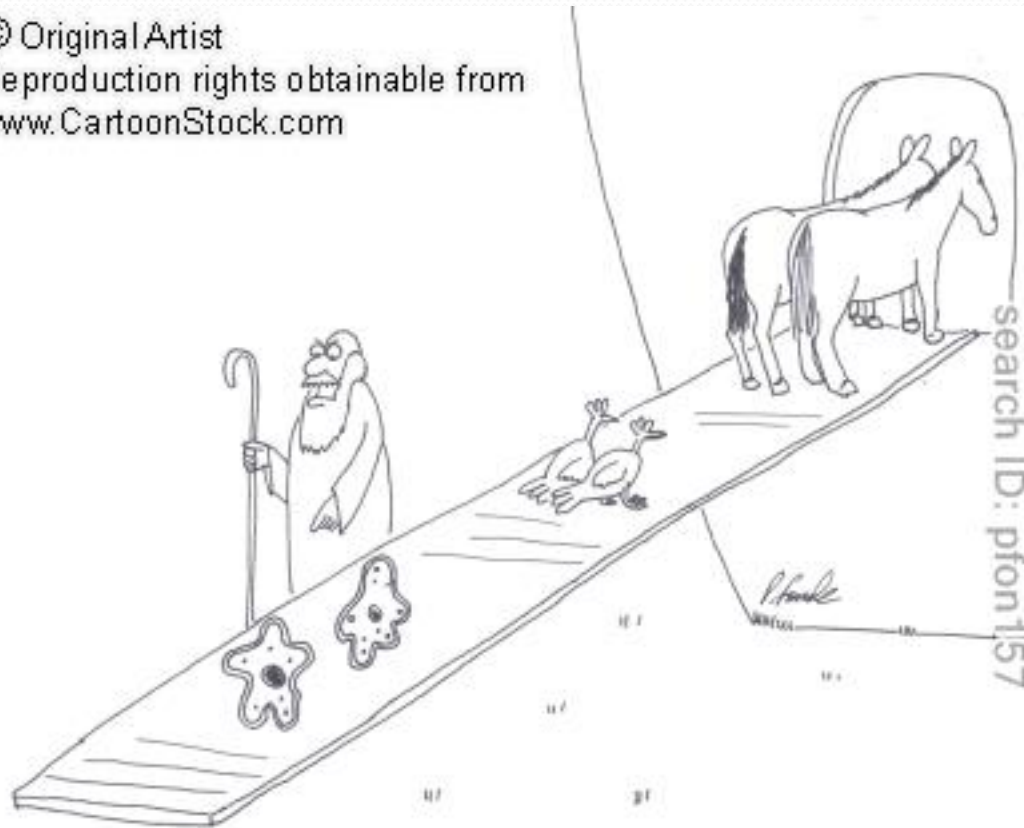


MEIOSIS AND SEXUAL REPRODUCTION

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"Nice try! We only need *one* of you. You can just turn around and be on your way, buddy."

Activator???

What is the difference
between

ASEXUAL Reproduction and
SEXUAL Reproduction

????????????

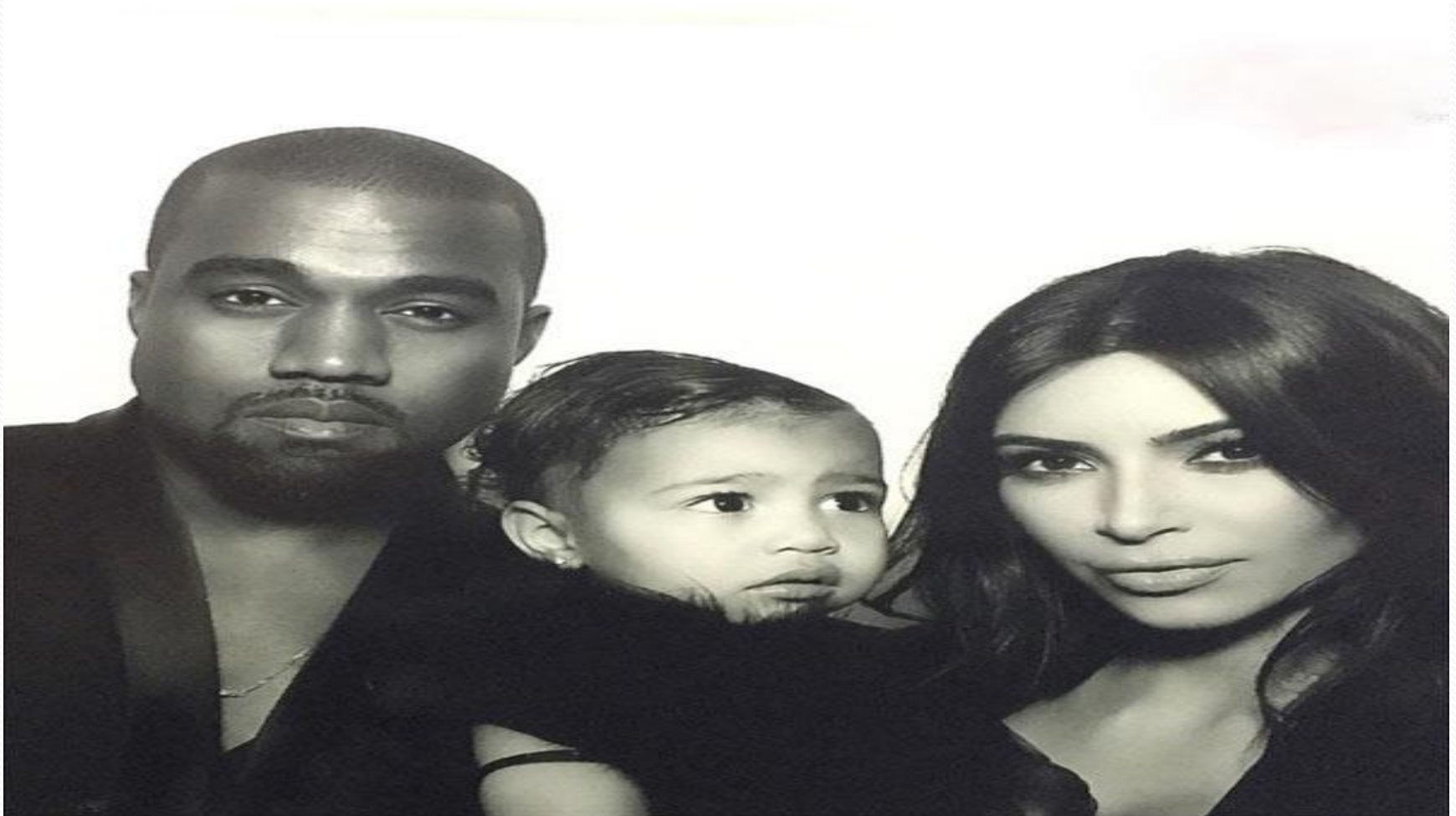
Asexual Reproduction there is only 1 parent.

The 2 are exact copies of each other



In SEXUAL REPRODUCTION there are 2 parents.

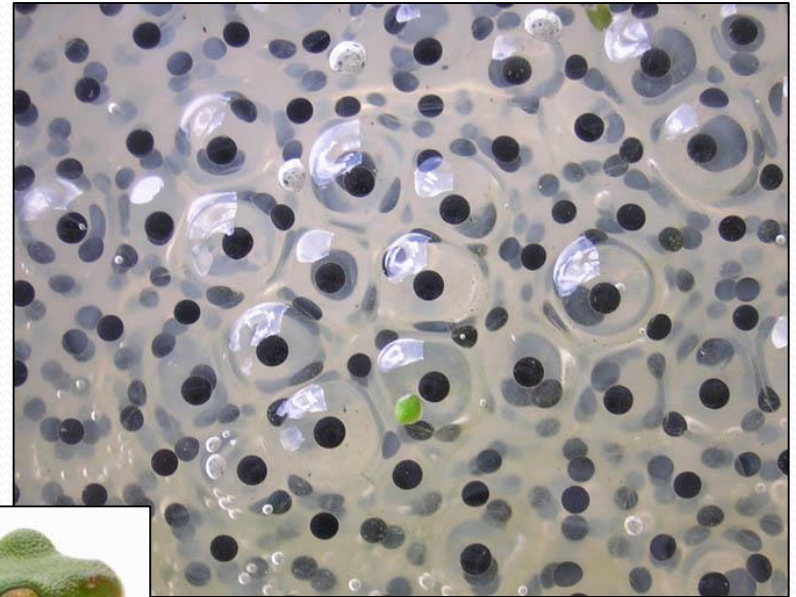
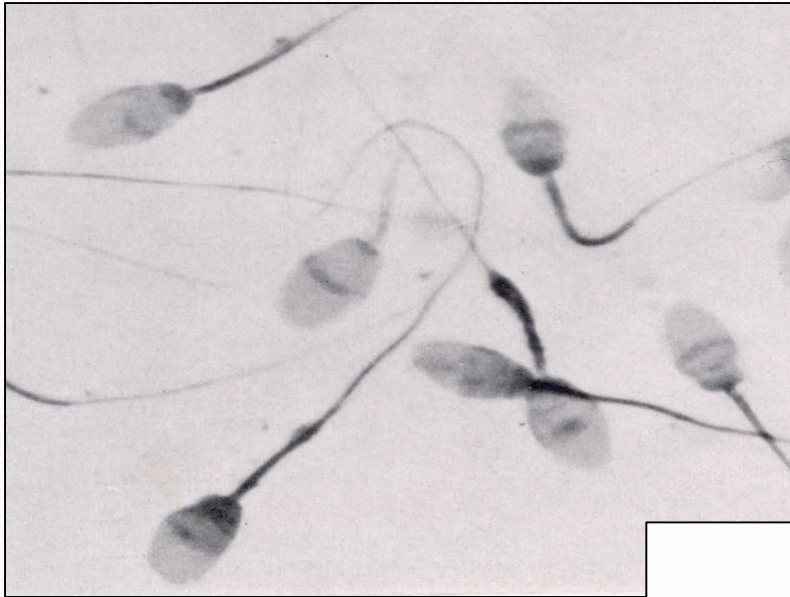
Each contributes a specialized cell to the new generation.



IN SEXUAL REPRODUCTION

Each individual has specialized sex Cells.

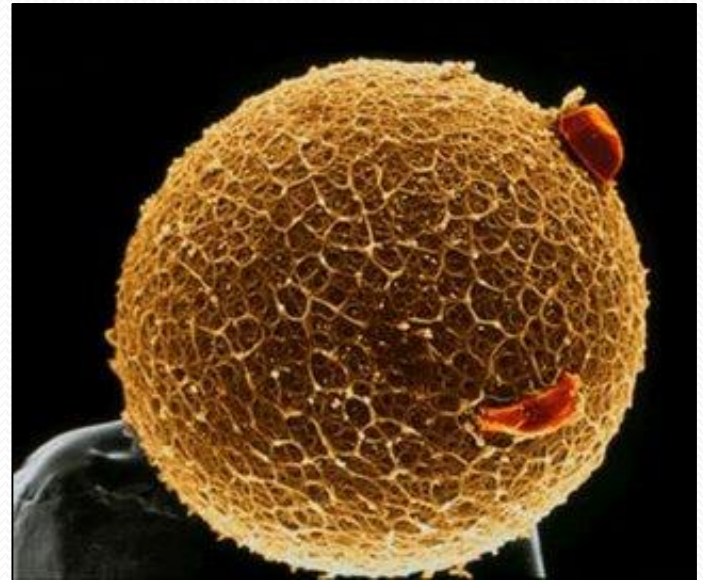
These are called Gametes.



All Male Organisms produce their own Gametes called the Sperm Cell



Another type of gamete, the EGG cell (ovum),
is produced by the female parent.

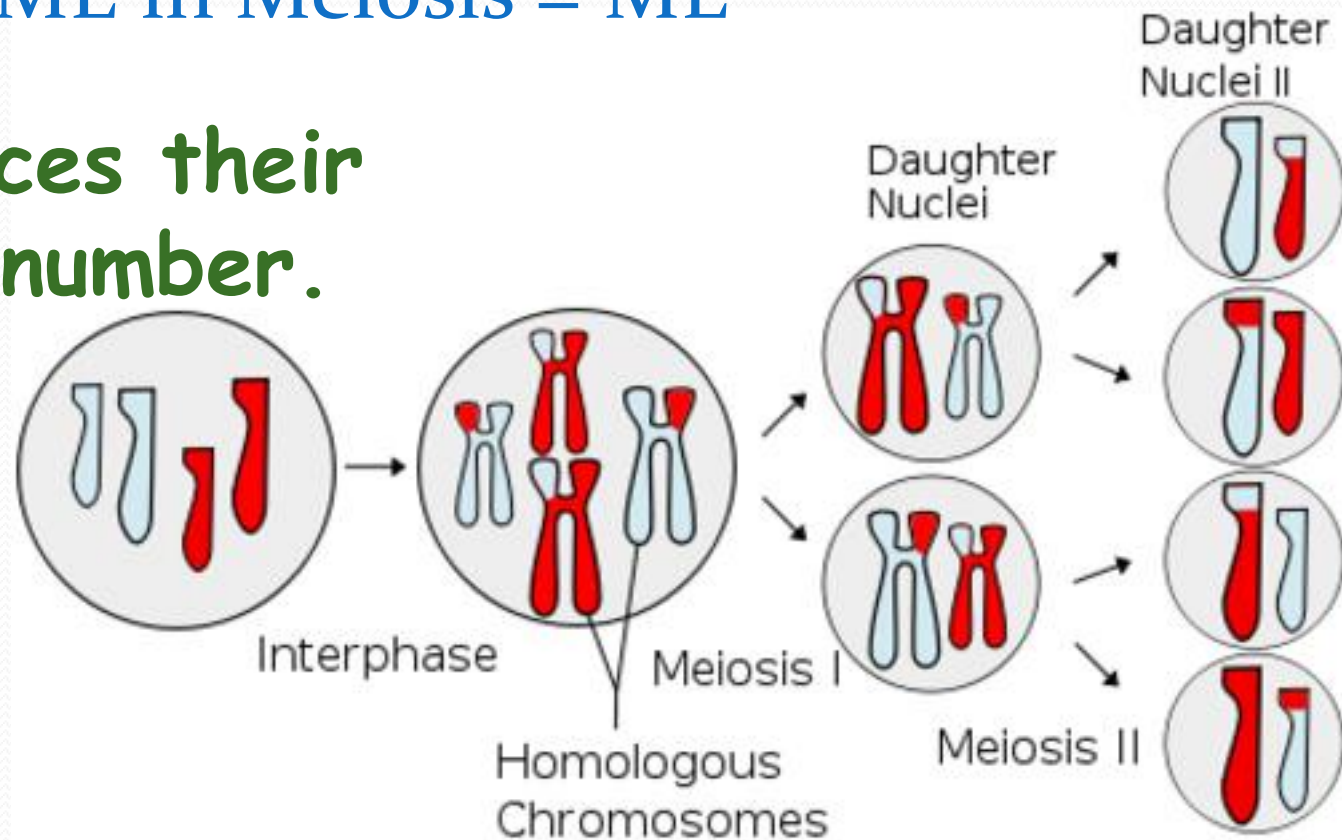


The sperm and egg cells are produced by a special kind of cell division called **MEIOSIS**

The ME in Meiosis = ME

Meiosis reduces their chromosome number.

http://www.youtube.com/watch?v=D1_-mQS_FZ0



Mitosis

USED
Primarily
In Body Cells
And simple
organisms

SAME
CELLS
ARE
DIVIDING

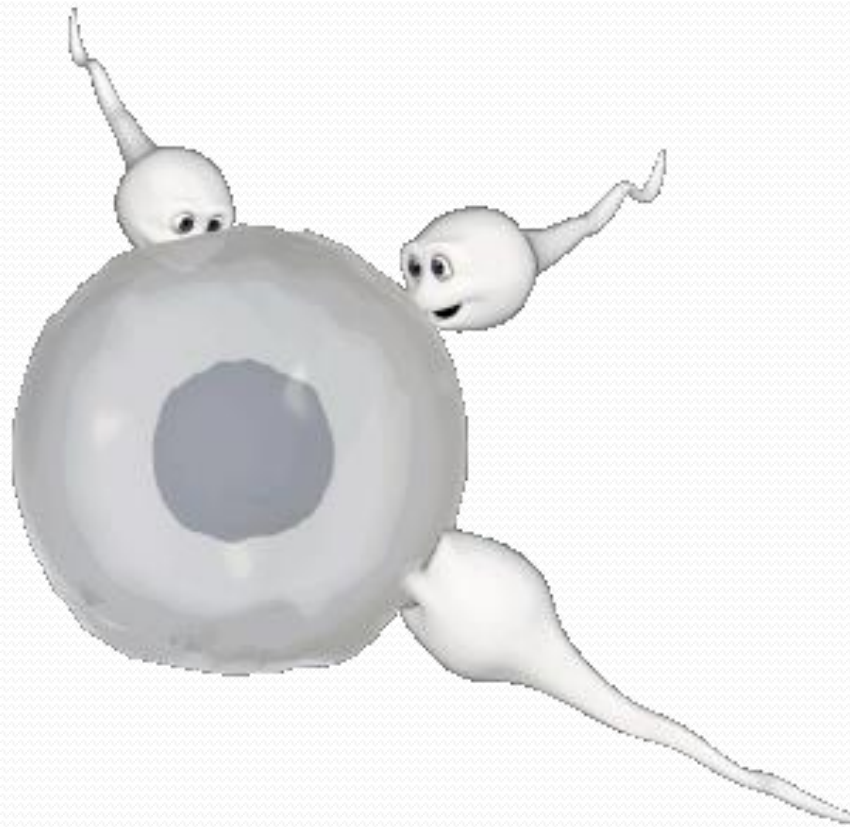
Meiosis

USED
WHEN
CREATING
SEX
CELLS
OR GAMETES



FERTILIZATION

is when the sperm and egg fuse together.

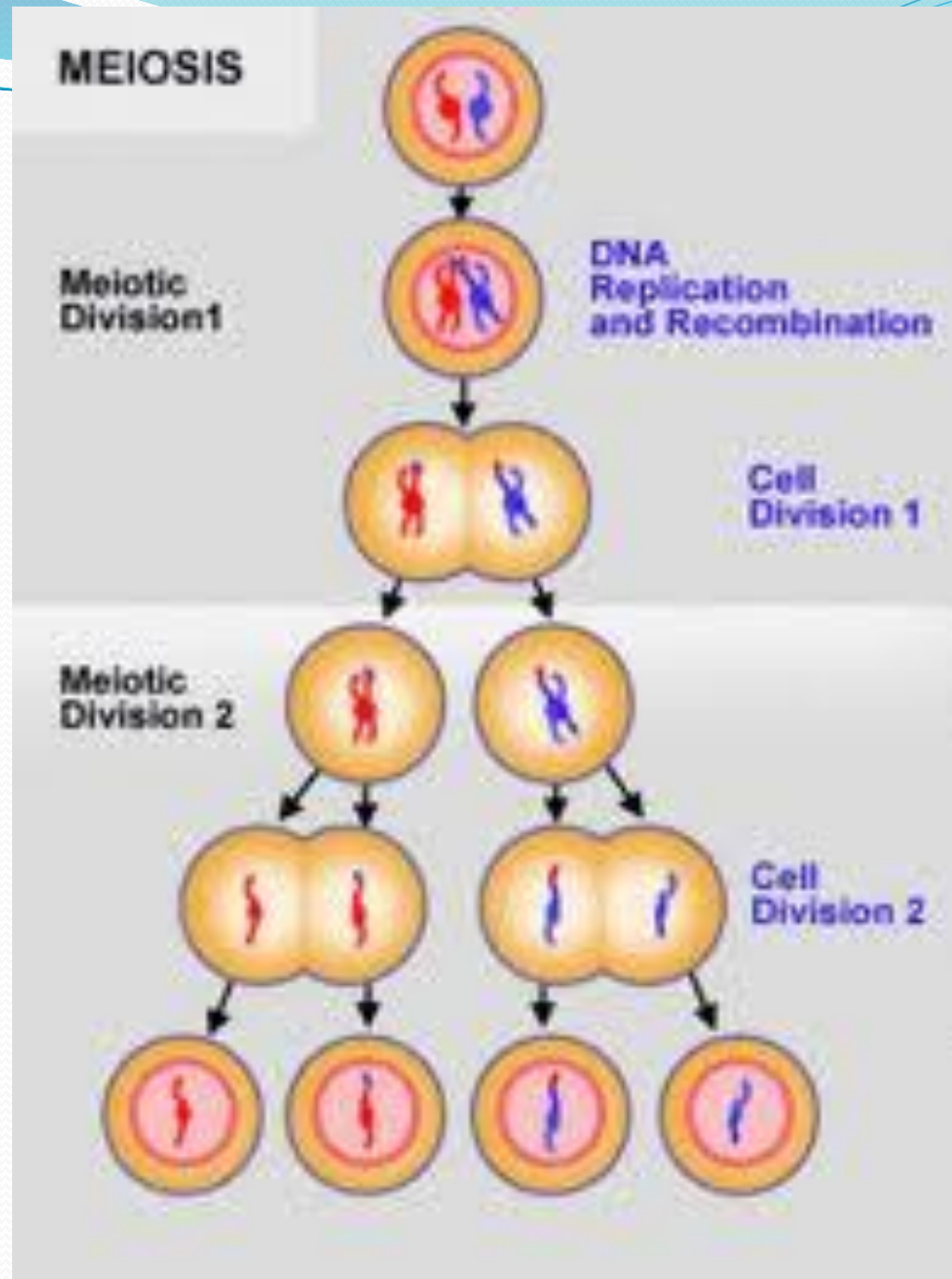


Meiosis

I
P
M
A
T
P
M
A
T

Interphase
Prophase 1
Metaphase 1
Anaphase 1
Telophase 1

Prophase 2
Metaphase 2
Anaphase 2
Telophase 2

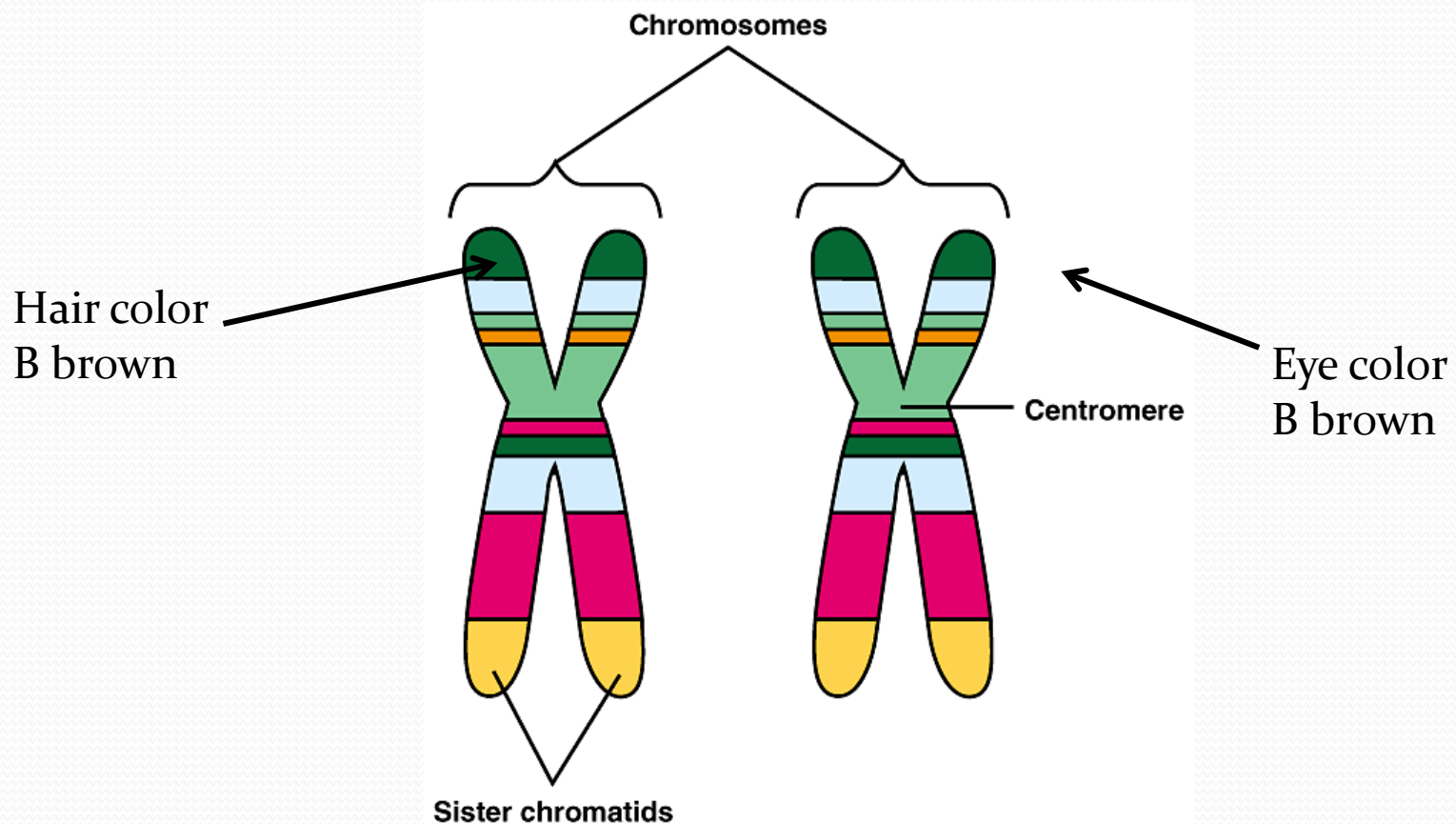


Fertilization

results in a ZYGOTE. The Zygote undergoes repeated mitotic cell divisions to form the embryo.

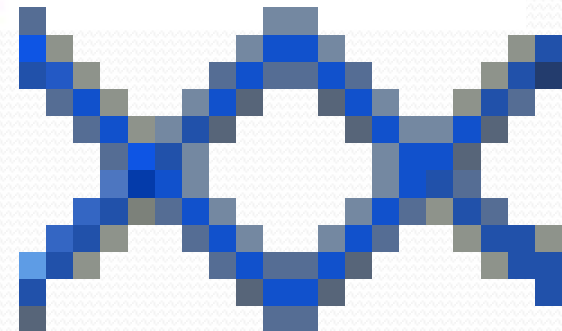
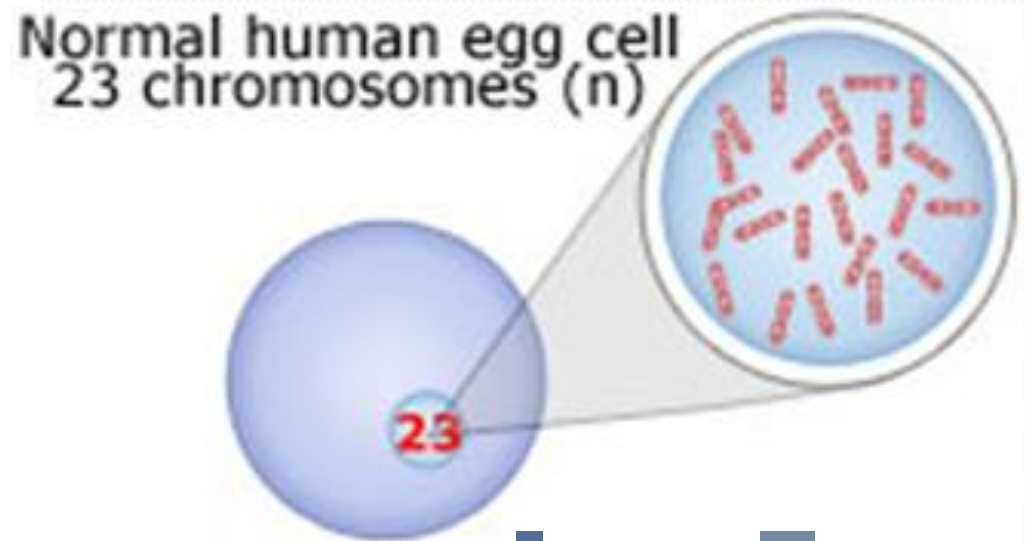


The two chromosomes of each pair are **HOMOLOGOUS**.
Homologous means **They are similar in size
and shape,
and control the same traits**

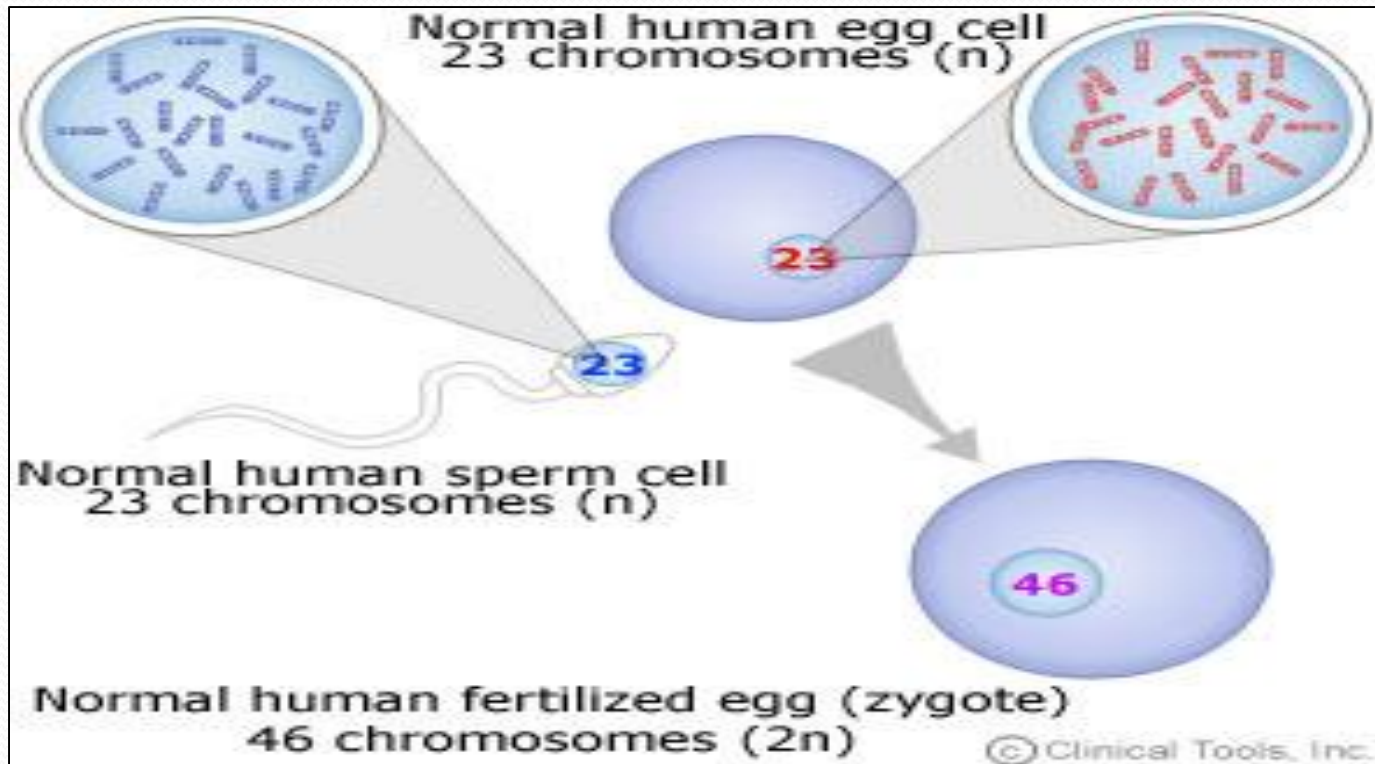




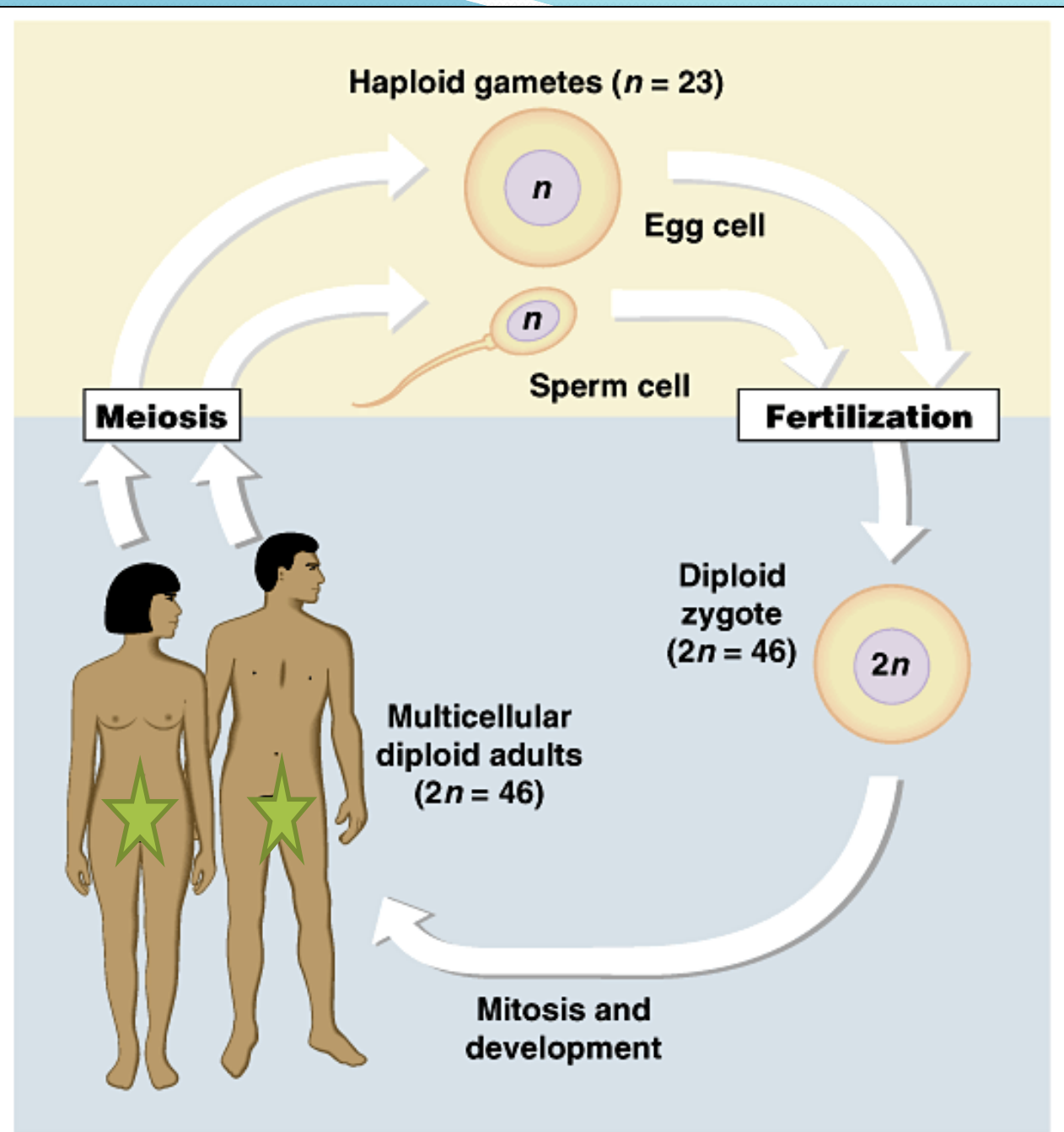
Sperm and egg cells contain half the number of chromosomes of a human.



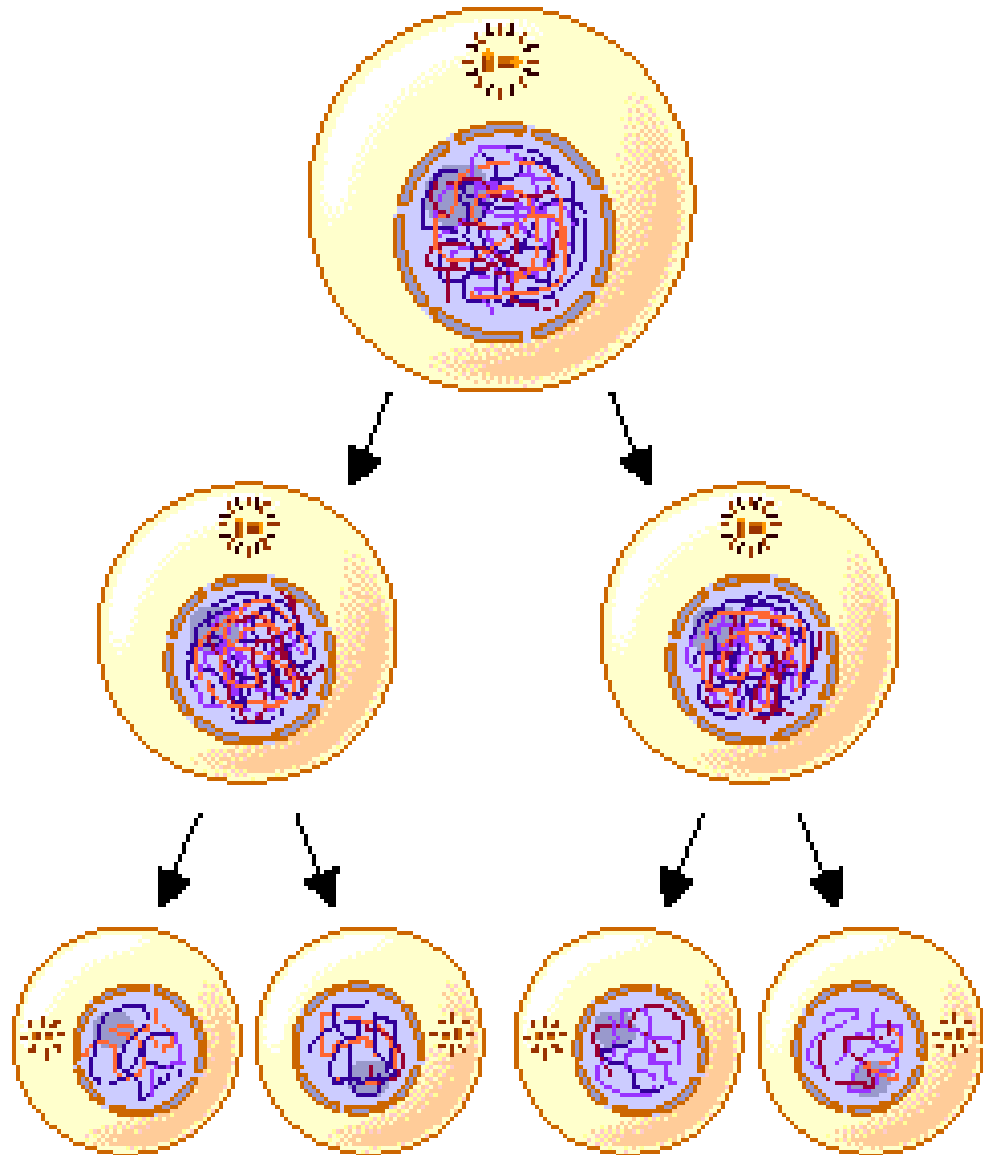
The sperm and egg cells are produced by **MEIOSIS** which reduces the chromosome number in half.



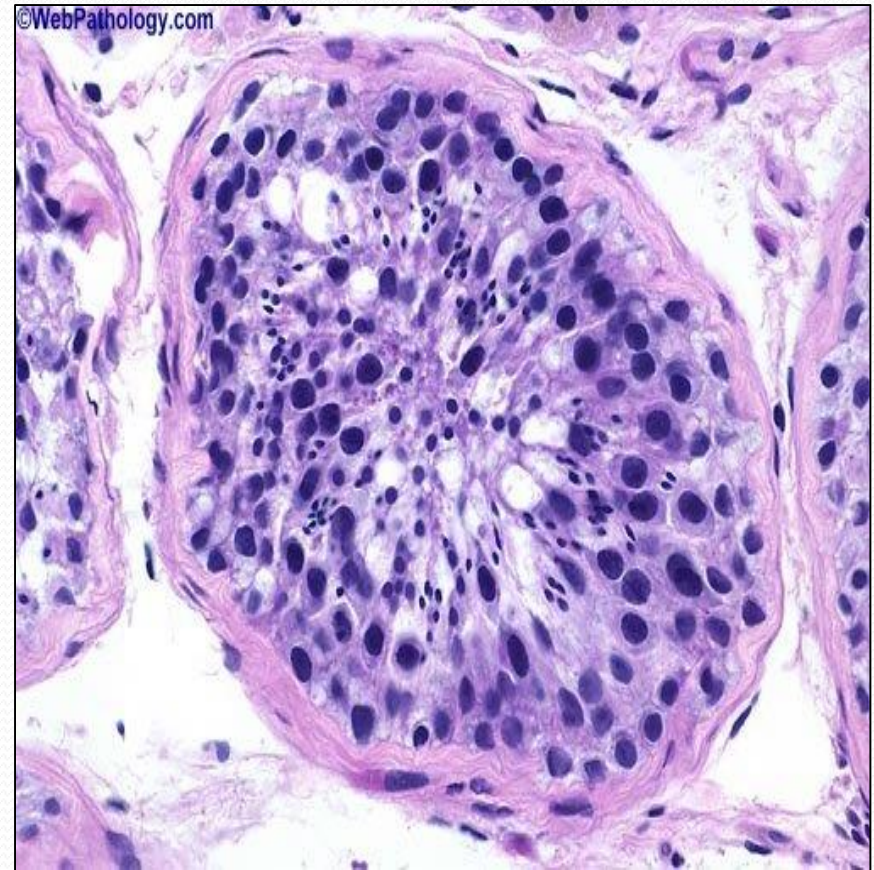
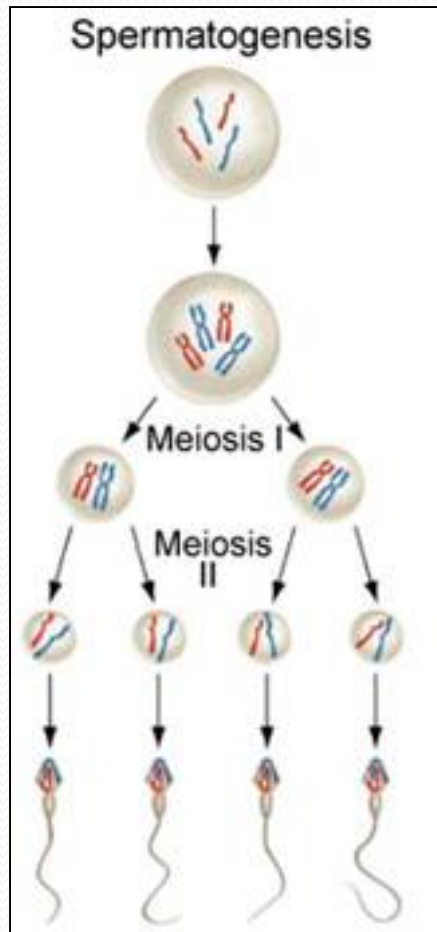
FERTILIZATION joins the sperm and egg to restore the species chromosome number.



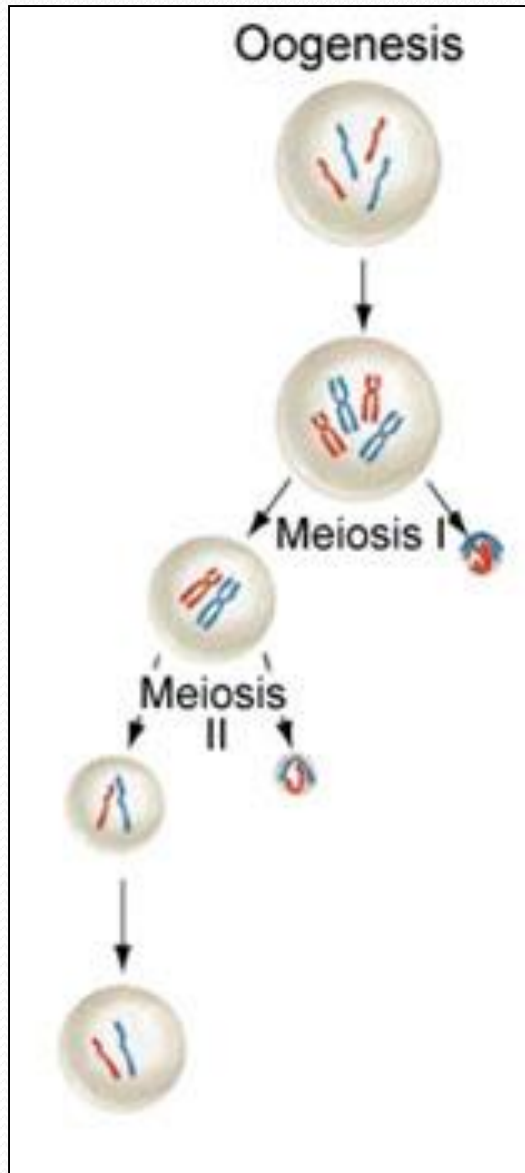
Meiosis occurs **ONLY** in the formation of sex cells.



SPERMATOGENESIS



In the testes, 4 sperm are produced by each meiotic division.



OOGENESIS

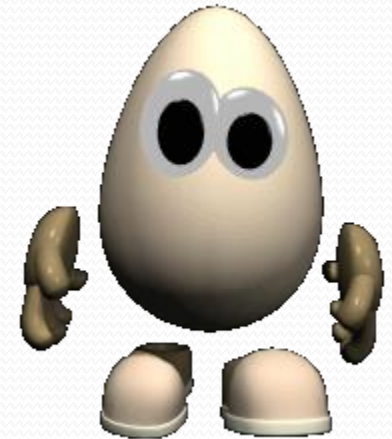
During egg production in the ovaries, division of the cytoplasm is unequal.

Only one mature egg cell is formed.

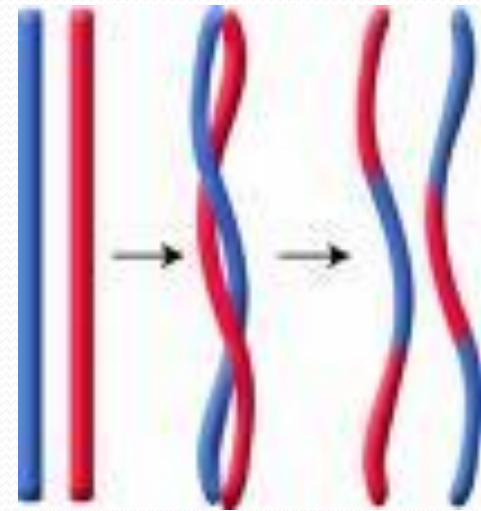
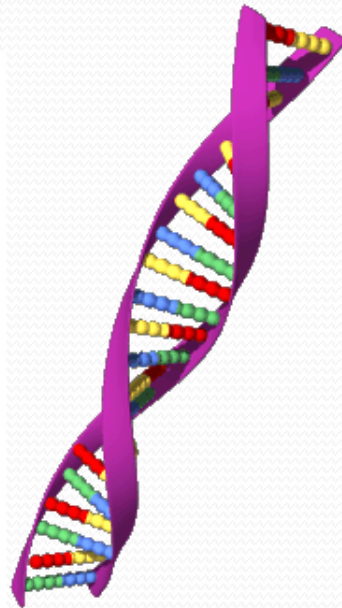
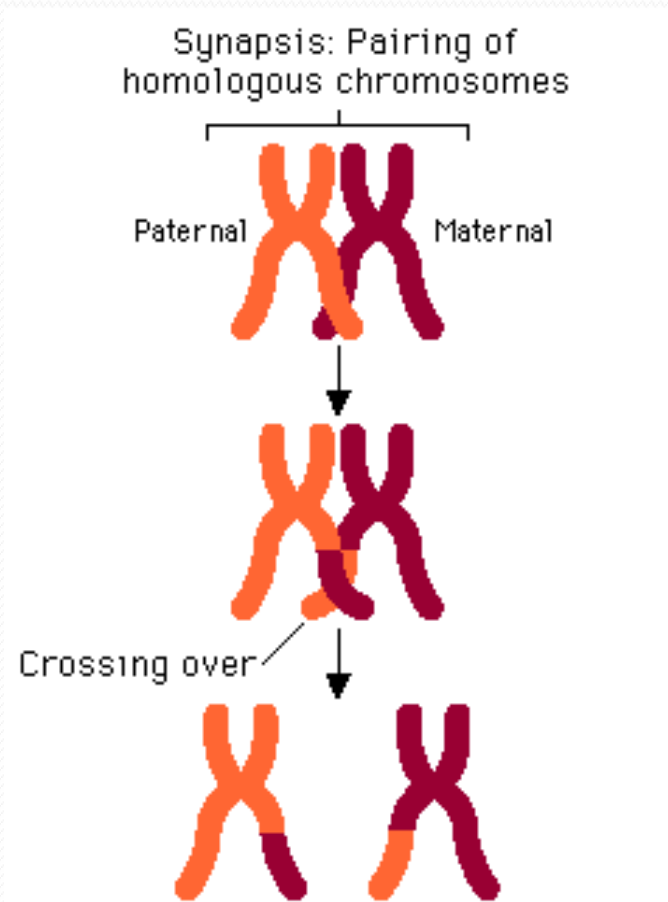
The other "cells" are called **POLAR BODIES**.

They disintegrate in the body.

As a result, the egg cell is provided with a large supply of stored nutrients in the form of yolk.



During the process of synapsis, the homologous chromosomes exchange DNA with one another.



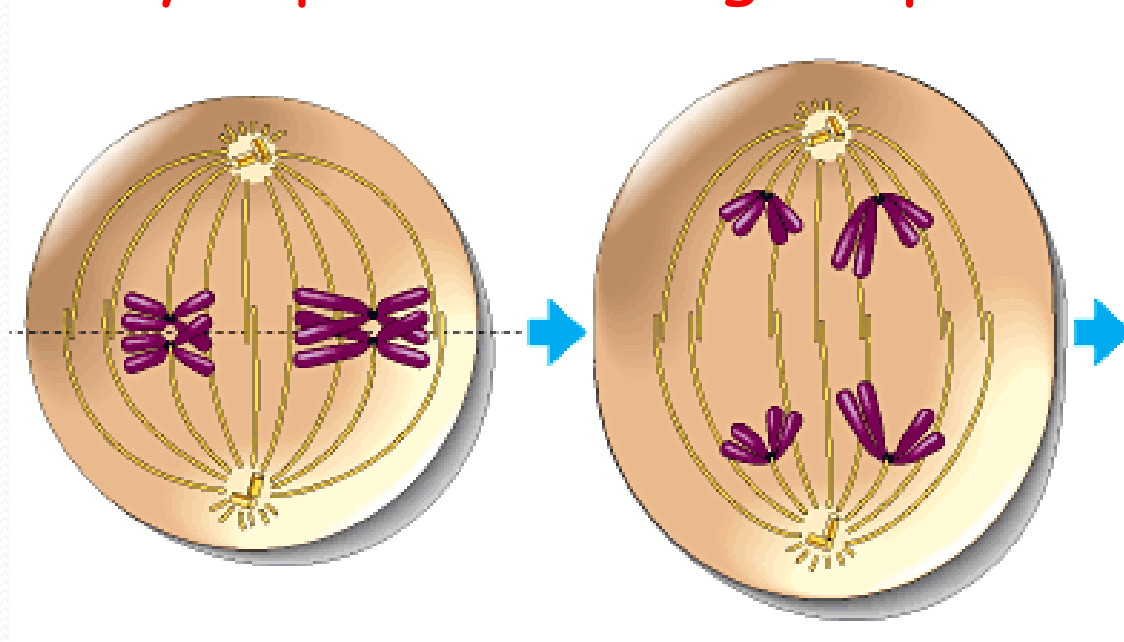
This process is called **CROSSING OVER**.

This is why Synapsis is important. It creates different variations for All new offsprings.



During metaphase, the paired chromosomes line up.

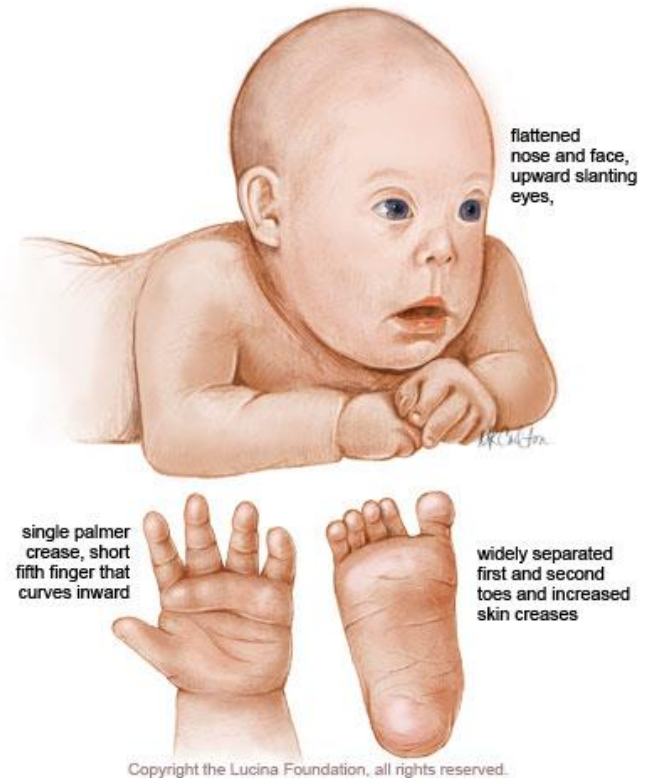
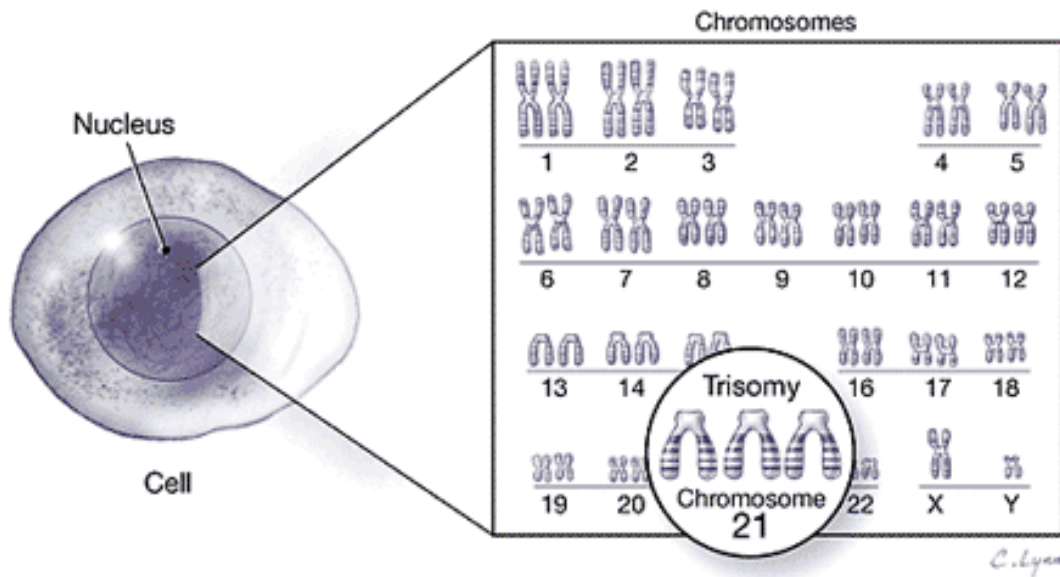
They separate during anaphase.



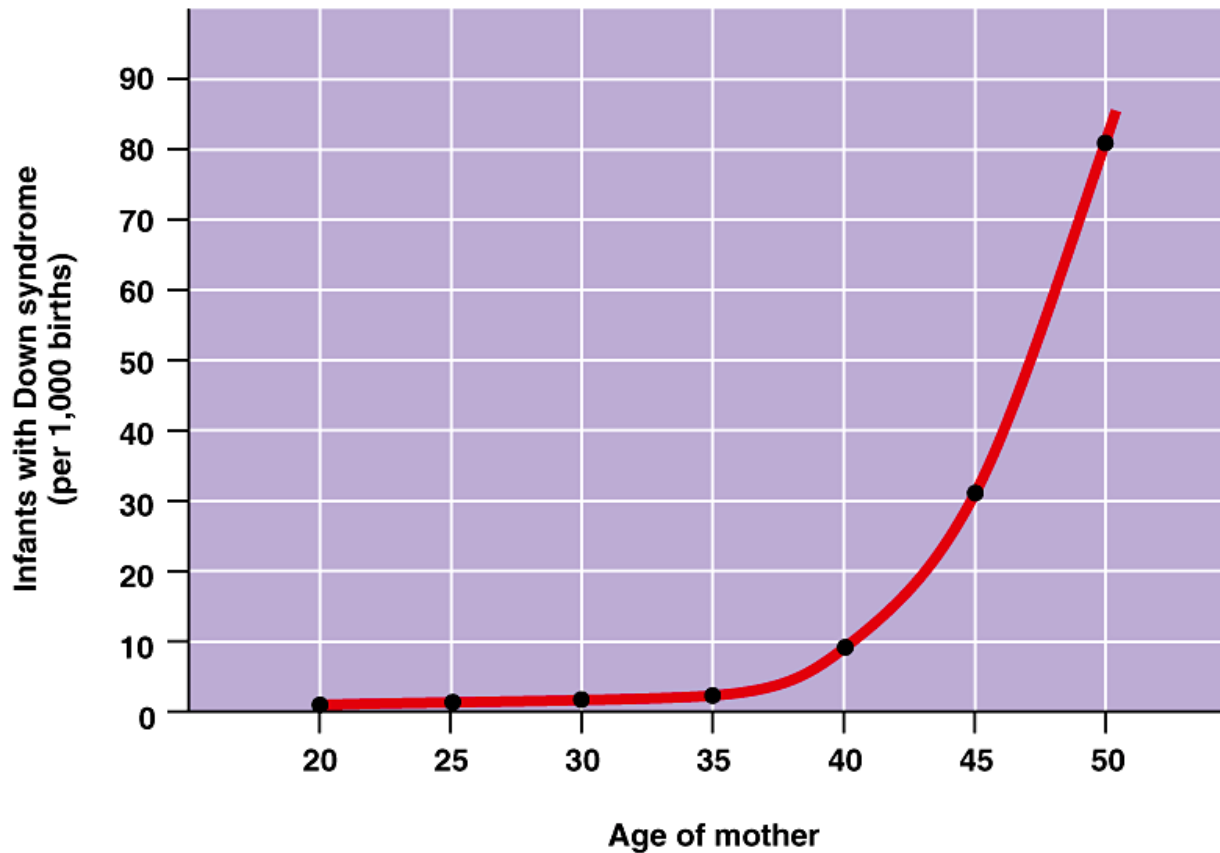
The separation of the homologous chromosomes is called

DISJUNCTION.

Non-disjunction disorders include Down Syndrome, which is caused by Trisomy-21.



The risk of having a baby with Down Syndrome increases greatly as a woman ages past 35.

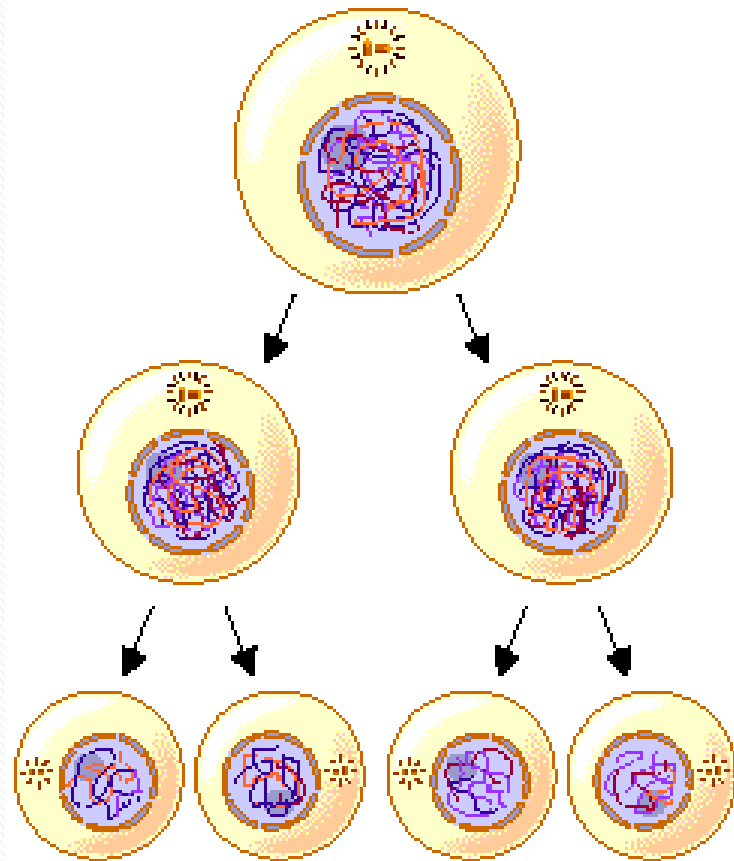


**Meiosis is a source of GENETIC VARIATION
because it provides new combinations of
chromosomes.**

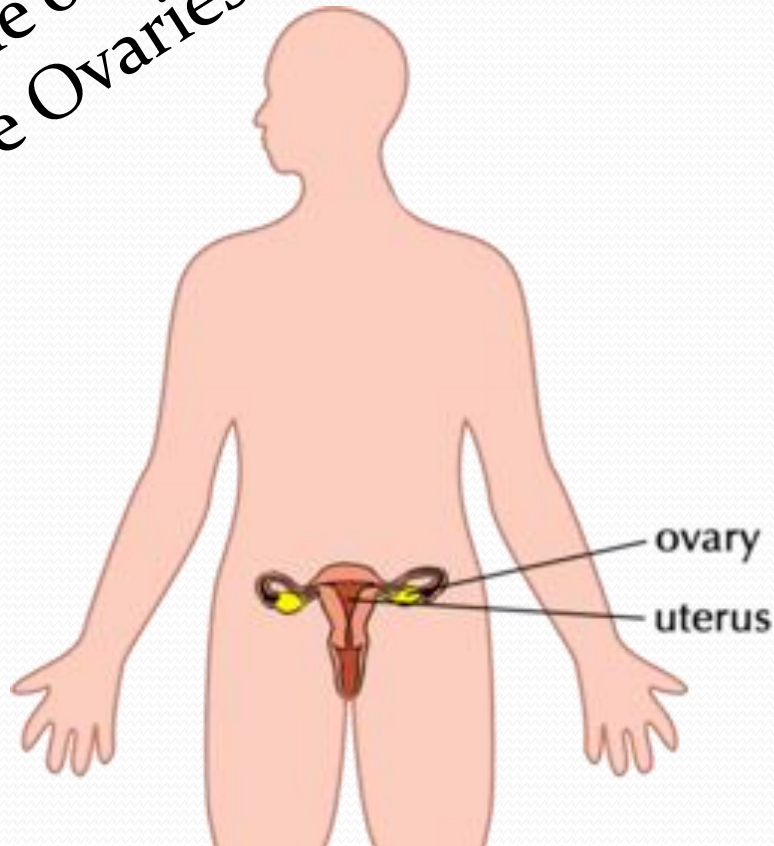


Meiosis begins with one cell and ends with the production of four cells.

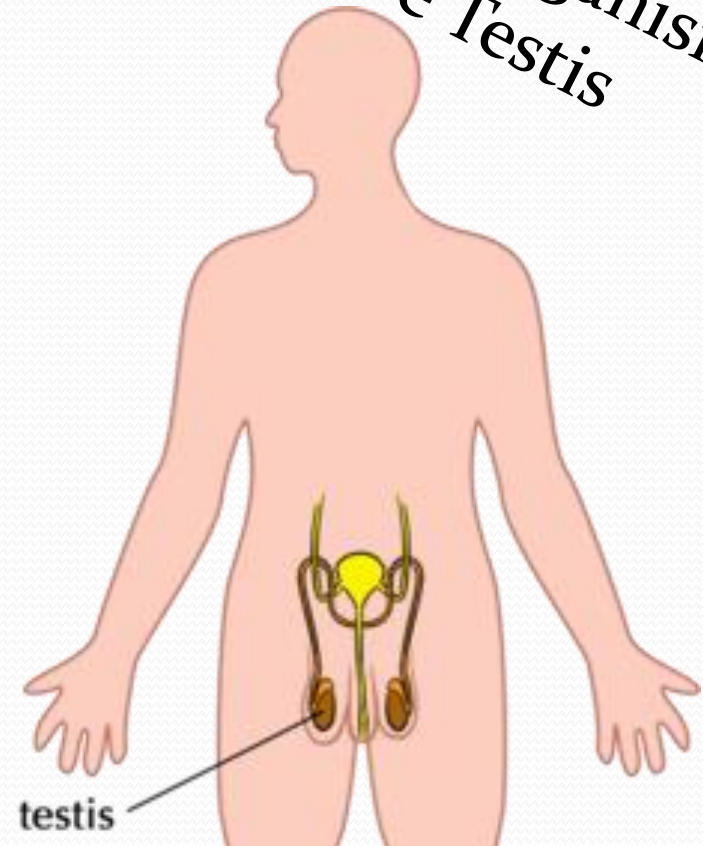
These cells mature into *GAMETES* - sperm or eggs.



Female organisms
Have Ovaries



Male organisms
Have Testis





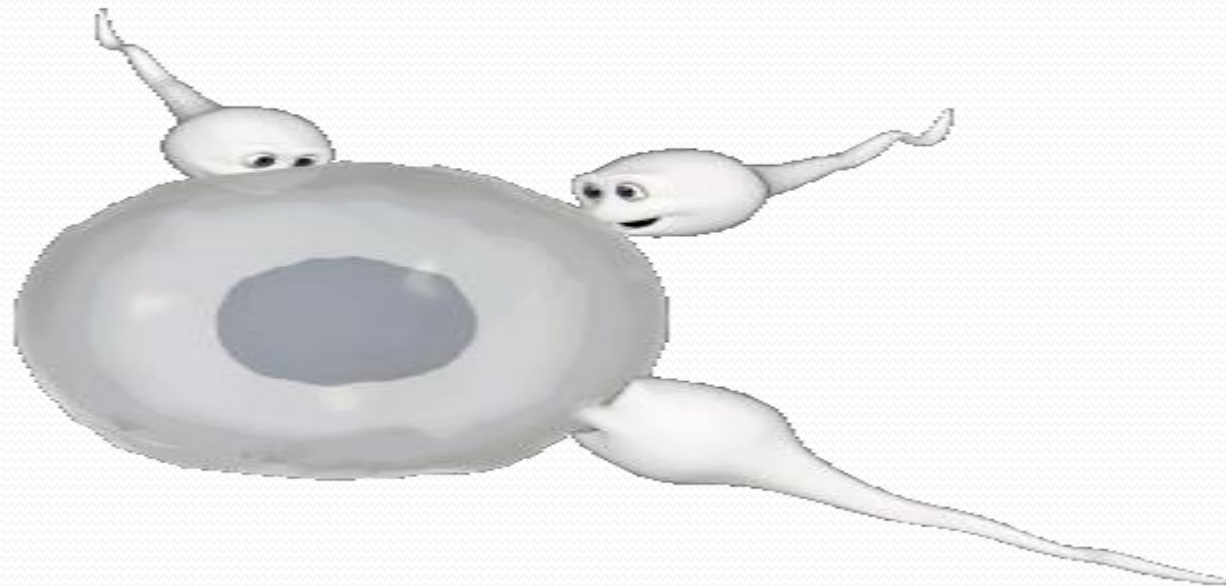
But some animals are.
HERMAPHRODITES:
they have both ovaries AND testes

Most hermaphrodites cannot fertilize themselves.
Mating is required. **Usually both individuals have babies.**



FERTILIZATION

is the union of a
sperm with an egg to form a ZYGOTE
- the first cell of the new organism.

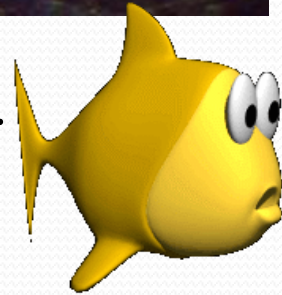


The union of a sperm and egg outside the body of the female.

is called **EXTERNAL FERTILIZATION**



This generally occurs in a water environment
(in fish, frogs, and many other aquatic
vertebrates).



- Large numbers of gametes are released to
1. increase the chances that fertilization will take place
 2. help ensure that at least some of the fertilized eggs will develop and survive to adulthood.



Large numbers of gametes are released to

1. increase the chances that fertilization will take place

2. help ensure that at least some of the fertilized eggs will develop and survive to adulthood.



The union of a sperm and egg in the moist reproductive tract of a female is called **INTERNAL FERTILIZATION**.



This occurs in terrestrial (land-dwelling) vertebrates,

This includes all mammals, birds, some insects....

Relatively few eggs are produced at one time.

The chances that fertilization will occur are much greater.



To help couples that are having trouble having a baby, eggs can be fertilized with the father's sperm in a laboratory. This technique is called IN VITRO fertilization.



The resulting embryo is implanted into the mother's UTERUS where it develops.

1st trimester



2nd trimester



3rd trimester

