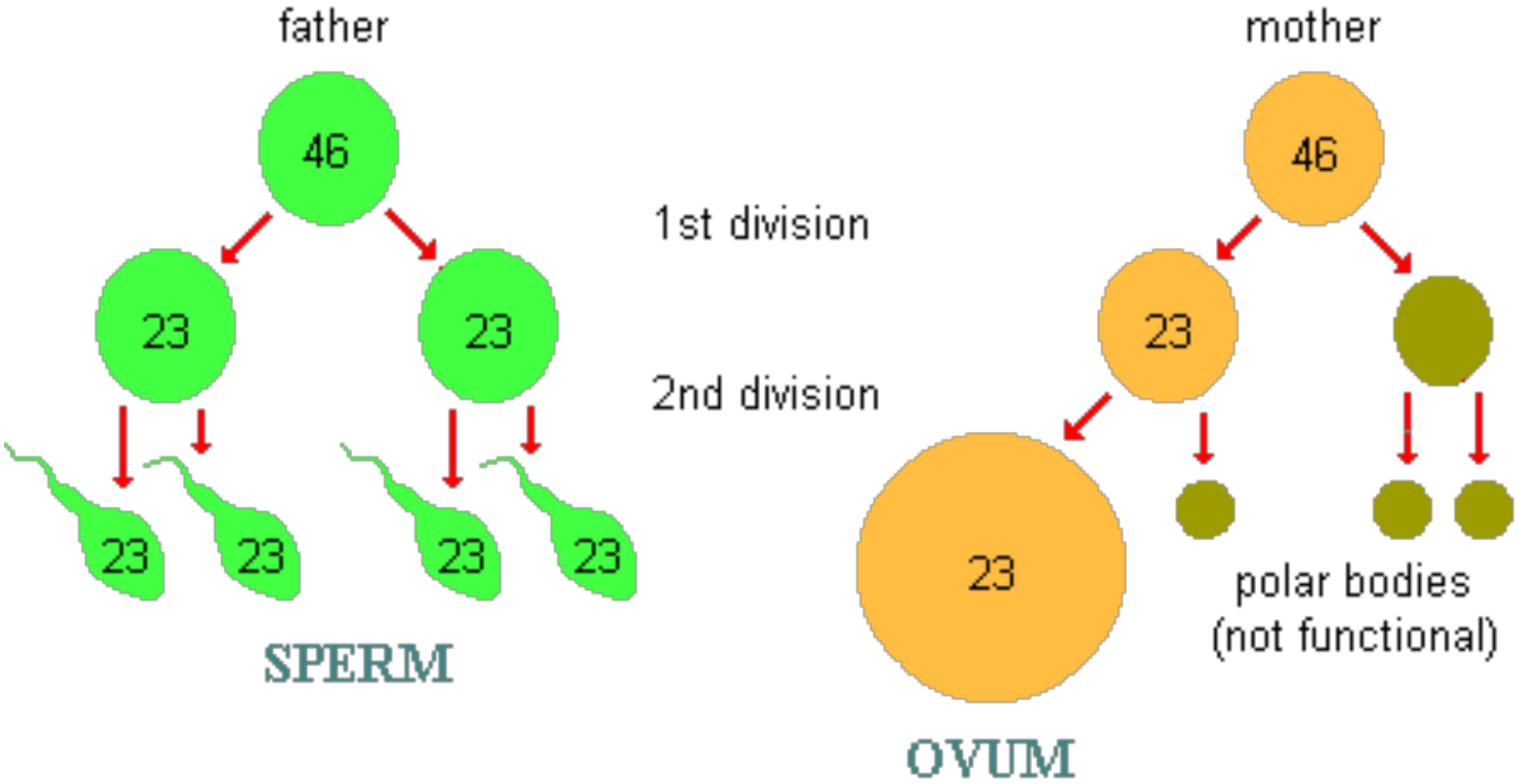
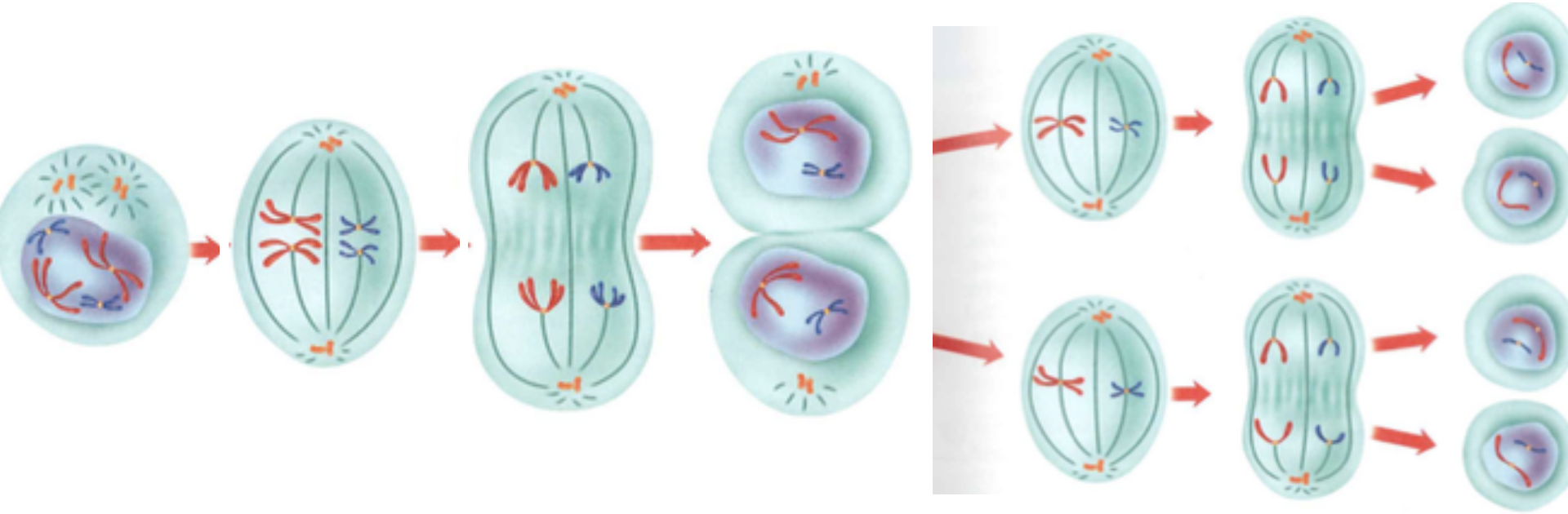
Meiosis

- The making of sex cells (sperm & egg).

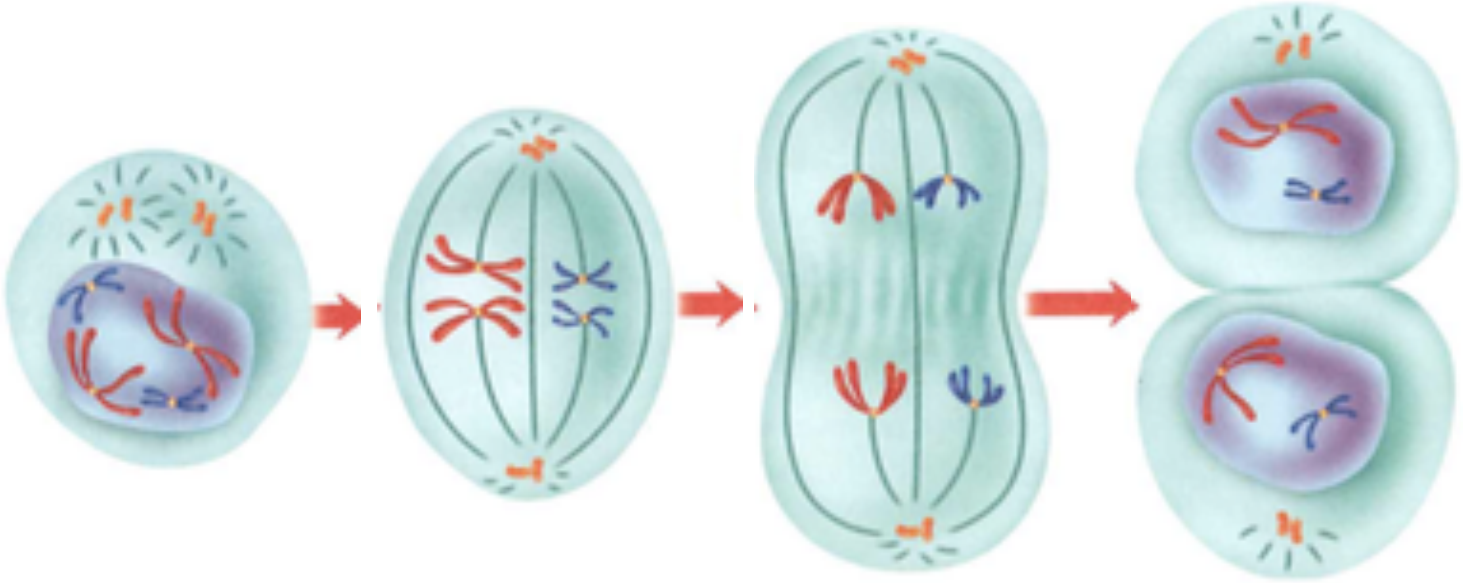


Meiosis *(continued)*



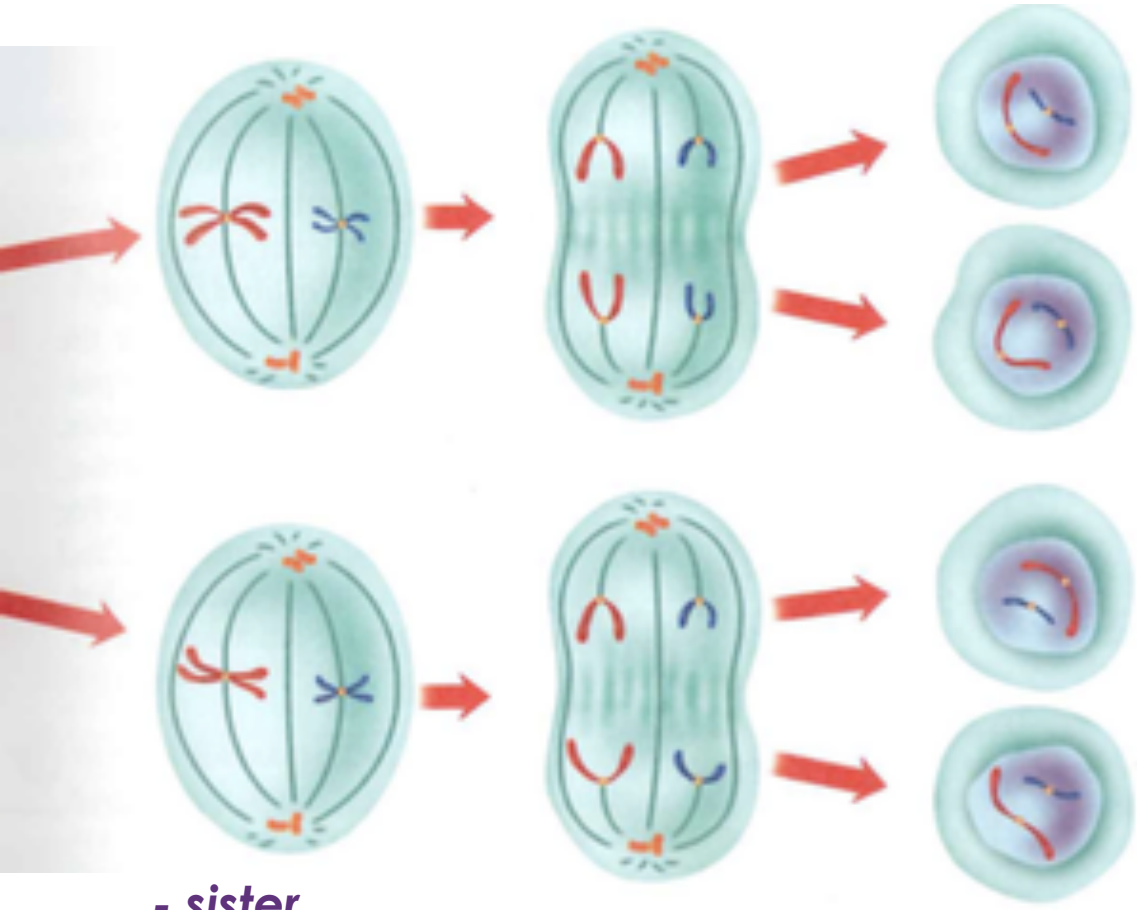
Meiosis I

2n → **1n**

Prophase I	Metaphase I	Anaphase I	Telophase I
			
	- ***Homologous*** *Chromosomes line up at equator*	- ***Homologous*** *Chromosomes pull apart*	*Cytokinesis*

Meiosis II

Metaphase II **Anaphase II** **Telophase II**



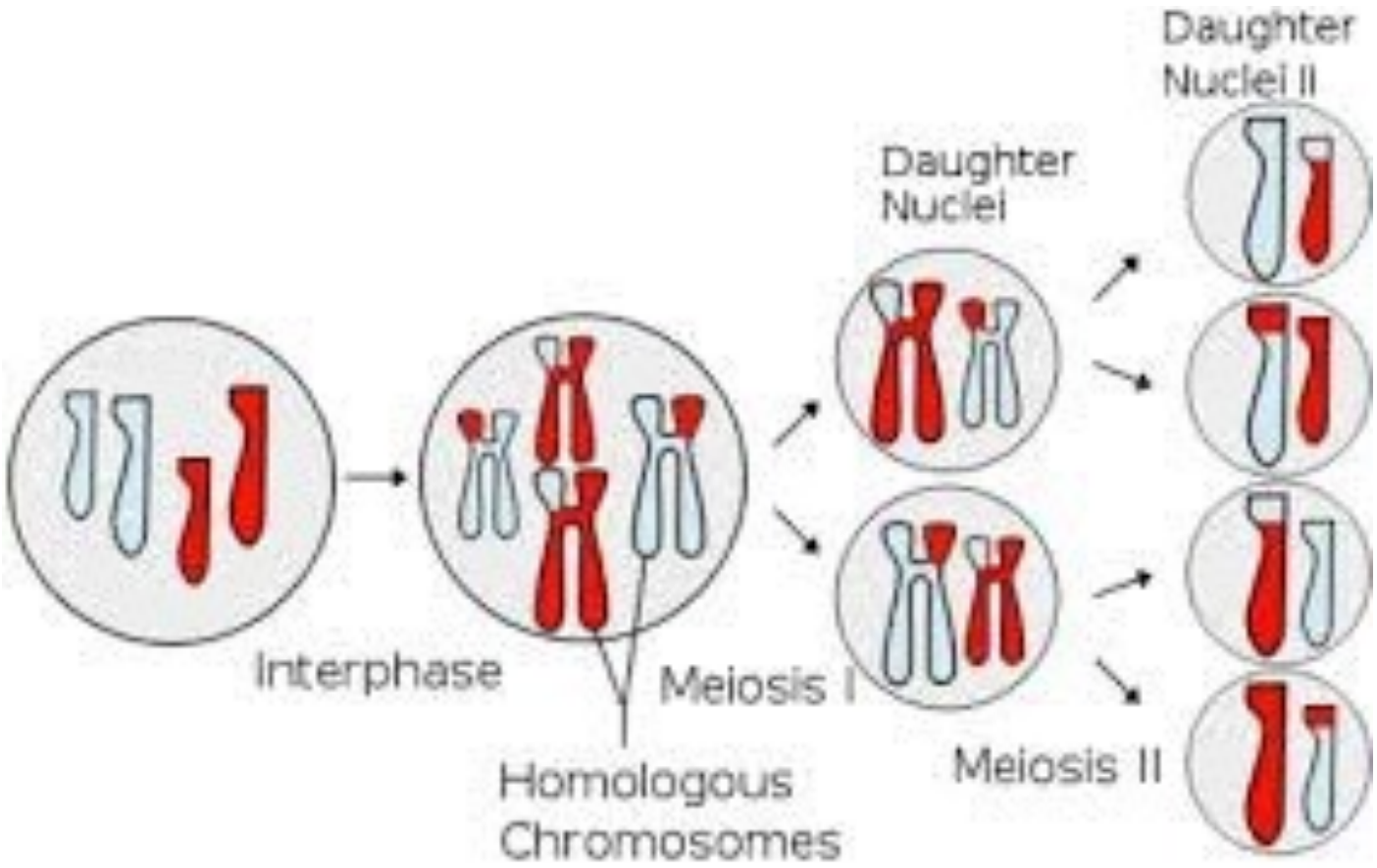
- sister chromatids *line up at equator*

- 4 haploid gametes result

***NB**: 4 sperm cells but only 1 egg produced due to uneven separation of cytoplasm*

Meiosis

Cell Division in **Reproductive** Cells



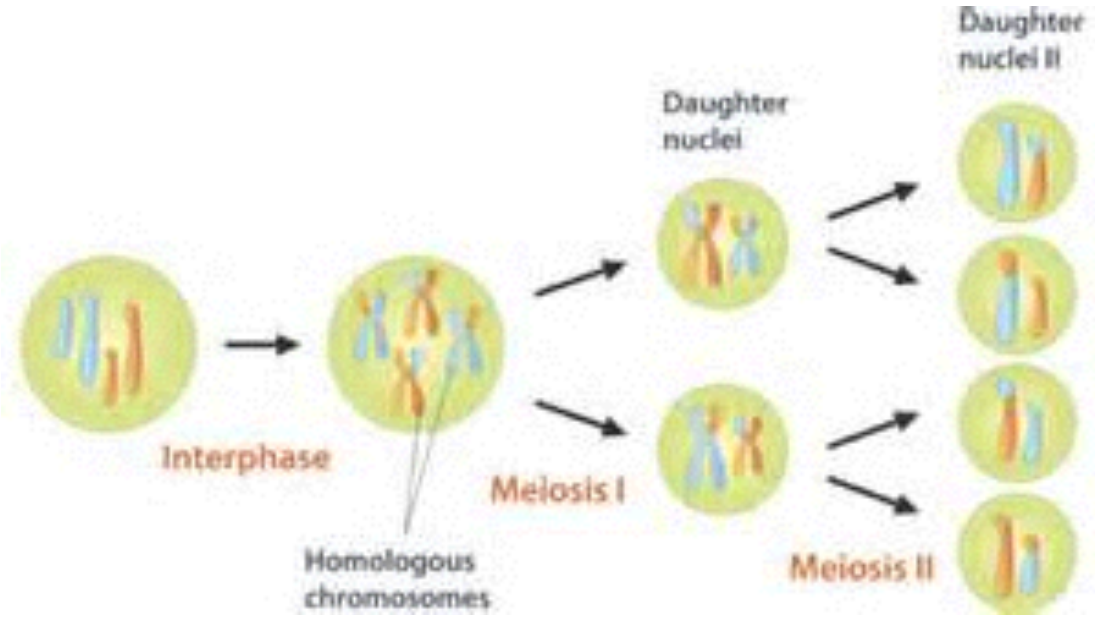
How many chromosomes do cells have?

- **Somatic** cells (i.e., body cells) have diploid number (2n)
- = *two sets of chromosomes*
- **Sex** cells have haploid number (1n)
- = *one set of chromosomes*

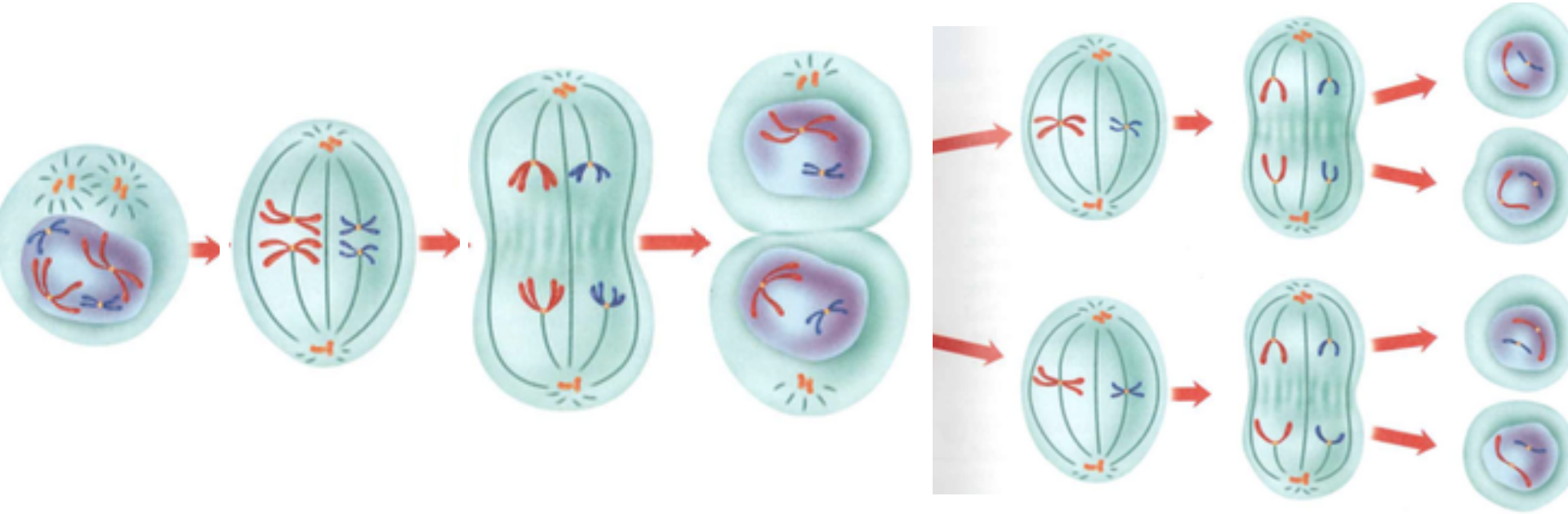
How Are Gametes (sex cells) Produced?

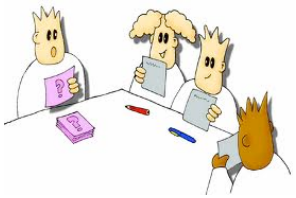
Meiosis

- cells divide and the new cells have exactly **half** the # of chromosomes = **haploid (1n)**

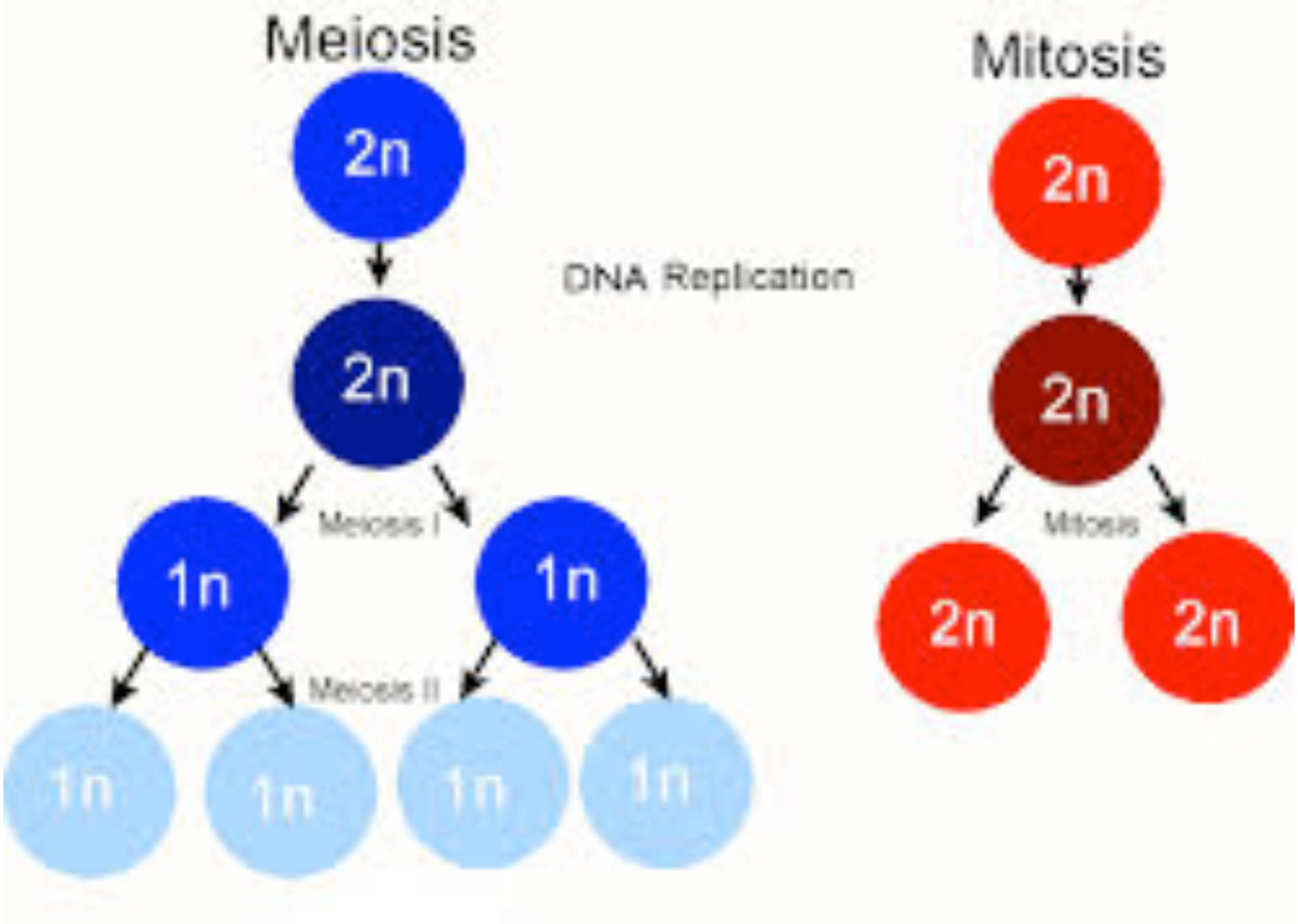


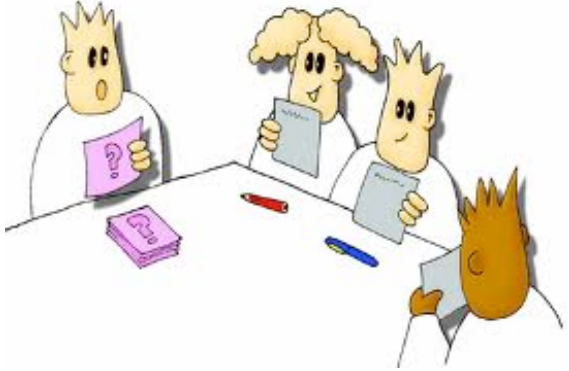
Take out your meiosis diagram!



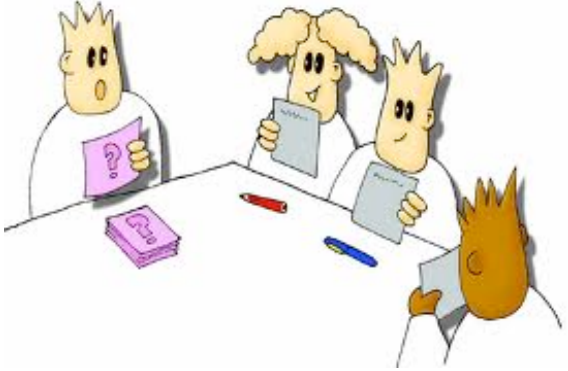


What must be different about <u>meiosis</u> compared to <u>mitosis</u>?

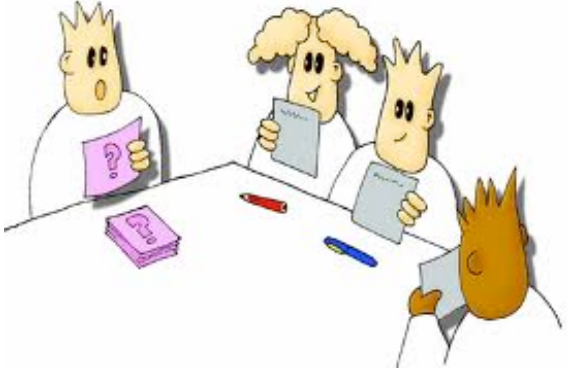




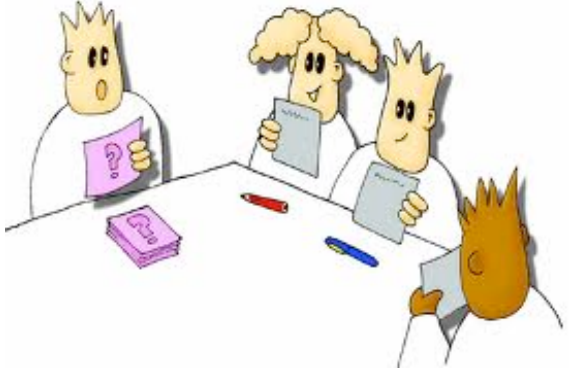
1. What is the name of the **pairs** of chromosomes that are lining up at the equator?
2. What stage of meiosis is it?



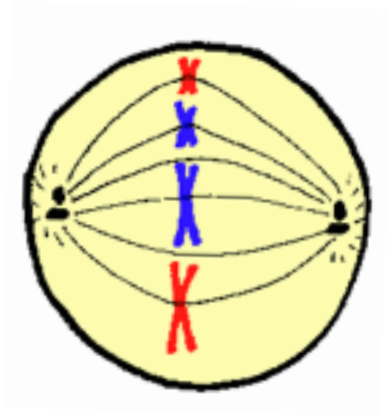
1. What is the name of the chromosomes that are lining up at the equator?
2. What stage of meiosis is shown?



- What stage of meiosis is shown below?

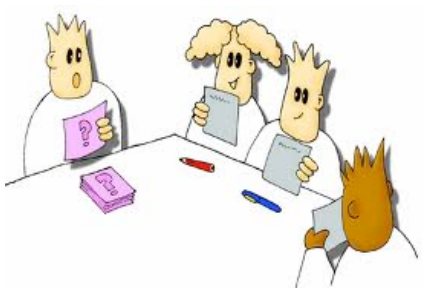


1. What is the difference between the two stages?
2. What stage of meiosis is shown by each of the following?



a

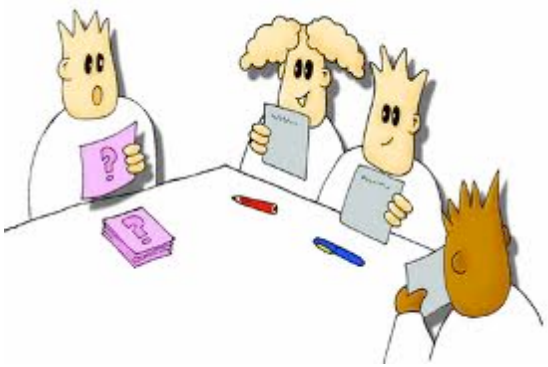
b



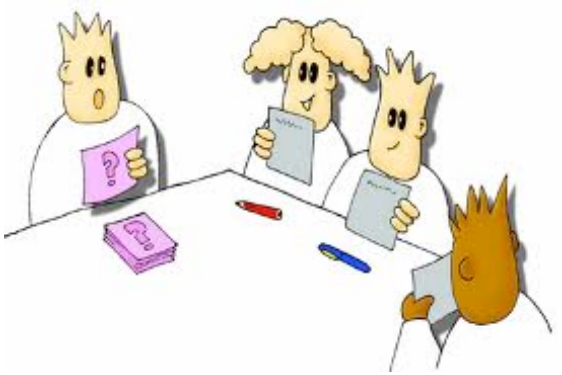
1. What is the difference between the two stages?
2. What stage of meiosis is shown by each of the following?

a

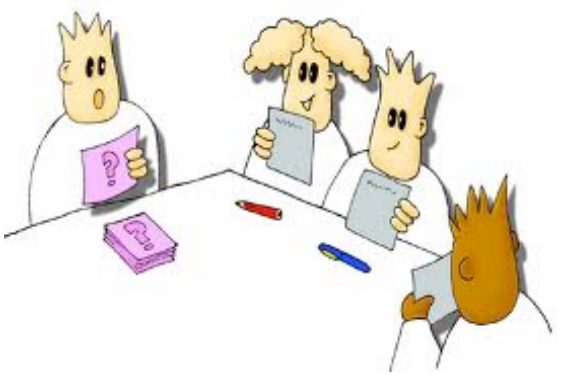
b



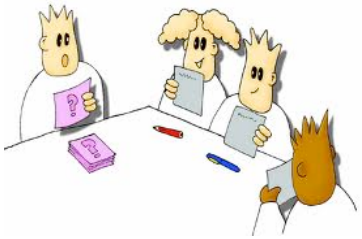
- Draw sister chromatids.
- Draw a pair of **homologous** chromosomes.
- Where did each homologous chromosome originally come from?
- Draw three pairs of homologous chromosomes lining up at the equator of a cell.



- What does diploid mean?
- What does haploid mean?
- If the diploid number of chromosomes in an animal is 10, what is the haploid number?

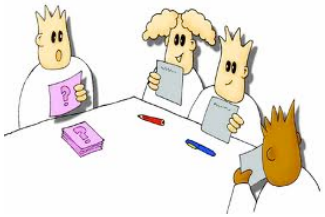


- If the original human cell has 46 chromosomes, how many chromosomes will each of the gametes (sperm or egg) produced have?
- If the diploid (2n) number of chromosomes is 8, what is the haploid number (1n)?
- IF there are 11 chromosomes in the gametes, how many are in somatic cells?



Mitosis VS Meiosis

1. What is the ***function*** of **Mitosis**?
2. What is the ***function*** of **Meiosis**?
3. How many cells are made in **Mitosis**?
4. How many cells are made by the end of **Meiosis**?
5. Does **Mitosis** or **Meiosis** produce cells that are genetically **identical** to the parent cells?
6. Does **Mitosis** or **Meiosis** produce new cells that are **all genetically different**?
7. What is the **ploidy** of the new cells of **Mitosis**? **Meiosis**?



Compare **MITOSIS** with **MEIOSIS**

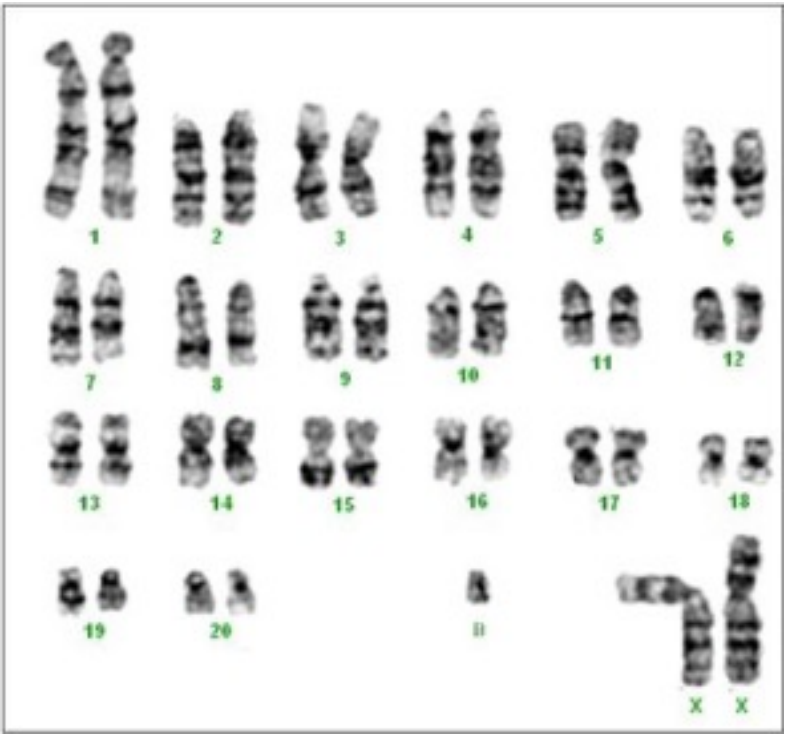
		Mitosis	**Meiosis**
1	In what cells does it occur?		
2	How many cells are produced?		
3	What is the **ploidy** of the cells **produced**? ***(haploid vs diploid?)***		
4	How do the new cells compare to the parent cell?		
5	Function		
6	What other differences occur?		

Why is Variation Important?

- variation in genes allow organisms to survive different circumstances

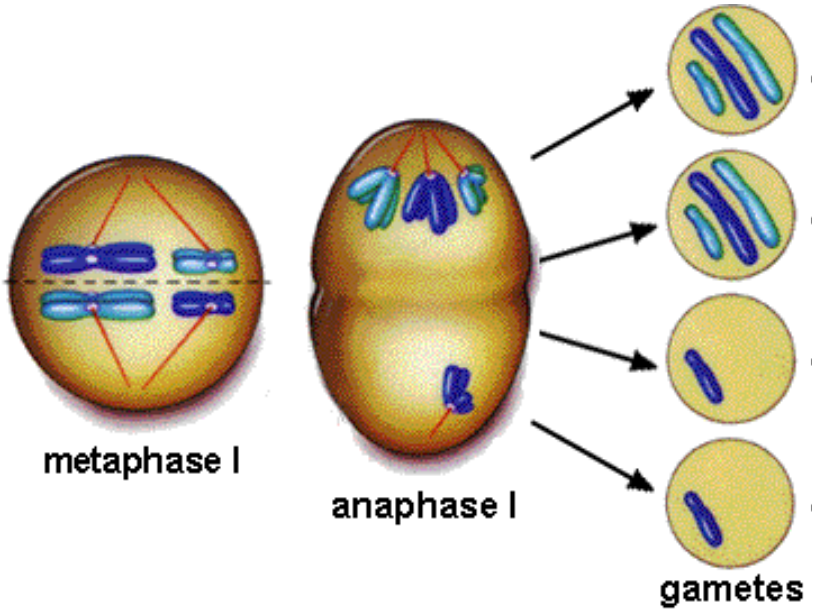
First let's look at chromosomes (Karyotype)

Is this person a male or female?
What do you notice about how the chromosome are arranged?



What is wrong with the gametes?

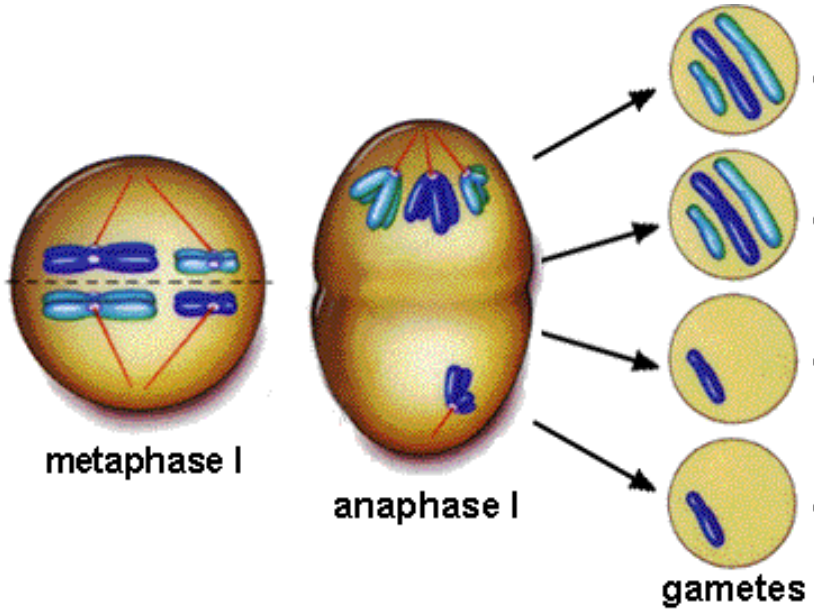
What went wrong with meiosis?

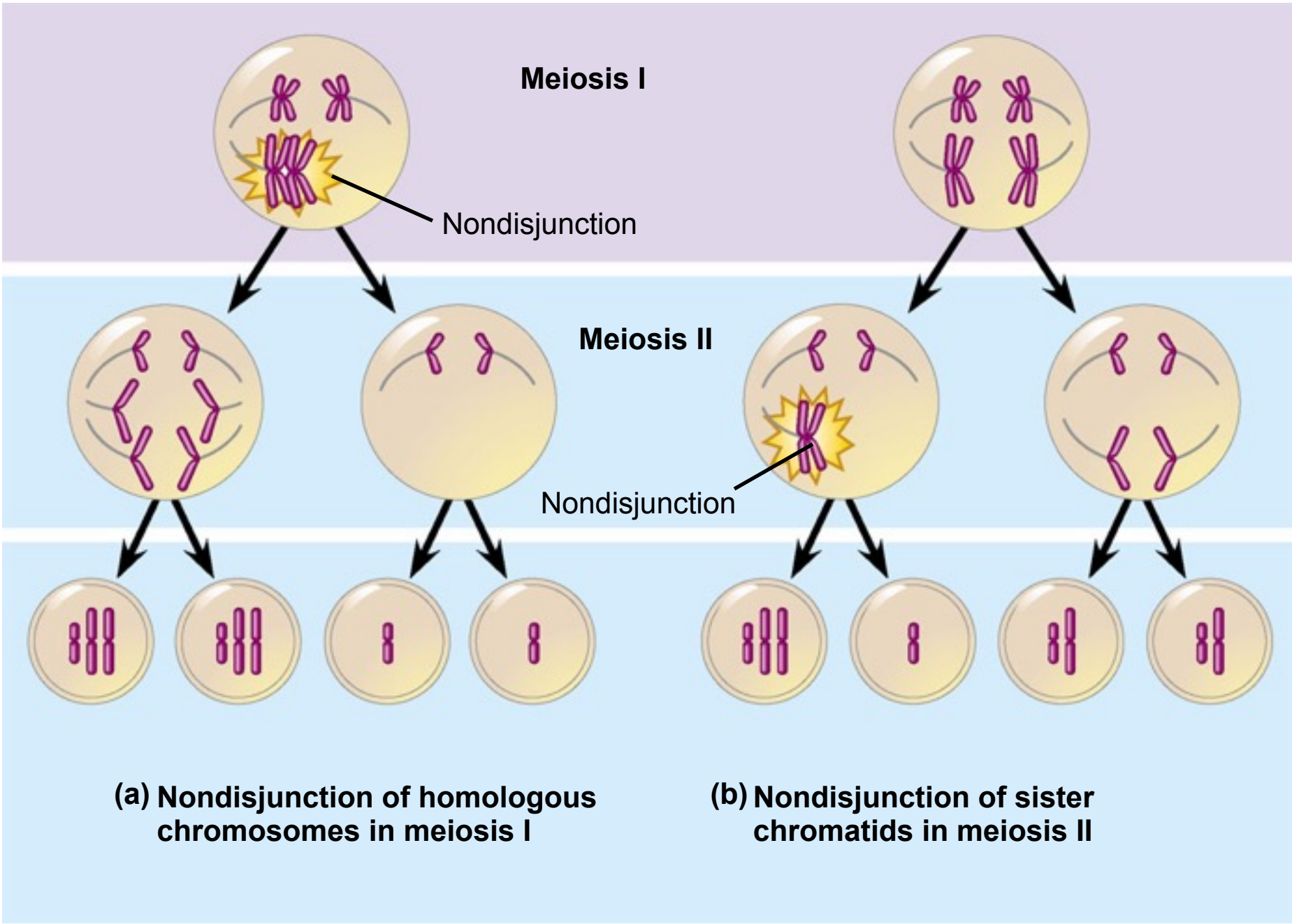


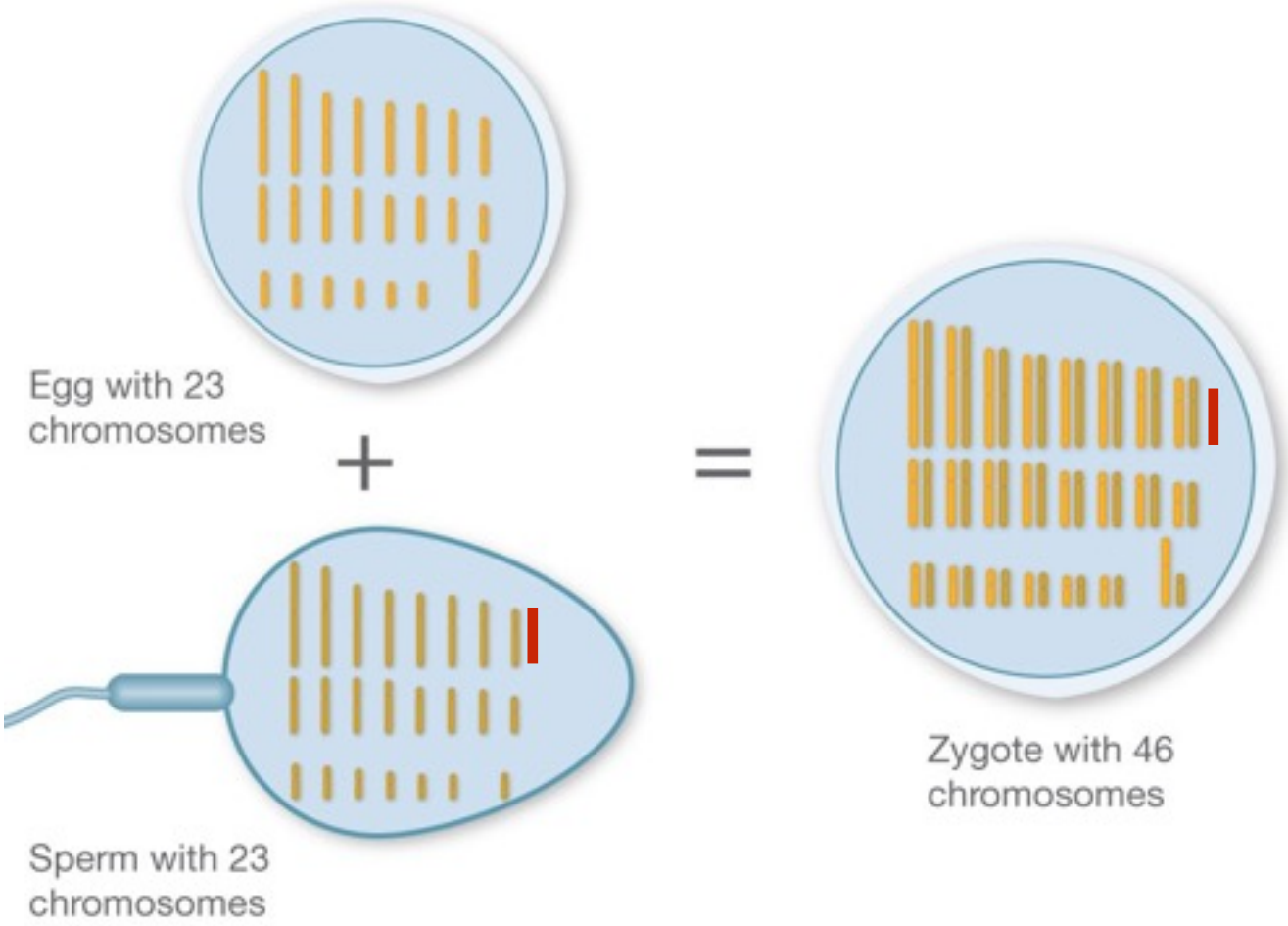
Errors can occur in Meiosis

Nondisjunction

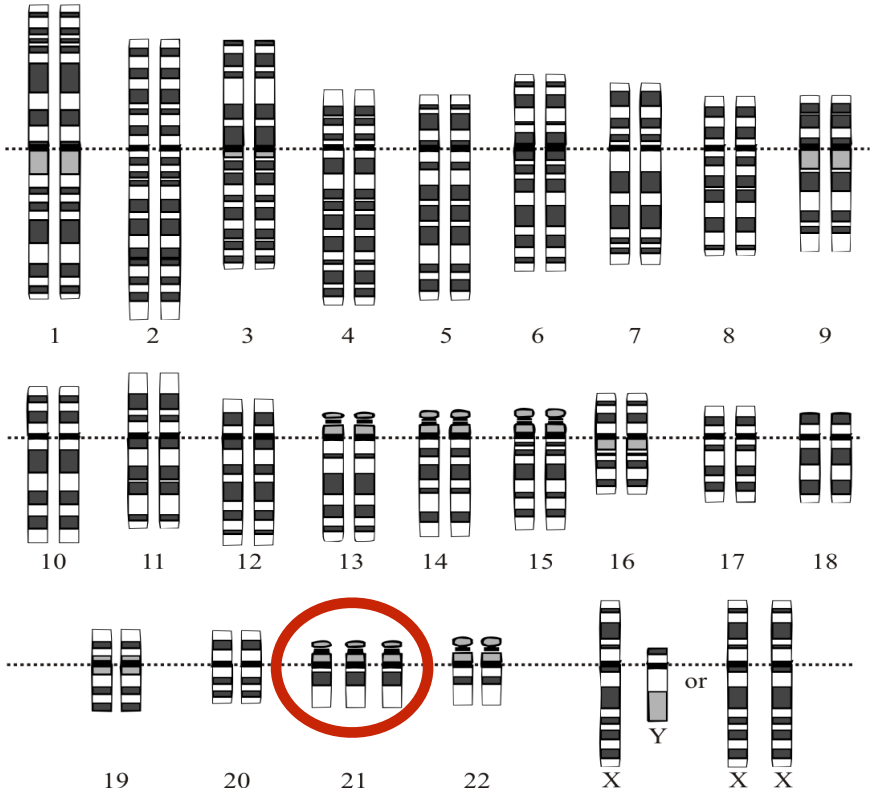
- happens when chromosomes don't separate properly
- occurs during **anaphase I** or **anaphase II**
- results in gametes having a missing or an extra chromosome




Meiosis I
Nondisjunction
Meiosis II
Nondisjunction
(a) Nondisjunction of homologous chromosomes in meiosis I
(b) Nondisjunction of sister chromatids in meiosis II


Egg with 23 chromosomes
+
Sperm with 23 chromosomes
=
Zygote with 46 chromosomes

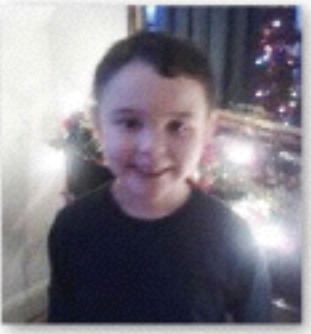
Errors can occur in Meiosis



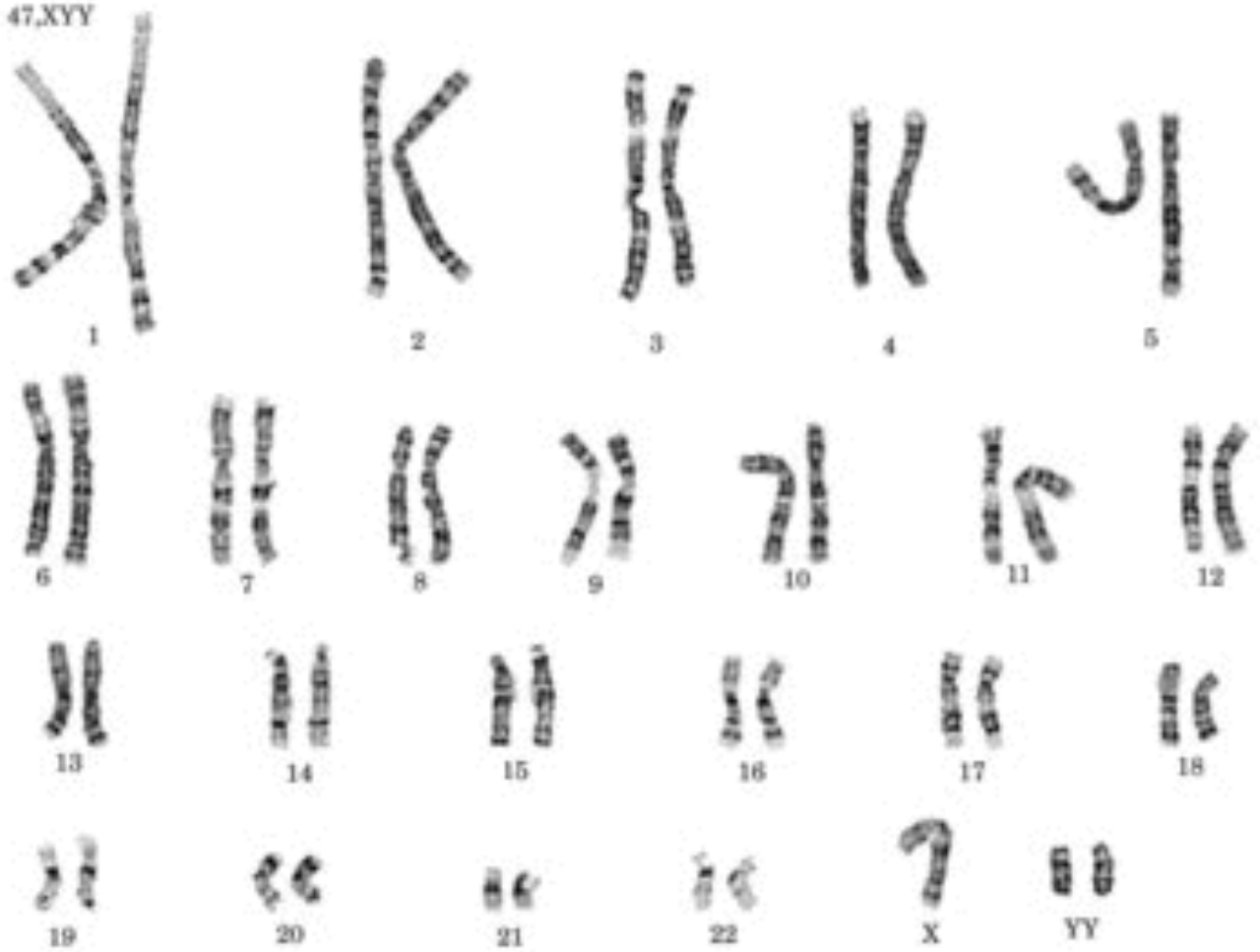

KEEP
CALM
IT'S ONLY
AN EXTRA
CHROMOSOME


Sienna

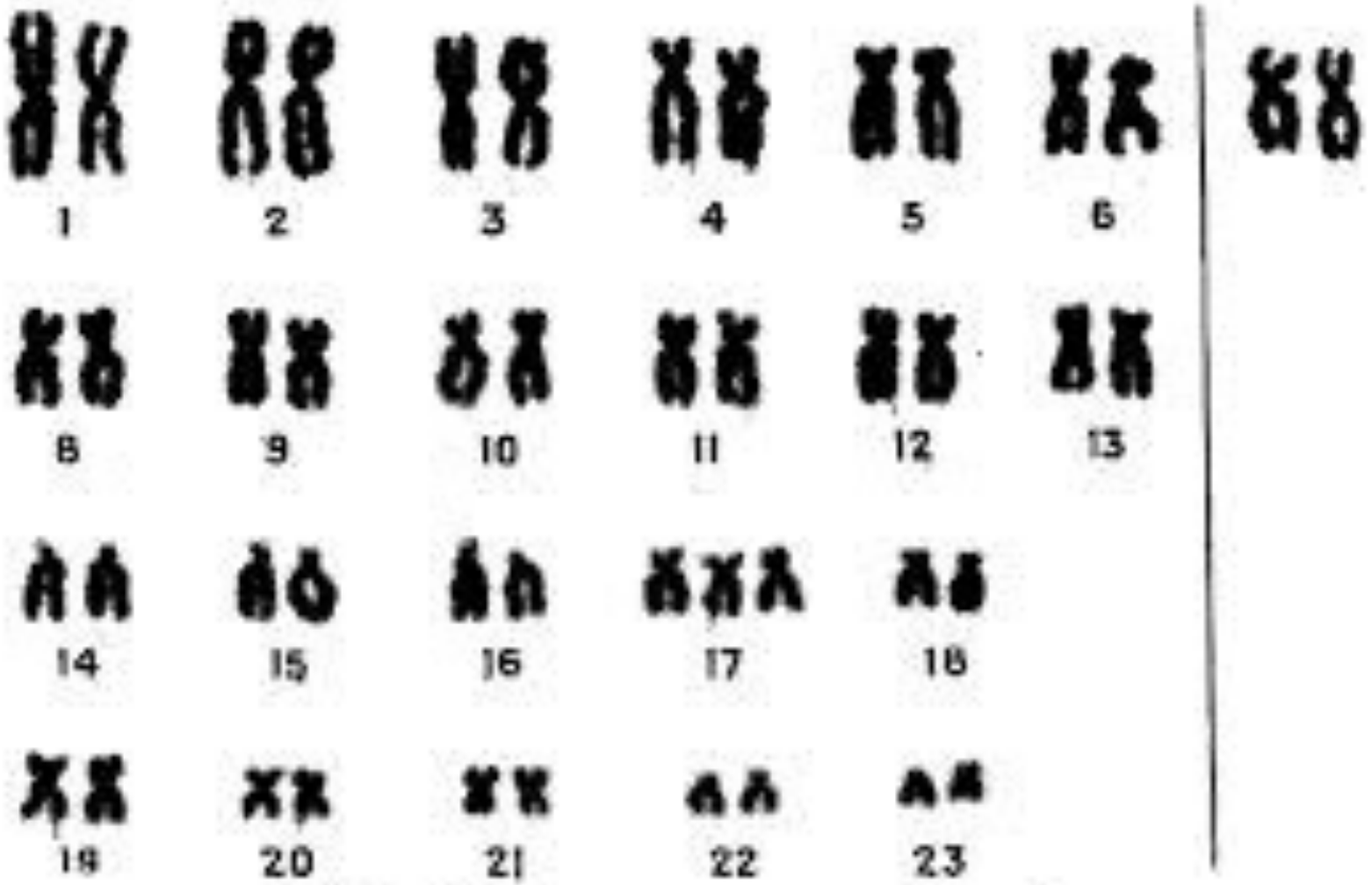

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
X
Y

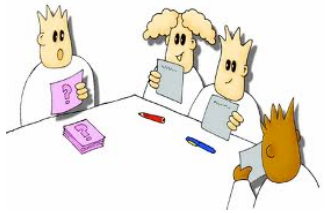


Kleinfelter Syndrome

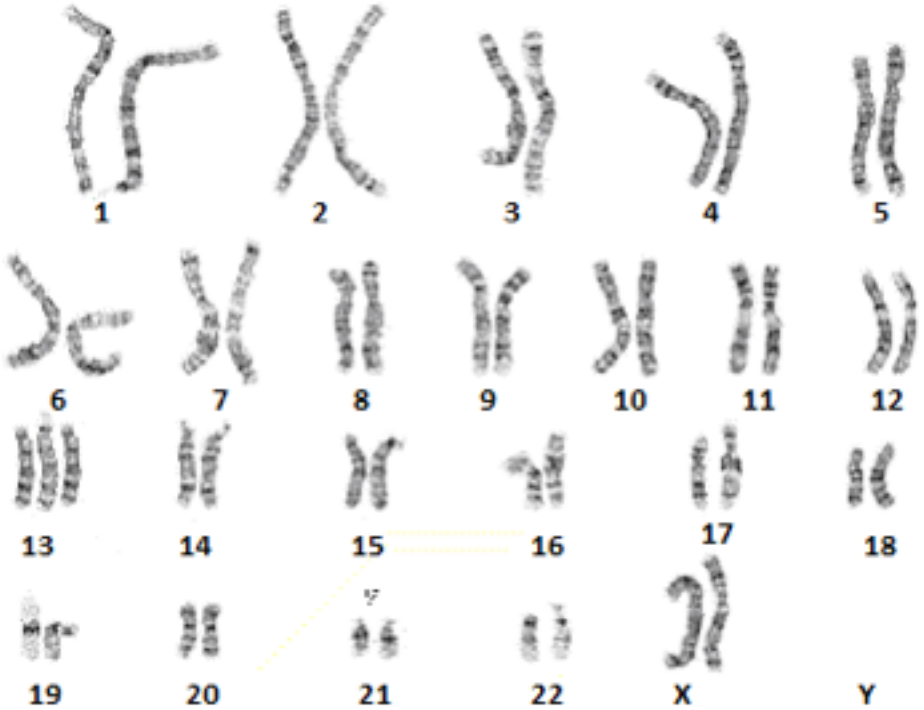


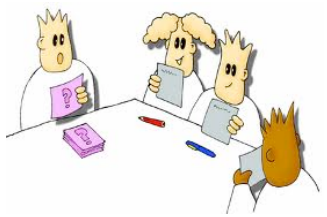
Is there evidence of non-disjunction?





1. a. Is this person male or female? How do you know.
b. Does this person have the correct number of chromosomes? How do you know?
c. During what phases of meiosis do you think this error likely occurred? Explain.





2. a. Is this person male or female? How do you know?
b. Does this person have the correct number of chromosomes? How do you know?
c. During what phases of meiosis do you think this error likely occurred? Explain.

Classwork

- Complete the handout & hand in!