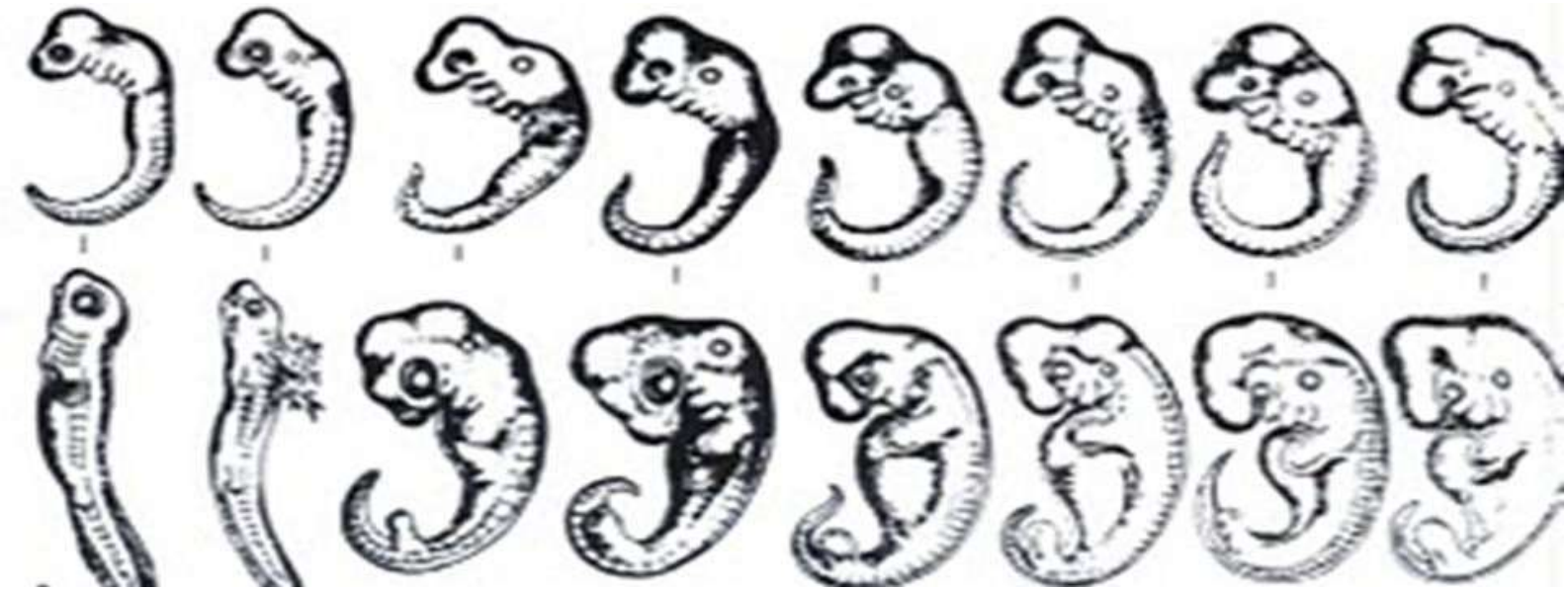
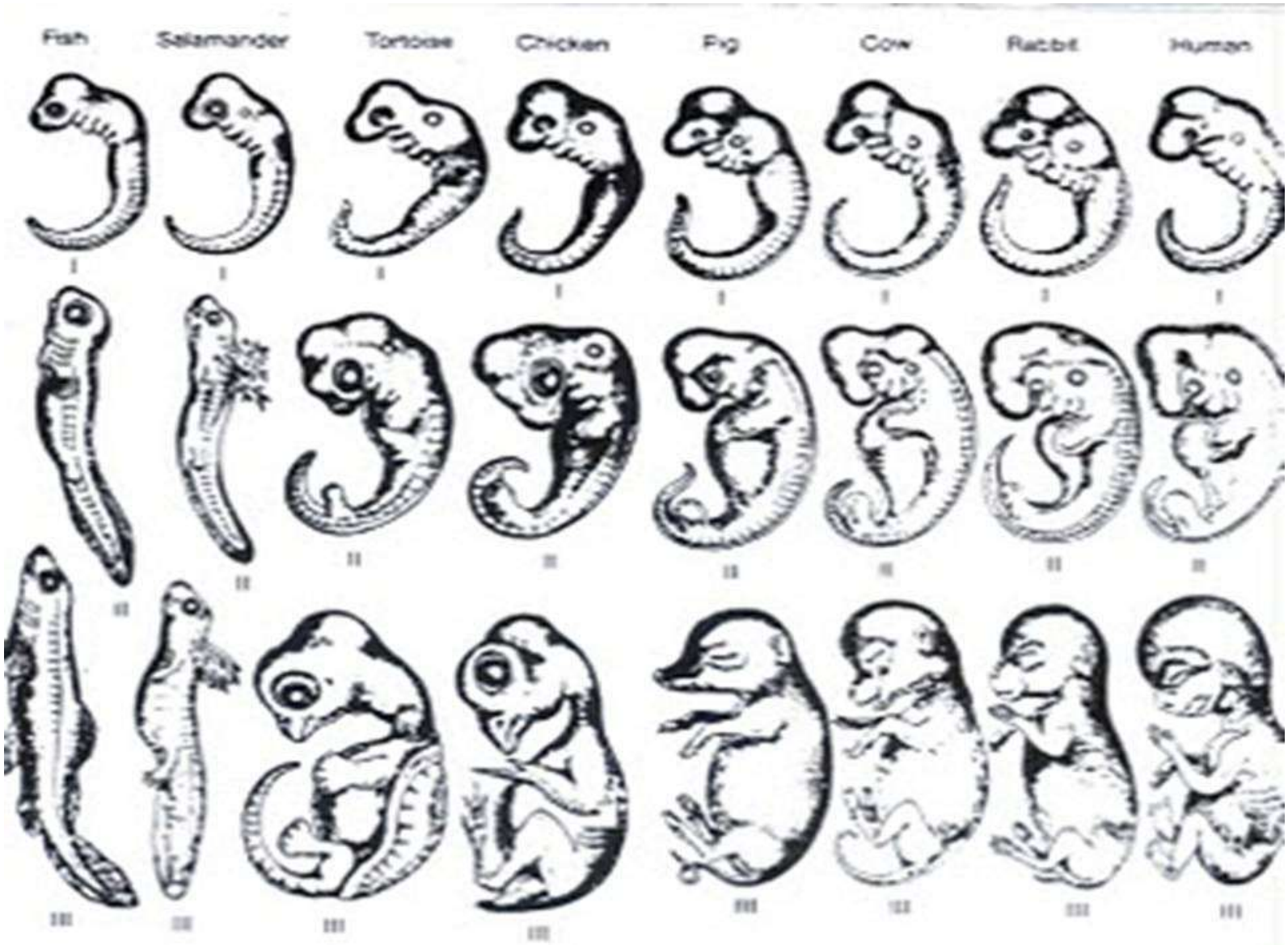
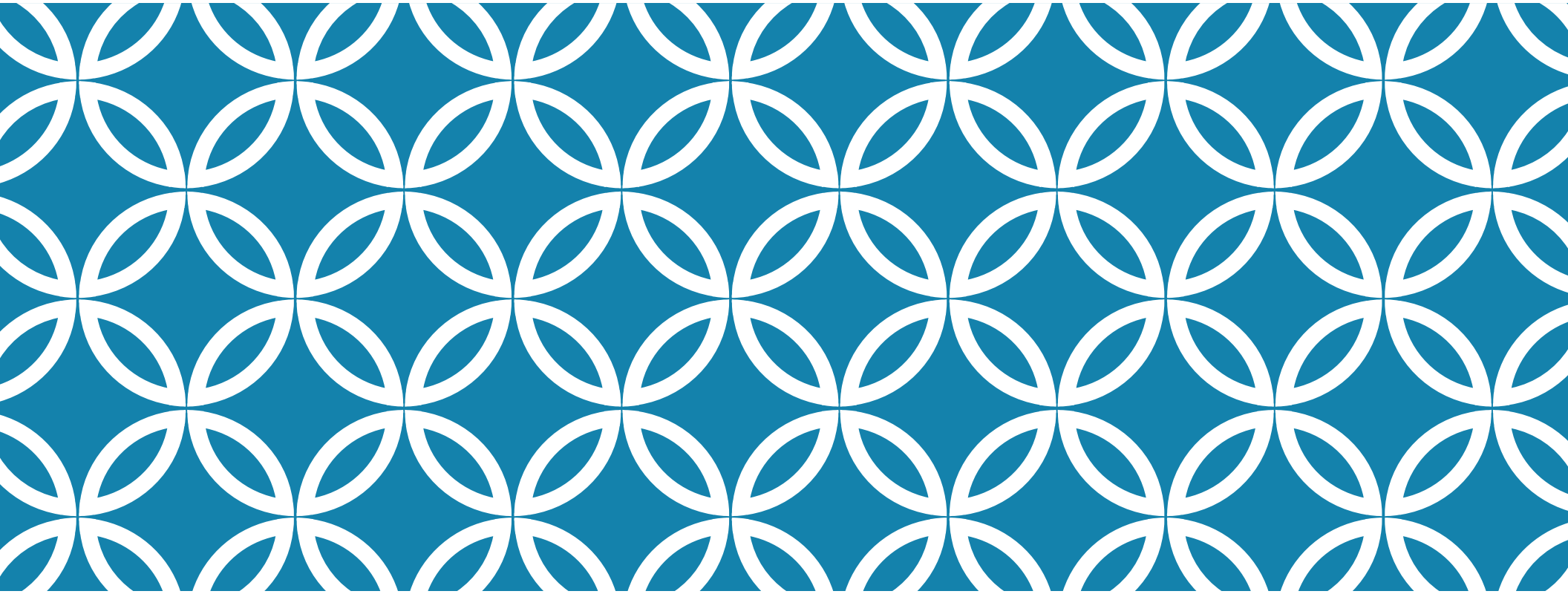



Fish
Salamander
Tortoise
Chicken
Pig
Cow
Rabbit
Human
I
II
III



BIOLOGY VI

Human Embryonic Development

HUMAN EMBRYONIC DEVELOPMENT

The human zygote develops through two main stages.

Human prenatal (before birth) development begins when fertilization occurs. Fertilization occurs when the male and the female gamete combine their nuclei together to make a zygote.

There are a number of ways in which fertilization can occur; there are reproductive technologies that exist which may aid in this process.

HUMAN EMBRYONIC DEVELOPMENT

- In the first 30 hours, the zygote divides through mitosis and eventually becomes a blastocyste
- Cell division continues rapidly
- The dividing cells travels and implants to the lining of the uterus


Two cell
Four cell
Eight cell

HUMAN EMBRYONIC DEVELOPMENT

Human prenatal development occurs in two stages:

- Embryonic stage: first 8 weeks
- Fetal stage: 30 weeks

In total, it takes approximately 38 weeks from fertilization to birth.

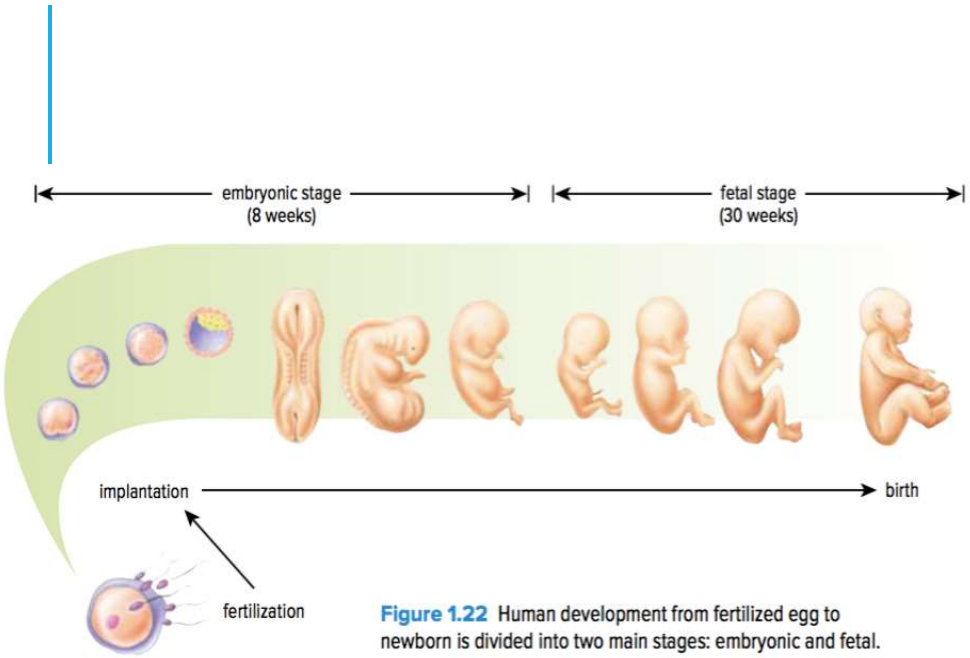


Figure 1.22 Human development from fertilized egg to newborn is divided into two main stages: embryonic and fetal.

Table 1.2 Human Prenatal Development

Month	Mass at End of Month (g)	Some Key Developments
1	<1	• Spinal column and central nervous system start to form • Appendages are represented by small limb buds • Heart begins beating (around day 22)
2	1	• Eyes form, but eyelids are fused shut • Brain waves are detectable • Limb buds form paddle-like hands and form ridges
3	30	• Eyes are well developed, but eyelids are fused • Limbs are well-formed, with nails on fingers and toes • Fetus moves but too weakly for mother to feel it
4	100	• Face looks more distinctly human • Heartbeat can be heard with a stethoscope • Scalp begins to grow hair
5	200–450	• Body covered with fine hair (lanugo) • Mother can feel fetal movements • Fetus is now bent forward into "fetal position"
6	500–800	• Eyes are open • Skin is wrinkled, pink, and translucent
7	1100–1350	• Fetus turns to an upside-down position • Fetus can usually survive if born prematurely
8	2000–2300	• Fetus has a "babyish" appearance, with less wrinkled skin
9	3200–3500	• More fat deposits • Nails extend to or beyond fingertips • Birth is imminent

VIDEO

https://www.youtube.com/watch?v=I1qvUPYDnOY&ab_channel=DavidBarlow

SEXUAL REPRODUCTION

Sexual reproduction varies based on a variety of factors. Three main factors are…

- Reproductive behaviors
- Methods of fertilization
- Ways that offspring development

Different organisms will develop offspring either internally or externally (in the form of eggs) depending on the species.

VIDEO: SALAMANDER DEVELOPMENT

https://www.youtube.com/watch?v=SEejivHRIbE&ab_channel=NationalGeographic