

A vertical strip on the left side of the slide shows a microscopic view of a sperm cell with a pink head and a long, wavy tail, swimming towards a large, light blue egg cell. Other smaller sperm cells are visible in the background.

# Fertilization

B.M.C. Durfee High School

# Objectives

- **Identify the female gamete**
- **Identify the male gamete**
- **Describe the process of human fertilization**



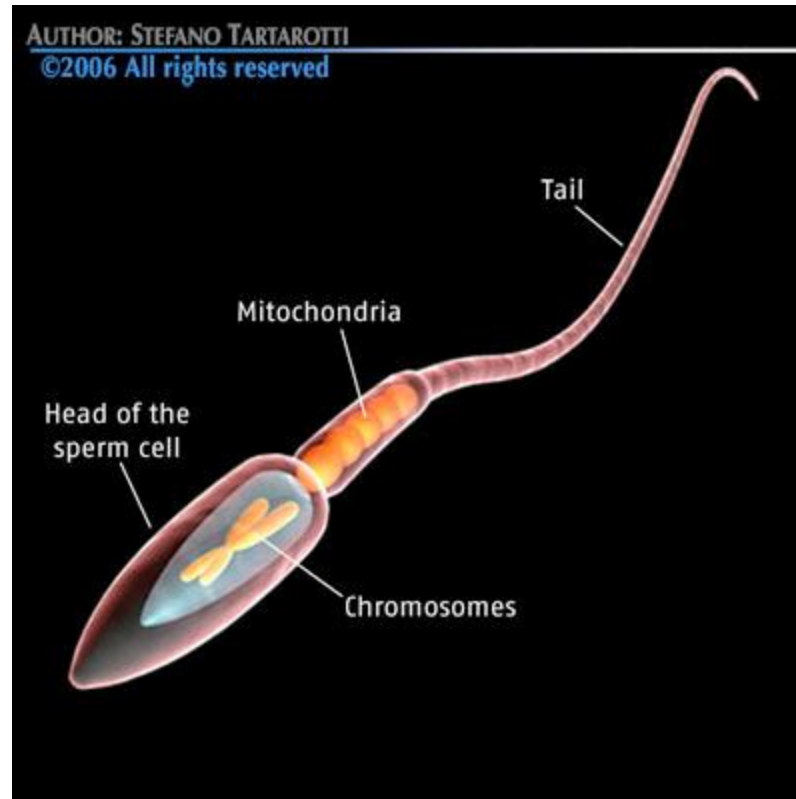
# Introduction to Fertilization

- **Gametes**
- **Release of the egg**
- **Journey of the sperm**
- **Fertilization**
- **Implantation**
- **Pregnancy**

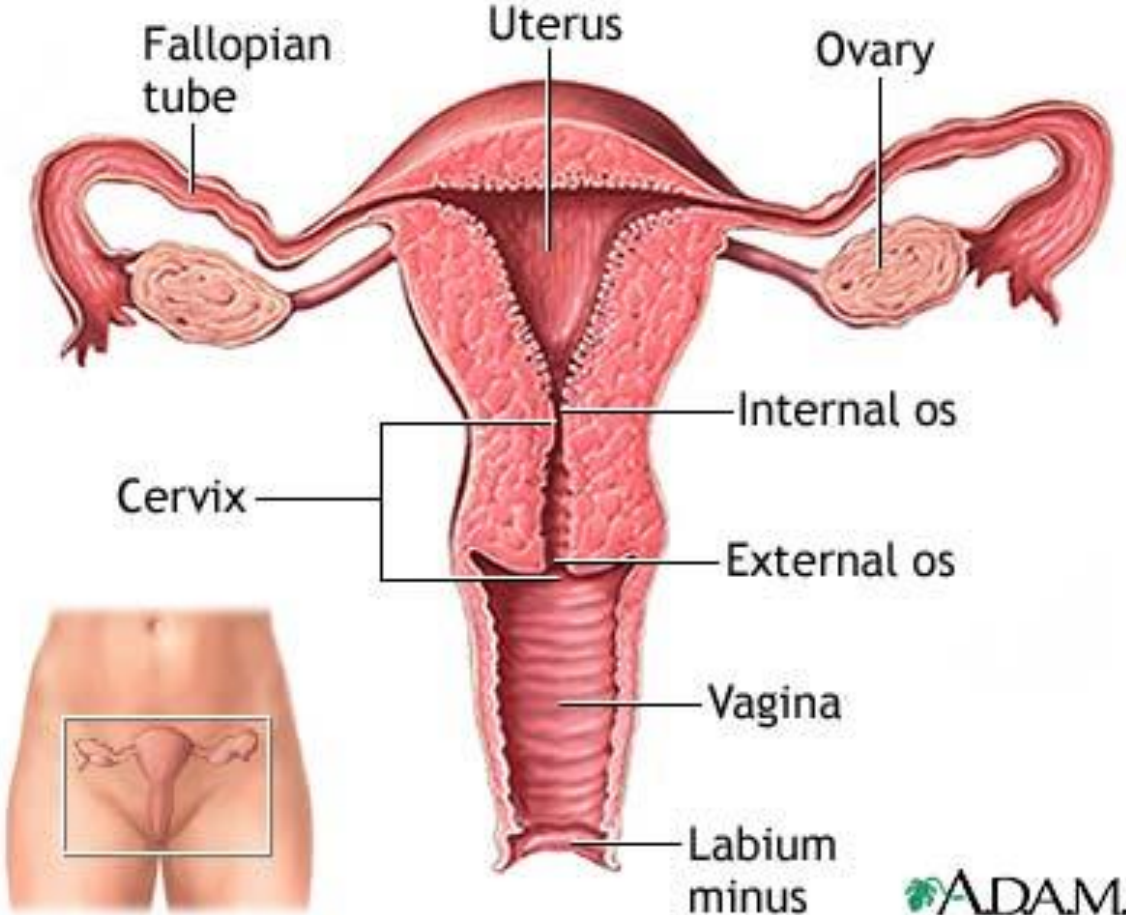


# Gametes - Sperm

- After meiosis sperm matures



# Uterus



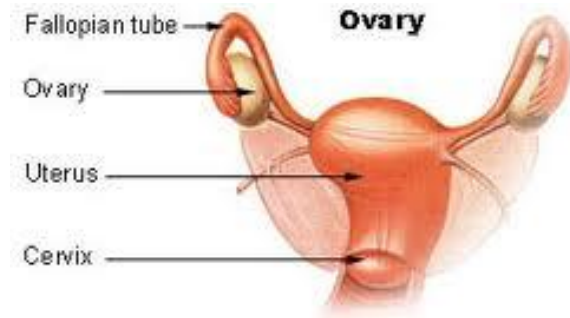
# Gametes - Eggs

- Female gametes are called ova or eggs

- Ovaries produce eggs

- Egg is released from ovary & moves into fallopian tube

- Fallopian tube carries the egg into the uterus



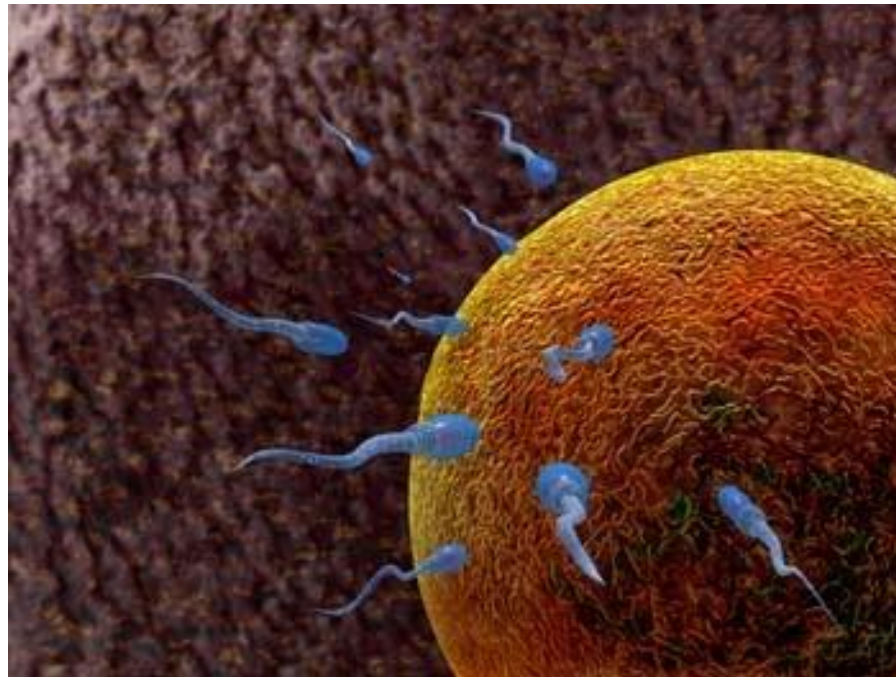
# Gametes – Eggs...

- Ovarian cycle prepares egg for fertilization once a month (**this is called ovulation**)
- If egg is not fertilized, then another will be produced for next month
- Eggs mature while female is still in mother



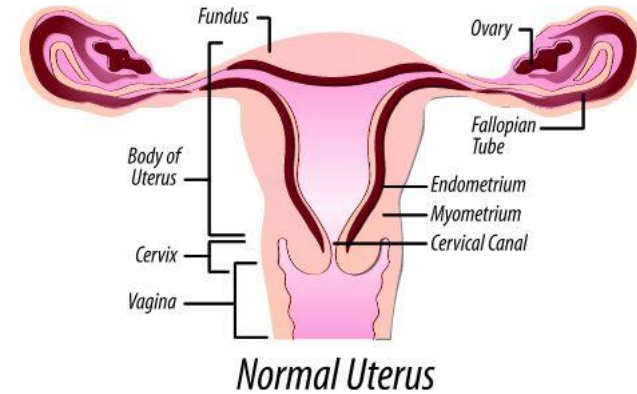
# Fertilization

- This is fusion of gametes
- During ejaculation 150 million to 350 million sperm are deposited in vagina near fallopian tubes where fertilization can occur



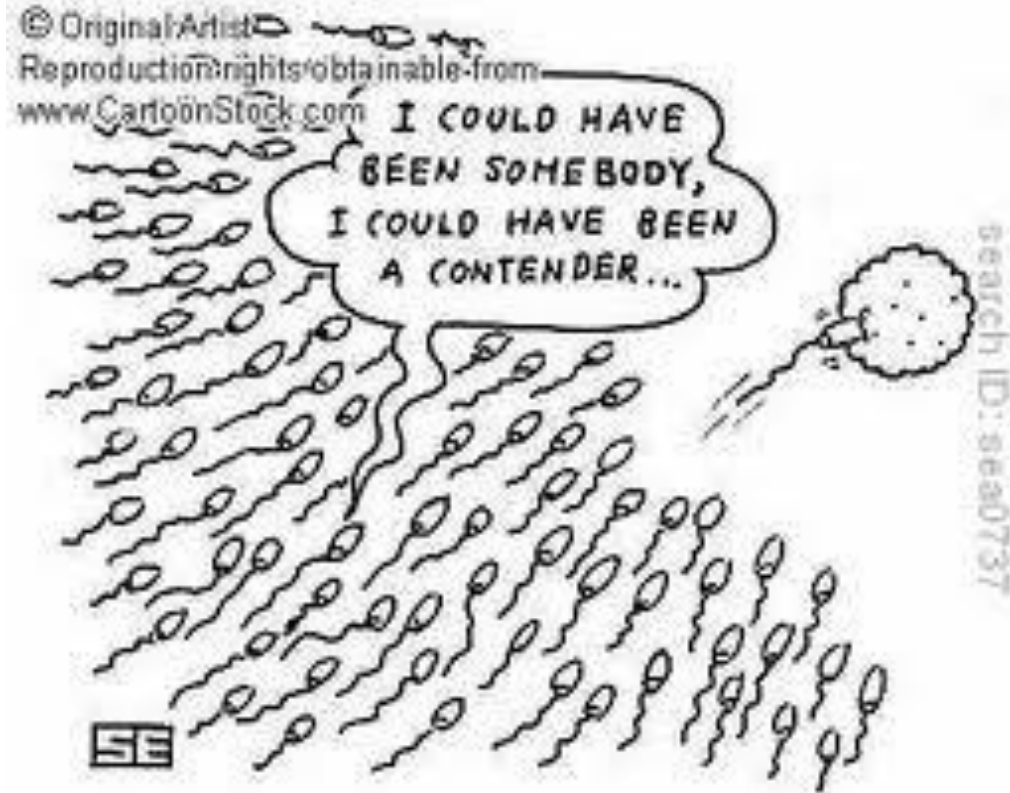
# Fertilization...

- **To reach egg sperm must:**
  - **Pass through cervix**
  - **Cross uterus**
  - **Swim up fallopian tubes**
  - **Many will not make it past vagina (trapped in mucus)**
  - **½ will swim up the wrong tube**



# Fertilization...

- Many sperm arrive at the egg at the same time



# Fertilization...

- Enzymes in the head loosen the protective layer of cells around the egg
- Head of sperm enters egg and fuses with genetic information inside the egg
- Protective shield goes around the egg so no more sperm can get through
- Sperm (haploid) fuse with egg (haploid) to form a diploid zygote (23 chromosomes each – zygote with 46 chromosomes)



# Fertilization Video



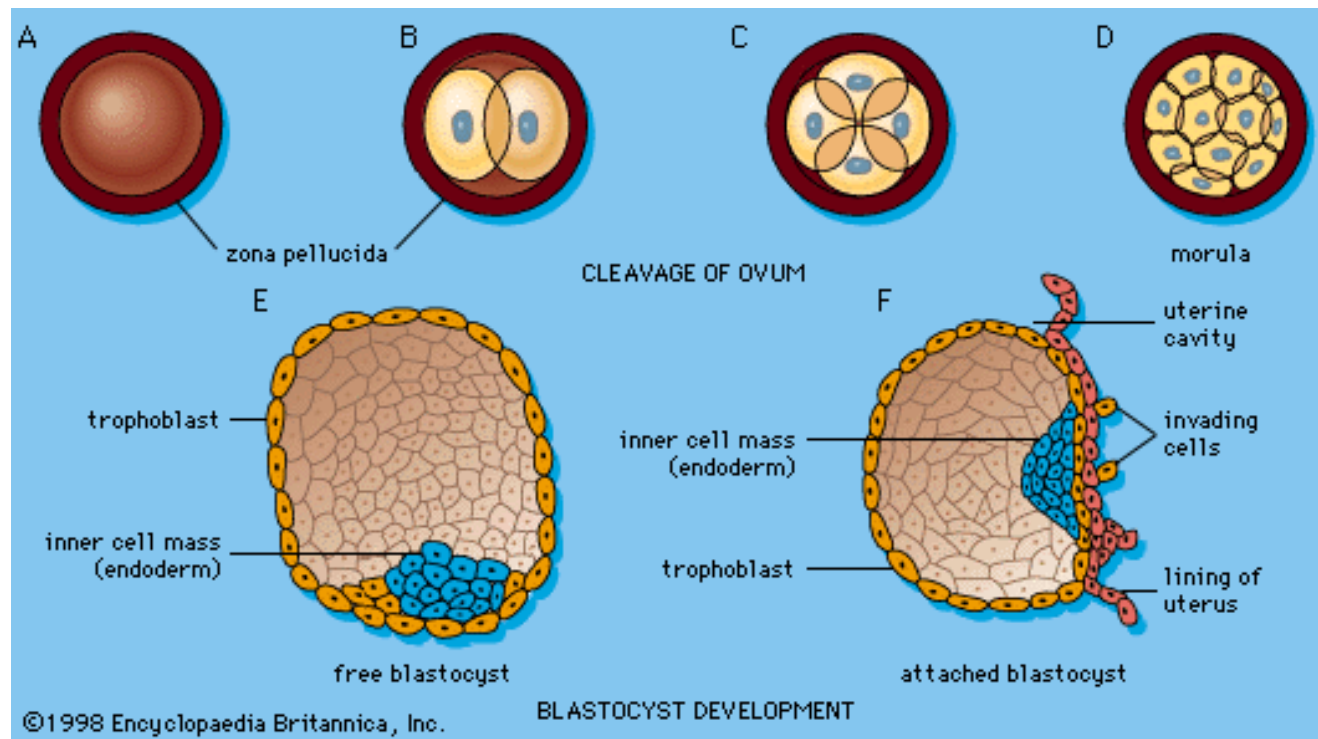
# Embryonic Development

- Newly fertilized egg is called a **zygote**



# Embryonic Development...

- Begins mitotic division (**cleavage**) after 30 hours (**embryo**)



# Embryonic Development...

- These cells don't increase in size
- Cleavage produces a ball of cells called a morula (not much larger than zygote)



# Embryonic Development...

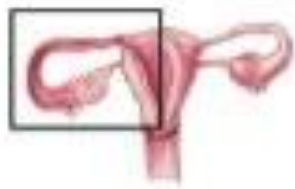
- Cells of the morula divide and form a blastocyst (ball of cells with a fluid filled cavity)



# Embryonic Development...

- **Travels through fallopian tubes down to uterus as divides**
- **4-5 days, the embryo reaches the uterus and is made up of 100 or more cells**
- **By the time it reaches the uterus, the morula becomes a blastocyst**





DAY 1

DAY 2

DAY 3-4

Uterus

First cleavage

2-cell stage

4-cell stage

8-cell uncompact morula

DAY 4

8-cell compacted morula

Fertilized egg (zygote)

DAY 0

Fertilization

Ovary

DAY 5 Trophoblast

Early blastocyst

Blastocoel

Inner cell mass

DAY 6-7

Zona pellucida

Late-stage blastocyst (hatching)

DAY 8-9

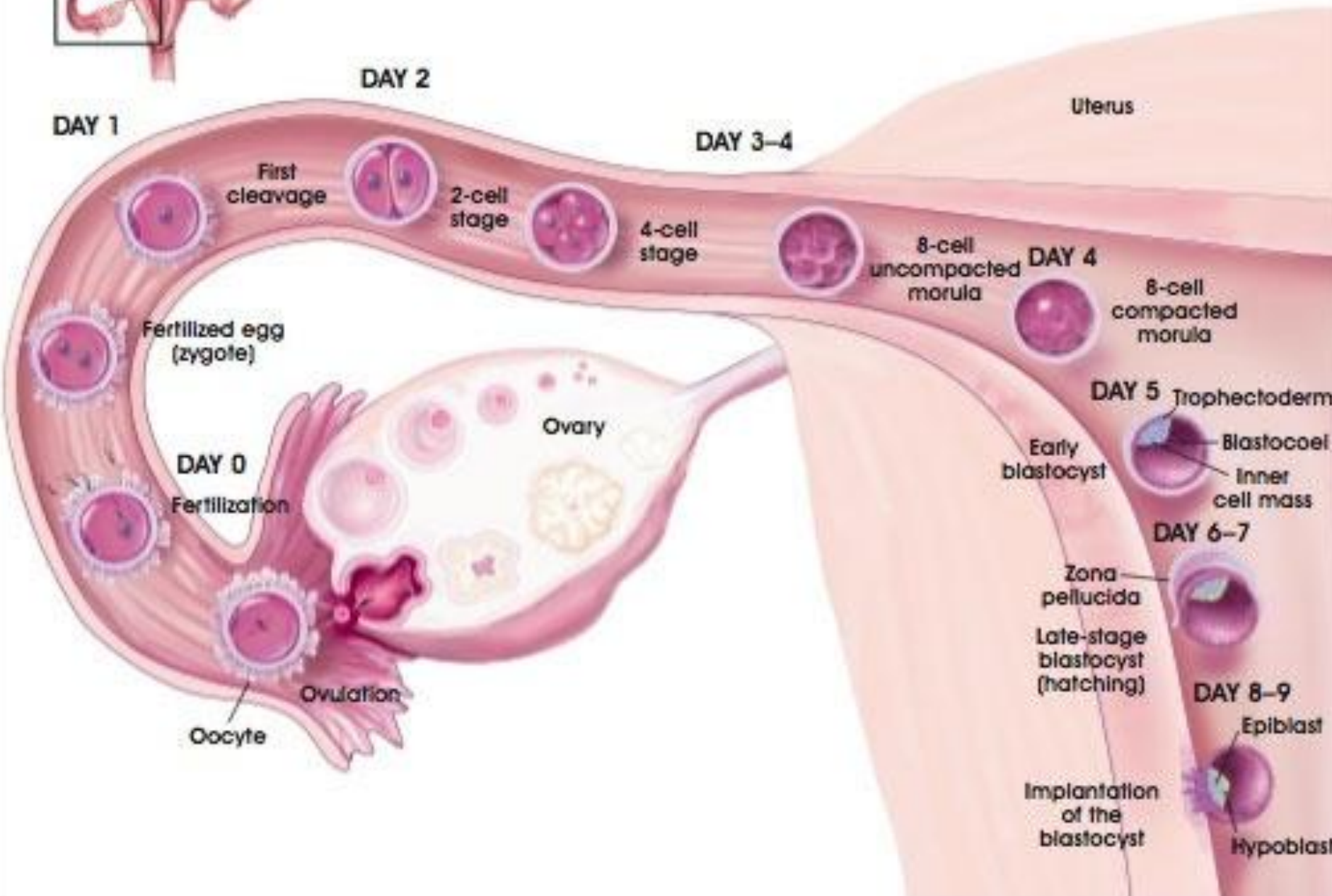
Epiblast

Implantation of the blastocyst

Hypoblast

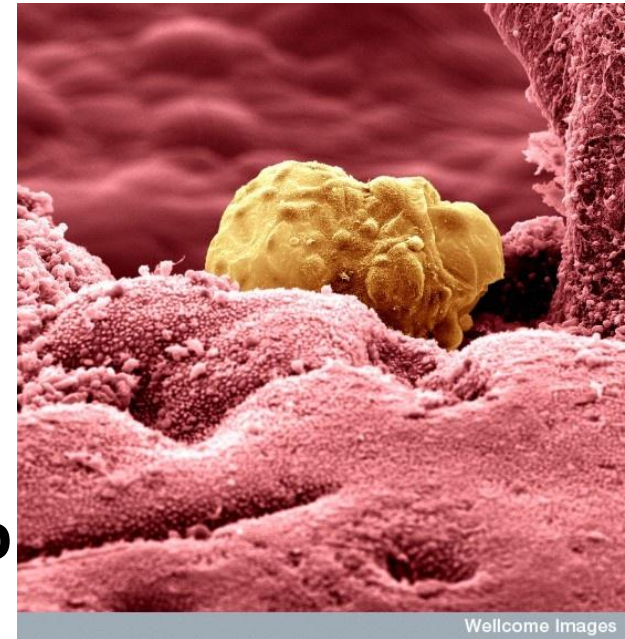
Oocyte

Ovulation



# Embryonic Development...

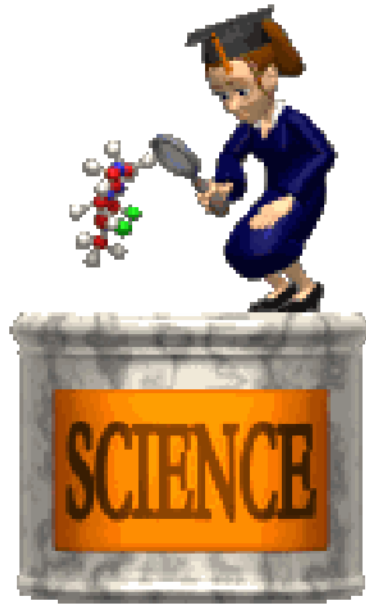
- When it reaches the uterus, the embryo embeds itself in the thick uterine lining; **implantation**
- Pregnancy begins at implantation (6 days after fertilization) from 9<sup>th</sup> week to birth it is called a fetus



# Review

- **Identify the female gamete**
- **Identify the male gamete**
- **Describe the process of human fertilization**





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Live Long