

ANIMAL BIOLOGY DURING THIS **SECOND SEMESTER 2023-2024**



&

EMBRYOLOGY

**STUDY OF HUMAN
EMBRYO DEVELOPMENT,
AFTER THE FERTILIZATION**

M^{RS} DIDA N.

EVERY TWO WEEKS

1/15

HISTOLOGY

**STUDY OF ANIMAL
TISSUES**

M^{RS} AITYAHIA D.

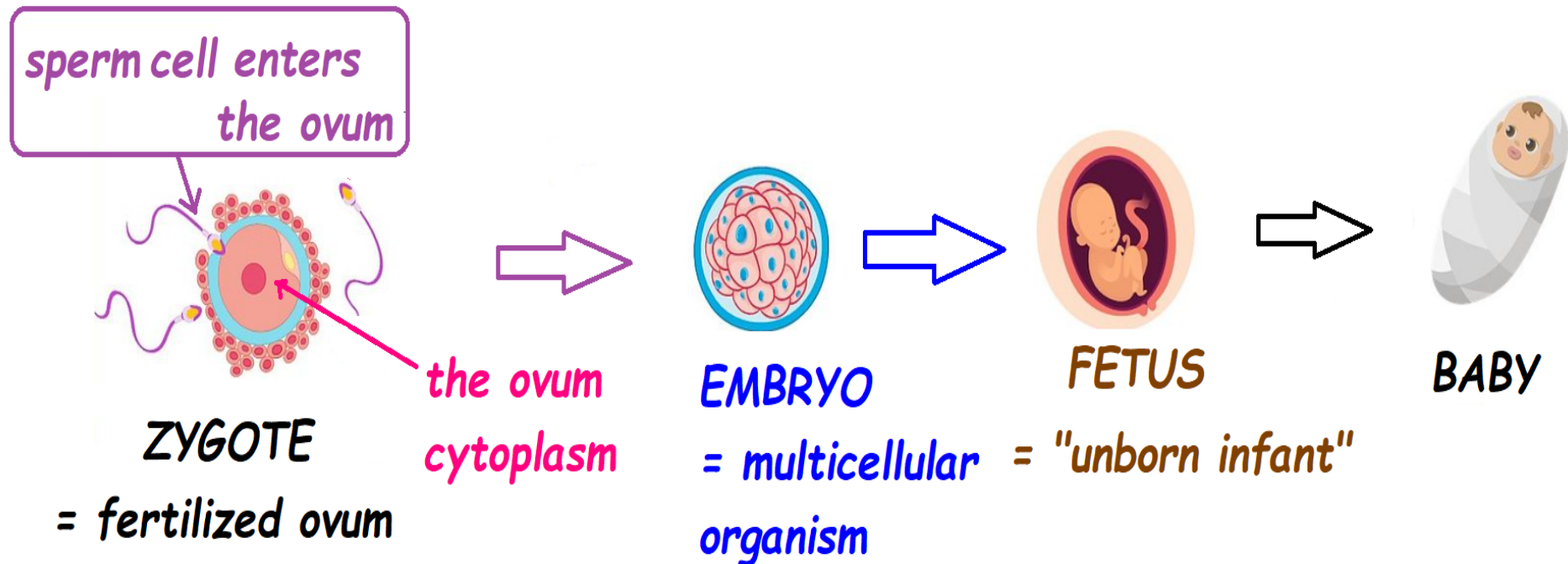
EVERY TWO WEEKS

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WHAT ARE THE STEPS OF EMBRYOLOGY IN HUMAN ?



THE STUDY OF THE FORMATION AND DEVELOPMENT OF
AN EMBRYO & FETUS = EMBRYOGENESIS



TITLE: FETAL DEVELOPMENT STAGES INSIDE THE MOTHER'S WOMB

**1-
GAMETE
FORMATION
=
GAMETOGENESIS**

**WHAT DOES
EMBRYOLOGY
STUDY?**

**2-
GAMETES
FUSION
=
FERTILIZATION**

**3-
EMBRYO DEVELOPMENT
=
EMBRYOGENESIS
(BEFORE HIS BIRTH)**

IN EMBRYOLOGY, WHAT DOES IT MEAN GAMETOGENESIS???



***DIPLOID CELL
(2n)***

**MEIOSIS
&
CELL
DIFFERENTIATION**

FORMATION

***HAPLOID CELL
(n)***



***IN
THE MALE***

GAMETOGENESIS

IN THE FEMALE



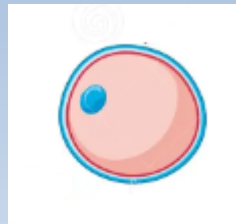
**=
SPERMATOGENESIS**

**=
OOGENESIS**

Formation

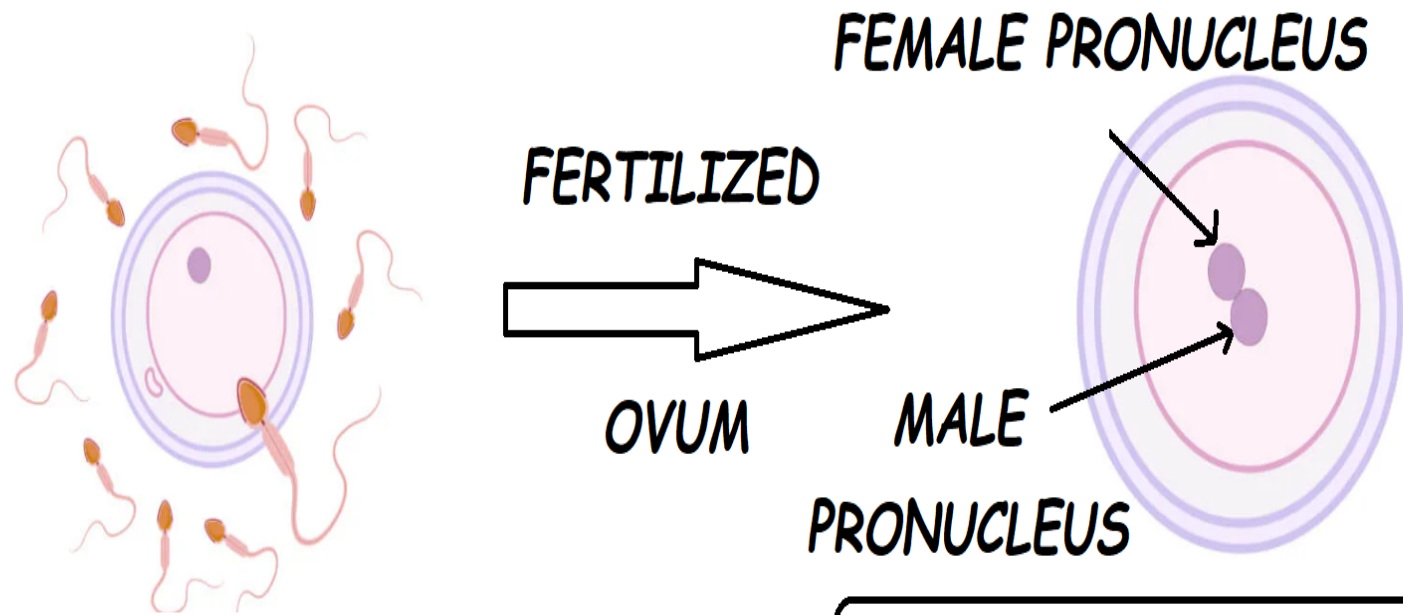
Formation

**MALE GAMETE
SPERMATOZOON**



**UNFERTILISED FEMALE
GAMETE
OVUM = EGG**

IN EMBRYOLOGY, WHAT DOES IT MEAN FERTILIZATION ???



**FERTILIZATION = UNION OF A FEMALE
GAMETE (EGG or OVUM)
WITH ONE MALE GAMETE
(SPERMATOZOON)**

**THE 2 PRONUCLEI FUSE
TOGETHER TO FORM A
DIPLOID CELL = ZYGOTE
(2n)**

***IN EMBRYOLOGY,
WHAT DOES IT MEAN THE EMBRYO DEVELOPMENT
???***

1- ZYGOTE CLEAVAGE

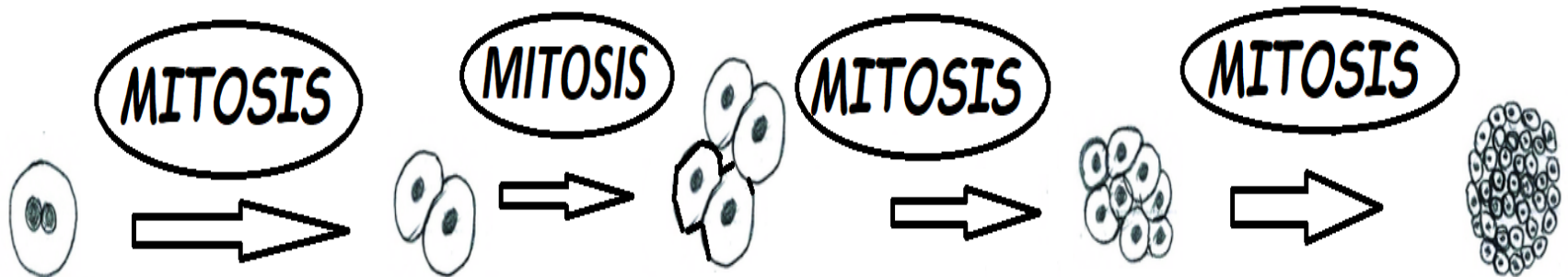
***2-
GASTRULATION***



***4-
ORGANOGENESIS***

3- NEURULATION

1- ZYGOTE CLEAVAGE



ZYGOTE

1 DIPLOID CELL

$2n=46$

2 CELL STAGE

= 2 blastomeres
(daughters cells)

4 CELL STAGE =

4 blastomeres

8 CELL STAGE =

8 blastomeres

MORULA

~ 60 or more
of blastomeres

THE ZYGOTE CLEAVAGE

ZYGOTE TO.....MORULA TRANSITION

2- GASTRULATION



**BY THE MIGRATING CELLS, THE EMBRYO
DIFFERENTIATES
INTO 3 GERM LAYERS (TISSUES)
OF EMBRYONIC CELLS**



ECTODERM



**OUTER CELL
LAYER**



MESODERM



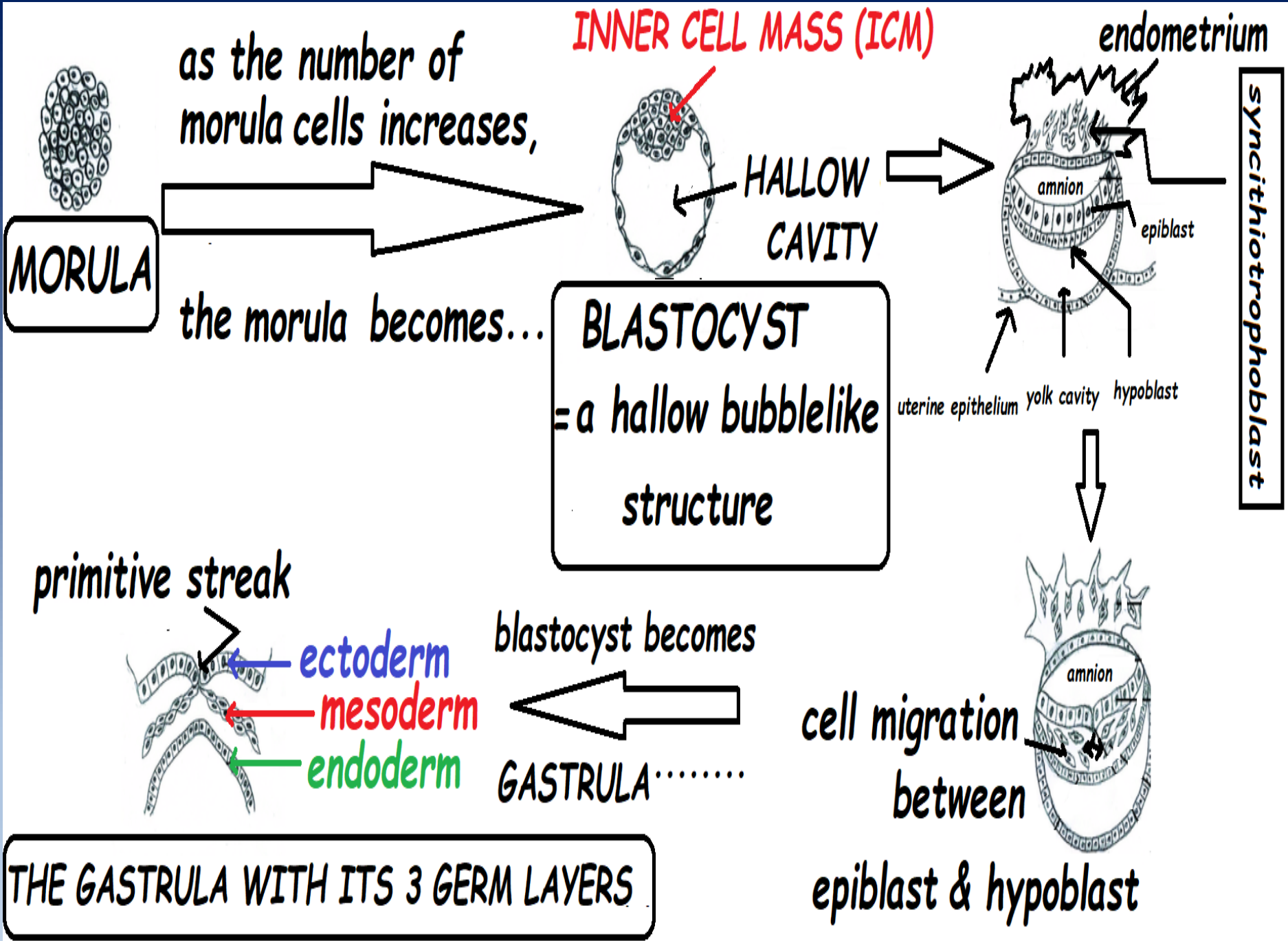
**CELL LAYER
BETWEEN
ECTODERM &
ENDODERM**



ENDODERM



**INNER CELL
LAYER**

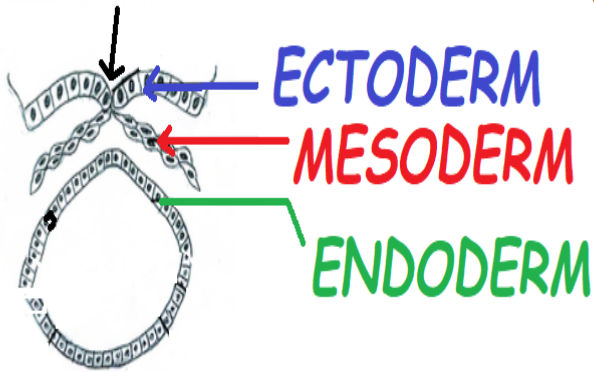


3- NEURULATION



FORMATION OF THE VERTEBRATE NERVOUS SYSTEM IN EMBRYO

PRIMITIVE STRIKE



GASTRULA becomes



..... a NEURULA



NEURAL PLAQUE

PRIMITIVE STRIKE

CARDIAC EMINENCE

GASTRULA

THE HUMAN NEURULA

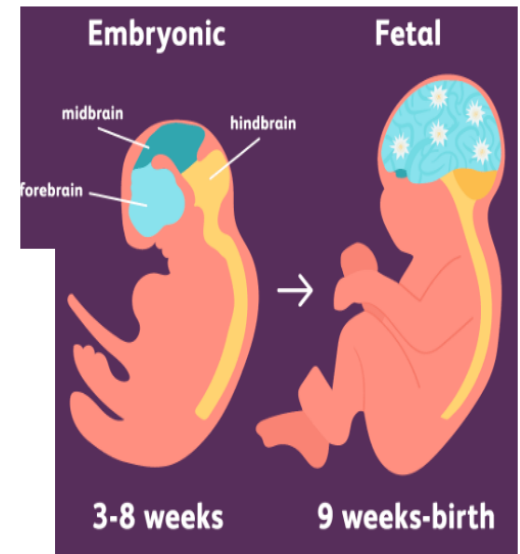
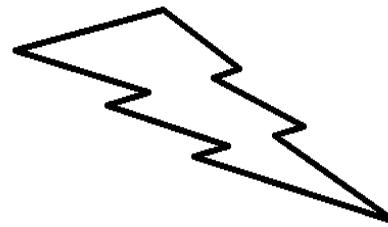
4- ORGANOGENESIS



FORMATION OF ORGANS FROM THE THREE (3) GERM LAYERS



LUNG CELLS & DIGESTIVE
CELLS & PANCREATIC CELLS
& THYROID CELLS



***EACH PART OF THIS EMBRYOLOGY
PROGRAM WILL BE STUDIED IN DETAIL IN
FUTURE COURSES!!!!***

HUMAN EMBRYONIC DEVELOPMENT

