

1-3 C3 Zygote Development

January 20, 2023 9:05 AM

Science 9 –Topic 1.3 – Concept 3: Development of the human zygote occurs in stages

Human prenatal (before birth) development begins when fertilization occurs

- Within 30 hours: Zygote divides by mitosis
- Cell division continues rapidly
- Mass of dividing cells travels and implants to the lining of the uterus



Human Prenatal Development: Embryonic and Fetal Stages

- Embryonic stage: 8 weeks
- Fetal stage: 30 weeks
- Total: 38 weeks from fertilization to birth

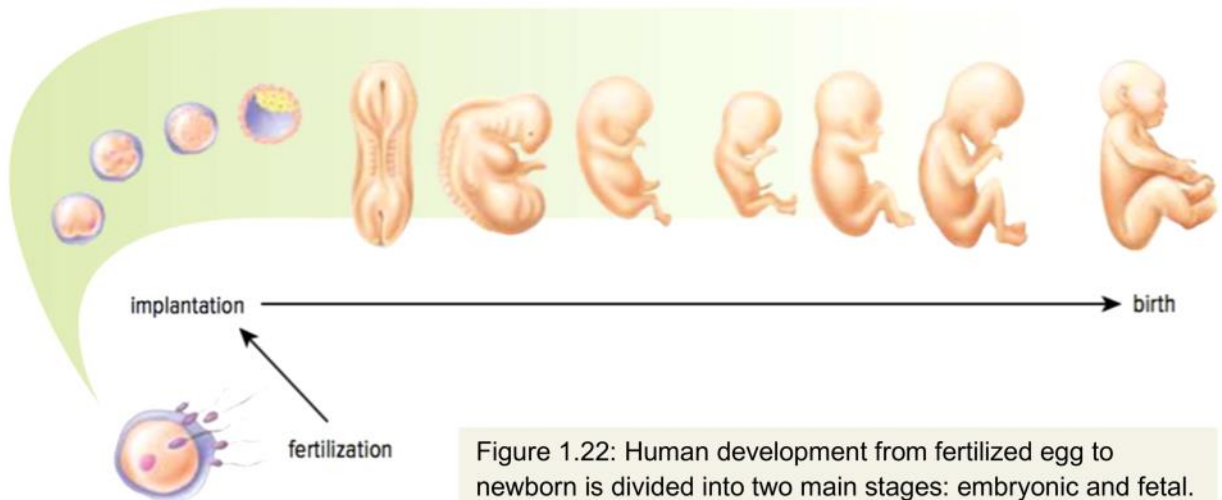
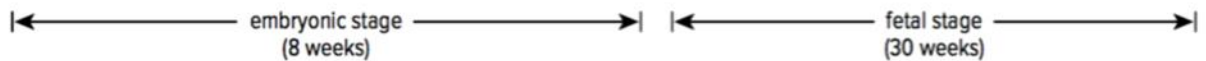


Figure 1.22: Human development from fertilized egg to newborn is divided into two main stages: embryonic and fetal.

Embryonic Development

Embryonic development is the early development of an organism - in humans, it is the first two months after fertilization

- Once a sperm & egg fuse to form a Zygote, the zygote divides and becomes an embryo (developing organism)
- Embryo is protected inside seeds, eggs, or the mother.
- Mitosis and cell division are the basis of embryonic development

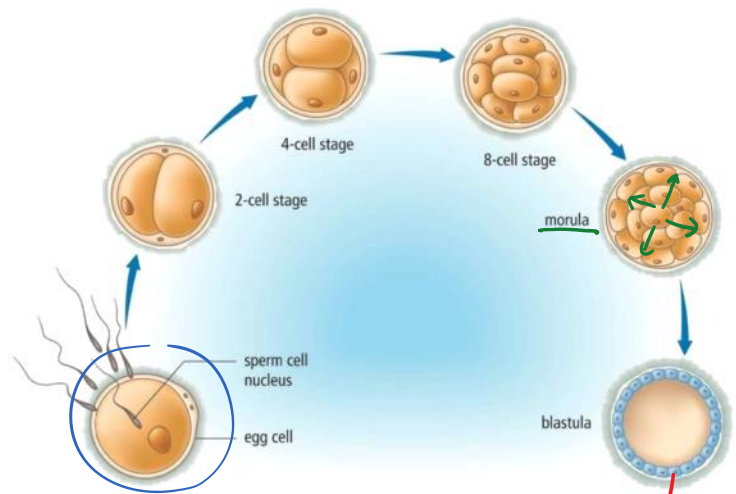


Figure 6.33 Mitosis and cell division are the basis of embryonic development.

Stem cells

• Stages:

- End of the first week - ball of cells called morula
- By end of second week it is a hollow ball called a blastula
- Cells at this stage are Stem cells, and have the ability to develop into any kind cell
- In the next stage the embryo develops 3 layers: ectoderm (skin, nerves), mesoderm (muscles, bones), and endoderm (lungs, liver, digestive system lining)

Fetal Development

The cell layers now differentiate into the organs and tissues of a baby - this is divided into 3 trimesters.

1. **First Trimester (0-12 weeks)**
Organ systems begin to develop and form. Bone cells form.
2. **Second Trimester (13-26 weeks)**
Rapid growth from 12-16 weeks.
The baby can now hear and swallow
3. **Third Trimester (27-40 weeks)**
Continued growth, especially of brain.
Fat begins to deposit at 32 weeks to keep baby warm at birth.

