





























Prenatal Development Timeline

■ Nervous	■ Cardiovascular	■ Muscular	■ Early Events
■ Special Senses	■ Respiratory	■ Skeletal	■ Growth Parameters
■ Blood & Immune	■ Gastrointestinal	■ Endocrine	■ General
■ Skin/Integument	■ Renal/Urinary	■ Reproductive	■ Movement










Unit 1: The First Week	
Day 0	Embryonic period begins
Day 1	Embryo is spherically shaped with 12 to 16 cells
Day 1 - Day 1	Fertilization - development begins with a single-cell embryo!!!
Day 2	Zygote divides into two blastomeres (24 - 30 hours from start of fertilization)
Day 4	Free floating blastocyst
	Inner cell mass
	See where the back and chest will be
Day 6	Embryo attaches to wall of uterus
1 week	Placenta begins to form
Unit 2: 1 to 2 Weeks	
1 week, 1 day	Positive pregnancy test
1 week, 2 days	Cells in womb engorged with nutrients
1 week, 5 days	Implantation complete
	Yolk sac
Unit 3: 2 to 3 Weeks	
2 weeks, 1 day	Rostral-caudal orientation
2 weeks, 2 days	Three types of blood-forming cells in yolk sac
2 weeks, 4 days	Foregut, midgut, and hindgut
	Brain is first organ to appear
2 weeks, 6 days	Beginnings of the heart can be seen
	Forebrain, midbrain, and hindbrain
	Three main divisions of brain
3 weeks	Blood and blood vessels
Unit 4: 3 to 4 Weeks	
3 weeks, 1 day	Respiratory outgrowth
	Circulatory system function begins
	Heart begins beating
	Tubular heart begins folding
	Umbilical arteries
	Umbilical veins (right and left)
	Body cavities
3 weeks, 3 days	Liver
	Membrane between future mouth and throat may begin to rupture
3 weeks, 5 days	First part of pancreas
	Lung bud

	 Descending aorta
	 Lowermost spinal cord formation begins
	 Neural tube closes (lower back)
	 Upper limb primordium at level of somites 8 to 10
	 Progressively C-shaped embryo
4 weeks	 Skin is so thin, you can see through it!
	 Esophagus primordia
	 Pancreas: Ventral pancreas
	 Pharynx
	 Small & large intestines
	 Lungs begin filling chest cavity
	 Trachea
	 Circulatory system "well established"
	 Functioning two-chamber heart
	 Heart rate (about) 113 beats/min
	 Fourth ventricle
	 Cervical flexure
	 Limb buds - the first sign of arms and legs
	 Umbilical cord emerging
	 Upper and lower limb buds




Unit 5: 4 to 5 Weeks

4 weeks, 4 days	 Nose: Nasal pits
	 Brain: Cerebral hemispheres appear and begin rapid growth
4 weeks, 5 days	 Blood vessels penetrate diencephalon
	 Brain with five main sections
	 First nerve fibers
5 weeks	 Lobar pattern mimics adult pattern
	 Pacemaker cells
	 Head is one third of entire embryo

Unit 6: 5 to 6 Weeks

5 weeks, 2 days	 All cranial nerves identifiable
5½ weeks	 Initial tooth formation
5½ weeks - 6 weeks	 Subtle movement begins
5 weeks, 6 days	 Primordial vermiform appendix
6 weeks	 Face withdraws from light touch around mouth
	 Blood forming in liver
	 Tooth buds (primary teeth)
	 Intestines fill base of umbilical cord
	 External ears

Unit 7: 6 to 7 Weeks

6 weeks, 2 days	 Elbow regions sometimes identifiable
	 Humerus, radius, and ulna
	 Submandibular gland primordia

	Brainwave activity has begun
6½ weeks	The hands begin to move
	Bones first form in the collar bones and lower jaw
6 weeks, 5 days	Arms point forward
	Beginnings of occipital and sphenoid bones
6 weeks, 6 days	Cloacal membrane ruptures
7 weeks	Head rotates
	Leg movements
	Ovaries
	Hiccups
	The heart has four chambers and is nearly complete.
	The heart rate peaks at 165 to 170 beats per minute.

Unit 8: 7 to 8 Weeks

7 weeks, 1 day	Upper limbs with slightly flexed elbows
	Sacrocaudal spinal cord formation (secondary neurulation) complete
7 weeks, 1 day - 8 weeks	Stomach: Folds in stomach wall
7 weeks, 2 days	Arteries and veins of heart complete
7 weeks, 3 days	The knee joints have arrived
	Eyelids growing rapidly
7½ weeks	Fingertips thicken
	EKG pattern similar to adult
7 weeks, 4 days	The fingers are free
7 weeks, 5 days	Bone-forming cells emerge
	Hands can reach one another and fingers can overlap
8 weeks	Complex response to touch
	More frequent hand-to-face contact
	Urine production and release
	Occasional breathing motions begin
	Blood supply to the brain closely resembles adult pattern
	Ear drum
	"The hindbrain "presents striking resemblance to that of the newborn."
	Brain represents 43% of embryo
	Right- and left-handedness emerges
	Embryonic Period Ends

Unit 9: 8 to 9 Weeks

8½ weeks	Eyelids completely fused
9 weeks	Bends hip & knee if sole of foot touched
	Drinking fluid is becoming routine
	Sucking the thumb
	The young fetus now sighs, stretches, moves the head, opens the mouth, and moves the tongue
	Thyroid gland weighs 2 grams

	<div> <div></div> Face, hands, and feet sense light touch </div>
Unit 10: 9 to 10 Weeks	
9 weeks - 10 weeks	<div> <div></div> My weight will rise more than 75% this week </div>
9 weeks, 4 days	<div> <div></div> Yawns </div>
10 weeks	<div> <div></div> Palatine tonsils </div>
	<div> <div></div> Fingernails and toenails begin to grow! </div>
	<div> <div></div> Three-layered epidermis </div>
	<div> <div></div> Tiny unique fingerprints have arrived! </div>
	<div> <div></div> Now, all the bones are getting harder </div>
	<div> <div></div> Tooth buds (secondary teeth) </div>
Unit 11: 10 to 11 Weeks	
10½ weeks	<div> <div></div> Volar and plantar pads regress </div>
11 weeks	<div> <div></div> Nose & lips completely formed </div>
	<div> <div></div> Now you can tell if your baby is a girl or a boy! </div>
	<div> <div></div> Thyroid gland weighs 12 grams </div>
	<div> <div></div> Intestines absorb water & glucose </div>
Unit 12: 11 to 12 Weeks	
12 weeks	<div> <div></div> Many different hormones are present in pituitary gland </div>
	<div> <div></div> Upper limbs reach final proportion </div>
	<div> <div></div> Bowel movements </div>
	<div> <div></div> Liver: Bile production begins </div>
	<div> <div></div> There are taste buds all over the mouth </div>
	<div> <div></div> Head circumference 10 cm </div>
Unit 13: 3 to 4 Months	
13 weeks	<div> <div></div> Teeth are growing </div>
	<div> <div></div> Most of body sensitive to touch </div>
14 weeks	<div> <div></div> Girls move their jaws more than the boys do </div>
	<div> <div></div> Light touch to mouth evokes turn toward stimulus </div>
	<div> <div></div> Cerebellum resembles adult structure </div>
	<div> <div></div> Fat deposits in cheeks </div>
15 weeks	<div> <div></div> Body fat emerges throughout the body </div>
16 weeks	<div> <div></div> Quickening </div>
	<div> <div></div> Fat deposits upper & lower limbs </div>
Unit 14: 4 to 5 Months	
18 weeks	<div> <div></div> Cream-like substance protects skin </div>
	<div> <div></div> Sweat glands </div>
19 weeks	<div> <div></div> Melanin production </div>
	<div> <div></div> Daily cycles in biological rhythms </div>
20 weeks	<div> <div></div> All skin layers and structures </div>
	<div> <div></div> Hearing and responding to sound begins </div>
	<div> <div></div> Hearing and responding to sound begins </div>
	<div> <div></div> Head circumference 20 cm </div>
Unit 15: 5 to 6 Months	
20 weeks - 24 weeks	<div> <div></div> Eyelids separate, eyes open and close </div>

21 weeks - 22 weeks	□ If born prematurely from this point on, survival is possible
23 weeks	□ Brain weight 100 grams
Unit 16: 6 to 7 Months	
25 weeks	<div>■ Intestinal lining contains all adult cell types</div> <div>■ The ability to taste</div>
26 weeks	<div>■ Additional fat deposits decrease wrinkles</div> <div>■ The ability to smell has arrived</div>
26 weeks - 38 weeks	■ Brain weight increases 400% to 500%
27 weeks	■ Pupils react to light
Unit 17: 7 to 8 Months	
30 weeks	<div>■ Breathing motions are common even though there is no air in the womb</div> <div>□ Head circumference 30 cm</div>
32 weeks	■ Esophagus: Lower esophagus muscles functional
Unit 18: 8 to 9 Months	
32 weeks - 36 weeks	■ Prenatal food affects newborn taste preferences
35 weeks	■ Firm grip
36 weeks	□ Brain weight 300 grams
Unit 19: 9 Months to Birth	
37 weeks	■ Fetus drinks an estimated 15 oz (or 450cc) of amniotic fluid/day
38 weeks	<div>■ Heart beats 54 million times before birth</div> <div>□ Brain weight 350 grams</div> <div>□ Fetus initiates labor</div> <div>□ Head circumference 35 cm</div> <div>□ Time to be born!</div>