephalocaudal sequence, development proceeds from .....

   a) head to toe *b) near to far*
   c) head to neck

2. According to ..... law the child first gains control over the spine, then arms and then fingers.

   a) cephalocaudal *b) genetic*
   c) proximodistal

3. Each of the reproductive cells have ..... number of chromosomes.

   a) 2 *b) 3*
   c) 46

4. Sex of the child is determined by .....
   a) male *b) female*
   c) neither

5. Swimming is a ..... function

   a) phylogenetic *b) ontogenetic*
   c) genetic.

6 ..... refers to the changes in the individual as a result of practice and experience.

   a) Maturation *b) Genes*
   c) Learning

7. ..... is caused due to inadequate intake of protein and energy.

   a) kwashiorkor *b) marasmus*
   c) anemia.

Q. 2 Match the column

A	B
1) Pituitary gland	a) Oestrogen
2) Thyroid	b) Insulin
3) Adrenal	c) Hypothalamus
4) Pancreas	d) Testosterone
5) Ovary	e) Thyroxine
6) Testes	f) Fight, flight hormone

Q. 3 Differentiate between the following

1. Cephalocaudal and Proximodistal
2. Maturation and Learning
3. Rest and Exercise
4. Phylogenetic and Ontogenetic functions
5. Growth and Development

Q. 4. Define the terms

1. Heredity
2. Environment
3. Chromosome
4. Genes
5. Maturation
6 Learning
7. Ontogenetic function
8 Phylogenetic function
9. Malnutrition

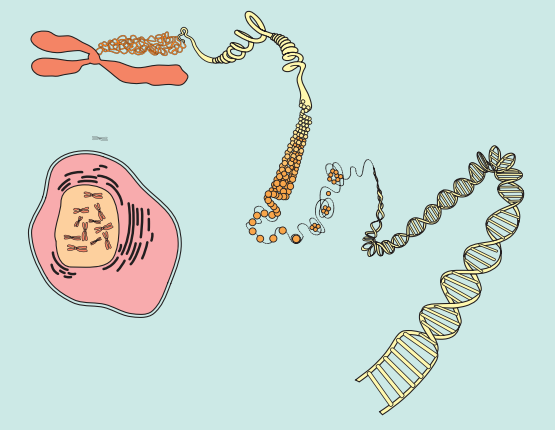
Q. 5 List the following

1. Factors which affect growth and development
2. Causes of malnutrition
3. Effects of malnutrition
4. Causes of physical defects
5. Effects of physical defects
6 Names of endocrine glands
7. Social changes that influence child development
8 Effects of lack of rest or sleep

Q. 6. Complete the following table.

	Glands	Hormones
a)	Pituitary	.....
b)	.....	Thyroxine
c)	Adrenal	.....
d)	Testes	.....
e)	.....	Insulin

Q. 7 Label the diagram and explain the same.



Q. 8. Short notes

1. Influence of heredity and environment
2. Kwashiorkor
3. Marasmus
4. Endocrine glands
5. Maturation and Learning
6 Sex determination
7. Advantages of exercise

Q. 9. Write in detail your answer to the following questions

1. Which are the Principles of development?
2. What are the effects of nutrition on development?
3. List the factors affecting growth and development. Explain any two factors in details.
4. What is the co-relation between prenatal and postnatal developement?

Project / Self Study

- Collect pictures of infants and young children doing various activities. Identify and classify them as Phylogenetic and Ontogenetic activities / functions.

❖ ❖ ❖

3 Reproductive System

Activity :

Observe the above picture.

What do you see?

A boy and a girl.

How did you recognize and label them as a boy and a girl?

You would have observed the outward physical appearance to differentiate them.

Activity :

Both male and female have some common body systems. Can you name a few?

1 .....

2 .....

3 .....

4 .....

Which is the only system that differentiate a male from a female? Yes, you guessed right. The reproductive system is the only system in the body that distinguishes males from females.

The reproductive system consists of internal and external organs, in both, males and females. These organs function together for the purpose of procreating. The male and female reproductive systems are very different in nature. The male reproductive system has one main function i.e to produce and deposit sperms. Female reproductive system has two functions namely, to produce egg cells and to protect as well as nourish the foetus.

3.1 Male Reproductive System

The male reproductive system includes the external genitals i.e the penis and the scrotum and the internal organs that include the prostate gland, vas deferens, seminal vesicles, epididymis and testicles.

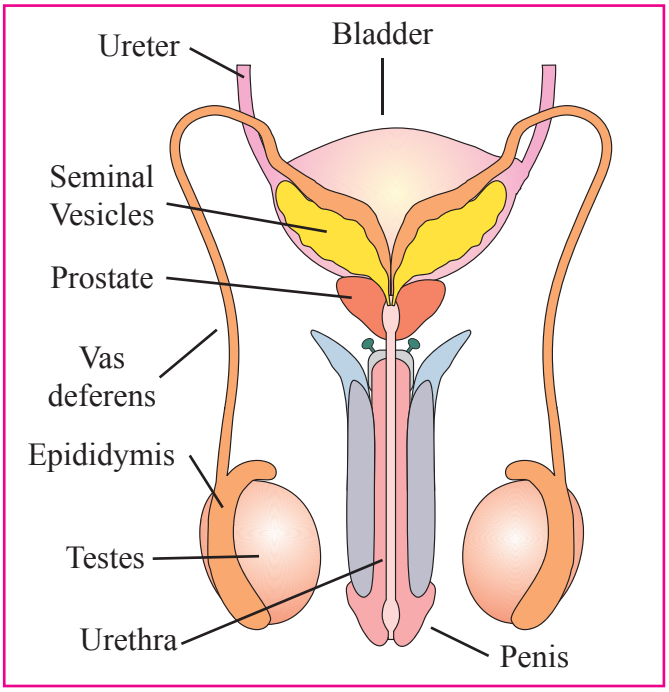


Fig 3.1 Male Reproductive System

Penis :

This organ is used to eliminate urine and to release seminal fluid with sperms. The penis as well as the urethra belong to both the urinary and reproductive systems in males. Head of the penis is called the glans which is covered with loose layer of skin called foreskin. Opening of the urethra, the tube that transports semen and urine is at the tip of the glans. The penis also has many sensitive nerve endings.

Scrotum :

The testes are carried in the external pouch called scrotum.Two scrotums are located below the penis They are loose pouch like sacs on either side of penis which normally remain slightly cooler than the body temperature to facilitate sperm production.

Testicles / Testes :

Testes are the glands located in the scrotum. Production of sperm cells in the testes starts from adolescence. For the maturation of sperm cells testosterone, the male hormone is required. Testes contain two types of cells namely sperm cells and interstitial cells. Interstitial cells produce the hormone called Androgen which is the sex hormone.

Epididymis :

This is a long-coiled tube that helps in the transport and storage of sperm cells. The function of Epididymis is to initiate maturation of the sperms.

Vas Deferens :

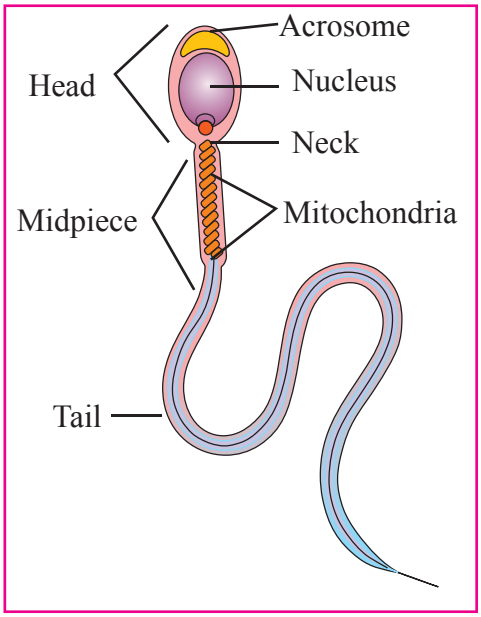
This is a tube with thick muscle walls where mature sperm cells are stored. These mature sperms are transported to the urethra in preparation of ejaculation.

Sperm cells :

The length of the sperm is 0.05 micron and is visible only under a high power microscope. The sperm is divided into three parts:

1. Acrosome - Head
2. Nucleus and Mitochondria - Middle part
3. Flagellum - Tail

The head contains enzymes that help the sperms penetrate the ovum. The middle part of the sperm consist of the nucleus and mitochondria and the tail of the sperm helps the sperm move forward. In a month 10-30 billions sperms are produced in the testicles which take 60- 72 hours to mature.



Prostate Gland :

Prostate gland is located between the bladder and the penis. It matures during adolescence. It produces a milky secretion with alkaline characteristics. It contains calcium phosphate and citric acid that nourish the sperms.

Seminal Vescicles :

Seminal vesicles are located above the prostate gland and behind the urinary tract. They are in the form of bags which transport sperms to the urethra.

Let's Try

- Name the organs of the male reproductive system.
- State the function of each.

3.2 Female Reproductive System

The female reproductive system has external organs namely as Labia Majora, Labia Minora, Clitoris and internal organs which consist of ovaries or gonads, fallopian tubes, uterus and vagina.

a) External organs of Female Reproductive System

- **Labia Majora :**

The labia majora encloses and protects other internal reproductive organs. This organ is covered with pubic hair at puberty.

- **Labia Minora :**

It lies just inside the Labia majora and surrounds the opening of vagina and urethra (opening for urinary excretion)

- **Clitoris :**

Meeting point of Labia majora and Labia minora is called clitoris which is sensitive to stimulation.

b) Internal Orgn s of Female Reproductive System :

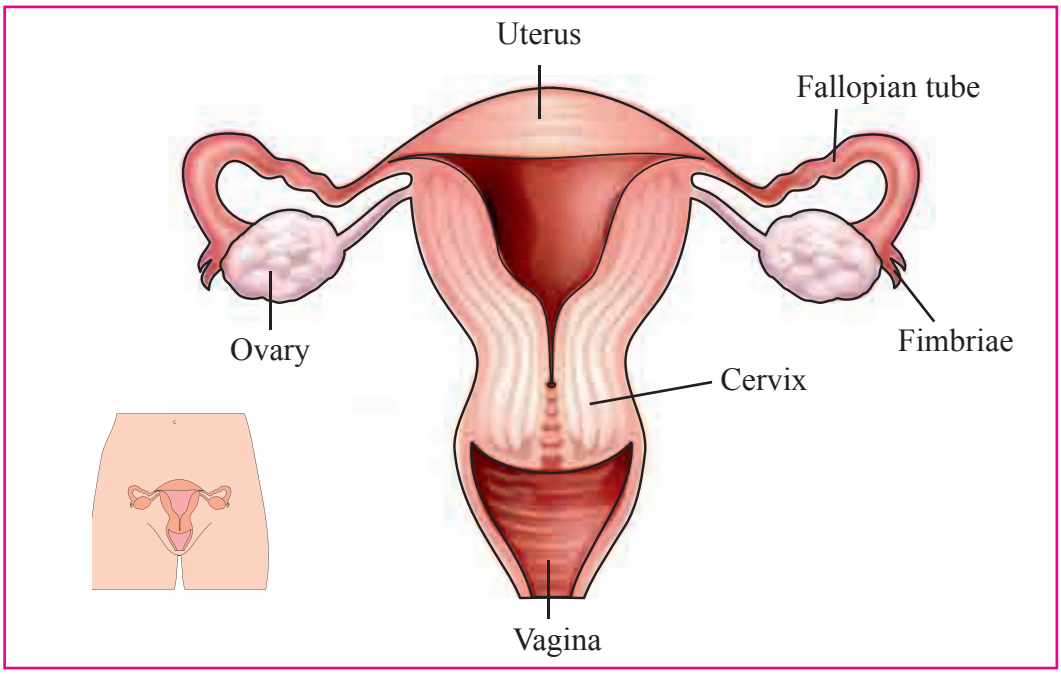


Fig.3.F emale Reproductive System

- **Uterus :**

Uterus is a pear-shaped muscular organ located inside the pelvis on top of the vagina. It is placed in between the bladder and rectum. It's width is 5cms, length is 7.5cms, thickness is 2 to 2.5cms and weighs around 50 to 60gm s. The uterus is divided into 3 parts

Fundus : The dome shaped part above the fallopian tubes

Corpus : The middle and broad part which expands to hold the foetus

Cervix : It is the mouth of the uterus. The uterus narrows down towards the cervix and joins the vagina

The lining of the uterine cavity is called Endometrium. If conception does not take place this lining is shed off through the menstrual cycle.

- **Fallopian Tube :**

To the right and left of the uterus are two 10-12cm long tubes. These tubes narrow down at the entrance of the uterus and are wide at the outer end close to the ovaries.The outer ends of the fallopian tube have a number of finger like projections called fimbriae which stretch towards the ovaries and collects the egg cells. Fertilization occurs in the tube after which the fertilized egg travels down to the uterus for implantation.

- **Ovaries :**

Ovaries are oval shaped ovum producing organs that lie on each side of the uterus near the outer end of the fallopian tubes.Ovaries are 3cms in length, 2cms in width having 1cm thickness.Each ovary contains about two lakh ova in early life but its production decreases with age. Approximately only four hundred ova actually mature in both the ovaries during the life span. Every month a mature ova is released from alternate ovary into the fallopian tube.

Ovulation takes place when a mature egg is released from the ovary, pushed down in the fallopian tube, and is made available for fertilization.

Ovaries serve 2 functions :

- To produce egg cells (ova)
- To produce female hormones – O estrogen and Progesterone

Importance of Oestrogen (Estrogen) and Progesterone

1) Oestrogen and Progesterone are female sex hormones that promote the development and maintenance of female characteristics.
2) They help to promote female secondary sex characteristics.
3) These hormones help to regulate the menstrual cycle and maintain the endometrium.
4) They help in increasing the calcium and phosphorus levels in blood.
5) They help in normalizing the blood sugar level.
6) They help in metabolism.
7) They provide protection against osteoporosis.
8) They function as natural anti-depressants.
9) They help in converting fats into energy.

Do you know?

A Hymen is of varying size, shape and thickness. The Hymen is flexible and may not remain intact due to vigorous physical activity like swimmimg, trekking, cycling and regular play.

- **Vagina :**

Vagina is a hollow tube between the bladder and the rectum and measures around 7-10 cms. Cervix opens in the vagina. At the lower end of the vagina there is a memberaneous fold called the "Hymen". Vagina allows the menstrual flow and also serves as a birth canal. During intercourse, the penis enters the vagina. The penis releases the sperms which are deposited at the mouth of the uterus i.e. cervix. From the cervix the sperms then travel towards the fallopian tube where fertilization may take place.

Table : 3 Female Reproductive Organs and their Functions :

Organs	Functions
1. Ovaries	• Ovaries produce Ova (oogenesis) • Discharge of mature ova (ovulation) • Secretion of hormones - Oestrogen and Progesterone
2. Fallopian Tubes	• Collect released ovum • Tube where ferilization of ovum takes place • Transport ovum/egg to the uterus
3. Uterus	• Zygote gets implanted in the uterus • It protects and nourishes the embryo after implantation
4. Vagina	• Passage for menstrual flow • Sperms are deposited in the vagina during sexual intercourse • Serves as a birth canal

3 Menstrual Cycle

a) Menarche :

The period (age) when menstrual cycle starts is called menarche. The average age of menarche was 13-15 years. The onset of menarche is earlier now. The onset of menarche is associated with geograhical region, linguistic groups, education, wealth status, caste and religious affiliations.

Menopause : The period (age) when the menstrual cycle stops is called menopause

b) Menstruation :

Menstruation refers to the periodic shedding of the uterine lining or the discharge of blood and mucosal tissues from the uterus. Menarche marks the onset of puberty in girls. Menstruation starts from menarche and ends with menopause. The average menstrual cycle takes around 28 days. Girls who have reached puberty start getting their periods once a month. This happens because the lining of the uterus has prepared itself for a possible pregnancy by becoming thicker and richer in blood vessels. If pregnancy does not occur this thickened lining is shed accompanied by bleeding. Menstrual bleeding lasts for three to eight days.

Activity :

A) Give one word for :

1. Periodic shedding of uterine lining —
2. Natural antidepressant —
3. 10 to12 cms long tubes —
4. The part which expands to hold foetus —
5. Onset of menstrual cycle —

B) Find the Co-relation :

i)	Testes	:	sperms	Ovary:	?
ii)	Male	:	?	Female:	Estrogen
iii)	?	:	Maturation of sperm	Ovary:	Maturation of ova
iv)	Male	:	?	Female:	2 ovaries

Do you Know?

According to a National Family Health Survey (NFHS) 2015-16 about 57.6 percent of the **Indian** women use sanitary napkins and 36 percent women in the age group 15-24 years still rely on a cloth during **periods**

Overview of Menstrual Cycle :

- **Days 1-5** menstrual bleeding takes place.
- **Days 6-14 :** as the bleeding stops, the uterine lining (endometrium) begins to develop again for a possible pregnancy. It becomes thicker and gets enriched with blood and nutrients.
- **Days 14-23 :** around day 14 an egg is released from one of the ovaries and begins its journey down the fallopian tube to the uterus. If the sperms are present in the fallopian tube, fertilization can occur. After fertilization, the egg will travel to the uterus and attempt to implant itself in the uterine wall.
- **Days 23-28 :** if the egg does not get fertilized, levels of estrogen and progesterone drop causing the shedding of the uterine lining along with the unfertilized egg.

Do You Know?

The **Chaupadi** tradition is a practice in rural parts of Nepal where women are literally put in isolation during their period. The reason stems back to "being unclean." Girls are not allowed to be in classrooms with other students while menstruating. Similarly there are many regions in India where the same holds true.

Do You Know?

- Certain environmental factors such as stress, poor diet, prolonged strenuous exercise can have an effect on the menstrual cycle
- Tampons is another option that can be used instead of sanitary napkins during menstrual cycle. It is made of cotton or rayon. It is inserted into the vagina which absorbs menstrual blood during the periods
- Menstrual cup can also be used during periods. It is made up of flexible medical grade silicone. The cup is folded and inserted in the vagina where it opens up and the blood is collected in it. The cup needs to be emptied, washed and reinserted depending upon the menstrual flow of the female using it.

***Tampoons and menstrual cup should be used only after consulting a gynaecologist**

3.4 Hygiene and Care during Menstruation

May 28 is observed as Menstrual Hygiene Day to create awareness regarding the importance and management of Menstrual Hygiene.

Menstruation and menstrual practices are still surrounded by taboos and socio-cultural restrictions. This results in adolescent girls remaining ignorant of the scientific facts and hygienic health practices which sometimes results in adverse health outcomes. Hygiene related practices of women during menstruation are significant as lack of it may have negative impact on their health resulting in vulnerability to reproductive tract infections. Hence, knowledge about menstrual hygiene right from childhood may encourage safe practices and help in enhancing the health conditions of women.

Points to be kept in mind for Menstrual Hygiene :

- Take a bath at least once a day.
- Use clean undergarments and change them regularly.
- Select suitable sanitary pads - women with sensitive skin should avoid sanitary pads with plastic lining, as they can cause rashes, itchiness, and boils when rubbing against the skin.
- Changing pads and napkins often can help prevent infections.
- It is necessary to gently clean around the external private part and keep it dry.
- Never use talcum powder/ deodorants on or near the private parts.
- Wash the reusable sanitary cloth with soap and clean water and dry it in the sun.
- Always wrap the used sanitary napkin in a paper and then throw them in the dustbin to prevent the spread of infections.
- Wash hands with soap and water before and after changing the sanitary napkin/material.
- Never flush sanitary napkins/pads in the toilet as that will lead to clogged drains.

Reflection / Darpan

1. What are the physical changes that you have observed in yourself since puberty?

Tick the changes you see in yourself.

a) Irritability

b) Emotional outburst

c) Wanting to be alone at times

d) Change in mood

e) Change in body odour

f) Pimples, acne, healthy skin, oily skin

g) Lethargy

h) Growth of hair on genital organs and under arms.

i) Facial hair

j) Change in voice

k) Broadening of shoulders

l) Broadening of hips

m) Development of breasts

2. Are there any family rituals/practices that are followed when the women in family is menstruating?

Table 3: Health Hazards of Incorrect Practices during Menstruation:

Incorrect Practice	Health Hazard
Unclean sanitary napkin/material	Risk of reproductive tract infection / urinary tract infection
Changing pad infrequently	May cause skin irritation, rashes, infection due to wetness
Insertion of unclean material into the vagina	Bacteria have easy access to cervix and uterine cavity
Unsafe disposal of used sanitary napkin / material	A person infected with hepatitis can transmit the infection to others through unsafe disposal of used sanitary napkin.
Lack of washing hands after changing sanitary napkin/material	Can spread infections

Do You Know?

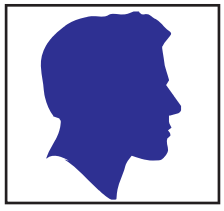
In the desert regions of Rajasthan (Jaisalmer), a rectangular shaped pocket was filled with fine sand to use as an absorbent. In the hilly areas of Uttrakhand, ash was used.

Arunachalam Murganathan developed and patented a low cost machine to make disposable sanitary napkins. The sale of Muruganathan's pad making machine increased with many NGOs installing units across India.

2012 saw the government's flagship sanitation programme, **Nirmal Bharat Yatra** including menstruation management as a part of the sanitation agenda, through collaborations with *Water Supply & Sanitation Collaborative Council* **(WSSCC)**.

State governments in India started the policy of giving out packs of sanitary napkins to every adolescent girl in government schools.

Revise the points



Male Reproductive System

External organs	**Internal Organs**
Penis	Epididymis
Scrotum	Vas deference
Testes	Prostate gland
	Seminal versecls

Female Reproductive system

External organs	**Internal Organs**
Labia Majora	Uterus
Labia Minora	Fallopian Tube
Clitoris	Ovaries
	vagina

Menstruation refers to periodic shedding of the uterine lining. Thickened lining is shed off when pregnancy does not occur. It begins at Menarche and ends at Menopause.

Exercises

Q. 1 Select the most appropriate answers from the choice given below and fill in the blanks.

1. ……..… is the female reproductive organ.

   a) testicles *b) ovary,*
   c) prostate gland

2. Testes secrete ……..… hormone.

   a) estrogen *b) progesterone*
   c) testosterone

3. The average menstrual cycle is of ……..… days

   a) 9 *b) 5*
   c) 8

4. Onset of menstrual cycle at the time of puberty is called .....

   a) menopause *b) menarche*
   c) metabolism

5. Discharge of ova is called as .....

   a) fertilization *b) ovulation*
   c) conception

6 The zygote gets implanted in the .....

   a) uterus *b) fallopian tube*
   c) ovary

7. The lining of the uterus is called .....

   a) menstrual *b) endometrium*
   c) labia

8 ..... is a pear shape muscular organ located on top of the vagina.

   a) Clitoris *b) Uterus*
   c) Ovaries

9. The length of the fallopian tube is .....

   a) 10 12 cm *b) 46 cm*
   c) 44 cm.

10. Membraneous fold at the lower end of the vagina is called …….

    a) cervix *b) hymen*
    c) vas deferens

b. Match the following

A	B
1. Ovary	a. External organ
2. Testes	b. 28 days
3. Uterus	c. Produces ova
4. Menstrual cycle	d. Implantation
5. Labia majora	e. Sperms
	f. 40 days

Q. 3 Write whether the following statements are right or wrong and correct the wrong ones and rewrite the statements.

1. Menopause is a sign of pregnancy.
2. Vagina serves as a birth canal.
3. Ovulation occurs during menstruation.

Q. 4 List the Following

1. Female reproductive organs
2. Male reproductive organs

Q. 5 Write short notes

1. Fallopian tubes
2. Testicles
3. Health hazards due to incorrect practices during menstruation
4. Menstrual hygiene practices

Q. 6. Explain the terms

1. Menstruation
2. Ovulation
3. Menopause
4. Menarche

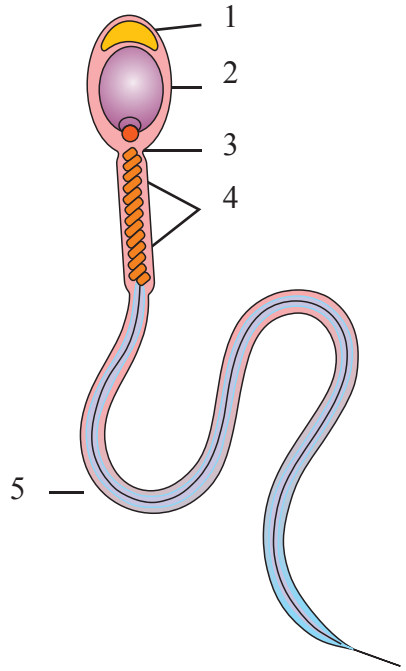
Q. 7. By considering the first correlation complete the second correlation

1. Female sex hormone : Estrogen : : Male sex hormone : _____
2. Testes : Sperm : : Ovary : _____

Q. 8. Identify the odd word

Ovaries, Uterus, Testes, Fallopian tubes, Vagina

Q. 9. Identify and label the diag am.



Q. 10 (a) Draw the female reproductive system.

(b) Write functions of the following

- Ovaries
- Uterus

Q. 11 (a) Name the orgn s of male reproductive system.

(b) Write in brief about Testes and Sperm Cells.

Project / Self Study

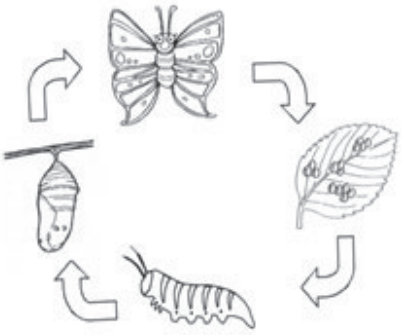
- Make a poster and slogan on menstrual hygiene.
- Display charts on myths and the facts of menstruation.
- Prepare a qi z on the topic of hygiene during menstruation and play the game in your classroom.

❖ ❖ ❖

4 Prenatal Development and care during pregnancy

Activity :

Look at the figures given below and compare the life cycle of a butterfly and a human being.



Life cycle of Butterfly

Life cycle of a Human being

Is there any similarity ? Yes !

Just like the life cycle of a butterfly begins as an egg, the life of a human being also begins as a fertilized egg. Now we will study in detail how individuals develop from the time of conception. The period from conception to birth is referred to as the Prenatal period. Fertilization of an ovum (egg cell) by a sperm is the starting point of new life. The average length of prenatal period is 38 weeks from the date of conception. During this time a fertilized cell or zygote develops in a series of stages into a full term baby.

4.1 Conception

a) Meaning of fertilization and conception

Fertilization :

Fertilization is the process by which sperm and ova combine to create a single cell called a zygote. It occurs within 24 hours after the ovum descends to the tube. The sperms are contained in a fluid called semen. Semen is deposited at the neck of the uterus during intercourse. The sperms are drawn up into the fallopian tube by hormonal attraction and muscular contraction. The sperms secrete an enzyme which disperses the wall from around the ovum. Once it reaches the ovum it penetrates the cytoplasm. This leads to change in the membrane of the ovum in such a way that no other sperm can now enter it .The nuclear material in the head of the sperm now fuses with the nucleus of the ovum to get 46 chromosomes from both the parents. The cell then begins its mitotic division through the different stages of prenatal development. Fertilized ovum (zygote) slowly travels to uterus and moves for 5-6 days to get implanted into the walls of the uterus. This process is known as implantation. When implantation occurs it is called conception. A yolk sac is formed around the ovum cells till implantation process completes and it continues to nourish the ovum.

Activity :

Complete the flow chart of fertilization and implantation

a) Ovum descends to the tube

↓

b) Sperm deposited .....?

↓

c) ?

↓

d) Sperm secretes enzyme

↓

e) ?

↓

f) Change in membrane .....?

↓

g) ?

↓

h) Mitotic division

↓

i) ?

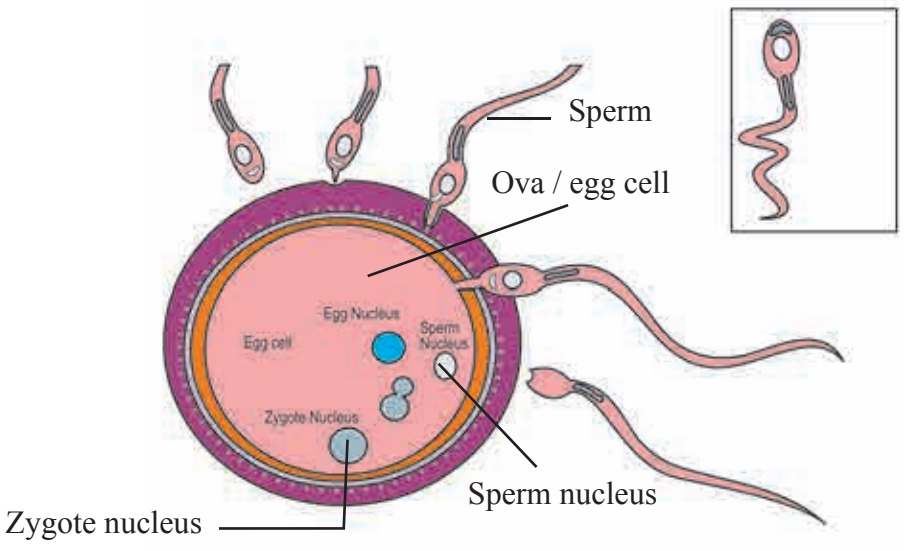


Fig. 4-1: Fertilization

b) Importance of fertilization :

Fertilization is most likely when intercourse happens 2 days before ovulation and a day after ovulation. This is so because the ova is capable of getting fertilized only for 24 hours after ovulation. Sperms also survive only for 12-48 hours in the female body. At the time of fertilization, few important factors such as i) heredity endowment ii) sex of the child iii) number of offsprings or children, are determined.

i) Heredity Endowment :

This is an important factor that influences development right from the prenatal stage. It is the genetic endowment inherited from the biological parents at the time of fertilization. When ovum and sperm unite, they endow the baby-to-be (organism) with a genetic makeup that influences a wide range of characteristics such as colour of skin and hair, height, health, intellect.

ii) Sex determination :

The sex of the child is determined at the time of fertilization. The combination of chromosomes from both the parents will determine whether the foetus is a girl or a boy. When the X - Chromosome of the father combines with the X - Chromosome of the mother the foetus will be a girl. When the Y - Chromosome of the father combines with the X - Chromosome of the mother the foetus will be a boy.

iii) Number of offsprings :

The important condition determined at the time of conception is whether the birth will be single or multiple. Singletones are children who are born alone. They may have siblings- brothers and sisters - but a period of nine months or more separate their birth from those of their siblings. The term 'multiple birth' refers to the birth of two or more babies within a few hours - twins, triplets.

There are two different types of twins: identical and fraternal.

- **Identical or Uni-ovular twins -**

Identical twins come from a single ovum fertilized by a single sperm. As identical twins are formed from one fertilized ovum, they are of same sex i.e. both boys or both girls. They have the same genetic make up and similarities are observed among them.

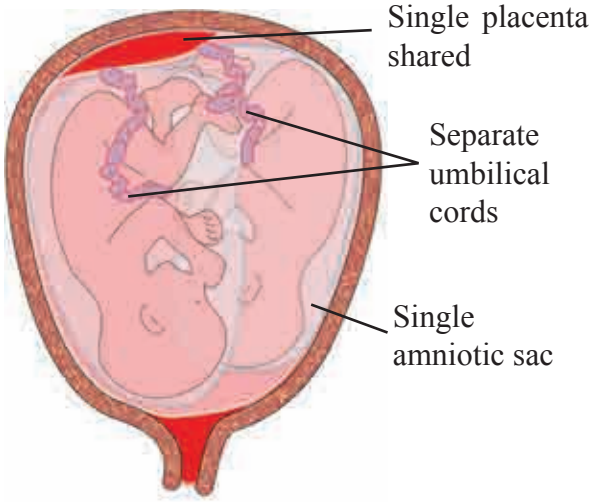


Fig. 4.2 (a) : Identical Twin Pregnancy : Single Placenta Twins

- **Fraternal or Non-identical twins -**

Two different sperms fertilize two ova released simultaneously. Such twins are called fraternal twins. They can be of same sex or different sex. Their genetic makeup will be different. Multiple birth i.e. having more than one child at the time of conception increases the possibility of premature birth and low birth weight. Proper care and nourishment of the pregnant woman should be ensured for a healthy baby and a safe delivery.

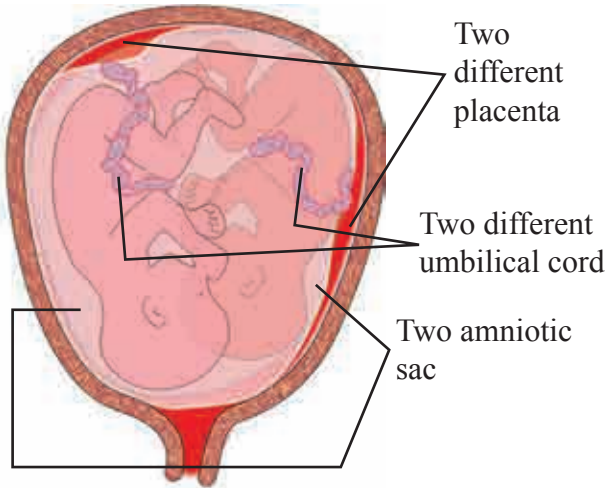


Fig. 4.2 (b) : Fraternal Twins

Table 4.1: Difference between identical twins and fraternal twins

Identical Twins Fig. 4.2 (a)	Fraternal/Non-identical Fig. 4.2 (b)
1. Single sperm fertilises single ovum	1. Two different sperms fertilizes two different ova
2. Mono zygotic	2. Di zygotic
3. Zygote divides into two separate individuals due to hormonal disturbances (before reduction division)	3. Result of simultaneous pregnancy due to two separate ova fertilized by two separate sperms.
4. Same genetic make-up	4. Different genetic make-up.
5. Same sex i.e. Boy-Boy or Girl-Girl	5. Different or same sex i.e. Boy-Boy, Girl-Girl and Boy-Girl
6. Usually share same placenta and same foetal sac	6. Usually different placenta and sac

4.2 Stages of Prenatal development :

Prenatal period is the period of the development from fertilization till birth. The length of this period is 280 days or 9 months 7 days or 40 weeks. This period is divided into three stages:

(a) Period of Ovum (fertilization – 2 weeks).

(b) Period of embryo (3 weeks – 8 weeks).

(c) Period of foetus (9 weeks till birth or 40 weeks).

(a) Period of ovum / zygote (fertilization – 2 weeks)

This is the period of about two weeks i.e. from fertilization to implantation (fixation of ovum in the uterine walls). The fertilized egg cell known as the zygote, divides into two cells by 36 hours then it divides into 4, 8, 16 and then sub divides into many more cells. Finally a cluster of many cells is formed which is known as 'Morula'. The next division of cells is within this cluster where a small cavity is formed. This stage is known as 'Blastula stage'. It further travels to the uterus and gets implanted. Sometimes it gets implanted in the fallopian tube resulting in 'tubal or ectopic pregnancy'. Sometimes there is a possibility of the tube getting ruptured due to growth of embryo. This leads to bleeding. In such cases, the embryo is removed by surgery.

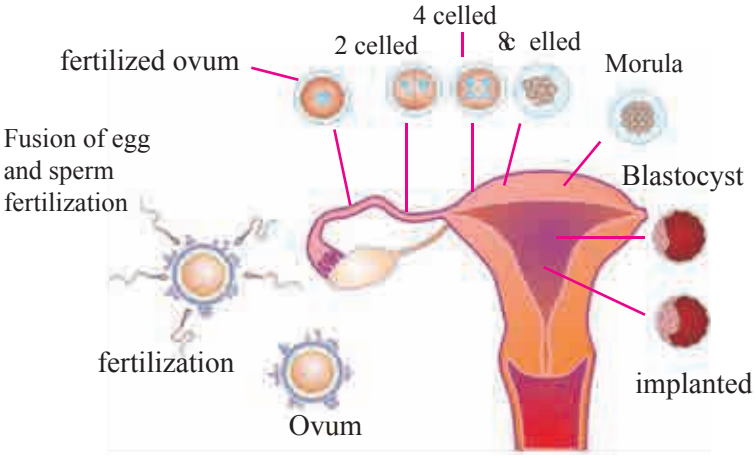


Fig. 4.3 : Fertilization, Morulla stage , Blastula Stage and Implantation

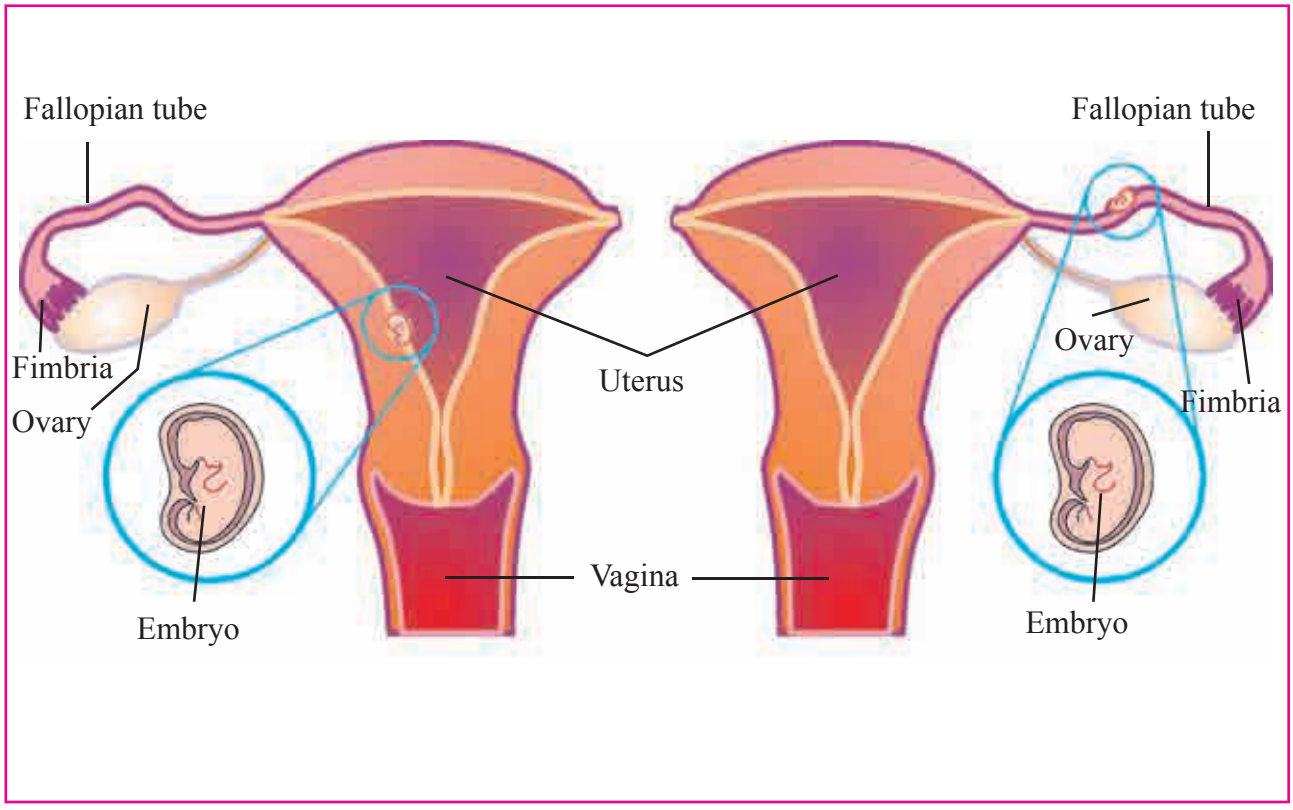


Fig. 4.4 : Embryo implanted normally

Fig. 4.5 : Ectopie Tubal Pregnancy

Implantation takes place in the second week after fertilization. i.e the zygote burrows into the uterine wall and establishes connections with the mother's blood vessels. When implantation takes place there will be some hormonal changes that prevent menstruation indicating that woman has conceived. The small cluster of cells near the center of the zygote will develop into the foetus. The layer, closest to the uterus(trophoblast), will develop into the placenta, a structure which provides nutrients to the foetus.

(b) Period of Embryo (3-8 weeks)

The period of embryo extends from 3rd to 8th week of pregnancy. In this period the internal organs and body structures of the embryo develop. The embryo is made up of three layers.

- **Ectoderm (outer layer) :**

It forms the skin, nails, hair, teeth, external part of sensory organs, e.g. taste buds of the tongue, nervous system, brain and spinal cord.

- **The Mesoderm (middle layer) :**

It forms the blood muscles, skeletal, circulatory, excretory and reproductive system.

- **The Endoderm (inner layer) :**

It forms the lungs, digestive system i.e. formation of internal body parts.

The period of embryo is marked by development of vital organs and other body structures called organogenesis.

Table 4.2 : Growth of Embryo

At the end of 2 weeks	The embryo is the size of a pinhead.	
At the end of 3-4 weeks :	• The embryo is now about the size of a pea. 	• The brain, spine, and heart have begun to form. By the end of 4 weeks the heart will be pumping blood. • A critical period as many birth defects may occur in the developing embryo • The eyes, nostrils, and arms are taking shape.
At the end of 8 weeks :		• the embryo's tail disappears and it is now called a foetus • **Fingerprints** are being formed , and bone cells are replacing cartilage.

Embryo's life support system :

There are three support systems for the developing embryo-the placenta, amniotic sac, and the umbilical cord.

Amniotic Sac :

About two weeks after fertilization, the amniotic sac begins to grow and fill with fluid. Outer layer of cells of embryo forms foetal membranes called amnion and chorion. These membranes along with a third membrane from mother's uterine wall become a sac around the embryo which is known as amniotic sac. This is filled with watery fluid i.e. amniotic fluid which protects the embryo from shocks, experienced by the mother. It also provides stable temperature to the embryo and prevents the sac from adhering to the embryo.

The placenta :

The fertilized ovum enters the uterus and implants itself in the wall. The portion of the mucus membrane which comes between the ovum and the muscular layer is the placenta. It develops during the first 12 weeks. The placenta is formed partly from cells of uterine lining and partly from the trophoblast. It is a disk shaped mass of tissues in which small blood vessels from mother and foetus intertwine but do not join. The placenta is connected to the embryo by the umbilical cord through which it delivers oxygen and nourishment to foetus. It also removes its bodily waste. The foetus breathes, eats, disposes waste products through this. Nutrients, amino acids, fatty acids, drugs are passed through this to the foetus. At 40 weeks the size of the placenta is approximately 9 inches in length and 0.8 inches in thickness. Its weight is approximately 1/6 th of the weight of the baby.

Umbilical Cord :

The umblical cord forms around the fifth week of pregnancy and can grow up to 20 inches at full term. It consist of two arteries and one vein. The vein carries oxygenated and nutrient rich blood from the placenta to the foetus and arteries carry the deoxygenated nutrient-depleted blood and waste product away from the foetus. When the infant is born, the umbilical cord is cut close to the baby's body.

Activity :

Represent the following diagrammatically / as a tree chart

a) The three stages of Prenatal development.

b) The three stages of Embryo development.

c) The three life support system of embryo.

(c) Period of foetus (9 weeks to birth) :

This period extends from nine weeks upto delivery.

Table 4.3 : Growth of foetus

At the end of 9 weeks	• The neural tube (brain, spinal cord and other neural tissues of the central nervous system) is well formed. • The digestive tract and sensory organs begin to develop.
At the end of 2-3 months :	• The foetus makes random movements . Finger nails, toe nails and teeth are beginning to develop. External ears are formed. • Reproductive organs develop.
At the end of 3-4 month :	• The foetus starts having breathing movements. It can open its mouth and swallow. • Foetal movement may be sensed now (called quickening). • The fingers and toes are well-defined. Eyelids, eyebrows, eyelashes, nails, and hair are formed. • Foetus also sucks his or her thumb, yawns and stretches. • Nervous system starts functioning. • Reproductive organs and genitalia are fully developed and visible on ultrasound. • Foetal heartbeat is audible through an instrument called a stethoscope.
5th Month	• Hair begins to grow on the head of the foetus. • Shoulders, back, and temples are covered by soft fine hair called lanugo.

At the end of 6th month :	• The foetus can respond to sounds that occur in the mother's surroundings. • Eyelids can open and close
At the end of 7th month :	• Hearing is fully developed. • If born prematurely, infant is more likely to survive after the seventh month.
At the end of 8th month	• Most internal systems are well developed, but the lungs may still be immature.
At the end of 9th month :	• Foetus continues to grow and mature, the lungs are nearly fully developed. • Reflexes are coordinated so the foetus can blink, close the eyes, turn the head, grasp firmly, and respond to sounds, light and touch. • Foetus is about 18 to 20 inches long and usually weighs about 7 pounds

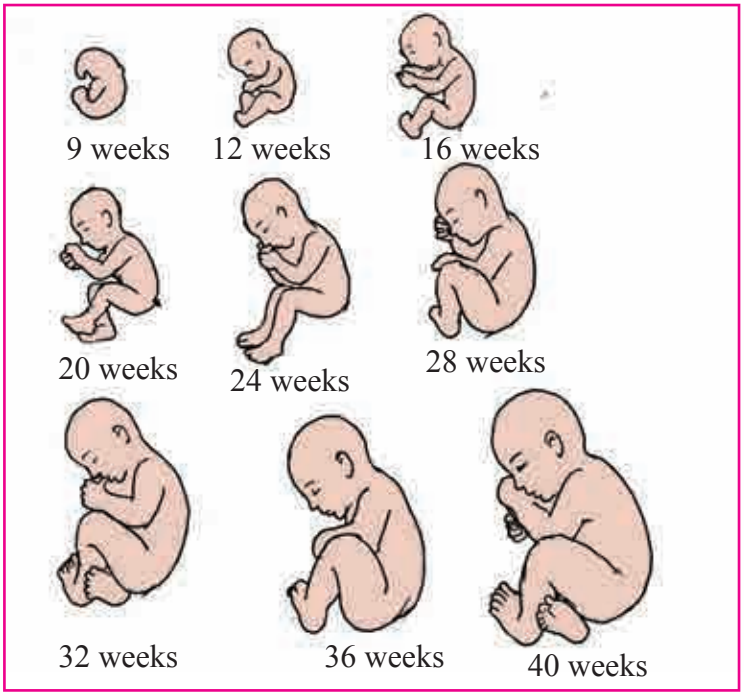


Fig. 4.6 : Growth of Foetus

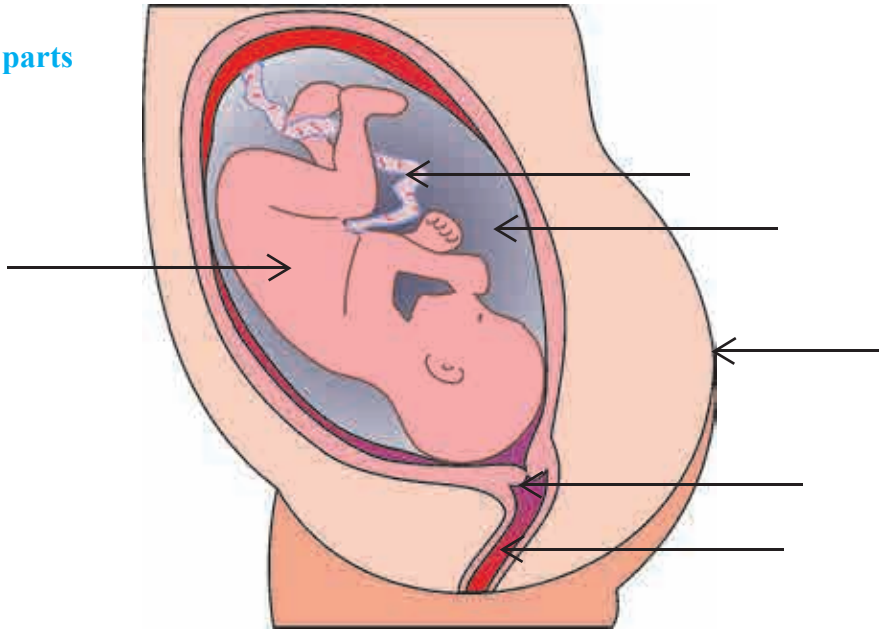
Importance of Period of Foetal Development :

Major parts of the body are completed in a rudimentary form. Since the nervous system is maturing, mental growth may be affected if there are any adverse conditions. Any deficiency in nutririon may cause defects in the foetus. Similarly the risk of miscarriage depends on a wide range of prenatal conditions.

The attitude of the mother, her anxiety and other such factors affect birth and delivery process. The educational level, socio-economic conditions, emotional state and whether it is hospitalized delivery or home delivery can affect the process of delivery and ultimately affects the infant.

Activity :

Label the different parts



Pregnancy and Gestation :

Gestation refers to a period of foetal development from the time of conception until birth. Full gestation period is usually nine months. Pregnancy refers to changes in the mother during this period.

4.3 Signs and symptoms of Pregnancy

- Amenorrhea
- Nausea
- Tiredness
- Changes in breast
- Micturition
- Enlargement of uterus
- Quickening

Signs and symptoms of Pregnancy

a) Signs and Symptoms :

1 Amenorrhea :

Absence of menstrual cycle during active sexual periods of life.

2. Nausea :

Most but not all pregnant women may have sensation of vomiting. Nausea may be experienced at any time of the day.

3. Tiredness :

In early pregnancy many women may feel more sleepy and tired, hence sufficient rest is necessary.

4. Changes in breast :

Breast becomes enlarged, tender and more noticeable as soon as pregnancy occurs. The area around the nipple (areola) darkens and from the 12th week, colostrum, a clear yellow fluid, is secreted from the nipple.

5. Micturition or frequent urination :

The enlarging uterus presses on the bladder resulting in frequent urination. During pregnancy many women feel thirsty which results in an increased intake of fluids, thereby resulting in frequent urination.

6. Enlargement of uterus :

Enlargement of uterus is rapid and uniform due to the growing foetus.

7 Quickening

Movement of the foetus felt by the mother is usually around 4 months.

8. In some women increased vaginal discharge secretions may be seen. Additionally pigmentation of the face and abdominal region may occur.

b) Diagnostic tests :

i) Biological pregnancy test or Urine test :

6-8 weeks from the last menstrual cycle (LMC), the gonadotrophic hormone is seen in sufficient quantity. The first urine in the morning has to be tested for accurate results.

ii) Foetal heart sounds :

One is able to detect this by 5th month. The rate of heart beat is approximately 120-140 per minute. In boys it is below 130 and in girls above that.

iii) Sonography, Ultra Sound and Ultrascan :

Sonography is used to observe growth and development of the foetus during pregnancy. Physical development and brain development of foetus is seen with the help of this. A picture of the developing embryo can be obtained by 5-6 weeks after LMC. By 8 weeks a clear picture of the embryo with its hearts beating is visible. It is widely used now.

In India sex determination test is illegal and a punishable offence.

Fig. 4.7 : Sonography / Ultra Sound / Ultra Scan

Do you know?

The government has launched **'Pradhan Mantri Surakshit Matritva Abiyan'** (PMSMA) a new scheme to provide comprehensive and quality antenatal care to pregnant women on the ninth of every month. The scheme is estimated to help over 3 crore pregnant women across the country in order to detect and prevent high risk pregnancies.

4.4 Danger Signals during Pregnancy :

a) Minor disturbances during pregnancy

i) Morning sickness and Nausea :

Many women suffer from nausea and vomiting. The condition may be due to hormonal changes during pregnancy, decreased glucose levels and increased levels of ketone bodies in the body. It can affect a mother's daily routine. Eating smaller portion at regular intervals throughout the day helps instead of overeating or forcing oneself with big meals. The pregnant woman can have biscuits, fruit juices, toast or sugary drink for energy. Cutting down on fried foods also helps relieve nausea.

ii) Back ache :

Hormones secreted during pregnancy soften the ligaments and joints especially those of the lower back. The enlarging uterus changes the posture of the pregnant woman. Increased pressure on the back causes shoulder to be pressed backwards while walking. This results in backache. Supporting the lower back with a cushion while sitting and not standing for long periods can bring some relief. Comfortable footwear, preferably flat ones can give a good amount of relief.

iii) Frequent urination :

The enlarged uterus puts pressure on the bladder resulting in pregnant women having frequent urination. This is more evident in the first and last trimester of pregnancy. Pregnant women could aviod drinking any fluid or water two hours prior to sleeping.

iv) Varicose veins :

A pregnant woman has more blood in circulation, which causes the dilation of blood vessels leading to varicose veins. Most varicose veins disappear in 2-3 months after delivery. The pregnant woman can avoid standing for too long or can wear support tights if suggested and prescribed by doctor. While sitting she must keep legs on a raised stool or cushion for additional support.

v) Constipation :

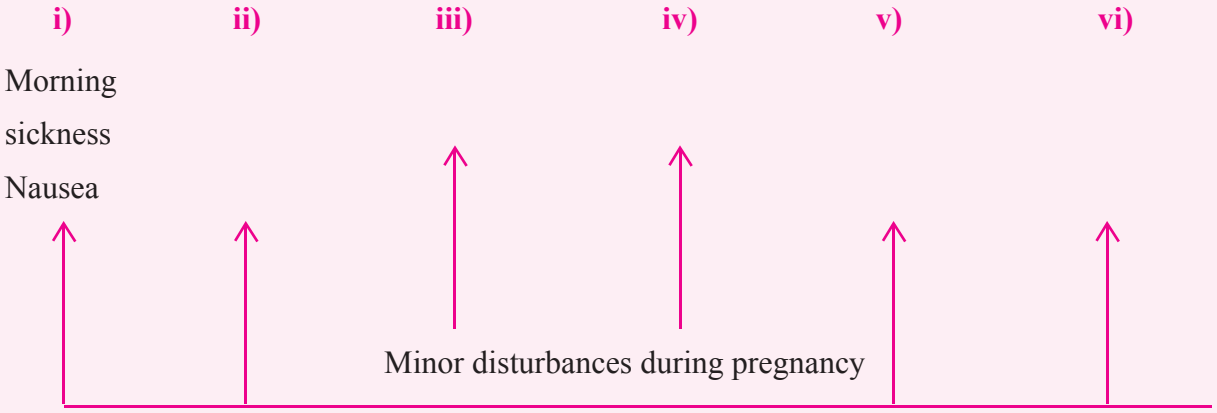
This could be due to lack of dietary fibre , poor intake of water, lack of exercise, changes in the pregnant woman's internal system (bowels are sluggish) and irregular bowel habits. This may cause nausea, headache and restlessness. The pregnant woman can drink more fluids i.e. atleast two litres a day. She can also add bran oatmeal, porridge, fresh green leafy vegetables to her diet.

vi) Heart burn or indigestion :

Due to enlargement of uterus there is pressure on the stomach. This affects the functioning of the digestive system. Acid secretions from the stomach come to the lower part of the gullet or food pipe causing a sensation of heartburn. A few sips of cold milk, eating small meals more often, avoiding lying flat on back, avoiding bending or sitting in a hunched position can relieve some of the heartburns.

Activity :

Write down the main points to see if you remember. The first one has been done for you.



b) Major disturbances :

i) Toxemia :

It is a complication that may occur around the 26th week of pregnancy. This could be seen in women with multiple pregnancies, in women with a family history of high blood pressure. Swelling of face, feet, body, generalized fluid retention, weight gain, high BP, headache, blurred vision , spots before eyes are symptoms of Toxemia. The condition, if mild , can be treated by proper diet with salt restriction and rest. In severe cases anti hypertensive drugs may have to be given to prevent convulsions or Eclampsia in the mother. This may result in the death of the foetus.

ii) Anaemia :

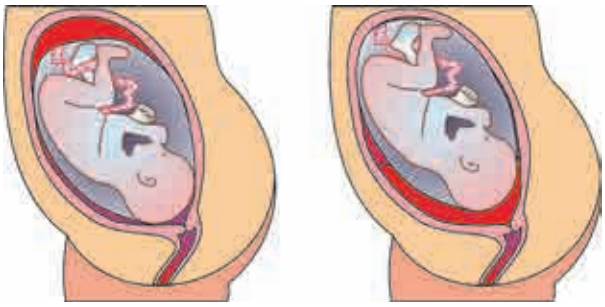
Anaemia is iron deficiency. Few causes of anemia are less intake of iron, lack of folic acid (a constituent of vitamin B) and decreased amounts of haemoglobin in the blood. The woman feels weak, there is loss of appetite, fatigue and breathlessness on slight exertion. A diet rich in leafy vegetables, eggs and meat is highly recommended. Iron tablets can be taken after consulting a doctor as her requirement of iron is 35 mg per day.

India has the highest number of anaemic women between the ages of 15 and 49 years. Globally, anaemia affects a whopping 614 million women in that age bracket.

iii) Vaginal bleeding :

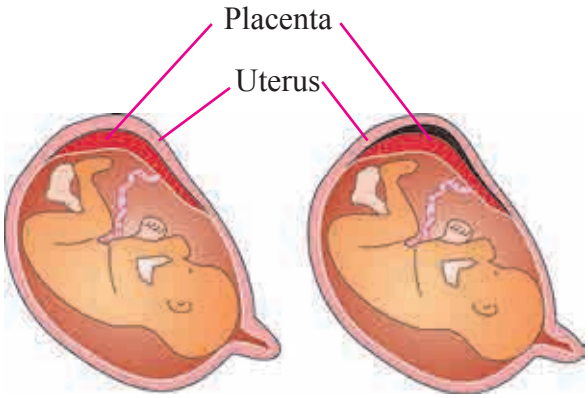
Vaginal bleeding in pregnancy is any discharge of the blood from the vagina. Vaginal bleeding during first three months of pregnancy may be a sign of miscarriage or ectopic pregnancy. During 4-9 months of pregnancy, bleeding may be a sign of placenta previa, placenta abruption, miscarriage, early labour and infection of the cervix. It can be a risk for pregnant women and her baby.

In placenta previa, placenta is attached to lower part of uterus (cervix). This condition can cause severe bleeding before or during labor. This could put the mother to be and the baby in danger. In placenta abruption, placenta gets separated from walls of uterus. This can be dangerous to baby due to lack of supply of oxygen. This may result in to death of foetus or abnormalities in the foetus. (fig. 4.8 a & b)



Normal placenta position | Placenta previa

Fig. 4.8 (a) Placenta previa



Attached placenta | Detached placenta

Fig. 4.8 (b) Placenta abruption

iv) Urinary Infection :

Urinary infection during pregnancy is due to high level of hormones in the blood causing an ideal medium for the growth of bacteria. Increased intake of water is usually advised. Any medication should be as per doctor's suggestion only.

v) Prolong d vomitting

Many women during pregnancy continue to have vomiting which affects their intake of food, resulting in weakness and dehydration. Doctor's advice in such cases is urgently required.

vi) Insomnia :

The pregnant woman may feel tired but is usually unable to go to sleep. However, drug treatment should be avoided at any cost. Insomnia may be due to worry, restlessness or anxiety.

Reflection / Darpan

Find out from your mother or any other family member.

(a) What kind of major or minor disturbances did she have during pregnancy?

(b) What type of delivery did she have?

(c) Does she have any record of the antenatal check up.

Activity

Find the given words hidden in the grid. The words maybe vertical, horizontal, diagonal.

K	E	T	O	N	E	A	O	G	A	R	T
L	Y	O	F	A	S	N	R	N	M	X	O
A	Z	X	D	U	O	I	E	I	G	F	M
T	R	E	S	S	C	M	A	N	P	E	P
A	N	M	A	E	I	T	I	E	W	O	D
N	T	I	K	A	R	E	V	K	L	T	J
E	F	A	L	Q	A	C	E	C	H	I	Y
T	G	M	O	K	V	A	R	I	S	R	Z
N	J	K	N	O	I	T	P	U	R	B	A
A	C	U	Y	E	S	O	Z	Q	I	U	N
W	V	I	C	U	l	J	A	V	R	E	P
E	R	Q	S	A	Q	M	R	T	O	X	I

1. Ketone
2. Antenatal
3. Nausea
4. Varicose
5. Toxemia
6. Anemia
7. Previa
8. Abruption
9. Quickening

4.5 Care During Pregnancy

i) Diet :

A woman's diet before conceiving can affect her child's future health. Her diet during pregnancy is even more important. A well balanced diet helps in giving birth to a healthy baby. Pregnant women who gain at least 20 pounds are less likely to miscarry or have babies who are still born or underweight. Her diet must incorporate foods rich in calories, proteins, folic acid ,calcium, iron and other essential minerals to meet the needs of the growing foetus. Food must be adequate in quality and quantity.

ii) Physical Care :

Physical care during this period is essential. It includes bathing, care of teeth, care of breast and clothing.

a) Bathing :

A daily bath is necessary. Use of very cold or very hot water should be avoided. Warm water should be used for bathing.

b) Care of teeth :

Care of teeth should be taken in this period. The diet should be enriched with calcium and vitamins. Regular dental checkup is essential.

c) Care of breast :

The breast and nipples should be kept clean by washing and drying with a soft towel. It should be cleaned with lukewarm water. Massage with cold cream is good to prevent cracks in the skin.

iii) Rest and Exercise :

A pregnant woman should take rest during the day if possible. She should lie down in a comfortable position. Rest reduces fatigue and blood supply to the foetus is enhanced. Moderate exercise will be helpful. An expectant mother can jog, swim, cycle etc. Regular exercise helps in preventing constipation, improves circulation, respiration, skin elasticity and muscle tone, all of which contribute to an easier and safer delivery. Being employed does not necessarily entail any risk. However having strenuous working conditions or long working hours may result in premature birth.

iv) Antenatal Checkup (ANC) :

This is to ensure that the mother to be is fit and healthy and there are no complications during pregnancy. Even if there were, an antenatal check up can help prevent the same. In the checkup the urine is examined and tested for protein and glucose. This is to rule out the possibility of developing diabetes during pregnancy or pre-eclampsia. Urine test is also taken to see if any urinary infection is present.

A blood test is done for finding out the blood group and haemoglobin levels. Clinics also do a HIV screening test. Further foetal heart sound and its movement can be monitored to indicate any irregularities. Antenatal visits help the woman get familiar with the hospital, the gynaecologist / obstetrician, and the unit who will help her during labor.

Info Hub :

- The World Health Organisation recommends that all pregnant women receive at least four ANC visits.
- More than one in seven Indian women do not receive antenatal care during their pregnancy.
- According to National Family Health Survey there is a need to sensitise men about women's rights to healthcare.
- Antenatal care (ANC) constitutes :
    - Monitoring for signs of complications, detection and treatment of hypertension and diabetes, provide iron and folic acid tablets, vaccination and counsel on preventive care, diet during pregnancy, delivery and postnatal care.

v) Personal and environmental hygiene :

It is very important to maintain personal and environmental hygiene. Pregnant women should undergo all the above mentioned tests, keep herself healthy by taking good rest, exercise in moderation, have a balanced diet and wear loose clothes as her pregnancy advances.

She must go for walks in fresh air and sunlight. To ensure a healthy child she must also be cheerful and not be anxious or stressed.

vi) Immunization and regular health check up :

Going for regular checkup is essential during pregnancy to ensure a healthy baby. Regular immunization of Tetanus injection usually in the third trimester is advised to pregnant women. Before pregnancy begins the woman can take a rubella vaccine if she is not immune to it.

vii) Attitude :

One of the most influential factors that can affect the prenatal life is the attitude of the pregnant women as well as other people in the family. For example an unwanted pregnancy can lead to a lot of friction and unpleasantness. If the husband blames the woman for the pregnancy it is likely to bring about a lot of resentment and later may make the child feel unwanted. A positive attitude towards pregnancy and motherhood is ideal. Knowing the sex of the child before hand or having a very idealistic image about how the child should be, can color the attitude of both the mother and the family members.

4.6 Types of Birth :

An easy birth plan is ideal. However even the most carefully planned birth can take twists and turns. In those cases, it is important to prepared for the alternative delivery methods. Different kinds of childbirth and delivery methods are as follows –

a) Natural Delivery (Vaġ nal Delivery):

In a natural birth, the baby is born through the birth canal. It is difficult to know when exactly women go into labor, but most women give birth at around 38-41 weeks of pregnancy. Benefits of natural delivery are :

i) Shorter hospital stay

ii) Lower infection rates

iii) Quicker recovery

iv) Babies born naturally have a lower risk of respiratory problems

b) Caesarean Section :

When complications arise, the caesarean method of delivery is imperative. A cesarean section or C-section is the delivery of baby through a surgical incision in the mother's abdomen and uterus.

c) Forceps Delivery :

Forceps are used when the baby is on its way via birth canal but fails to fully emerge out. Forceps are used when there is any small obstruction or the mother is tired and loses consciousness. If the rate of labor pain slows down and the woman is not able to push down, then also the doctor uses forceps to hold the skull of the baby and pull the head out. The forceps are specially designed for this delivery.

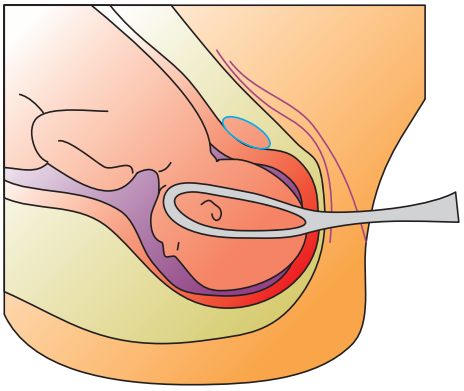


Fig. 4.9 Forceps Assisted Birth

d) Vaccum Extraction :

Similar to forceps delivery method, this type of delivery technique is again used in the case of a vaginal birth. The baby is on its way out but somehow has stopped moving any further through the canal.The doctors then make use of a specialized vacuum pump which is inserted up to the baby via the canal. The vacuum end has a soft cup which is placed on the top of the baby's head. Vacuum is created so that the cup holds the head and the baby is gently guided outwards through the canal.

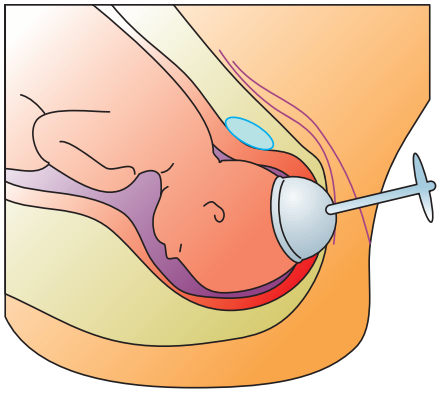


Fig. 4.10 Vacuum Assisted Birth

e) Breech Delivery :

In a Breech birth the bottom of the baby emerges first instead of the head. Nowadays a caesarean section is advised to ensure a safe delivery.

Activity :

Correct the statements given below :

1. In forceps delivery a vacuum pump is used to deliver the baby.
2. A pregnant woman requires 30 mg of iron per day.
3. When the head emerges out first it is called a breech birth.
4. In vacuum birth, surgical incision is done on the pregnant woman's abdomen.

4.7 Factors affecting prenatal development:

i) Age of the mother :

The best age for a woman to bear a child is 23-29 years. If younger, then the girls' reproductive organs are not well developed and hormones have not reached optimum level of functioning. If above 35 years then more chances of miscarriage, abnormalities and still birth.

ii) Maternal nutrition :

Good nutrition helps in growth and development of the foetus. Under weight and malnourished mothers have greater chance of premature births. Mothers who are overweight and have toxemia, may deliver stillborns. A pregnant woman should have healthy food and rest. She must ideally gain at least about 10-12 kilos of weight during pregnancy.

iii) Rhesus factor (Rh Factor) :

Blood comprises of two primary elements they are as follows

i) Blood groups namely 'A', 'B', 'AB', 'O'

ii) Rhesus factor (Rh factor)

The presence of this factor in the blood is referred to as Rh Positive (Rh +ve). The absence of this factor is in the blood is referred to as Rh negative (Rh -ve)

- A mother who is Rh -ve with a partner who is Rh +ve has higher chances of her baby being Rh +ve. This is because a very high percentage of the population is Rh +ve.
- In case of Rh incompatibility between the mother and the baby, antigens from the baby are likely to enter the blood stream of the mother. To fight these antigens, antibodies are produced in the mother's blood. The Rh incompatibility does not pose any threat to the first born. However with subsequent pregnancies there is a definite danger of the baby's blood cells being rapidly destroyed before its birth.
- The destruction of the baby's blood cells are likely to develop a miscarriage, retardation, severe jaundice, anemia (erythroblastosis) or death.
- In order to avoid complications the mother must be given an injection known as an 'anti D' injection within 72 hours after the birth of the baby.

iv) Medicines :

A pregnant woman should not consume any medicine without consulting a doctor. Medicines taken without consultation have hazardous effects on the foetus such as fetal abnormalities, deafness, visual impairments, bone deformities. Regular medicines are not prescribed to pregnant women for fever, common cold, aches or pains.

v) Illness :

Illness of mother affects the foetus. If the mother has diabetes, there is increased possibility of the foetus having diabetes or physical abnormalities or getting aborted. Jaundice damages the liver of the foetus and may

result in prematurity. If mother is suffering from chicken pox, it may affect the ear and heart of the foetus. Mothers with rubella results in bitot's spot, deafness, and affects heart, ear and brain of the foetus.

vi) Maternal emotions :

Extreme emotions felt by the mother may bring about hormonal changes which are communicated through the blood stream to the foetus and can affect its development.

vii) Radiation :

It is a well known fact that X rays can cause gene mutation. The greatest damage seems to occur in early pregnancy. Therefore, exposure to radiation of any kind should be avoided. With the use of ultrasound, X-rays are not necessary.

viii) Alcohol :

Moderate drinking can affect and harm the foetus, resulting in growth retardation. Babies suffer from foetal alcohol syndrome i.e. facial and bodily malformation, disorders of the central nervous system, short attention span, poor sucking response and motor defects.

ix) Smoking

Excessive smoking has an effect on the foetal heart, circulatory system and other organs. Children whose mothers smoke during pregnancy were found to be more hyperactive, shorter, generally less well developed and are less well adjusted socially. Women who smoke during pregnancy risk having babies with congenital defects and spina bifida.

x) AIDS and Sexually Transmitted Diseases (STD) :

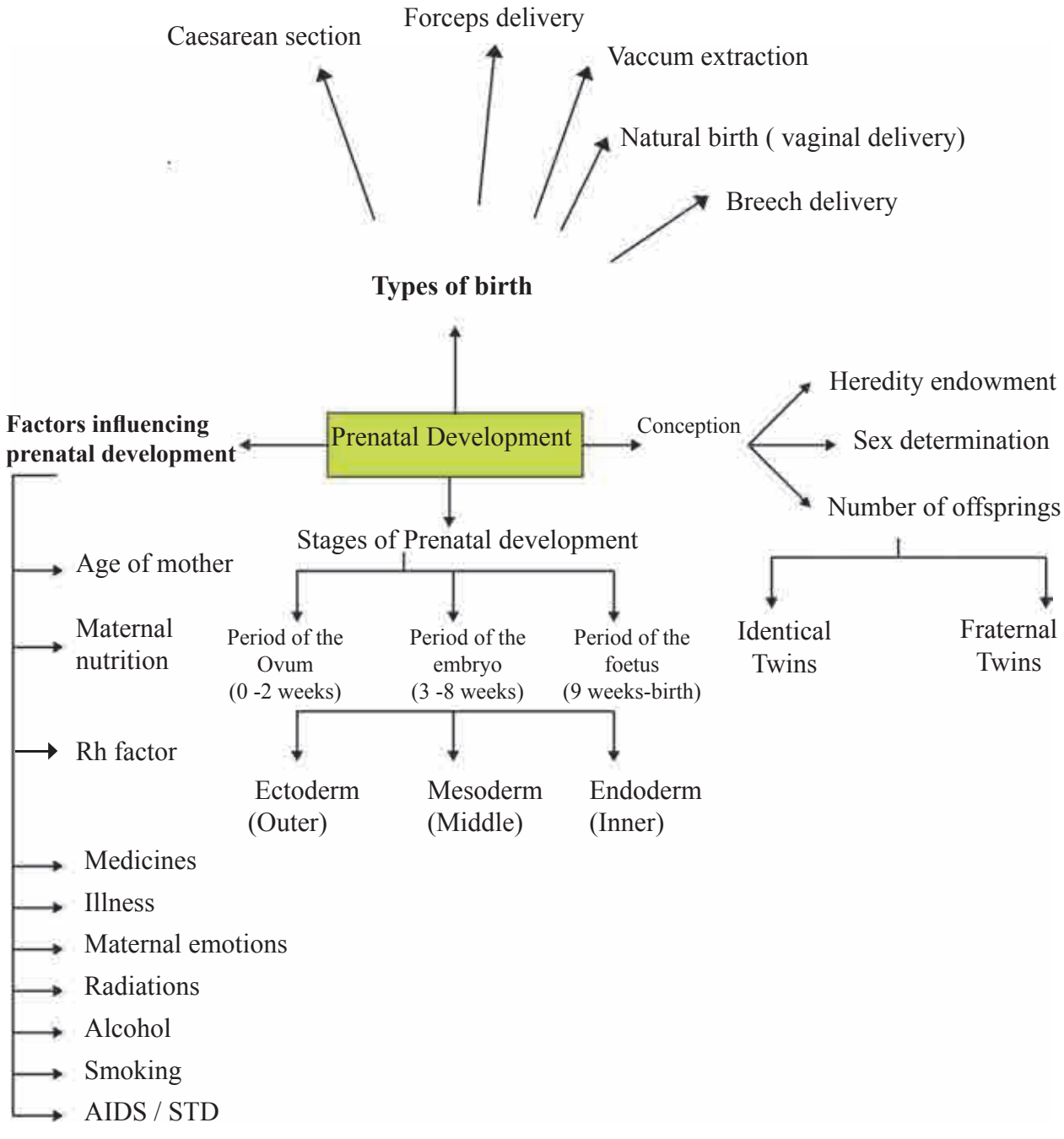
It is Acquired Immune Deficiency Syndrome. It is a disease caused by the human immunodeficiency virus (HIV) which affects the functioning of our immune system. A foetus can be infected with HIV as it can be passed via the placenta or after birth through breast milk. Sexually transmitted diseases and its effects on mother and foetus are given in the table below :

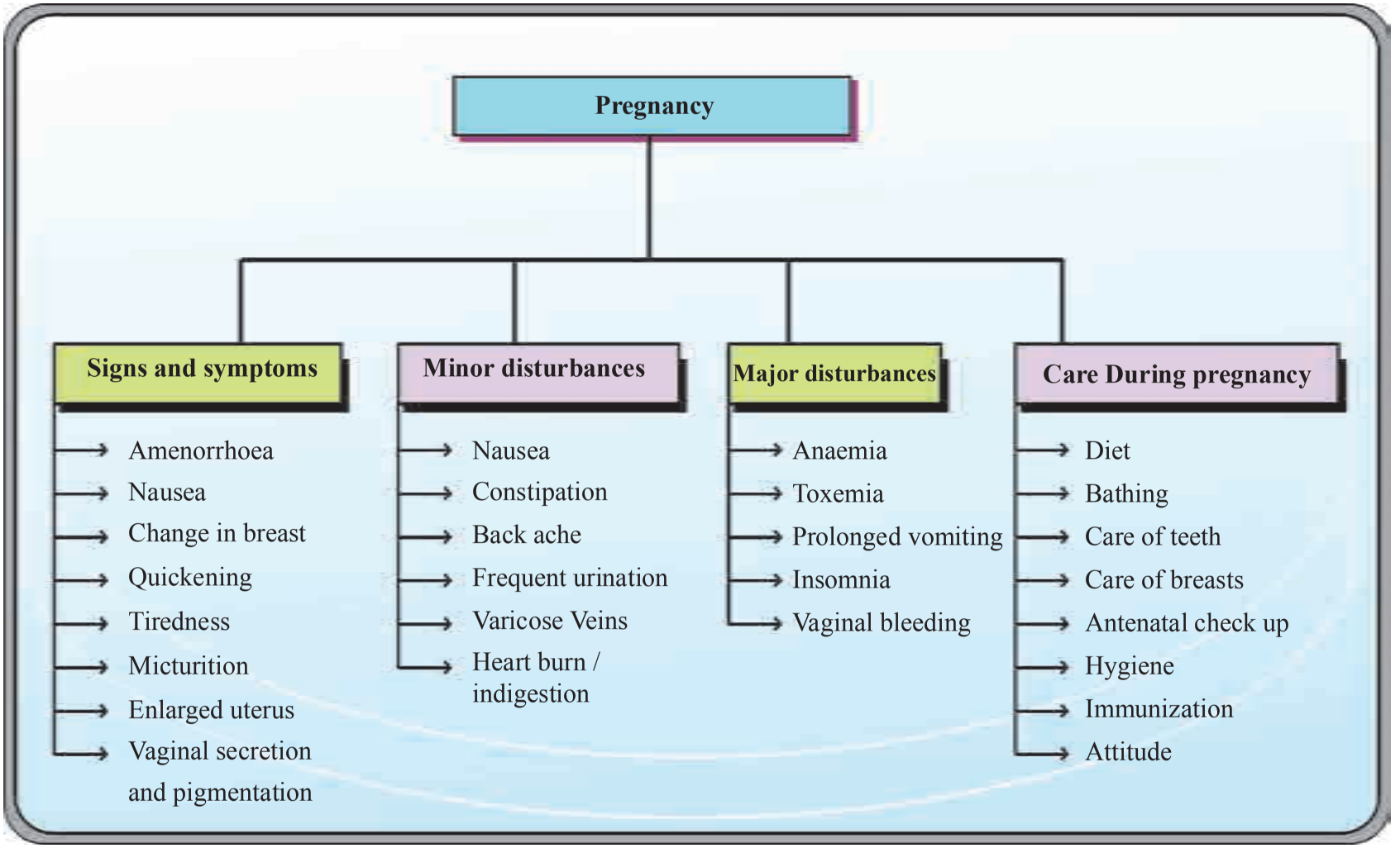
Table 4.4 : Sexually Transmitted Diseases

STD	Effect on the mother	Effect on the foetus
Gonorrhea	• Infertility, Miscarriage • Ectopic pregnancy • Pelvic inflammatory disease	• Pass the disease to their baby while in the womb or during delivery • Premature birth
Herpes	• Pregnancy complications and miscarriage	• Infection of the skin, mouth and eyes • Open sores, cause brain damage, blindness or death of the newborn
Syphilis	• Affect the central nervous system - brain and spinal cord, • Can lead to seizures, blindness, and hearing loss, dementia, psychosis, and eventually death	• Skin sores, rashes, fever • Still-birth or neonatal death • Weakened or hoarse crying sounds • Swollen liver, spleen, yellowish skin (jaundice), anaemia and various deformities

Chlamydiah,	• Can spread into the uterus causing damage to the fallopian tubes, uterus and surrounding tissues • Can experience an ectopic pregnancy and miscarriage	• Eye infection,pneumonia

Revise the points





Revise the points

Exercises

Q. 1 Select and write the most appropriate answer from the alternatives given

1. Conception takes place at the time of ……..…..

   a) pregnancy *b) Implantation*
   c) birth

2. Fertilisation of an egg by a sperm normally occurs in .....

   a) fallopian tube *b) uterus*
   c) ovary

3. Fertilised egg cell is called .....

   a) zygote *b) morula*
   c) conception

4. Sex of the child is confirmed at the time of .....

   a) birth *b) conception*
   c) pregnancy

5. Period of foetus is from .....

   a) 0 to 2 weeks *b) 3 to 8 weeks*
   c) 9 weeks to birth

6. Implantation of ovum to uterine walls is known as .....

   a) menopause *b) conception*
   c) fertilization

Q. 2 State whether the following sentences are True or False.

1) Period of ovum is from conception to 2 weeks.
2) Fertilized egg cell is released during menstruation.
3) Identical twins have different placenta
4) Placenta maintains stable temperature in the womb

Q. 3 Match the column

A	B
1. Period of foetus	a. Iron deficiency
2. Anaemia	b. Diabetes
3. AIDS	c. 9 weeks to birth
4. Amenorrhea	d. Sign of pregnancy
5. Period of embryo	e. Formation of internal body parts
6. Endoderm	f. 3 weeks to 8 weeks
	g. HIV

Q. 4 Answer the following in one or two sentences.

1. Which layer of embryo forms skin, nails, hair?
2. What are diagnostic tests of pregnancy?
3. What is ectopic pregnancy?
4. What is Morulla stage?
5. What is gestation?

Q. 5. List the following

1. Prenatal stages
2. Embryo's life support system
3. Minor disturbances in pregnancy
4. Factors affecting prenatal development.

Q. 6 Write short notes.

1. Toxemia
2. Importance of fertilisation
3. Uterus
4. Anemia
5. Antenatal checkup
6. Signs of pregnancy
7. Types of birth
8. Rh factor

Q. 7. Differentiate between

1. Period of ovum and period of embryo.
2. Placenta and Amniotic Sac

Q. 8. Complete the given table.

Identical Twins	Fraternal / Non identical Twins
1) ____ _____ fertilizes single ova	1) Two different sperms fertilizes two different ova.
2) Uni Zygotic	2) ____ Zygotic
3) _____ genetic make-up	3) Different genetic make-up
4) E.g. Boy-Boy or -----	4) E.g. Boy-Boy, Boy ____, ____

Q. 9. Unscramble the word to get the answer from the given clue.

Clue : Process in which sperm and ova combine to create a single cell called zygote.

Word : rzfanitloiei

Q. 10. Arrange the stages in serial order : period of embryo, period of ovum, period of fetus.

Q. 11. Write in detail signs of pregnancy.

Q. 12. Discus any three factors affecting prenatal development.

Q. 13. Read the following paragraph and answer the questions.

Fertilization is the process by which sperm and ova combine to create a single cell called a zygote. It occurs within 24 hours after the ovum descends to the tube. The sperms are contained in a fluid called semen. Semen is deposited at the neck of the uterus during intercourse. The sperms are drawn up into the fallopian tube by hormonal attraction and muscular contraction. The sperms secrete an enzyme which disperses the wall from around the ovum. Once it reaches the ovum it penetrates the cytoplasm. This leads to change in the membrane of the ovum in such a way that no other sperm can now enter it .The nuclear material in the head of the sperm now fuses with the nucleus of the ovum to get 46 chromosomes from both the parents. The cell then begins its mitotic division through the different stages of prenatal development. Fertilized ovum (zygote) slowly travels to uterus and moves for 5-6 days in uterus and it gets implanted to the wall of uterus. This process is known as implantation. Yolk sac is formed around the ovum cells till implantation process completes and it nourishes the ovum. Once implantation process is over, the yolk sac continues to nourish the ovum.

1. What do you mean by fertilization?
2. How many chromosomes does the individual child get from the parents?
3. What is the function of yolk sac?

4. Complete the passage by choosing the appropriate words given in the bracket:

Semen is deposited in the ..... . Semen contains ..... . By hormonal attraction and contraction of ....., they are transferred to ..... . Once it reaches the ovum, it penetrates ..... . Nucleus of sperm unites with the nucleus of ..... . Fertilized ..... is formed. The zygote then begins its ..... division and it starts moving to the ..... for implantation

(uterus, mitotic, cytoplasm, muscles, fallopian tube, ovum, Zygote, sperms, cervix)

Project / Self Study

- Visit to Maternity home and collect the information regarding antenatal checkup, care and services.

5. Neonatal Development (Birth to 15 days)

What are the things that you note when newborn babies are brought home?

Here is a hint for you :

A. Appearance

B. Bathing

C. Clothing

The human body goes through amazing changes during gestation which is the time spent in the mother's uterus. It starts out as a tiny, microscopic group of cells that grow and form all the organs and tissues found in a newborn baby. These changes don't stop at birth! Birth is just an interruption in the process of development which starts at conception. The fetus gets separated from the internal uterine environment of the mother to the external world environment. This period after birth, marked with crucial adjustments is called the Neonatal period. The neonatal period extends from birth through the first fifteen days of life. During this time, the new born undergoes physiological changes as it adapts to the new environment.

The first two weeks of neonatal period is the time of transition from the uterus where foetus is supported entirely by the mother to an independent existence.

Definition :

The period from the birth to the time when the newborn makes a stable adjustment to his new environment is generally referred to as the neonatal period and the baby is known as a neonate.

Facts about Newborn Babies :

- A newborn baby has no kneecaps at **birth!** ...
- A new born baby cries without tears as the tear ducts and glands only produce enough liquid to lubricate and protect their eyes.
- Newborn babies have more bones than adults.They have 270 -300 bones at birth
- Newborn babies can hear as well as you do. .
- The voice and smell of the mother, is recognized by the baby from **birth**.

5.1 Physical appearance of neonate :

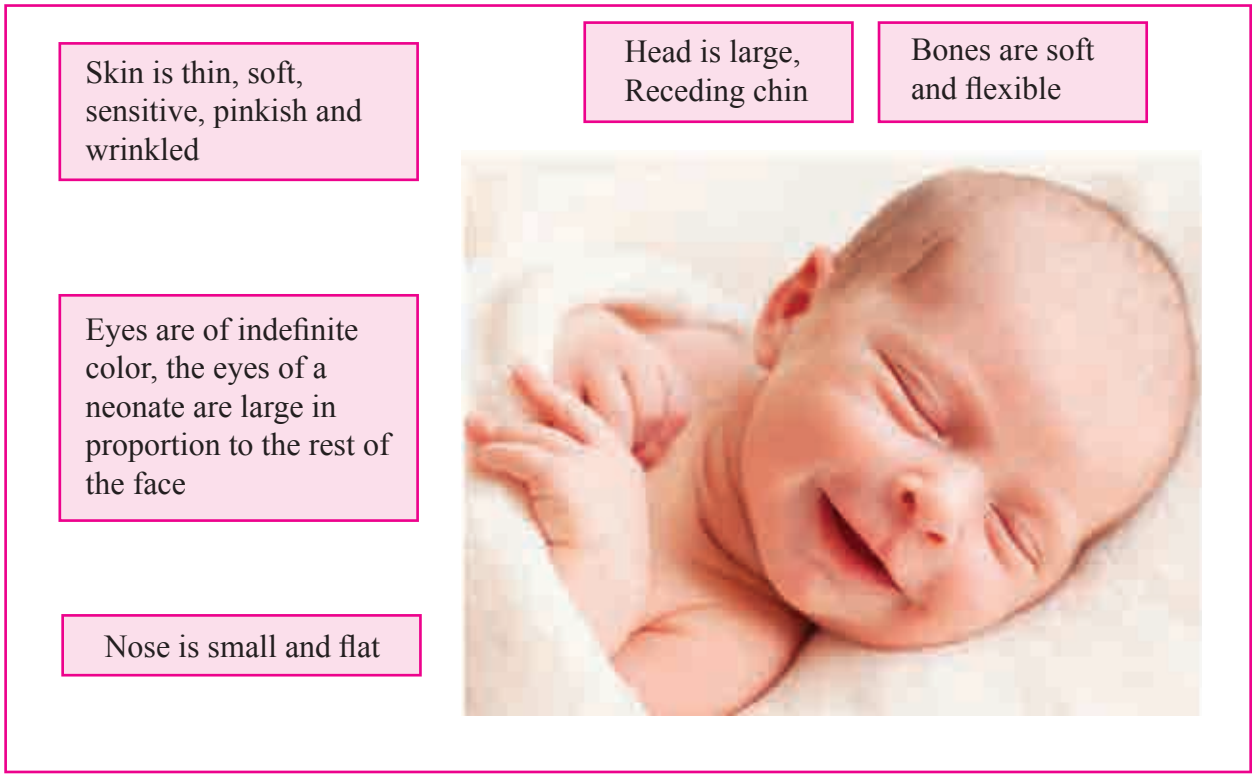


Fig 5.1 Physical appearance of a neonate

The skin of the neonate is wrinkled, thin, soft and sensitive with a pinkish cast. During the first few days neonates have prenatal hair which has not yet fallen off and hence they look very hairy. New babies are covered with a protective layer of vernix caseosa, an oily substance that protects them against infection. This dries off within the first few days after birth.

The muscles of the neonate are soft, small and uncontrolled. At the time of birth the muscles of the neck and legs are less developed than the muscles of the hand and arms. The bones are soft and flexible due to the high percentage of cartilage present in them. The flesh is also elastic.

Neonates have a large head with a receding chin. At birth, many regions of the newborn's skull have not yet been transformed to bone, leaving "soft spots" known as fontanelles. These bones will fuse together in a natural process and form the skull. During labour and birth, skull of the foetus changes shape to fit through the birth canal, sometimes causing a misshapen or elongated head which will usually return to normal on its own within a few days or weeks. The eyes of newborns are of an indefinite colour which gradually changes to a permanent colour. The eyes of a neonate are large in proportion to the rest of the face and the nose is flat and small. The teeth and jaw are undeveloped.

Can you tell?

- What is vernix caseosa?
- What do you mean by soft spots?

Body Proportion of a neonate :

All Neonates are different in size and weight. At first glance, all babies seem to look alike but there are significant differences among them. Head of the neonate covers 1/4th proportion of the total body length. The head circumference of the neonate is almost eqa l to that of his/her chest.The shoulders are narrow whereas the abdomen is large and bulging. As compared to the head, arms and legs of a newborn are small. The average height of an Indian neonate is 45cms to 50cms and weight is 2700gms to 3250gms. In the first few days neonates lose almost 10 percent of their body weight due to loss of fluid and adjustments to the surroundings.

Activity :

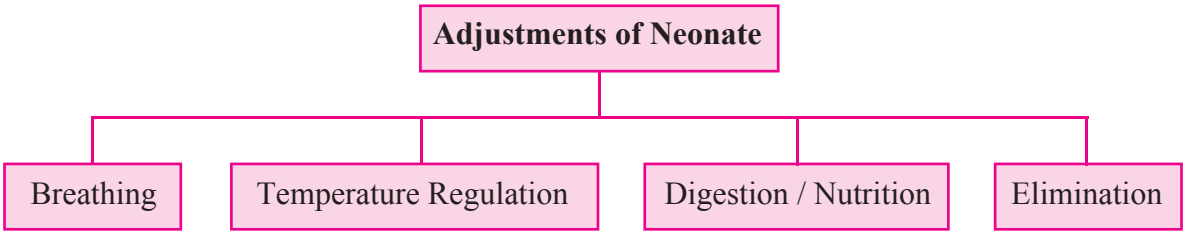
Observe and discuss the body proportion of a newborn in your family, one known to you in your surrounding

2 Adjustments of Neonate :

During the prenatal period, blood circulation, respiration, nourishment, elimination of waste and body temperature are regulated through the mother's body.Even though foetus and the mother have separate circulatory systems, the foetus's used blood is cleansed through the umbilical cord which carries the impure blood to the placenta and replaces it with the purified blood.The infant has to make four major adjustments after birth in order to live.

Do You Know?

A newborn can see mostly blurry shapes because they are near sighted. A baby can see things best from a distance of 8 to 12 inches. Their eyes are sensitive to bright light, so they are more likely to open their eyes in dim light



The new born has to make the adjustments given above. You will see more information related to this as shown below.

a) Breathing

The first adjustment that the neonate has to make is breathing. While in the womb, foetus gets oxygen through the umbilical cord which also carries away the carbon dioxide.

Even though the lungs develop during the prenatal period they are not used for breathing because the foetus is surrounded by the amniotic fluid.Therefore, the supply of oxygen to the foetus comes from the placenta through the umbilical cord. This cord is cut after birth and thereafter it becomes necessary for the neonates to start inhaling and exhaling air on its own. The first cry after birth usually helps in inflating the lungs thus enabling the infant to take the first breath. Initially newborn baby's breathing is very fast, i.e. nearly 30 to 40 times per minute as compared to adults breathing which is 18 times per minute. There is no regularity in inhaling and exhaling in a neonate during the first few days after birth. To regulate this, newborns respond through sneezing, yawning and hiccups.

Interesting fact

Newborns sneeze a lot, but not because they're cold or sick. It helps clear their nasal and respiratory passages of congestion and airborne particles. Sneezing also helps to reopen a temporarily closed nostril. When a mother nurses and her baby is pressed up against her, the baby's nose might get flattened or one nostril may be pushed shut. After feeding, the baby will take a breath or sneeze to open up his nose again.

b) Temperature Regulation :

The temperature in the mother's womb is around 100° F (38 Celsius). After birth, the neonate has to adjust to the temperatures of the environment. In India, temperature changes from state to state depending upon the weather conditions. This is the reason for wrapping the new born babies for protection and enable them to adjust to the changes in temperature.

c) Digestion / Nutrition :

The neonate is well equipped to make the change from passively receiving nourishment from the mother's blood through the umbilical cord to actively seeking food from the mouth. Hunger sensations are felt by the newborn which reflects through rooting (head turning), sucking and swallowing reflex to get the nourishment required for growth. Newborn babies instinctively suck the milk and their own gastrointestinal secretions help in digestion.

d) Elimination :

In the uterus, foetus relies on the umbilical cord to carry the foetal body waste away. After birth, in the first few days infant eliminates 'meconium', a sticky, greenish black waste matter formed in the foetal intestinal tract.

Do You Know?

- **Meconium** is harmless. Most babies can pass it while still in utero or during labour and have no problems.
- If the **meconium** is inhaled into the lungs (meconium aspiration syndrome or MAS), it has the potential to be **dangerous** or fatal to newborns.

Activity :

Can you name or tell?

- The different types of adjustments of the neonate?
- The sticky waste matter excreted by the neonate?
- The breathing rate of a newborn?
- The temperature within the uterus?

5.3 Reflexes :

Neonate reflexes are involuntary motor responses to specific stimuli. The neonate reflexes are not learned. They are closely connected to the physiological functioning of the brain. These primitive neonatal reflexes are present at birth. A few reflexes form the basis of complex motor skills which the neonate will develop in later life. The new born should show most of the essential reflexes at birth. Their absence is an indication of developmental hazards. This is because many early reflexes specify the ability of the infant to survive. Reflexes reveal the capability of the nervous system, thus if there is an indication of weak or absence of reflexes at birth, it may be a hint suggesting brain damage.

Remember !

An absent or weak reflex may be a side effect of birth trauma, medical condition and illness

Types of Reflexes :

a) Rooting Reflex :

In this reflex a newborn turns his/her mouth towards the nipple or finger that touches its cheek. The newborn baby responds by turning the head toward the source of the stimulus and opening the mouth.

Figure : 5.2 Rooting reflex

Do You Know?

Babies respond positively to the smell of the mother. Even more striking is the discovery that a blindfolded woman has the ability to identify her own child from a host of other babies by scent alone.

b) Sucking Reflex :

The sucking reflex combines with the rooting reflex. A slight stimulation to the infant's lips, cheeks or chin may result in the vigorous sucking movements. This permits feeding as the infant sucks milk from the nipple.

Figure: 5.3 Sucking Reflex

c) Babinski Reflex :

It involves the peculiar extension and fanning of the toes, when the sole of the foot of a new born is stimulated. This reflex disappears by eight to twelve months of age. This reflex is an indication of the neonate's responsiveness to the outer stimulus.

Figure: 5.4 Babinski Reflex

d) Moro Reflex :

This is a "startle" response to sudden changes in position or sudden loud noises. When the neonates are stimulated in this manner, they quickly fling their arms and legs to the side with their hands open, and their fingers spread. This reflex begins to decline in the third month and disappears by six months.

Figure : 5.5 Moro Reflex

e) Darwinian Reflex (Grasping reflex) :

This reflex is also known as "Palmar Grasp". It occurs when an object touches an infant's palm. This causes the infant to automatically grasp the object. This ability becomes more pronounced in the first few weeks of life, then gradually declines and vanishes after 3 to 4 months.

Figure : 5.6 Grasping Reflex/ Darwinian Reflex

Amazing act

The grasp of a newborn baby is so strong that its whole body can hang in midair, with its bent fingers supporting its weight

f) Tonic Neck Reflex :

This is also known as the 'Fencing' position. It involves coordination of the position of the head, arms and legs. While lying awake on the back, the neonate assumes the position with his head turned to one side. One arm is extended in front of the eyes on the side to which the head is turned and the other arm is flexed.This reflex appears at four months of age and may prepare the infant for voluntary reaching. This reflex of the neonate continues up to infancy.

Figure : 5.7 Tonic Neck reflex

Do You Know?

Tonic neck reflex is an Asymmetric reflex

It signals the proper development of the baby's hand-eye coordination.

Reflection / Darpan

(1) Ask your mother to show you a photograph of yourself as a neonate.

(2) Observe the photograph and see if you can find the description given as per the text.

(3) Find out from your mother if you had any adjustment problems during the first few week after birth. If yes, what were they?

5.4 Prematurity :

Have you heard of babies being born before time i.e. before nine months? What do you think were the causes? Have you seen or heard of problems the baby faced? Discuss these with your class mates.

For those of you who aren't aware, they are called premature infants.

Let us now understand what a premature birth is.

Prematurity is a birth that takes place more than three weeks or more before the estimated due date. In other words, a premature birth is one that occurs before the start of the 37th week of pregnancy.

Complications of prematurity vary greatly and are often accompanied by related medical problems. The earlier a baby is born, the higher the risk of complications.

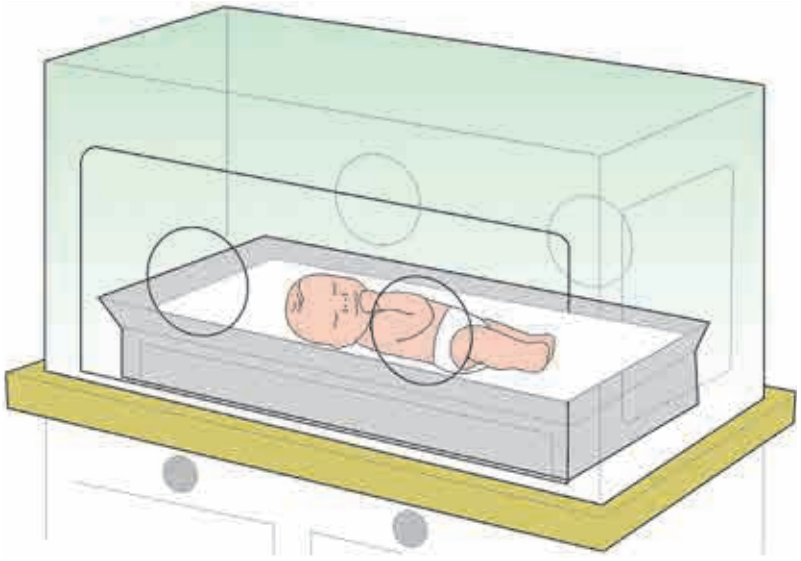
Depending on how early a baby is born, he or she may be:

Late preterm, born between 34 and 36 completed weeks of pregnancy.

Moderately preterm, born between 32 and 34 weeks of pregnancy.

Very preterm, born at less than 32 weeks of pregnancy.

Extremely preterm, born at or before 25 weeks of pregnancy.



A premature baby in an incubator

Prematurity is also determined by birth weight of the baby. If the birth weight of the baby is below 2.5 kg, such babies are generally kept in an incubator in order to maintain womb temperature i.e. 100^0F.

Do you know?

According to World Health Organization (WHO), every year about 15 million babies are born prematurely which is more than one in ten of all babies born globally

- **Some sig s and symptoms of prematurity include the following**

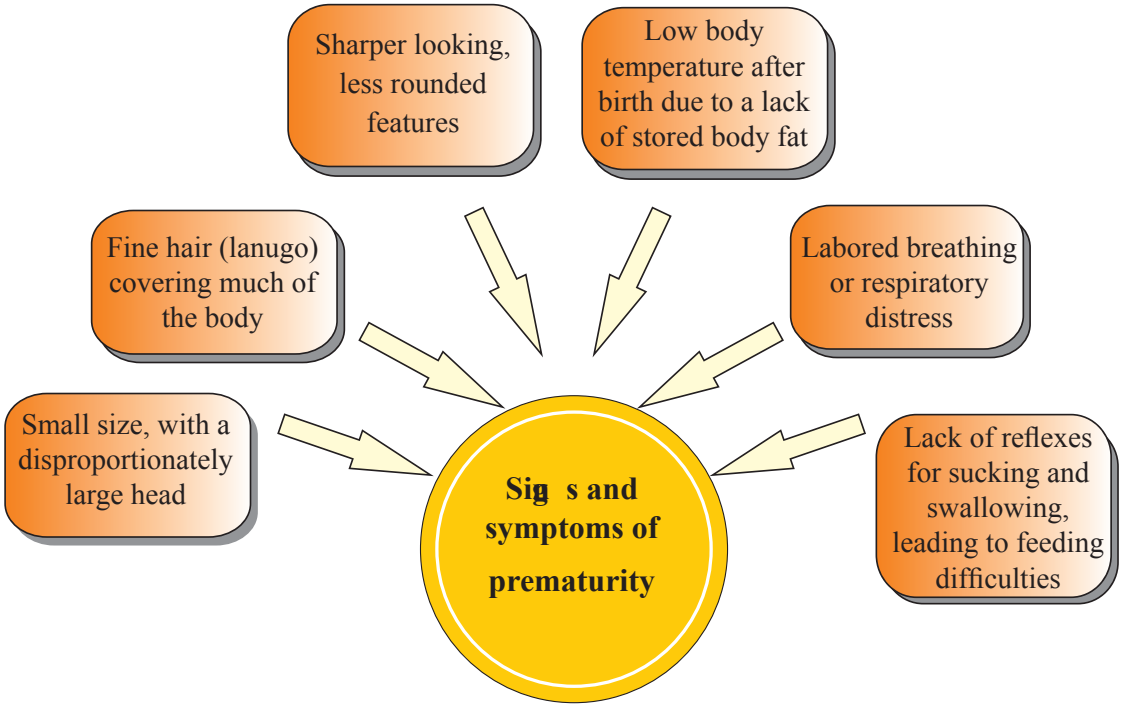


Fig 3 S ig s and symptoms of prematurity

Very often, the specific cause of premature birth may not be evident. However,t here are a few known causes :

- History of a previous premature birth
- Pregnancy with twins, triplets or other multiple pregnancy
- A gap of less than six months between pregnancies
- Problems with the uterus, cervix or placenta
- Smoking cigarettes or using narcotic drugs
- Some infections, particularly of the amniotic fluid and lower genital tract
- High blood pressure and diabetes
- Being underweight or overweight before pregnancy
- Stressful life events such as the death of a loved one or domestic violence
- Multiple miscarriages or abortions
- Physical injury or trauma

Interesting Fact :

Famous People Born Premature

Charles Darwin, Albert Einstein, Pablo Picasso, Stevie Wonder and Sir Winston Churchill were all premature births.

Being born too early can cause some health problems and increase the risk of complications. Let us see some problems that may be apparent at birth:

1 Breathing problems :

A premature baby may have trouble breathing due to an immature respiratory system.

2 Heart problems :

In infants there is an opening in the heart, which often closes on its own. If this does not happen and is left untreated it can lead to heart failure as well as other complications.

3 Brain problems :

The earlier a baby is born, the greater the risk of problems related to the brain.

4 Temperature control problems :

Premature babies can lose body heat rapidly. They do not have the fat insulation that a full-term infant has and are therefore unable to generate enough body heat. If body temperature dips too low in a premature baby, it can lead to breathing problems and low blood sugar levels.

Premature babies require additional heat from an incubator. This is so because the premature infant may use up all the energy gained from feeding to stay warm.

5 Other complications :

- **Gastro intenstinal problems :** Premature babies who receive only breast milk have a much lower risk of developing gastro intestinal problems.
- Premature babies are at risk of anemia and neonatal jaundice.
- Some premature babies may develop an abnormally low level of blood sugar (hypoglycemia). This can happen because premature infants typically have smaller stores of glucose than do full-term babies. Premature babies also have more difficulty converting their stored glucose into more-usable, active forms of glucose.
- Premature babies have an underdeveloped immune system. This can lead to a higher risk of infection.

Some complications resulting from premature birth can be solved. Yet there could be other health issues which may reqi re treatment.Some premature birth complications cannot be prevented. However, keeping them in a neonatal intensive care unit can save a lot of lives.

Activity :

Can you now ġ ve a reason?

Premature babies may have:

a) difficulty in regulating body temperature

b) low blood sugar

c) heart problems

d) infections

Remember :

A preterm baby might not meet growth or development milestones like a full term baby. This is normal. Preterm babies usually catch up to full-term babies developmentally by the age of two years.

Revise the points

Neonate

Physical appearance and body proportions

- Vernix caseosa
- Large head
- Fontanelles
- Soft bone
- Thin pinkish skin

Adjustment

- Breathing
- Temperature regulation
- Digestion / Nutrition
- Elimination

Reflexes

- Rooting
- Sucking
- Babinsky
- Moro
- Darwanian
- Tonic-neck

Prematurity

Sig s and symptoms	Causes	Complications
1) Small size	1) Maternal BP, Diabetes	1) Heart problem
2) Lanugo covering body	2) Multiple birth	2) Breathing problem
3) Less fat on the body	3) Physical or mental trauma	3) Low blood sugar
4) Low body temparature	4) Substance abuse	4) Low body temperature
5) Irregular breathing	5) Underweight / overweight	5) Poor immune system
6) Lack of reflexes	) Maternal infections	) Increased risk to brain

Exercises

Q. 1 Select and write the most appropriate word from the given alternatives.

1. Neonatal period is from birth to ..... days

   a) 0 day s *b) 2 day s*

   c) 1 day s

2. Neonate ..... weight soon after birth.

   a) gains *b) loses*

   c) balance

3. Bones of the neonate are soft and flexible due to the high percentage of ..... present in them.

   a) protein *b) vitamin*

   c) cartilage

4. Tonic Neck reflex is also known as the ..... position.

   a) Darwinian *b) Fencing*

   c) palmar

5. The temperature in the mother's womb is around ..... .

   a) 38 ^0F *b) 0 ^0F*

   c) 98 ^0F

6 Infants born between 34 and 36 completed weeks of pregnancy are called .....

   a) moderately preterm

   b) very preterm

   c) late pretermm

Q. 2 Match the column :

A		B	
1.	Neonate sucks fingers rhythmically	a)	Tonic neck reflex
2.	Head turns towards source of stimulation	b)	Moro reflex
3.	Newborn makes embracing motion	c)	Grasping reflex
4.	Toes fan out	d)	Sucking reflex
5.	Spontaneous grasp of adult's finger	e)	Rooting reflex
6.	Infant lies in a fencing position	f)	Babinski reflex
		g)	Stepping reflex

Q. 3 Write whether the following statement are right or wrong and rewrite the statement.

1. Newborn babies look good and cute.
2. Neonate has to make many adjustments immediately after birth.
3. Babies skin is usually wrinkled and soft.
4. Foetus breathes through its nose during prenatal period.
5. Premature infants are born at 40 weeks.

Q. 4. Give reasons

1. Reflexes reveal the capability of the nervous system.
2. New born baby's bones are soft
3. In the first few days neonates lose almost 10 percent of their body weight
4. New born babies are wrapped in cloth
5. Premature infants have difficulty in regulating body temperature.

Q. 5 Answer the following in one sentence.

1. What is the meaning of neonate?
2. What is reflex action?
3. What is the importance of birth cry?
4. What is meconium?

Q. 6. Explain the terms :

1. Temperature regulation
2. Vernix caseosa
3. Babinski reflex
4. Prematurity

Q. 7 Answer the following in brief

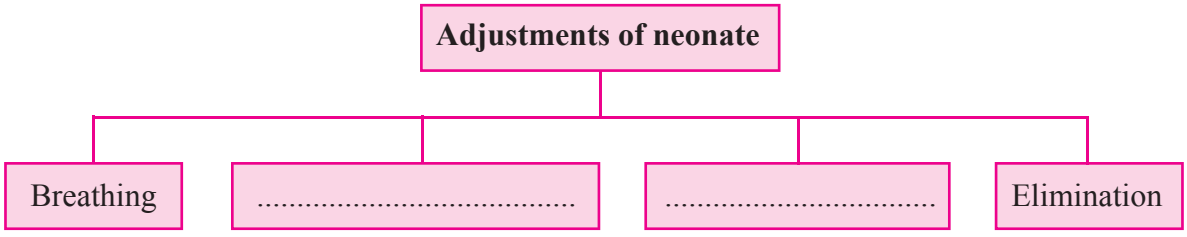
1. Physical appearance of a neonate.
2. Body proportions of a newborn.
3. List the signs and symptoms of prematurity.
4. Give the causes of prematurity.

Q. 8. Identify the following reflexes and describe in short.

.....

.....

Q. 9. a) Complete the following chart



b) Explain the importance of the first cry after birth.

c) What complications does a premature infant undergo?

Project / Self study

- **Make a chart on reflexes of a new born baby / care of neonate/ feeding practices.**

6. Infancy: Physical and Motor Development



The word Infancy is derived from the Latin word 'Infans'. 'In' means 'not' and 'fans' means 'to speak'. It means the child who is not able to speak is an infant. It is the foundation period during which behaviour patterns, attitudes and patterns of emotional expressions are established. The period of infancy spans from birth to two years. The initial period is characterized by helplessness and radical adjustment; and later by rapid growth and the beginning of socialization.

Infancy can be further divided into three periods :

Neonatal (Birth to 15 days), Infancy (15 days to 18 months), Toddler (18 months to 2 years)

Activity :

Match the Picture :

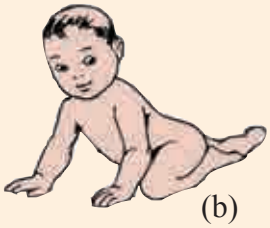
Infancy

(1) Neonatal Period (Birth to 15 days)

(2) Infancy (15 days to 18 months)

(3) Toddlerhood (18 months to 2 years)


(a)


(b)


(c)

Now let us see what are the developments that take place during this period.

6.1 Physical Development :

Physical development is the development of the body and its parts. Changes in the body size, brain development, body proportions, development of sensory capacities, functioning of various body systems are all part of physical development. It is essential to know how children develop physically. Physical development influences children's behaviour both directly and indirectly. It also provides them with the opportunities to explore the world around them. Physical development is an important indicator of health and wellness. Although physical growth follows similar pattern in all children, the rate of development differs from individual to individual. It is also different from one stage to another and is affected by genetic, environmental and circumstantial influences.

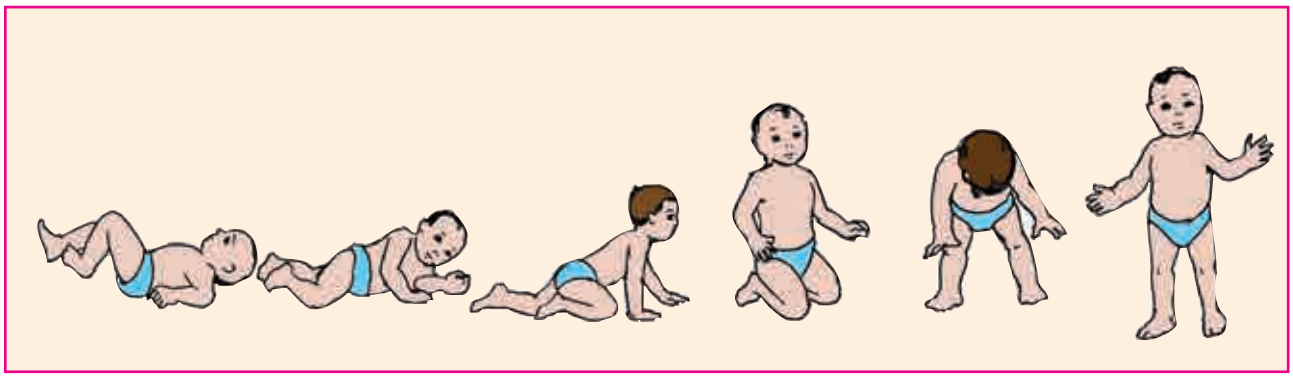


Fig 6.1 : Growth of an infant

Physical Development During Infancy :

During infancy physical development proceeds at a rapid rate than at any other time after birth. However, it slows down at the end of the first year. Although the pattern of growth and development remains the same in all children, there are variations in the aspects of physical development. The general pattern of physical development during infancy is given below:

a) Height :

- The infant's length and weight increases during the first year of life.
- The term length is used for the one-year-old infant because they cannot stand without support. After the completion of one year the term height is used.
- The length of a normal baby at birth is already one third of his/her adult height.
- By the end of the first year, the height of a typical infant is about 50 percent greater than that at birth.
- At two years, infants are about half as tall as they will be as adults.

b) Weight :

- In the first fifteen days of life, most newborn infants lose 150- 200 gms of weight as they are making adjustments to postnatal life.
- After that they grow rapidly and gain about 25-30 gms of weight per day for the first three months.
- At 4-5 months, an infants weight approximately doubles that at birth and at one year, average normal babies weigh three times their birth weight.
- At two years, the weight is 4 times that of the birth weight.
- During infancy boys are generally taller and heavier than girls.

Activity :

Compare the height, weight, body proportion (head circumference, shoulder, waist, length of legs) of young siblings / children (boys and girls) in your family.

Table 6.1 Weight and Height of Boys and Girls from Birth to 24 months according to WHO growth standards:

AGE	GIRLS		BOYS	
	Weight (kg)	Height (cm)	Weight (kg)	Height (cm)
Birth	3.2	49	3.3	50
6 months	7.3	6	7.9	8
1m onths	8.9	74	9.6	76
2m onths	11.5	8	12.2	8

c) Body Proportion :

- Children's body parts grow at different rates and their relative body proportions change as well.
- Changes in the body proportions of infants occurs in an orderly and predictable pattern following the laws of development as mentioned earlier-the cephalocaudal and the proximodistal laws of development.
- The head, chest and trunk grow fast, followed by the arms and legs and finally the hands and feet.
- However, there are variations in this pattern and that is why children become increasingly dissimilar in their appearance with each passing year.
- During infancy, the head of the infant is approximately one fourth the size of their body length. This is because the brain which is nearly the adult size has to be accomodated.
- The cranial region, the area over the eyes is proportionally larger than the rest of the head.
- The infants have a small chin and nose, tiny mouth, a short neck, large and bulging abdomen and narrow shoulders.
- In proportion to the body, their arms and legs are short.
- By the end of infancy period, head growth slows down, while the trunk and limb growth increases.
- The body proportions of boys and girls are similar during infancy.

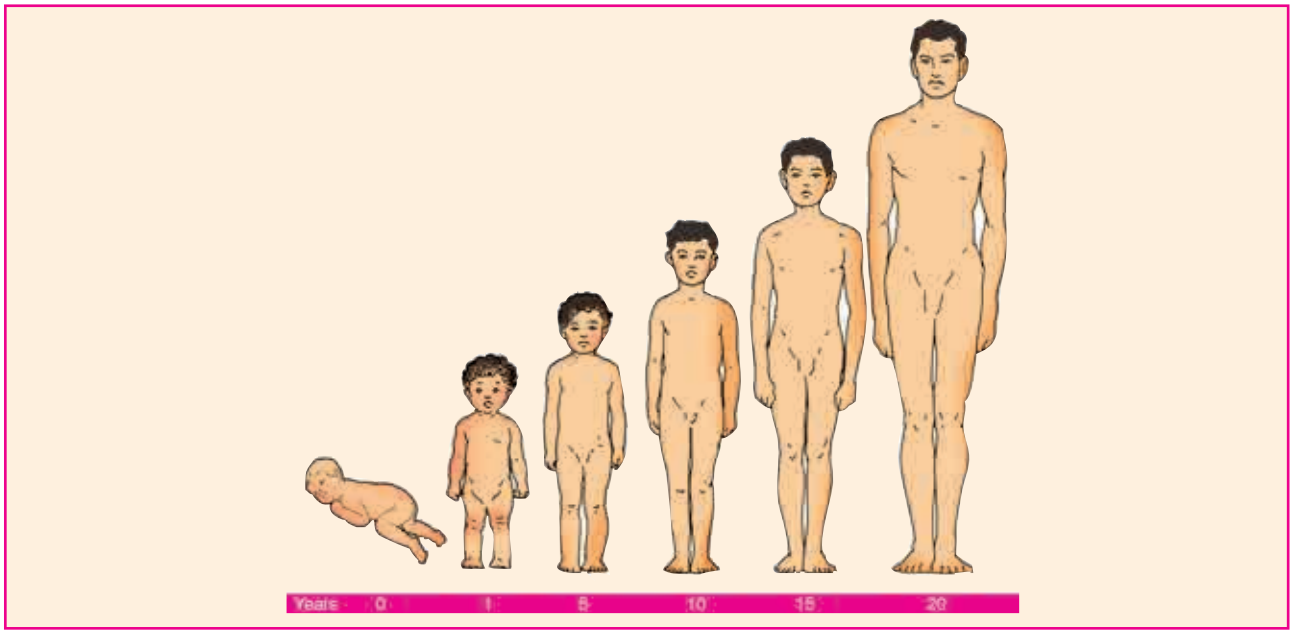


Fig6.2B ody Proportions form Infancy to Adulthood

Reflection / Darpan

(1) Take your own measurements.

(a) Height

(b) Weight

(c) Head Circumference

(2) Compare it with a six month old or one year old infant.

d) Muscle Development :

- An infant's muscle fibres are very undeveloped at birth. They have more of adipose tissue (fat fibre).
- Muscle development also follows the principles of development. Therefore, larger muscles develop before the finer muscles.
- At every age boys have slightly larger and stronger muscles than girls.

e) Skeletal Development :

- The best way of estimating a child's physical maturity is to use skeletal age.
- Skeletal development consists of growth in bone size, changes in the number of bones and changes in their composition.
- The human body gets definite shape and support due to the skeleton.
- The skeleton helps in protecting internal organs such as heart, lungs and brain. It also acts as a point of attachment for muscles.
- Skeletal development is the most rapid during the first year of life.

- At birth, an infant has about 300 bones that eventually fuse together to form the 206 bones found in the adult body.
- The infant's skeleton is mainly made up of **cartilag s**. This gives softness to the bones, which also increases the chances of the bones becoming misshapen.
- The process of hardening of the bones due to the deposition of calcium, minerals and phosphorus is called **Ossification** of bones.
- Ossification makes the bones stronger. This is a long and gradual process.
- Babies are born with spaces between cranial bones in the skull, which allows their head to mould during birth for easier delivery. These soft spots in the skull are called **Fontanelles**. These close by the age of 18 24 months.
    - Bone development occurs rapidly during the first year of life.
    - Skeletal growth of girls is considerably ahead of boys.

Do You Know?

- A **human** body has 206 bones of which :
- 26bo nes are in the **human** foot.
- **Human** hand, including the wrist, contains 54 bones.
- The femur or thighbone, is the longest and strongest bone of the **human** skeleton.
- The stapes in the middle ear, is the smallest and lightest bone of the human skeleton.

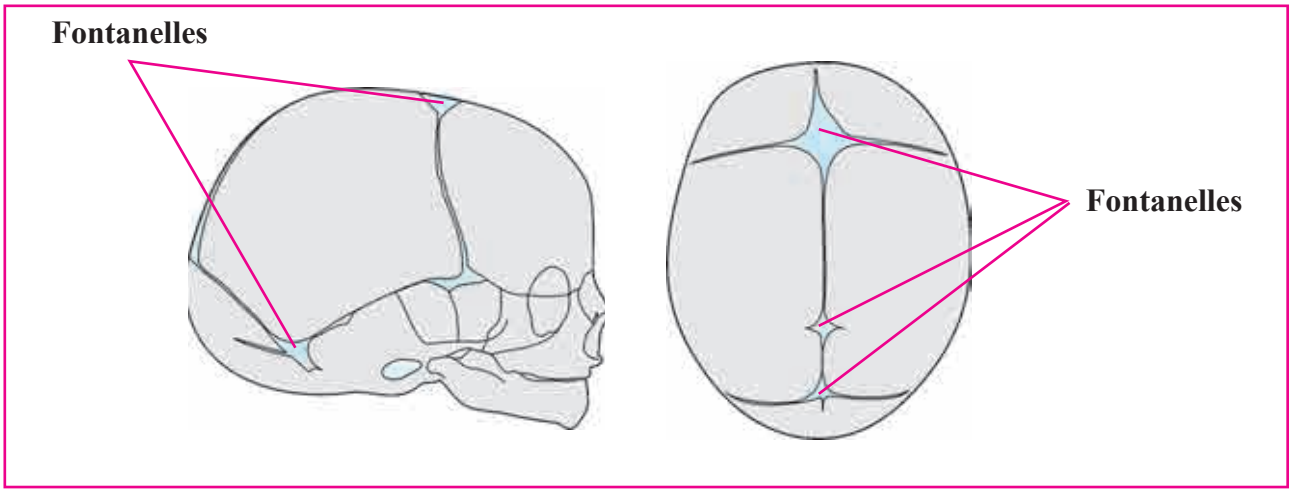


Fig6.3F ontanelles

f) Teeth Development :

- Development of teeth is a gradual process.
- Teeth begin to form in the sixth week of prenatal life.
- Eruption of first tooth usually happens during the sixth or seventh month after birth.
- The average baby has four to six teeth by the age of one year and sixteen teeth by the age of two years.
- All 20 milk teeth appear around two and a half years of age.

Do You Know?

- **Bones** are not as **strong** as **teeth**. Teeth are the hardest part of the human body. Teeth mostly consist of a calcified tissue called dentine. The **tooth's** dentine tissue is covered in enamel, which is the hard, shiny layer that you brush.

Table 6.2 Development of Teeth during Infancy

Age	Teeth
6 to 7 Months	1st tooth
1 Year	4 to 6 teeth
2 Year	16 teeth
2 and Half Year	20 teeth

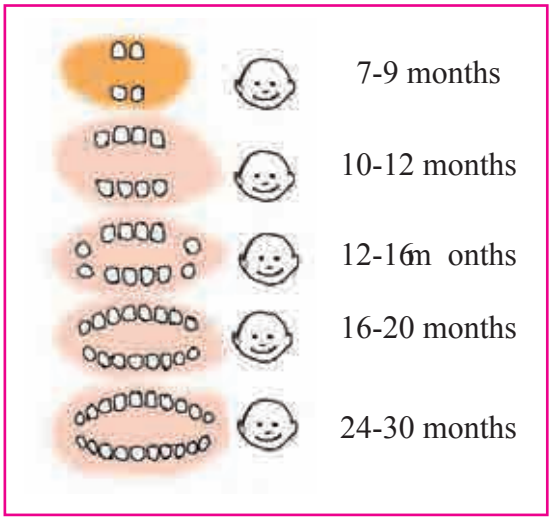


Fig6.4 Teeth Formation

Brain Development :

- Brain is one of the important part of the central nervous system.
- At the time of birth, the brain is about 25 percent of its adult weight.
- At the age of 3 months it is 40 percent, by 6 months it is 50 percent and by 2 years of age it is 75 percent of the adult size.
- All the motor and cognitive skills of an individual are influenced by the maturing nervous system which includes the brain, spinal cord and the nerves.

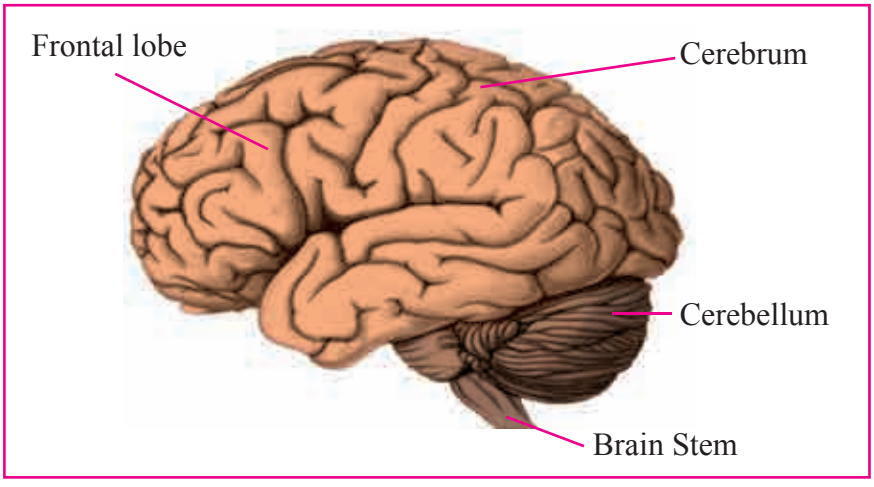


Fig6.5 Brain

- The nervous system is made up of two basic types of cells called the neurons and the glial cells.
- The human brain has 100 to 200 billion neurons or the nerve cells. These transmit and store information.
- Glial cells are the "glue" that hold the whole nervous system together providing structure and firmness to the brain. They also segregate the neurons.

- As the neurons are segregated, when an impulse passes from one neuron to another, it jumps across a tiny space. This is called a **synapse**.
- Formation of synapses is rapid during the first 2 years of life, especially in the auditory, visual and language areas.
- **Myelinization** is the process in which neurons become insulated by a fatty sheet of myelin which speeds up and improves the efficiency of message transfer.
- By the end of infancy, the anatomical features of the brain are reasonably well established.

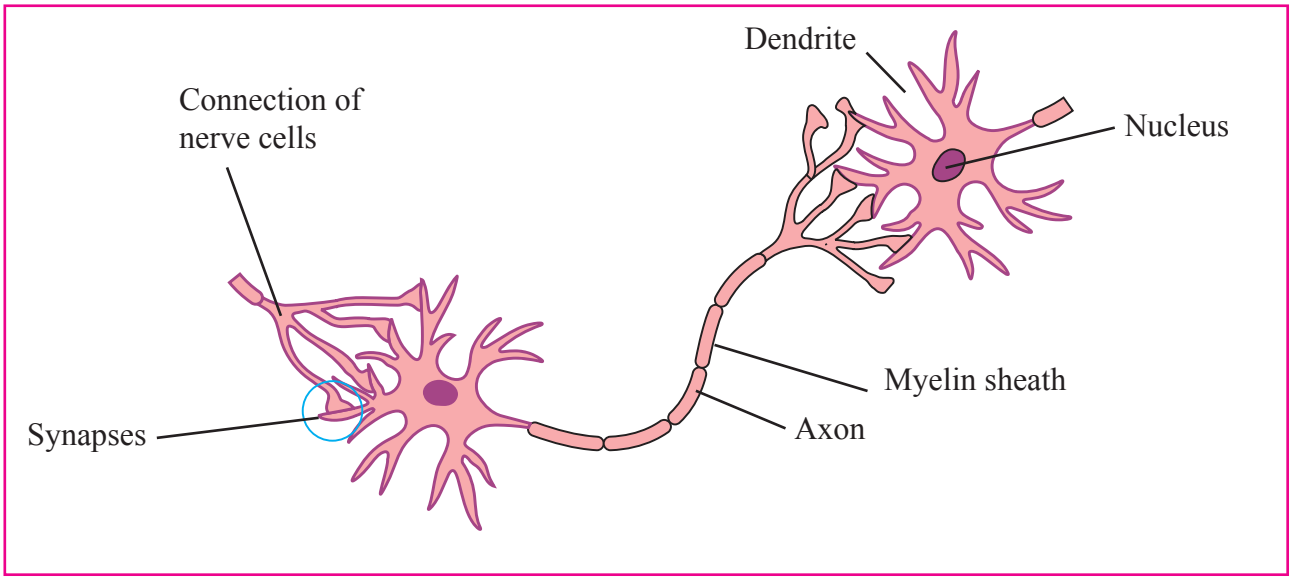


Fig6.6 Typical myelinated neuron

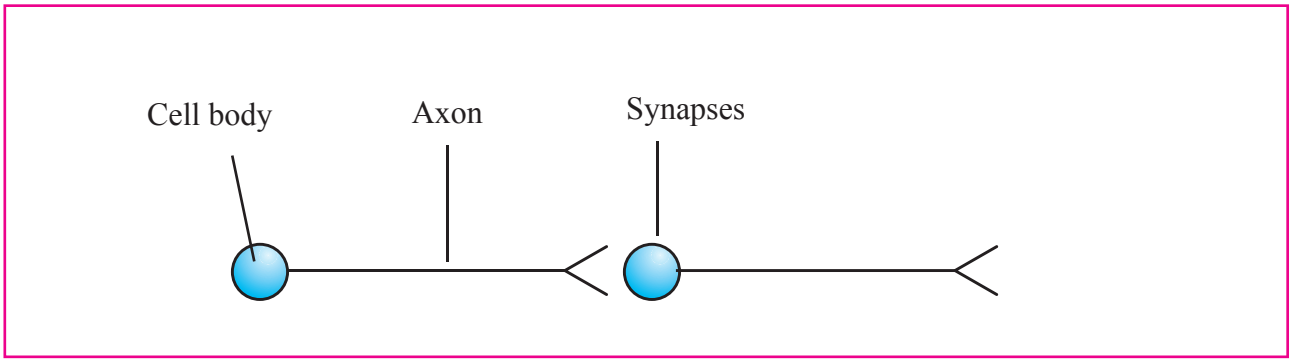


Fig6.7R epresentation of synapse

6.2 Motor Development :

Meaning

- Motor development means the development of control over bodily movements through the coordinated activity of the nerve centres, the nerves and the muscles. This control comes from the development of the reflexes and mass activity present at birth.
- For example, in the beginning a baby's body is in constant motion. Gradually this random and meaningless movement becomes more coordinated and organized and makes the control on muscles possible.

Importance :

- Motor development depends on neural and muscular maturation.
- Motor development allows the child to explore and understand the environment.
- It helps children to become self sufficient and independent.
- As speech is a motor mental activity, motor development is also essential for speech.

Definition :

- Motor development is the study of change in motor behaviour as influenced by biological and environmental factors (Gabbord,2008)
- According to Hurlock, controlling body movements by coordination between muscles and nerves means motor development.

Motor Development During Infancy :

- Infants and children show remarkable and rapid progress in their motor development.
- By the end of the first year most infants are able to crawl, sit up, stand up and many are taking their first steps.
- They also develop eye-hand coordination that allows them to explore and manipulate objects.
- By 15 months of age, children become proficient at walking and running.
- New research suggests that infants use a variety of different grips according to the size and shape of the object, indicating that the infant's motor abilities are highly flexible and able to adapt to the demands of the situation.
- Motor development follows the cephalocaudal and proximodistal laws of development.

Sequence of Motor Development

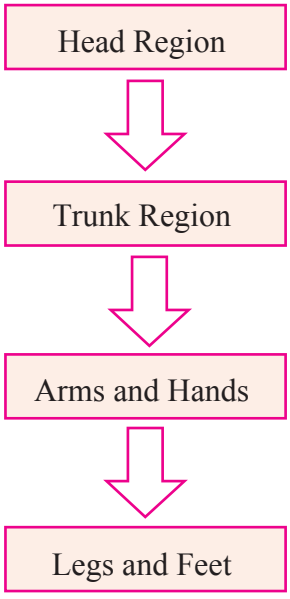


Table 6.4 Sequence of Motor Development during Infancy:

Average age	Motor Development
6 weeks	When held upright, holds head erect and steady
2 months	When baby is lying on the stomach he / she lifts self by arms, rolls from side to back
3 months and 3 weeks	Grasps cube
4.5 months	Rolls from back to side
7 months	Sits alone, crawls
8 months	Pulls to stand
9 months 3 weeks	Claps
11 months	Stands alone
11 months 3 weeks	Walks alone, builds tower of 2 cubes
14 months	Scribbles vigorously
16 months	Walks upstairs with help
23 months and 2 weeks	Jumps in place
24 months	Walks on tiptoe

Activity :

Refer to the table 6.4 given above and look at each age and the corresponding motor development. Identify the developmental sequence and write it down.

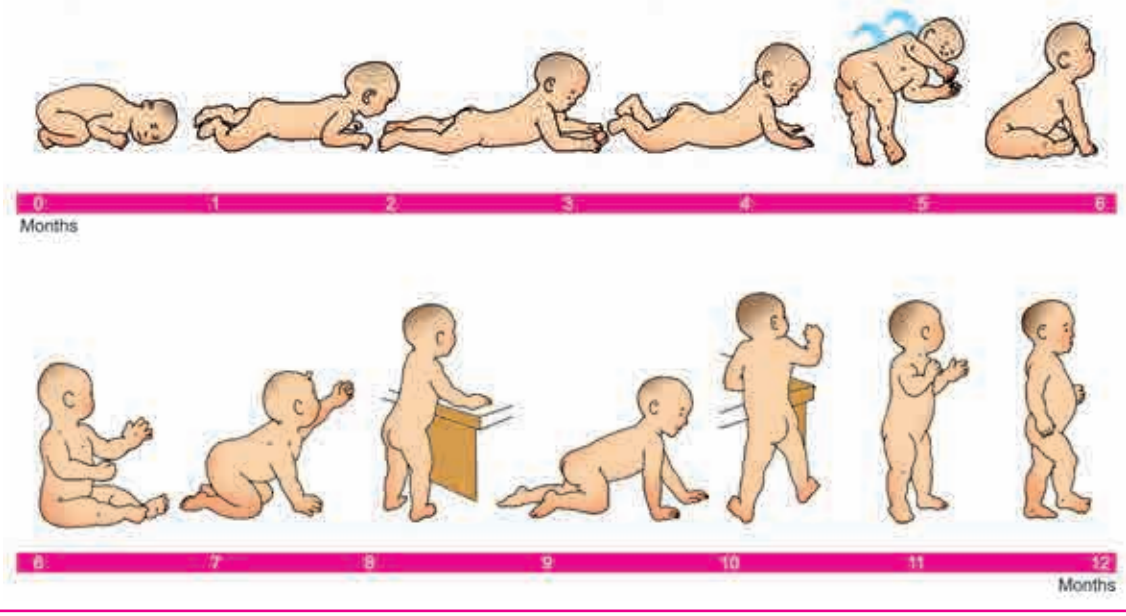


Fig 6.8 Chronological Progression of Gross Motor Development

Motor Skills :

- Motor skills are actions that involve the movement of muscles in the body. They are divided into gross and fine motor skills. These include all the hand and the leg skills.
- Gross motor skill is the ability to control and use large muscles of the body especially the arms, legs and back. Eg. Crawling, walking, running, jumping.
- Fine motor skills can be defined as small muscle movements that occur in fingers as well as eye-hand coordination. Eg. Zipping, unzipping, drawing, painting.
- Certain factors such as body size, readiness to learn particular skills, opportunities, motivation, feedback and practice influence the development of motor skills.

Activity :

Give a few examples of daily activity that can be categorised as fine and gross motor skills

Activity :

Complete the blanks with the words studied in the chapter.

ME — I N — AI — N	(Clue : Fatty sheet of neuron)
— S IFC — AI — O —	(Clue : Hardening of bones)
CR — I — LG — —	(Gives softness to the bones)
—Y— A—S —	(Passage of impulse)
C— PA — LC — U — — AL	(law of development)
— OT — AE — — L — E	(Soft spots in the skull)
NU — —N	(Nerve cell)

Activity :

Read the chapter and find the word :

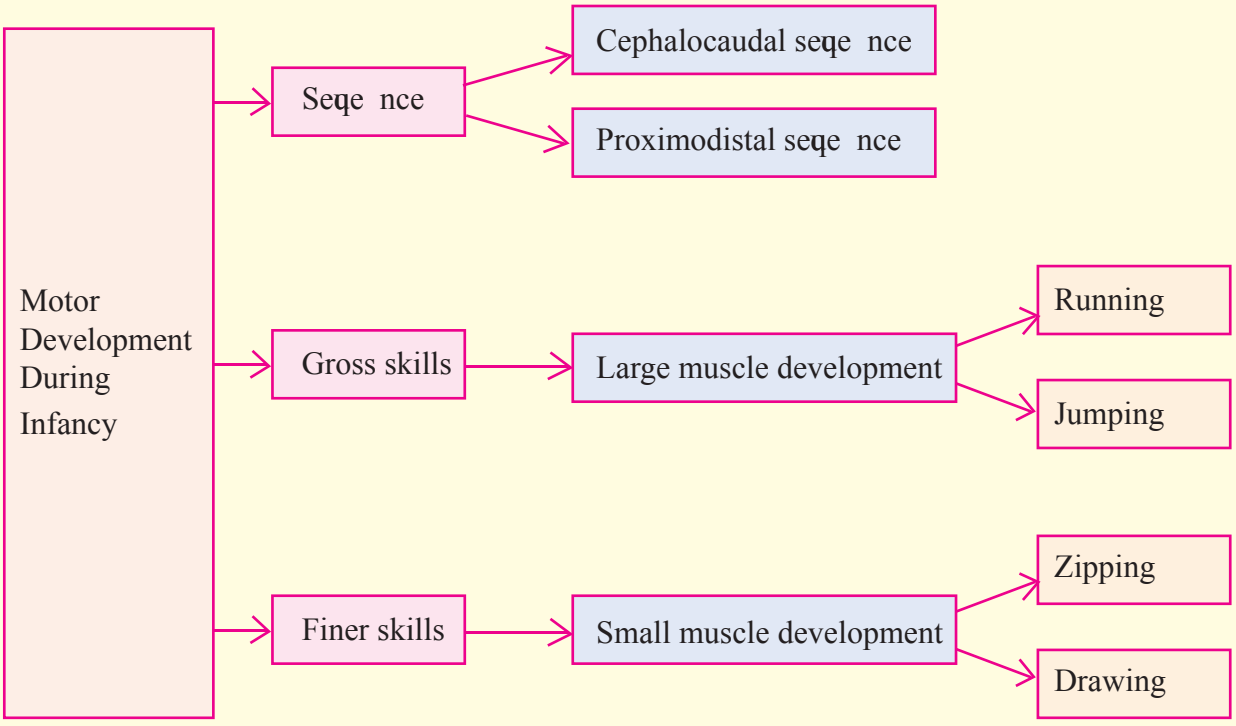
- An important indicator of health and wellness
- Measurement of head circumference, length of arms and legs
- Producing movement and maintaining position of parts of the body
- Change in number of bones, their length and composition
- Softness of the bones
- Hardening of bones
- Soft spots in skull
- Hardest part of the human body
- CEO (Chief executive officer) of the human body
- Transmits and stores information
- Holds the nervous system together
- An impulse passes across a tiny space
- Efficiency of message transfer

Revise the points

Physical Development during infancy

- **Height** → End of 2 years infants are half as tall as adults
- **Weight** → At 2 years infant is 4 times the birth weight
- **Body Proportions** → Head of infant approximately one fourth size of body length
- **Muscular Development** → Muscle fibre is undeveloped at infancy, there is more of fat fibre
- **Skeletal Development**
  - Made up of cartilage
  - Ossification of bones
  - Soft spot - fontanelle
- **Teeth Developement**
  - 2 years - 16 teeth
  - 2 1/2 years - 20 teeth
- **Brain Development**
  - 2 years - 75 % of adult size
  - Synapse
  - Myelination

Revise the points



Exercises

Q. 1. Select and write the most appropriate word from the given alternatives.

1. At the end of 2 years the weight of an infant is …….. times more than the birth weight.

   a) 2 *b) 4*
   c) 8

2. The head of an infant is …….. the size of their body length.

   a) 1/4 *b) 3/4*
   c) 2/3

3. The process of hardening of the bones is called ……..

   a) synapse *b) ossification*
   c) cartilage

4. An average infant has …….. teeth by the age of one year.

   a) 4 6 *b) 6*
   c) 0

5. The jump of a message across a tiny space from one neuron to another is called ……..

   a) myelination *b) synapse*
   c) ossification

6 …….. skills refer to the movements of the finger and eye-hand coordination.

   a) Fine motor *b) Gross motor*
   c) mental

Q. 2 Write whether the following statements are True or False.

1. The rate of physical development is rapid during infancy.
2. Skeletal development takes place very slowly in infancy.
3. The infant's skeleton is mainly made up of cartilage.
4. By the end of 2 years babies have 16 teeth.

Q. 3 Match the pairs.

A	B
1. Infancy	a. 20 temporary teeth
2. Two and half years	b. Drawing ,painting
3. 15 months of age	c. Age of radical adjustment
4. Gross motor skills	d. Can walk alone
5. Fine motor skills	e. Crawling, jumping
	f. Age of relaxation

Q. 4. Define the terms.

1. Synapse
2. Gross motor skills
3. Motor development
4. Glial cells
5. Physical development

Q. 5. By considering first correlation complete the second correlation

1. Neonatal period : Birth to 15 days : : Toddlerhood : _____
2. 6 to 7 months : 1st tooth : : 2 year : _____

Q. 6. Rearrange the sequence of motor development in serial order.

Arms and hands, Head region, Legs and feet, Trunk region

Q. 7 Fill in the boxes with the help of the given clue.

1. Process of hardening of the bones.

		s				c					n

2. The infant's skeleton is mainly made up of

c				i				e

3. Gap between two neuron

	Y			P		

Q. 8. Short Notes

1. Sequence of motor development
2. Teeth development
3. Skeletal development
4. Body proportions during infancy

Q. 9. Answer in detail.

1. What is Infancy? Explain the Physical development in infancy.
2. Explain motor development during infancy.

Project / Self Study

- Observe the Todlers in your residential area and measure their height, weight and teeth. Enter the data in a chart.

❖ ❖ ❖

7 Infancy - Cog itive and Lang ag Development:

Reflection / Darpan

Use your imagination and thinking and give unique uses of the following objects.

News paper	Pen	Dupatta

The answer that you came up with indicates your ability to preceive the object, think about it, use your knowledge and experience. This is your cognitive ability.

COGNITIVE DEVELOPMENT

Cognition is a general term that refers to the mental activities involved in acqi ring, retaining and using knowledge. It includes concepts such as learning, perception, memory and thinking. It is influenced by biological, environmental, experiential, social and motivational factors.

7.1 Meaning and Importance :

- Cognitive development refers to the growth and refinement of intellectual processes.
- It is concerned with the ways children acqi re, develop and use mental capacities such as problem solving, memory and language.
- Cognitive development refers to a gradual and orderly change by which mental processes become more complex and advanced.
- It helps children to adapt to the changing environmental conditions.
- It helps them to acquire important cognitive skills such as thinking, reasoning, observation, memorizing, problem solving.

7.2 Mental Processes involved in Cognitive Development :

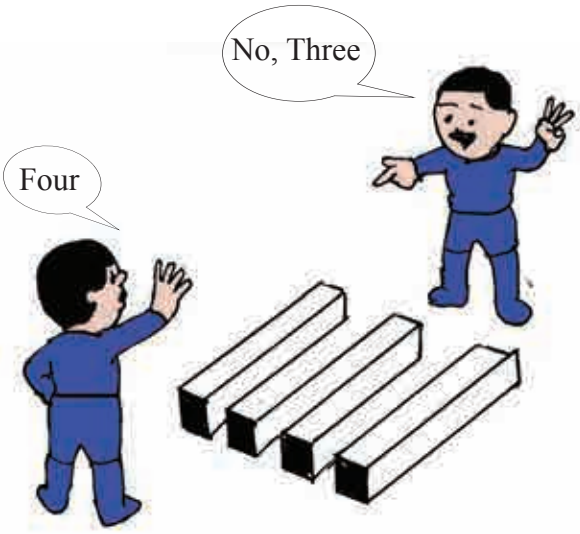
a) Perception :

Perception is the active process of interpreting information received from the senses. It means becoming aware of something through the five senses. It is our primary source of knowledge. Once a child gets information through his / her sensory organs it gets associated with prior information. The child then finds out the relationship between the two pieces of information. For example, when a child is fed a banana, he sees it, tastes it, smells it and feels it. With all these experiences he develops a perception of a banana i.e. a mental image of a banana.

Activity :

Observe the following picture and discuss what you see?

Fun Facts :



How many slabs do you see?

Visual Perception

What do you see ? An old woman or a young lady?

b) Thinking :

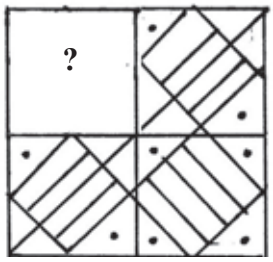
Thinking consists of mental rearrangement or manipulation of information and symbols stored in the memory. The symbols used in thinking are words and mental images using all five senses. Thinking takes place even in the absence of an object. It is an abstract process. For example : What will I wear to the wedding ?

c) Reasoning :

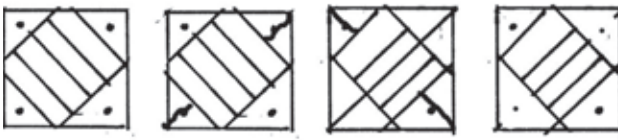
Reasoning is a method of solving a problem based on a set of rules. It consists of making new judgments on the basis of existing ones. It includes the ability to generalize and to make deductions. Reasoning also involves analysis of cause and effect relationship, goal directed thinking and drawing conclusion from other information. For example :

1. There are dark clouds in the sky - Observation
2. Dark clouds signify rain - Reasoning
3. It is therefore likely to rain - Deduction

Activity : Select the appropriate option.



Problem figure :



Answer figures

d) Memory :

Memory is the process of storing information that can be retrieved whenever required or needed. It is the retention of what is learnt over a period of time. There are three basic processes on which memory is built- acquisition, storage and retrieval. Acquisition is translating information into a form in which the brain can process. The facts are then placed in the memory. For example : observing an apple and observing that it is red (acquisition).

Storage is the retention of memorized material over a period of time. The information is stored under different headings, in different categories. Here the facts are retained in the memory. For example : Remembering that an apple is red (storage).

Retrieval is the process by which previously stored information is brought back for current use. Here the facts are recovered from storage. For example : Painting an apple red in colour as you remember (retrieval).

Activity : SPOT THE DIFFERENCES

Activity :

Lets try :

1) **Imagination :** Imagine a walk through the jungle. Write down the details that you visualized.

2) **Creativity :** Develop a new cartoon character.

e) Imagination :

Imagination is the act or power of forming a mental image of something not present in the immediate environment. It is the power of the mind to mould experiences into something new and unique. Imagination is generally considered to be the foundation for artistic impressions.

f) Curiosity :

Curiosity is the inborn desire or urge to 'find out'. It is therefore a base instinct. It is also termed as a motivational drive to seek information from the world around. This desire helps to explore experiment and discover. Curiosity is a brain function. It is characteristic trait in people.

Promoting / Encouraging

- Keep age- appropriate toys and books
- Let baby feel the toys, work on grasping the bright toys
- Let them listen to a story, song or soothing music
- Let the baby play with common household objects
- Provide stimulation for sensory developement

Fig. 7.1 Curiosity

g) Creativity :

Creativity is a mental process involving the generation of new ideas or new associations. It is a product of experience, sensitivity, spontaneity and originality. To create something innovative, 'out of the box' thinking is essential.

h) Attention Span :

Attention is the process of selecting a stimulus from the environment that is going to be perceived. Therefore, attention span is the duration of time in which a child focuses and concentrates his attention on a given activity. Attention span is necessary for an individual to be able to learn new things. Children are usually able to maintain longer attention span when performing activities that match their abilities and interests.

Activity :

Put the story in the correct sequence

1.	Mommy bird sees a stick.	2.	Mommy bird feeds the babies.
3.	Mommy bird builds a nest.	4.	Mommy bird sits on the eggs.
5.	Mommy bird sees a tree.	6.	Mommy bird sees a worm.
7.	The eggs hatch.	8	It is spring!

Now that definitely caught your attention isn't it?

i) Concept Formation :

A concept is an abstract idea or notion, which combines elements of an object or event into an idea. Eg. The concept of a circus includes a joker, a juggler, acrobats, animals and tent. Concept formation is the integration of varied images resulting from different sensory experiences.

7.3 Cognitive Development during Infancy and Toddlerhood :

- Swiss psychologist Jean Piaget has studied cognition in depth and developed a theory of cognitive development.
- According to him cognitive development proceeds through a set of stages from infancy to adolescence.
- The first stage, which lasts from 0-2 years is called the Sensorimotor stage.
- During the Sensorimotor stage, children use the abilities and skills that they are born with to understand and explore their environment.
- They explore and gain experience and knowledge through their senses and motor activities.
- **Schema :** Schemas are the basic building blocks of intelligent behaviour- a way of organizing knowledge and gathering information. They are like 'index cards' in the brain like the ones in a filing cabinet that tell an individual how to perceive the stimulus or information.

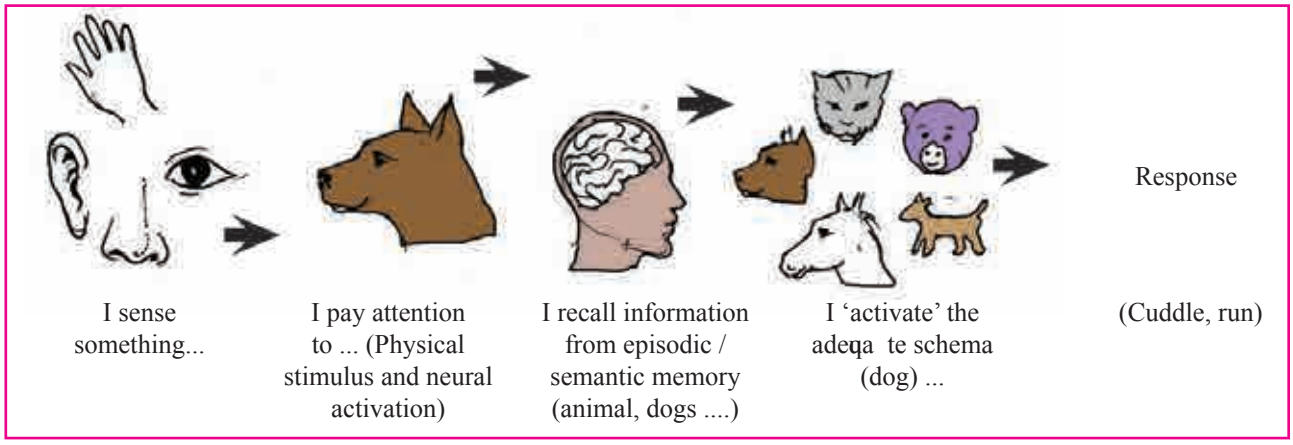


Fig. 7.2 Schema Theory

- **Object Permanance :** The major development during this stage is the development of the concept of object permanance. It is the ability to understand that objects and events continue to exist even when they cannot be seen or heard.

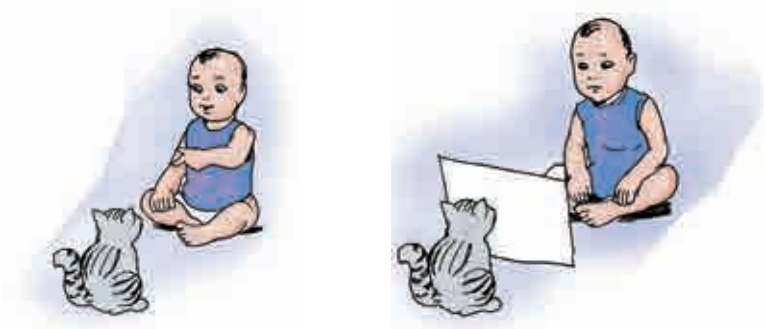


Fig. 7.3 Object Permanance

- There is an astonishing amount of development in the understanding of the children in the short span of two years. **The sensorimotor stage** is subdivided into six substages. Each substage is characterized by the development of certain new skills that enhances the child's understanding of the environment.
- The six substages are as follows :

Table : 7.1 Sensorimotor stage

Stages	Age	Example
Stage I	0-1 month 	Child understands the environment through inborn reflexes. eg. sucking, rooting
Stage II	1-4 months 	Child learns to coordinate sensations and new schemas. eg. child sucks his/her thumb by accident and then later intentionally repeats the action as it is pleasurable.
Stage III	4-8 months 	The child becomes more focused on the world and begins to intentionally repeat an action in order to trigger a response. Eg. A child purposefully shakes the rattle to make a sound.
Stage IV	8 12 months 	Child starts showing clear intentional actions. Eg. The child crawls to reach the toy.
Stage V	12-18 months 	Child begins trial-and-error experimentation. Eg. Child may try different ways of removing the ball from under the sofa.
Stage VI	18-24 months 	Child begins to develop symbols to represent events or objects in the world. Eg. Child uses the word "mumum" for food.

Do You Know?

- According to sociocultural theorist Lev Vygotsky, the way adults demonstrate the process of solving a problem helps children learn to think. Children's cognitive development is shaped by their interactions with their parents, peers and other members of the society. It is also influenced by cultural factors.

7.4 Infant Stimulation :

- Infants are active seekers of stimulation.
- They need people, sound and physical contact to stimulate their cognitive development and to give them a feeling of security in their world.
- Infant stimulation includes activities that can arouse or stimulate the infant's sense of sight, sound, touch, taste and smell.
- Infant stimulation is very important as it plays a crucial role in the development of their brain.
- In the first three years of life, the brain is busy building its wiring system. Recent researches in brain reported that the infant's environment has a dramatic effect on its brain building and healthy development. It is this early stage of brain development that results in how, and how well, one thinks and learns both as a child and as an adult. The amount of stimulation an infant recieves directly affects the brain development.
- Infant stimulation can also improve curiosity, attention span, memory and perception. In addition, infants who are stimulated reach developmental milestones earlier, have better muscle coordination and a more secure self image.

Early Intervention:

Early intervention means identifying and providing effective support and services early, not only to children who are at risk (having challenges in the physical, mental, emotional and social aspects) of poor outcomes but also to their families. Early intervention will help promote in the child age- appropriate growth and developement and lend support to families during the critical early years.

The purpose of early intervention is to identify any delay in development thus preventing disability. Prevention at the primary level is where we attempt to prevent the occurrence of any anomaly and at the secondary level we aim to minimize the magnitude of the anomaly.

The objective of early intervention is to ensure improved normal functioning. Only when we know and understand what is normal we would be able to recognize the delay in development.

Neurons that fire together, wire together. Children with developmental dalays often experience the wiring of neurons together in a manner that is "unhelpful", causing them to strugggle with communication, social skills and other activities. Intervention therefore is best during early years when there are 50 percent more connections between neurons than exists in an adult brain. Keeping this in view as parents / caregivers it is our responsibility to ensure that we provide a rich and stimulating our environment for infants. Let us now see what are the various types of stimulation.

Types of Infant Stimulation :

Infant stimulation is of five types which covers five major areas as shown below :

Vision / Visual Stimulation	Hearing /Auditory Stimulation	Touch/Tactile Stimulation	Taste	Smell / Olfactory Stimulation

1 Visual Stimulation :

The development of sight is a complicated process and an infant has to learn to see. The infant needs to be stimulated from the time of its birth with numerous visual activities for visual stimulation:

Activities for Visual Stimulation :

Many activities can be given for visual stimulation. A few activities are mentioned below:

- Hanging mobiles within the infant's range of vision
- Provide colourful and a wide variety of toys and eqi pments to play
- Use picture books, pictures, colourful charts and such other visual materials etc.

2. Auditory Stimulation :

Auditory perception is the ability to understand and relate auditory impressions. It is the ability to be able to connect what one hears with previous auditory experiences. This ability develops slowly. The newborn infant can take in auditory impressions but cannot use them as it does not understand what these impressions mean. He/she is able to interpret the auditory signals when the central nervous system is more developed.

Activities for auditory stimulation :

Many activities can be given for auditory stimulation. A few are mentioned below :

- Use toys that make sound
- Conscious use of human voice
- Expose the child to various sounds of instruments, animal sounds and various other sounds to develop auditory perception.
- Encourage cooing, babbling and speech formation.

3. Touch/Tactile Stimulation :

Touch is critical to develop different types of sensory experiences. Touch helps the infants to know they are loved and is a source of comfort. Infants actively touch and explore objects. This is one way in which they learn about the world around them. Infants need gentle touching, holding and eye contact just as they need food to grow and develop. Research has proved that nurturing touch actually help infants to gain weight and develop healthy relationship with caregivers. Holding and stroking an infant stimulates the brain to release important hormones necessary for growth.

Activities for Tactile Stimulation :

- Oil massage for babies
- Gentle stroking
- Soft and smooth textured clothing, blankets and soft toys.
- Experience of lukewarm, slightly hot and cold water
- Gently stroking the infant's hair.

4 Taste :

Facial expressions reveal that newborn can distinguish several basic tastes. They relax their facial muscles in response to a sweet taste, turn their lips outwards when the taste is sour and pull their mouth downwards when it is bitter.

Activity :

Refer the types of stimulation and Collect pictures of the same

Make a chart and display the same in your classroom

Activities for stimulation of taste :

1) Introduce the taste of different foods such as:

- Sweet : jaggery, honey, ripe mango, ripe banana
- Sour : lemon, tamarind
- Citrus/ Tangy : orange, sweet lime, pineapple
- Salty : cheesed, wafers, salt
- Bitter : bitter gourd ('karela')

2) Infants should be introduced to different fruits, fruit and vegetable juices and soft cooked foods and vegetables. Avoid strong tastes such as onion, garlic

5. Smell / Olfactory Stimulation :

The sense of smell is well developed among young infants. They can identify their mother on the basis of her distinct smell. They react to the smells of certain foods in the same way as adults. They can identify the direction from which they sense an odour and also turn away from it if unpleasant.

Activities for stimulation of the sense of smell :

- Introduce the smell of various foods
- Smells of various flowers
- Soaps with mild fragrance

Activity :

Team Triathlon

Find what each of the following word has in common. (Clue : Each group has a common prefix or suffix)

Group I	Group II	Group III
Food	**Picture**	**Appear**
Cars	**Door**	**Allow**
Friends	**Car**	**Connect**

7.5 Language Development : Meaning, Importance and Functions

Meaning and importance :

Language is a means of communication. Children express their thoughts, feelings and ideas by using their verbal and non verbal skills. Language is a complex phenomenon associated with auditory and vocal communication of thoughts, emotions and ideas. It includes different forms of communication such as listening, reading, writing, speaking, sign language, facial expressions, gestures and mime.

The study of language can provide a window into cognitive and socio-emotional development. Parents and other adults play a critical role as facilitators of a child's language acquisition.Speech is a form of language in which articulate sounds and words are used to convey meaning. It is a motor-mental activity.

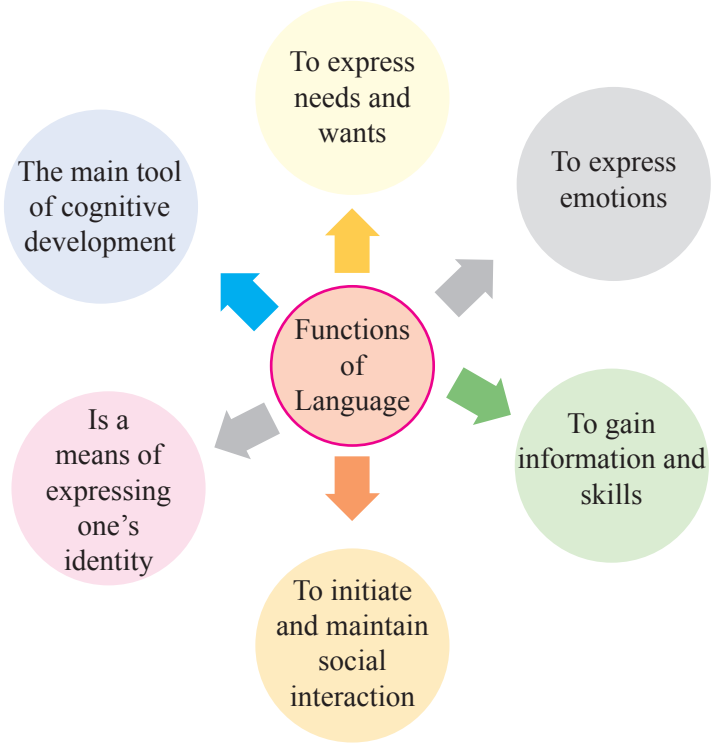


Fig 7.4 Functions of Language

Is language and communication the same? No! There is a difference between the two.

7.6 Communication and Prespeech forms

Communication means an interchange of thoughts and feelings. This can be in any form of language- verbal, non verbal, gestures, emotional expressions or written.

Recap :

- What is language?
- What is communication?

- To communicate effectively children must use a form of language that is meaningful to others. For example, pointing to an object that they want.
- They must understand the language used by others. For example, when an adult is shaking her head and saying 'no', the child must realize that he/she is being told not to do something

So, what are the abilities that an individual must have for effective language development? An individual must have the following two abilities :

i) Comprehension :

It is the ability to understand what others are trying to communicate. The ability to comprehend will not only depend upon the intellectual ability of the infant but also upon the stimulation and encouragement recieved from the environment.

ii) Communication :

It is our own ability to make others understand what we want to say. An infant is able to understand what others are saying much before he/she is able to put his/ her ideas and feelings into words.

Words need to be reinforced with gestures such as pointing out to objects until the age of 18 months in order to enhance comprehension and communication.

Learning to speak is a long and difficult task. The infant is not mature enough to perform these tasks in the first year of life. So children use other forms of communication. These are known as the pre-speech forms of communication.

Let us now understand the prespeech forms of communication.

Pre Speech Forms :

Before infants say their first words, they use substitute forms of communication in order to make their needs and wants known. These are known as "pre-speech forms of communication".The infant is not mature enough to speak in the first year of life. The child's early production of sound - the pre-speech forms of communication- follow an orderly sequence, beginning with crying, followed by cooing, babbling, gestures and facial expressions. All these patterns of speech end by the first year. The five pre-speech forms of communication are :

Crying	Cooing	Babbling	Gestures	Facial Expressions

1. Crying :

- It begins at birth. It is the first way in which the infant is able to communicate with the external world.
- It is a reflexive vocalization when the infant is in discomfort such as hunger, pain, fatigue and other such unpleasant states.
- It also satisfies the infant's need for attention.
- It is possible to indicate what the cry signifies by the third or fourth week of life from the tone, pitch or intensity. Example, a loud shrill cry indicates pain; a loud cry with sucking movement indicates hunger.

2 Cooing

- Cooing involves vowels sounds especially 'uu' which start at the end of the first month.
- In addition to crying, babies make a simple sound of cooing.
- At around two months, infants make sounds expressing pleasure and contentment.
- Many of the cooing sounds disappear but some develop into babbling.

3. Babbling :

- Babbling includes a broad range of vowels and consonants and a variety of stress and intonation patterns.
- At the end of 3 months, infants begin to utter vowel- consonant combinations such as ba, da, ma. This is known as babbling.
- The expansion of babbled sounds results from the maturation of the vocal structures and from hearing language in the environment.
- At 6 months, the intonations are repeated by stringing them together such as 'ma-ma-ma-ma, or da, da, da, da. Infants produce these repetitively.
- Due to a growing ability to control the flow of air over the vocal cords, the infant can produce sounds at will.
- When the infants are stimulated to reproduce the sound, they can pronounce one word out of babbling like 'Baba', 'Dada'.

Babbling has long term values:

a) It is a verbal practice that lays foundation for speech.

b) It encourages the desire to communicate with others.

c) It helps infants feel that they are a part of the social group.

Interesting information !!

a) All infants whether deaf or with normal hearing babble.

b) Infants need to move their tongues to distinguish between sounds.

c) Psychologists and audiologists found that the use of a pacifier prevented 6 months old infants from moving their tongue. Thus they were not able to distinguish between sounds. Keeping the pacifier in the mouth hinders speech production and speech perception.

4. Gestures :

- They are the movements of the body, arms and limbs. They serve as a substitute to supplement speech. They take the place of words. They emphasize the meaning of a spoken word.
- Infants uses gestures to point out to an object which they want. e.g. When parents ask the child, "Do you want a banana?", the child replies by nodding his/her head.
- Some of the common gestures during infancy are pushing objects away, reaching out to a person, smiling and holding out arms.
- Children continue to use gestures to make their incomplete sentences meaningful until they build up a large enough vocublary to express their wants and needs. As speech improves, the need for gestures decreases.

5. Emotional expression :

- Infants express their emotions through facial expression and bodily movements.
- Infants express emotions such as fear, anger, joy, love, rejection through facial expressions and gestures.
- The pleasant emotions are accompanied by cooing and chuckling sounds; while unpleasant emotions are accompanied by whimpering and crying.
- As child grow older they learn to express emotions in a socially acceptable way.

How do Children Develop Language?

There are different theories on how children develop language. Given below are a few theories that tell us how children acquire language:

i) Behaviourist B.F. Skinner proposed that imitation and reinforcement contributes to language development. i.e. through ***operant conditioning***. The infants repeat behaviors when they get positive reinforcement such as smiles, hugs and verbal response from the parents/ caregiver.

ii) Linguist Naom Chomsky proposed that young children's language skills are etched into the structure of the human brain. He believed that all children are born with a ***language acquisition device (LAD)*** which is an innate system that contains a set of rules common to all languages. It permits children to understand and speak in rule-oriented fashion(grammatically correct manner) as soon as they pick up enough words.

7.7 Language Development in Infancy :

Table : 7.2 Language Development in Infancy

Approximate Age	Milestones
2 months	Infants coo,making pleasant vowel sounds
3 months	Make cooing sounds Quieten or smile when spoken Seem to recognize caregivers or significant adult's voice Cry differently for different needs
4 months	Infants babble, adding consonants to their cooing sounds and repeating syllables
6 months	Make gurgling sound while playing or when left alone Babble and make a variety of sounds Use voice to express pleasure or displeasure Move eyes in the direction of the sound Respond to changes in adult's tone of voice Notice that some toys make sound and respond Pay attention to music
7 months	Babbling starts to include many sounds of mature spoken languages Infants and parents establish joint attention, parents often label what the child is looking at Interaction between parents and babies includes games such as pat-a-cake and peek -a- boo.
8-12 months	Infants start using preverbal gestures, such as showing and pointing to influence the behaviour of others Word comprehension appears first Infants actively participate in games such as peek-a - boo and pat-a-cake

12 months	Toddlers say their first recognizable words--**holophrase** **Holophrasic speech** is a form of speech where single words convey complex meanings. Infants while learning language express themselves in a single word where adults may use complex language/sentences. Eg. "mummum…" to express please give me food. Try imitating speech sounds Understand simple instructions such as "Come here" Recognize words of common items such as 'shoe' Turn and look in the direction of sounds
18- 24 months	Vocabulary expands from 50 to 200 words Recognize names of familiar people, objects and body parts Follow simple directions accompanied by gestures
20-26 months	Toddlers combine two words-**telegraphic speech** **Telegraphic speech** is a form of communication consisting of simple two to three word long sentences. It can be a noun-noun, noun-verb or noun adjective combination. For eg. "Ria tata…" Follow simple commands and understand simple questions.

7.8 Activities to enhance language development :

Listed below are some activities that adults can use for language stimulation :

* Pronounce words clearly.
* Use meaningful gestures along with speech
* Use facial expression with speech
* Always give positive instruction
* Point out to the picture or objects
* Sing nursery rhymes to children
* Recite poems for them
* Tell stories to children
* Play small word games with children
* Encourage Informal talks on different topics
* Give social experiences like visiting a market place, garden, fair etc.

Info Hub

THEY START LEARNING IN THE WOMB.

The parts of a baby's brain that process sound start working during the third trimester of pregnancy,

Infant can remember what it hears in the womb after it's born. A study found that Swedish infants only 30 hours old could differentiate between Swedish vowel sounds and the unfamiliar vowel sounds of foreign languages. Another study found that when expectant mothers listened to a soundtrack with a made-up word, the infants recognized that word and its modified version after birth.

Revise the points

Cog itive development

- Mental Process
  - Perception
  - Thinking
  - Memory
  - Reasoning
  - Imagination
  - Curiosity
  - Creativity
  - Attention span
  - Concept formation
- Piaget
  - Theory
    - Sensori-Motor stage
      - Schema
      - Object permanence
- Infant Stimulation
  - Visual
  - Auditory
  - Tactile
  - Taste
  - Smell

Lang ag development

- Theories
  - Chomsky
    - LAD
  - Skinner
    - Operant Conditioning
- Means of Communication
  - Pre Spech Forms
    - Crying
    - Cooing
    - Babbling
    - Gestures
    - Emotional Expression
- Functions
  - To Express
  - To Gain Information
  - To Express needs
  - To Express Identity
  - To Start and maintain interation
  - Tools for Cognitive Development
- Language Stimulation
  - Picture Talks
  - Story Telling
  - Poems
  - Language Games
- Language Development Infancy
  - Cooing
  - Babbling
  - Holophrase
  - Telegraphic Speech

Exercises

Q. 1. Select and write the most appropriate word from the given alternatives.

1. Jean Piaget has studied …….. development in depth.

   a) Emotional *b) Cognitive*

   c) Physical

2. The time span of sensorimotor stage is ……..

   a) 0 - 2 years *b) 2 - 6 years*

   c) 3 - 5 years

3. …….. are the building blocks of cognition.

   a) Structure *b) Schemas*

   c) Thought

4. …….. is a means of communication.

   a) Language *b) Comprehension*

   c) Skill

Q. 2. Write whether the following statements are True or False, correct the false statement and rewrite.

1. Cognitive development prepares children for critical thinking and problem solving.
2. Retrieval is the process by which previously stored information is brought back.
3. Child understands the environment through inborn reflexes.
4. Infants are active seekers of stimulation.
5. Auditory perception is the ability to understand and relate visual impressions.

Q. 3. Match the pairs.

A	B
1. Reasoning	a. Smell of various flowers
2. Visual stimulation	b. Solving problems based on a set of rules
3. Memory	c. Provide colourful pictures and variety of toys to the child
4. Concept formation	d. Storing information
5. Stimulation of smell	e. Transmission of knowledge
	f. An abstract idea

Q. 4. Complete the boxes.

1. Pre speech forms :

crying			Gestures	

2 Types of infant stimulation :

	Auditory Stimulation			Smell

Q. 5. Explain the following terms

1. Perception
2. Thinking
3. Memory
4. Curiosity
5. Object permanance

Q. 6. Write short notes.

1. Meaning and importance of cognitive development
2. Piaget's approach to cognitive development
3. Influence of socialization and environment on cognitive development
4. Meaning and importance of language development.
5. Role of adult in language stimulation

Q. 7. Answer in detail the following questions.

1. What is cognition? Explain the mental processes involved in cognitive development.
2. What is language development? Explain the pre speech forms of language development.

Project / Self Study

- Lsit out ways to stimulate infants or list different activities (other than the ones given in text) by which you would stimulate infants.
- Find out some memory games that you could play in your classroom.

❖ ❖ ❖

8. Infancy : Emotional Development

Reflection / Darpan

Read the episode and answer the questions :

Child (Excitedly) : "Ma, it's my friend's birthday this weekend. She has asked me to come for a sleepover."

Mother (working in the kitchen) replies : "You cannot go since we are going to see your grandparents."

Child : " But Ma !!, I promised her I would be there...."

Mother : " Tell her you'll come next week."

Child (in a small voice) : "But Ma... I wanted to go and her voice trails off.

(1) Can you identify the feelings of the child during the conversation?

(2) How would you describe the mother's response?

(3) Have you faced a similar situation like this too?

(4) What would you feel?

(5) How can you change the ending keeping in mind the feeling of the mother and the child?

The above story and exercise will give you an idea of the importance of recognizing emotions and managing them. In this chapter we will try to understand the meaning of emotions, its components and managing a few of the emotions in children.

Reflection / Darpan

Can you think of an event / incident which made you angry?

How did you react? What did you say and do?

What was the result?

If you could change your response what would you say? Why?

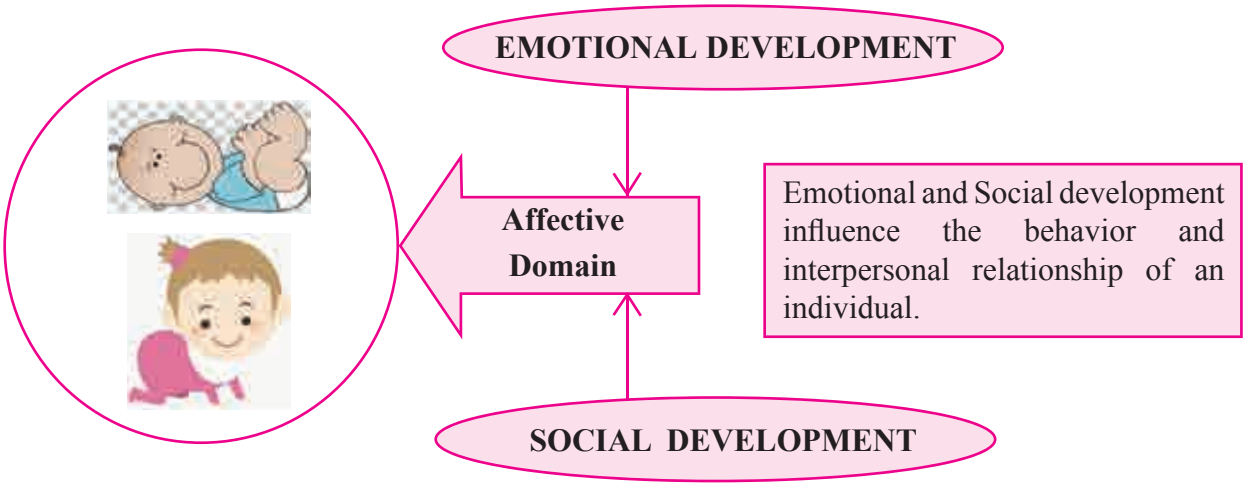


Fig. 8.1 Interrelation between social and emotional development.

8.1 Meaning and Definition of Emotional Development :

The word Emotion is derived from the Latin word 'Emovere', which means "to stir up." Emotion is a stirred up state of an organism. The important and basic part or core of emotions is 'feelings.' Emotions play an important role in life.

Emotions have four basic components :

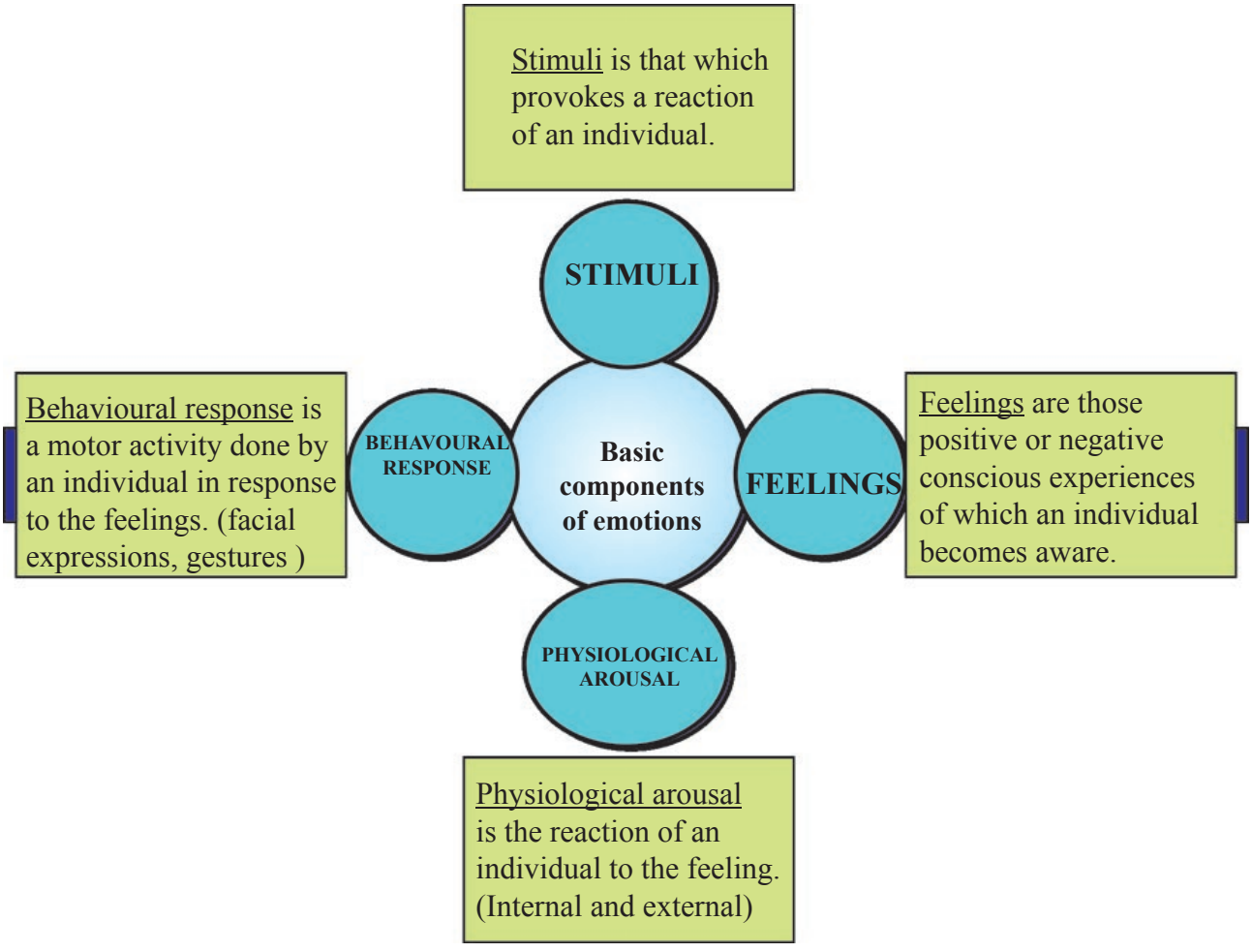


Fig. 8.2 Four basic components of emotions.

Definition of Emotions and Emotional Development.

- Kimball Young defined Emotion as, "An acute disturbance of the individual as a whole, psychological in origin, involving behaviour".
- Emotional development means the ability to recognize, express and manage feelings in socially approved ways. It includes accurately identifying emotions in oneself and others, managing strong emotions such as excitement, anger, frustration and distress.

Some points to note about emotions are :

- Emotions are an aroused state of body and mind.
- Emotions are manifested through behaviour.
- Emotions are a reaction to feelings and impulses.

  For example when we experience excitement, our heart beat increases, breathing is faster. Children manifest excitement through waving of arms and legs, eyes look brighter and larger or by jumping up and down.

Activity :

Select any one emotion and describe its four components.

Observe and identify what you are feeling right now? Notice the physiological changes in your body and note which part of the body experiences it.

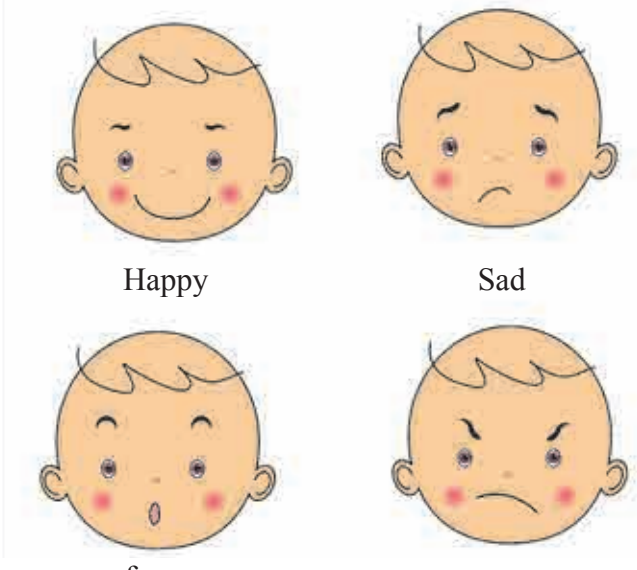


Fig. 8.3 Types of emotions

8.2 Milestones in Emotional Development During Infancy :

Developmental milestones are physical or behavioural signs of development in infants and children. They provide important information regarding a child's development. The milestones are different for each age group. Additionally a child's development is influenced by the environment at every stage. Children progress toward milestones through interaction with their environment. Let us now see some of the milestones of an infant's emotional development.

Table 8.1 : Milestones in Emotional Development During Infancy

Age group	Milestones	
At Birth	• Attraction to pleasant stimuli and withdraw from unpleasant stimuli • Shows distress • Begins to self soothe after crying	
2-4 months	• Infant engages in social smile and responds to active stimuli • Shows interest in things around. • Respond to adult's facial expression • Express anger, fear • Laughs spontaneously	
6-8 months	• Stranger anxiety and fear begins to rise • Attachment to caregivers is evident • Separation anxiety is expressed • Curiosity about environment • Shows surprise, happiness • Explore more when they feel secure in the presence of caregiver	
8-12 months	• Social referencing appears • They laugh at subtle elements of surprise • begin to show spontaneous shift in emotions.	

8.3 Types of Emotions : (Causes, Expression and Handling)

Emotional development begins during infancy and continues through childhood. There are numerous factors that influence the development of emotions in children. How parents and primary caregivers interact with children, plays a vital role in the development of emotions in children. Other important influencing factors include childrens abilities, disabilities, cultural influences, the opportunities for social interaction, and their temperament.

Let us now see what the common emotions expresed during infancy are, their causes and handling.

1) Love and Affection :

Love and affection are pleasant emotions. The Infant is closely attached to its mother, as she fulfills all its basic needs. As trust grows overtime, the infant begins to bond with the mother or caregiver.

Expressions :

- Infants look at their mother and smile.
- Lean towards the mother.
- Show satisfaction on face after being breast fed.
- Feel secure in mother's lap.
- After 6 to 8 months facial expressions show love towards other family members.
- Social smile, giggling.
- Show playful behaviour, towards the concerned person.
- Reaching out to people.

Expression of love and affection

Handling :

- Give loving attention
- Be affectionate
- Respond / reciprocate in a loving manner
- Express love and affection.

2) Joy :

Joy is a pleasurable feeling and emotion. This emotion arises in the presence of stimuli such as a familiar voice, playful sounds of toys, feeding, being taken for an outing.

Expressions :

- Smile, giggle, laugh, gurgle, clap
- Moving legs and hands
- Social smile and joyful expressions when talked to and played with.

Joyful baby

Handling :

- Provide appropriate stimuli
- Reciprocate, smile be attentive.
- Be loving and playful.

Discuss what are the things that arouse your joy / fear.

4) Fear :

Fear is an unpleasant emotion. Feelings of insecurity usually arouse fear. Fear emotion emerges at the age of 8 to 9 months. Fear emerges during this stage as children are able to compare an unfamiliar event with what they know. Unfamiliar situations, objects or individuals often elicit fear responses in infants.

Remember !

Fear can be a good informant. Don't ignore it, block it out, or censor it. Pay attention to the warning it is giving. For eg when you feel unsafe with someone, ask or call for help. Get away. Use your judgment, and figure out what is the best thing to do.

Fear

Expressions:

- Cries with eyes closed
- Holds mother or caregiver's hand tight.
- Holds onto the adult's clothes, clings to them
- Screams
- Hides behind mother or caregiver
- Avoids situation that create fear

Causes:

- Big and sudden noise, darkness
- Sometimes children get scared to touch a new toy
- Children get fearful of strangers
- Sudden change in position also makes an infant fearful
- Infants exhibit associated fear e.g; they get scared of doctor because of injection.
- Fears are learnt through first hand experiences like fear of sudden noise of fire crackers or of an adult who is afraid of a cockroach, lizard
- Due to adult's words of caution infants often develop fear of fire, or sharp pointed objects such as knives or electric sockets.

Handling:

- The first step in helping a child to overcome their imgined fear is to accept their feelings as real and respond to them sensitively
- Avoid ridiculing or dismissing a child's feelings
- Be patient instead of getting frustrated and angry.
- Avoid being overprotective
- Parents may have to help their child to avoid the feared object for a while
- Express understanding of their fear

Do you know?

When you label and validate the emotions of a child or any person the intensity of the emotion reduces

Activity :

Make a note of when you experience emotions such as anger, anxiety or any other emotion for a few days. Label the emotion and acknowledge what you are feeling. Notice and rate the intensity of these emotions on a scale of 1 - 10.

5) Anger :

Anger is an unpleasant emotion. All human beings feel angry occasionally. Babies sometimes differ from toddlers and preschoolers in what makes them feel frustrated or angry. Anger is a normal part of a child's development and dealing with it is one of the most important challenges of parenthood. It is important to remember that a baby has only one means of expressing anger i.e. crying.

Anger

Expressions:

- Crying is the first expression of anger by an infant
- Screaming, throwing objects, or tearing things are some of the other expressions
- Biting or hitting
- Sometimes babies curl their bodies when picked up against their will.
- Facial muscles become tight while expressing anger towards something they want to avoid
- Toddlers throw tantrums to show anger

Causes:

- Unpleasant stimulus
- When left for too long in their bed with no stimulation and attention
- When an adult hovers over them or becomes an obstacle for them or tries to slow them down.
- Restricting movement - when a baby wants to move freely and cannot, it may result in desperate cries.

Handling:

- Give comfort and affection to the infant. This will help the child feel secure, loved and valued.
- Try distracting the baby
- Be calm and just hold the baby close Our calmness will help to calm down the baby
- With slightly older children, be firm and draw boundaries or limits when something is totally unacceptable such as biting or hitting
- The response should be a clear statement: "You are allowed to feel angry .Hurting yourself and others is not acceptable"
- At the age of two, teach the child to use language to express feelings
- Parents can model positive coping skills to help children handle their own anger

Activity :

Recognize the emotion and the age at which it is expressed

Picture No. 1

Picture No. 2

Picture No. 3

Picture No. 4

Picture No. 5

Write your Answer here

Picture No. 1 .....

Picture No. 2 .....

Picture No. 3 .....

Picture No. 4 .....

Picture No. 5 .....

Activity :

- Observe children in your surrounding, and make a note of the causes of their anger and fear.

  Write an incident of your observation of the same

8.4 Development of Attachment, Separation Anxiety and Stranger Anxiety :

Attachment :

Infants always show attachment behaviour. Infant attachment is a deep emotional connection that an infant forms with his or her primary caregiver, often the mother. It is a bond that leads the infant to experience pleasure, joy, safety and comfort in the caregiver's presence. The baby feels distress when that person is absent. Soothing, comforting and providing pleasure is a primary element of attachment. Attachment protects the child from any impending harm as they cling, grasp or vocalize indicating discomfort or distress. This attachment behaviour is an indication of the infant's trust toward the caregiver.

Anxiety

Anxiety is the body's natural response to stress. It is a feeling of fear about what is to come. e.g. An infant may show nervousness and fear in the presence of a stranger. This is called 'stranger anxiety.'

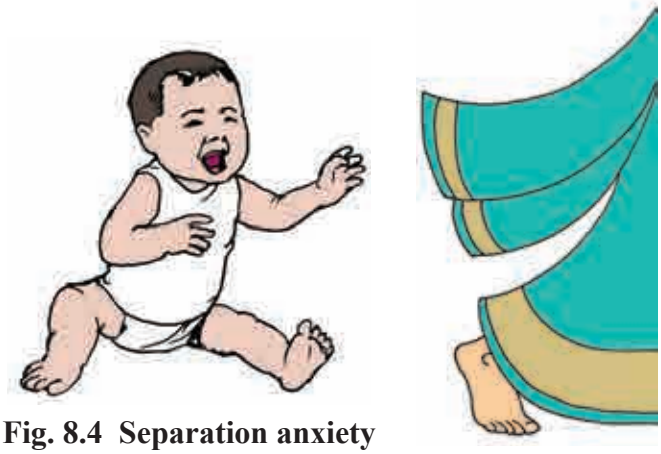


Fig. 8.4 Separation anxiety

Separation Anxiety :

Separation anxiety is a normal part of development. Separation anxiety is when a baby becomes anxious or upset when they are separated from the person who cares for them.

Leaving the baby with a babysitter or in childcare can be more upsetting for the baby than the parents. During this stage, children develop anxiety when they are separated from their parents or primary caregivers. Separation anxiety begins when children are about 8 months old and reaches its peak when children are 10 to 18 months old. Children become frightened when they meet new people or visit new places. They turn to their parents and caregivers for safety and reassurance. Children at this age cry when their parents or caregivers leave the room. This indicates that the children have developed a sense of attachment to their parents or caregivers.

Handling Separation A nxiety in children :

- Make sure that the caregiver is familiar with the child.
- Encourage the person caring for the child to engage the child with toys, a game, or another activity as the parents leave.
- Parents should validate their child's emotion before leaving. e.g. "Yes you are sad", or "Yes you are going to miss me, I will be back".
- Remain calm and reassuring.
- Establish routines at separation to ease the child's anxiety.
- Feeding the child and letting the child nap before the caregiver leaves (because separation anxiety may be worse when a child is hungry or tired).
- Parents or caregivers may try playing peek-a-boo with children of this age to reassure children that out of sight does not mean gone forever.

Separation anxiety continues until children are about 24 months old. It reduces when children learn that their parents or caregivers still exist even when they cannot be seen. Children gradually learn to trust that their parents or caregivers will eventually return.

Fig. 8.5 Stranger Anxiety

Stranger Anxiety :

Infant show stranger anxiety and become worried or fearful when someone unfamiliar approaches them. It indicates that the baby has learnt to differentiate between known and unknown people and formed a strong bond with the caregiver. Stranger anxiety may begin between 6 and 12 months of age.

Expression of Stranger Anxiety in Infants and Toddlers

The signs of stranger anxiety in infant is not difficult to spot, and can generally be observed whenever social interactions are taking place. These are seen in the following conditions.

- Fearful behaviour when interacting with other children.
- Seeing an unknown person or guest at home
- Any stranger making an attempt to get closer
- A known person dressed in a different manner
- Being alone in a room with an unknown person
- Breathing rapidly to calm down
- Searching around the house looking for the people whom they know
- Hiding behind an object
- Turning away from the stranger
- Getting too fussy
- Start crying uncontrollably
- Clinging to the caregiver when some unknown person tries to come closer

Stranger anxiety is a normal stage of emotional development. There are a few simple ways that stranger anxiety can be reduced.

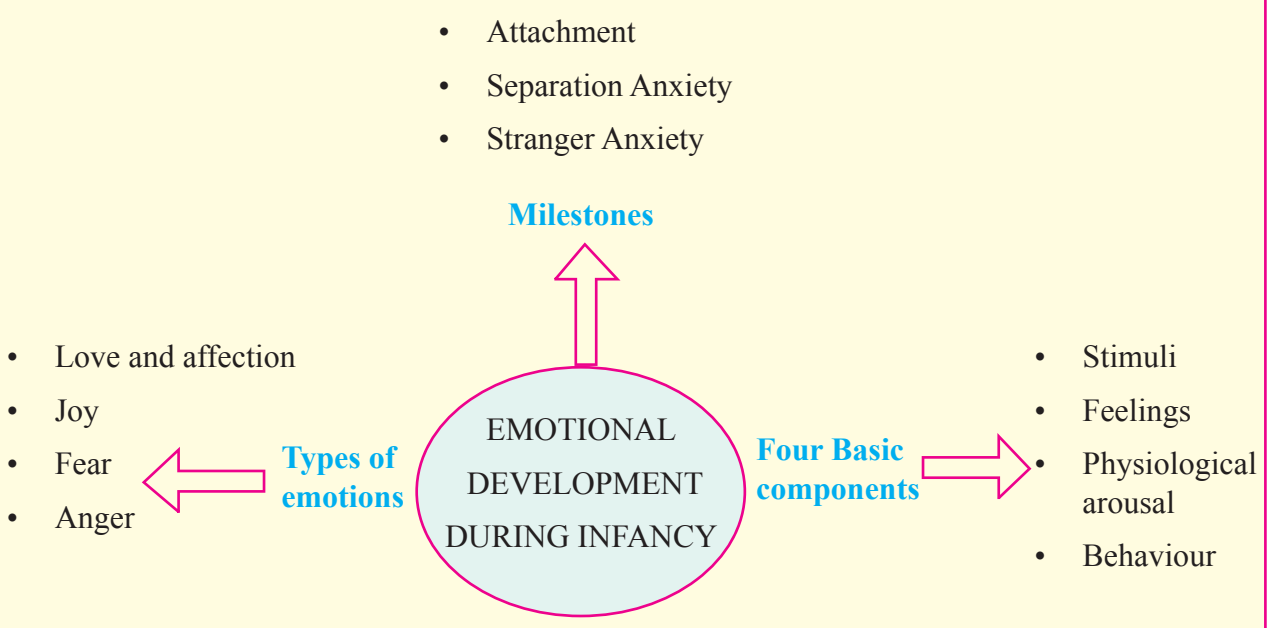
Handling

- Allow the new person to interact with the child from a distance.
- If the infant is meeting someone new, let them know that he /she has trouble dealing with new people right away.
- Interacting with the new person along with the caregiver can lessen anxiety or make it fade away.
- Allow the child to take his / her own time to get used to new people.
- Let the baby know that his / her feelings are understood. Do not force the infant to interact and support him / her when needed.

Activity :

Write the difference between separation anxiety and stranger anxiety

Revise the points



Exercises

Q. 1. Select and write the most appropriate word from the given alternatives.

1. A stirred up state of an individual is called ……..…..
   a) excitement *b) emotion*
   c) attachment
2. ……..…. is a pleasant emotion.
   a) joy *b) anger*
   c) fear
3. Body's natural response to stress is ……..….
   a) tendency *b) anxiety*
   c) crying
4. Anything that still exists even when it is not seen or heard is called ……..….
   a) separation anxiety *b) attachment*
   c) object permanance

Q. 2. Match the pairs.

A	B
1. Love and affection	a. Left alone in the bed for too long
2. Joy	b. Sudden change in position
3. Fear	c. Smile, reacting out
4. Anger	d. Smiling, gurgling, laughing
	e. Early feelings are limited

Q. 3. State whether following statements are True or False.

1. Stimuli is that which provokes a reaction of a person.
2. Physiological arousal means feeling.
3. Infant attachment is the deep emotional connection.
4. Stranger anxiety shows that a baby has learnt the difference between known and unknown people.

Q. 4. Explain the following term.

1. Separation anxiety
2. Joy
3. Anger

Q. 5. Define the following.

1. Feeling
2. Stimuli
3. Physiological arousal
4. Behavioural response
5. Emotion

Q. 6. Write the differences.

1. Separation Anxiety and Stranger Anxiety

Q. 7. Write the causes of.

1. Separation Anxiety
2. Stranger Anxiety
3. Joy
4. Anger
5. Fear

Q. 8. How to handle the following emotions.

1. Stranger anxiety
2. Anger
3. Fear

Q. 9. How is the emotion expressed.

1. Joy
2. Fear
3. Attachment

Q. 10. Write short notes on.

1. Fear
2. Attachment

Q. 11. Read the following paragraph, and write answers to the question

Infants always show attachment behaviour. Infant attachment is an emotional connection that an infant forms with his or her primary caregiver, often the mother. It is a bond that leads the infant to experience pleasure, joy, safety, and comfort in the caregiver's presence. The baby feels distress when that person is absent. Soothing, comforting, and providing pleasure is the primary element of attachment. Attachment protects the child from any impending harm as they cling, grasp or vocalise indicating discomfort or distress. This attachment behaviour is an indication of the infant's trust toward the caregiver. They show distress when the caregiver is absent.

1. Describe attachment with a suitable example.
2. When does a child show distress? Write some symptoms of distress.
3. Attachment behaviour is an indication of the infant's trust toward the caregiver. Explain the statement with your experience in day to day life.
4. Soothing, _____ and providing pleasure are primary element of attachment.

Project / Self Study

1. **Observe at least two infants to record their milestones in emotional development based on the chart given in the text**
2. **Make a chart on different emotions using Emojis**
3. **Collect pictures of infants from magazines or news papers depicting various emotions and label them.**

9. Infancy : Social Development

Refelction / Darpan

Here is a small interaction between two friends.

Anu was walking slowly towards school. On her way she met her classmate shalini.

Shalini : "You look sad! What happened?"

Anu : "Nothing much... I did not get selected in the drama group. I am not in a great mood."

Shalini : " Oh! that must be so disappointing!" I too feel sad or disappointed when such things happen to me."

Anu : "You do? Then what do you do?"

Shalini : "Well I talk it out. Would you like to talk about it?

Anu : "Yes!!"

They both walk along to school. Anu shares her disappointment with Shalini.

Anu is feeling better now and there is a spring in her step.

1) What skills did Shalini show?

2) How was Anu feeling before and after talking to her friend.

Reflection / Darpan

1. Name any 3 people whom you are close to?

2. Who are your best friends?

3. Which are the people you admire the most?

4. With whom do you like to share your secrets?

5. Which friends do you hang out with more often?

6. Whom will you approach for help in project or studies?

7. Which activities do you like to perform individually and in a group?

8. Do you initiate activities as a leader?

9. Do you like to follow others in different activities?

10. Do you accept changes easily?

Answers to these questions will give you an understanding of your social skills and interactions with others.

Social interactions are an important component of nearly every aspect of our lives. The development of skills necessary to form positive and lasting social interactions begins in infancy and continues to evolve as an individual grows and develops. Skills such as trust, empathy for others, cooperation, channelling of emotions (e.g., joy, anger, sadness, frustration) develop throughout childhood. The skills needed for social interaction develop naturally for most children. A child's ability to interact in a healthy way with the people around her / him impacts everything right from learning new words as a toddler, to being able to resist peer pressure, to successfully navigate the challenges as an adult. Healthy social development is an important aspect of an infant's healthy growth and development.

9.1 Concept of Social Development and Socialization :

Social development refers to the process by which a child learns to interact with others around them. Social development begins from home. Infants first come in contact with their mother and gradually with others as they grow. As they develop and perceive their own individuality within their community, they also gain skills to communicate with other people and process their actions. The definitions given below will throw more light on the meaning of Social Development.

1. According to Hurlock, "Ability to behave according to social expectations means Social Development."
2. According to Freeman, "Social development is maturity in social relationship."

Both the definitions have common points as follows

- Healthy social relationships are important.
- Communication is the base of healthy relationships
- Maturity in social relationships means behaving according to social expectations, learning to share, effective communication, establishing rapport, taking turns.

The area of Social development involves learning to interact with other people and to understand and manage our own emotions. Babies start to develop relationships with the people around them right from birth, but the process of learning to communicate, share, and interact with others takes time to develop.

Process of Socialization

Socialization is the process by which an individual acquires the skills necessary to fulfil the expectations of the society. This process continues throughout an individual's life. During socialization, we learn the language of the culture we are born into, as well as the roles we are to play in life.

Fig. 9.1 Socialization

Table 9.1 : Milestones of Socialization :

Sr. No.	Age in Months	Milestones of Socialization
1	**Birth to 3 Months**	• Develops a social smile • Imitates movements and facial expressions • Makes eye contact • Shows excitement as parent prepares to feed • Recognizes mother
2	**3 to 6 Months**	• Recognizes familiar people and self • Makes vocal sounds when happy • Attempts to say words • Laughs when tickled or amused • Responds to name being called • Becomes upset when needs are not met • Responds to voices • Show wariness of strangers, may become upset when parent leaves the room • Happy to see faces they know • Enjoy social play
3	**6 to 12 Months**	• Stranger Anxiety and Separation Anxiety • Raises arms to be picked up • Shows specific preferences for people and toys • Repeats sound or gestures for attention • Actively seeks to be near , physically close to parent • Offers toy to adult but does not release it • Actively explores and plays when parent is present • Aware of verbal praise • Enjoys familiarity of routines • Understand object permanence • Plays games such as “peek a boo” • Gives and receives cuddles and affection

9.2 Social Smile, Social Referencing And Cueing :

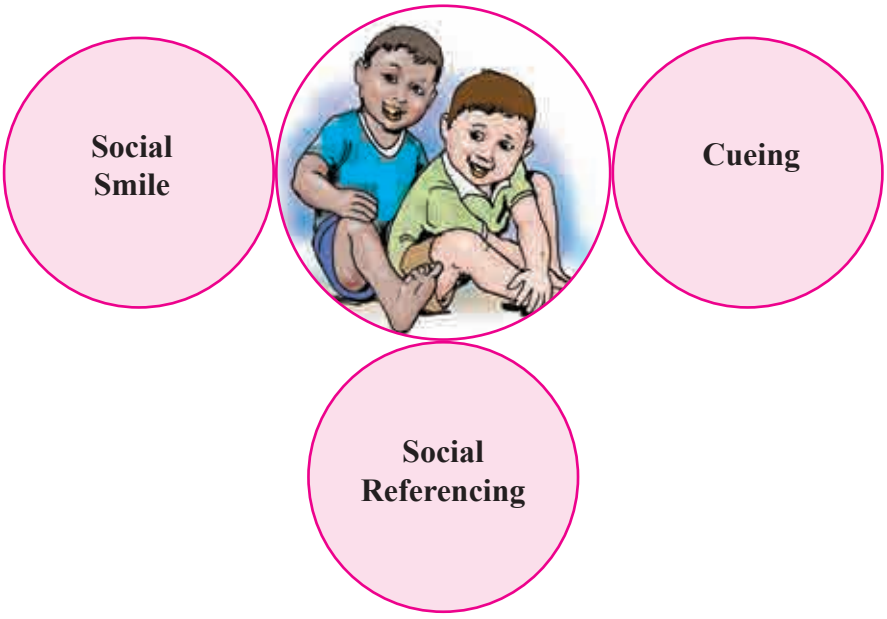


Fig. 9.2 Social Smile, Social Referencing and Cueing

Social Smile :

Babies develop a "social smile" -- an intentional gesture of warmth. It is an important milestone. A social smile is reciprocal, meaning baby smiles in response to someone else's smile. It is not a spontaneous smile. A social smile also boosts bonding.

Here is what a baby's smile means at this stage:

- Baby is growing up and starting to figure out human behaviour.
- Realizes that smiling back gets adult's attention.
- The baby's brain development is advancing and communication skills are also developing.
- It indicates their ability to see and respond to the expressions of the mother or caregiver.

Fig. 9.3 Social Smile

Social referencing

Social referencing is a process in which the infant takes cues from other people in the environment about which emotions are appropriate in a certain context or situation. They emulate the action and behaviour of the adult or caregiver.

Fig. 9.4 Social referencing

An infant's behaviour toward the situation is then, a response to parent's or caregiver's reaction. When a young child falls, he or she will react looking at the expression of the parent/ caregiver. Caring and providing comfort to the child are the primary elements responsible for development of attachment. This attachment helps the infant in social referencing.

Various researches point out to the fact that infants are likely to respond almost immediately to parent's negative reaction as opposed to the positive ones.

e.g. If a child sees a fearful expression on his mother's face as he reaches to touch something, he will be less likely to touch it. If the child sees an approving or excited look, he will be more likely to go ahead and touch the object. Hence social referencing assists in regulating emotins and behaviour.

Activity :

Try it out

1. Make a gesture of shaking your head or with your tone to indicate scolding or anger and note the expression of the baby.
2. Show different facial expressions and see the response of the infant
   - **Smile**
   - **Frown**
   - **When baby is reaching out to you.**

Cueing

- A social cue can either be a verbal or non-verbal signal, which can be positive or negative.
- These cues guide the infants' social interactions with people.
- An infant uses social cues in order to comprehend and learn about his / her surroundings.
- Children look for social cues. Infants use the verbal and nonverbal cues of others to guide their behaviour. Vocal cues and gestures are seen as more effective than other types of cues.

Fig. 9.5 Cueing

Activity :

Can you now differentiate between social referencing and cueing?

Write at least 2 points of difference

Social cues include :

Facial expression, tone of voice, body language, posture, gestures and proximity. These cues often dictate how well each interaction goes and how individuals feel about the said interactions.

Facial expressions : Infants watch the eyes, smile or frown on the face of the parent / caregiver and get an idea whether to respond positively or negatively to the situation.

Body language and body posture :

When the adult isn't looking at the child or their body is turned away from the child he / she interprets that they are not paying attention or the adult isn't interested.

Gestures :

When the infant or child is asked to sleep which is followed with the gentle patting and rocking they can understand the meaning of the word 'sleep'

Proximity :

When infant is held close to the parent caregiver they feel secure and safe .

Voice Tone and Pitch :

The mood and emotion of the parent/ caregiver can be sensed through their voice.

Activity :

Observe an infant's body language and try to interpret what they indicate

- Clenched fist
- Arched back
- Grabbing ears
- Sqi rming
- Vocalizing

It is important to know the role of family and society in ensuring an emotionally stable and socially mature child.

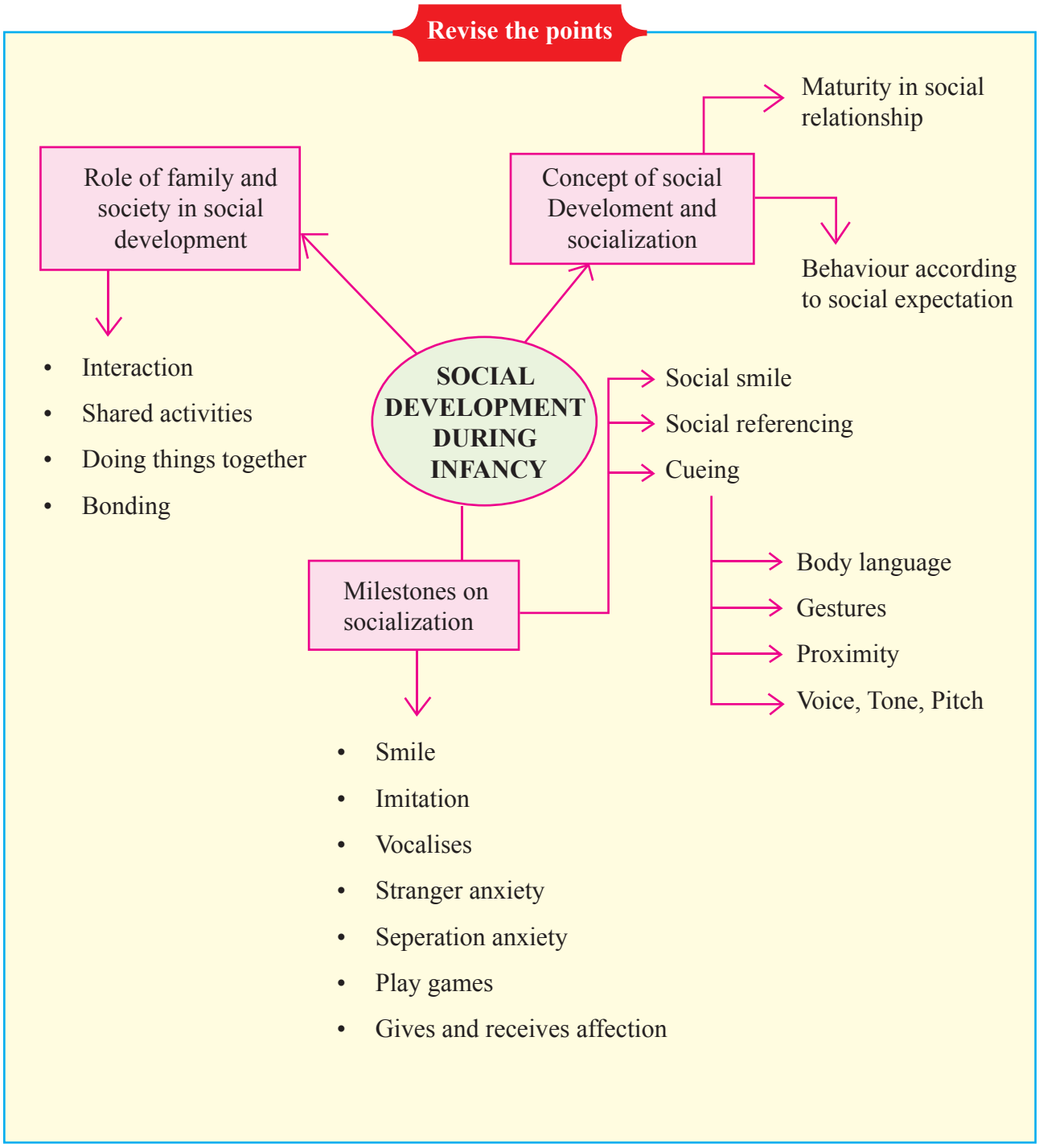
9.3 Role of Family and Society in Social development :

Family is usually considered to be the most important agent of socialization. Infants are completely dependent on others to survive. Parents are responsible for teaching them to function and care for themselves. They, along with the rest of the family, teach about close relationships, group life, and how to share resources. Additionally, parents are providers of first system of values, norms, and beliefs.

Sometimes children learn by being told something directly. However, the most common way children learn is by observation of everyday life. As the family is the child's primary social group socialization of the child is most influenced by the family. Children begin to develop social skills first from their relationships and interactions with family members.

They develop skills in communication, collaboration and cooperation by :

- Interaction with different members of the family
- Observing parents and siblings
- When Families treat each other with respect and love
- Enjoying activities together and sharing meals at the dinner table,
- Doing things together as a family
- Promoting family bonding which enhances emotional development in children.



Exercise

Q. 1. Select and write the most appropriate word from given the alternatives.

1. Healthy relationships are maintained because of ……..….

   a) shaking hands *b) communication*
   c) language development

2. A child learning to interact with others around him / her it is referred to as ……..….

   a) emotional development *b) growth and development* *c) social development*

3. The positive emotional bond formed between an infant and a primary caregiver is……..….

   a) stress *b) attachment*
   c) anxiety

4. Taking emotional cues from other people is called ……..….

   a) social referencing *b) social cueing*
   c) language

5. In unfamiliar situations, children look for ……..…. .

   a) social cues *b) trust*
   c) love

Q. 2. Match the pairs.

A	B
1. 0 to 3 Months	a. Verbal cue
2. 3 to 6 Months	b Develops separation anxiety
3. 6 to 12 Months	c. Role of family
	d. Develops a social smile

Q. 3. Name the milestones of socialization as per the age of infant.

Age in Months	Milestones of Socialization
Birth to 3 months	
3 to 6 months	
6 to 12 months	

Q. 4. Answer the following questions.

1. What is social smile?
2. What is the role of family in social development?

Q. 5. Explain the following terms

1. Social referencing 2. Social smile
3. Cueing

Q. 6. Write short notes

1. Social development
2. Social referencing 3. Cueing
4. Role of family in social development

Q.7. Write the answer in detail

1. Explain in detail about social referencing and cueing with examples?

Project / Self study

- **Make a list of activities that can enhance socialization skills in children. For eg. Taking children to the garden, having a family get together.**

10 Care During Infancy

What is the preparation required before bringing a neonate home?

Infants require a lot of care and attention especially in the first few years of life.The first few hours after birth is a very sensitive time when the parent makes a deep connection with the infant. Physical closeness can promote an emotional connection. A lack of connect and tenderness can have a long term impact on the infant . Attachment contributes to their emotional growth, which in turn affects development in other areas, such as the physical and social growth. Children thrive when caregivers love them unconditionally.

Newborn babies are completely dependent on adults for their sustenance. The physical needs of a newborn are obvious. It needs to be fed, bathed, clothed and protected from harm.

Care of the neonate :

As the newborn baby is completely dependent for fulfilment of its needs, the caregiver has to be very cautious, prompt and vigilant while caring for the neonate. Since the neonate was in the amniotic fluid for many months, the mouth, nose and ears need to be cleaned of the fluid after birth. Secretion from nose and ears should be cleaned carefully with soft cotton cloth. The navel of the newborn should be kept dry and clean, any discharge surrounding the eyes should be gently cleaned with lukewarm water. Mouth also needs to be cleaned with a soft cloth.

Feeding

From the beginning of human history, babies are breast fed. Breast milk is known to be the best food for infants. Breast Milk is produced in small sac-like glands (alveoli) in the breast. The milk is squeezed out of the milk gland into the milk ducts and then into the nipple. Regardless of size of the breasts, lactating mothers produce enough milk for their new born baby. Milk is the main food for infant for the first six months of life.

Feeding can be of two types :

- Breast feeding
- Bottle feeding

• Breast Feeding

The first nutrition that any child is exposed to comes from the breast milk. There is no substitute for mother's milk even though several other market products may claim to match the nutrition in breast milk. Breast milk has all the necessary ingredients in the right proportion. It is well balanced in fat, carbohydrates and proteins, Formula milk or other food supplements are no match to this. Babies who are exclusively breastfed gain weight better, have higher IQ, better immunity and are less prone to allergies and infection.

Did you know ?

The WBW-World Breast Feeding Week is celebrated from 1st August to 7th August every year.

- **Benefits of Breast Feeding**

- Mother's milk is easily digestible and contains all the nutrients which are required for the growth of the baby.
- It is uncontaminated since the baby directly drinks from mother's breast, free from any kind of infection and has an appropriate temperature.
- After child birth for the first few days mother's breasts produces the first milk called as Colostrum which is thick, sticky and yellowish in colour. Colostrum is higher in protein, minerals, salt, Vitamin A and E, low in fat and carbohydrates.
- Colostrum is also full of unique disease-fighting antibodies called immunoglobulin that strengthen the baby's immune system. When neonates are fed colostrum, it acts as their first natural vaccination.
- Mother's milk contains lactose sugar and therefore is naturally sweet
- Breast fed babies show signs of better growth and development
- It creates a bond of warmth, comfort, security between the mother and the baby
- It helps the uterus of the mother to contract and return to it's original size and shape
- Breast feeding delays monthly period of the mother and helps in family planning
- Studies show that mothers who breast feed are less prone to breast cancer

Did you know ?

- In India, less than 50% of children are breastfed within an hour of birth
- The rate of exclusive breastfeeding in the first six months stands at 55%.
- Breastfeeding immediately after birth and exclusive breastfeeding can prevent nearly 99,499 deaths of children every year due to diarrhoea and pneumonia.
- Globally, only 38 percent of infants aged 0 to 6 months are exclusively breastfed.

- **Bottle Feeding**

If the mother is unable to produce adequate quantity of milk or is suffering from any illness/ diseases and cannot breastfeed her baby then in such circumstances infants are fed with bottles.

Powdered/formula milk or diluted cow's milk can be fed as per the suitability of the baby. Formula/cow's milk can be fed to the baby by using a feeding bottle or a spoon and bowl. The bottle, nipple or spoon and bowl that are used for feeding the infant have to be sterilized properly every time before feeding to avoid infections.

Activity :

Try to recap ?

1. The two types of feeding
2. Benefits of breast feeding
3. The antibody present in breast milk

Weaningan d Supplementary feeding

- Till what age or month does a baby feed on breast milk?
- What is the first food introduced to an infant?
- What considerations do caregivers keep in mind when introducing foods for infants?

You would have seen certain practices in your family about how infant moves from breast milk to other source of nourishment so let us now see how this process is introduced and understand why it is important.

Weaning - Weaning is a process of shifting an infant's diet from breast milk to other fluids and foods. It is systematic, scientfic and gradual process.

The gut of an infant develops slowly and therefore acceptabilty to new foods is slow. Lactation reduces after six months and breast milk is insufficient to fulfill the nutritive needs of the baby. To support the rapid growth requirement of the infant, other foods have to be introduced.

Supplementary Feeding: Any nutritive food given in addition to breast milk is supplementary feeding.

Let us now understand and remember the guidelines to be kept in mind when weaning the infant and giving him / her supplementary food.

When to feed :

- The first new feed should preferably be given in the morning. This is to ensure that the baby gets time to digest the food. One could also check whether it is creating any allergic reaction in the infant.
- The subsequent new feed can be introduced after a week or two. This can be initiated in the early part of the evening. Gradually number of new feeds can be increased.
- The supplementry feeds will be increased gradually, limiting breast feed only to the night feed.

How much to feed :

Start with one or two teaspoon of supplementary feed and slowly increase the quantity after ensuring that the child is able to digest the supplementary food.

What to Feed :

- When we wean the baby, we start with liquid foods such as rice water, dal water and vegetable clear soup.
- We can then move to semi solid foods such as steamed apple, ripe banana, boiled potato, soft khichdi, porridge and thick soup.
- Once the infant's teeth start erupting and he / she is able to chew well, other solid foods can be introduced. Finally, by the age of one year or later the infant should be able to eat foods that are consumed by adults. Care should be taken to prepare foods that are not very oily, spicy and should consist of food items from all five-food groups namely proteins, carbohydrates, vegetables, sugars and fats.

Precautions and Guidelines while Weaning

- Since the infant is being weaned off the breast of the mother, the baby may express distress. Therefore, the mother has to comfort and cuddle the infant to calm him /her.
- Cleanliness and hygiene has to be maintained by the caregiver while feeding the infant.
- Clean and sterilized utensils should be used while cooking and feeding the infant.
- The caregiver has to be patient and not to force feed the infant.

Activity :

- Find out how many teeth do six to eight month old infants have? What kind of foods can infants eat?
- Observe a one year old infant and find out what foods can he / she eat.
- Can you now differentiate between breast feeding and bottle feeding?

Bathing

Infants should not be given a bath in a tub until the umbilical cord dries and falls off. Till then the babies are given a sponge bath. The idea of a bath is to keep the baby clean. A newborn's skin is soft and delicate. Proper skin care and bathing can help maintain the health and texture of the baby's skin while providing him/her with a pleasant experience. Traditionally, babies have always been massaged with oil before a bath, which is still popular today. It helps in improving blood circulation, digestion bowel movements, soothes and relaxes the infant, improves and regulates the infant's sleeping pattern. Traditionally, a paste made with turmeric powder, gram flour and milk is used instead of baby soap to bathe the infant. After bath, a soft cotton towel is used to dry the infant.

Making bathing enjoyable and fun for the baby

Float a toy, croon to the baby, pat the water gently to make a splash, blow bubbles (take care that it doesn't hurt the baby's eye.)

For a toddler, sponge could be given to wet and squeeze . Use old bottles as water sqi rters to play

Points to be kept in mind while massaging and bathing an infant :

1. If you have heated the oil for massaging the infant, make sure it is not too hot.
2. The baby's comfort is of prime importance, so at any point while giving a massage if the baby seems uncomfortable or cries and seems fussy, you need to stop the massage.
3. Do not allow even a drop of oil to go into the nose and ears of the infant, as it may lead to a fungal infection.
4. Ensure safety in handling and cleanliness while massaging and bathing an infant.

Clothing

According to the temperature of the environment, comfortable clothes need to be used for the infant. Warm clothes can be used for the babies during winter, monsoon, early mornings or late evenings and nights depending upon the outside temperature. If the weather is very cold then the baby's head and ears should be covered with a warm cap and feet with socks. Clothes of infant should not be fancy.

During summer, soft cotton clothes should be used. Do not overdress the baby. Diapers are an important item of clothing for infants, they should be soft, of good quality and easy to change. Cotton diapers should be washed disinfected and dried in the sun before every use.

Sleep :

Sleep conserves the energy that is required for growth and development of the infant. The amount and timing of sleep varies with age.

Did you know?

Babies have shorter sleep cycles

They move from light sleep to deep sleep every 50-60 min

It takes up to 20 minutes for babies to reach a deep sleep.

Important Points about sleep pattern of Neonates :

a. Newborn baby sleeps on and off through the day and night.

b. On an average a neonate sleeps for around 18-20 hours in a day.

c. Neonates sleep only in short stretches throughout the day and night since they require to be fed and changed regularly.

d. Babies need a cozy, comfortable, clean and safe place for sleeping.

e. Things required for sound sleep of infants are comfortable mattress, easily changeable and clean bed cover of cotton/ linen, mosquito net.

f. Babies should be made to sleep on the sides alternately or on the back to maintain the round shape of their head.

g. Babies can be made to sleep on their stomach also which will help them to relieve them of colic, if any.

WHO and UNICEF recommendations for exclusive breast feeding of infants for first six months for their healthy growth and development

- Initiation of breast feeding within the first hour of life.
- Exclusive breast feeding- infant must be given only breast milk without any additional food or drink/water.
- Breast feeding on demand- as often as the infant wants.
- Continue Breast feeding to the infant up to two years of age with introduction of semisolid and solid foods from six months of age onwards.

Toilet training

Toilet training - the process of training a child to control bladder and bowel movements and to use the toilet.

- Bladder and bowel control usually develops in the following sequence. **First bowel movements become more regular** and less frequent. Next, bowel control develops. Then day-time bladder control emerges. Finally, children gain full night time bladder control (Largo and Stutzle 1977). Bladder training and control takes more time .The timing of these milestones varies from individual to another.

Learning to use the toilet is an important milestone. Most children start working on this skill between **18** months and **3** years of age. The average age of potty training falls somewhere around **27** months.

Activity : Fill up the table below. (Hints are given to complete the same)

	Bladder	Bowel
Gains control		
Age		
Time taken		

(First, later, 18 months, 3 yrs, more less)

How do parents know when their babies need to g?

Infant toilet training is the practice of introducing the baby to the toilet or potty.

- In India, when babies have to eliminate, parents hold them up right in a toilet or an outdoor latrine, or in an open area until it is done. By paying close attention, parents learn to read their babies' cues, and eventually babies learn to hold back until their parents give them the signal—usually a special vocalization, like "sheee-sheee" or "shuuuus" (meaning to urinate or defecate).
- Observe the baby's body signals before he/she passes urine or stool voids. For example, a baby may squirm, shudder, make faces or change his/her breathing patterns.

Even though child development experts do not agree on the best technique to use for toilet training, they do agree that it is extremely important that the toilet training phase should not be rushed. Just because children are physically ready to toilet train does not mean that they are mentally or emotionally ready to do so. Successful toilet training depends on having all three factors physical, cognitive and emotional readiness.

The best way to tell that a young child is ready to start toilet training is to watch for sig s of readiness. Children show sig s of being eady if:

- They indicate that they are ready to use the toilet on their own. For example, the child may want to watch Mom or Dad use the toilet. The child may also sit on the "potty" without prompting comes to the caregiver and tugs the diaper signaling that it is wet or soiled.
- Use words or gestures before they urinate or defecate.
- Can follow simple instructions.

Depending the child's readiness parents could decide whether they want to train the child to use a potty seat or the toilet.

The advantag of usinga P otty seat is :

Children find a potty seat less scary than a toilet. If a child is using a western toilet he / she needs a smaller seat that is securely attached inside the existing toilet seat. Hence the need to choose the right equipment.

It is best to plan toilet training for a time when there are not major changes coming up in the family life. Changes might include going on holiday, starting day care, arrival of a sibling or shifting house.

Toilet training might take days, weeks or months. The key is not to pressurize the child, and let them learn at their own pace. Encourage and remind the child to use the toilet or potty. Praise even if progress is slow. In case child loses control, avoid getting frustrated. Also help the child to clean themselves until they learn to do so. Remember to wipe from the front to the back, particularly with girls. Teach the child how to wash hands after using the toilet.

Autonomy or Shame

Children could be ready for toilet training as early as age 2, because most babies of this age recognize the urge to urinate or defecate and can control the sphincter muscles that facilitate waste elimination .Between the ages of 18 months and 3 years, children learn to master skills and make decisions, such as picking out what they will wear each day, putting on their own clothes, and deciding what they will eat. They begin to express a sense of independence and want to feel in control. While this can often be frustrating for parents and caregivers, it is an important part of developing a sense of self-control and personal autonomy. How the caregiver reacts to these decisions can either encourage autonomy or foster an environment of shame and doubt.

Reflection / Darpan

- What are the things that you need to take care of as a young adolescent to keep yourself safe?
- How would you keep yourself safe?
- Whom would you depend upon / whose support would you need to help you be safe?

Just like you need the support of your parents or your friends, so do young children, especially infants. Infants and young children are completely dependent on their caregiver to ensure a safe environment. Let us now see how we should equip ourselves for the same.

12 Preventive Care And Safety

In the first few years of life, babies are developing physically, mentally, emotionally and socially by exploring and experimenting with the things in the environment around them. Caregivers can help babies and young children to safely explore their world by attending to and fixing aspects of the environment that may prove dangerous for them. Caregivers need to baby-proof the home as it is the primary environment.

IMPORTANT PRECAUTIONS TO BE OBSERVED

A) Bathroom Safety :

To keep babies and young children safe from bathroom hazards :

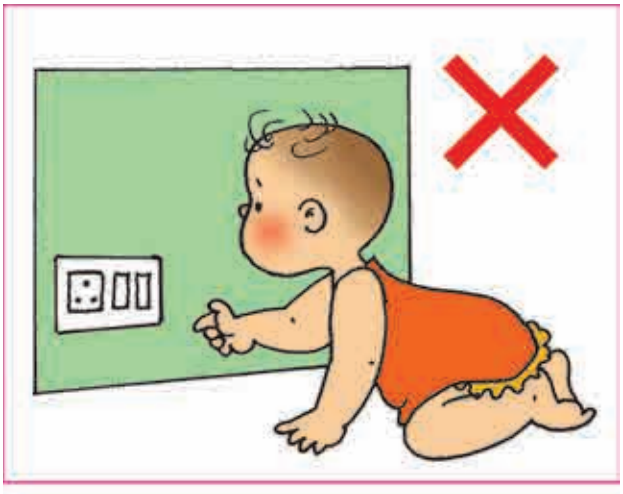
- Keep them out of the bathroom when they are not accompanied by an adult.
- Substances such as shampoo, perfumes, cosmetics, sharp and dangerous objects such as fingernail clippers and razors should be kept out of the reach of children.
- Caregivers should never leave a child under the age of five alone in the bathtub or in the bathroom. If the doorbell or telephone rings, parents should either ignore the signal or take the child with them (wrapped in a towel) while responding to it. Bathtubs / buckets should be drained immediately after each use. Any standing water left in a bathtub or bucket creates an unnecessary drowning hazard.
- Caregivers should always test the water temperature before bath.
- Install non-slip mats in the bathroom to prevent slips and falls for older toddlers.
- The bathroom door latch should be strictly out of reach of the child.

B) Kitchen Safety

- Countertops and floors should be kept neat and clean to prevent babies from choking on small objects or slipping on it .

- Parents should store all knives and other sharp food preparation tools as well as detergents and other potentially hazardous things out of the reach of toddlers.
- Cabinets and drawers should be kept latched.
- When feeding babies and toddlers, most caregivers find it useful to use a high chair. Caregivers should inspect for loose or broken parts or other defects in the chair. During feeding time, babies should be securely fastened into the high chair using safety harnesses. The feeding tray should also be securely fastened to the chair so that it cannot be pushed away onto the floor spilling its contents.
- Caregivers should avoid leaving an infant or toddler alone in a room strapped into the high chair, as the child will eventually try to get out and harm themselves in the process.
- During feeding, parents should position the high chair far enough from the table or other feeding surface to prevent baby from grabbing or touching objects on the table that could be dangerous such as hot cookware, glass or sharp cutlery.
- Avoid taking children near the gas stove when cooking.

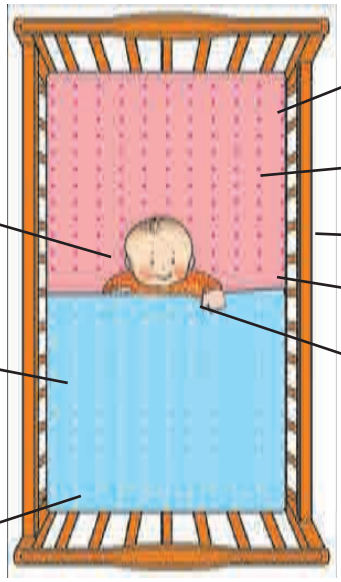
C) Electric safety



- Adults should make sure that no wires are frayed or cut, no outlets have loose screws and no outlets have become unseated from their proper snug position inside the wall.
- Child outlet covers should be plugged into any unused outlets to prevent little fingers from injury or death by electric shock.

D) A Safe Sleeping Space for Infants and Toddlers.

What does a safe sleep environment look like?



- Many parents often choose to use a traditional baby hammock (jhoola) or rocking cradle (palna) instead of a cot. The traditional jhoola is essentially a cloth hammock made from cotton fabric, sarees, rope or cane attached to a spring and strung up on ceiling beams or the bars of the staircase or window in the room.
- A cloth hammock (jhoola) holds the baby snugly, as though the baby has been swaddled. This can help to make the baby feel secure.
- Babies may associate the gentle rocking motion of a jhoola with the movements they felt while nestled in the safety and security of the womb. The rocking movement can feel reassuring and soothing
- There are claims that sleeping in a jhoola will help the baby's head develop a nice, rounded shape .
- The safety of the traditional baby hammock has become an issue in recent years. There may be risks such as:
- The face may get pressed against the material leading to suffocation.
- When babies are old enough to roll over, they can fall out of the jhoola and injure themselves.

- Walkers are discouraged today.
- Causes accidents.
- Child may fall down or across thresholds.
- Developmentally harmful.
- Prevent muscles from developing in a normal manner.

- Baby swings can be used safely in the presence of the caregiver.

E) Toy safety

- Parents must inspect labels for age recommendations. If a toy is recommended for children under 3 years old, caregivers should still inspect toys regularly to make sure that there are no loose or damaged pieces that could create a choking hazard.
- While shopping, caregivers can also look for other toy safety features such as construction, using non-toxic, or machine washable materials.
- Ensure that babies and toddlers are never allowed to play with plastic bags or packing materials as these can easily lead to suffocation.

F) Outdoor Safety

- Selecting an appropriate and safe area.
- Safe playground equipment to be provided.
- Teach rules for playing safely on playground equipment and with other children.
- Adult vigilance and supervision to enforce playground rules is also required for overall safety.

Activity :

Recall and write two points of each.

- Bathroom safety.
- Kitchen safety
- Crib safety
- Electric Safety

6.3 mmunization

Immunization is a simple and effective way to protect the child from serious diseases. Immunizing a child, will give them the best start to a healthy future and help in minimizing the spread of diseases. An immunization programme is one of the key interventions for protection of children from life threatening conditions, which are preventable.

Importance of immunisation

- It saves lives from potentially fatal illnesses.
- It protects against diseases.
- The risk of certain diseases affecting the future generation could be ruled out.
- It helps in staying healthy.
- It is a cost effective intervention for global welfare.

Table 6.1 National Immunization Schedule (NIS) for Infants, Children and Pregnant Women

Vaccine	When to give	Dose	Protection from infection
For Pregnant Women			
TT-1	Early in pregnancy	0.5 ml	Tetanus
TT-2	4 weeks after TT-1*	0.5 ml	
TT-Booster (Tetanus Toxoid)	If received 2 TT dose in a pregnancy within the last 3 years	0.5 ml	
For Infants			
BCG (Bacille calmette Guerin)	At birth or as early as possible	0.1 ml (0.05 ml unit 1 month age)	Tuberculocis
Hepatitis B - Birth Dose	At birth or as early as possible within 24 hours	0.5 ml	Jaundice - B
OPV-0 (Oral Polio vaccine)	At birth or as early as possible within the first 15 days	2 drops	Poliomyelitis
OPV 1, 2, 3	At 6 weeks, 10 weeks & 14 weeks (OPV be given till 5 year of age)	2 drops	Poliomyelitis
Pentavalent 1, 2, 3	At 6 weeks, 10 weeks & 14 weeks (can be given till one year of age)	0.5 ml	DPT - Diptheria, Pertussis (Whooping cough), Tetanus, Hepatitis -B, Haemophilus Influenza
Rotavirus (Optional)	At 6 weeks, 10 weeks & 14 weeks (can be given till one year of age)	5 drops	Diarrhoea
IPV (Inactivated Polio Virus)	Two fractional dose at 6 and 14 weeks of age	0.1 ml	Poliomyelitis
Measles / MR 1st	9 completed months-12 months (Can be given till 5 years of age)	0.5 ml	Measles, Mumps Rubella

Vitamin A (1st dose)	At 9 completed months with measles-Rubella	1 ml (1 lakh IU)	Vitamin A Deficiency
For Children			
DPT booster-1	16-24 months	0.5 ml	(Diptheria, Pertussis Tuberculosis)
Measles/MR 2nddose	16-24 months	0.5 ml	
OPV booster	16-24 months	2 drops	Poliomyelitis
Vitamin A (2nd to 9th dose)	every 6 months up to the age of 5 years.	(2 lakh IU)	
DPT booster-2	5-6 years	0.5 ml	Diptheria, Pertussis
TT	10 years & 16 years	0.5 ml	Tetanus

Do you know ?

- Immunization Programme in India was introduced in 1978 as Expanded Programme of Immunization (EPI)
- The programme gained momentum in 1985 and was expanded as Universal Immunization Programme (UIP) to be implemented in a phased manner to cover all districts in the country by 1989-90.
- UIP is a part of Child Survival and Safe Motherhood Programme since 1992. Since 1997, immunization activities have been an important component of National Reproductive and Child Health Programme and is currently one of the key areas under National Rural Health Mission (NRHM) since 2005.
- Under the Universal Immunization Programme, Government of India is providing vaccination for preventable diseases. such as Diphtheria, Pertussis, Tetanus, Polio, Measles, severe form of Childhood Tuberculosis and Hepatitis B, Hoaemophilus influenza type b (Hib) and Diarrhoea.

Care during infancy

Feeding

- Breast feeding
- Bottle feeding
- Weaning
- Supplementary feeding

Bathing

- To maintain good health and cleanliness
- Oil massage for improved circulation
- Soothing and relaxing
- Ensure safety when massage is given

Clothing

- According to temperature, climate
- Soft, cotton clothes
- Cotton diapers should be dried in the sun.

Sleep

- Comfortable mattress
- Clean bed cover
- Cotton / linen material
- Mosquito net cover

Toilet training

Bowel control comes earlier than bladder control.

Preventive care and safety

- Bathroom sefety
- Kitchen safety
- Electric safety
- Safe sleep space
- Toy safety
- Outdoor safety
- Immunization

Revise the points

Reflection / Darpan

- Do you have any favourite thing (a blanket, plate, toy) as an infant that you still possess?
- Can you recollect any hazardous incident experienced by you as an infant, that has been related to you?
- Do you know which immunization you have received ? Write it down if you know or find out from your parents.

Exercises

Q. 1. Select and write the most appropriate word from the given alternatives.

1. After child birth for the first few days mother's breasts produces the first milk called as …….. which is thick, sticky and yellowish in colour.

   a) iron *b) calcium* *c) colostrum*

2. Mother's milk is naturally sweet as it contains …….. sugar.

   a) fructose *b) glucose* *c) lactose*

3. A newborn sleeps for …….. number of hours

   a) 12 15 *b) 8 10* *c) 7 8*

4. Average age for potty training is ……..

   a) 2 months *b) 8m onths* *c) 3m onths*

5. UNICEF recommends exclusive breastfeeding for the first …….. months.

   a) 8 *b) 3* *c) 6*

Q. 2. Write whether the following statement is True or False.

a. Cotton diapers of babies should be washed and dried in the sun before every use.

b. A neonate sleeps for around 10 hours in a day.

c. Bladder control comes before bowel control.

d. During summer, silk clothes should be used.

e. Child outlet covers should be plugged.

Q. 3 List the precautions or safety measures taken with reference to :

1. Kitchen
2. Bathroom
3. Toys
4. Sleep area
5. Outdoor area
6. Electrical

Q. 4 Write in brief

1. Differentiate between breast feeding and bottle feeding
2. Advantages of breast feeding
3. Bathing
4. Importance of immunization
5. Immunization schedule

Q. 5 Find out the breast feeding and sleeping pattern of a neonate and prepare a report on it.

Q. 6. What points should be kept in mind while bathing an infant?

Project / Self Study

Street Play

- Collect / prepare material required.
- Write proper script with attractive slogans.
- Along with your friends perform a street play to create awareness about safety during infancy and immunization.
- Collect authentic and detailed information regarding immunization.

❖ ❖ ❖

Related Activities and Projects

1 Preparation of Resource File

1.1 Collection of songs related to children

1.2 Collection of stories related to children

1.3 Collection of riddles related to children

1.4 Collection of pictures related to children's toys/play

1.5 Collection of relevant articles from newspapers and magazines related to children

11 Collection of song related to children

Simple and familiar language/words, repetition of lines/words, attractive tune, scope for actions while singing, song to be related to the surroundings/environment of children, help to release pent-up energy/emotions, songs should be selected keeping the age group of children in mind (length and language of the song)

Types of song :

- Non-sensical / Gibberish rhymes e.g. Ging gang goolie, Roll a bowl a ball a penny a pitch
- Action song e.g. 'Clap your hands', 'boogie woogie'
- Story e.g. 'Welcome to my jungle "I am karadi the bear.'
- Tongue twister : e.g. 'If I had a purple penny or a purple nickle' or 'Chandu ke chacha ne chandu ki chachi ko'
- Alphabets : e.g. 'A B C D E F G . Come and sing along with me H I J K L M N O P. Tell me what you want to be.'
- Concept rhymes e.g. on family, seasons, fruits, transport etc.

Sources :

Collect rhymes/songs from children rhyme books, magazine, CDs. You can also create your own songs keeping the above points in mind.

12 Collection of Stories related to children :

Repetitive phrases and sounds, simple and engaging, age- appropriate, familiar, element of surprise, generate curiosity (what will happen next in the story), Non – moral stories. Stories should have one main character, minimum 2 to 3 and maximum 5 to 6 and there should be proper interaction between the characters and dialogues. Story should have satisfying climax, simple language with introduction of new words to enhance the vocabulary of children, no stories on fairy tales, elves, ghost, giants, stepfamilies, concepts of death and dying.

Techniques of story telling

Story books with pictures, flashcards, TV scroll, puppets, charts, flipcharts, OHP sheets, PPT, picture books etc.

Source :

- Stories from children's story books magazines
- Tradition stories with modification of children's environment, CD
- You can even create your own stories keeping the above points in mind

13 Collection of Riddles related to children :

Familiar language, leading to creating curiosity, encouraging the children to think and reason, enhance vocabulary, should include living and non-living things, the riddles should have rhymes, age-appropriate (3-6 age group- riddles on 'who am I?' can be related to human beings/fruits/vegetables/ vehicles/any other object)

Source :

- Children's books
- Magazine
- Newspapers

You can prepare riddles keeping the above points in mind.

14 Collection of Pictures related to toys or play :

Collect pictures of age appropriate toys of different kind. These can include :

1. Manipulatives such as ring pyramid, blocks, jigsaw puzzles, clay and many others.
2. Toys for dramatic play such as dolls, puppets, soft toys and others.
3. Toys for outdoor play such as slide, bat, skipping rope, jungle gym and others.
4. Toys for sensory, development such as rattles, teethers, mobiles and others

15 Collection of Relevant articles from newspapers and magz ines related to children

Collect articles from newspapers and magazines related to

- Domains of development
- Discipline
- Parenting
- Nutrition
- Behaviour problem
- Special needs
- Any other

2) Prepare poster on the following topics :

2.1 Immunization Schedule for pregnant women

2.2 Immunization Schedule for the child

2.3 Prevention of Accidents and Hazards

2.4 Stages of Development

2.5 Developmental Milestones

2.6 Reproductive system

2.7 Endocrine Glands

2.8 Menstruation

2.9 Prenatal development

2.10 Types of Birth

3) Survey of Ten girls regarding the care and hygiene practices they follow during menstruation

4) Prepare a scrap book with pictures of infants depicting various emotions.

5) Visit the following centres and write a report of the same :

5.1 Visit to Anganwadi Centre to study the services available for women and children.

5.2 Visit to Maternity Home and write a report on facilities and services available.

5.3 Visit to Neonatal / Pediatric clinic and write a report on services and facilities available.

6) Project

Observe an infant and assess his / her development using following checklist

I	**Personal Information** Name of the infant Age Gender	
II	**Physical Development** Weight Height Head circumference Arm circumference	

III	**Motor Development**	
	Holds objects with one / both holds	Yes/No
	Stands alone	Yes/ No
	Walks alone	Yes / No
	Jumps in a place	Yes / No
	Walks on tiptoe	Yes / No
	Climbs stairs with help	Yes /No
IV	**Self help Skills**	
	Self- feeding	Yes / No
	Eating with spoon	Yes / No
	Self- dressing with adult help	Yes / No
	Self - grooming	Yes / No
	Rolling a ball	Yes / No
	Openig a box	Yes / No
	Unscewing a lid from the bottle	Yes/ No
	Turning pages of a book	Yes / No
V	**Social Development**	
	Gives social smile	Yes / No
	Shows excitement	Yes / No
	Recognizes familiar people	Yes / No
	Play games such as peek a boo	Yes/ No
VI	**Emotional Development**	
	Expresses happiness	Yes / No
	Expresses joy listening to	Yes / No
	Different sounds of toys	
	Fear of a stranger	Yes / No
	Throws objects when angry	Yes / No
	Biting when angry	Yes / No

Glossary

Adolescence - The bridge between childhood and adulthood refers to age growth of 12-19 years, during which an individual attains sexual maturity

Adrenal Gland - It is one of the endocrine glands that produces variety of hormones

Adulthood - 20 years of age and is further divided into 3 stages – young, middle and late childhood

AIDS - Acquired Immuno Deficiency Syndrome – Viral disease that undermines effective functioning of the immune system.

Amenorrhea - Absence of menstrual cycle during active sexual period of life

Amniotic Sac - The sac which holds and protects the embryo

Anemia - A condition in which the red corpuscles of the blood are reduced in number or are deficient in hemoglobin, causing pallor, shorten of breath and palpitation of the heart.

Angn wadi - Anganwadi is a court yard or play center located within the village and focal point for delivery of services provided under ICDS.

Antenatal Care (Prenatal Care) - Care shown to the woman throughout her pregnancy in order to prevent any potential health problems,prevent complications which may occur and ensure a normal labour, delivery.It is a preventive health care that will benefit both mother and child

Antibodies - A blood protein produced in response to and counteract specific antigens

Antig ns - A toxin or substance which induces an immune response

Anxiety - Bodies natural response to stress

Attachment - Reciprocal, enduring bond between infant and caregiver, each of whom contribute to the qa lity of the relationship.

Attention - The process of selecting specific stimulus from the environment or surroundings is attention.

Attention span - Attention span is how long the child can focus and concentrate is attention on a given task or activity.

Autosomes - The 22 pairs of chromosomes that are not sex chromosomes.

Axon - Single long nerve fiber that carries outgoing messages from the neurons cell body.

Babinsky Reflex - Fanning of the toes by the infant when the sole of the foot is stimulated

Babbling - Consonant-vowel intonation patterns of an infants language usually seen around 6 months of age

Blastocyst/Bastulla - The further division of cells in the morula

Body Proportion - Body proportion is the measurement of the body parts in relation to the whole body

Cartilag - Infants bones are made of soft, flexible tissues called cartilage

Cephalocaudal Sequence - An organized pattern of physical growth and motor control that proceeds from head to feet.

Childhood - The period from the birth to twelve or thirteen years.

Child Development - Child development is a specialized area of study which concerns itself with Growth and development of the child right from the moment of conception to adolescence.

Children with special Needs - Children with special needs include those whose intellectual emotional Needs or physical performance differs significantly from the expected average within their peer and cultural group

Chromosome - A thread like structure carrying genetic material of an organism

Chronolog cal ag - Refers to the age of a person from birth to death

Cog ition - The process by which we perceive, know or understand something. It is the act of knowing or the processes involved in knowing.

Cog itive Development - Cognitive Development is the construction of thought processes including remembering, problem solving and decision making

Colostrum - The first milk from the mother's breast occurring shortly before or during the first days after childbirth. It is rich in protein and antibodies

Communication - Interchange of thoughts and feelings

Comprehension - Ability to understand

Concept Formation - A concept is an abstract idea or notion, which combines elements of an object or event into the idea.

Conception - Implantation of the embryo in the uterus

Cooing - Vowel sounds produced by infants by the end of first month after birth

Cranial reg on - Area above the eyes, encompasses upper part of the head.

Creativity - Creativity is the mental process of manipulating environment which results in the production of new ideas, pattern or relationship

Cueing - Signal that encourages the infant to take action

Curiosity - Quality related to inqi sitive thinking

Darwinian Reflex - Darwinian Reflex is known as Palmar grasp. When an object touches the palm of an infant, he or she automatically grasps it

Delivery - Delivery is the process of giving birth to a baby either by vaginal passage or caesarean section

Dendrites - Short nerve fibers that pick up messages and then carry them to the neuron's cell body

Dental enamel - Glossy coating on teeth

Development - The qa ntitative and qa litative changes that take place in an organism from its initial state, through maturity until death

Developmental Milestone - Levels of achievement or competence, which at a given age are considered to be necessary or desirable for socially acceptable functioning

Dig stion - Process by which the injested food is broken into materials in the digestive system

Disability - The term Disability refers to a total or partial behavioral, mental, physical or sensory loss of functioning

DNA - Deoxyribose Nucleic Acid, chemical that carries inherited instructions for the formations and functions of body cells

Domains - Referes to specific aspects of growth and change like physical, motor, Cognitive, social, emotional, moral

Ectoderm - Outer layer of the embryo

Elimination - Removal of solid, undigested waste from the body

Embryonic Stage (Period of Embryo) - Second stage of gestation (2 to 8w eeks) characterized by rapid growth and development of major body system and organs of embryo

Emotional Development - Refers to development of emotions and their effect on personal and social adjustment

Emotional Expressions - How individuals express their emotions

Emotions - A complex psychological phenomenon which occurs as intense feelings that are directed at someone or something.

Endocrine Glands - Endocrine Glands are ductless glands which are situated in different parts of the body that secrete chemical substances called hormones

Endoderm - Inner layer of the embryo

Eye-hand Coordination - Eye hand coordination is the co-ordinated control of eye movement with hand movement and the processing of visual movement to guide reaching and grasping

Fertilization - Union of sperm and ovum to produce a zygote

Fetal Stag (Period of fetus) - Final stage of gestation (From 9 weeks to birth) characterized by increased detail of body parts and greatly enlarged body size

Fine Motor Skills - Physical abilities which involves small muscle groups

Fontanelles - Soft spots on the neonates head

Fraternal Twins - Twins conceived by the union of two different ova (or single ovum that has split) with two sperm cells

Frontal Lobe - The front part of brain that controls important cognitive skills such as memeory, language, judgement.

Genes - A unit of DNA that is located on a chromosome responsible for traits of an individual

Gestation - Period between conception and birth during which development of fetus takes place

Glial Cells - Supporting cells of the nervous system.Hold the neurons in place

Grasp - To hold firmly

Gross Motor Skills - Physical abilities which involves large muscle groups

Growth Hormone - A hormone secreted by pituitary gland that affects growth and development of all tissues except the central nervous system

Growth - Growth refers to qa ntitative change. Example –he ight, weight etc.

Heredity - Genetic attributes inherited from the biological parents at the time of fertilization

Holophrase - Form of speech where single words convey complex meaning

Hormones - Chemical substances secreted by the endocrine gland

Identical Twins - Twins resulting from the division of a single zygote after fertilization

Illness - Period of any ailment which affects the body/mind

Imag nation - It is the act or power of forming a mental image of something not present to the sense or even before wholly perceived in reality

Immunization - The process of rendering a subject immune or of becoming immune, protecting against any particular disease, as by inoculation

Implantation - Fixation of ovum in the uterine wall

Infancy - Period from birth to two years which is subdivided into neonatal (birth to 15 days), infancy (15 days to 18 months), toddlerhood (18 to 24 months)

Infant Stimulation - Infant Stimulation includes activities that arouse or stimulate babies **senses of sig t,s ound,t ouch,t aste and smell**

Kwashiorkar - A form of malnutrition caused by protein deficiency in the diet of an infant

Lang ag - A means of communication

Language Development - Acquisition of language of the respective cultural subgroups. Language enables people to communicate information, meanings, intentions, thoughts and requests as well as to organize ideas and express emotions

Late Adulthood (Old age) - Refers to age group from 60 years onwards

Learning - Changes in the individual as a result of experience and practice

Malnutrition - A condition in which the body does not receive adequate nutrients for proper functioning.

Marasmus - Under nourishment causing a child's weight to be significantly low for their age

Meconium - Meconium is a sticky greenish black waste matter formed in the intestines of a neonate

Memory - It is a process of storing information that can be retrieved whenever required or needed

Menarche - The period (age) when menstrual cycle starts is called menarche

Menstruation - Periodic shedding of the uterine lining, also refers to discharge of blood and mucus from uterus

Menopause - The period (age) when the menstrual cycle stops is called menopause

Mesoderm - Middle layer of the embryo

Micturition - Frequent urination

Middle Adulthood - Refers to age group from 40-60 years

Milestone - An important stage in development

Miscarriage - Spontaneous or unplanned loss of fetus from the womb before it is viable

Moral - Concerned with what is right and wrong behavior, acceptable and unacceptable behaviour

Moro Reflex - 'Startle' response to sudden change in position or loud noise

Morulla - The zygote which further subdivides and forms a cluster of cells

Motor Control - The ability to control the muscles that bring about movement in the body

Motor Development - The Development of control over bodily movements through the coordinated activity of the nerve centres, the nerves and muscles

Myelin - An insulating fatty sheath on nerve fibers

Myelination - The coating of neural fibers with an insulating fatty sheath i.e. myelin, that improves the efficiency of message transfer

Neonate - A new born baby upto two weeks old

Neonatal period/stag - The period from birth to 15 days

Neurons - Nerve cells that store and transmit information in the brain

Nutrition - Process of providing or obtaining the food necessary for health and growth

Ontog netic Function - Functions that are acqi red through environmental factors such as training, opportunities and practice

Operant Conditioning - Learning Process through which a behaviour of an infant is modified by reinforcement

Ossification - Hardening of the bones due to deposition of the minerals, calcium and phosphorus

Ovaries - Oval shaped ovum producing organs that lie on either side of uterus

Ovulation - Release of egg cell from the ovary

Ovum - Reproductive cell of a female

Perception - Perception is the cognitive process that gives organization and meaning to sensory information such as what we see, hear, touch, smell and taste

Period of Ovum - First two weeks of prenatal development characterized by rapid cell division and implantation in the wall of the uterus

Physical Development - Development of the body and its parts

Phylog netic Function - Functions that are acqi red with age and do not reqi re any training

Placenta - Provides nourishment, oxygen to fetus and removes its body waste

Postnatal - Period after birth

Preg ancy - Period when a female carries a developing embryo or fetus within her Uterus

Prematurity - Infant who is born before 37 completed weeks of gestation and who weighs less than 2500 gms at birth is called prematurity

Prenatal Period - The period from the time of conception until the onset of labor and birth

Preschool Child - A child in the age group 3-6 years. This period extends from about 3 years of age and till entrance into formal school at 5 or 6ye ars of age

Pre-speech forms - Substitutes forms of communication used by infants in order to make their needs and wants known

Proximodistal Sequence - An organized pattern of physical growth and motor control that proceeds from central axis to extremities

Puberty - A period of hormonal changes in boys and girls leading to sexual maturity

Quickening - Movement of the fetus felt by the mother

Reasoning - Method of problem solving based on a set of rules, attributing a cause

Reflex - An inborn automatic response to a particular form of stimulation

Reproduction - Process by which offspringsare produced through parents

Rooting Reflex - Response to a stimulus of a newborn infant by turning towards the source of stimulation

Schema - Basic building blocks of intelligent behaviour – a way of organizing knowledge

Sensory - Relating to physical senses perceived through touch, smell, taste, sight and hearing

Sensory-motor stag - First stage of cognitive development, a period from birth to two years, infants gain knowledge using their senses and movements

Separation Anxiety - Infants become anxious or upset when they are separated from the primary caregivers

Sex Determination - Establishment of the sex of the individual at the time of fertilization

Skeletal Development - Increase in size, shape, number of bones and change in composition of bones

Skeleton - Framework of bones inside the body

Skull - The bony framework of the head

Social Development - Acqi sition of ability to behave in accordance with social expectation The Development of the ability to get adjusted to the group. It includes the learning of ways and means of establishing relationship with people and becoming and accepted member of the group

Social Referencing - Process where an infant takes cues from other people in the environment

Social Smile - Intentional gesture of warmth expressed by infants

Sperm - Male reproductive cell

Stimulation - Action of arousing interest, enthusiasm or excitement in an individual

Strang r Anxiety - Infants become worried or fearful when someone unfamiliar approaches them

Sucking Reflex - Vigorous sucking movements of the infant on slight stimulation of lips, cheeks or chin

Supplementary Feeding - Feeding in addition to breast milk

Synapse - The gap between the neurons across which chemical messages are sent

Temperature Regulation - Temperature regulation is the process by which the body tightly controls the internal temperature and preserves a stable internal state to survive

Telegraphic Speech - A form of communication consisting of simple 2 to 3 words sentences

Testes - Testes are glands located in the scrotum of males that produce sperm cells

Thinking - Thinking is an abstract process in cognitive development which consists of mental rearrangement or manipulation of information from the ear and symbols stored in memory

Toddlerhood Period - A period from 12-36 months during which the ability to talk and walk is acquired

Tonic neck Reflex - Tonic neck reflex is known as fencing position. It involves coordination of head, arms and legs

Toxemia - Condition during pregnancy where the blood pressure increases

Umbilical Cord - The vital link connecting the placenta and the fetus/baby

Vernix Caseosa - White, cheesy, protective layer, covering the skin of a neonate

Weaning - Introducing an infant to food other than mother's milk

Young Adulthood - Refers to age group from 20-40 years

Zygote - One-celled organism resulting from fertilization

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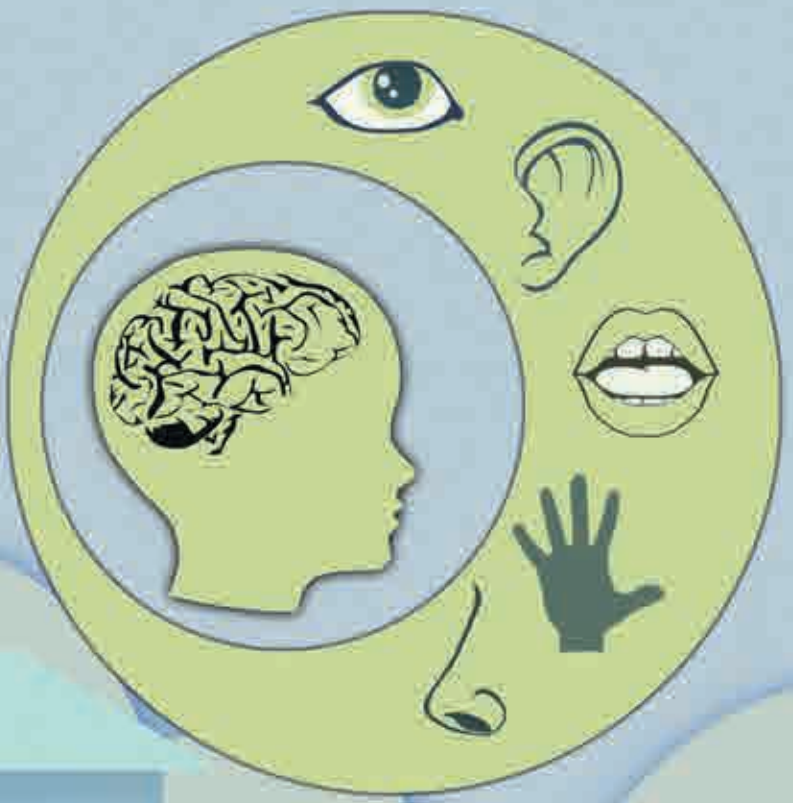

Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune- 411 004.

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