

Bell Ringer

You are a doctor who has just diagnosed a patient with lung cancer. Use what you know understand about the cancer cell cycle to help the patient understand what cancer is and what it is doing in the body.



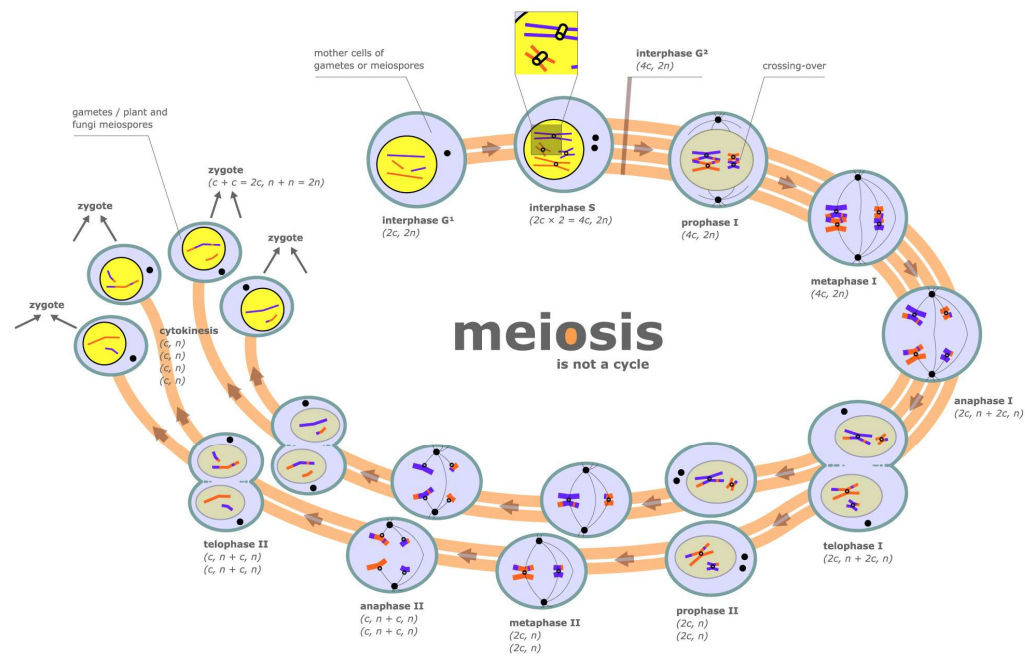


MEIOSIS

What is it?

The process of making sex cells (sperm, egg)

*NOT A CYCLE



The Goal

To create sex cells with HALF the number of chromosomes.



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If human somatic cells have $2n$ chromosomes, what is “ n ” for sex cells?

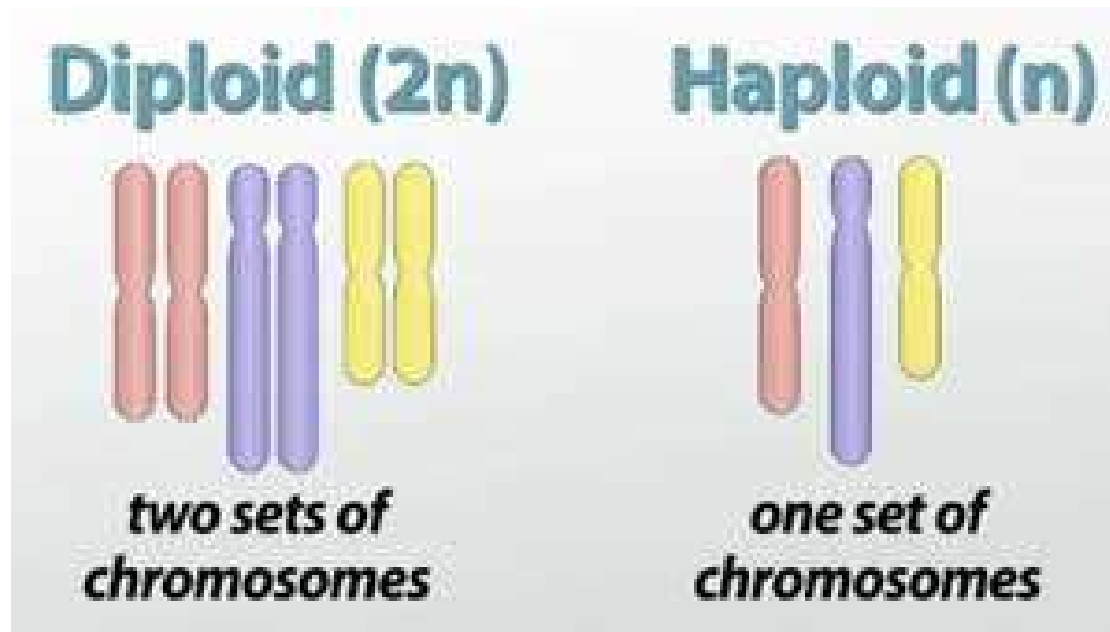
The Goal

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Haploid

When a cell has only ONE set of chromosomes



Step 1: Meiosis I

Diploid ($2n$) cell goes through mitosis (PMAT).

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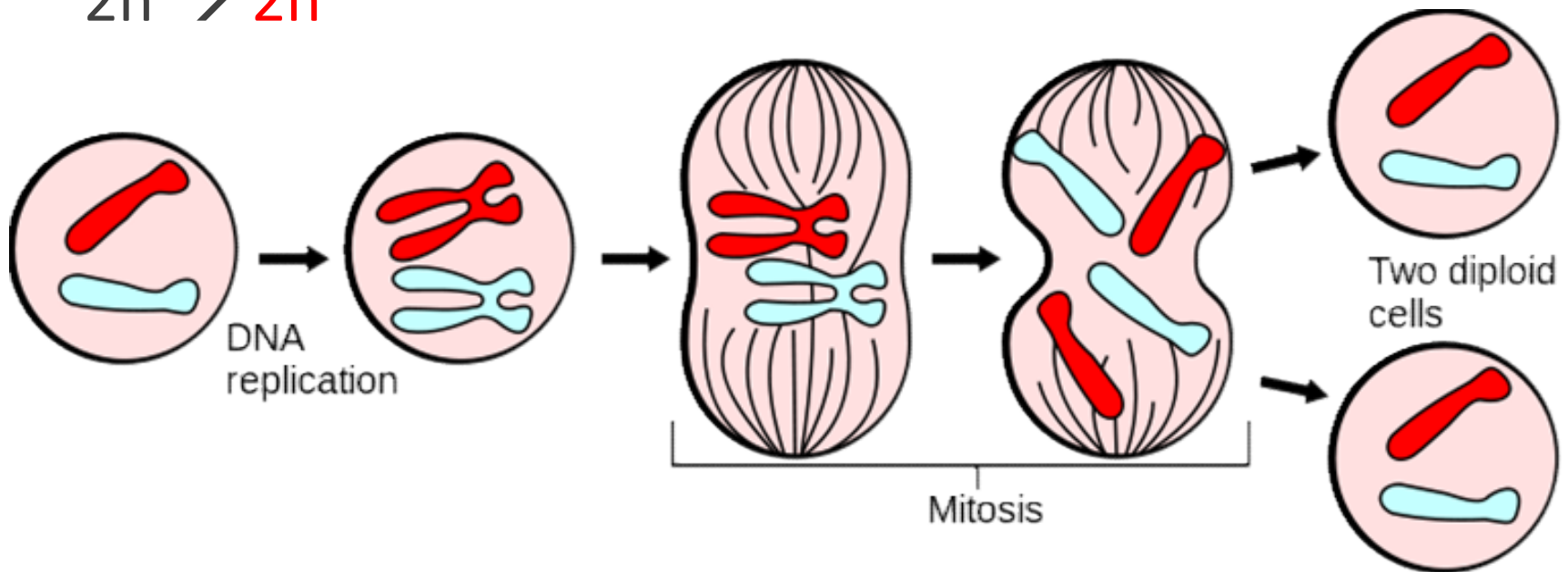
$2n \rightarrow$ _____



Step 1: Meiosis I

Diploid ($2n$) cell goes through mitosis (PMAT).

$2n \rightarrow 2n$



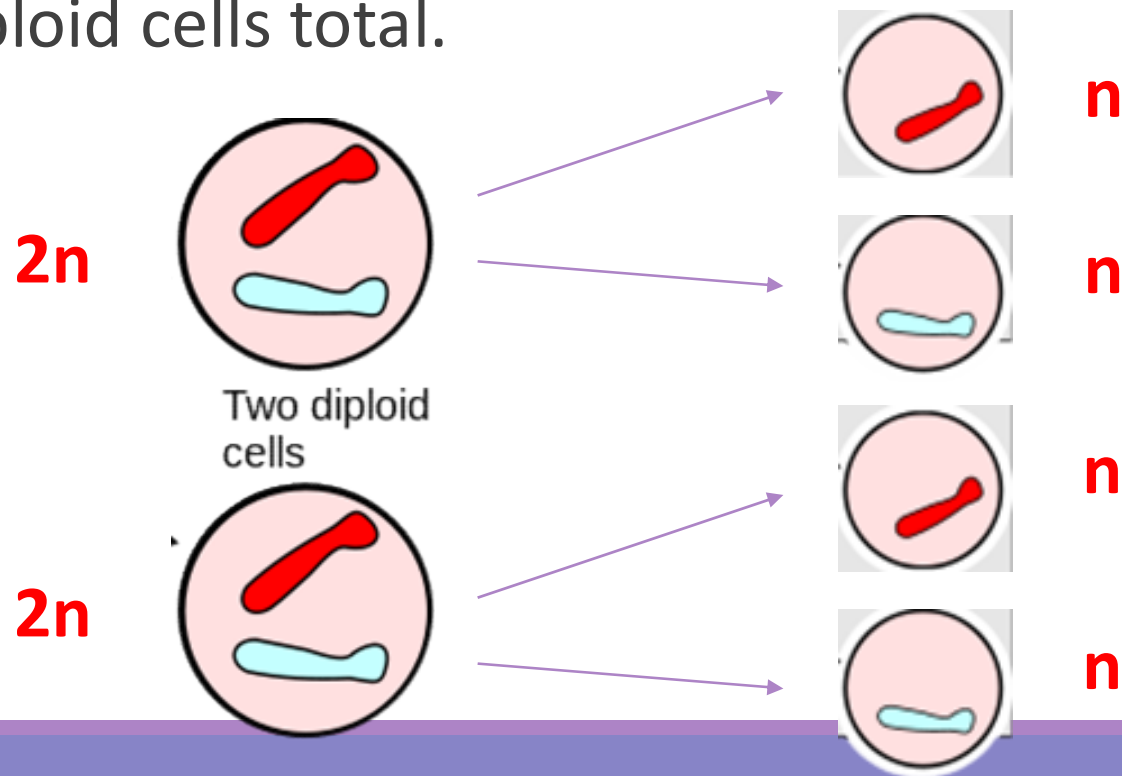
Step 2: Meiosis II

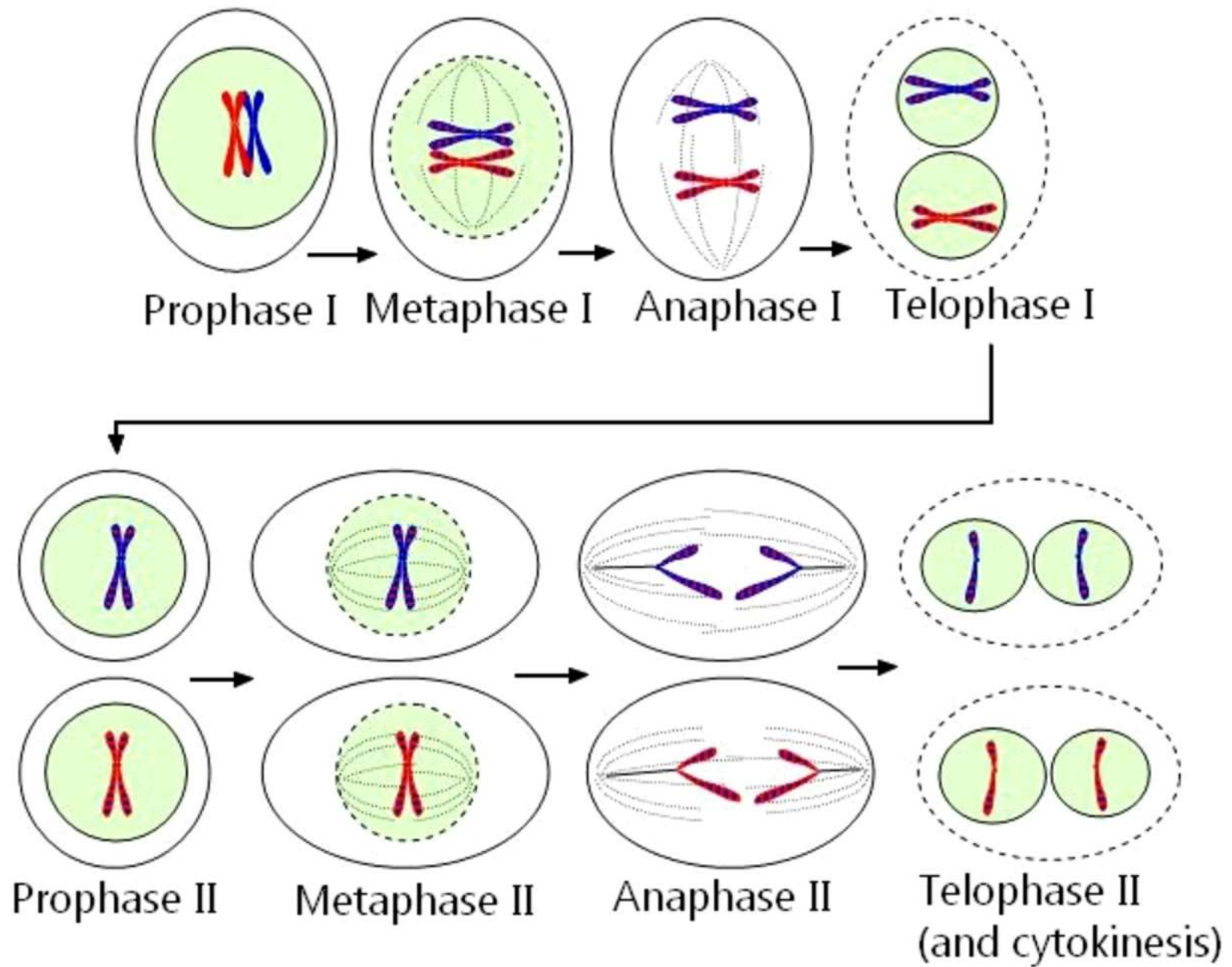
Each daughter cells divides again (PMAT) to create two haploid cells.

Step 2: Meiosis II

Each daughter cells divides again (PMAT) to create two haploid cells.

4 haploid cells total.





Why haploid?

Why do you think sex cells have only half the number of chromosomes?



Why haploid?

Why do you think sex cells have only half the number of chromosomes?

When an egg (n) and a sperm (n) combine they must create a new cell that create offspring with the correct total number ($2n$).

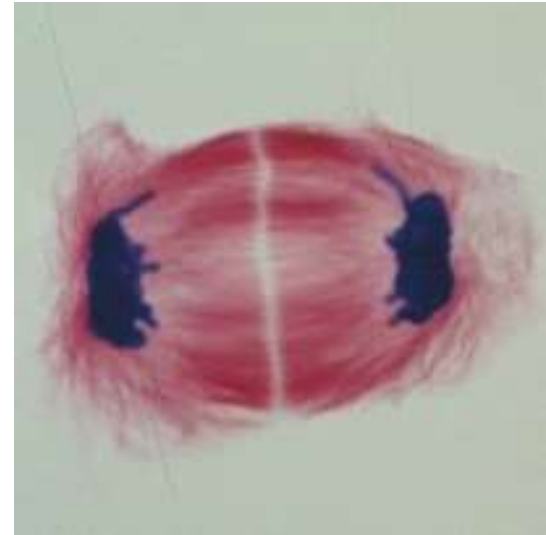
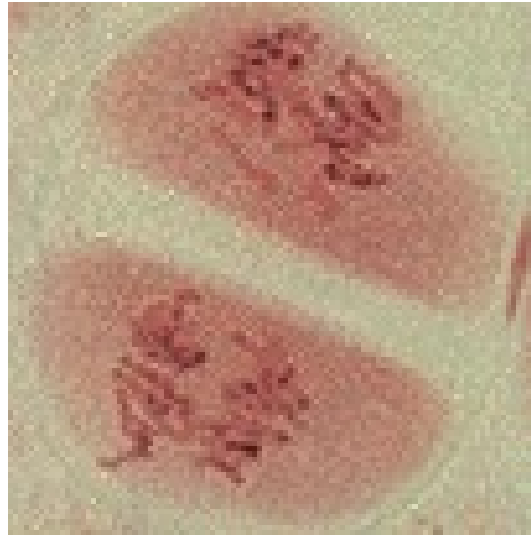
EXIT TASK

How is the purpose of meiosis different from the purpose of mitosis?



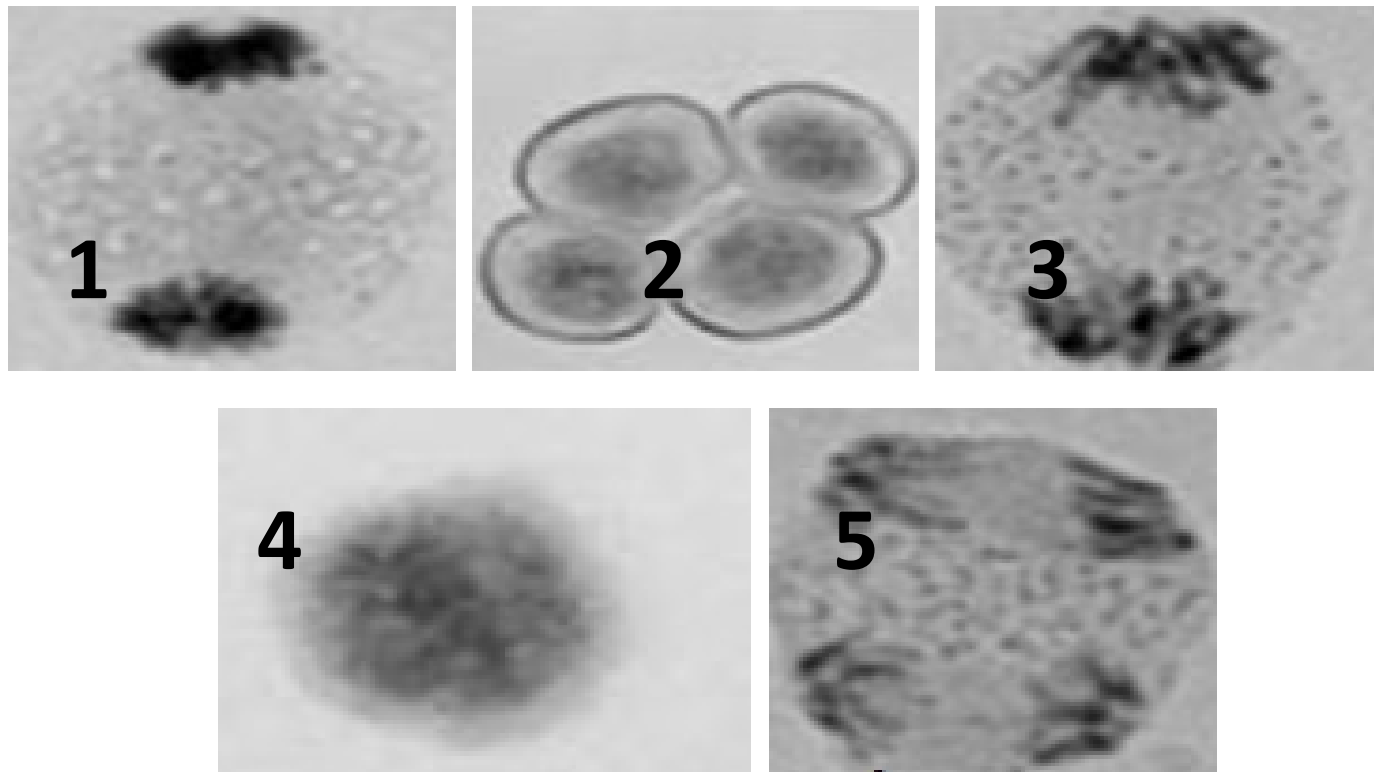
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Which phase(s) are in Meiosis I? Which phase(s) are in Meiosis II?



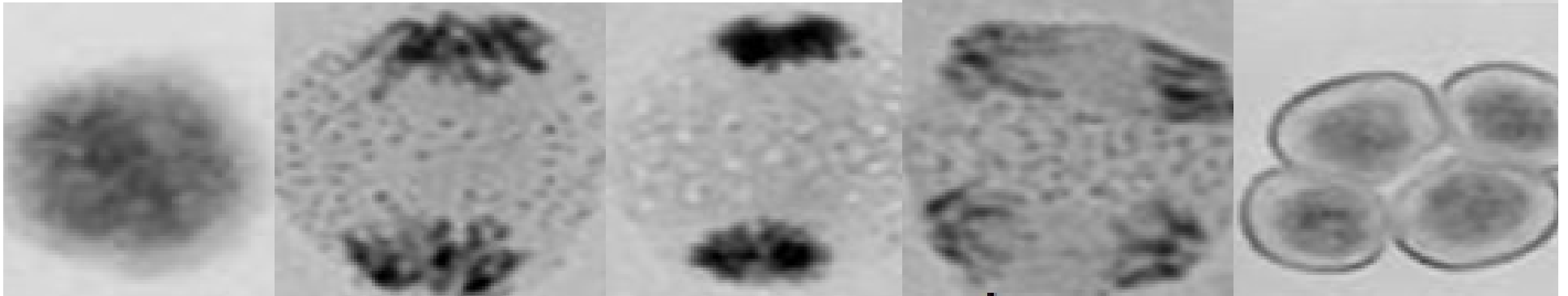
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Put these phases of Meiosis in the correct order:



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4 3 1 5 2



Types of reproduction

Asexual = parent uses mitosis to create identical offspring.

- Only one organism required.
- No genetic variation

Examples: single-celled organisms, strawberry runners, komodo dragons



Types of reproduction

Sexual = sperm and egg combine to create offspring with full chromosome number.

- Sperm and egg (sex cells) are also called **gametes**.

Types of reproduction

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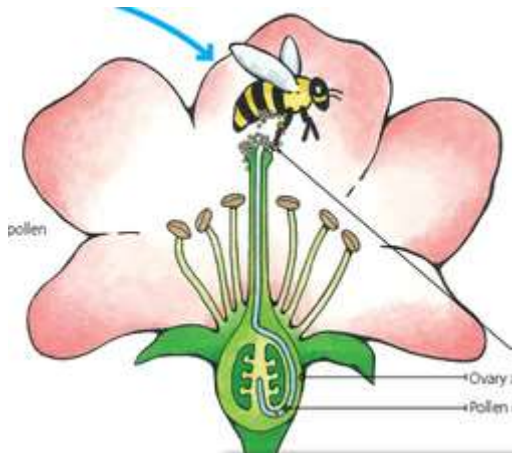
- Takes two to tango!
- Increased genetic variation

Types of reproduction

Sexual = *gametes* combine to create offspring with full chromosome number.

- Takes two to tango!
- Increased genetic variation

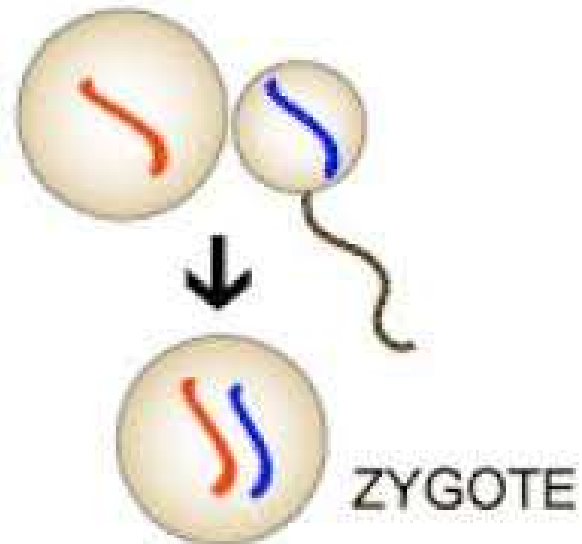
Examples: plants, sharks, humans, etc.



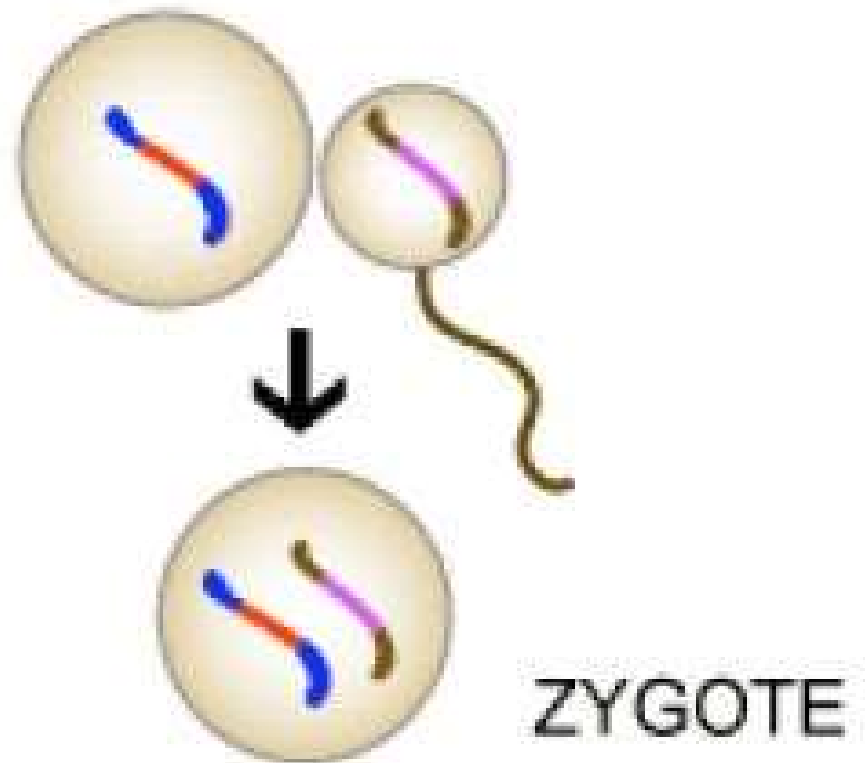
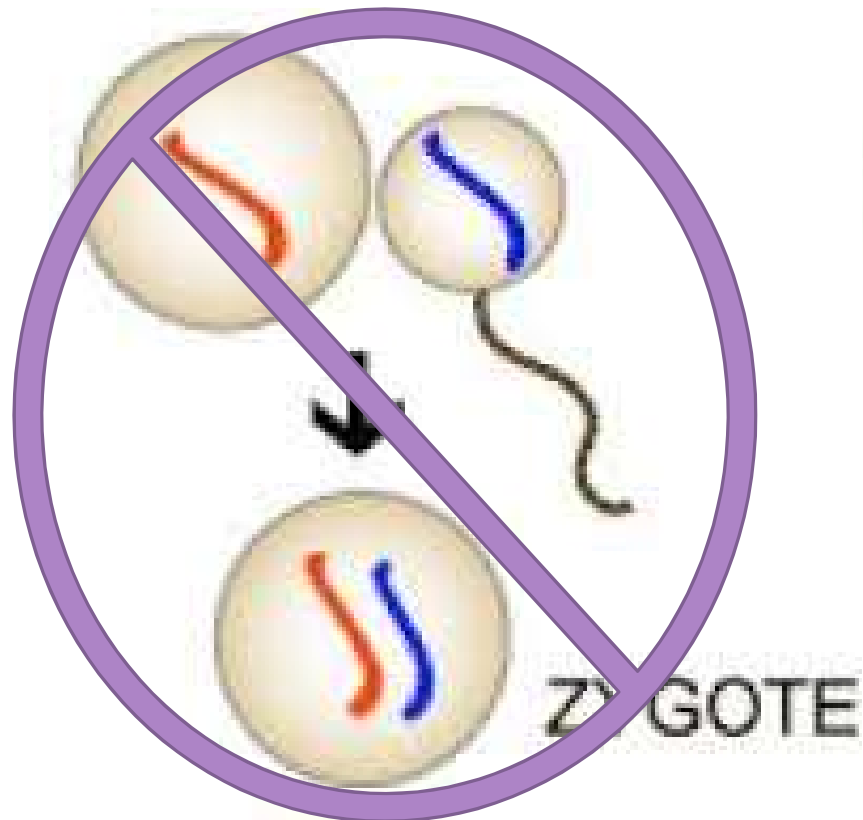
Fertilization

When sperm donates chromosomes to an egg, thus restoring full chromosome number.

The resulting cell is called a **zygote**.

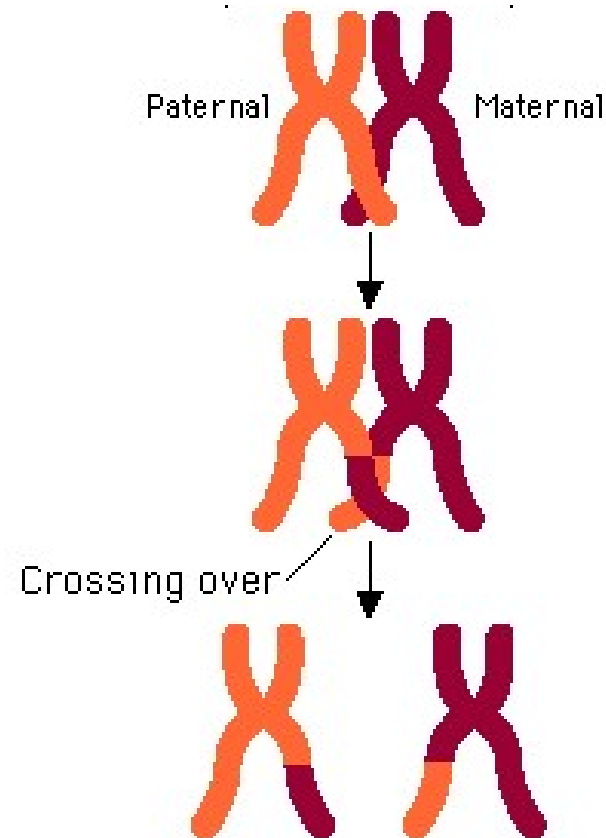


Fertilization



Recombination

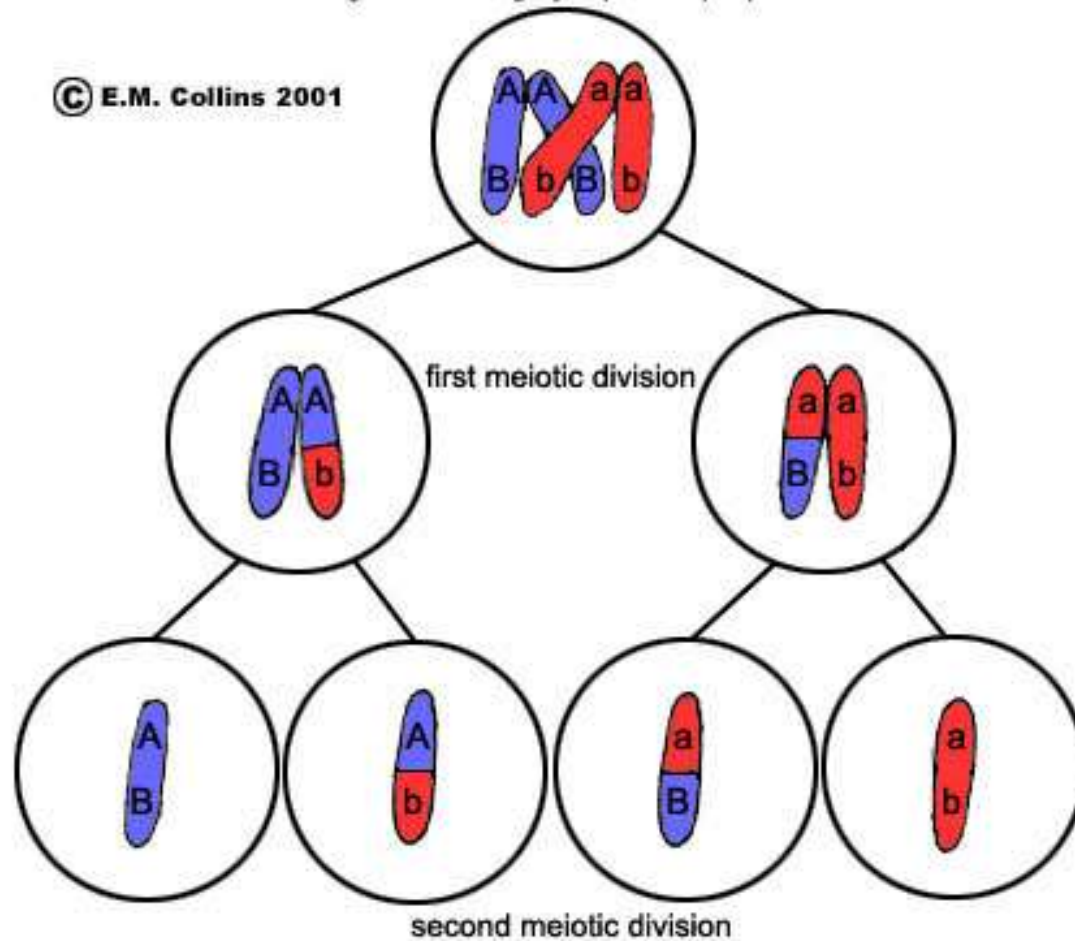
The sister chromatids of homologous chromosomes in Prophase I will “cross over” each other and swap whole sections of DNA.



Crossing over

crossing over during synapsis of prophase I

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EXIT TASK

Use what you know about recombination in meiosis to explain why siblings do not look identical to each other even though they share the same mother and father.

