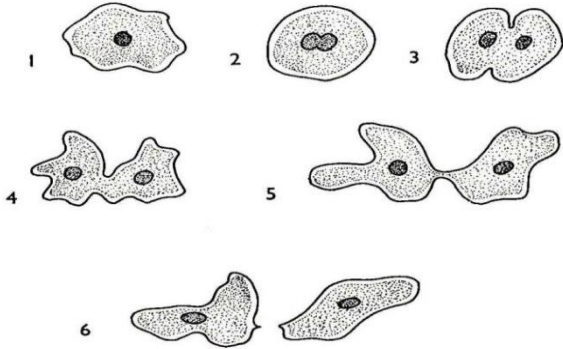


# Lesson 1 - Reproduction

## Male Structures & Functions

# Reproduction

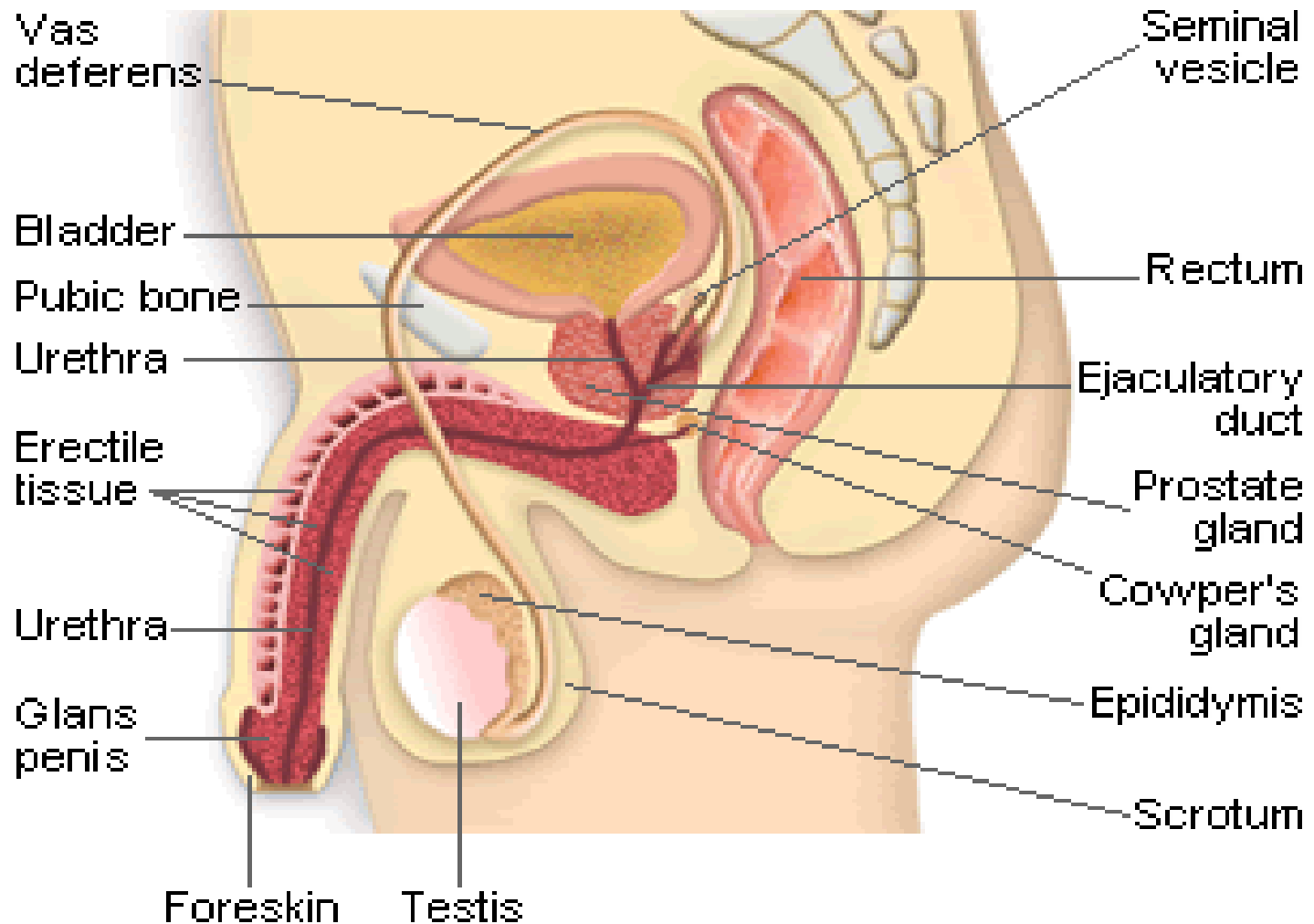
Life Process: to produce offspring (necessary for survival of species, not individual)



# Male Reproductive System

## Functions:

- 1) Produce sperm (male gamete)
- 2) Produce testosterone
- 3) Secrete fluids to nourish sperm & protect it from the acidic female reproductive tract
- 4) Deposit sperm inside the female



Produces an alkaline (basic) substance to neutralize the female's acidic tract

Produces fluid and glucose for sperm

8. **Urinary Bladder**

7. **Seminal Vesicle**

9. **Prostate**

Carries urine and semen out of the body

**Urethra**

11. **Penis**

Adaptation for internal fertilization on land

6. **Rectum**

5. **Bulbourethral / Cowper's Glands**  
(produce fluid for semen)

4. **Vas deferens**

Carries sperm to the urethra

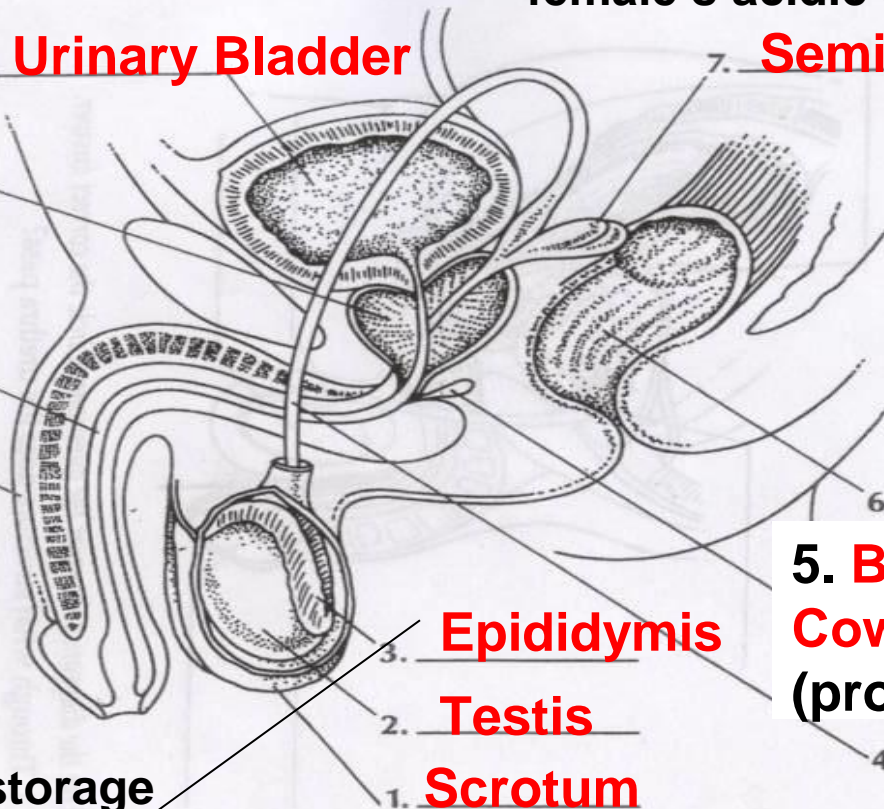
3. **Epididymis**

2. **Testis**

1. **Scrotum**

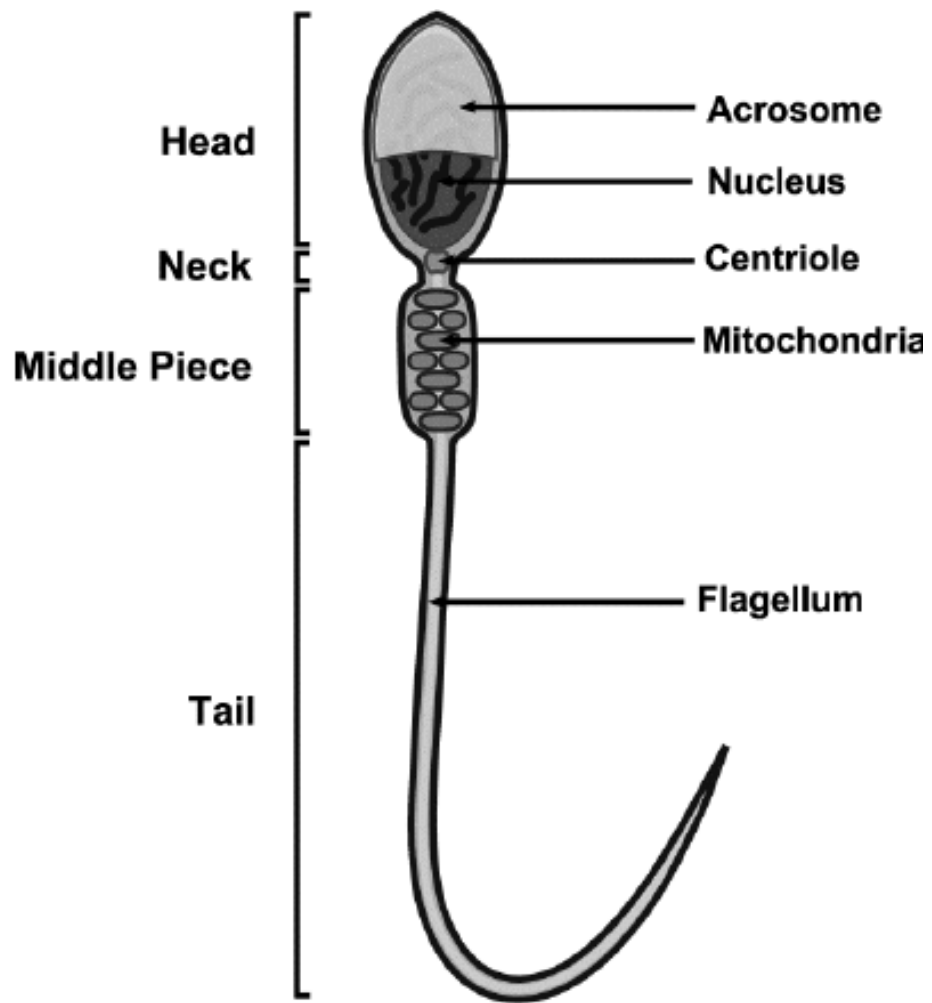
Site of sperm storage & maturation

temp is lower than body temp



# Sperm Structure

- Acrosome (contains digestive enzymes)
- Nucleus (contains DNA, half # of chromosomes)
- Mitochondria (provide energy to swim)
- Flagellum (tail for propulsion)

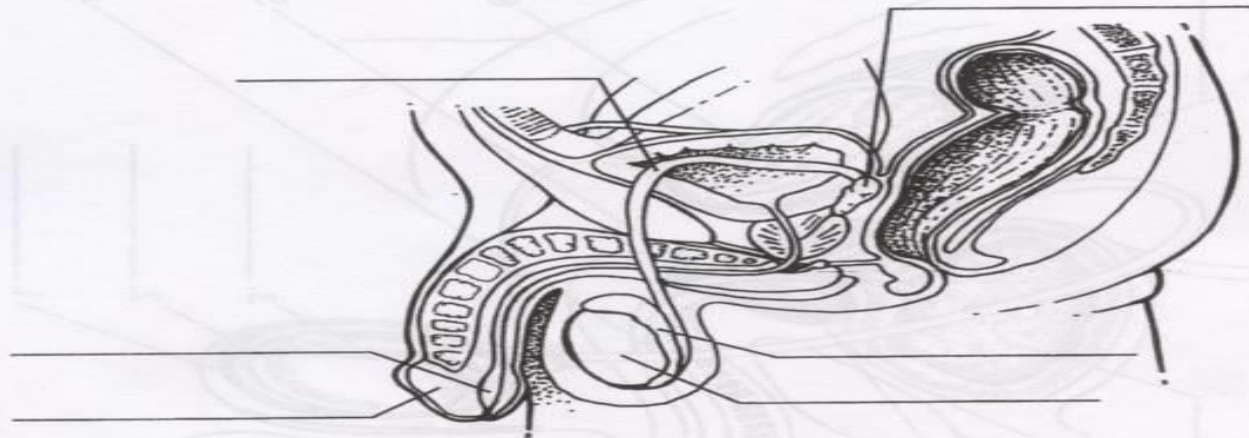


## The Male Reproductive System

Sperm are produced in the testes and mature in the epididymis. To leave the body, they travel through the vas deferens and the urethra. Glands, including the seminal vesicles, produce seminal fluid that nourishes and protects the sperm.

Use the words below to label the diagram.

epididymis	seminal vesicle	urethra
penis	testis	vas deferens



Use the diagram to answer the questions. Circle the correct answer.

1. Through what structure does the urethra pass?

testis      penis

2. Through which structure do sperm pass?

seminal vesicle      vas deferens



# Lesson 2

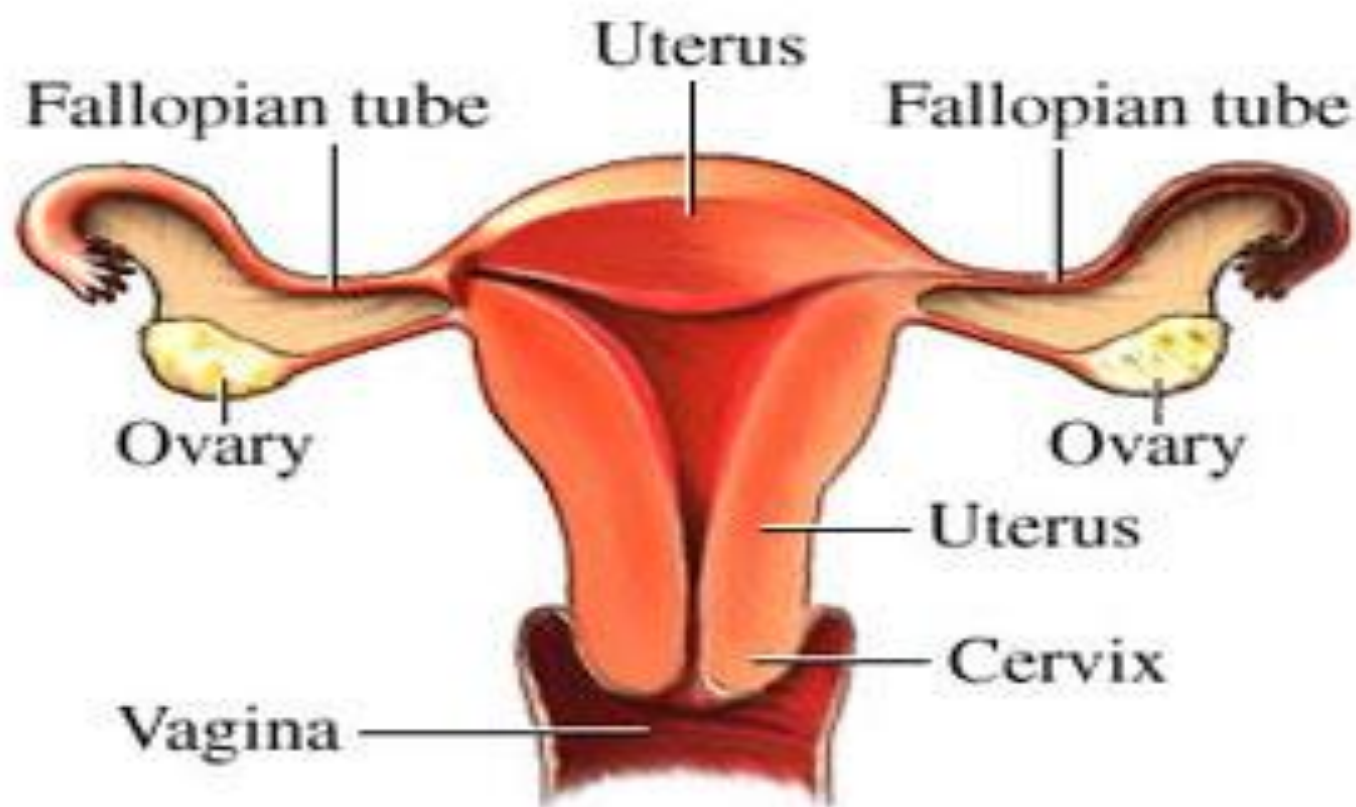
- Female Structures & Functions

# Female Reproductive System

## Functions:

1. Produces an egg cell / ovum (female gamete)
2. Produces estrogen & progesterone
3. Site of implantation & development of an embryo / fetus
4. Growth of placenta & umbilical cord for exchange of gases & nutrients/waste between mother and baby

# Female Reproductive System



## 2. **FALLOPIAN TUBE**

- Site of fertilization

## 4. **BLADDER**

**OVARY** – Contains follicles which mature into eggs, produces estrogen

## **UTERUS**

– site of implantation & development of embryo, lining thickens and sheds monthly

## **URETHRA**

5.

## 6. **VAGINA**

- Receives sperm, birth canal

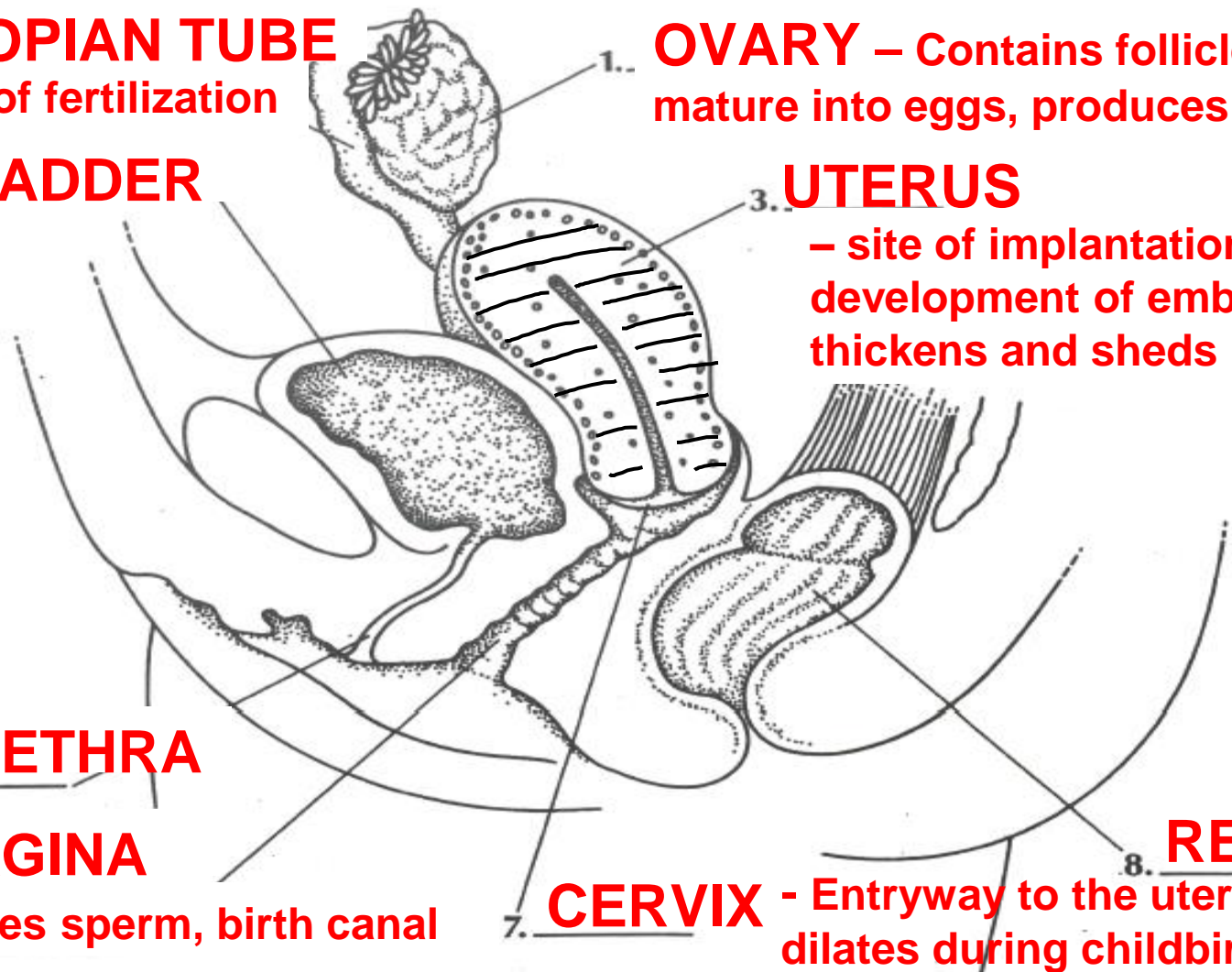
## **CERVIX**

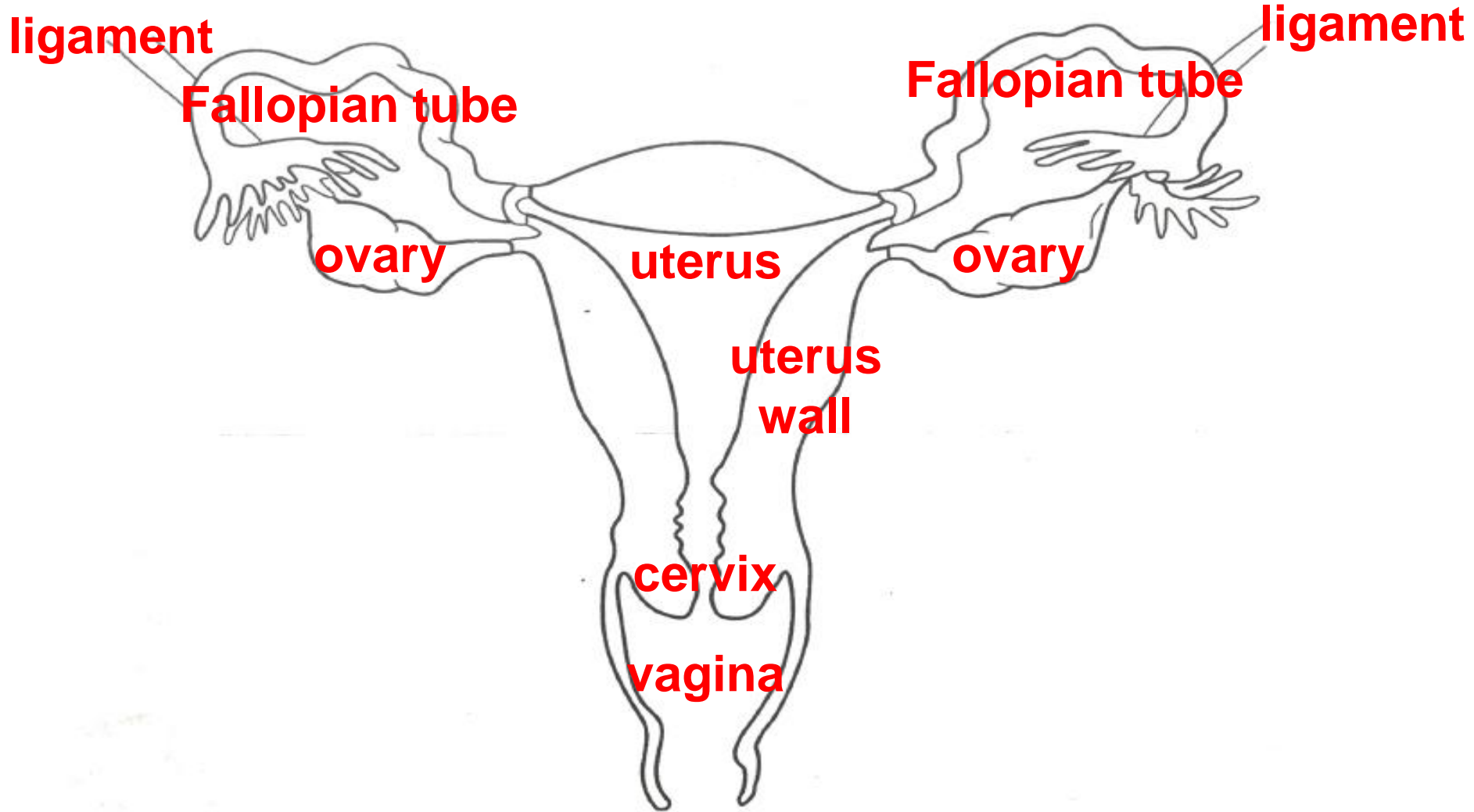
7.

- Entryway to the uterus, dilates during childbirth

## **RECTUM**

8.





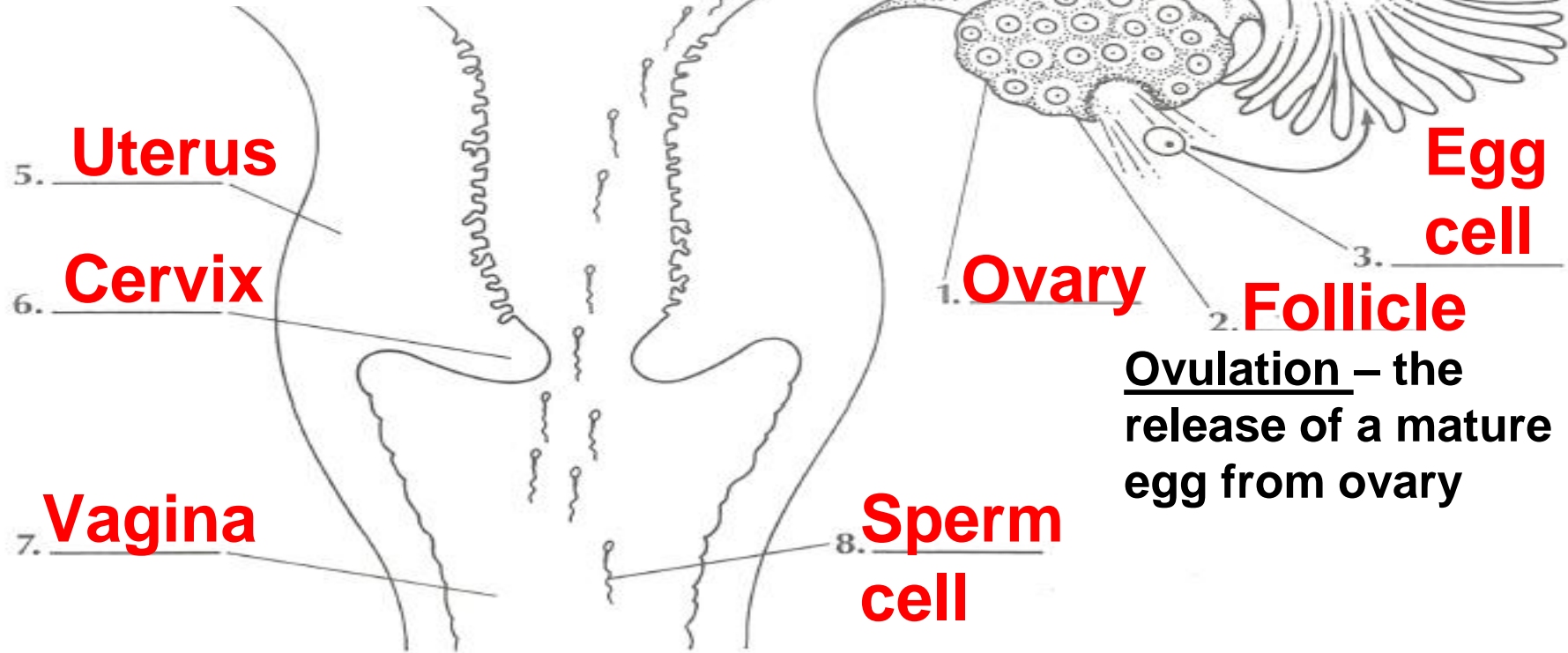
# Lesson 3

- Menstrual Cycle
- Key Terms
  - Ovulation
  - Fertilization
  - Implantation

Implantation – embryo  
burrows into thickened blood  
lining of uterus = pregnancy  
(not pictured here)

Fertilization – sperm &  
egg join to form a zygote

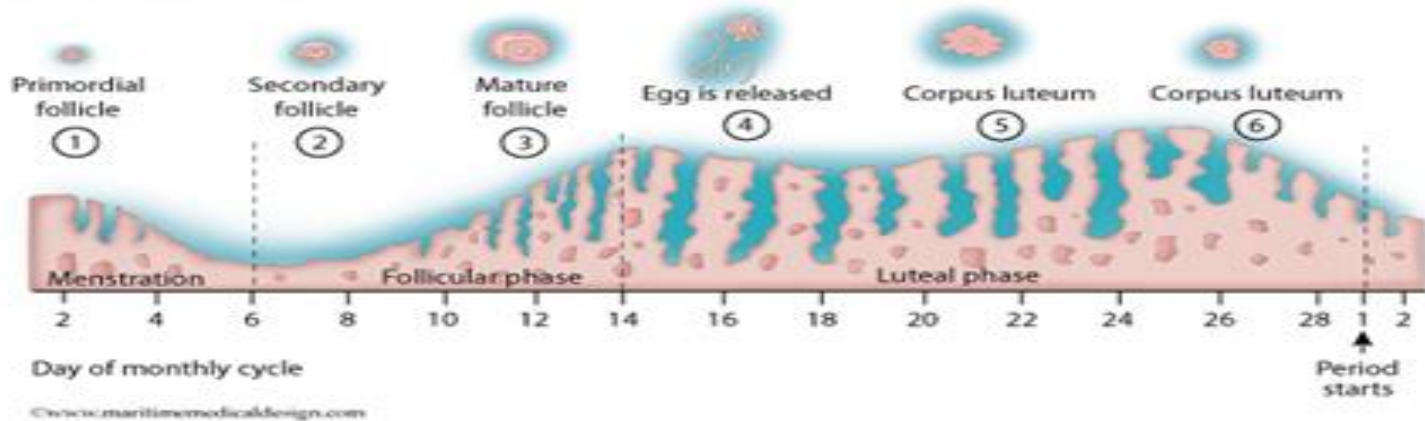
**Fallopian  
tube**



Ovulation – the  
release of a mature  
egg from ovary

# The Female Menstrual Cycle

- begins at puberty & ends at menopause
- duration is approximately 28 days
- can vary & may be interrupted by pregnancy, illness, and other factors





# 4 Stages / Phases of the Menstrual Cycle

## 1. MENSTRUATION

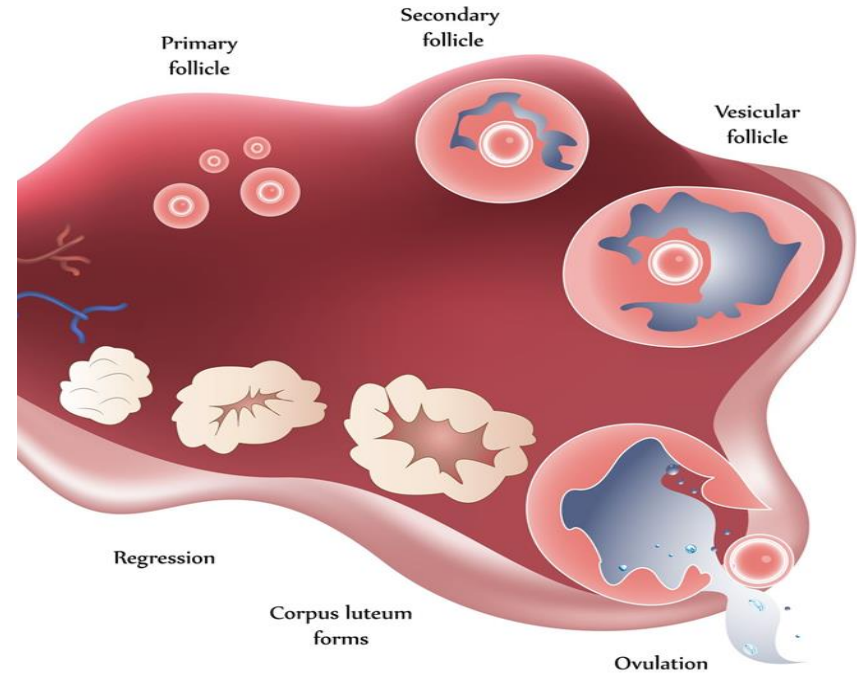
- uterine lining & unfertilized egg are shed if NO implantation occurs
- Vaginal bleeding (Day 1 of cycle) lasts for 3 to 7 days
- New egg in ovary begins to mature



Menstrual phase

## 2. FOLLICLE STAGE

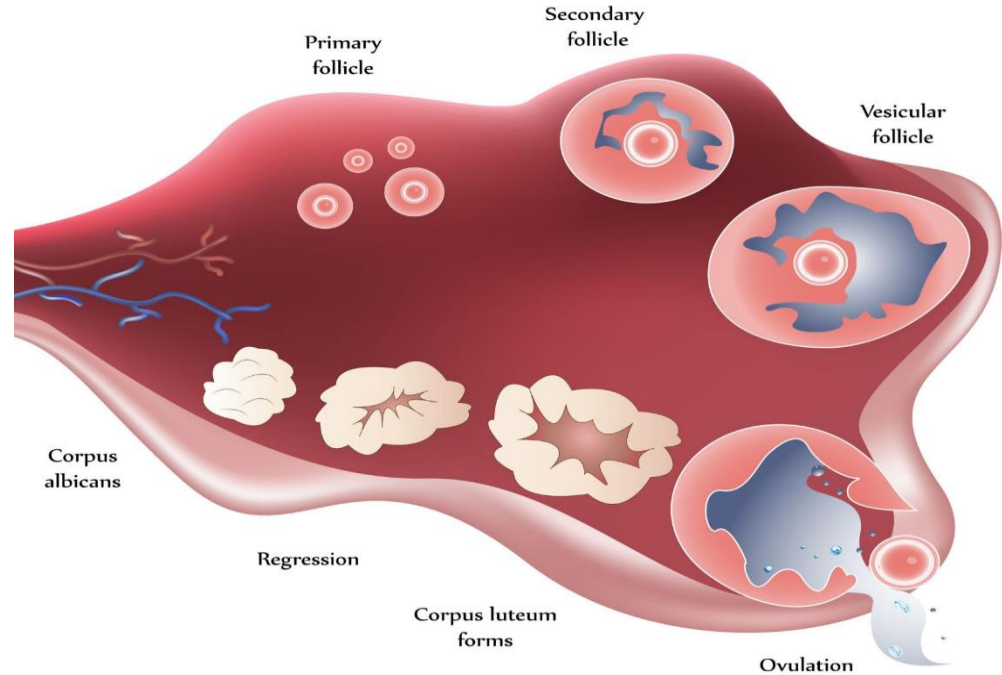
- Follicle in the ovary continues to grow & mature
- estrogen is secreted by ovary to begin thickening of uterus lining w/ blood vessels (vascularization)



### 3. OVULATION

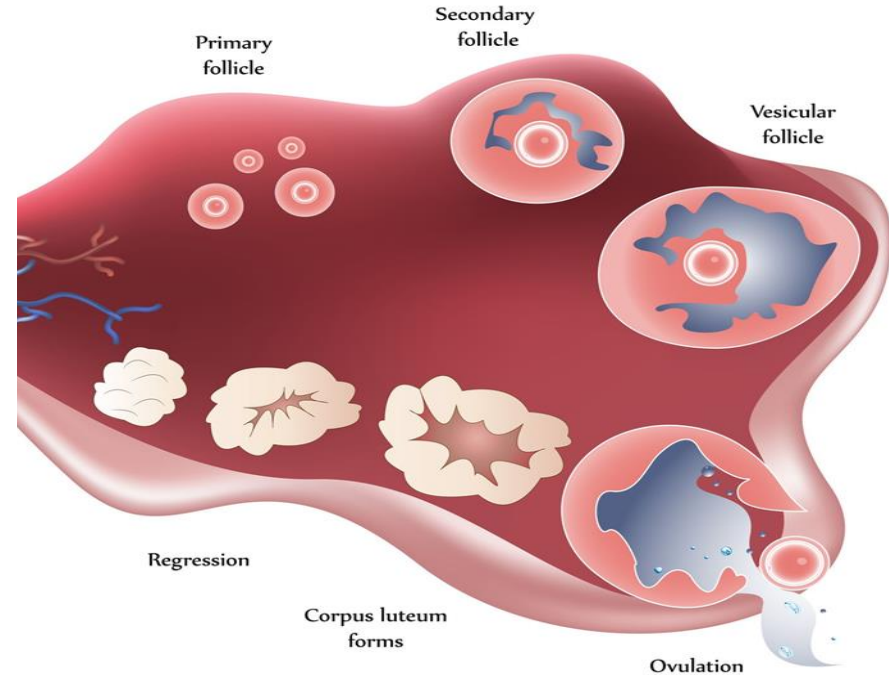
(Day 14 of 28)

- Pituitary releases a surge of LH
- Causes mature egg to be released from its follicle in the ovary

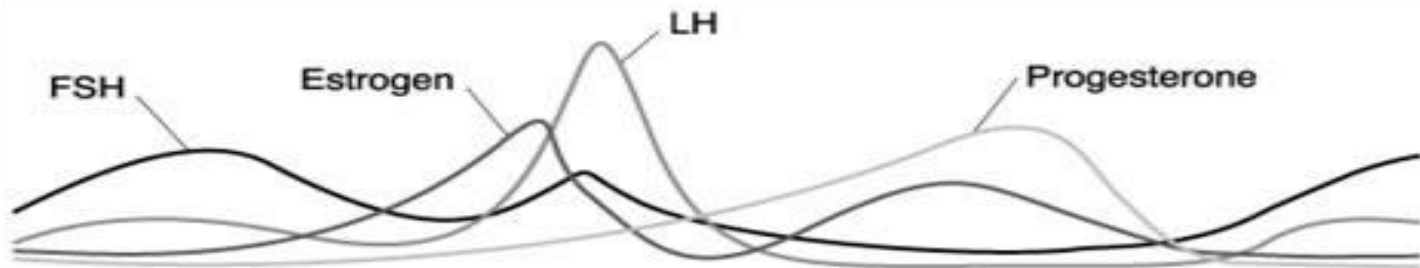


## 4. LUTEAL STAGE

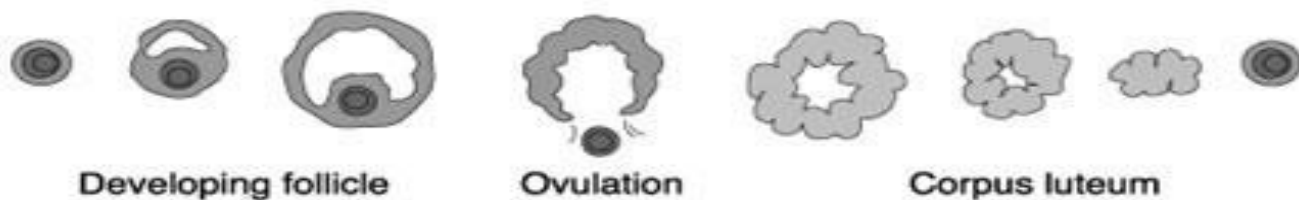
- ruptured follicle in ovary becomes corpus luteum
- secretes progesterone to thicken uterus lining to prepare for possible implantation
- If no pregnancy occurs, menstruation begins & cycle repeats



**Hormone Levels in the Blood**

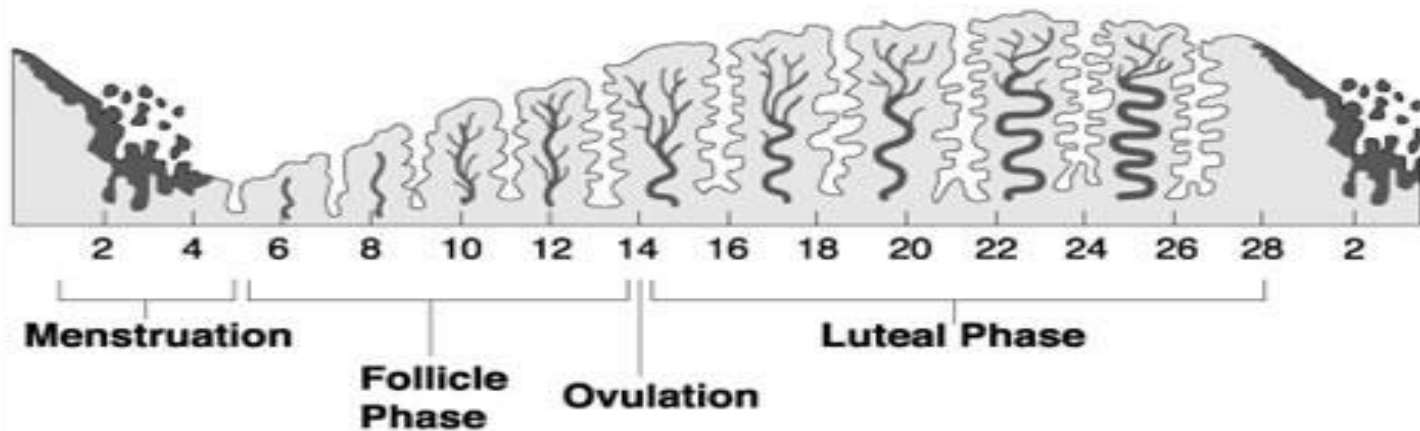


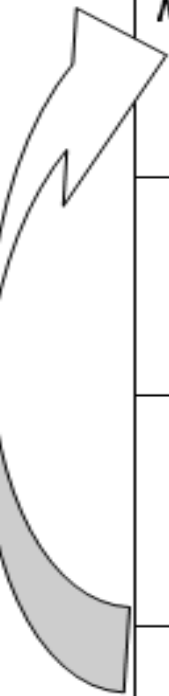
**Follicle Development**



**Uterine Lining**

Time (days)





Phase	Description	Time (days)	Changes in hormone levels in blood
Menstruation ↓	Uterine lining is shed (the “period”)	Days 1-5	FSH - <b>increases</b> LH - <b>increases</b>
Follicular phase ↓	follicle (egg) beings to grow & mature, lining thickens again	Days 5-13	Estrogen - <b>increases</b> Progesterone <b>increases</b> FSH - <b>dec. then inc.</b> LH - <b>increases</b>
Ovulation ↓	mature egg released into fallopian tube from the ovary	Day 14	FSH - <b>Inc then dec.</b> LH - <b>Surge then dec.</b>
Luteal phase	follicle→corpus luteum, makes progesterone to thicken uterine lining more	Days 14-28	Estrogen - <b>Increase then decrease</b> Progesterone -

# Lesson 4

- Internal vs External Fertilization & Development



# How would you group these organisms?

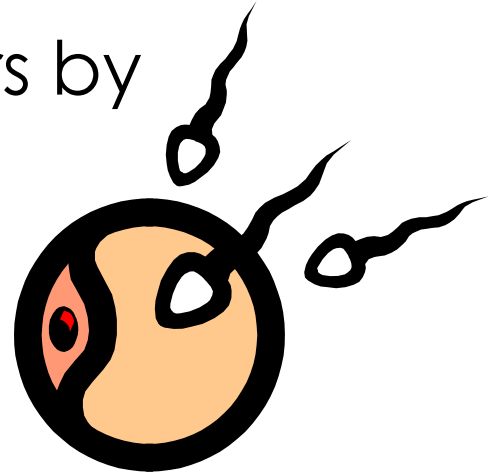




# Fertilization

- 1 sperm cell & 1 egg cell join, forming a zygote
- half of offspring's genetic material is from each parent
- can be internal or external (differs by organism)

[Fertilization Video](#)

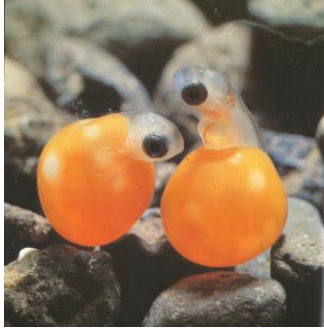


**External****Internal**

Who	<b>fish &amp; amphibians (frogs &amp; toads)</b>	<b>mammals, reptiles, birds</b>
What	<p>Fertilization <u>outside</u> the body</p> <p>Produce <b><u>MANY</u></b> eggs to ensure survival of offspring due to:</p> <ul style="list-style-type: none"><li>-<b>Lack of parental care</b></li><li>-<b>Harsh predatory environment</b></li></ul>	<p>Fertilization <u>inside</u> the body</p> <p>Produce <b><u>FEWER</u></b> eggs due to</p> <ul style="list-style-type: none"><li>-<b>more parental care</b></li><li>-<b>Protective internal environment</b></li></ul>
Where	<b>Mostly in <u>water</u> (aquatic organisms)</b>	<b>Mostly on <u>land</u> (terrestrial organisms)</b>

# Development

- physical changes & growth of unborn offspring
- can be internal or external (differs by organism)



# External

in WATER

on LAND

Who	<b>Most fish and amphibians</b>	<b>Birds and Reptiles, few mammals (ex. platypus)</b>
What	<p><b>Embryo growth outside the body; <u>LOW</u> survival rate due to:</b></p> <ul style="list-style-type: none"><li><b>- Harsh predatory conditions &amp; lack of parental care</b></li></ul> <p><b>To compensate, <u>MANY</u> eggs are produced</b></p>	<p><b>Embryo growth outside the body; <u>HIGHER</u> survival rate due to:</b></p> <ul style="list-style-type: none"><li><b>- Protection of a shell (hard or leathery) &amp; some parental care</b></li></ul> <p><b>Therefore, <u>FEWER</u> eggs are produced</b></p>

# Internal

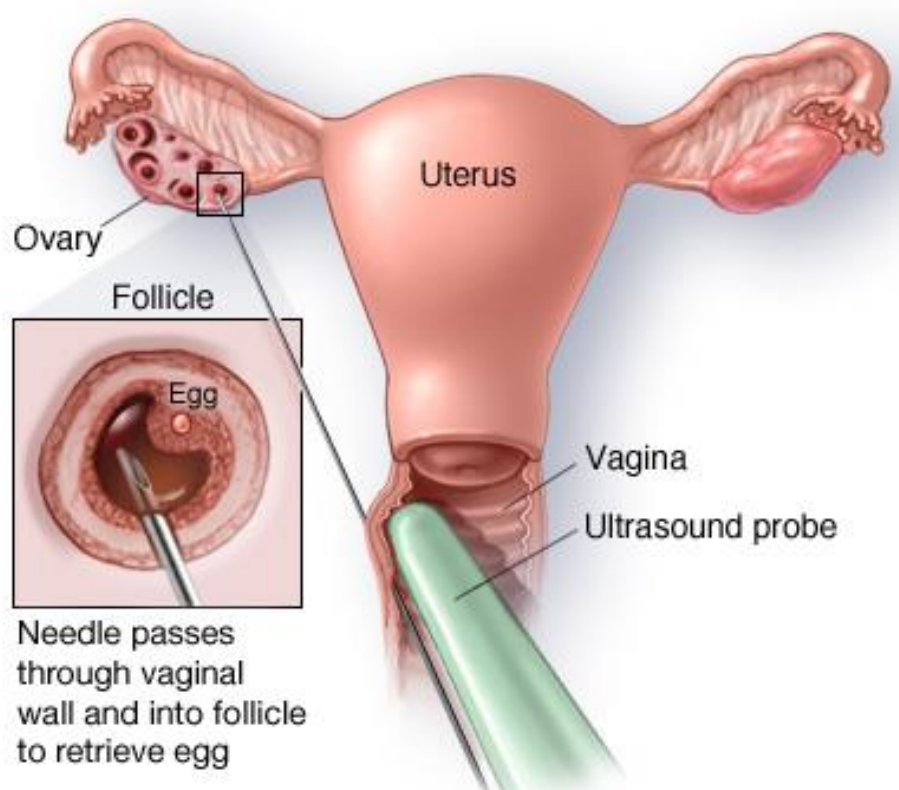
# PLACENTAL MAMMALS

# MARSUPIALS

Who	<b>Humans (most mammals)</b>	<b>Kangaroo, koala, opossum</b>
What	<b>-Embryo develops in the <u>uterus</u> attached to an <u>umbilical cord</u> (cut after birth) which connects to the <u>placenta</u> (structure with many capillaries, allowing gas &amp; nutrient exchange between mother &amp; fetal blood)</b>	<b>Offspring is born premature and continues its development in an external pouch containing mammary (milk producing) glands</b>  <a href="#">Kangaroo birth video (start at :25sec)</a>

# Assisted Reproductive Technology

## Egg Donation



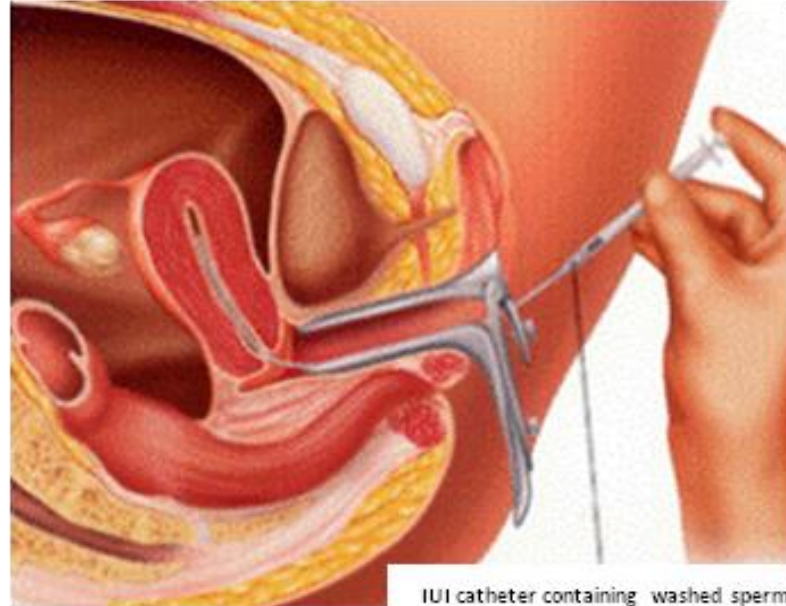
## Sperm Donation



# Artificial Insemination / IUI (Intrauterine Insemination)

[Video - IUI \(0:50 to 1:50\)](#)

- sperm is inserted into the female reproductive tract by catheter

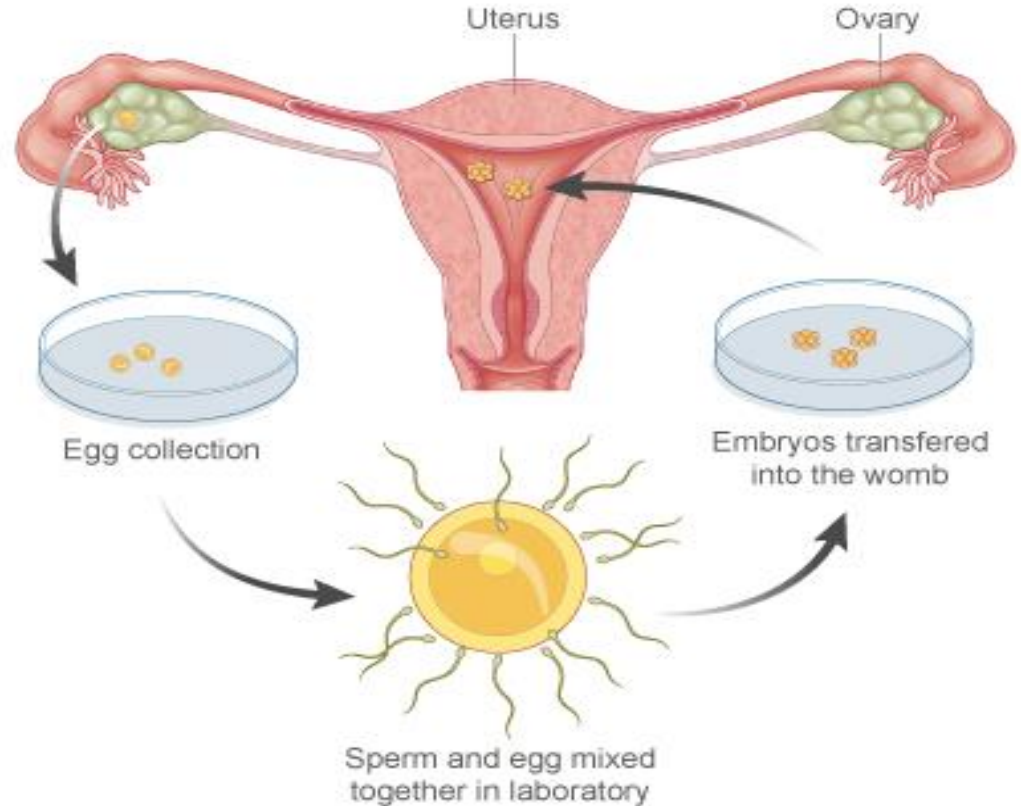


IUI catheter containing washed sperm



# In Vitro Fertilization (IVF)

- retrieved sperm & egg are combined in a lab
- resulting embryos are implanted in the uterus

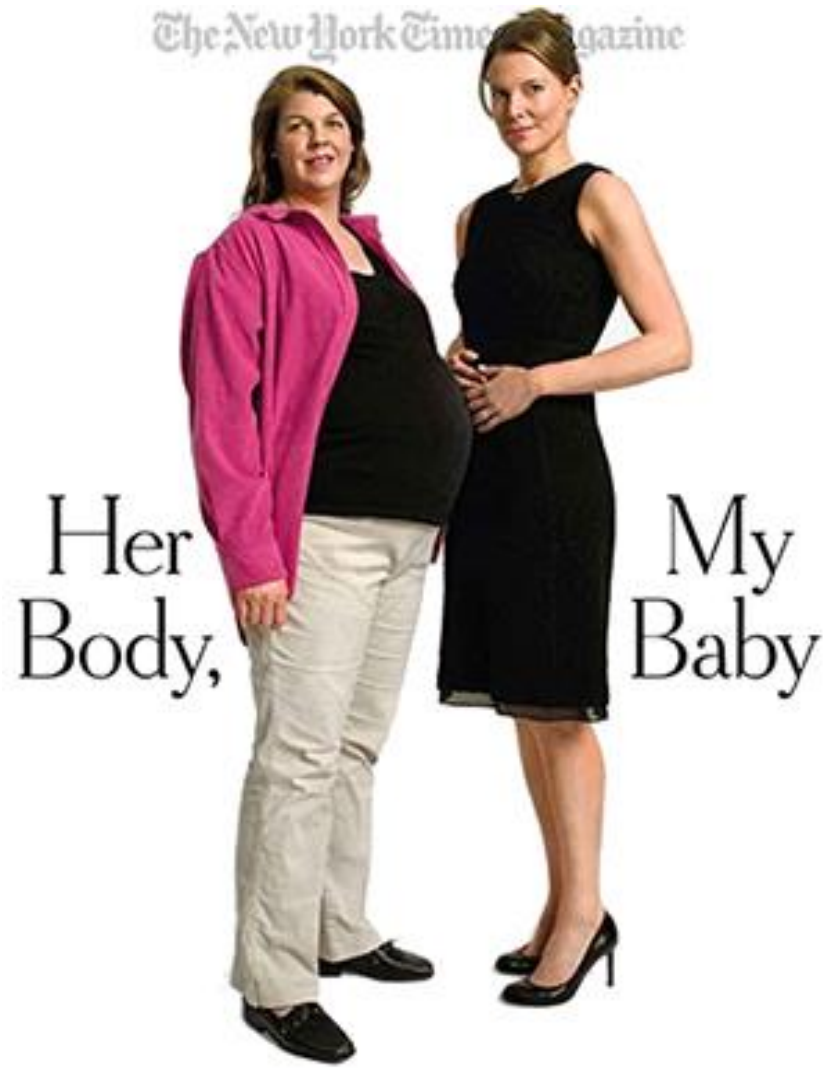


[IVF Video \(from 0:50 to 2:40\)](#)



# Surrogacy

a woman becomes pregnant by artificial insemination or surgical implantation of a fertilized egg for the purpose of carrying the fetus to term for another woman



# Fertilization & Development Practice

1

1. In some species very few eggs are produced by the females. Which reproductive pattern is most characteristic of these species?
  - (1) internal fertilization followed by internal embryonic development
  - (2) internal fertilization followed by external embryonic development
  - (3) external fertilization followed by internal embryonic development
  - (4) external fertilization followed by external embryonic development

4

2. In most animal species with internal development, the embryo becomes implanted in the lining of the
- |             |            |
|-------------|------------|
| (1) stomach | (3) ovary  |
| (2) liver   | (4) uterus |

3

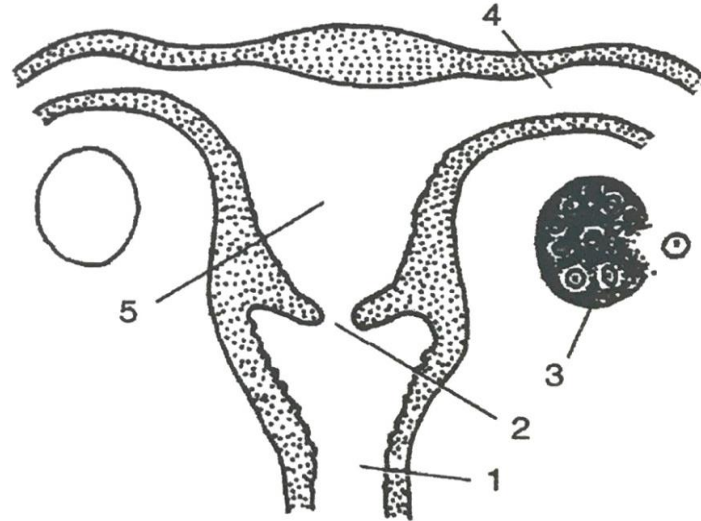
3. Which event would most probably result in the production of fraternal twins?
- (1) One egg is fertilized by two sperm cells.
  - (2) Two egg cells are fertilized by one sperm cell.
  - (3) Two egg cells are each fertilized by separate sperm cells.
  - (4) Two eggs develop without fertilization.

3

4. Which characteristic of sexual reproduction has specifically favored the survival of animals that live on land?
- (1) fusion of gametes in the outside environment
  - (2) male gametes that may be carried by the wind
  - (3) fertilization within the body of the female
  - (4) female gametes that develop within ovaries

4

5. The diagram below represents part of the human female reproductive system.



Fertilization and development normally occur in structures

(1) 1 and 5

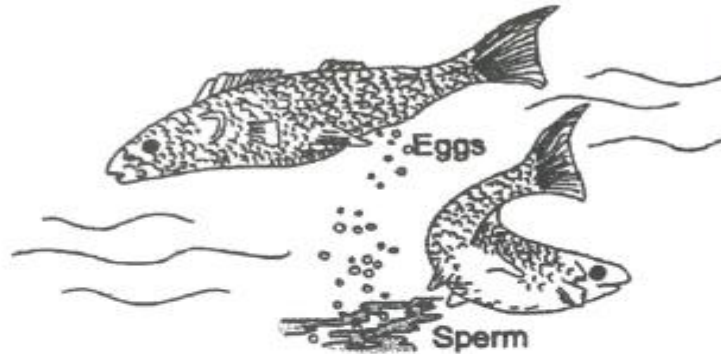
(3) 3 and 1

(2) 2 and 4

(4) 4 and 5

4

6. Which type of fertilization and development occurs in the life cycle of the organisms represented below?



- (1) internal fertilization and internal development
- (2) internal fertilization and external development
- (3) external fertilization and internal development
- (4) external fertilization and external development

1

7. Identical twins develop from

(1) one egg, fertilized by one sperm cell

(2) one egg, fertilized by two separate sperm cells

(3) two eggs, both fertilized by the same sperm cell

(4) two eggs, each fertilized by a separate sperm cell

4

8. Why is the release of 2,000 to 10,000 eggs by a female salmon during one season considered a favorable reproductive adaptation?

(1) External fertilization increases the chance of sperm reaching the eggs.

(2) Overproduction decreases the rate of embryo development.

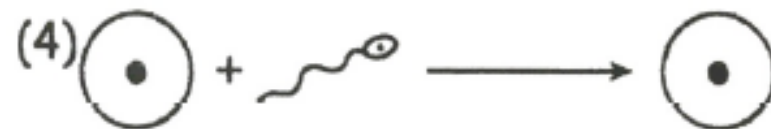
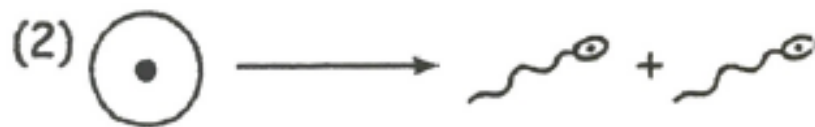
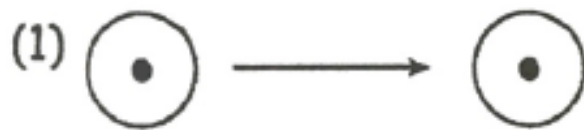
(3) The species is declining, so the reproductive rate has increased.

(4) Unfavorable environmental conditions may destroy gametes.



4

9. Which diagram best illustrates an event in sexual reproduction that would most directly lead to the formation of a human embryo?



4

10. Complex organisms produce sex cells that unite during fertilization, forming a single cell known as

(1) an embryo

(3) a gonad

(2) a gamete

(4) a zygote

# Lesson 5

## Early Embryonic Development

- Twinning
- Gastrulation & Differentiation

# Early Embryonic Development

## Types of Twins

### Fraternal Twins:

- 2 separate eggs are fertilized by 2 separate sperm
- NOT genetically identical (can be same or opposite sexes)

**"We Couldn't Look More Different If We Tried": Sisters Who Look Nothing Alike Are Actually Biological Twins!**



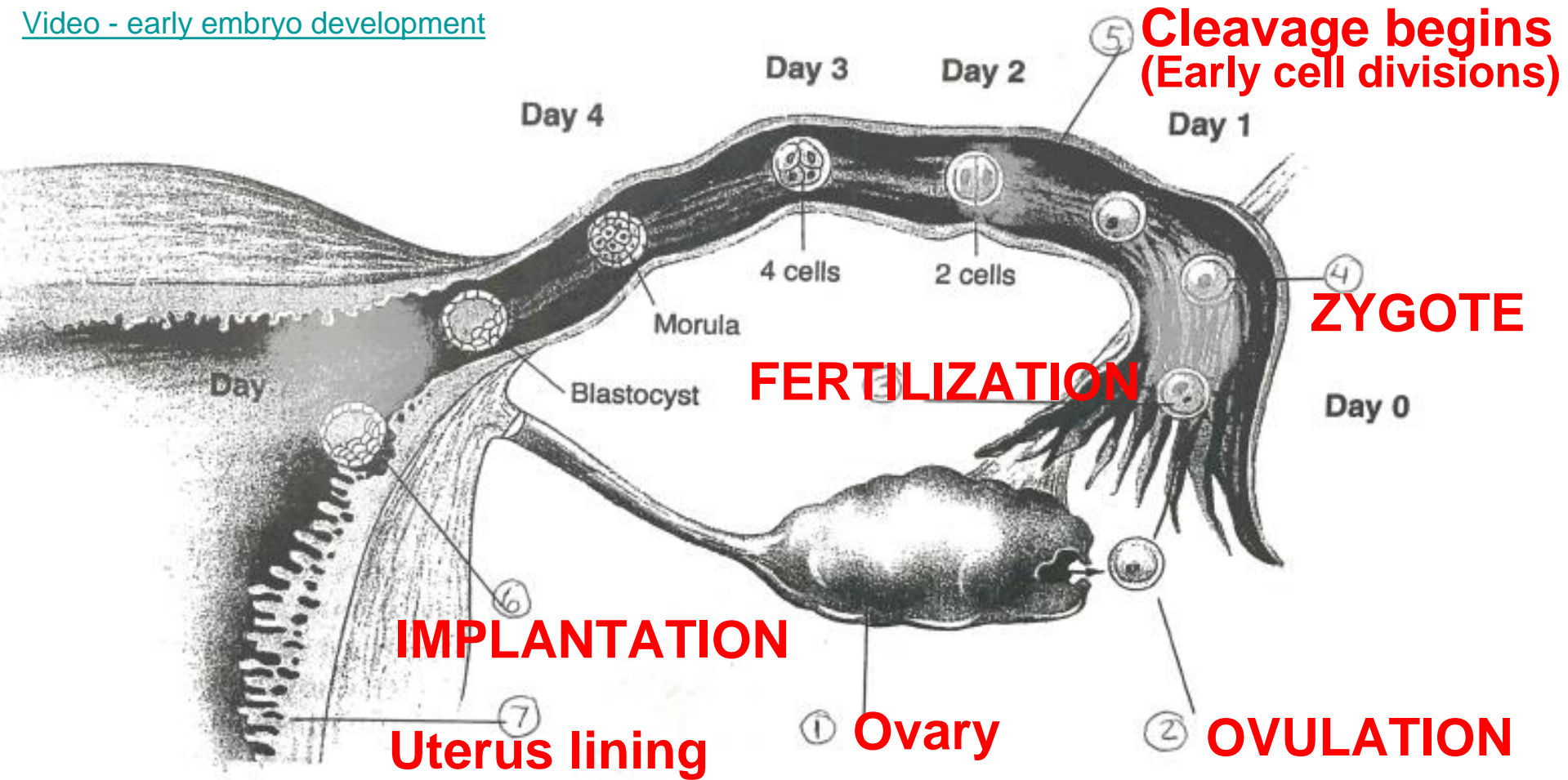
# Early Embryonic Development

## Identical Twins:

- 1 sperm fertilizes 1 egg which then splits into 2 embryos
- Are genetically identical
  - May be conjoined if embryo does not fully separate



[Conjoined Twins, Abby & Brittany video](#)



# Implantation of a Blastocyst



# Early Embryo Development

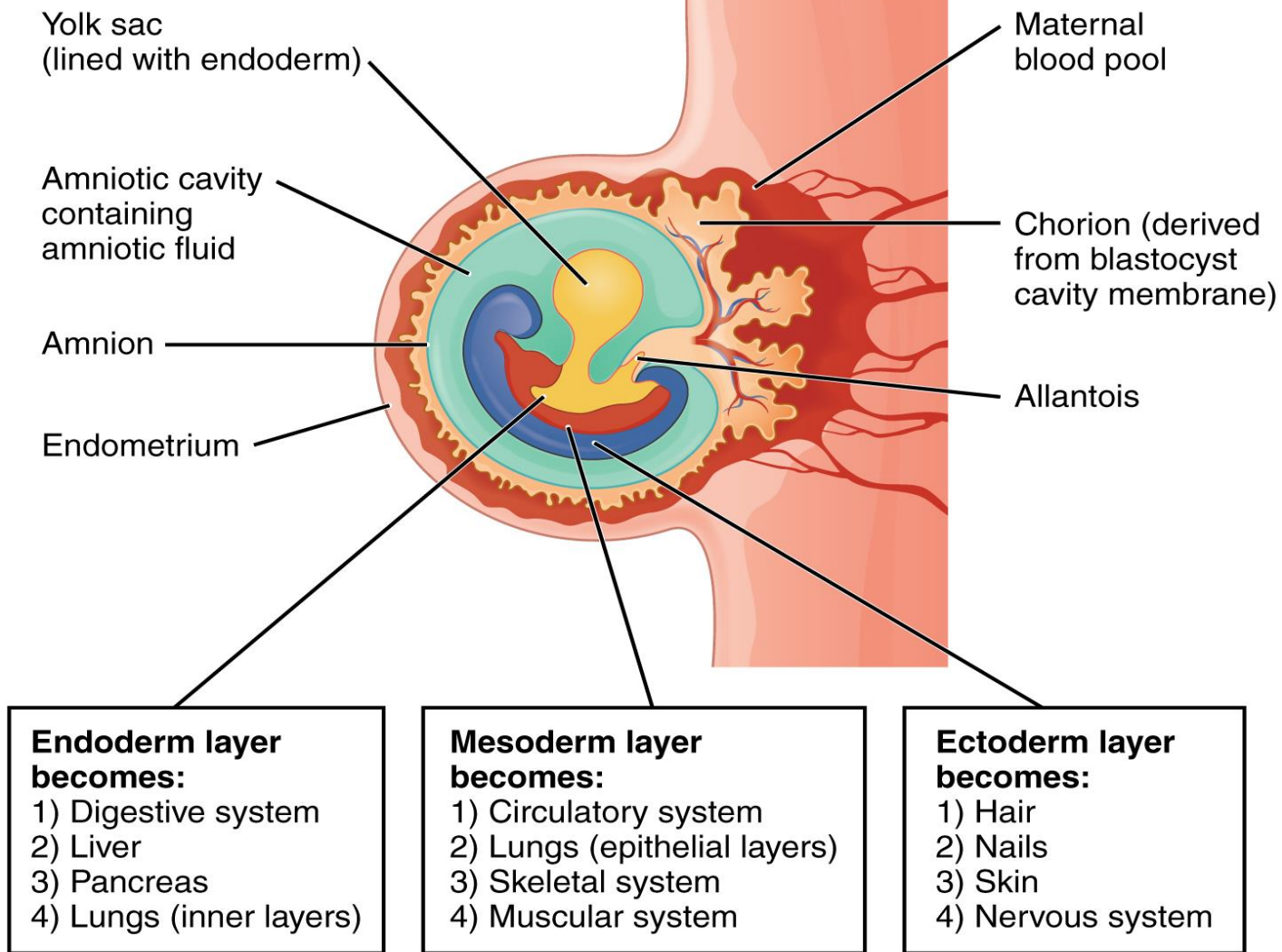
- Mor – Mass
- Ula – small one
- Gastru – stomach cavity
- Zygous – yoked
- Blast – hollow
- Cleav – break or separate
- Endo – inner
- Meso – middle
- Ecto - outer



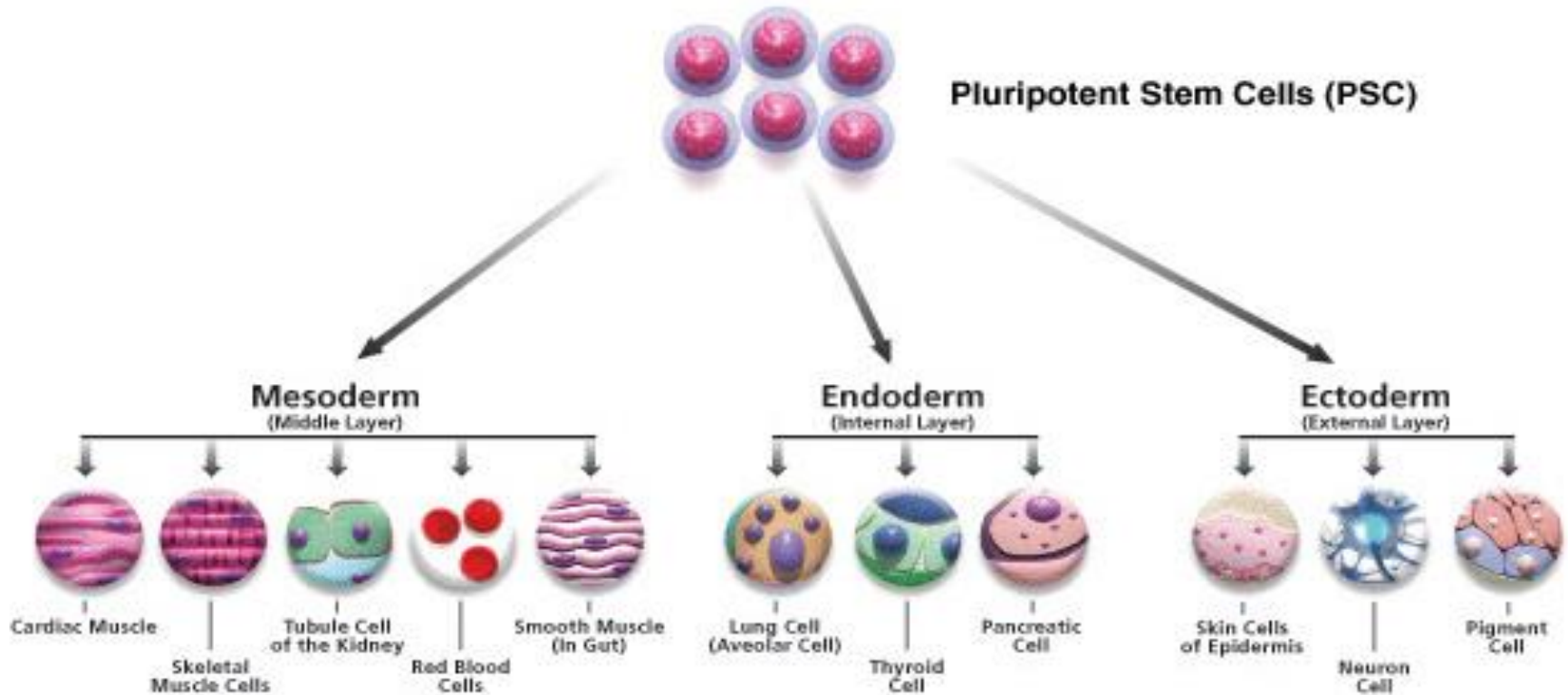
# Early Embryo Development

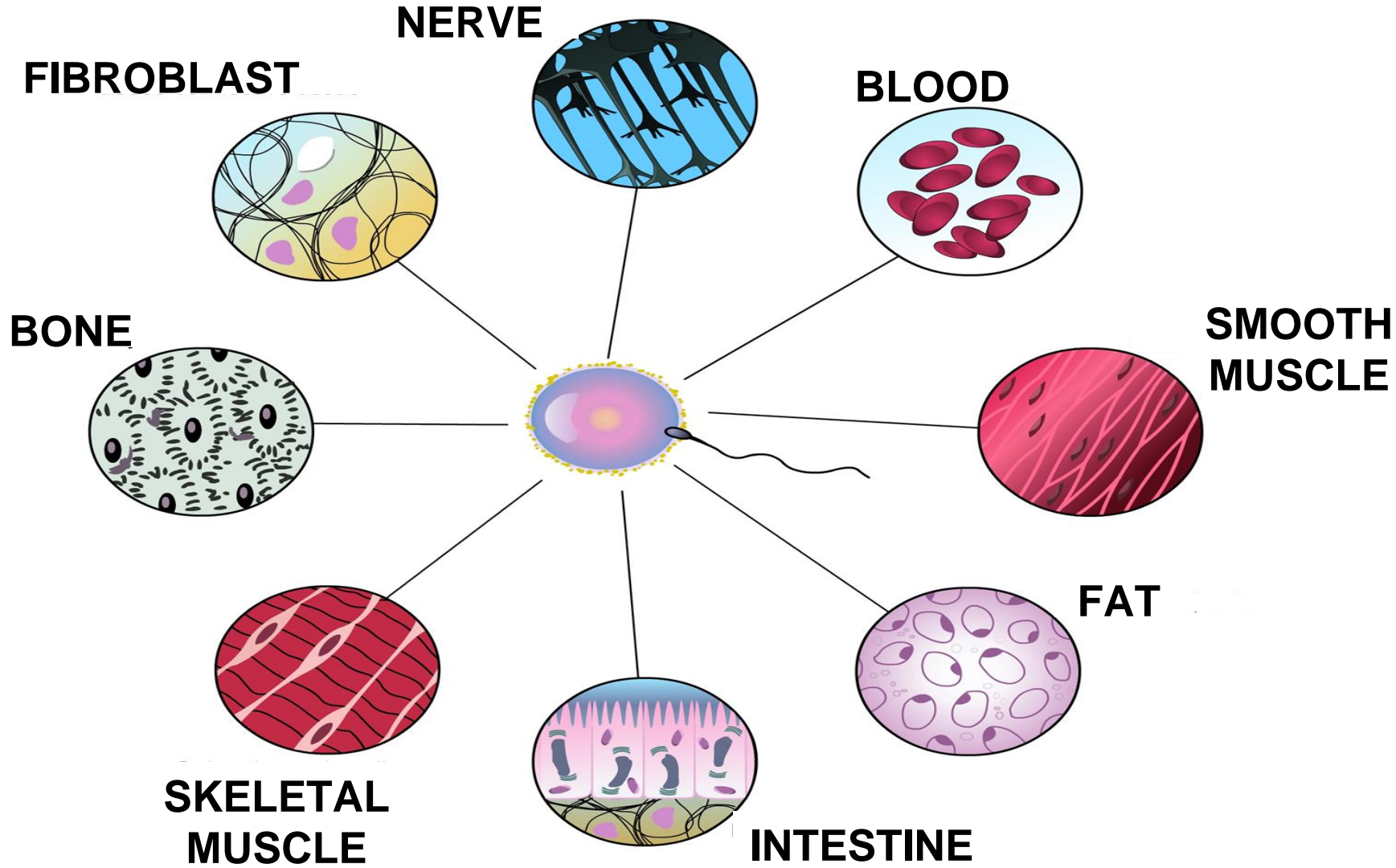
**Gastrulation:** 3 embryonic germ(cell) layers form after implantation

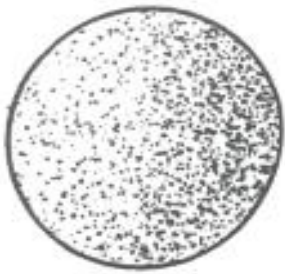
- Ectoderm: outermost layer
  - skin, hair, nails, brain / nervous system
- Mesoderm: middle layer
  - Bones, cartilage, muscle, gonads, circulatory, excretory systems
- Endoderm: innermost layer
  - Digestive Tract, Respiratory System, Glands



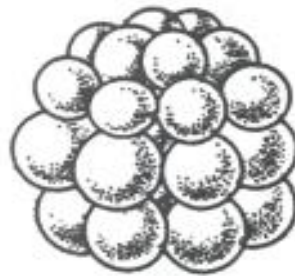
**Differentiation** - embryonic stem cells from each layer begin to specialize into different specific cells



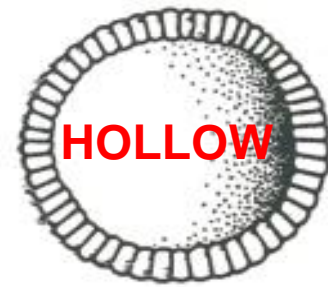




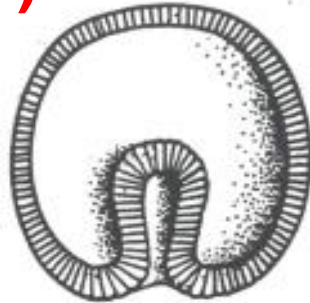
**Fertilized Egg  
(ZYGOTE)**



**MORULA**



**BLASTULA  
(at implantation)**



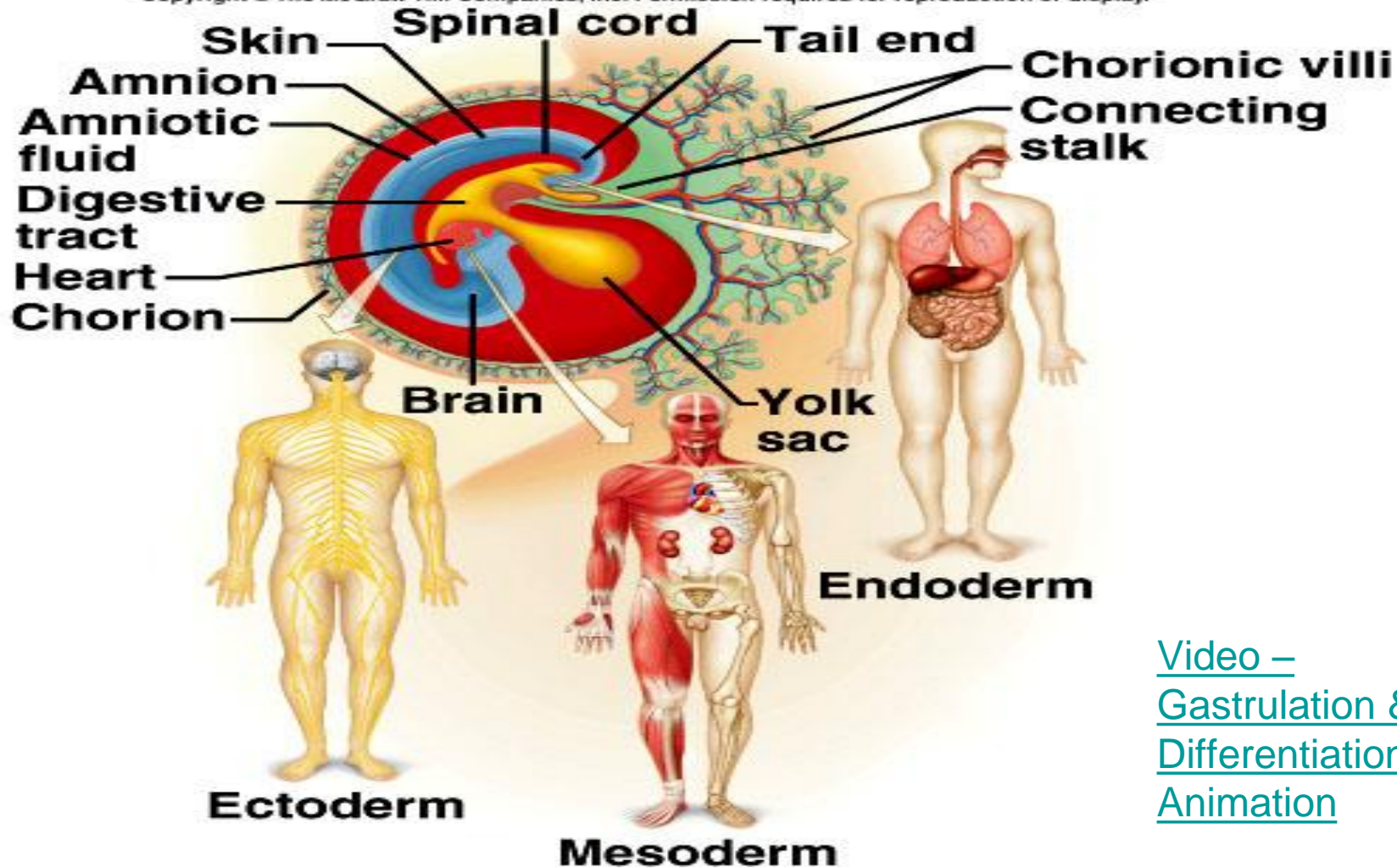
**Early GASTRULA**



**Late GASTRULA**

2. The three embryonic germ layers are the **Ectoderm**, **Endoderm**, and **Mesoderm**.
3. Mitotic division in embryonic development is commonly called **Cleavage**.





[Video –  
Gastrulation &  
Differentiation  
Animation](#)

# Lesson 6

- Fetal Development

1 mo



2 mo



3 mo



4 mo



5 mo



6 mo



7 mo



8 mo



9 mo





**A - embryo**

**D - uterine wall**

**I - uterus**

**E - umbilical cord**

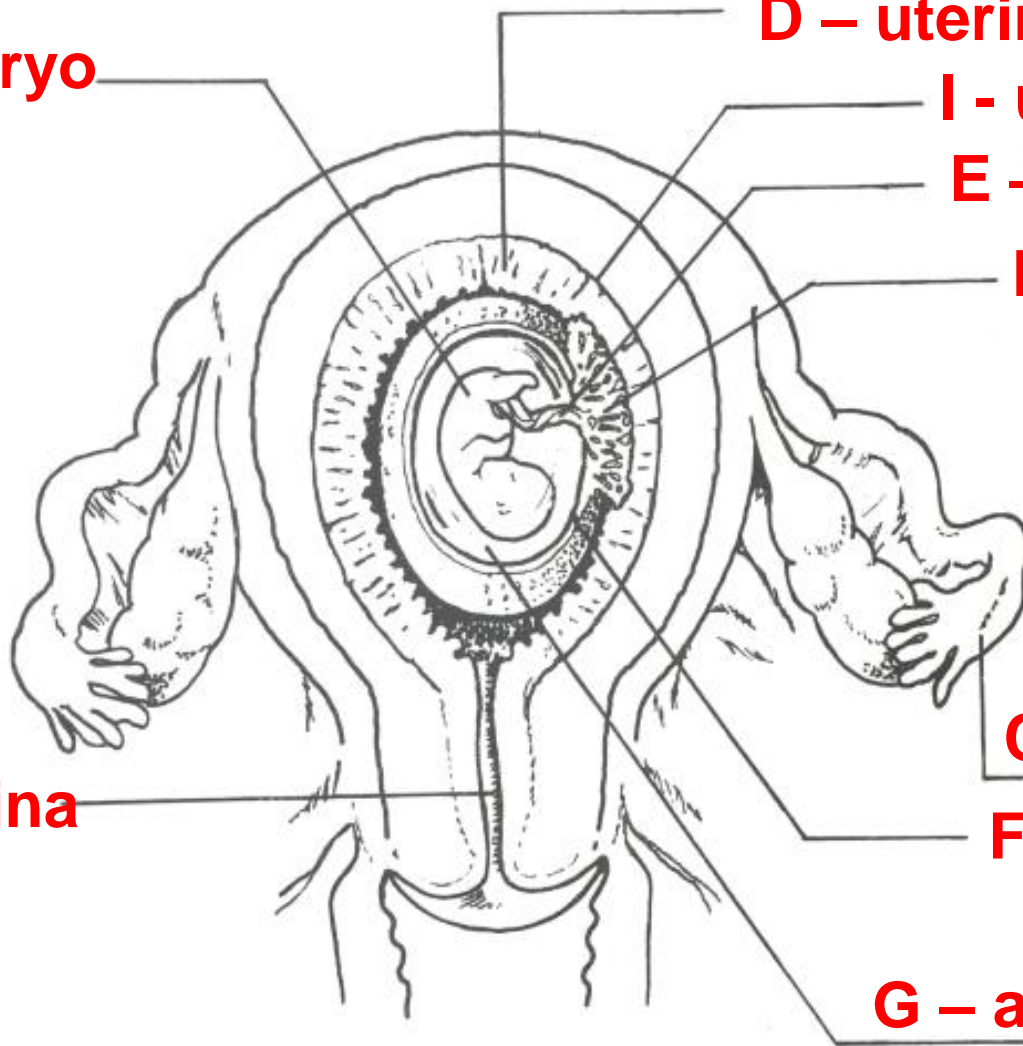
**B - placenta**

**C - fallopian tube**

**F - amnion**

**G - amniotic fluid**

**H - vagina**



# A Mammal Embryo

- a. embryo – offspring during 1<sup>st</sup> 8 weeks of gestation
- b. placenta - organ for gas & nutrient/waste exchanges between mother and fetus;  
NOTE: Their blood supplies do NOT mix!!!
- c. Fallopian tube – where fertilization occurs; carries egg from ovary to uterus
- d. uterine wall – muscular part of uterus, contracts during labor

- e. umbilical cord – attaches embryo/fetus to the placenta
- f. amnion – protective sac around fetus
- g. amniotic fluid – fluid in protective sac
- h. vagina – birth canal
- i. uterus – site of fetal development (40 weeks gestation in humans)

Fill in the blanks with the correct answers.

After two months of development, the embryo is called a (an) **fetus**. The

**placenta** is formed in part from the inner lining of the uterus and in part from

other membranes. It is through the placenta that the embryo/fetus is nourished while in

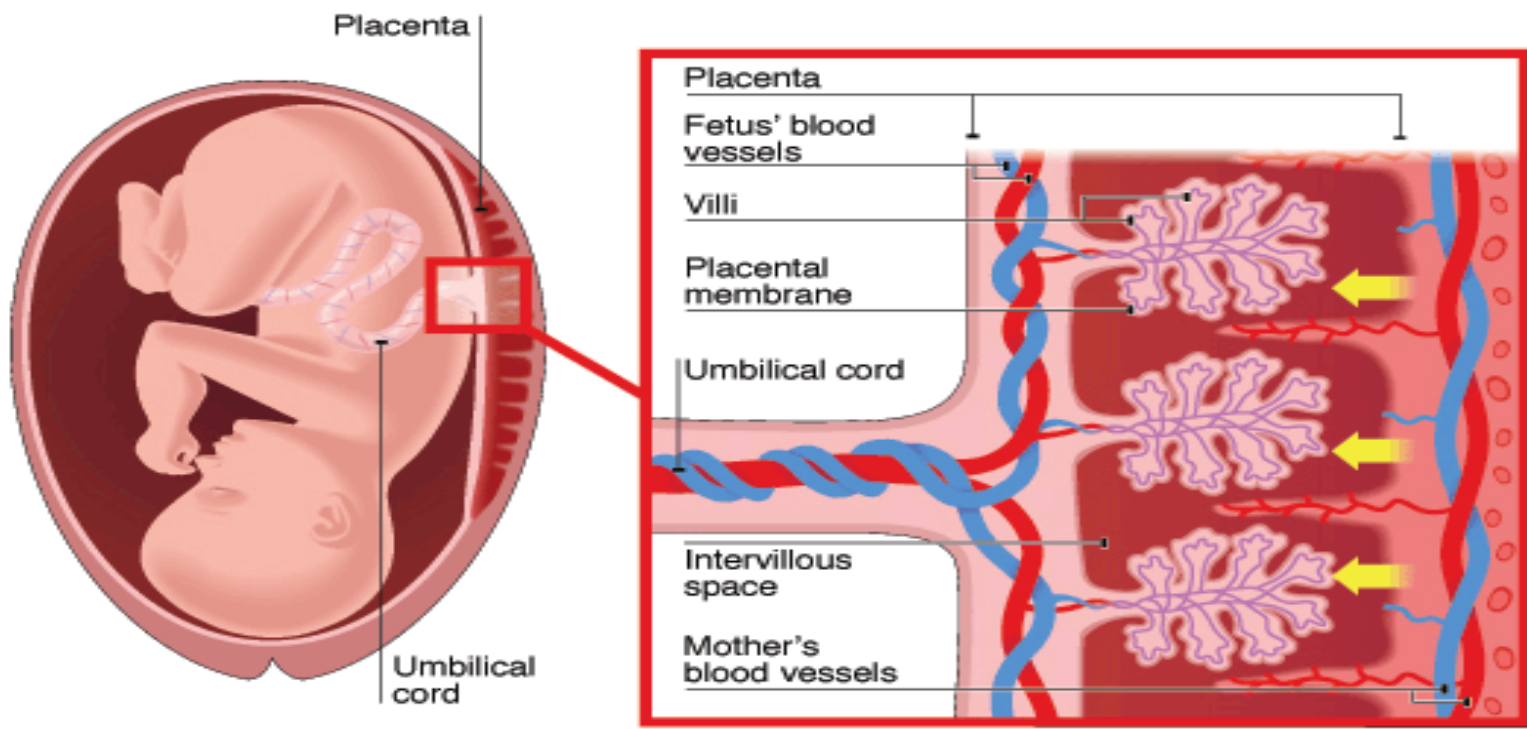
the **uterus** and **wastes** are carried away. The

**umbilical cord** connects the embryo/fetus with the placenta. It provides a transport

system for placental-fetal circulation. The **amnion** is the innermost of the

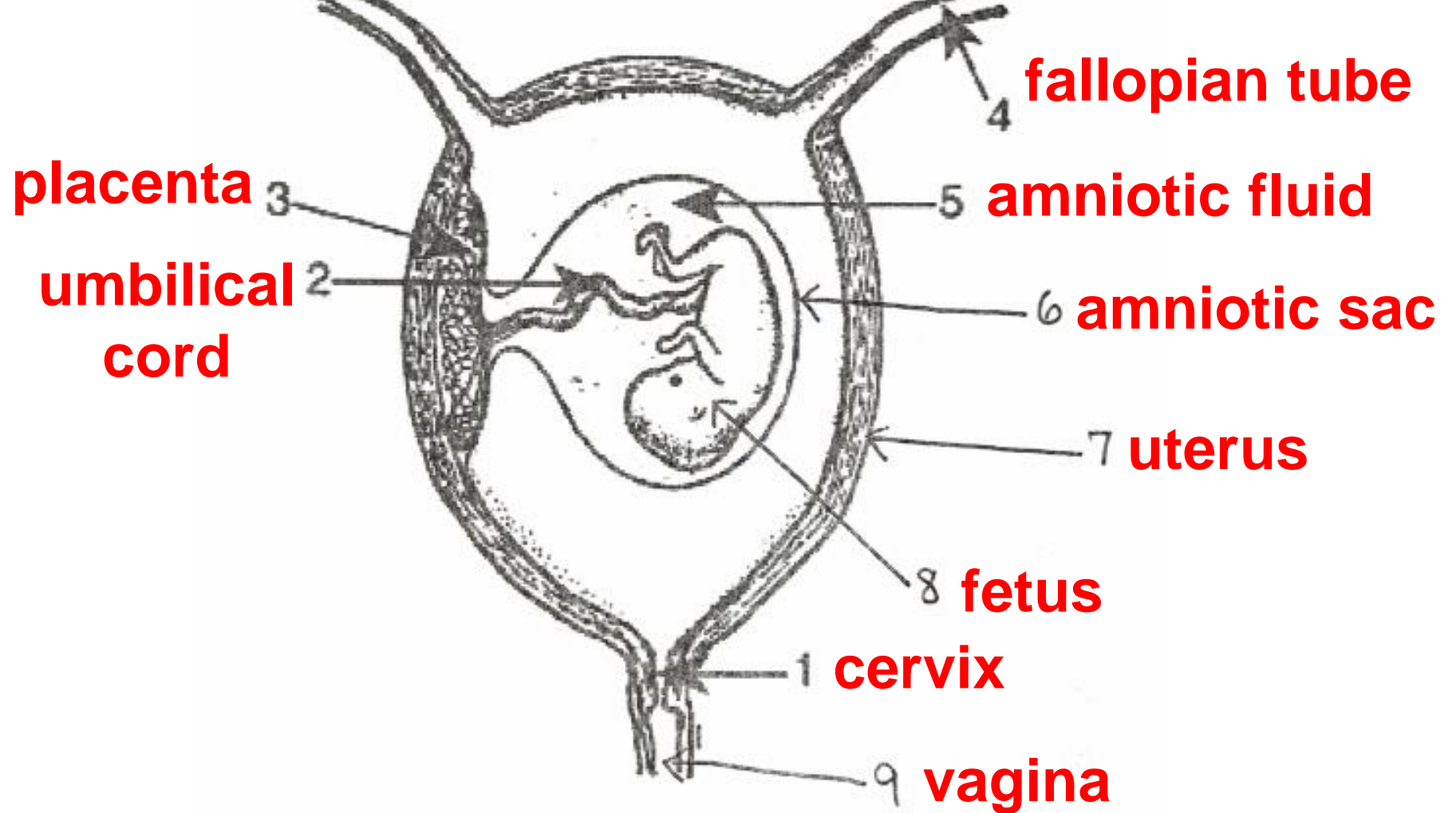
extra embryonic membranes, and it forms a fluid-filled **sac**, around the

embryo/fetus.



If maternal and fetal blood supplies do NOT mix then how are the nutrients, gases, and wastes exchanged?

**Diffusion** across the capillary membranes!



# Warning – Graphic Photos (umbilical cord & placenta)



[Video - Computer Animated Vaginal Birth](#)

[Video - Computer Animated C-section](#)



[Baby born in sac \(en caul\)](#)

[Vaginal birth \(less than 1 min\)](#)

[In the Womb Birth Clip 9 minutes](#) (GRAPHIC)

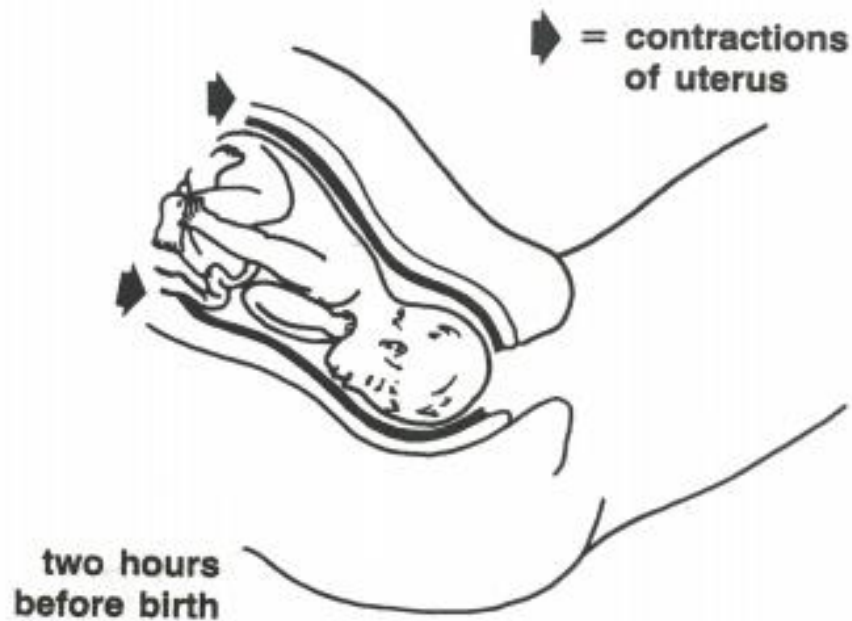
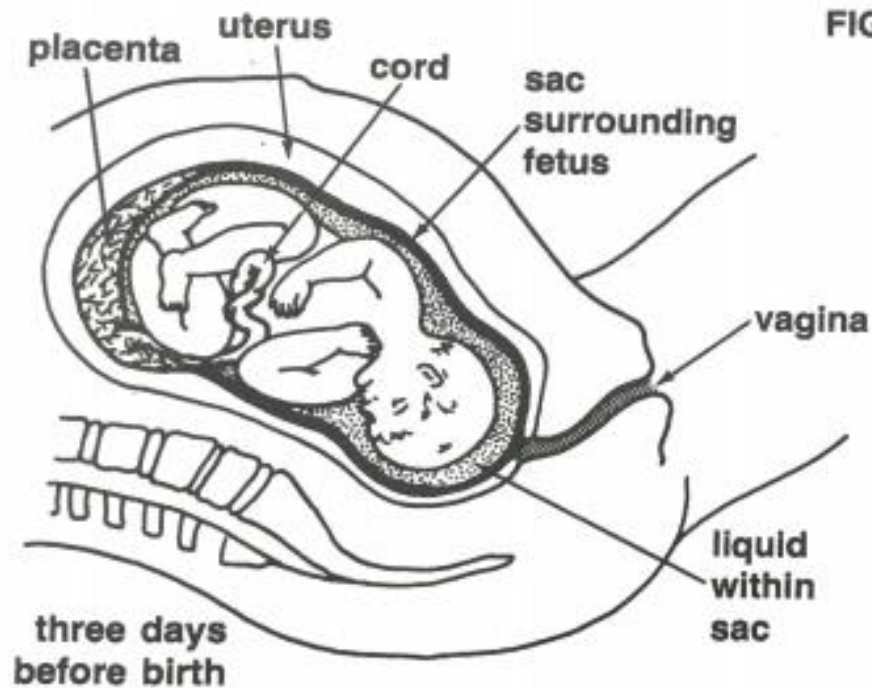
# Lesson 7

- Factors Affecting Fetal Development

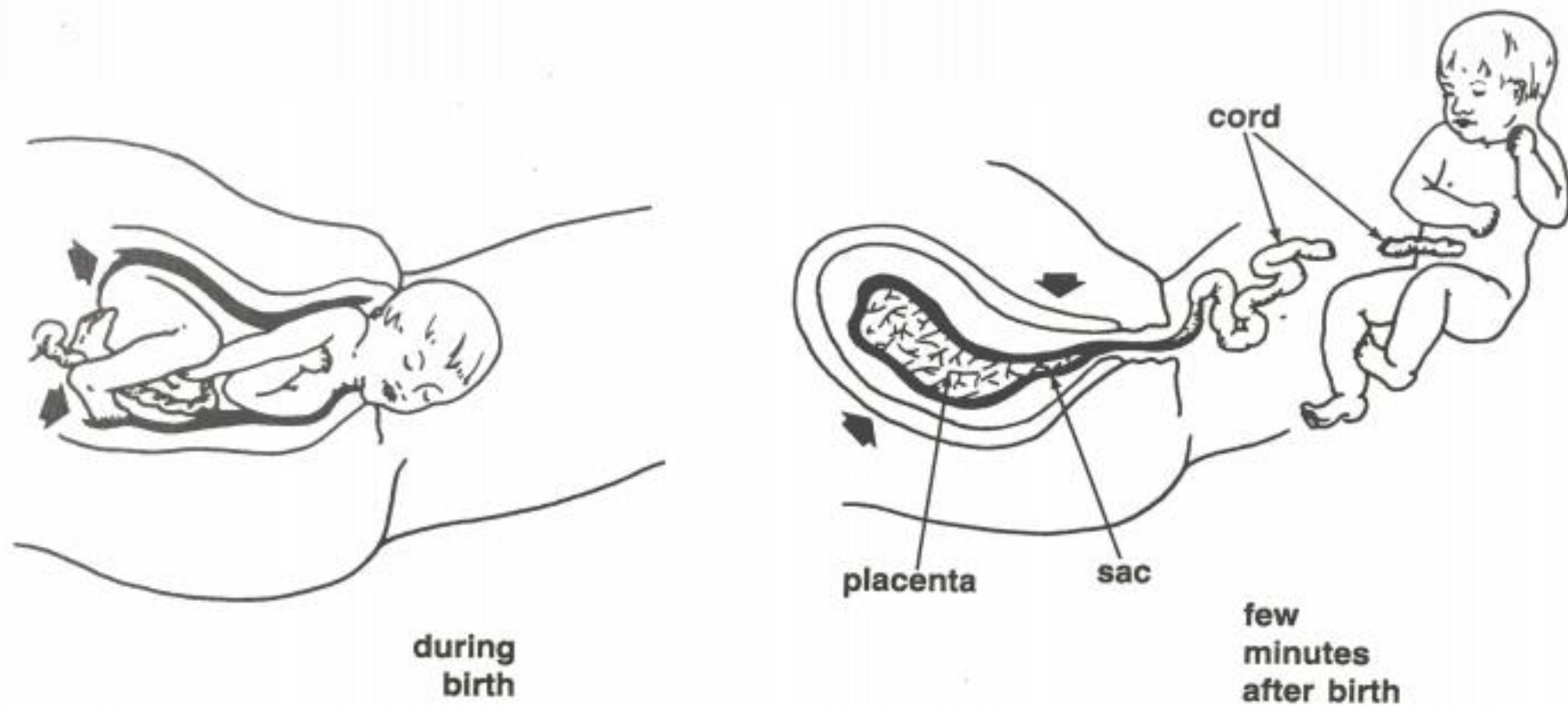


## Part A. Stages of Birth

1. Look at the diagrams of four stages of birth shown in Figures 1 and 2.



**FIGURE 2.**



	Three days before birth	Two hours before birth	During birth	Few minutes after birth
Is baby inside the uterus?	YES	YES	YES	NO
Is baby inside the vagina?	NO	NO	YES	NO
Is baby outside the mother's body?	NO	NO	YES	YES
Is baby inside the sac?	YES	YES	YES	NO
Has the sac broken?	NO	YES	YES	YES
Are contractions occurring?	NO	YES	YES	YES
Is baby attached to the cord?	YES	YES	YES	NO
Is the cord attached to the placenta?	YES	YES	YES	YES
Is the placenta attached to the uterus?	YES	YES	YES	NO
Is the placenta being pushed out?	NO	NO	NO	YES
Has the vagina opened?	NO	YES	YES	YES
Is baby attached to the mother?	YES	YES	YES	NO
Has liquid been lost from the sac?	NO	YES	YES	YES
Is baby still dependent on the mother?	YES	YES	YES	NO

### Part B. What Is a Caesarean Birth?

1. Look at the diagram in Figure 3 that shows the outline of the pelvis and the head of a fetus just before the time of birth.
2. Note carefully that the head must be able to pass through the opening in the pelvis during birth.
3. Measure line a. This represents the width of the opening in the pelvis.
4. Measure line b. This represents the width of the head of the fetus.

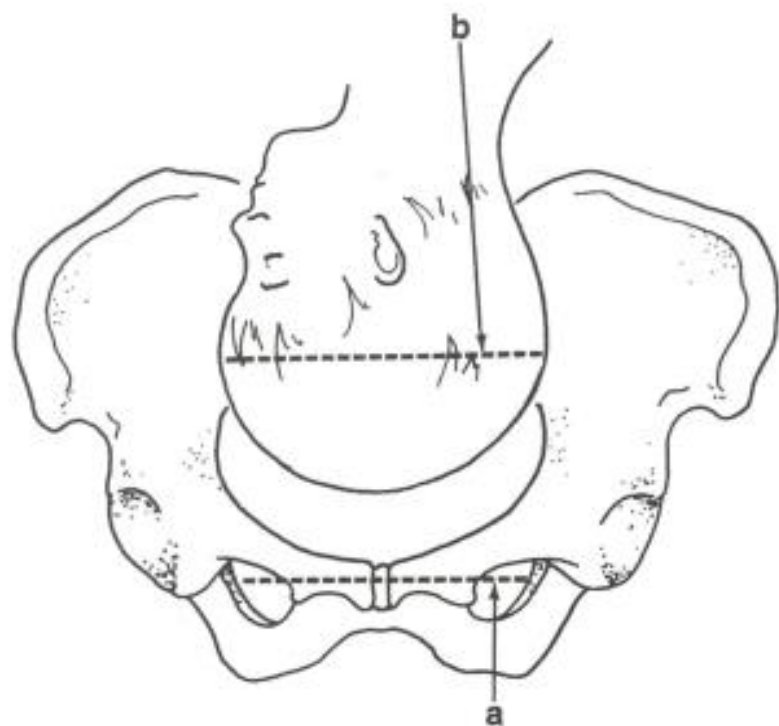


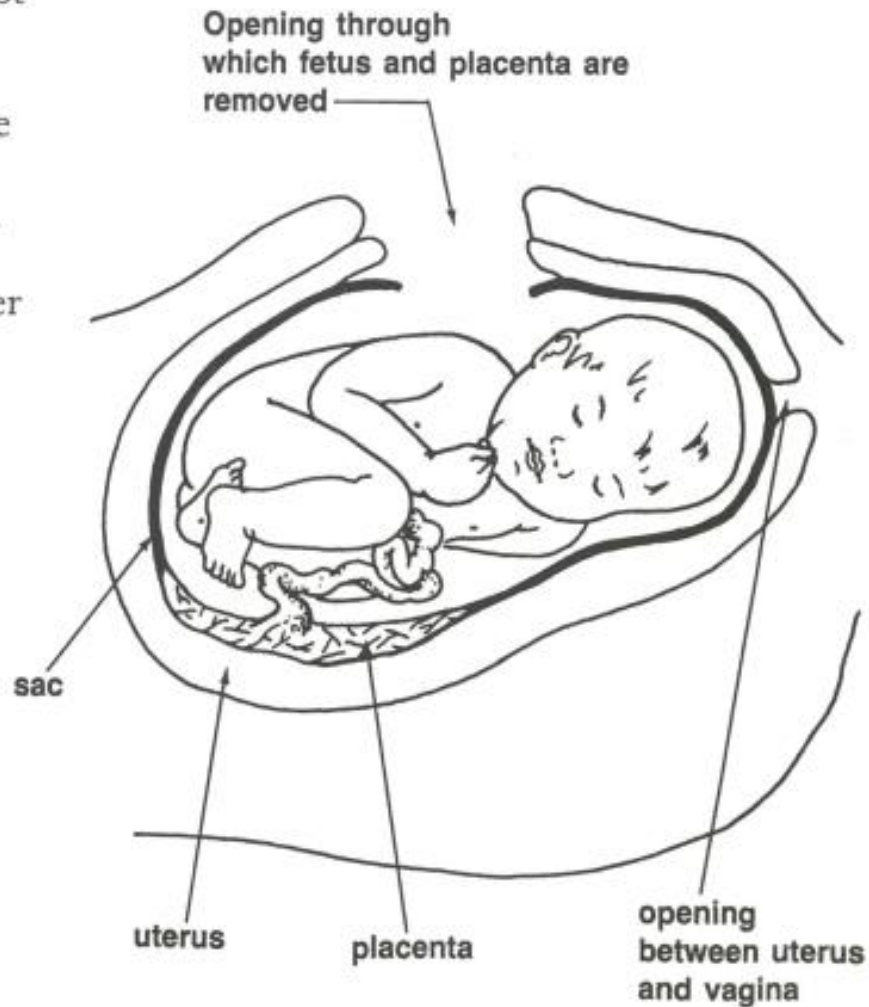
FIGURE 3. Sizes of pelvis and head of fetus

5. Record your data here:

a. width of pelvis opening 3 cm

b. width of fetus head 3.4 cm

6. Notice that this fetus would not be able to pass through this pelvis opening.
7. A caesarean operation must be done to deliver the baby.
8. Look at how a caesarean birth is done in Figure 4. This is usually done before the mother goes into labor.
9. To compare a birth canal delivery with a caesarean delivery, answer the questions in Table 2.



**Table 2. Comparing a Caesarean Delivery With a Birth Canal Delivery**

Trait	Birth canal	Caesarean
Does the fetus pass through opening in the pelvis?	<b>YES</b>	<b>NO</b>
Does the fetus pass through the vagina?	<b>YES</b>	<b>NO</b>
Does the placenta move through the vagina?	<b>YES</b>	<b>NO</b>
Is the fetus lifted from the uterus?	<b>NO</b>	<b>YES</b>
Is the uterus cut open?	<b>NO</b>	<b>YES</b>
Is the sac cut open?	<b>NO</b>	<b>YES</b>
Must the cord be cut to separate the fetus from the placenta?	<b>YES</b>	<b>YES</b>
Do contractions occur?	<b>YES</b>	<b>NO</b>



## QUESTIONS

1. What two body parts surround and protect the fetus as it develops?

**Amniotic sac filled with fluid and uterus**

2. What is the job of the placenta? **To allow nutrient and gas exchange between mother & fetal blood supplies by diffusion**

3. What is the job of the cord? **To connect the fetus to the placenta**

4. What is meant by the word *labor*? **The uterus contractions that help push the baby out through the vagina**

5. The placenta is sometimes called the *afterbirth*. Why is this a good name for this part? **The placenta is birthed after the baby**

6. List several changes that take place several hours before birth.

**Uterus contractions begin, cervix dilates, amnion breaks**

7. List several changes that take place a few minutes after birth.

**Umbilical cord is clamped & cut, placenta detaches from uterus and is expelled, baby is placed on mother for skin to skin contact and breastfeeding**

Should you wait  
to have a child?  
Get the facts.

# The Fertility Factor

M

OST WOMEN who are on a career track do not worry about the consequences of delaying childbirth—they're confident that all the technical advances they hear about will enable them to become pregnant well into their 40s and beyond.

The truth is that fertility declines steadily with age. A woman's best chance of becoming pregnant is between 18 and 25. Over the next 10 years, that number drops by half. By age 40, her fertility is only 15% of what it was at age 25. At 44 and beyond, there's only a 1% chance of success each month.

The success of *in vitro* fertilization in a woman over 35 drops significantly if her own eggs are used. If she's pushing 50, her best chance of becoming pregnant is with eggs from

## Is There A Problem?

If you've been trying to start a family without success and are in your 20s

infection and abnormalities of the pelvic organs. The doctor looks for sexually transmitted diseases, evaluates the hormonal status and checks the efficiency of the immune system. An ultrasound may be needed to search for ovarian cysts and uterus abnormalities. A dye test checks the shape of the uterus and if the fallopian tubes are open. More invasive procedures—such as laparoscopy, hysteroscopy or an endometrial biopsy—also may be needed.

A post-coital test performed during or near ovulation also may be done. The cervix is scraped a few hours after intercourse to obtain a sample of the cervical fluid to see if any sperm has "made it."

Treatment depends on the findings. For example, irregular or absent ovulation can be treated with drugs. In endometriosis, the aberrant tissue sometimes can be removed surgically or with lasers, or treated with birth-control pills or hormones. Infections are eradicated with an antibiotic; scar tissue can be removed; missing or deficient hormones can be replenished. Lifestyle changes also may be necessary, especially eliminating tobacco and reducing alcohol consumption.

Assisted-reproduction techniques also are available (see box). They take sacrifice, patience, time, money, optimism and an expert in the field. An easier alternative is to work on both your career and motherhood when you're young, if you can. **III**

## Alternatives

Some commonly recommended



cantly if her own eggs are used. If she's pushing 50, her best chance of becoming pregnant is with eggs from a younger donor.

## Your Eggs And Your Age

The reason for all this lies in the number and characteristics of the eggs themselves. At birth, a girl's ovaries contain 1 million to 2 million eggs. At puberty, that number drops to 400,000 and continues to fall—especially quickly approaching 35. There also is some deterioration in egg "quality" with age. No one knows why.

When a couple can't conceive, *both* partners should be evaluated—statistically they're equally "at fault." While sperm is a key player and can be inadequate for various reasons, a woman's age does not appear to be a major factor in the infertility equation.

## IS THERE A PROBLEM?

If you've been trying to start a family without success and are in your 20s and healthy, give it a year before seeking professional help.

But don't wait longer than six months if you're female and over 30, or if you have one or more of the following: chronic pelvic infection, endometriosis (uterine tissue occurring elsewhere in the pelvis or abdomen), painful or irregular periods, or recurrent miscarriages.

If, after several months without success, a couple decides to get help, the male should see a urologist (who may refer him to a specialist in infertility).

## Testing And Treatment

Testing a woman for fertility usually is more involved. A careful history is taken and a physical exam is done, especially looking for evidence of pelvic

## Alternatives

*Some commonly recommended assisted-reproduction procedures:*

**Artificial insemination.** Sperm is inserted into the uterus, usually via a catheter. This technique, which works about 15% to 20% of the time, is appropriate when the male partner's sperm is unhealthy or he is impotent and cannot penetrate.

**In vitro fertilization (IVF).** Sperm is introduced with a needle to fertilize eggs in a test tube. The resulting embryo is transferred to the mother's uterus two or three days later. It's successful in 20% to 26% of cases.

**Intra-cytoplasmic sperm injection.** A single sperm is injected into one egg. This is especially useful when the man has a low sperm count; it also avoids the risk of multiple pregnancies.

**Donor eggs.** If your own eggs are not viable, those from a younger woman can be fertilized and the embryo transferred to grow in your uterus.

Read the article and fill in the following:

1. A woman's best chance of becoming pregnant is between the ages of \_\_\_\_\_ and \_\_\_\_\_.
2. From age 25 to 35 a woman's chance of becoming pregnant drops by \_\_\_\_\_.
3. From age 44 and up a woman's chance of becoming pregnant is only \_\_\_\_% each month.
4. The success of \_\_\_\_\_ drops significantly if her own eggs are used.
5. At birth a girl's ovaries contain \_\_\_\_\_ eggs.
6. At puberty the number of eggs drops to \_\_\_\_\_.
7. There is deterioration in egg \_\_\_\_\_ as a woman ages.
8. Define:  
endometriosis \_\_\_\_\_  
\_\_\_\_\_

9. What are some of the conditions mentioned that explain why some women cannot conceive (become pregnant)?\_\_\_\_\_

10. List four commonly recommended assisted-reproduction procedures.\_\_\_\_\_

# Factors That Affect Prenatal Development

- MUTAGENS like x-rays can cause mutations in the developing embryo/fetus' DNA

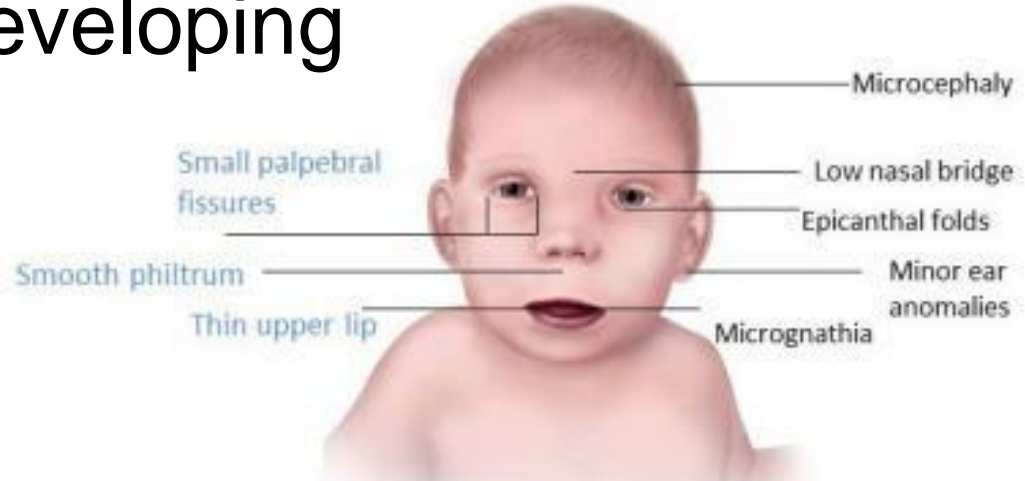


- Some harmful substances can DIFFUSE across the placenta



# Alcohol can cause:

- brain damage
- birth defects such as fetal alcohol syndrome (FAS), a form of mental retardation
- Highest risk during early pregnancy when organs are still developing



# **Cigarette smoke** can increase risk of:

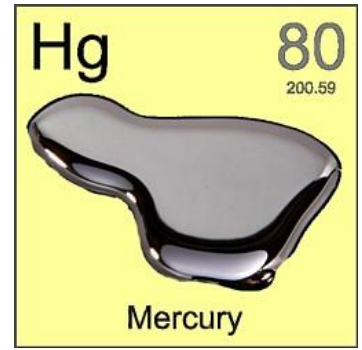
- pre-mature birth
- low birth weight
- Heart defects
- Cleft lip / palate
- Miscarriage / stillbirth
- Ectopic pregnancy (implants outside of uterus)
- Placental abruption (separates from uterus)





**Mercury** exposure can lead to:

- Stunted neurological development
- Vision and hearing problems



Pregnant women should avoid eating large fish  
– shark, swordfish, king mackerel, tuna



## Pregnancy-Safe



crab	perch
crayfish	squid
trout	herring
tilapia	sardines
sole	scallops
anchovies	haddock
oysters	pollock
shrimp	salmon

## Limit Servings\*



bass  
lobster  
carp  
mahi mahi  
halibut  
grouper  
albacore tuna  
yellowfin tuna  
cod

## Avoid



king mackerel  
shark  
tilefish  
marlin  
orange roughy  
bigeye tuna  
ahi tuna

\*Limit to 3 to 6 servings a month or less

# Prenatal Care—A Case Study

Martha was happy to find out that she was pregnant. She and Bill had wanted to have a child for more than a year, with no success. Now that the pregnancy test was positive, Bill and Martha breathed a sigh of relief. They looked forward to being able to relax and enjoy themselves over the next nine months as they waited for the arrival of the new member of the family.

Before long Martha began to realize that having a baby was not as simple as she had at first thought. She discovered that there was much to think about and many things to do to help ensure that the baby would be born healthy.

Soon after she knew she was pregnant, Martha visited an obstetrician, a doctor who specializes in caring for pregnant women and delivering their babies. Dr. Thomas set up a regular schedule of appointments so that he could observe how Martha's pregnancy was proceeding. This would also give him the opportunity to advise Martha concerning how to care for herself during her pregnancy. The doctor took a complete medical history. He advised Martha concerning her diet, the need to keep her weight under control, the kinds of exercise that would be good for her, and the importance of staying away from alcohol, drugs, and tobacco.

The nurse explained that good nutrition is essential to the health of pregnant women and their developing babies. The doctor prescribed special vitamins that contained extra amounts of the minerals iron and calcium. The doctor's nurse explained that the extra iron would reduce the chances of complications arising from anemia (a medical condition in which there are too few red blood cells or too small an amount of hemoglobin in the blood). A pregnant woman needs extra calcium so that her bones and those of her developing baby will be strong. The vitamins would contribute toward good nutrition for both Martha and her developing baby, and would help ensure that the baby does not have an abnormally low birth weight, which can be harmful to the health of the baby and is associated with birth defects.

Following the advice of Dr. Thomas, Martha exercised to develop and

Following the advice of Dr. Thomas, Martha exercised to develop and strengthen her body. She knew that staying in good shape would help make childbirth easier. She took regular walks and did breathing and stretching exercises. She kept up her weekly swim at the Y and her tennis game with Bill on Thursdays. She and Bill started spending more time together.

Perhaps most important of all, Martha took seriously her doctor's warning that she should not take any drugs or medicines without his permission. Drugs, medicines, and most other kinds of chemicals that a pregnant woman takes into her body can cross the placenta and affect the baby. Even such common drugs as aspirin, nicotine, and alcohol can be harmful. The pregnant woman who uses cocaine and barbiturates runs a high risk of giving birth to a baby who is addicted to these drugs. If she smokes and drinks alcoholic beverages during her pregnancy, her baby is more likely to have low weight and be sickly than are the babies of pregnant women who avoid smoking and drinking. Dr. Thomas pointed out that babies of drinking women have higher death rates and are more likely to be born premature.

From Martha and Bill's story, answer the following questions about prenatal care.

1. Why is prenatal care important? \_\_\_\_\_  
\_\_\_\_\_
2. What are some factors that can cause low-birth-weight babies? \_\_\_\_\_  
\_\_\_\_\_
3. Name some diseases of the pregnant woman that can harm unborn children. \_\_\_\_\_  
\_\_\_\_\_
4. What extra mineral supplements are important for the diet of a pregnant woman? \_\_\_\_\_  
\_\_\_\_\_
5. What do these extra nutrients do? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. List eight physical symptoms that should prompt a pregnant woman to call her obstetrician immediately. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
7. List some rules that a pregnant woman should follow to ensure giving birth to a healthy child. \_\_\_\_\_

# Lesson 8

Sexual Reproduction in Plants

Seeds

Flowers

# Seed Dispersal

- Methods:
  - Wind
    - [Maple Copters - YouTube](#)
  - Mechanical
    - [Exploding Seeds](#)
  - Animal





# Structure of a Flower

## BrainPOP | Pollination

The flower is a specialized structure for sexual reproduction in some types of plants

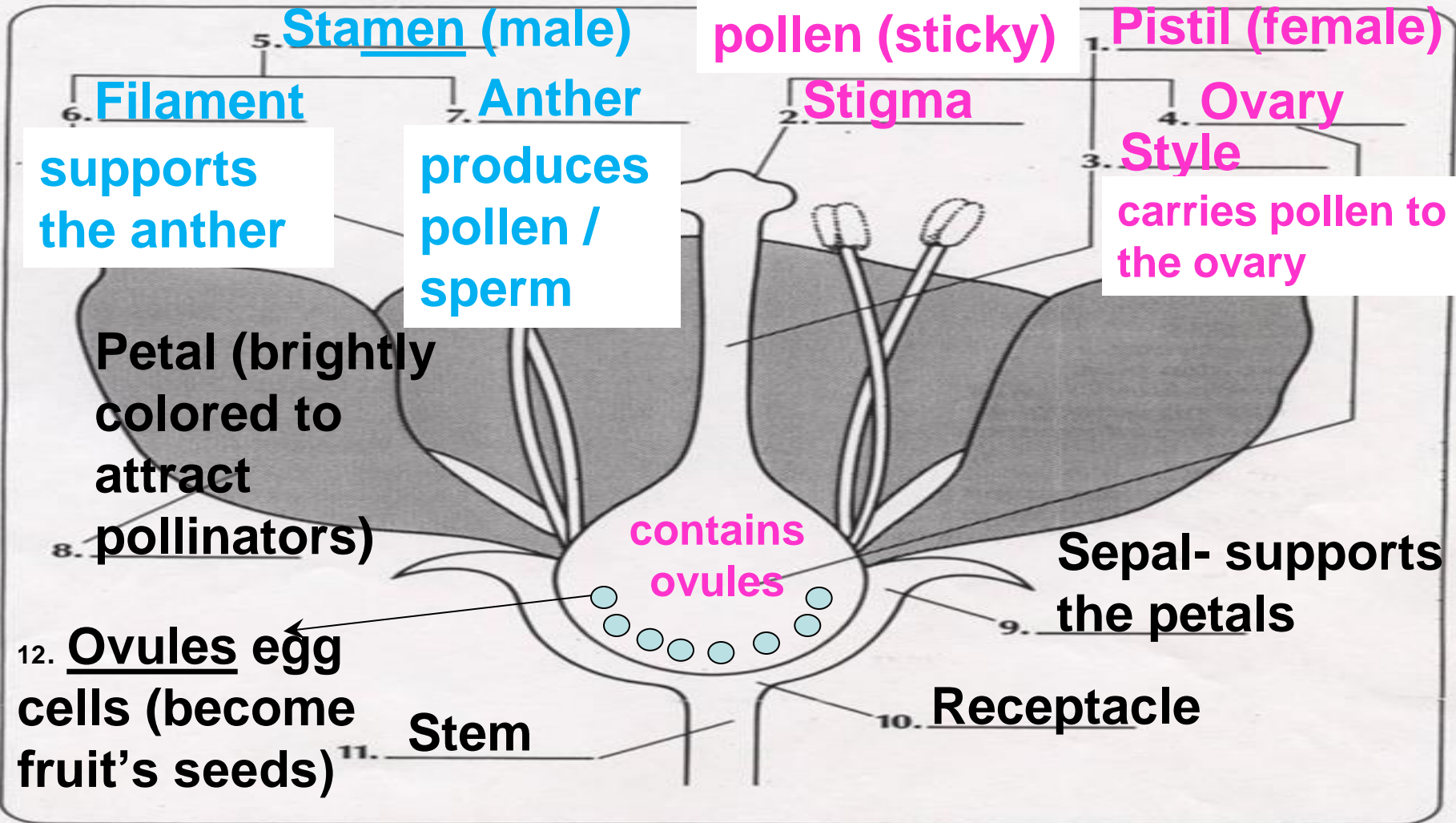
Pollination – transfer of pollen (containing sperm) from the male anther to the female stigma

Cross pollination – transfer between 2 flowers

Self pollination – transfer on the same flower



# Structure of a Flower



# Reproduction Review

The outermost germ layer of an embryo

**Ectoderm**

Three accessory glands that produce  
semen/prepare sperm to leave body

**Cowper's (bulbourethral)**

**Prostate**

**Seminal Vesicle**

Fertilization occurs here

**Fallopian tube**



Two ovarian human hormones that control  
the female reproductive cycle

**Progesterone**

**Estrogen**

Two pituitary human hormones that control  
the female reproductive cycle

**FSH**

**LH**

The male sex hormone is produced in the

**Testes**

True or false?

Mother's blood mixes with fetal blood to transfer vital nutrients and remove waste products.

**FALSE!!! These materials are transferred through diffusion! Blood doesn't mix**

Put the following in order:

fetus, blastula, gastrula, zygote,  
embryo

**zygote, blastula, gastrula,  
embryo, fetus**

Put the following in order:

cleavage, differentiation,  
fertilization, gastrulation, growth,  
implantation

**fertilization, cleavage,  
implantation, gastrulation,  
differentiation, growth**

When stem cells begin to specialize, this is called...

**differentiation**



Most fish have \_\_\_\_\_ fertilization and  
\_\_\_\_\_ development!

**external, external**

Most birds have \_\_\_\_\_ fertilization  
and \_\_\_\_\_ development

**internal, external**

What is a reproductive adaptation for reproduction on land?

**Penis**

**Seminal fluid**

Which stage of the female reproductive cycle is characterized by the development of a “yellow body” which releases the hormone progesterone to maintain the lining of the uterus?

**Luteal phase**

Characterized by a permanent ending of the menstrual cycle

## **Menopause**

# Human Development Summary

1. Sperm and egg /ovum join in the oviduct/fallopian tube:  
FERTILIZATION
2. The fertilized egg is called a ZYGOTE
3. The zygote moves down the fallopian tube toward the uterus and divides many times: CLEAVAGE
4. Within the next 2 weeks, the zygote will become an EMBRYO, and continue to divide
5. The embryo implants itself into the uterine lining and GASTRULATES (hollows out) forming 3 germ layers
6. The embryo starts to form distinctive specialized cells, beginning the process of DIFFERENTIATION & GROWTH

7. The embryo develops its umbilical cord and PLACENTA, where DIFFUSION of gases, nutrients and wastes between mother and fetus occurs
8. During GESTATION (time in the womb), the fetus is protected from shock by the fluid-filled AMNION.
9. As the fetus grows larger, it may be exposed to many environmental factors that DIFFUSE across the placenta
10. MUTAGENS like x-rays can cause mutations in the developing fetus!
11. Other toxic materials like alcohol, cigarette smoke, and mercury can cause birth defects and low birth weight as well!