

The left side of the slide features a decorative design consisting of several vertical stripes of varying widths and shades of light purple and lavender. Overlaid on these stripes are several solid purple circles of different sizes, arranged in a roughly vertical, descending sequence from top to bottom. The largest circle is at the top, followed by a medium-sized one, a smaller one, and then two more circles of similar size at the bottom.

# **GROWTH AND DEVELOPMENT**

# GENERAL OBJECTIVES

At the end of the class students will be able gain knowledge regarding principles of growth of development and will develop a positive attitude towards it and will apply their knowledge in clinical and teaching area.

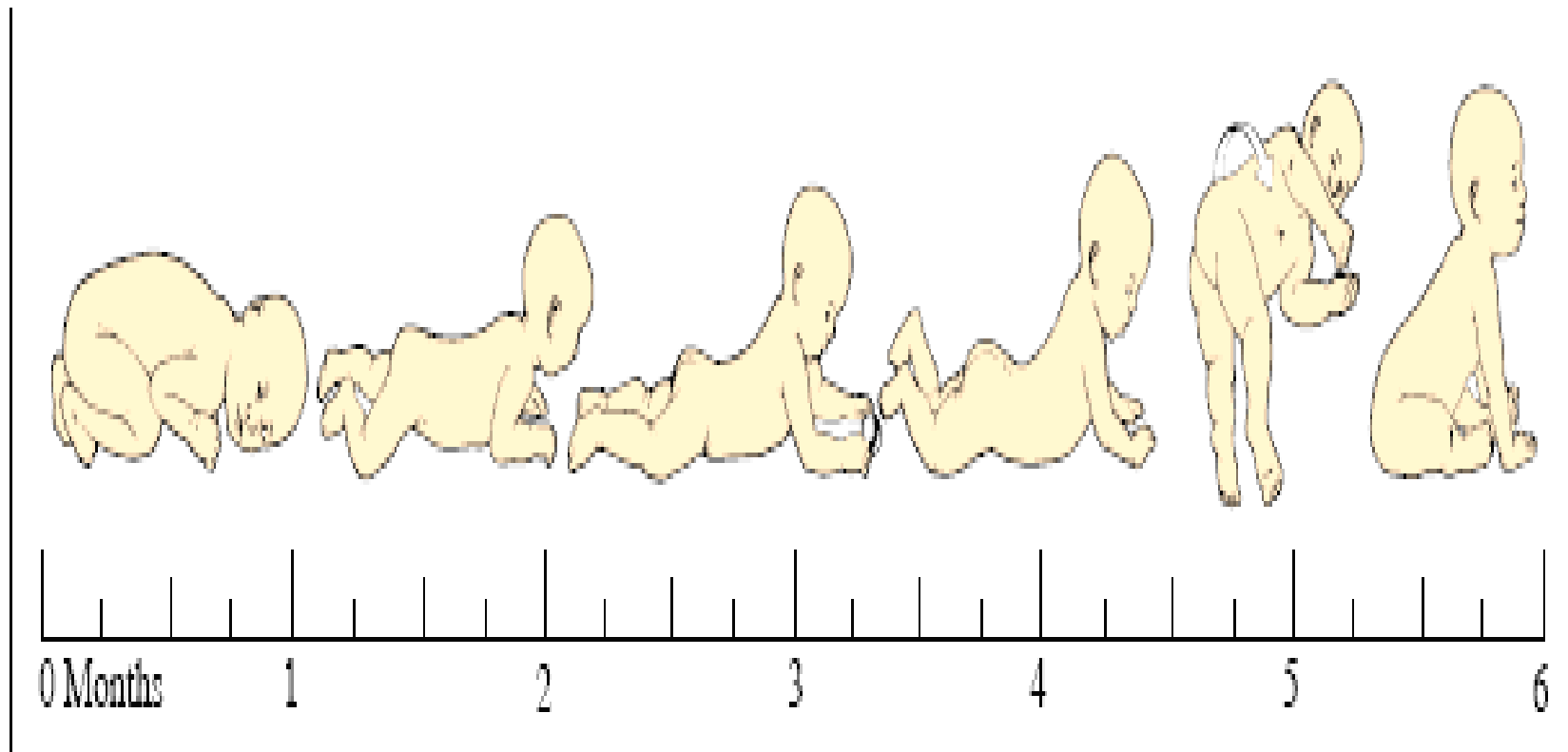


# SPECIFIC OBJECTIVES

- At the end of the class students will be able to,
  - Introduce the topic.
  - Define growth.
  - Define development.
  - Explain the stages of growth and development.
  - Explain the principles of growth and development.



# INTRODUCTION



# DEFINITION



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- ❑ **GROWTH:-**
- ❑ It is the process of physical maturation resulting an increase in size of the body and various organs.
- ❑ Growth means increase in size, height, weight, length etc. which can be measured.
- ❑ It is quantitative changes of the body which can be measured in centimeters/inches and pounds/kilograms.

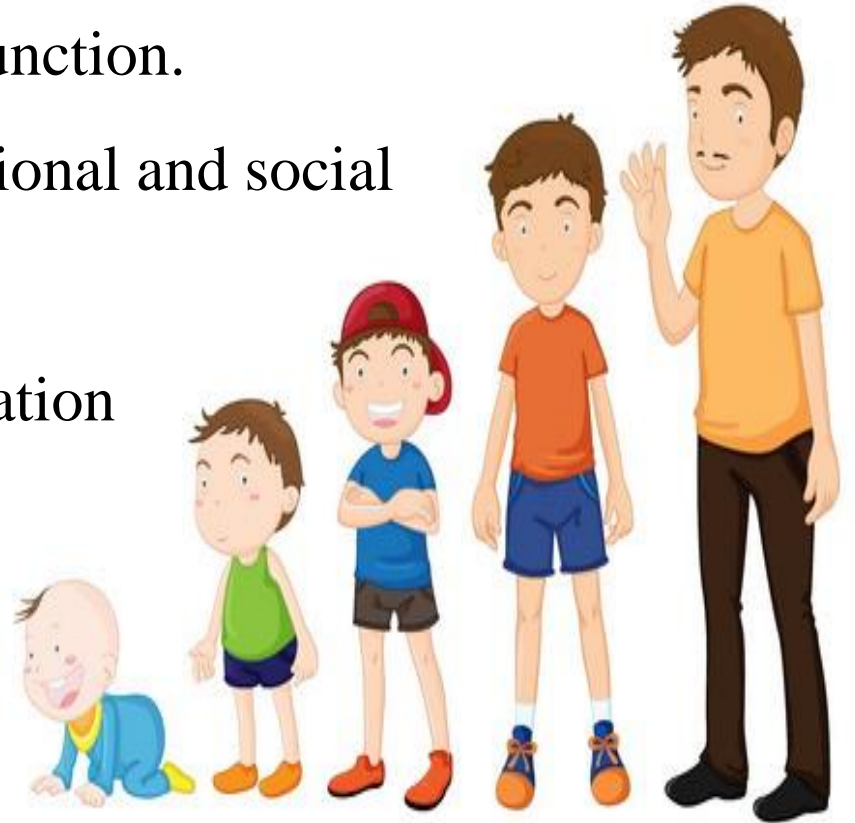


## ❑ DEVELOPMENT

❑ It is a process of functional and physiological maturation of the individual. It is progressive increase in skill and capacity to function.

❑ It includes psychological, emotional and social changes.

❑ It is qualitative aspect of maturation and difficult to measure.



# STAGES OF GROWTH AND DEVELOPMENT

Fetal Growth From 8 to 40 Weeks



## ➤ PRENATAL PERIOD



## ➤ POSTNATAL PERIOD





# PRINCIPLES OF GROWTH AND DEVELOPMENT

1) Growth and development is continuous and orderly process



**9 weeks**  
Fetal stage begins



**12 weeks**  
Sex organs differentiate



**16 weeks**  
Fingers and toes develop



**20 weeks**  
Hearing begins



**24 weeks**  
Lungs begin to develop



**28 weeks**  
Brain grows rapidly



**32 weeks**  
Bones fully develop



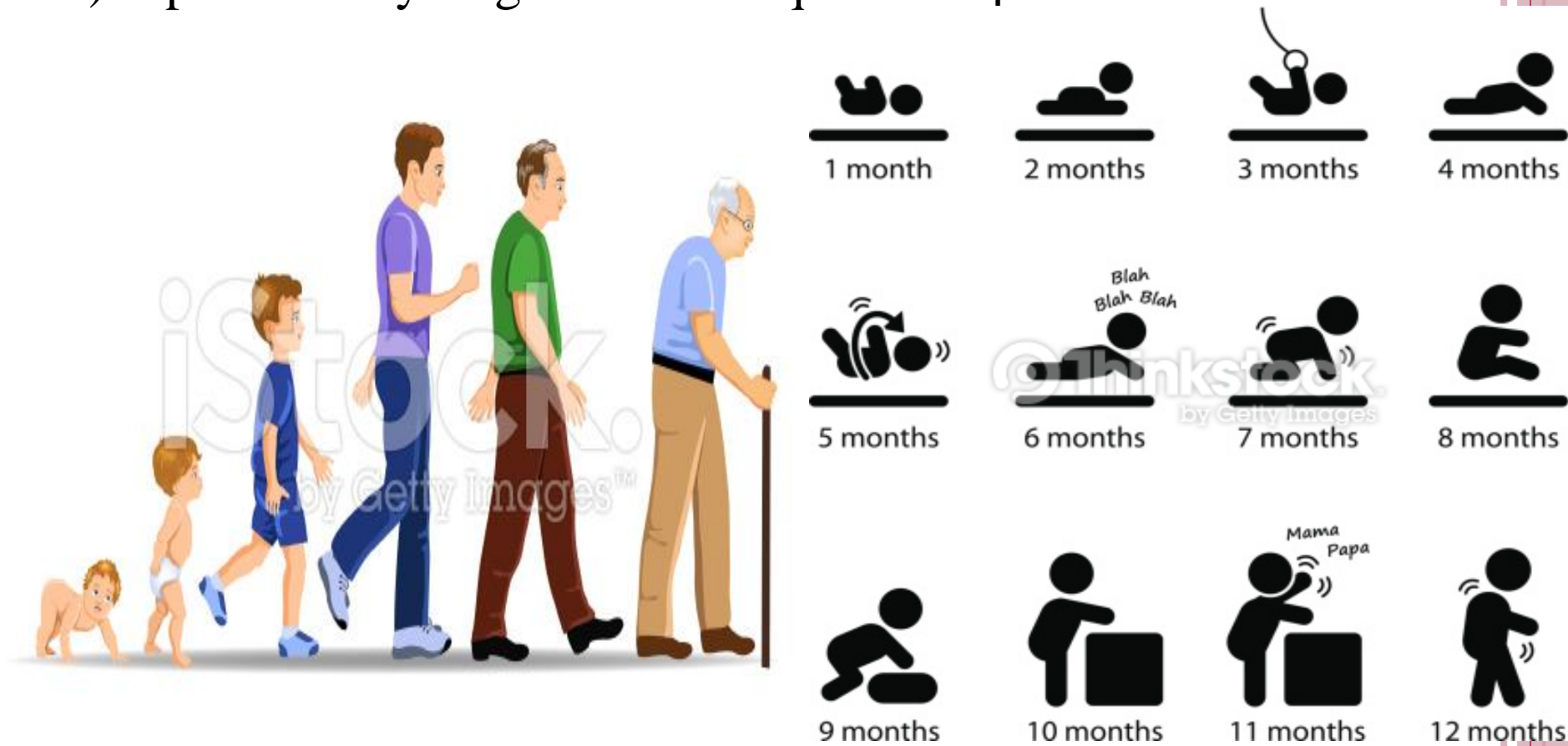
**36 weeks**  
Muscles fully develop



**40 weeks**  
Full-term development

# CONT....

2) It proceeds by stages and its sequence is predictable



## CONT....

3) There is co-ordination between increase in size and maturation

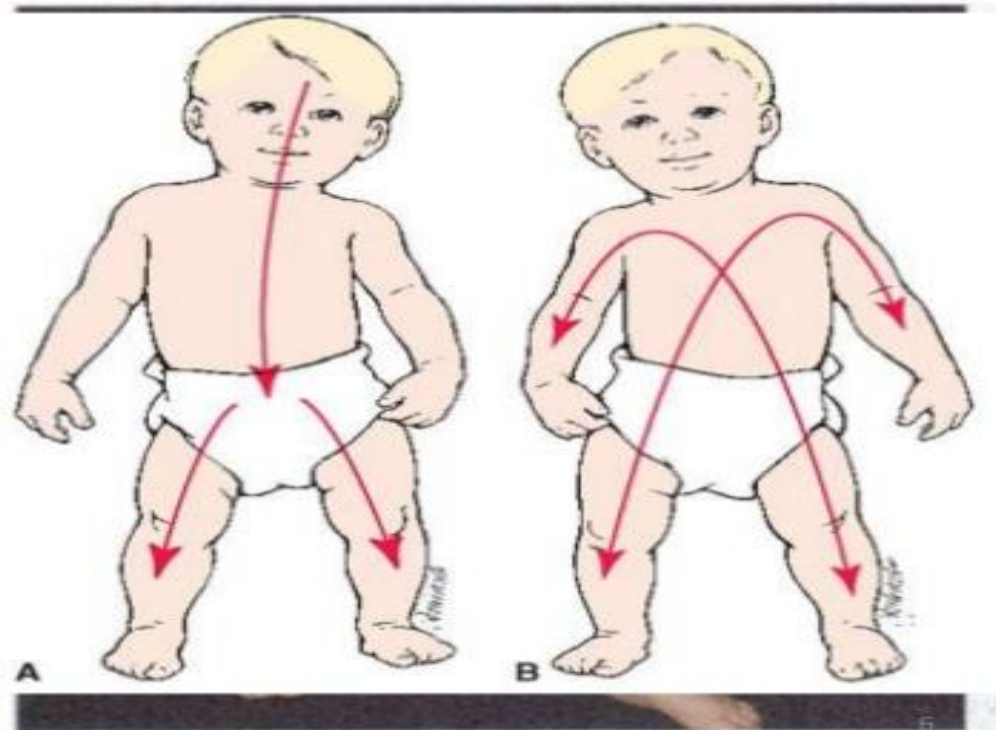


# CONT....

4) They proceed in

## Cephalocaudal direction

- The process of **cephalocaudal** direction from **head** down to **tail**. This means that improvement in structure and function come first in the head region, then in the trunk, and last in the leg region.

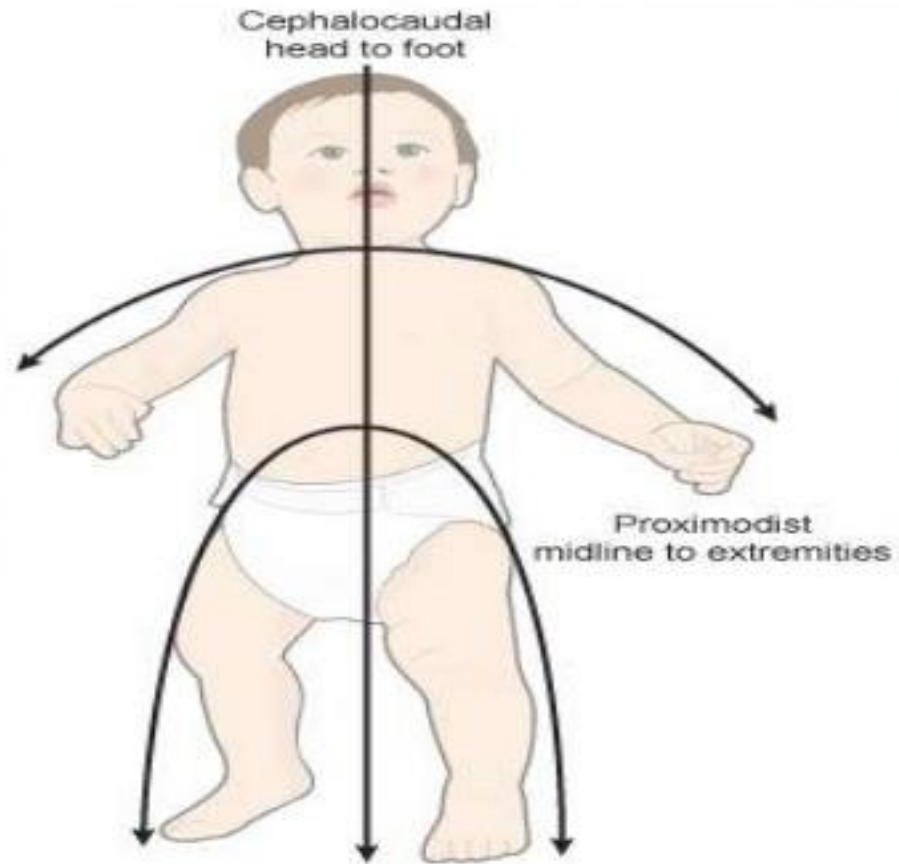


They proceed in

# Proximodistal direction

The process in

proximodistal from center or midline to periphery direction. development proceeds from near to far - outward from central axis of the body toward the extremities





- Development proceeds from general to specific responses



6)Rate of growth and development is interrelated and rapid in infancy and in puberty but slow in preschool and school age.

7)Growth and development depends on a combination of many interdependent factors especially by a heredity and environment.



# FACTORS INFLUENCING GROWTH AND DEVELOPMENT



## Genetic factor

- sex
- Race and nationality



## Prenatal factor

- Maternal malnutrition
- Maternal infection
- Maternal substance abuse
- Maternal illness
- Hormones
- miscellaneous





CONT...

## Postnatal factor



- Growth potential
- Nutrition
- Childhood illness
- Physical environment
- Psychological environment
- Cultural influences
- Socioeconomic status
- Climate and season
- Play and exercise
- Birth order of the child
- Hormonal influences



# SYSTEM CHANGES DURING GROWTH AND DEVELOPMENT

## Respiratory changes

- Rr in neonate -36 to 40 b/min gradually decrease 16-20b/min at 15 yr

## Cardiovascular changes

- Hr newborn- 120-160b/min at 1 yr is about 100 to 160b/min, at 4 yr it is 80 – 120 b/min, at 8 yr 70-100b/min, at 15 yr-70-90b/min, at 18 yr 70-80b/min

- BP in neonates- 80/46mmhg, at 1 yr 96/66mmhg, at 4 yr 99/65mmhg, at 8 yr 102/56mmhg, at 12 yr 113/59mmhg, at 14 yr 118/60mmhg



### Brain growth

- Growth occurs two third in first years , four- fifth in second year and fully developed within 5 yrs

### Blood changes

- Hb level newborn- 17(14-20)g/dl,
- At 3month-6yr, 12(11-14)g/dl, older children about 14 to 16 g/dl

### Gastrointestinal system

- Fat diagestion is less
- Liver is palpable throughout the childhood usually up to 18 months of age

### Urinary system

- Kidneys are large at birth
- Urine amount gradually increase from 250 ml /day in neonate and 12000ml /dya in 14 years
- Amount of creatinine is low in infant 10 to 20 mg/kg/day changed to 5 to 40 mg/kg/day in older children



## Hormonal changes

- Thyroid is well develop at birth
- Testicular and ovarian hormones appear at puberty

## Puberty changes in girls

- Growth in height and weight
- Breast changes like pigmentation of areola and enlargement of breast tissue
- Increase in pelvic girth
- Appearance of pubic hair and changes in vaginal secretion
- Activation of axillary sweat gland
- Appearance of axillary hair
- Onset of menstruation

## Puberty changes in boys

- Increase weight and height
- Increase in size of external genitalia
- Appearance of pubic hair followed by hair in axilla, upper lip, groin, thigh and umbilicus
- Appearance of facial hair after 2 yrs pubic hair
- Change in voice



# DIFFERENT ASPECTS OF DEVELOPMENT

- Development of children has different aspects which can be described in four important areas, viz. gross motor, fine motor-adaptive, language and personal-social behavior Other aspects are sensory, intellectual, emotional, sexual moral and spiritual.
- **Motor Development**
- Motor development depends upon maturation of muscular skeletal and nervous system. It is usually termed as gross fine motor development



- **Gross motor development** involves control of the child over his/her body by increasing mobility. It is assessed by ventral suspension, supine position, prone position, turning, reaching the object, etc.
- The important gross motor developmental milestones include head holding, sitting, standing, walking, running, climbing upstairs, riding tricycle, etc.



# FINE MOTOR DEVELOPMENT

- **Fine motor development** depends upon neural tract maturation. Initial neurological reflexes are replaced by purposeful activities.
- Fine motor developments promotes adaptive activities with fine sensory motor adjustments and include eye coordination, hand-eye coordination, hand-to- mouth coordination, hand skill as finger-thumb apposition, dressing, etc.



# LANGUAGE AND SPEECH DEVELOPMENT

- **Language and Speech Development**

Language development is the sensory motor development.

- It depends upon hearing, level of understanding, and encouragement. It is skill of communication with development of true speech.





# PERSONAL AND SOCIAL DEVELOPMENT

- **Personal and Social Development**
- Personal and social development includes personal reactions to his/her own social and cultural situations.
- It is related to interpersonal and social skill as social smile, recognition of mother, use of toys, play and mimicry.



# SENSORY DEVELOPMENT

- **Sensory Development**
- Sensory development depends upon myelination of nervous system and responds to specific stimuli.
- Taste, smell, touch and hearing are initial senses present in newborn babies.



# EMOTIONAL DEVELOPMENT AND PERSONALITY DEVELOPMENT

- **Emotional Development and Personality Development**
- Adequate guidance and problem solving at different stages help for the healthy progress to next stage of personality development which promotes emotional maturation in adulthood.
- The emotional needs include effective mothering, love, affection, safety, security, protection, play, guidance and counseling, independence, acceptance with positive approach, approval, etc.



# DEVELOPMENTAL MILESTONES

- Development is the functional maturation of organs.
- Developmental milestones are accomplished by the children at an anticipated age There may be great variations of time in achievement of different levels of development with extreme ranges.





1 month



2 months



3 months



4 months



5 months



6 months



7 months



8 months



9 months



10 months



11 months



12 months



# BABY DEVELOPMENT IN FIRST YEAR



1  
MONTH



Smiling

3



Holding head up

Rolling over  
both ways

4



6



Sitting  
without support

5



Rising up  
on hands

8



Crawling

9



Trying to get up

11



Standing with  
support, first steps

12



Walking

# THE AVERAGE ACHIEVEMENT LEVELS IN DIFFERENT AGE GROUP OF CHILDREN UP TO 12 YEARS ARE AS FOLLOWS:

## ○ **1 to 2 months:**

- Able to lift the chin momentarily on prone position.
- Able to regard bright colored object at 20 cm distance. Cries when hungry or at discomfort.
- Able to turn head toward sound and smiles back to mother or caregiver.

## ○ **2 to 3 months:**

- Able to lift head and front part of chest by supporting weight on extended arms.
- Can follow moving object with steady eye movement and able to focus eyes.
- Produce 'cooing' sound and enjoy people talking with her/ him. Able to recognize mother and turn head to sound.



- **4 to 5 months:**

- Can hold head steadily in upright position.
- Can reach a thing and grasp it crudely with palm. Make coos, gurgles and respond by making sounds. Join hands together in play, enjoy people and laugh out loudly.

- **5 to 6 months:**

- Able to sit with support, can hold a cube and transfer from one hand to other. Try to imitate sound and enjoy own mirror image.

- **7 to 8 months:**

- Can sit without support and roll in bed from back to side then back to abdomen. Produce bubbles and say aam, 'da 'la. Recognize unknown person and show anxiety. Resist toys to be taken from him/her.





- **8 to 9 months:**
- Able to crawl on abdomen. Speak 'Da-Da' and 'Ma-Ma' combining syllables without meaning.
- **9 to 10 months:**
- Able to creep on hands and knees. Can stand it with support and cruises around furniture. Able to pick up a s pellet with thumb and index finger. Understand emotions like anger, anxiety. Wave 'bye-bye' and want to please caregiver, say ba-ba, da-da, ma-ma with meaning.



- **10 to 12 months:**
- Can stand without support and walk holding furniture. Able to feed himself/herself with spilling. Pick up e small bits of food and take to mouth. Able to push toy car alone and play simple ball game. Can speak 3 to 5 meaningful of words and understand meaning of several words. Respond for affection by kiss.



# TODDLERS

- **15 months:**
- Able to walk alone, can walk several steps sidewise and few steps backward. Can feed himself or herself without spilling. Able to turn 2 to 3 pages at a time.
- **18 months:**
- Can creep upstairs. Able to feed from cup. Take shoes and socks off. Want potty, point the parts of body, if asked. Build tower of two blocks and stop taking toys to mouth. Use 6 to 20 words. Copy mother's action.
- **2 years:**
- Able to run and try to climb upstairs by resting on each step and then climbing up on next. Put shoes and socks on. Can remove pants. Build tower of six to seven blocks. Can copy and draw a horizontal and vertical line. Control bladder at day time (dry-by-day). Speak simple sentences without use of verb.



- **3 years:**
- Can walk on tip-toes and stand on one leg for seconds.
- Jump with both feet. Climb upstairs by coordinated manner. Ride tricycle.
- Can dress and undress. Brush teeth with help. Can draw a circle.
- Build tower of nine blocks.
- Has vocabulary of about 250 words. Repeat three numbers (once in three times).
- Know own name and sex.
- Achieve bladder. Healthy toddler control at night (dry-by-night).
- Fear dark. Interact and play simple games with peers.



# PRESCHOOLER

- **3 to 6 years:**
- Can jump. Able to draw a cross ('+') by 4 years and tilted cross ('x') by 5 years of age.
- Can draw a rectangle by 4 years and a triangle by 5 years.
- Able to copy letters. Can tell stories and describe recent experience.
- Become independent, impatient, aggressive physically and verbally.
- Jealous of sibling but gradually improve in behavior and manner.



# SCHOOL AGE

## **6 to 8 years:**

Able to run, jump, and climb with better coordination. Develop better hand-eye coordination. Able to write better and take self-care. Able to use complete sentences to express feelings and follow commands. Play in group. Learn discipline.

## **8 to 10 years:**

Play actively with different physical skill. Improved writing skill and speed. Use short and compact sentences. Participate in family discussion. Peer group involvement and increased awareness about sex role.

## **10 to 12 years:**

Develop more coordinated, skilful manipulative activities and games. Able to use parts of speech correctly. Accepts suggestions and instruction obediently. May show short burst of anger.



THANK YOU







Thank  
You