

## Chapter 17

# The Beginning of the Life Cycle

1. Prenatal Development and Care
2. Heredity and Genetics
3. Birth Through Childhood

#Onedaylwokeup #Doppitup

## Lesson 1 — Prenatal Development and Care

**Fertilization** (conception) occurs when a sperm and egg unite, typically in the fallopian tube, creating a **zygote** with 46 chromosomes (23 from each parent). Within 6 days, **implantation** occurs as the cluster burrows into the uterine wall. Development stages: zygote → embryo (weeks 3–8) → fetus (week 9 through birth).

### Three Trimesters of Development

<b>1st Trimester (0–14 wks)</b>	Most critical period. Organs form; heart beats; hands, fingers, feet, toes develop. Most vulnerable to damage.
<b>2nd Trimester (15–28 wks)</b>	Mother often most comfortable. Fetus can blink, hear conversations; regular sleep/wake cycles begin.
<b>3rd Trimester (29–40 wks)</b>	Rapid growth. Fetus uses all five senses. At week 40, weighs 6–9 lbs and is ready to be born.

### What to Avoid During Pregnancy

- ■ **Tobacco** — Linked to 30% of low-birth-weight babies, 14% of premature births. Vaping still exposes fetus to nicotine.

- ■ ■ **Alcohol** — NO safe amount during pregnancy. Causes Fetal Alcohol Spectrum Disorders (FASD) — leading preventable cause of intellectual disability in the U.S.
- ■ ■ **Drugs** — All medications need doctor approval. Illegal drugs cause severe risks: premature birth, developmental delays, addiction at birth.

## Lesson 2 — Heredity and Genetics

Humans have **46 chromosomes in 23 pairs** in almost every cell. Each chromosome contains thousands of **genes** — the specific segments of DNA coding for individual traits. You share about 99.9% of your DNA with every other human on Earth; that 0.1% difference accounts for all the variation between people.

### Gene Therapy — From Experimental to Real

When the original textbook was written, gene therapy was largely experimental. As of 2024, the FDA approved **eight new gene and cell therapies** in a single year, and over **76** have received global approval. **CRISPR-Cas9** is now the dominant gene editing tool. In 2023, the FDA approved the first CRISPR-based therapy (Casgevy) to treat sickle-cell disease.

## Lesson 3 — Birth Through Childhood

Developmental psychologists divide life into stages, each with developmental tasks — milestones that need to happen for healthy growth.

<b>Infancy (0–12 mo)</b>	Fastest growth period. Brain forms 1 million+ new neural connections per second. Building trust is foundational.
<b>Early Childhood (1–3 yrs)</b>	Developing autonomy — confidence to control their own body and choices. 'No' becomes their favorite word.
<b>Middle Childhood (4–6 yrs)</b>	Initiating play, forming friendships, testing limits. Beginning to understand cause and effect.
<b>Late Childhood (7–12 yrs)</b>	School becomes central. Developing moral conscience and deeper friendships.

## Chapter Vocabulary

### Lesson 1

<b>Fertilization</b>	The union of a sperm and egg cell, resulting in a zygote; also called conception
<b>Implantation</b>	The process by which the zygote attaches to and burrows into the uterine wall
<b>Embryo</b>	The developing organism from weeks 3–8 of pregnancy
<b>Fetus</b>	The developing organism from week 9 through birth
<b>Prenatal care</b>	The health practices and medical supervision a pregnant woman undertakes to protect her health and her baby's
<b>Fetal Alcohol Spectrum Disorders (FASD)</b>	A range of permanent physical and cognitive conditions caused by prenatal alcohol exposure

### Lesson 2

<b>Chromosomes</b>	Thread-like structures in the cell nucleus that carry the genetic code; humans have 46 (23 pairs)
<b>Genes</b>	Segments of chromosomes that are the basic units of heredity; each codes for specific traits
<b>DNA</b>	The double-helix molecule that makes up chromosomes and contains the complete genetic code
<b>Genetic disorders</b>	Conditions caused partly or completely by a defect or mutation in genes
<b>Gene therapy</b>	A medical treatment that corrects genetic disorders by introducing, repairing, or replacing defective genes

### Lesson 3

<b>Developmental tasks</b>	The milestones and experiences that must occur at each life stage for healthy growth
<b>Autonomy</b>	The growing confidence and ability to control one's own body and choices