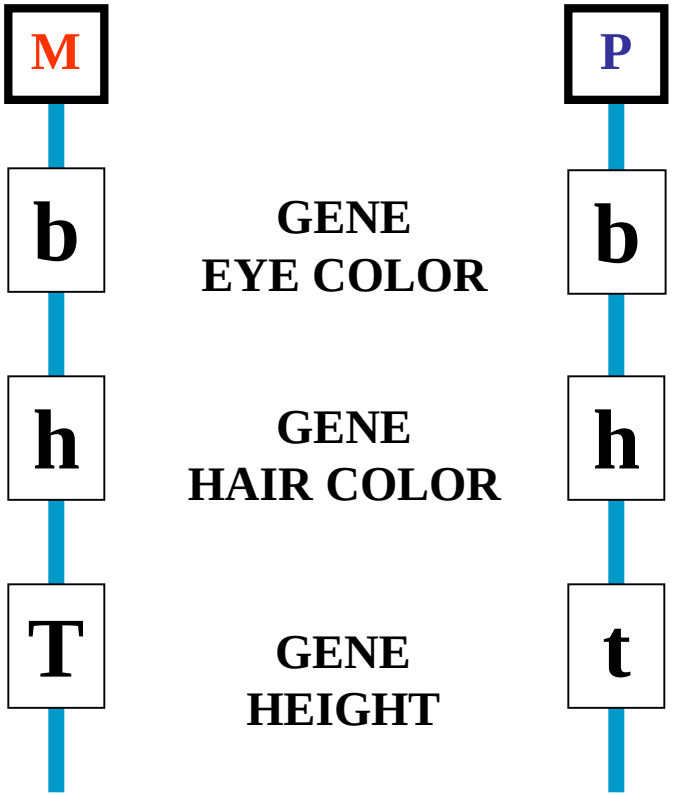
GENE POOL

INHERITED ALLELE COMBINATION



HOMOLOGOUS CHROMOSOMES

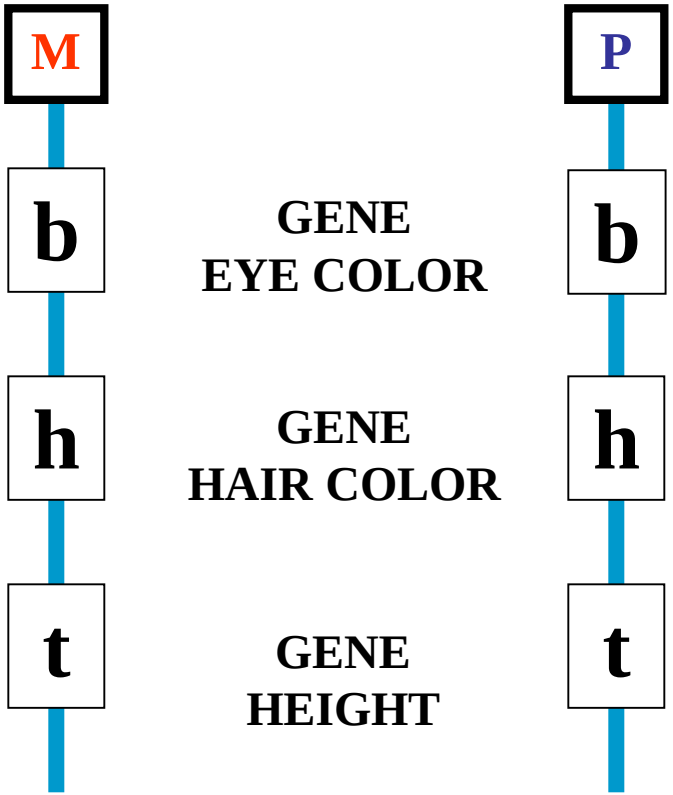
GENE POOL

	M		P
BLUE EYES	b	GENE EYE COLOR	b
LIGHT HAIR	h	GENE HAIR COLOR	h
TALL	T	GENE HEIGHT	t

HOMOLOGOUS CHROMOSOMES

GENE POOL

INHERITED ALLELE COMBINATION



HOMOLOGOUS CHROMOSOMES

GENE POOL

	M		P
BLUE EYES	b	GENE EYE COLOR	b
LIGHT HAIR	h	GENE HAIR COLOR	h
SHORT	t	GENE HEIGHT	t

HOMOLOGOUS CHROMOSOMES

HUMAN DIVERSITY

GENE POOL
PERMITS GENETIC DIVERSITY

HUMAN DIVERSITY

GENE POOL SHUFFLING

GENE POOL SHUFFLING

GENE POOL SHUFFLING

MIXING
GENE POOL
ALLELES

GENE POOL SHUFFLING

GENE POOL SHUFFLING TYPES

GENE POOL SHUFFLING TYPES

CROSSING-OVER

GENE POOL SHUFFLING TYPES

GENE POOL SHUFFLING TYPES

CROSSING-OVER

RANDOM INDEPENDENT ASSORTMENT

GENE POOL SHUFFLING TYPES

GENE POOL SHUFFLING TYPES

CROSSING-OVER
RANDOM INDEPENDENT ASSORTMENT
RANDOM GAMETE FERTILIZATION

GENE POOL SHUFFLING TYPES

C

CROSSING-OVER

CROSSING-OVER

CROSSING-OVER

HOMOLOGOUS CHROMOSOME ALLELE EXCHANGE BETWEEN NON-SISTER CHROMATIDS

CROSSING-OVER

?

CROSSING-OVER SPECIFICS

A

QUESTION

CROSSING-OVER OCCURS DURING MITOSIS OR MEIOSIS?

QUESTION

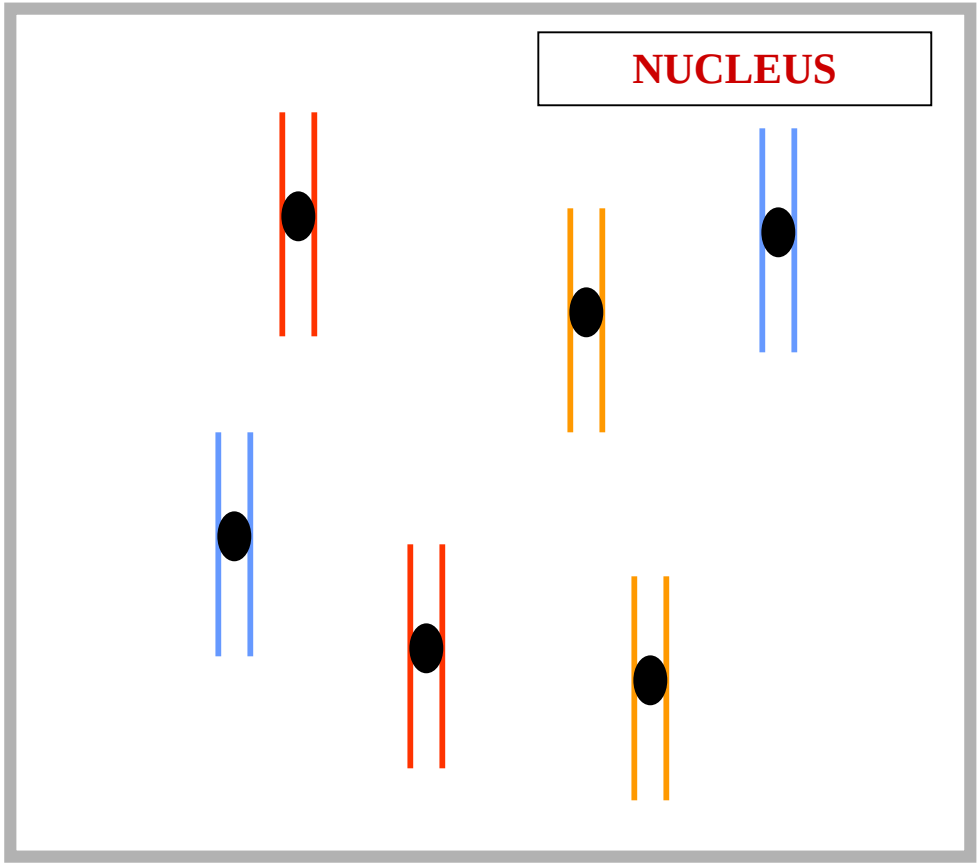
ANSWER

MEIOSIS
PROPHASE-I

ANSWER

MEIOSIS
PROPHASE-I

PROPHASE - I



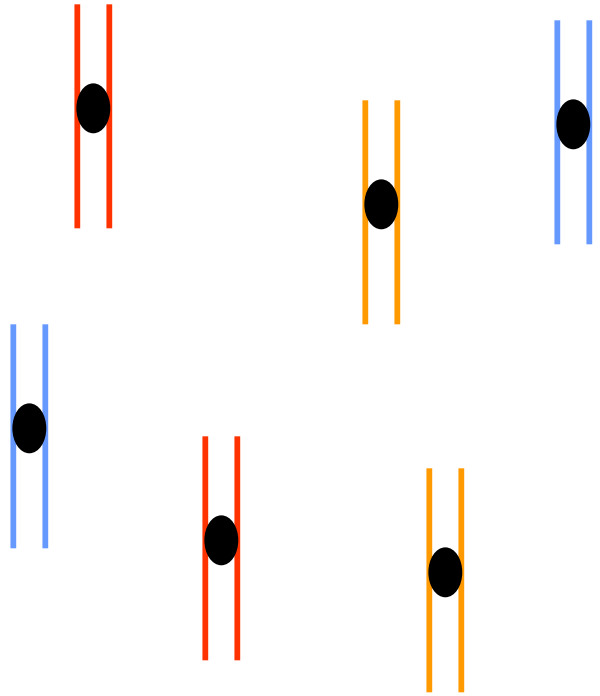
CYTOSOL

CYTOSOL

NUCLEAR MEMBRANE

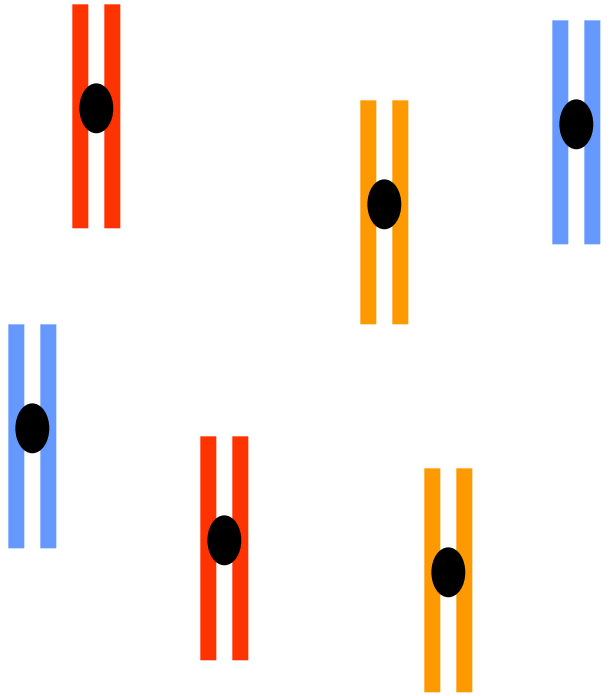
C

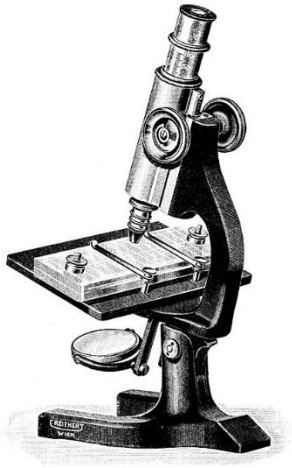
PROPHASE - I



NUCLEAR MEMBRANE DISSIPATES

PROPHASE - I

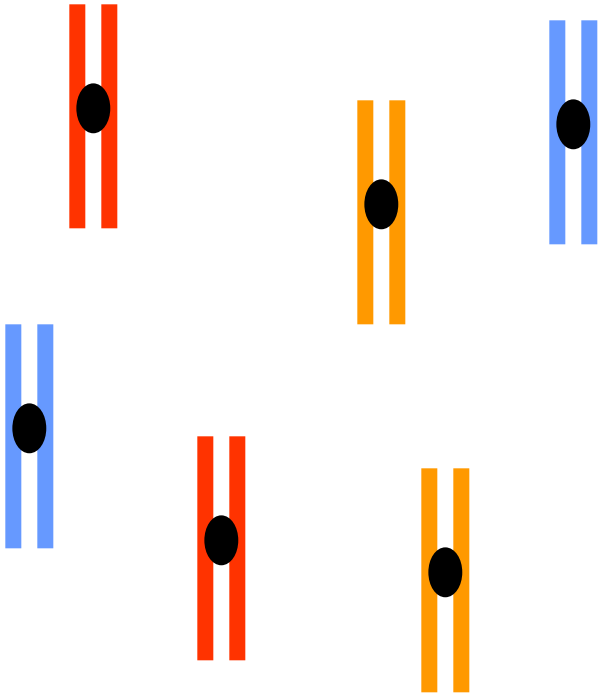




CHROMOSOMES CONDENSE

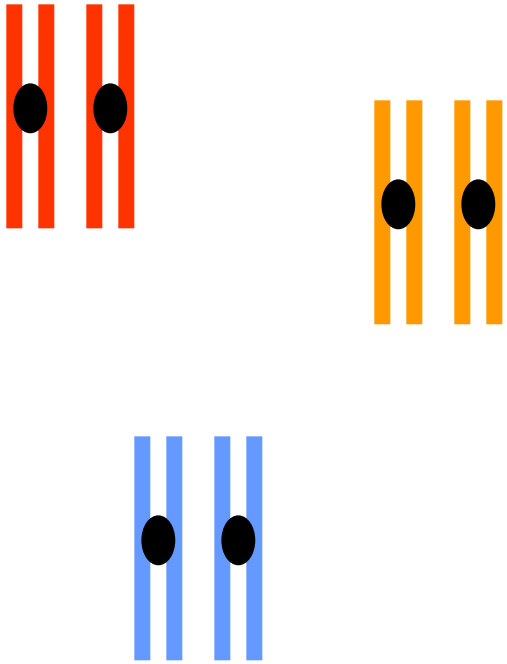
PROPHASE - I

P



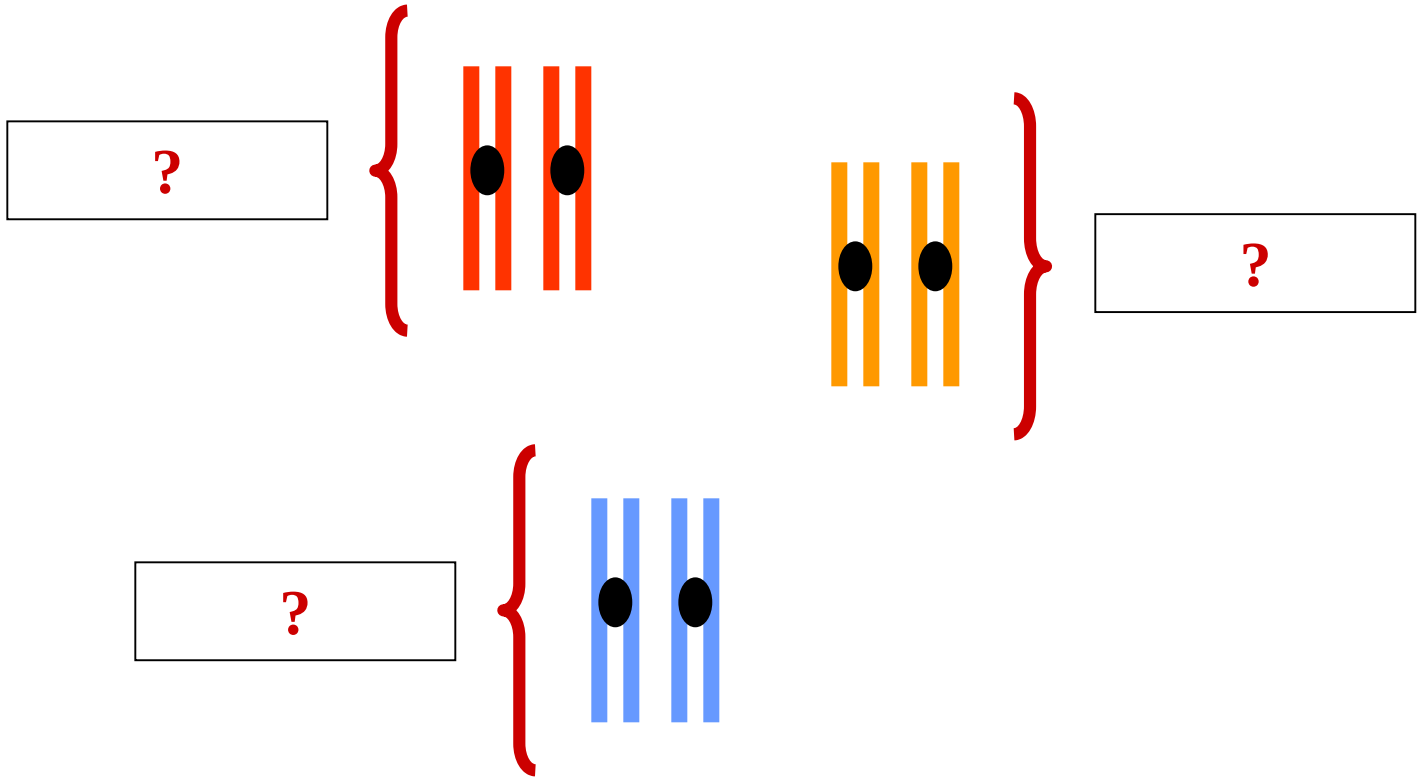
HOMOLOGOUS CHROMOSOMES

PROPHASE - I



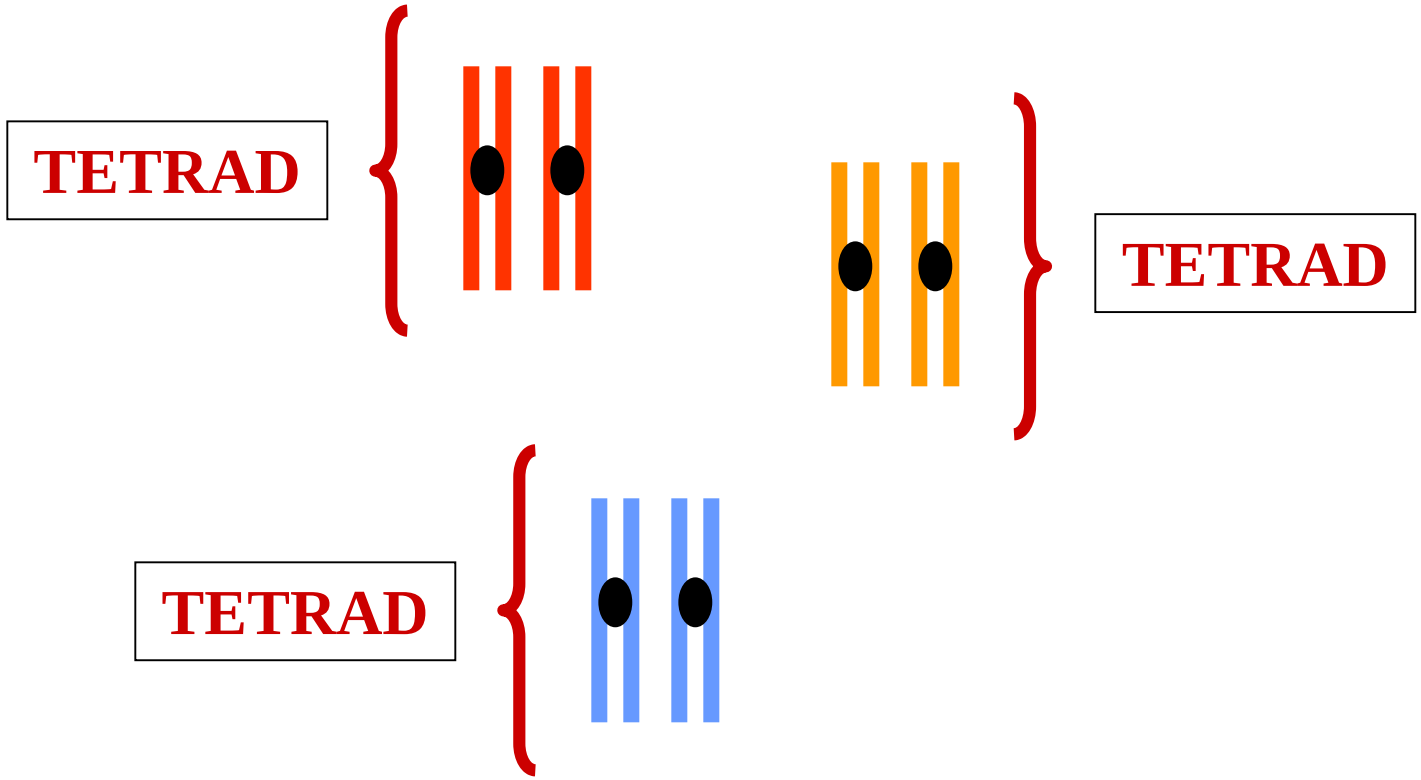
HOMOLOGOUS CHROMOSOMES PAIR

PROPHASE - I



HOMOLOGOUS CHROMOSOMES

PROPHASE - I

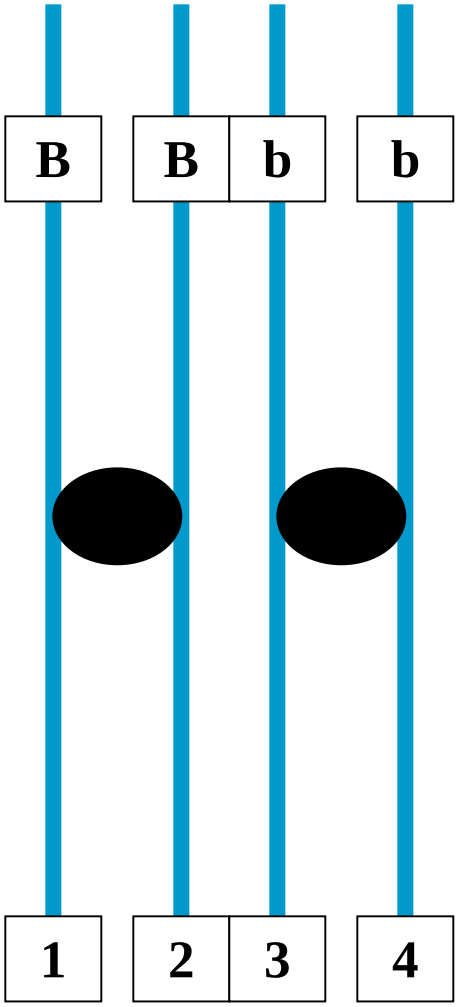


HOMOLOGOUS CHROMOSOMES

CROSSING-OVER

TC

EYE COLOR ALLELES



TETRAD

S

TETRAD CONSISTS:

SISTER CHROMATIDS

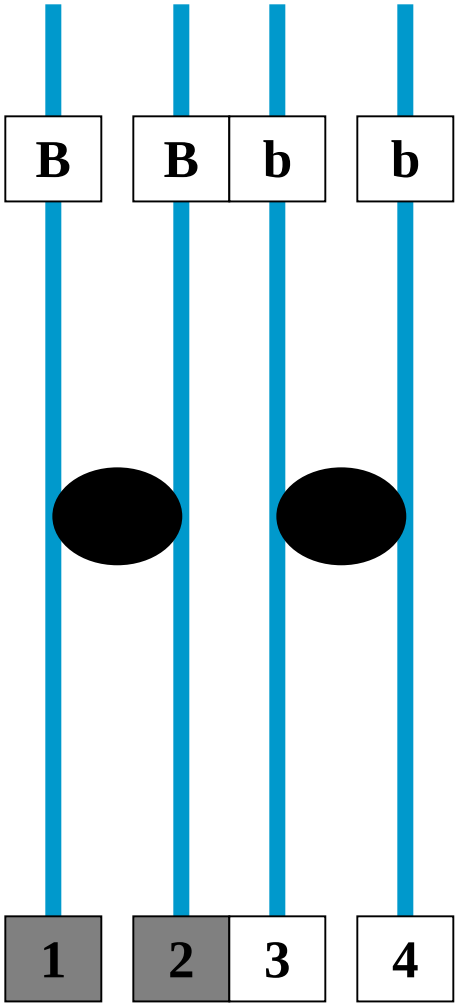
SISTER CHROMATIDS

CHROMATIDS SAME CENTROMERE

SISTER CHROMATIDS

CROSSING-OVER

EYE COLOR ALLELES



1&2 / 3&4 SISTER CHROMATIDS SAME CENTROMERE

1&2 / 3&4 SISTER CHROMATIDS SAME CENTROMERE

TETRAD

NON-SISTER CHROMATIDS

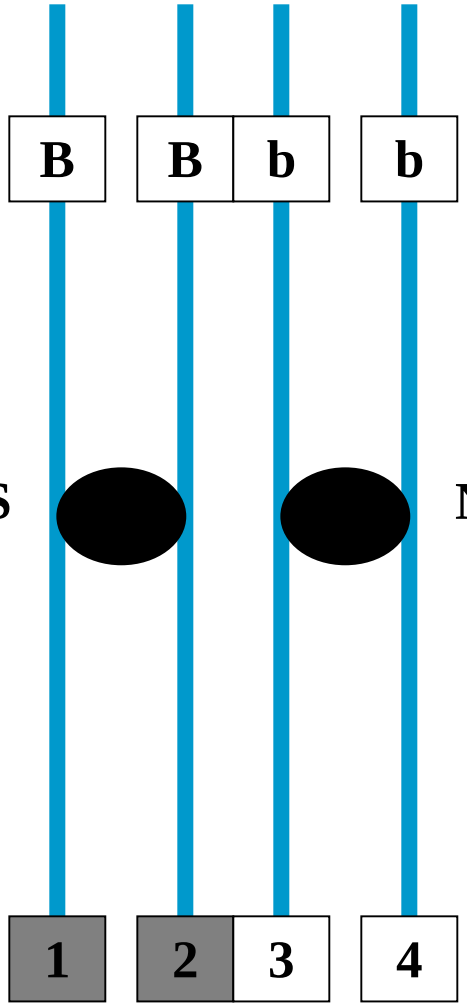
NON-SISTER CHROMATIDS

CHROMATIDS
DIFFERENT CENTROMERES

NON-SISTER CHROMATIDS

CROSSING-OVER

EYE COLOR ALLELES



2&3
NON-SISTER CHROMATIDS
DIFFERENT
CENTROMERES

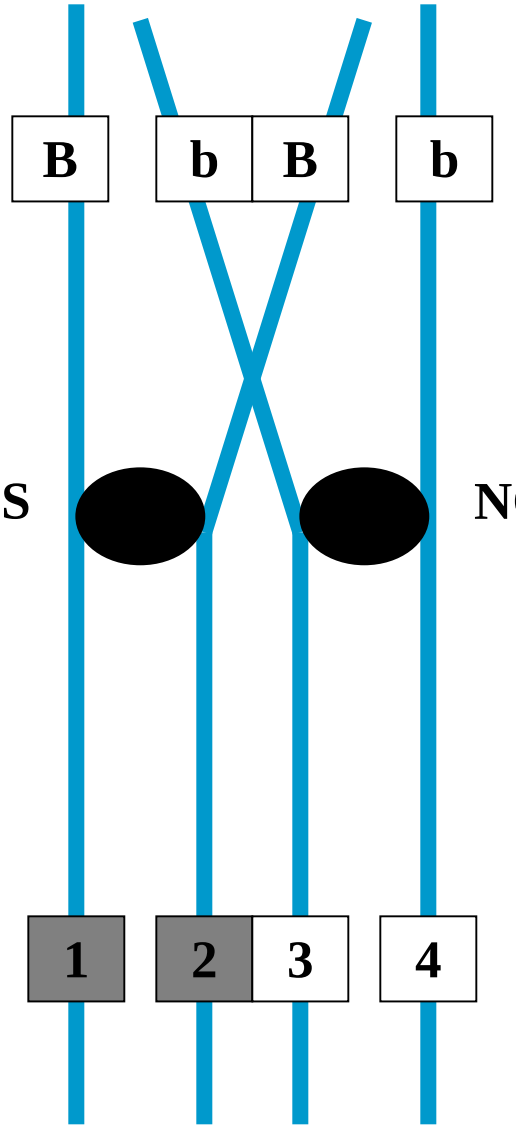
2&3
NON-SISTER CHROMATIDS
DIFFERENT
CENTROMERES

TETRAD

CROSSING-OVER

C

EYE COLOR ALLELES



2&3 NON-SISTER CHROMATIDS CROSS

2&3 NON-SISTER CHROMATIDS CROSS

CHIASMA

CHIASMA

X

C

+

CROSSING POINT BETWEEN NON-SISTER CHROMATIDS

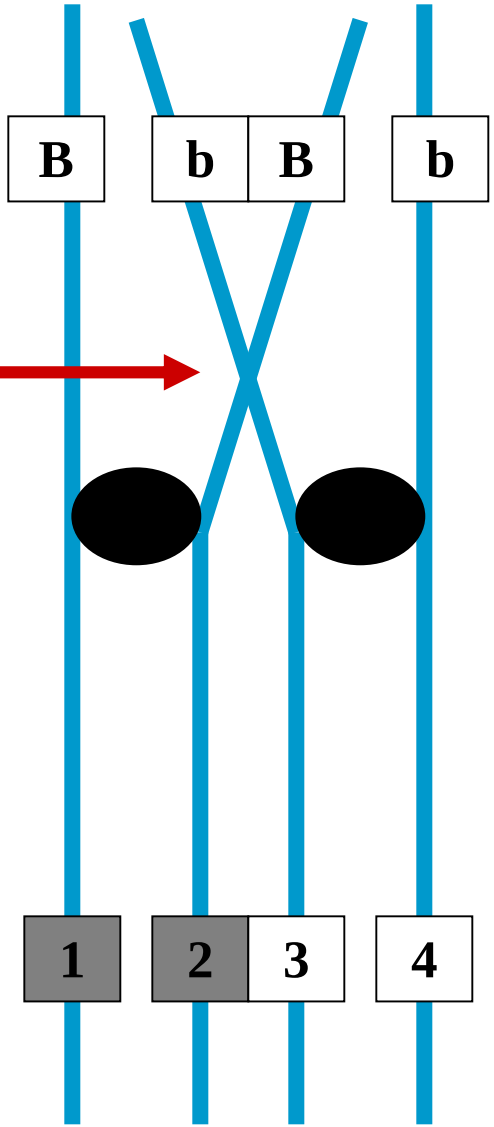
CHIASMA

CROSSING-OVER

EX

EYE COLOR ALLELES

CHIASMA

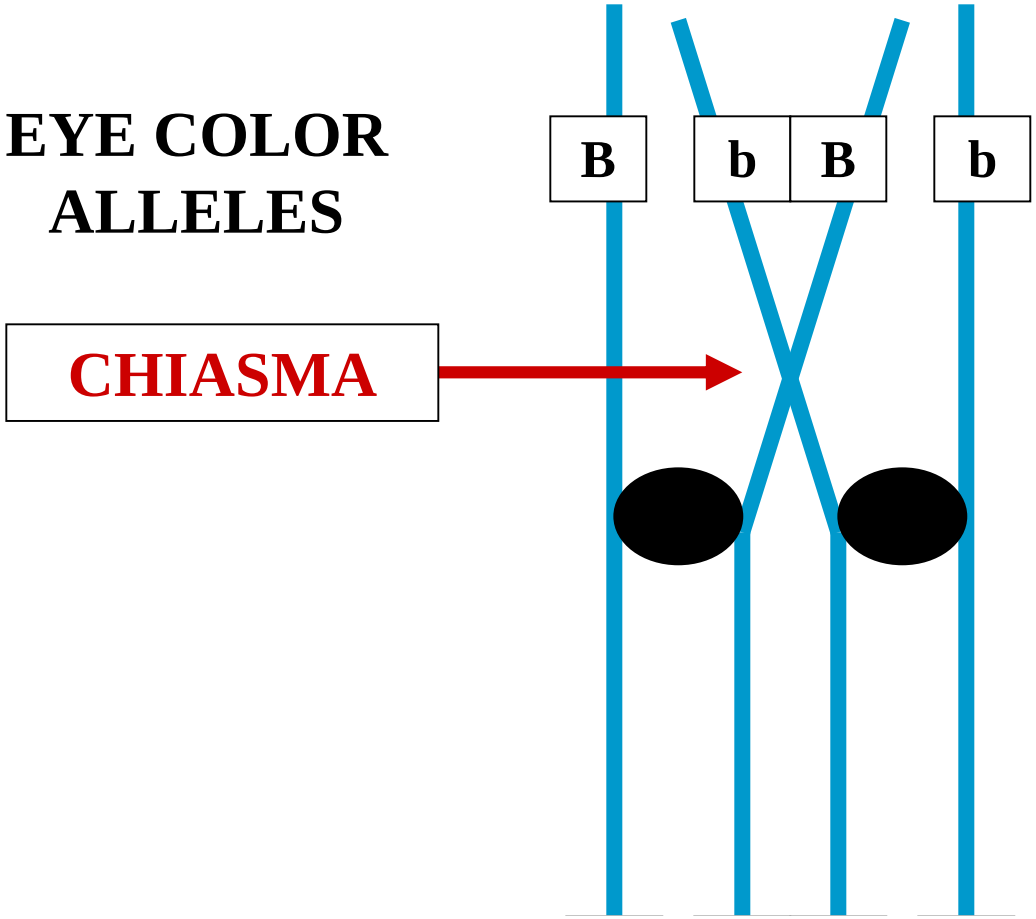


CROSSING-OVER

EX

+

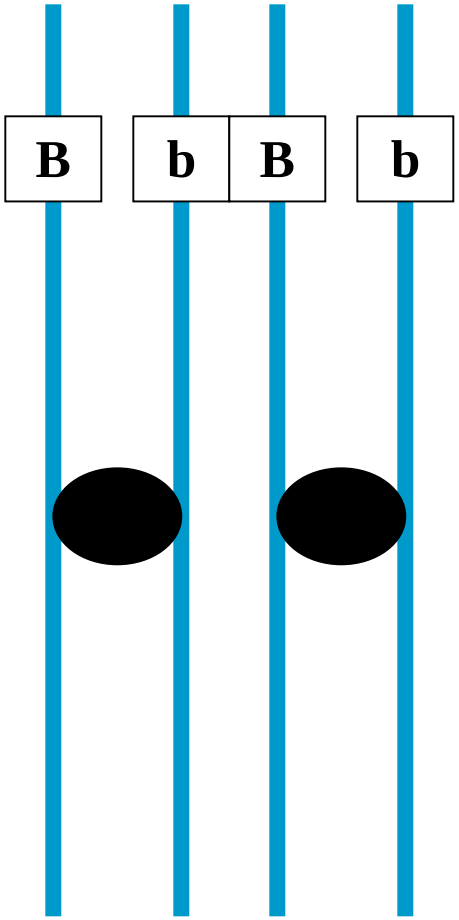
EYE COLOR ALLELES



ALLELE EXCHANGE

CROSSING-OVER

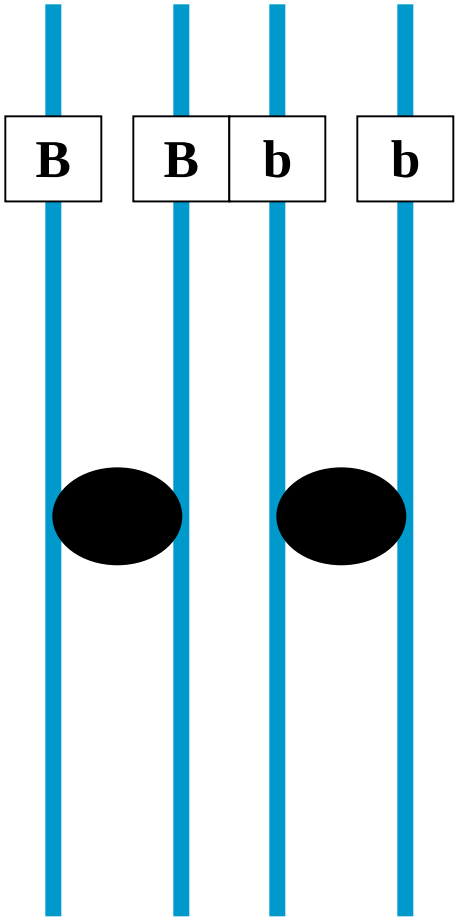
EYE COLOR ALLELES



ALLELE EXCHANGE

PRIOR CROSSING-OVER

EYE COLOR ALLELES



1ST HOMOLOG WITH DOMINANT ALLELES

2ND HOMOLOG WITH RECESSIVE ALLELES

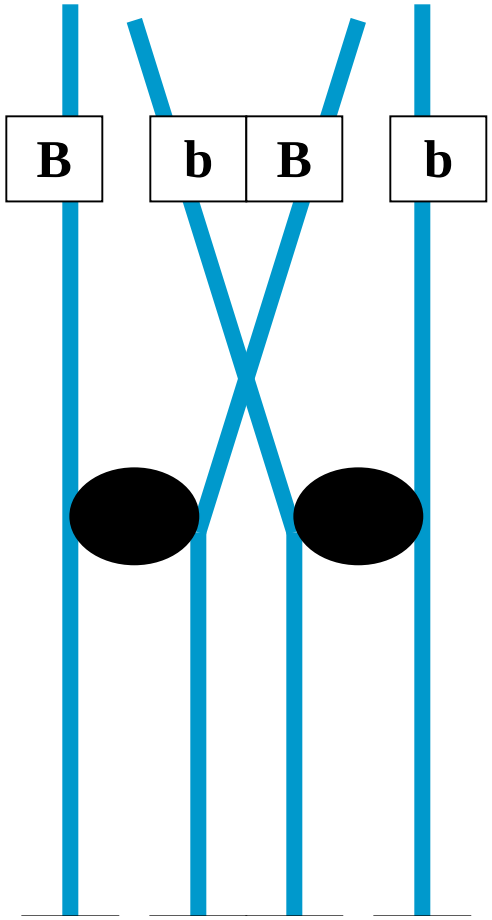
TETRAD

CROSSING-OVER

EX

+

EYE COLOR ALLELES

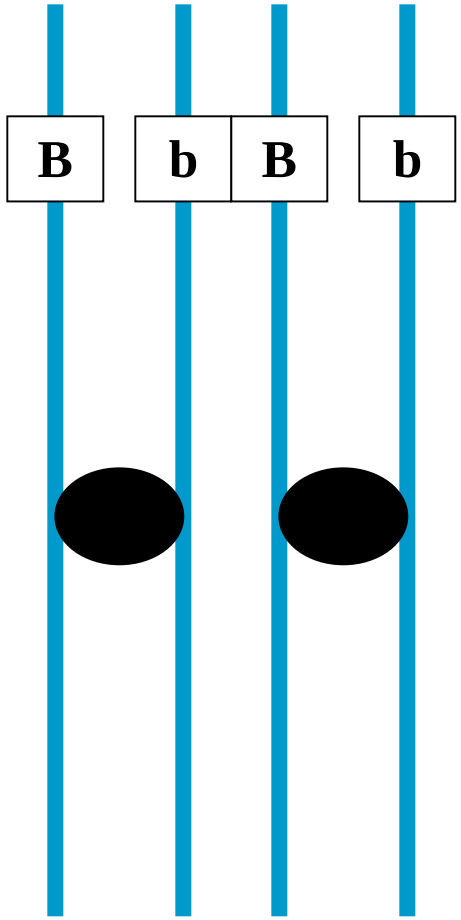


TETRAD

POST CROSSING-OVER

EYE COLOR ALLELES

1ST CHROMOSOME WITH BOTH DOMINANT ALLELE AND RECESSIVE ALLELE



2ND CHROMOSOME WITH BOTH DOMINANT ALLELE AND RECESSIVE ALLELE

ALLELE EXCHANGE

CROSSING OVER

INCREASES GENETIC DIVERSITY

CROSSING OVER

CROSSING OVER

VIA: ALLELE EXCHANGE

CROSSING OVER

R

RANDOM INDEPENDENT ASSORTMENT

RANDOM INDEPENDENT ASSORTMENT

RANDOM INDEPENDENT ASSORTMENT

RANDOM INDEPENDENT ASSORTMENT OF PAT & MAT HOMOLOGOUS CHROMOSOMES ALONG EQUATORIAL PLANE OF METAPHASE-I

RANDOM INDEPENDENT ASSORTMENT

HOMOLOG ASSORTMENT

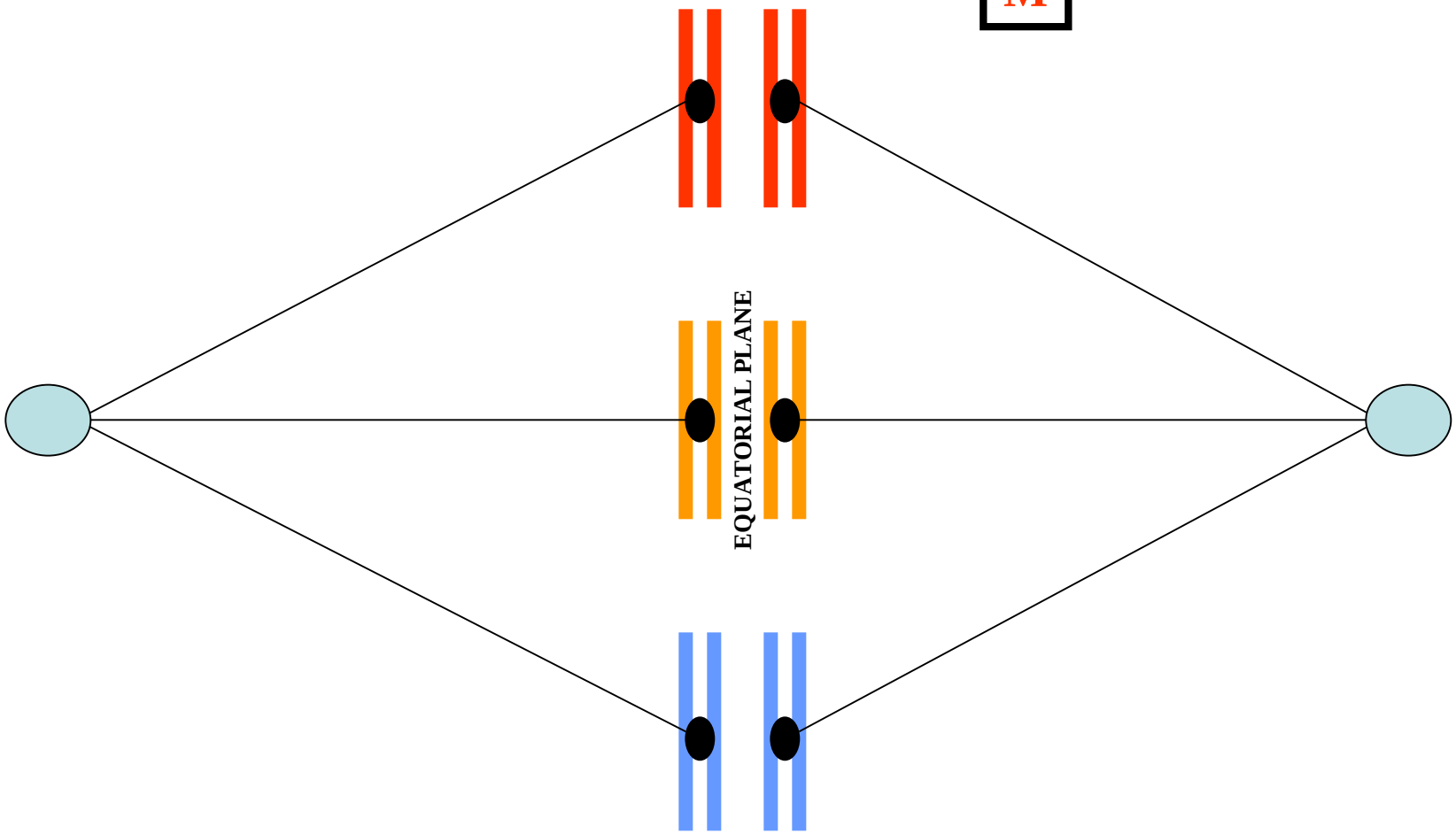
METAPHASE - I

P

M

P

1



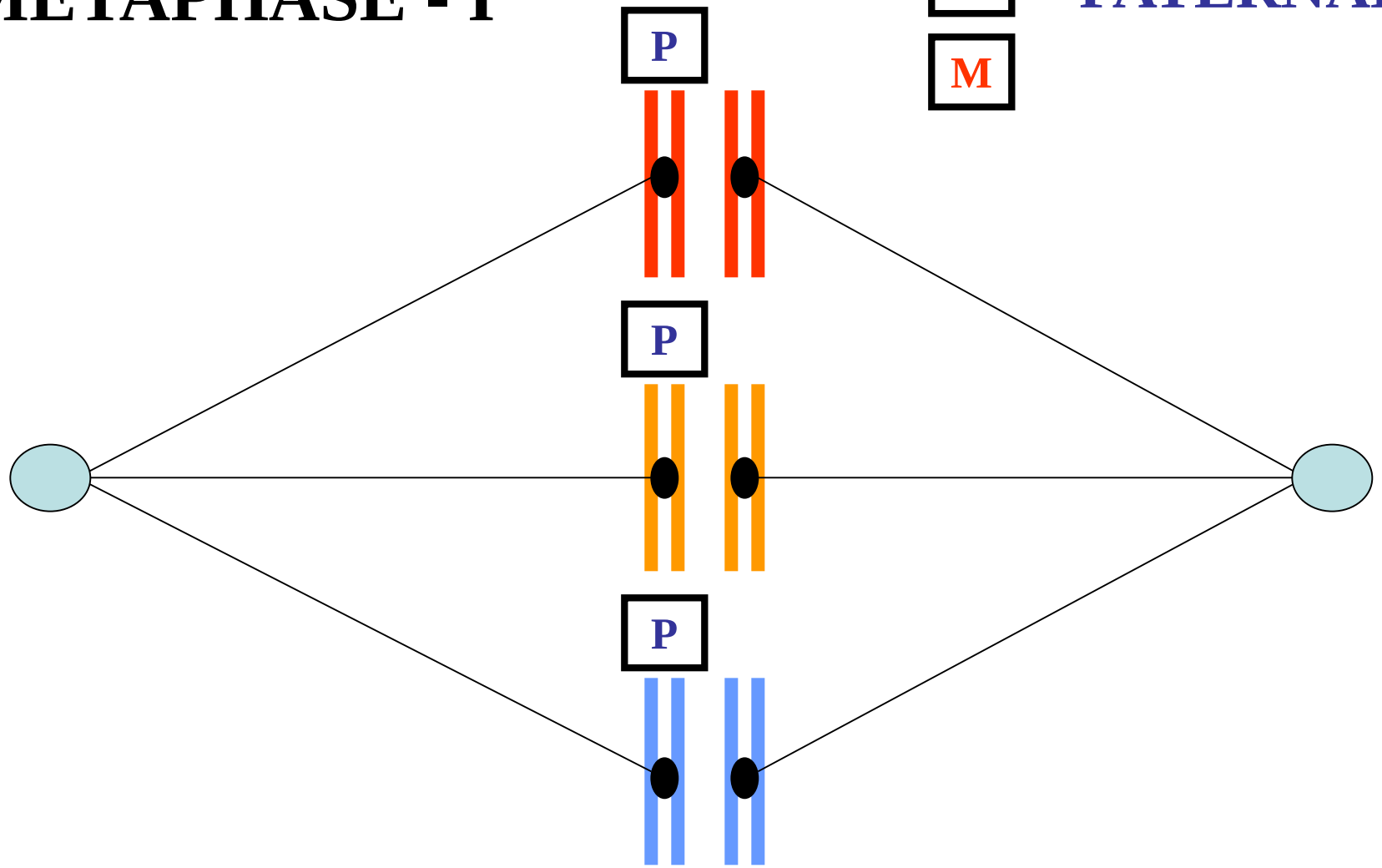
HOMOLOGOUS CHROMOSOMES

METAPHASE - I

P = PATERNAL

M

2

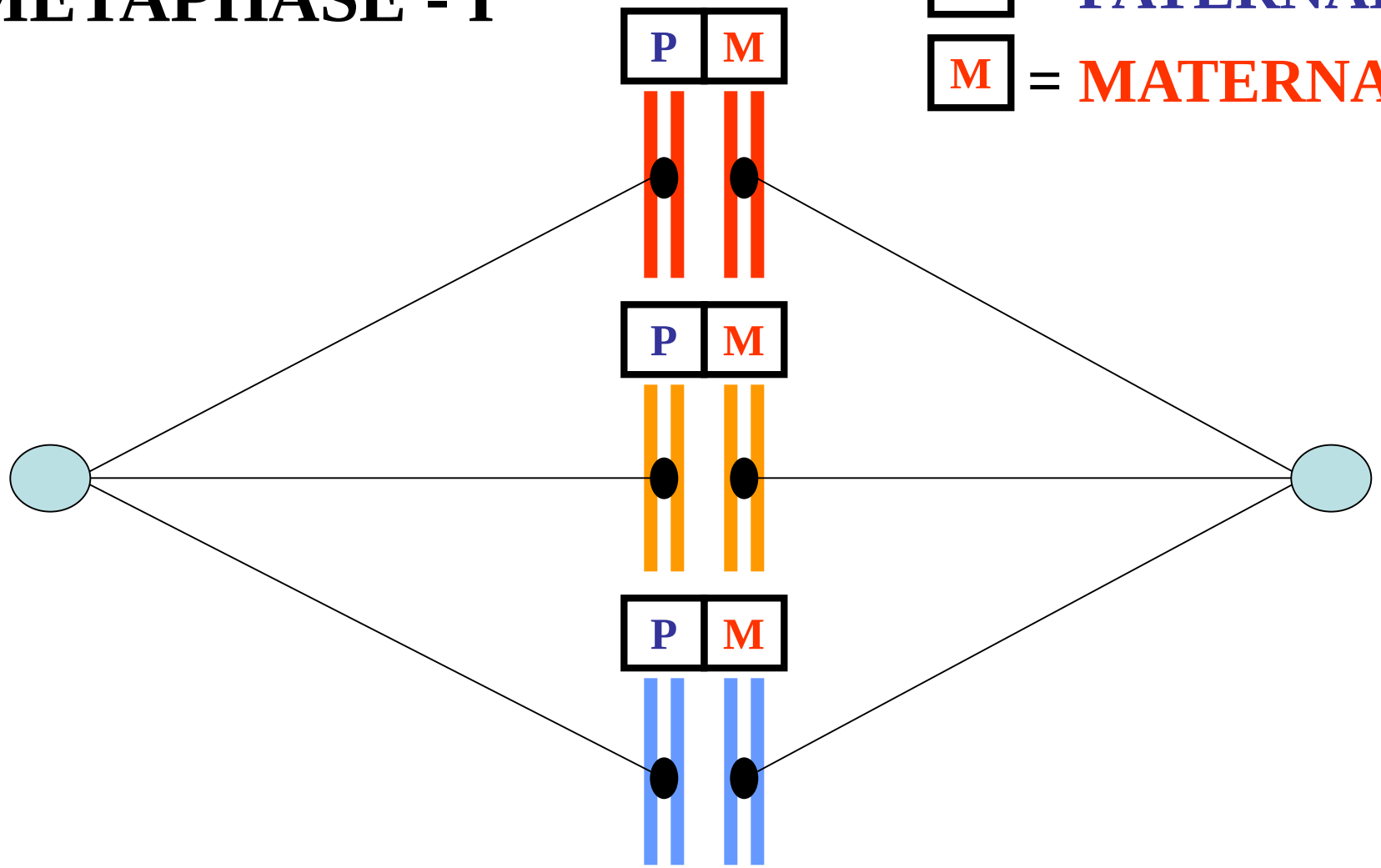


HOMOLOGOUS CHROMOSOMES

METAPHASE - I

P = PATERNAL

M = MATERNAL

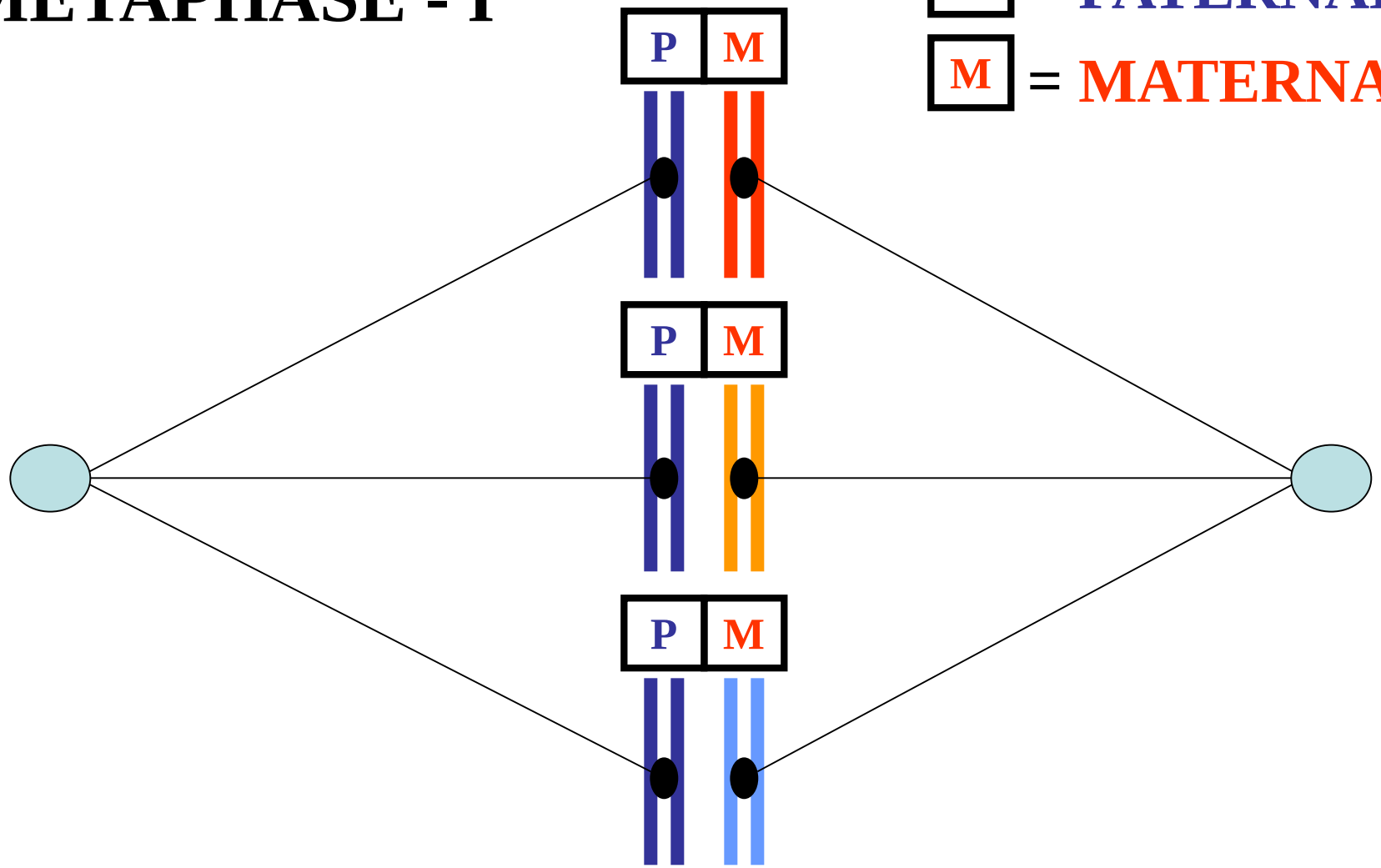


HOMOLOGOUS CHROMOSOMES

METAPHASE - I

P = PATERNAL

M = MATERNAL

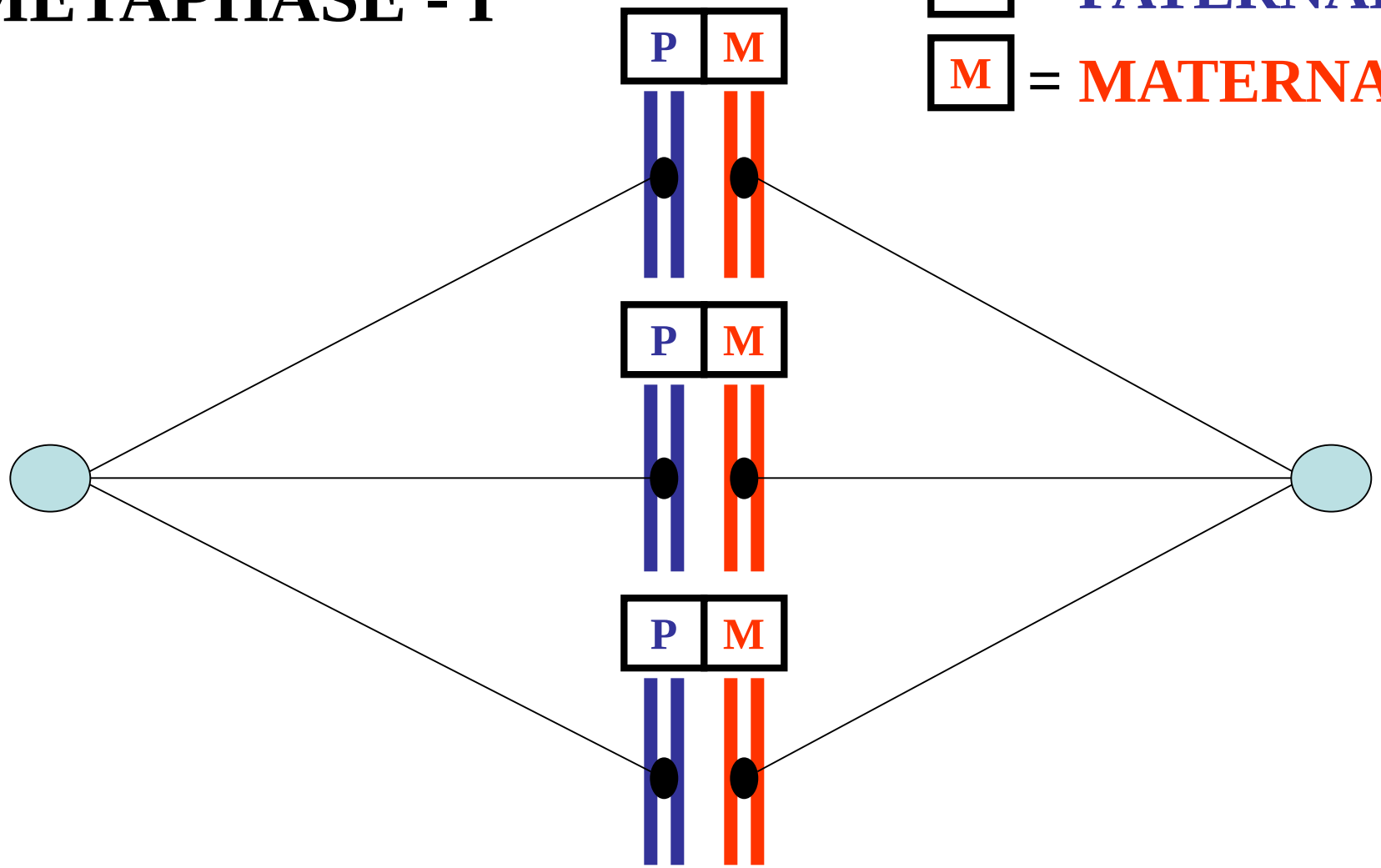


HOMOLOGOUS CHROMOSOMES

METAPHASE - I

P = PATERNAL

M = MATERNAL



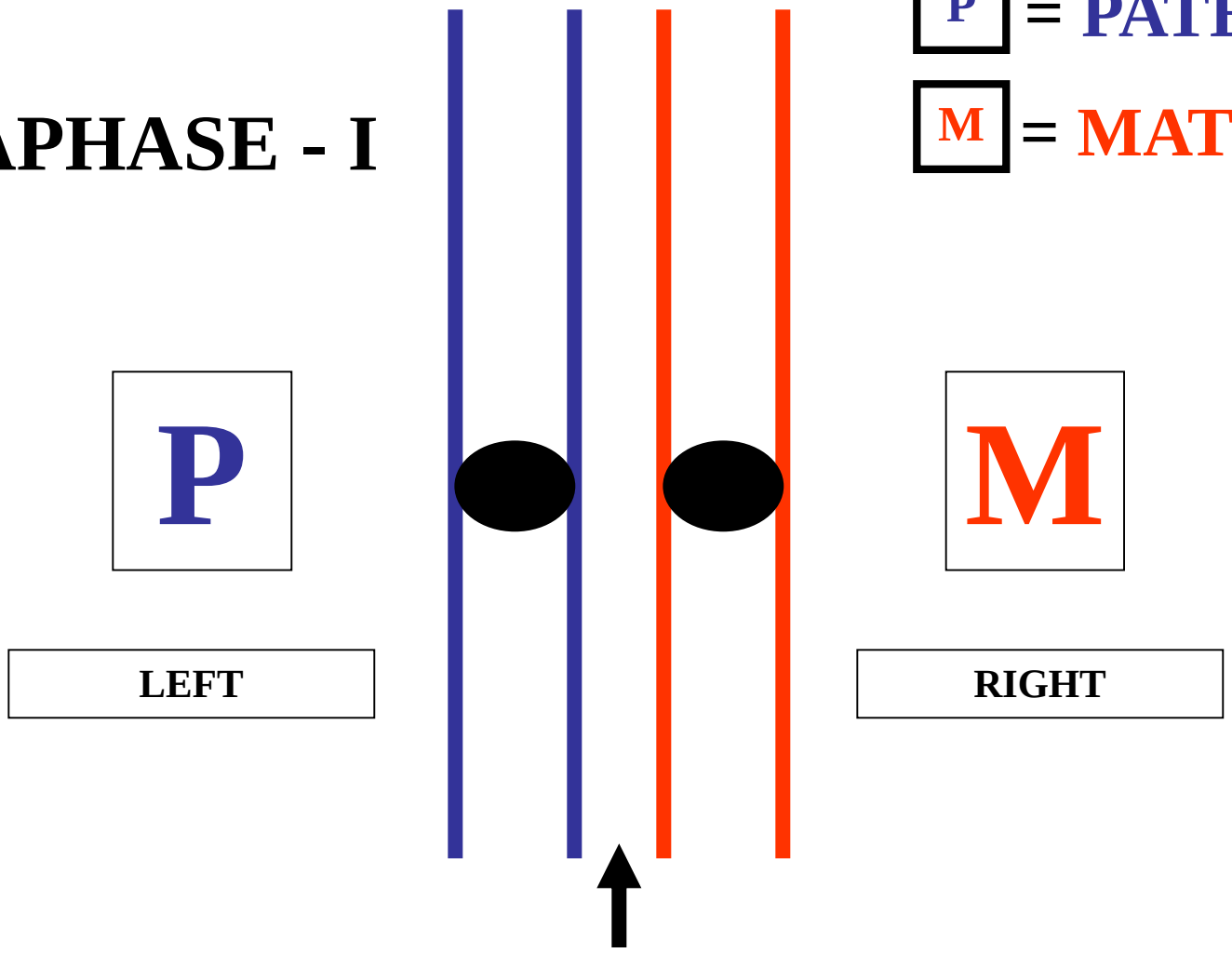
HOMOLOGOUS CHROMOSOMES

HOMOLOG ASSORTMENT

P = PATERNAL

M = MATERNAL

METAPHASE - I



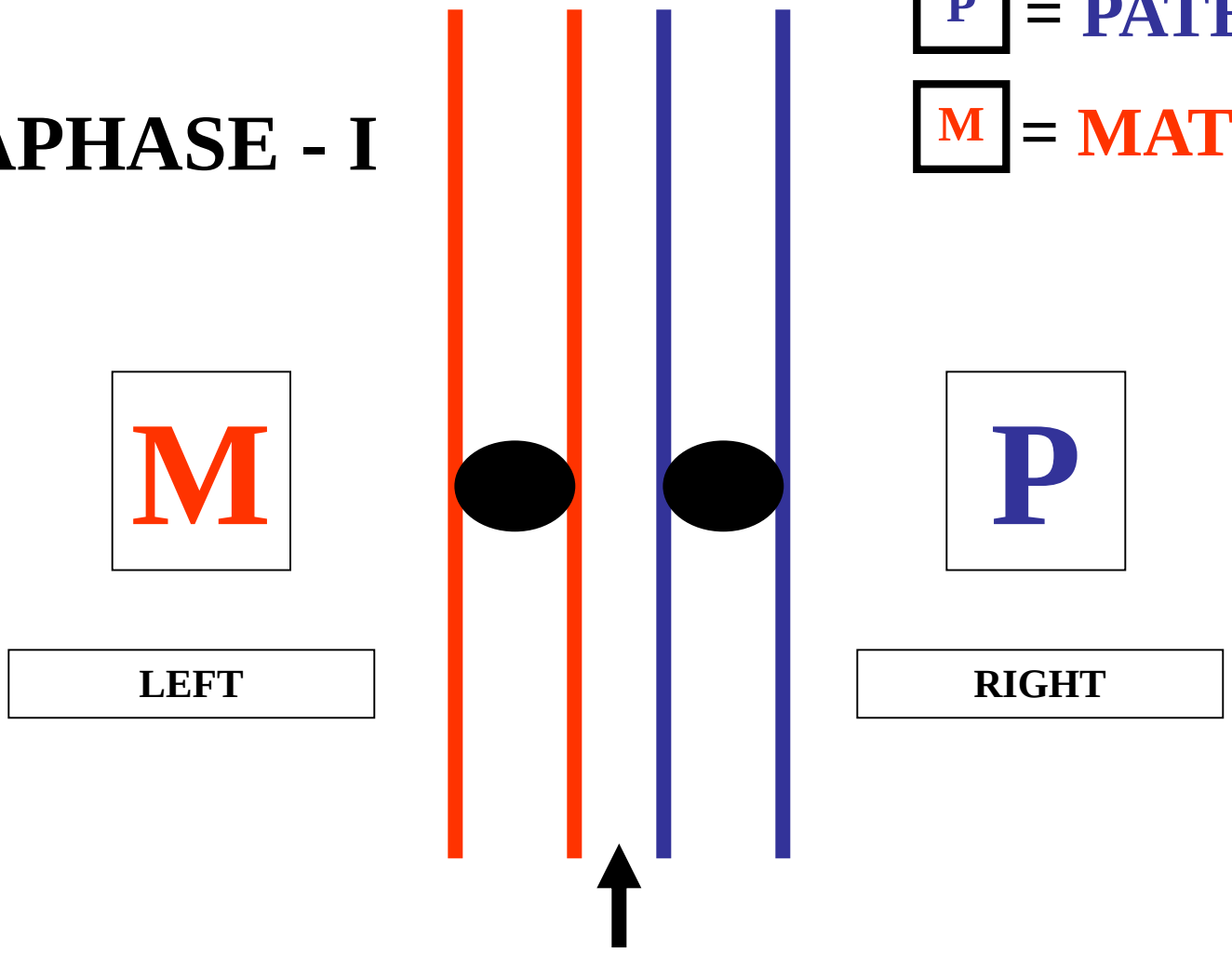
EQUATORIAL PLANE

HOMOLOG ASSORTMENT

P = PATERNAL

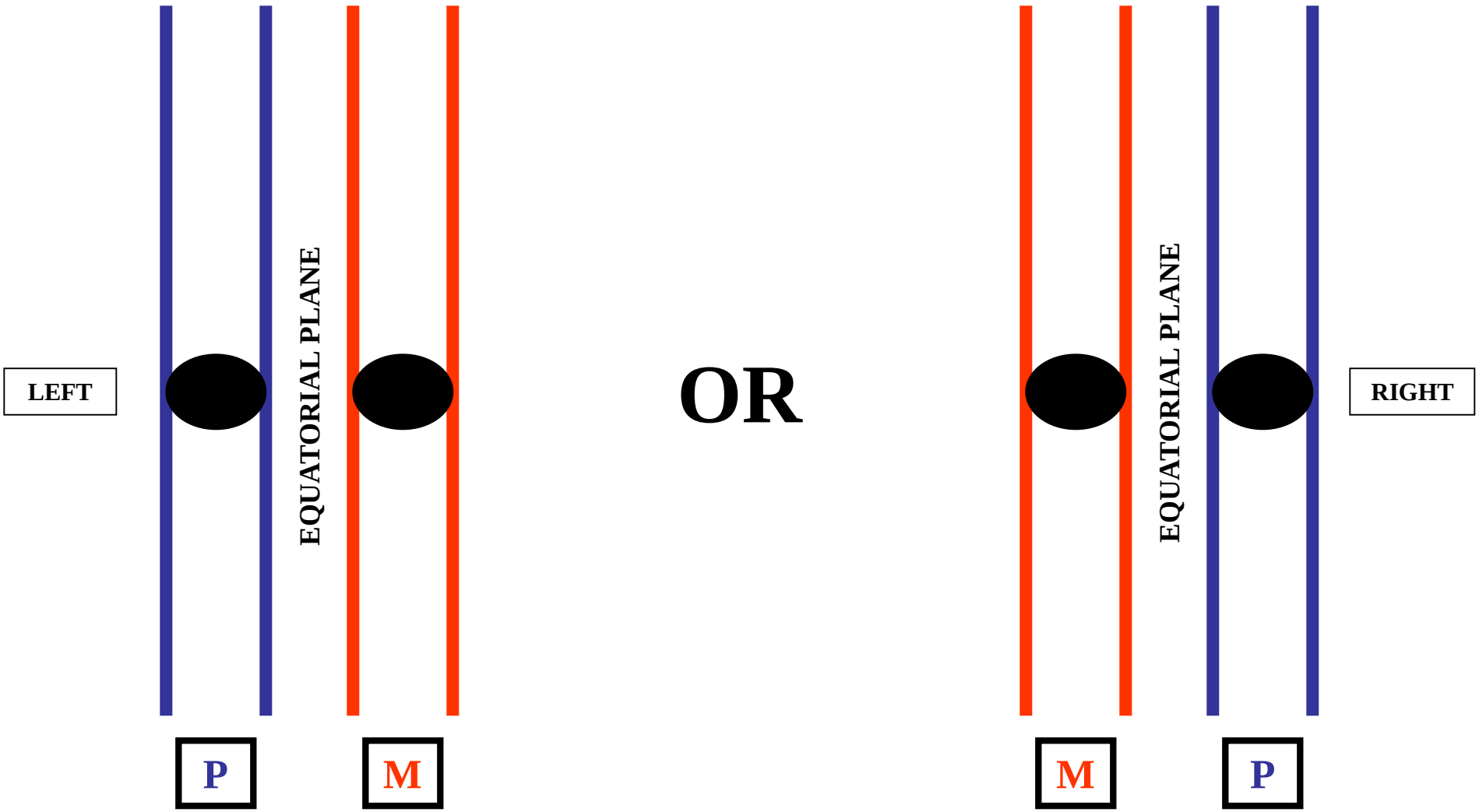
M = MATERNAL

METAPHASE - I



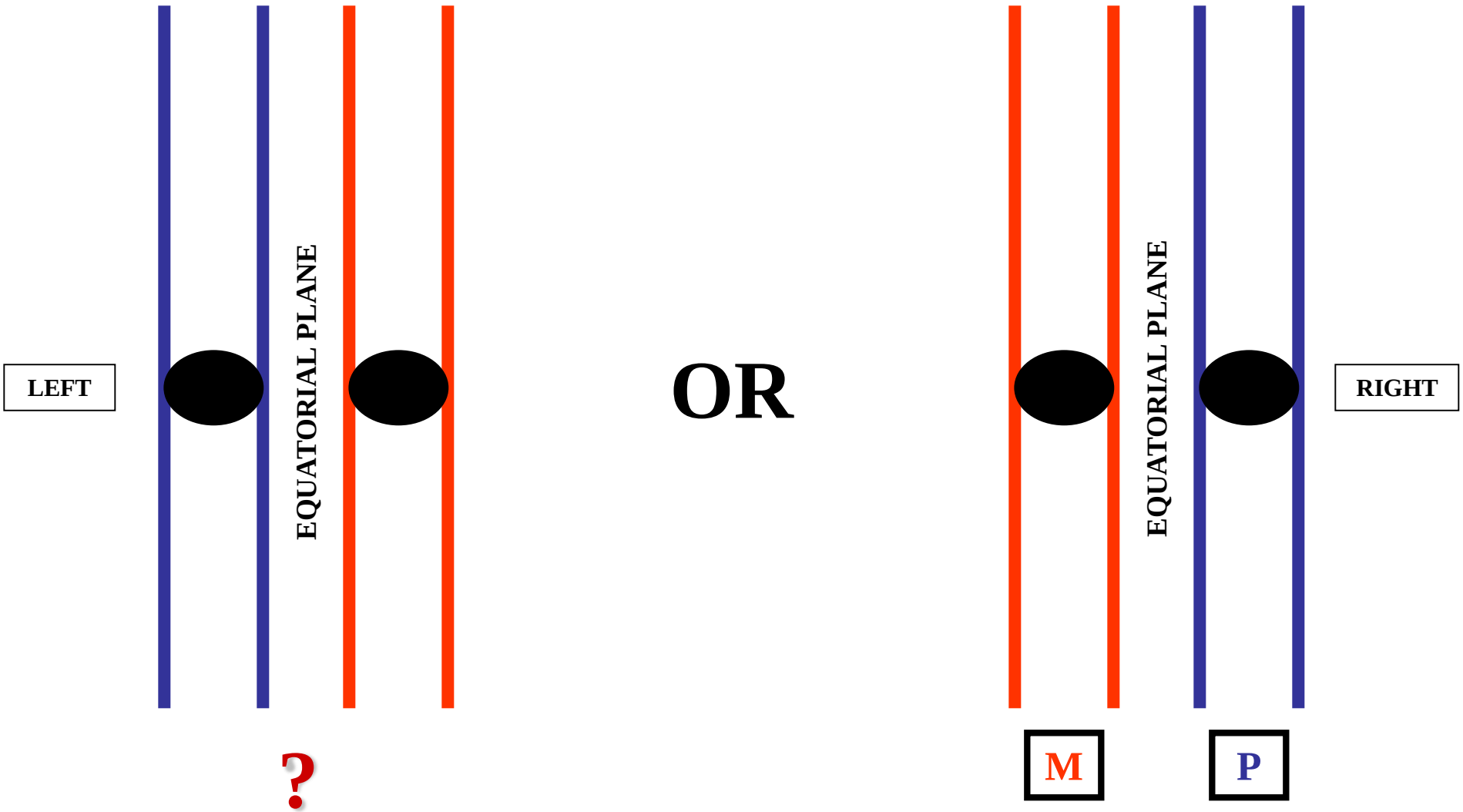
EQUATORIAL PLANE

HOMOLOG ASSORTMENT



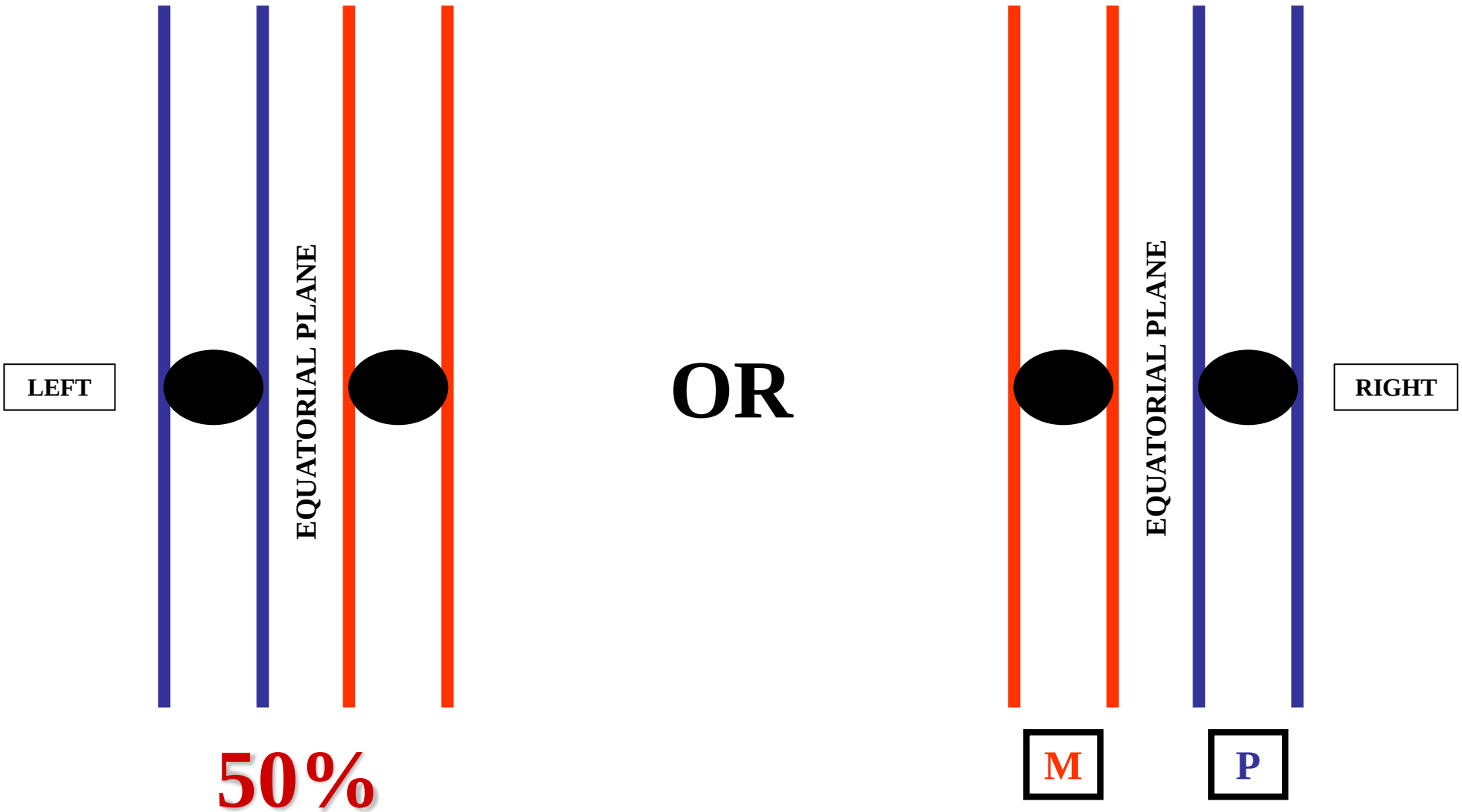
P = PATERNAL M = MATERNAL

HOMOLOG ASSORTMENT



P = PATERNAL M = MATERNAL

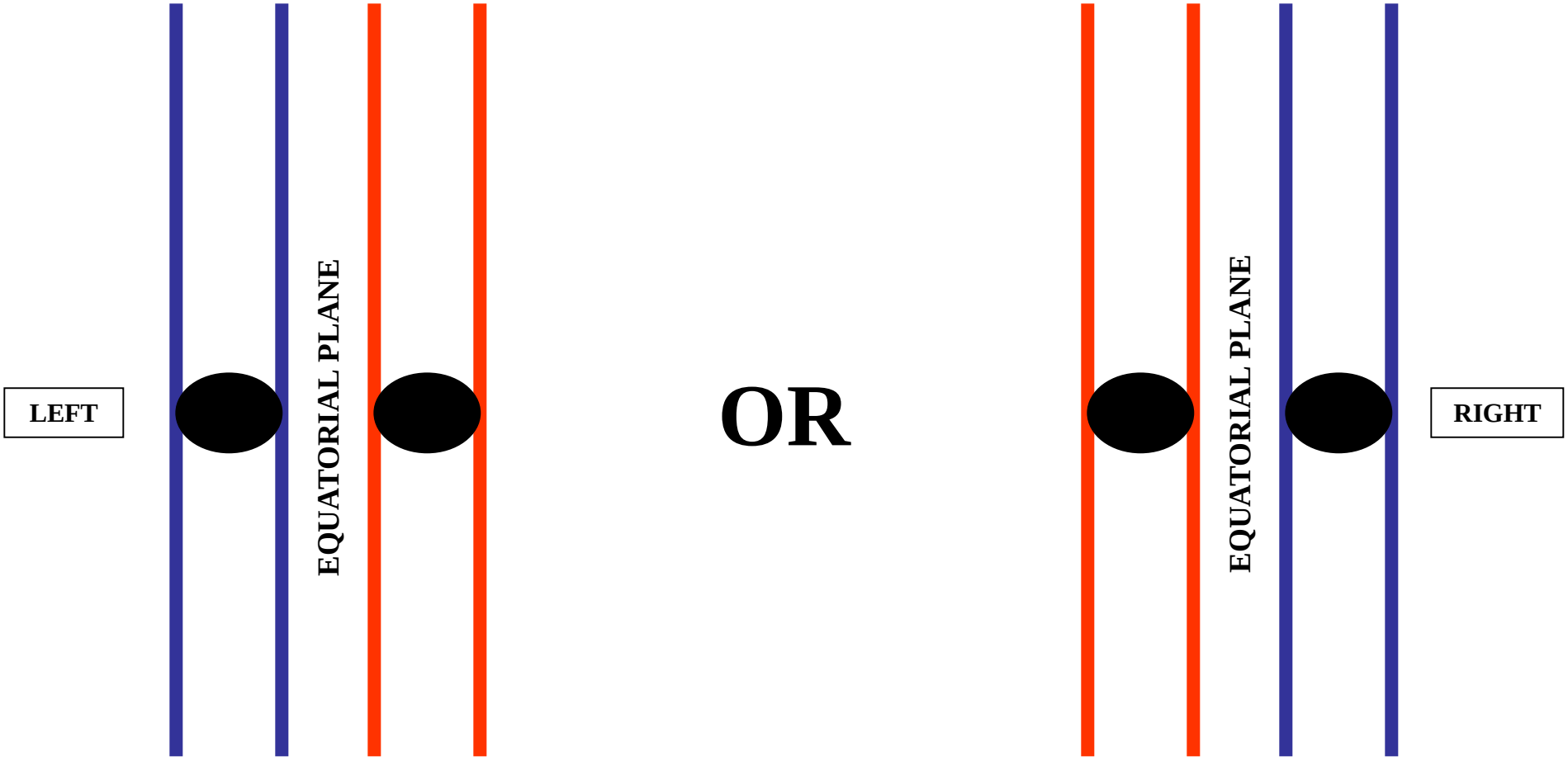
HOMOLOG ASSORTMENT



P = PATERNAL M = MATERNAL

HOMOLOG ASSORTMENT

%



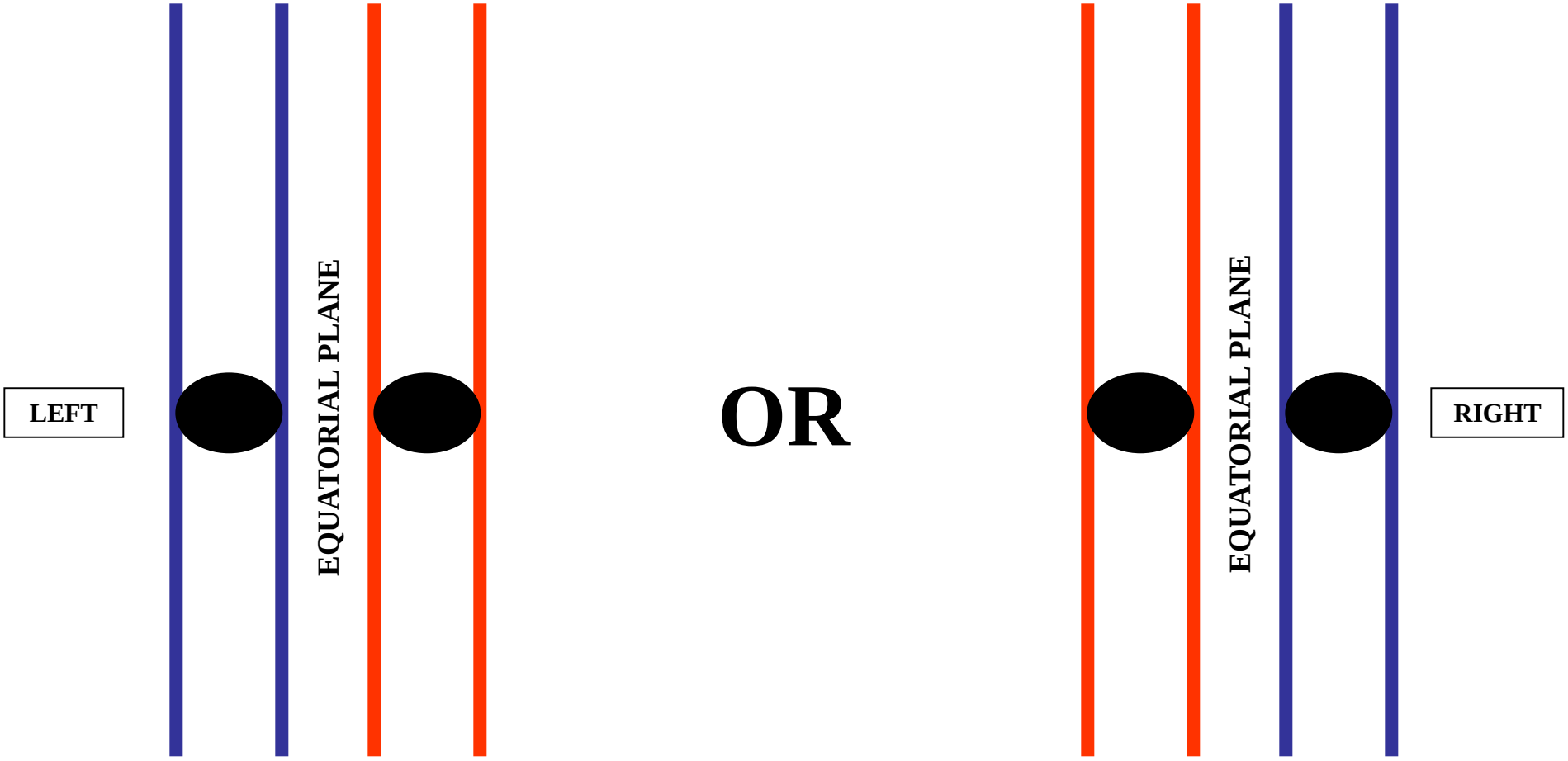
50%

?

P = PATERNAL M = MATERNAL

HOMOLOG ASSORTMENT

AP



50% **50%**

P = **PATERNAL** **M** = **MATERNAL**

APPLY HOMOLOG ASSORTMENT

RANDOM COMPONENT OF RANDOM INDEPENDENT ASSORTMENT

APPLY
HOMOLOG ASSORTMENT

RANDOM COMPONENT
OF
RANDOM INDEPENDENT
ASSORTMENT

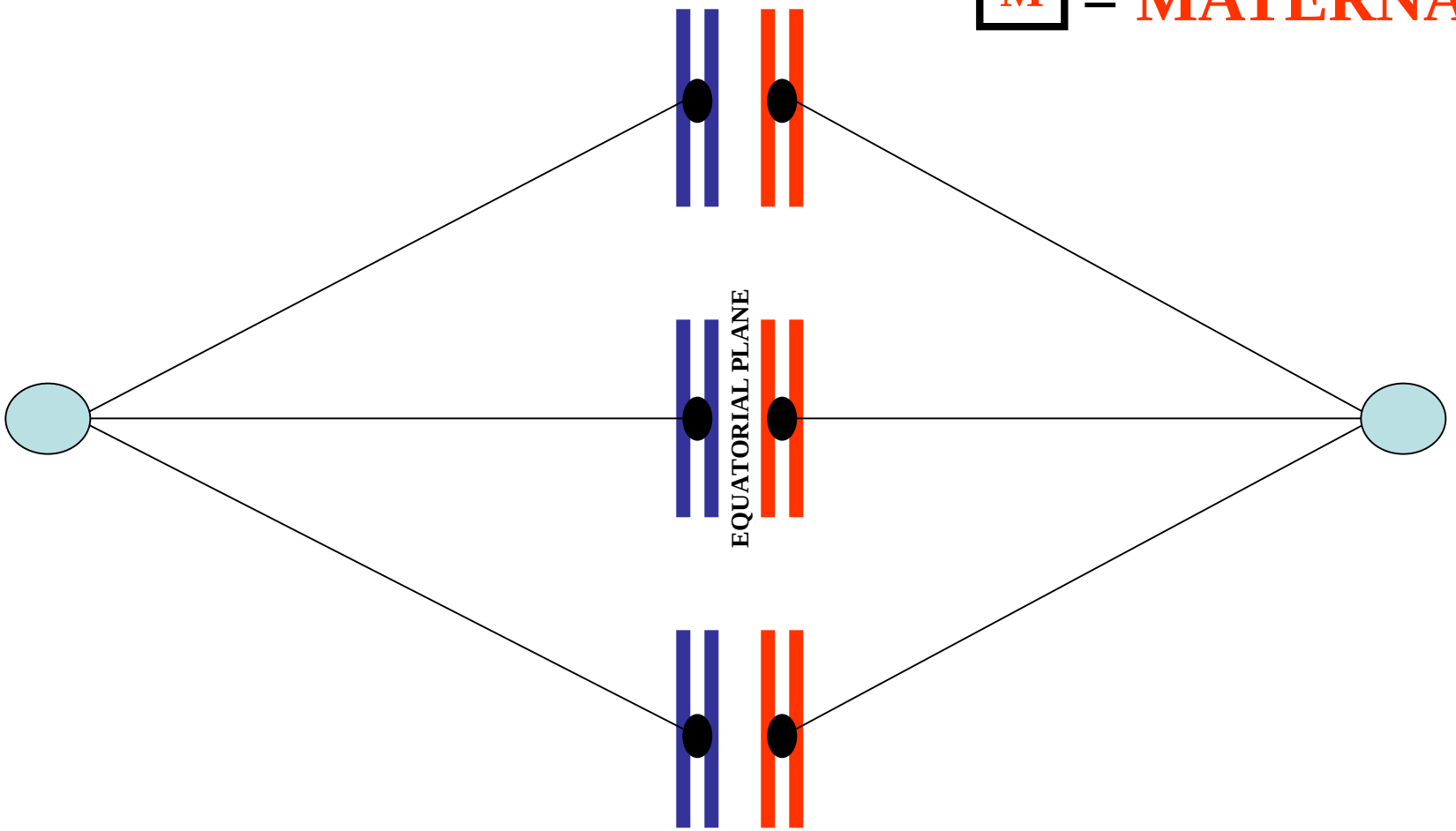
APPLY
HOMOLOG ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

H

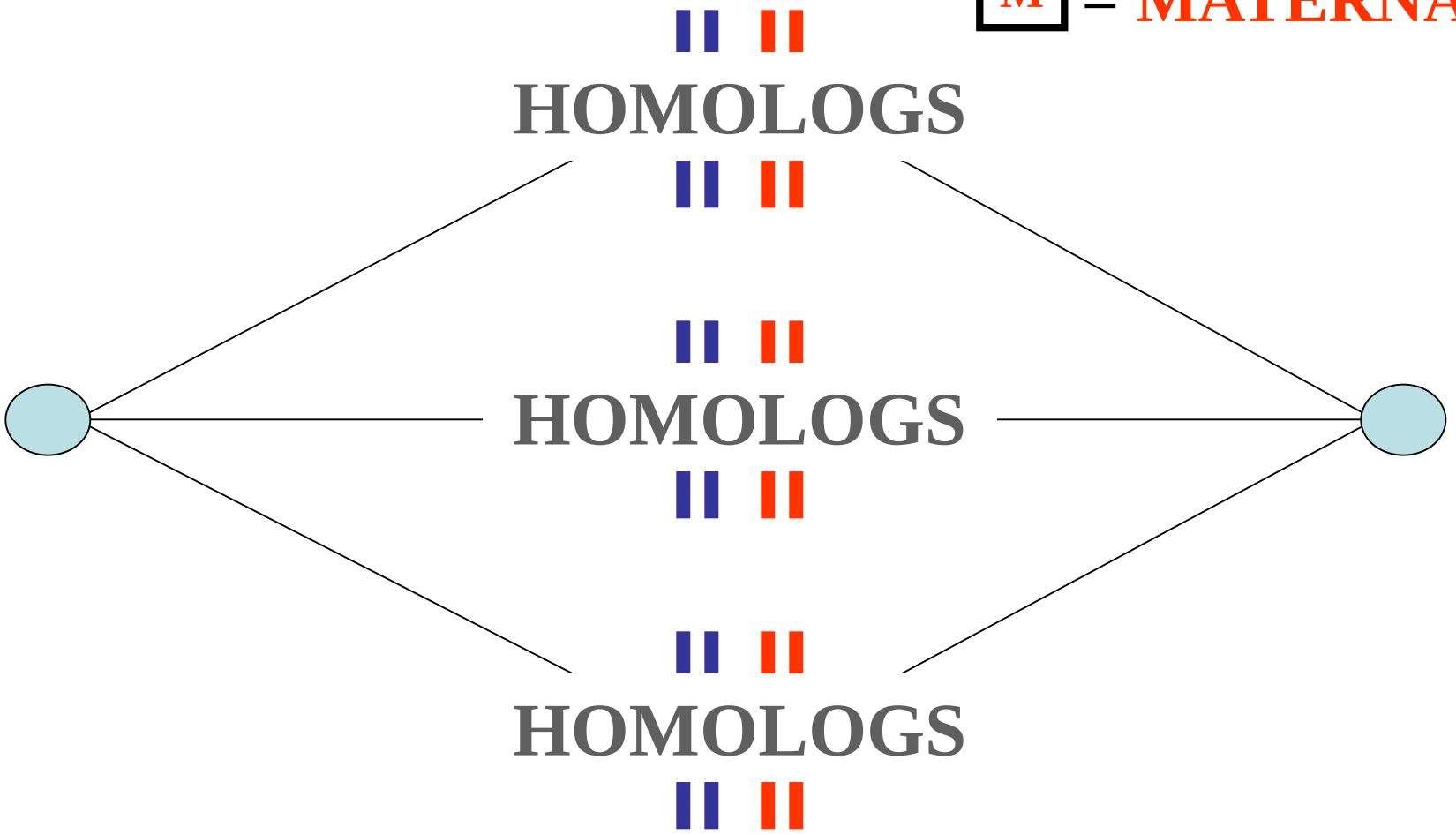


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

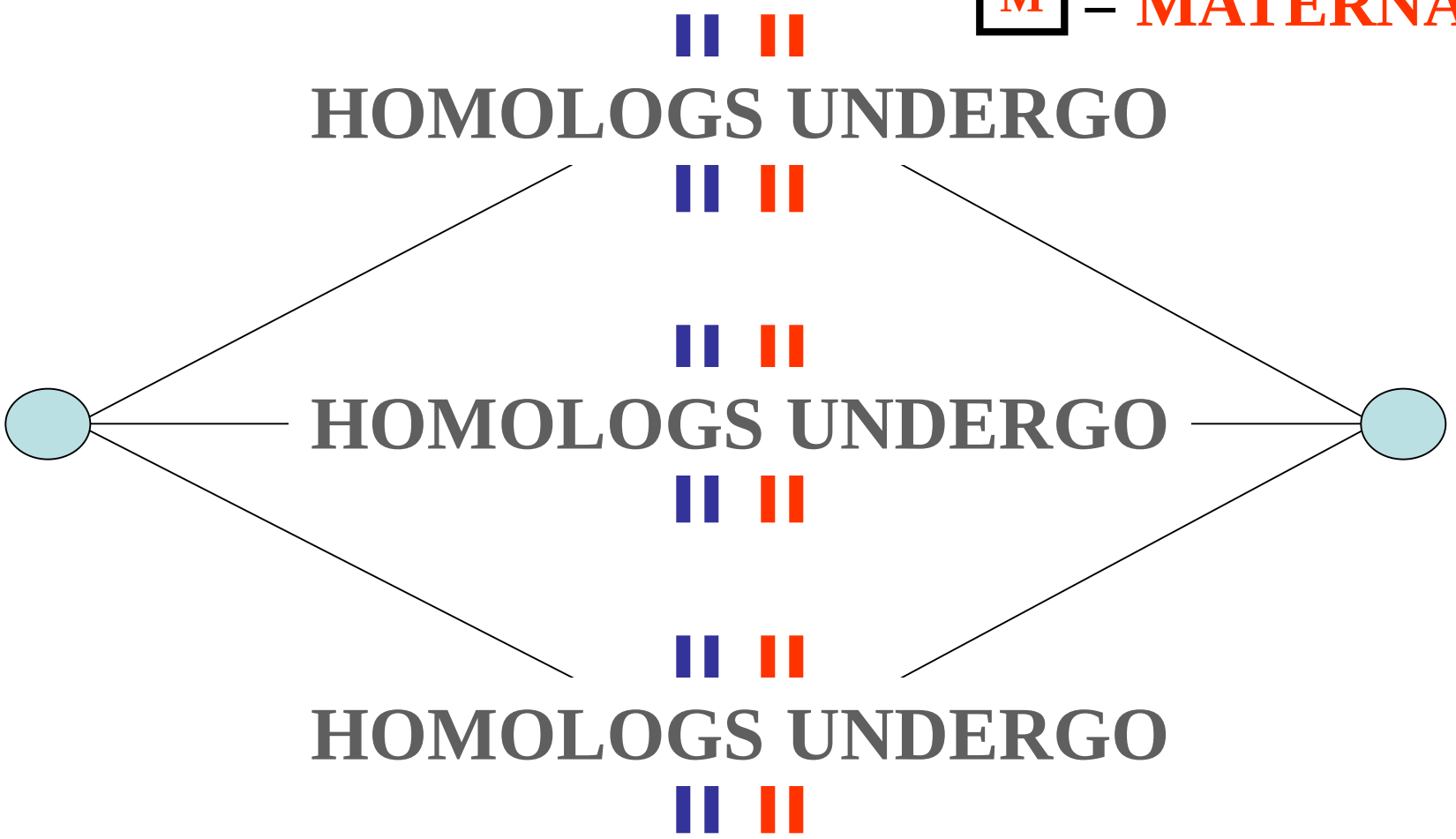


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

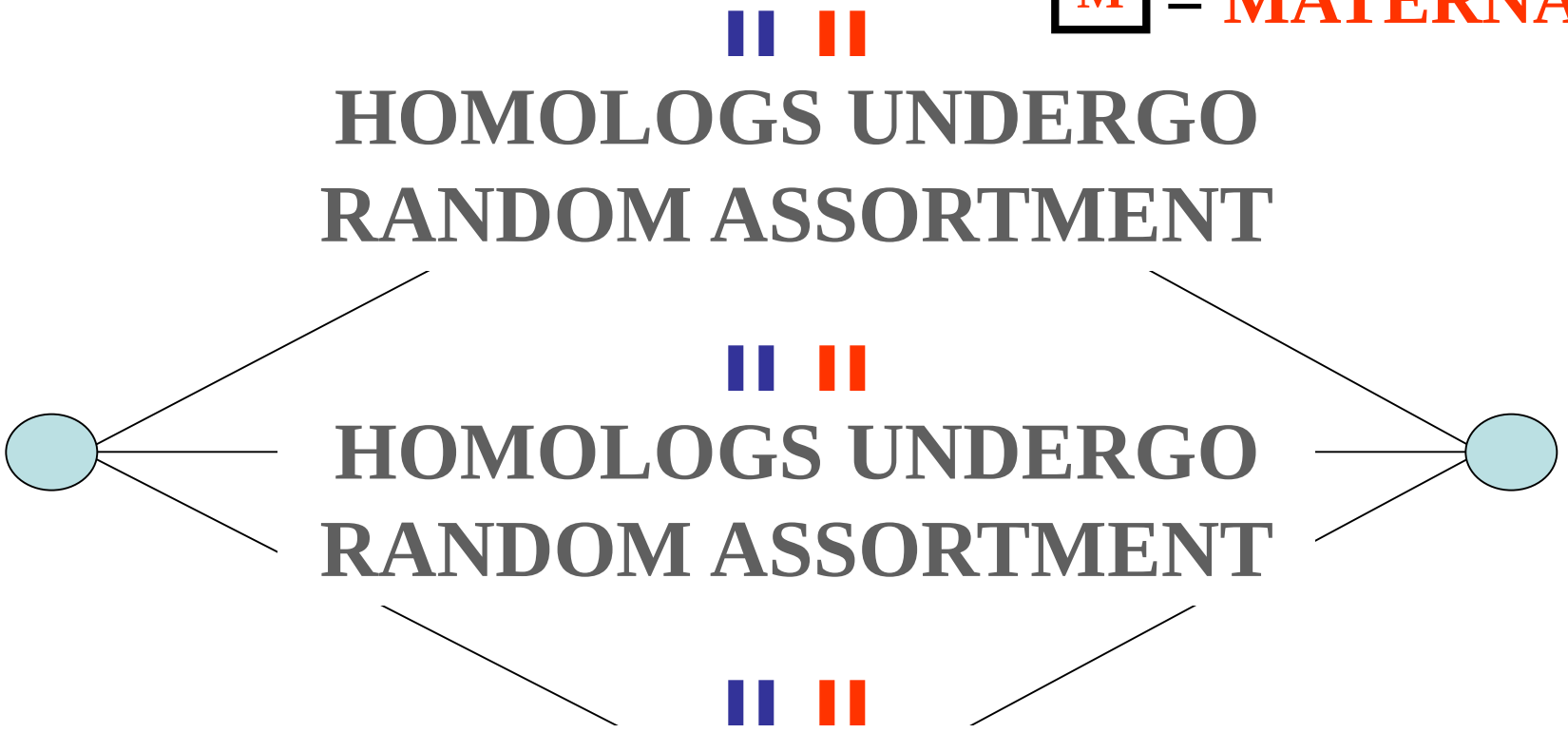


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

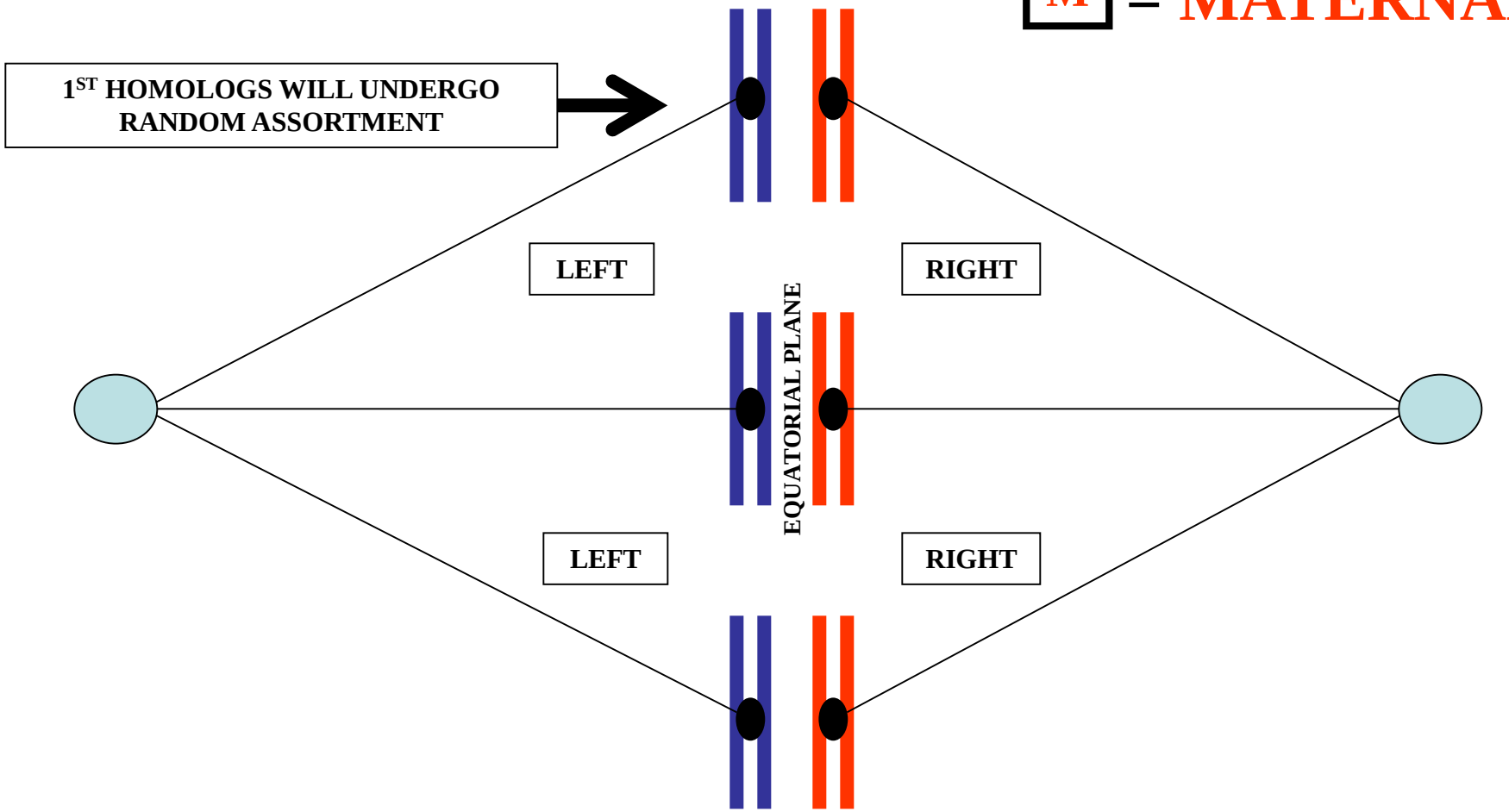


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

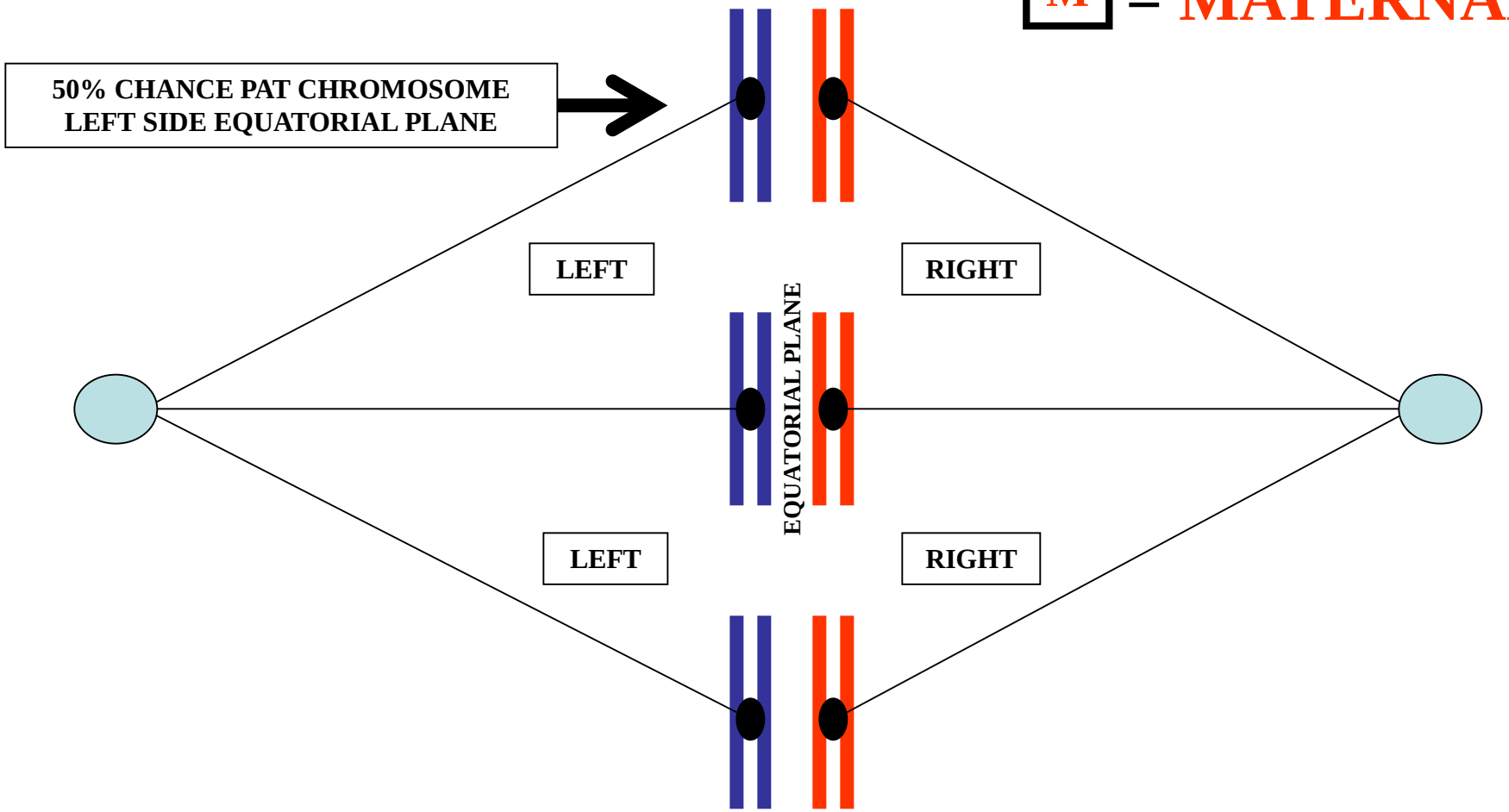


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

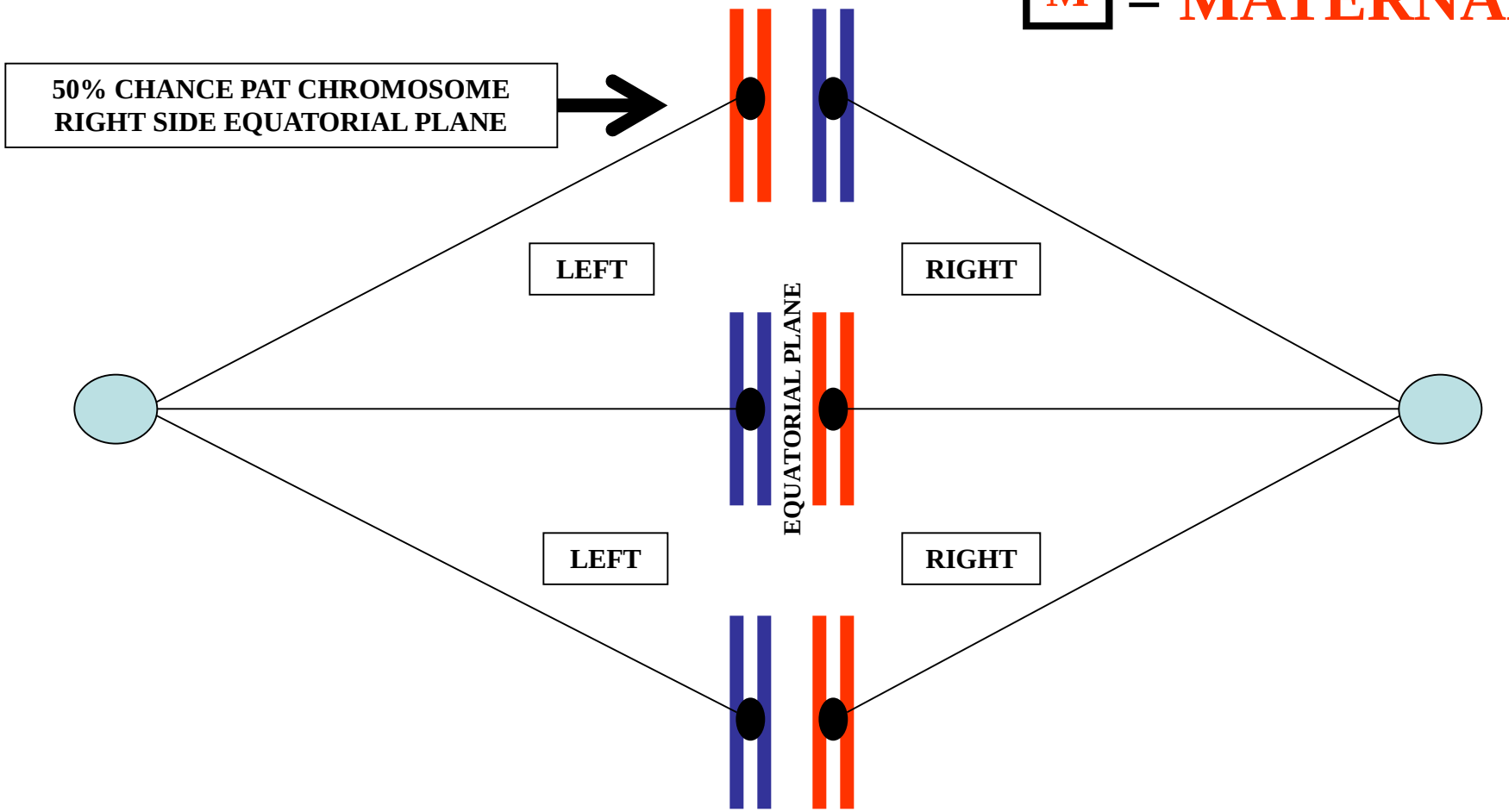


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

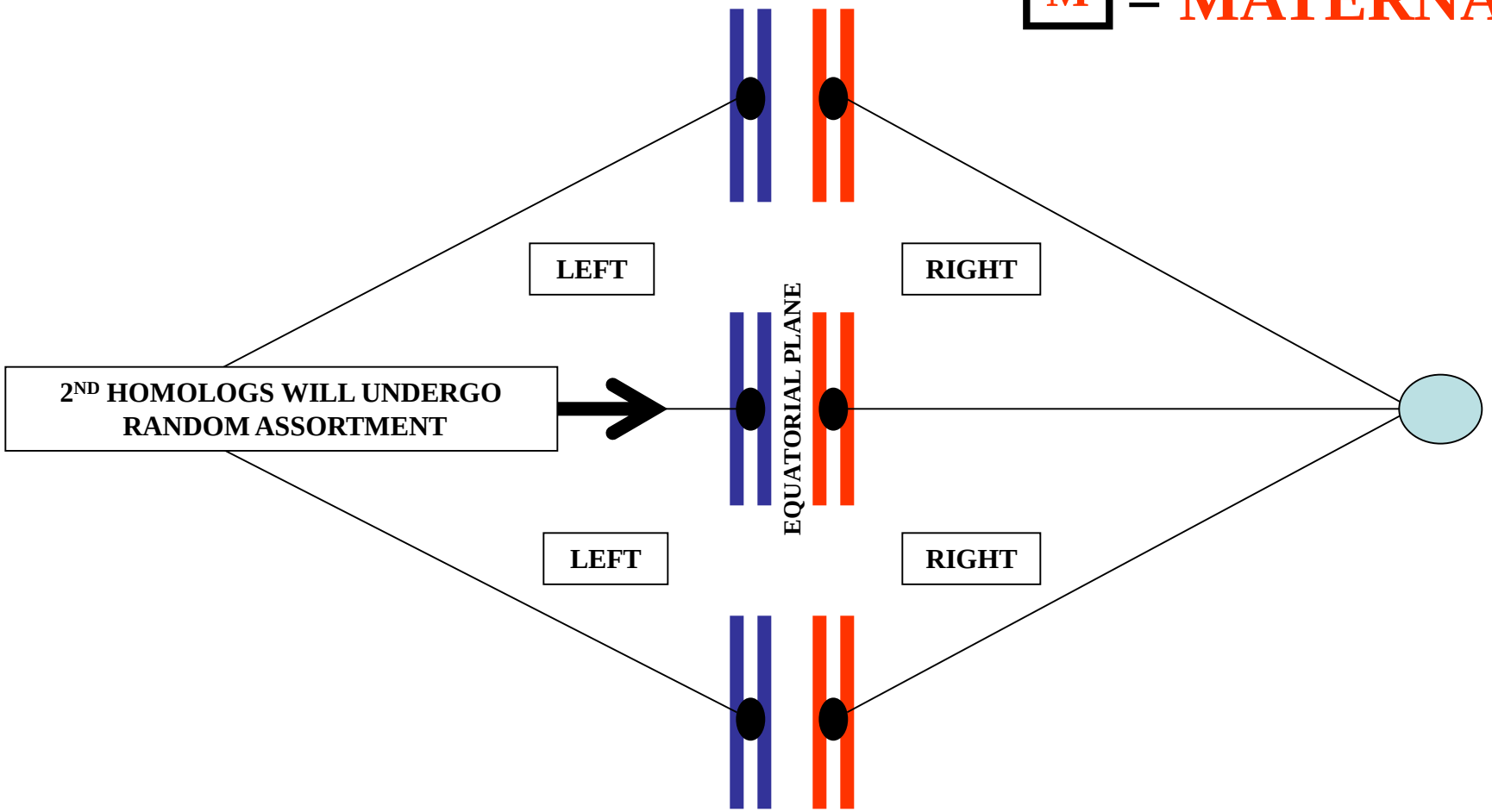


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

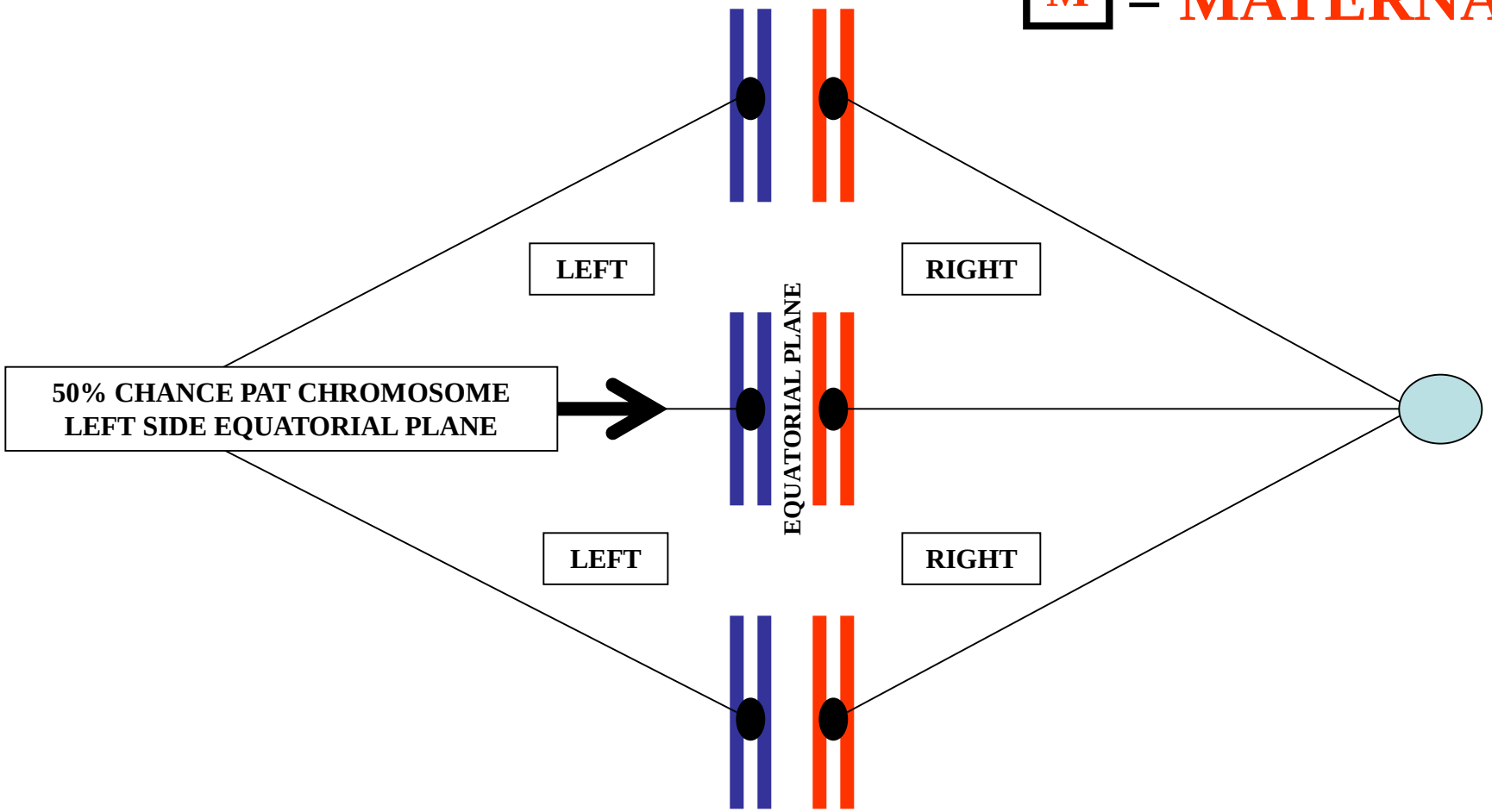


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL



RANDOM ASSORTMENT

METAPHASE - I

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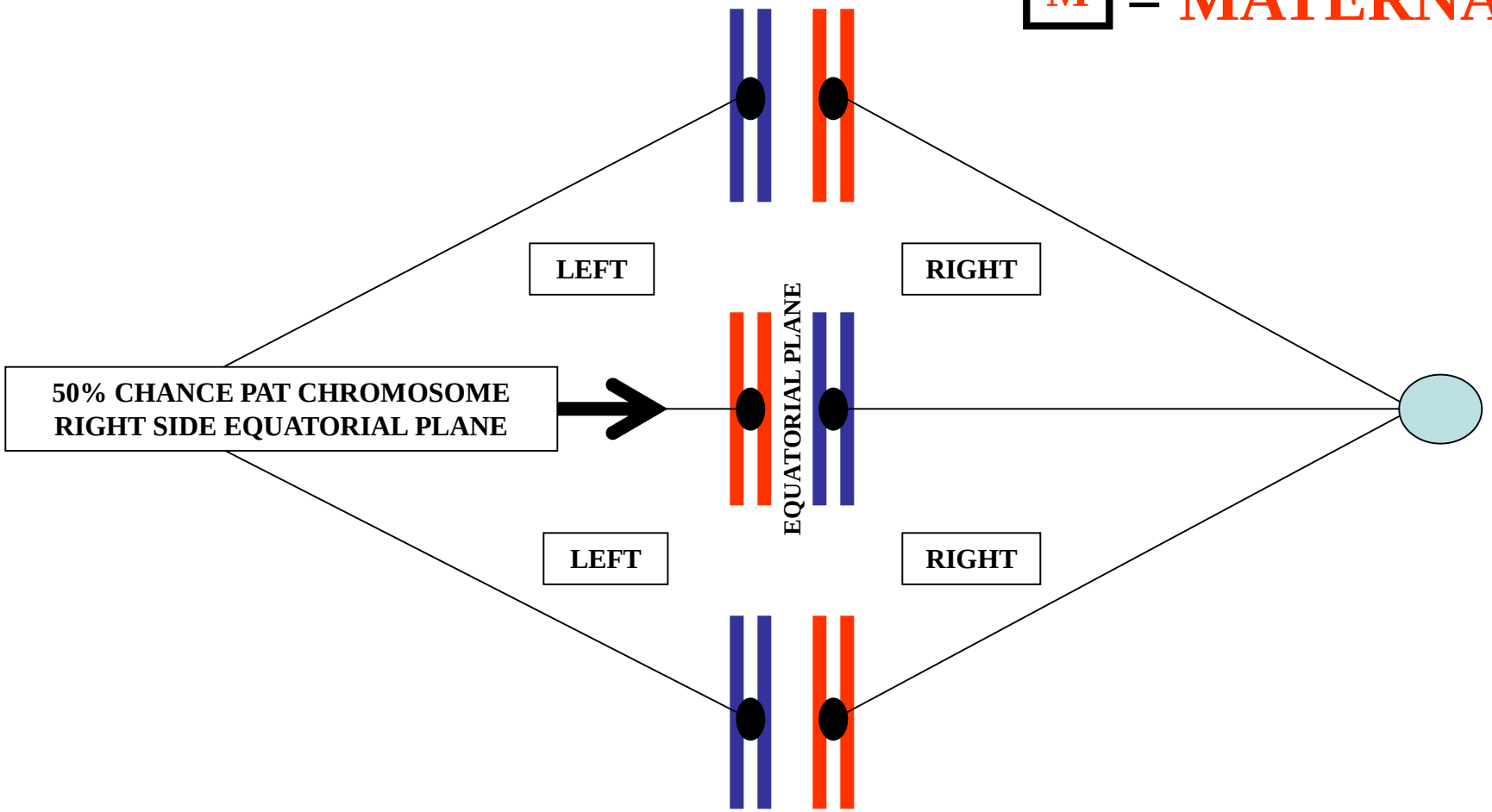
M = MATERNAL



RANDOM ASSORTMENT

METAPHASE - I

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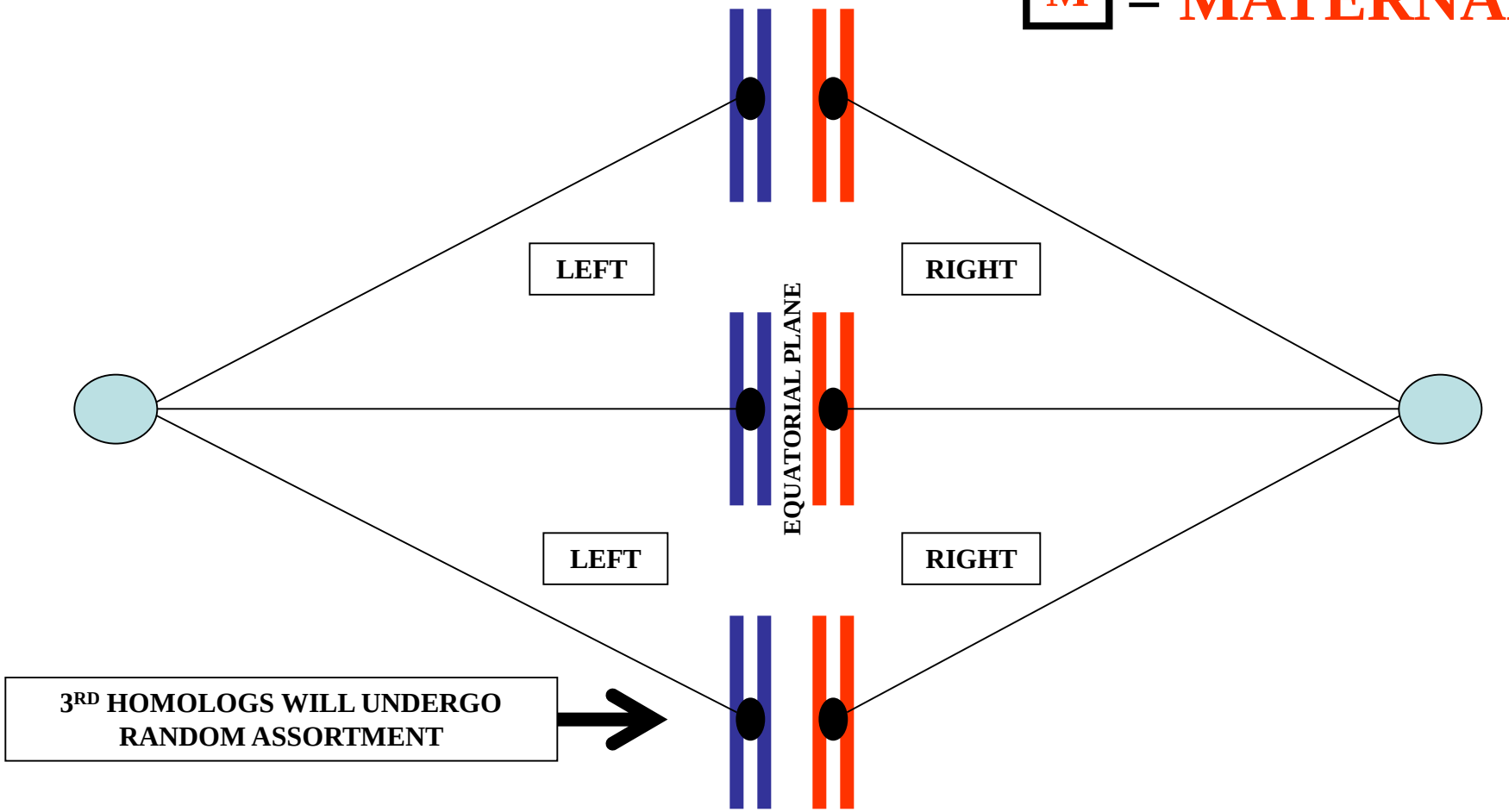
M = MATERNAL



RANDOM ASSORTMENT

METAPHASE - I

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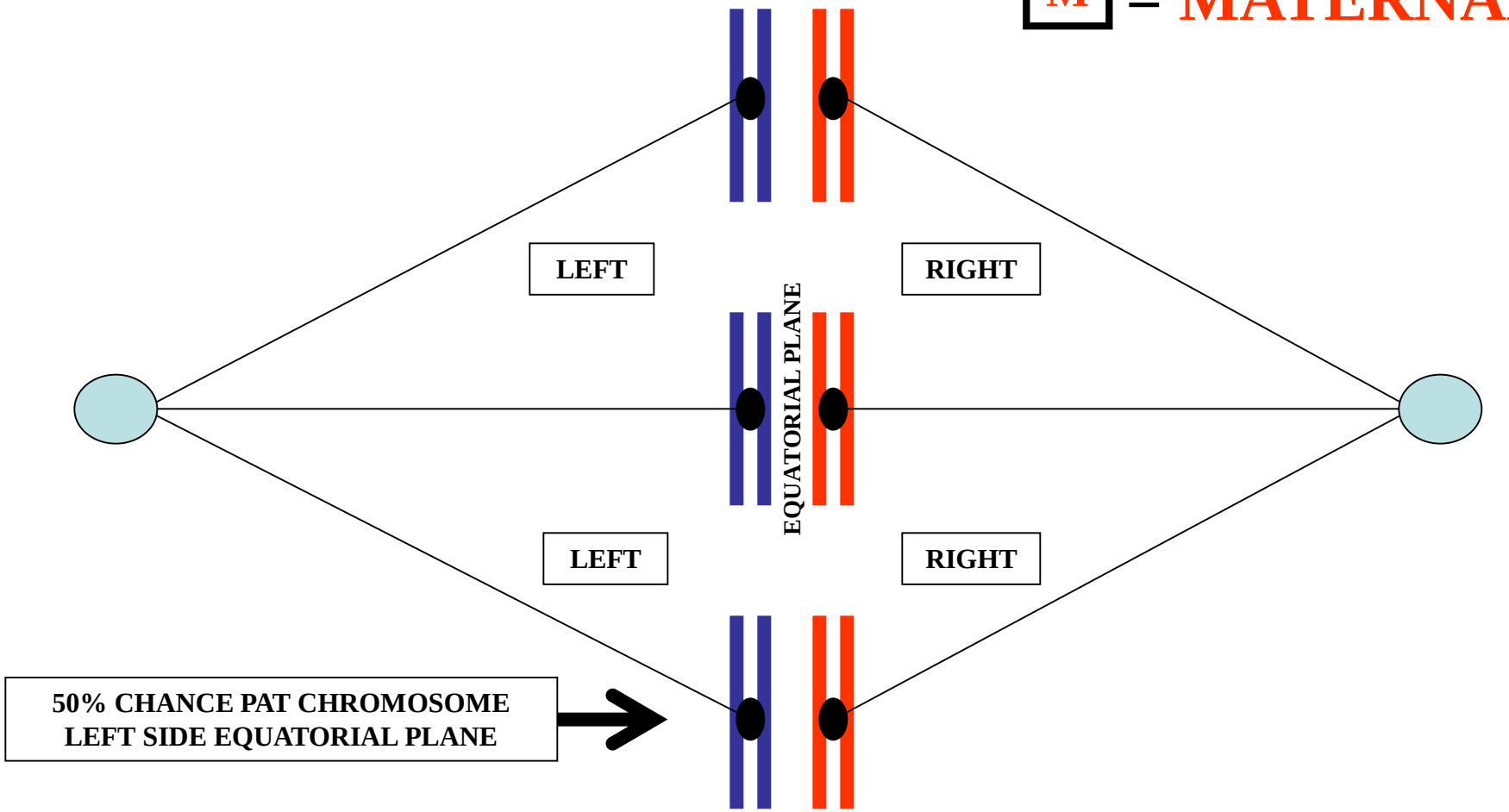
M = MATERNAL

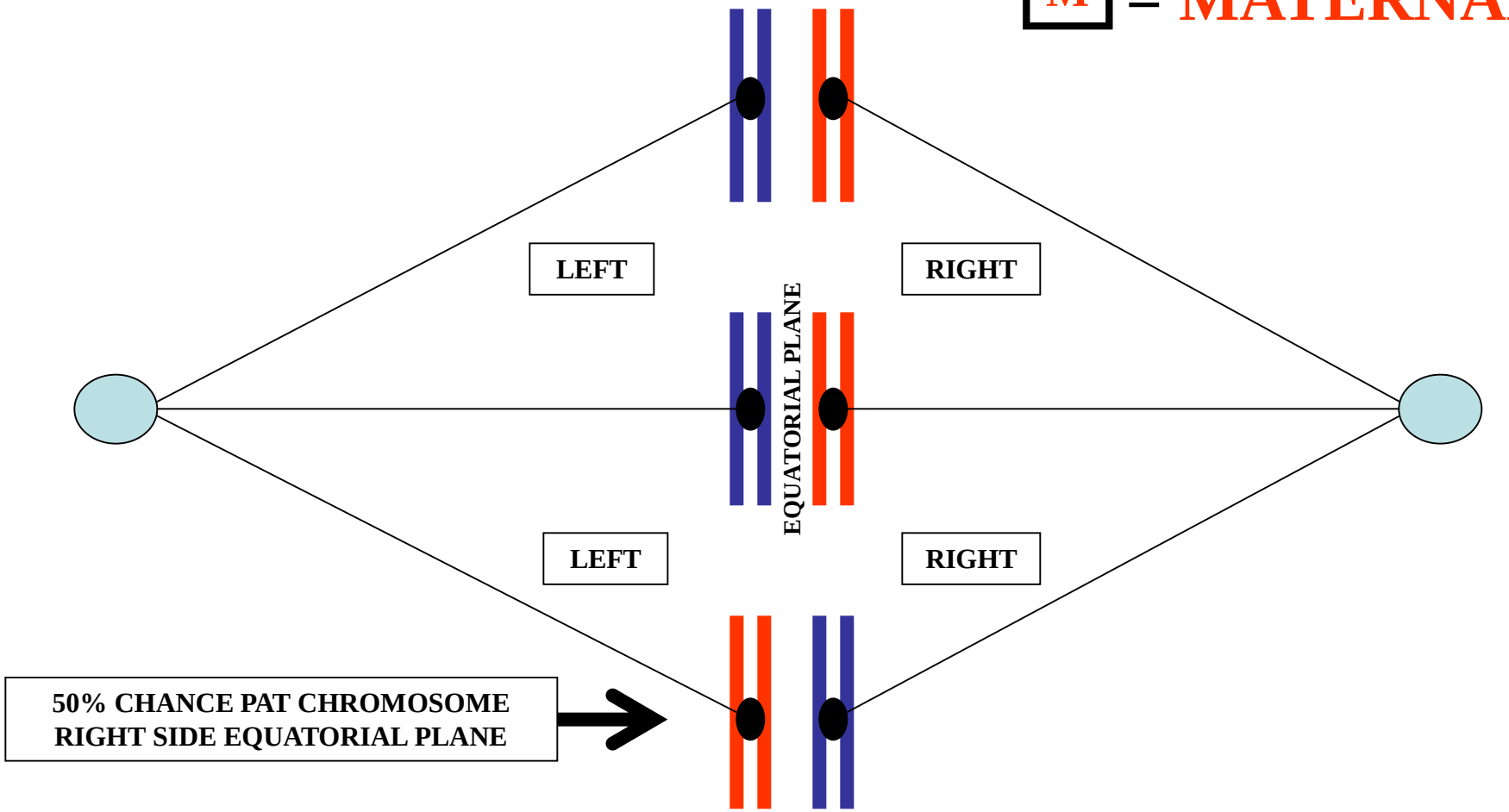


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL



RANDOM ASSORTMENT

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SUMMARY
HOMOLOG ASSORTMENT

RANDOM COMPONENT OF RANDOM INDEPENDENT ASSORTMENT

SUMMARY
HOMOLOG ASSORTMENT

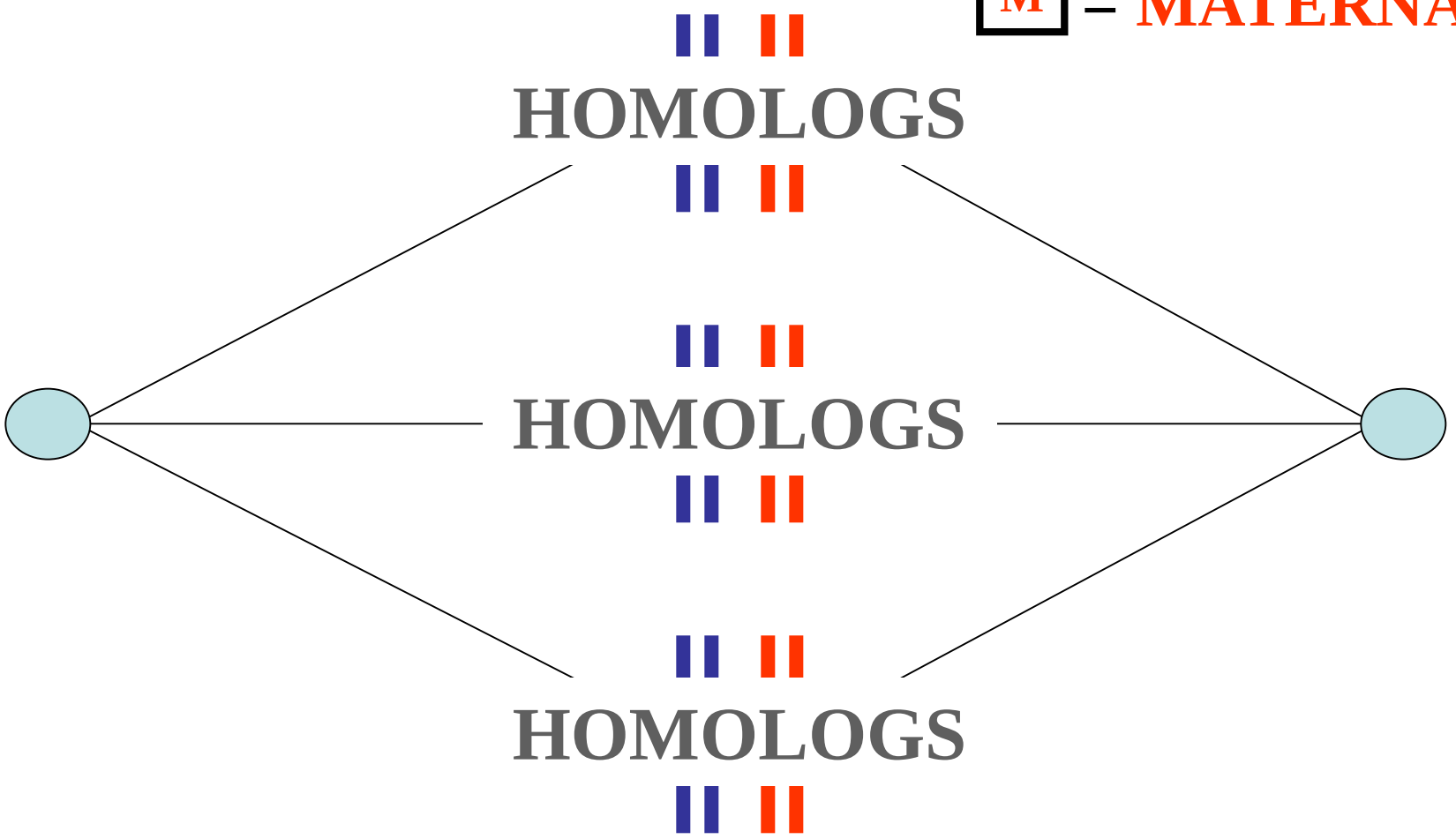
METAPHASE - I

P = PATERNAL

M = MATERNAL

+

w

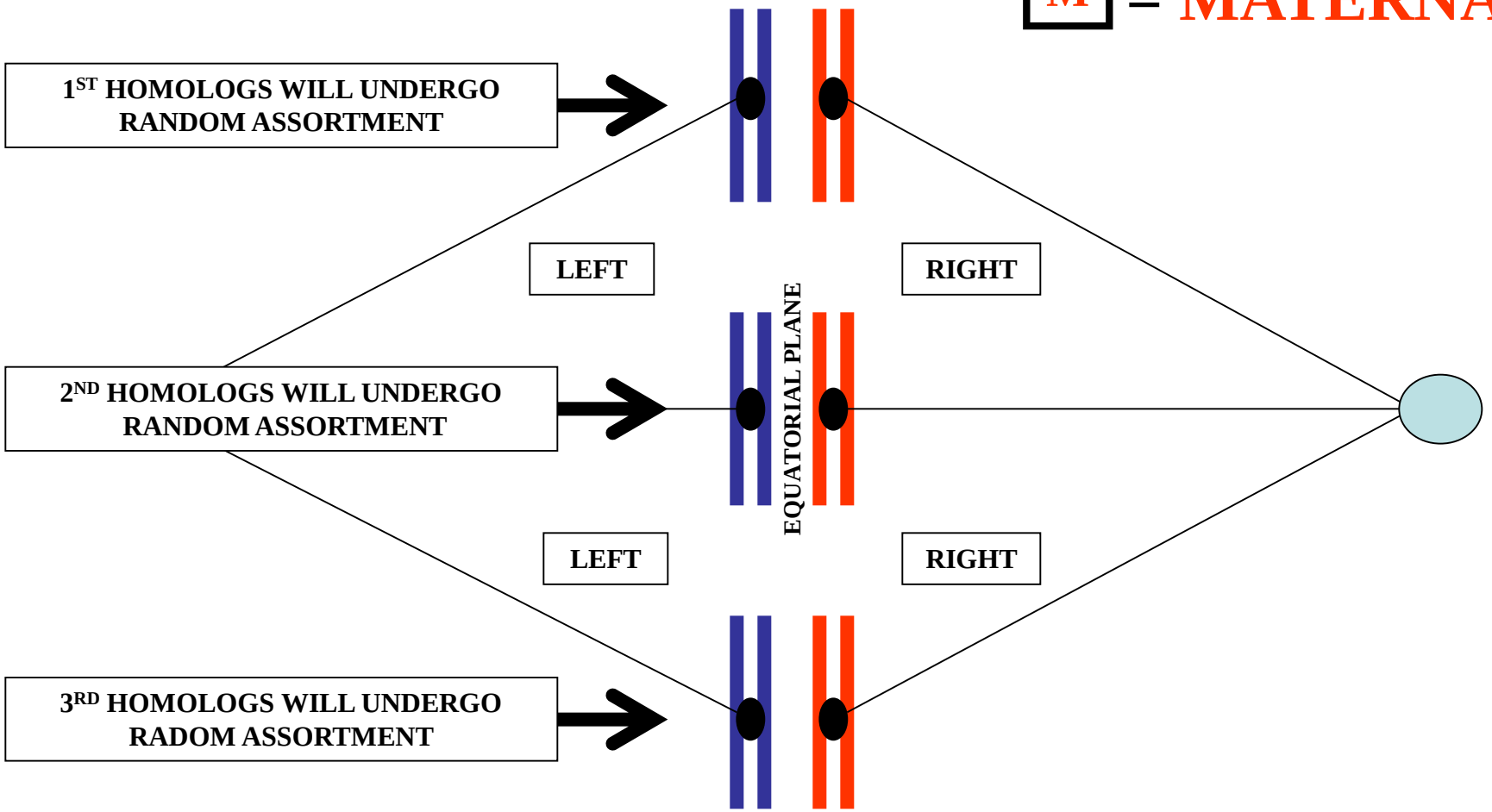


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

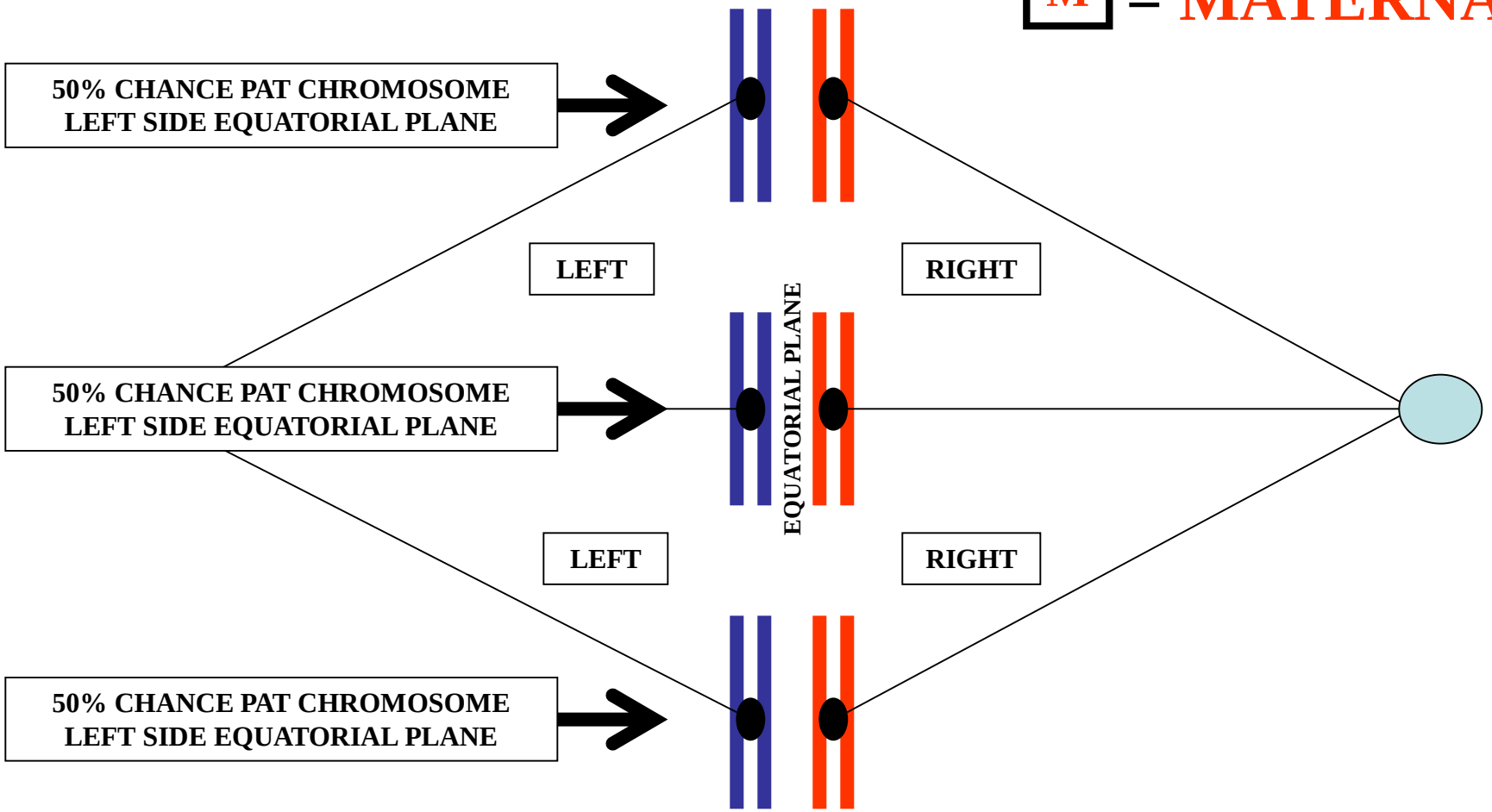


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

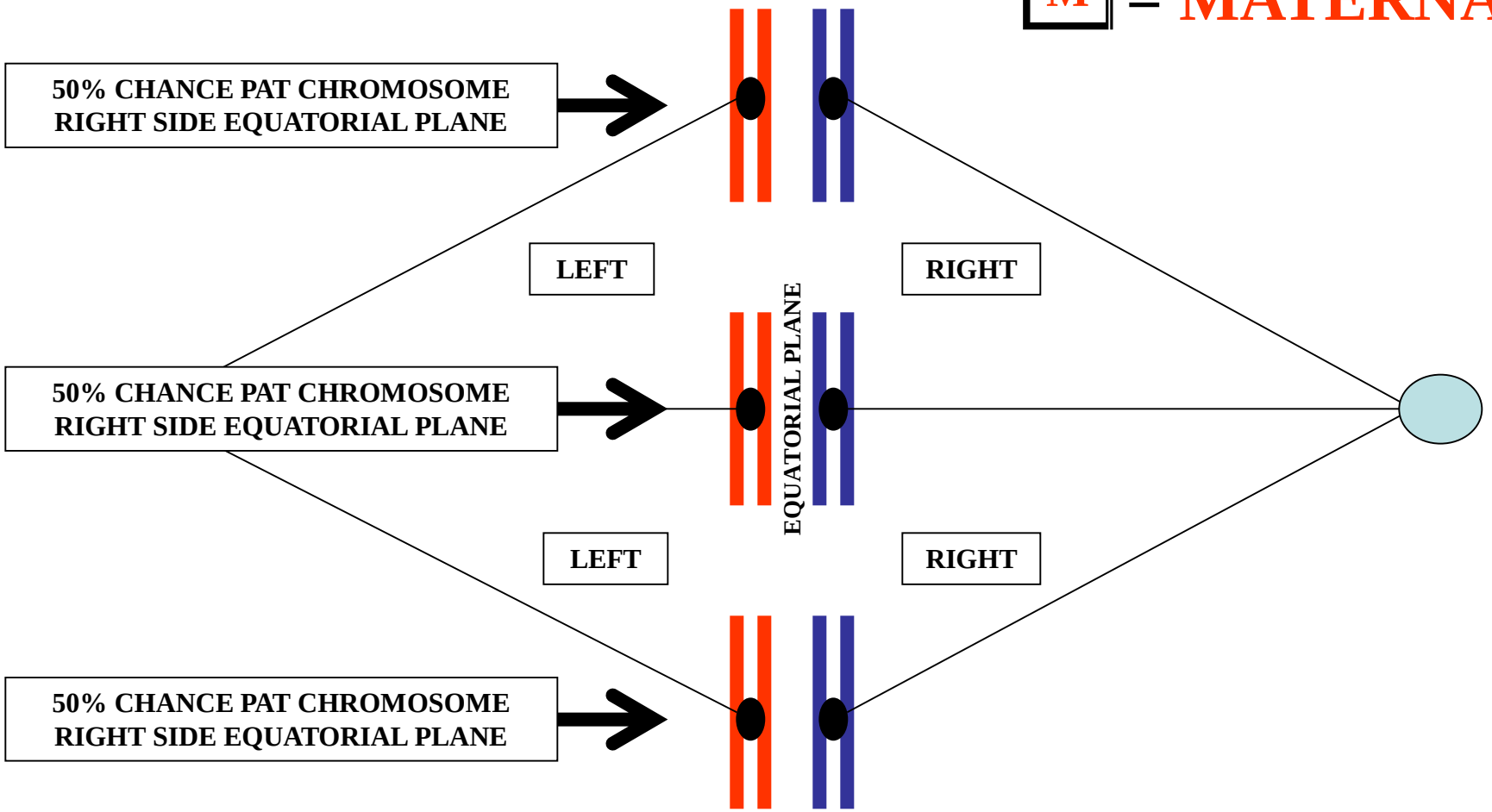


RANDOM ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL



RANDOM ASSORTMENT

^

AP

APPLY HOMOLOG ASSORTMENT

INDEPENDENT COMPONENT OF RANDOM INDEPENDENT ASSORTMENT

APPLY
HOMOLOG ASSORTMENT

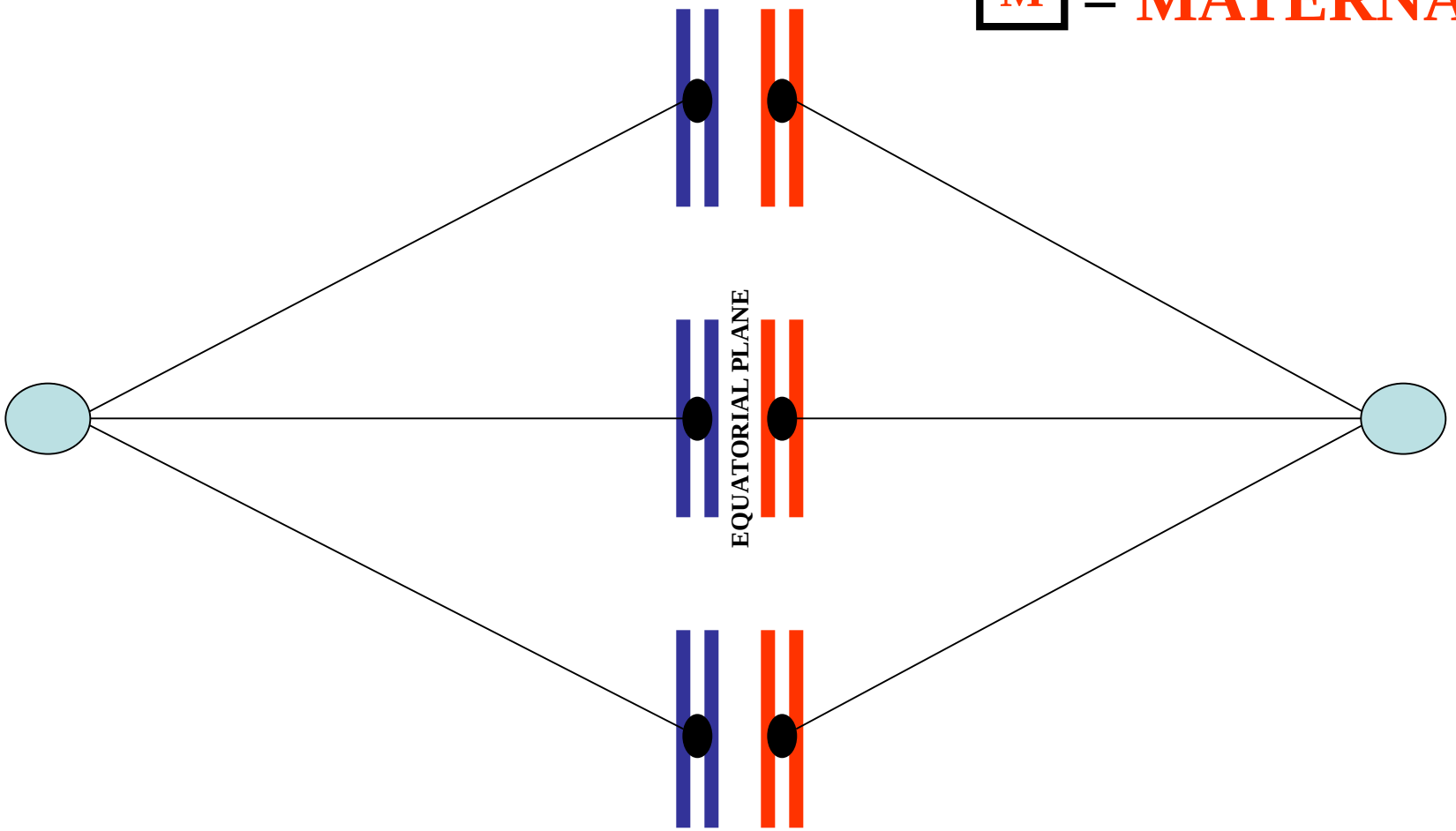
INDEPENDENT COMPONENT
OF
RANDOM INDEPENDENT
ASSORTMENT

APPLY
HOMOLOG ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

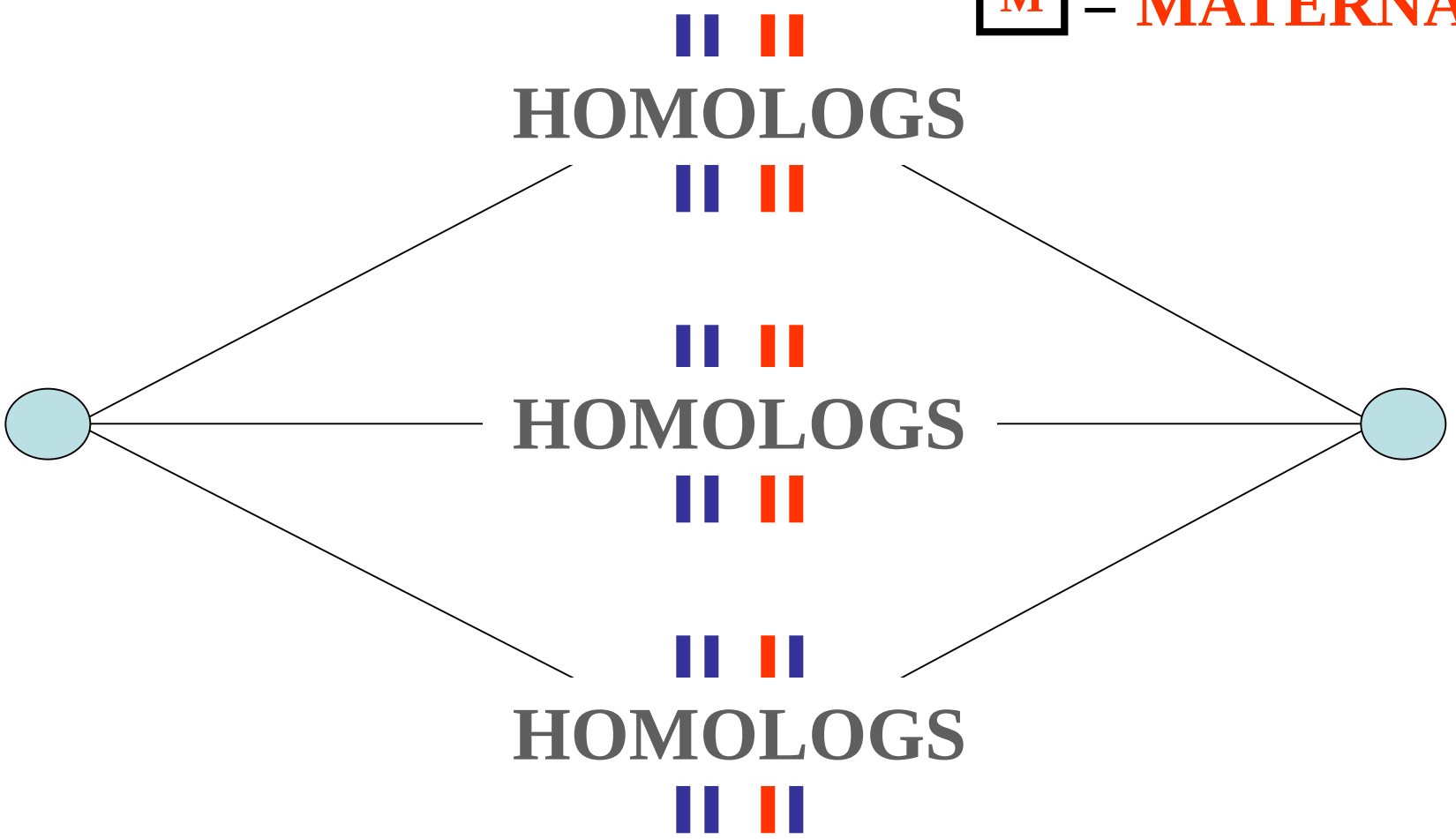


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL



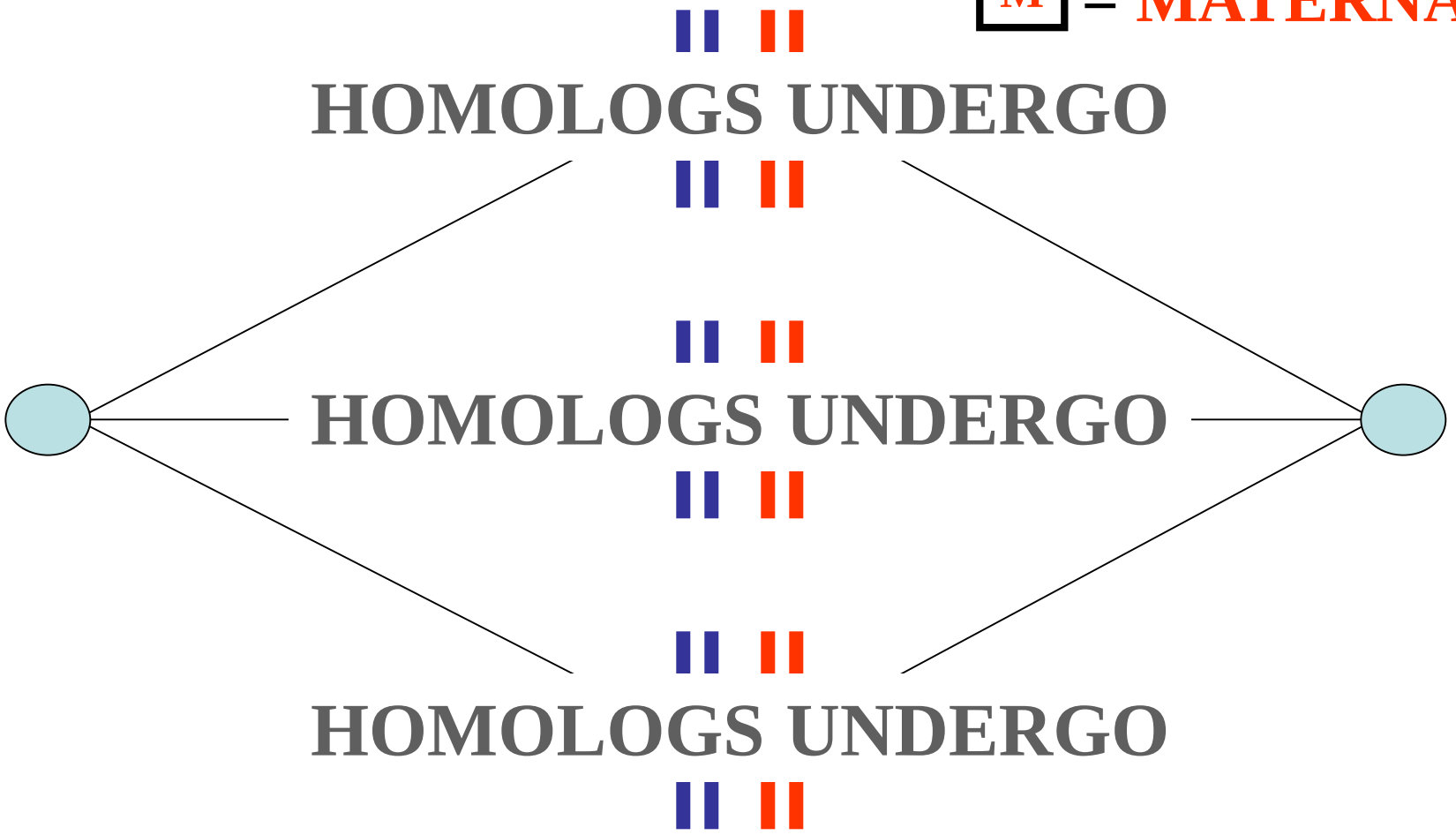
INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

I

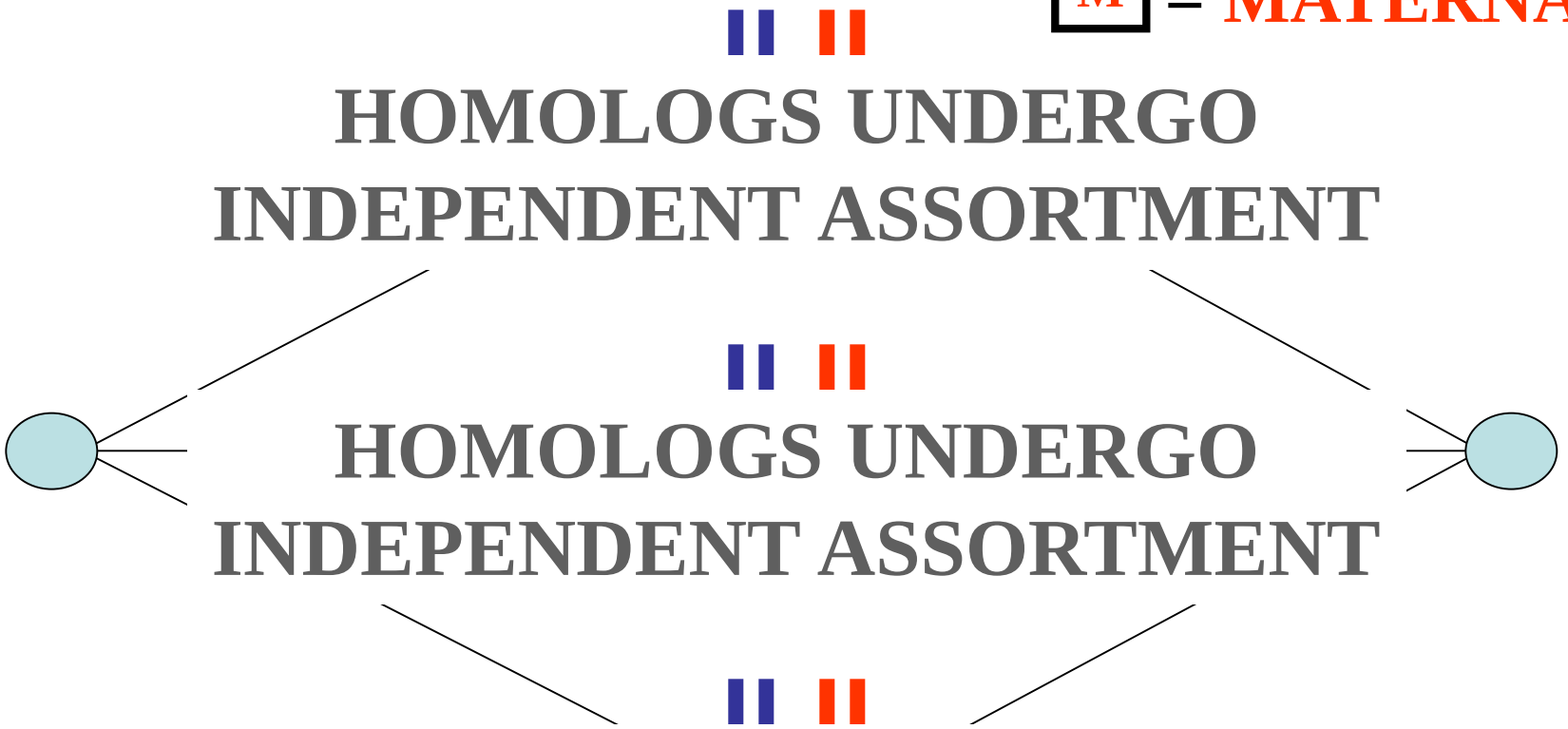


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL



INDEPENDENT ASSORTMENT

METAPHASE - I

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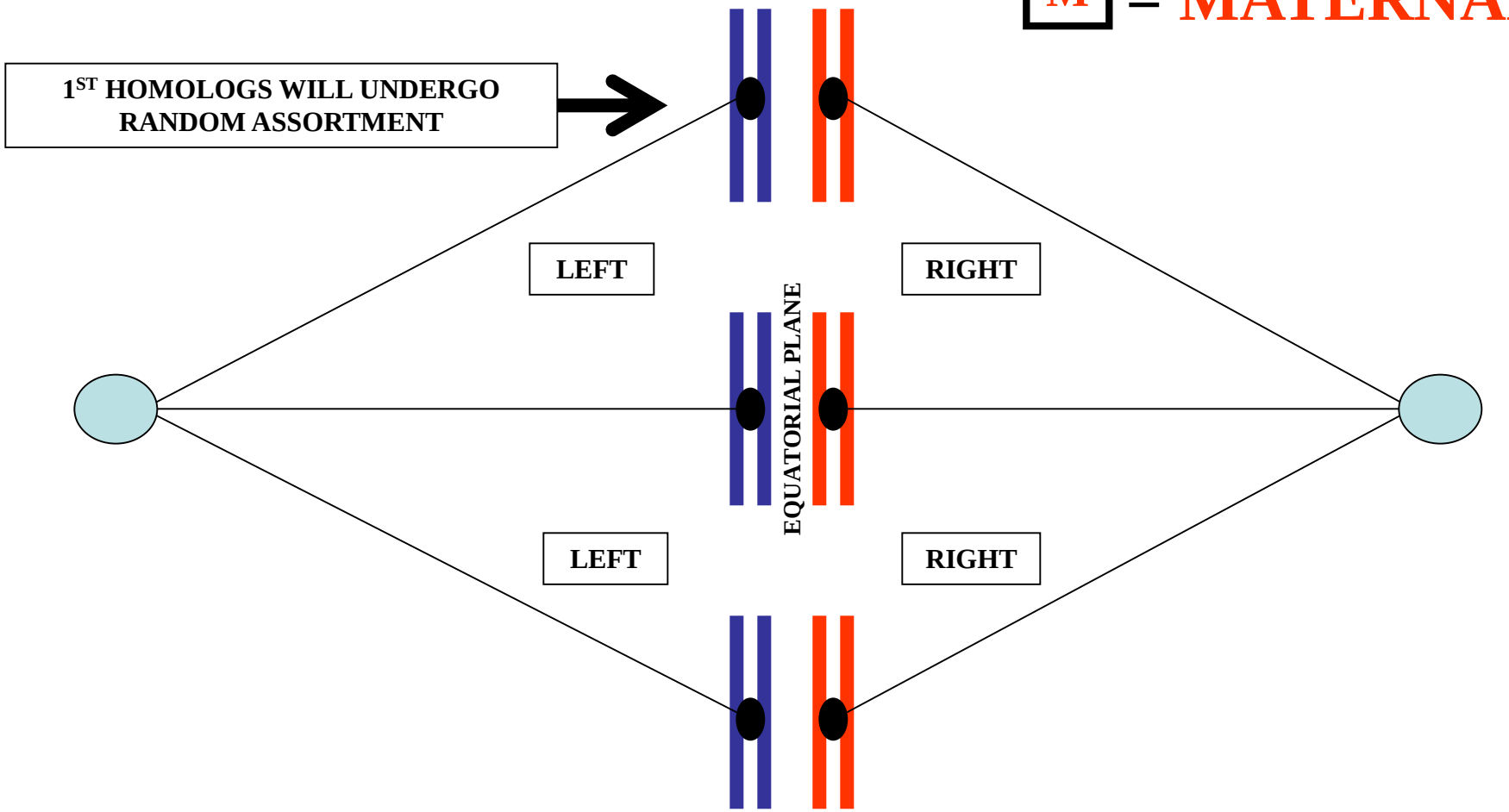
M = MATERNAL

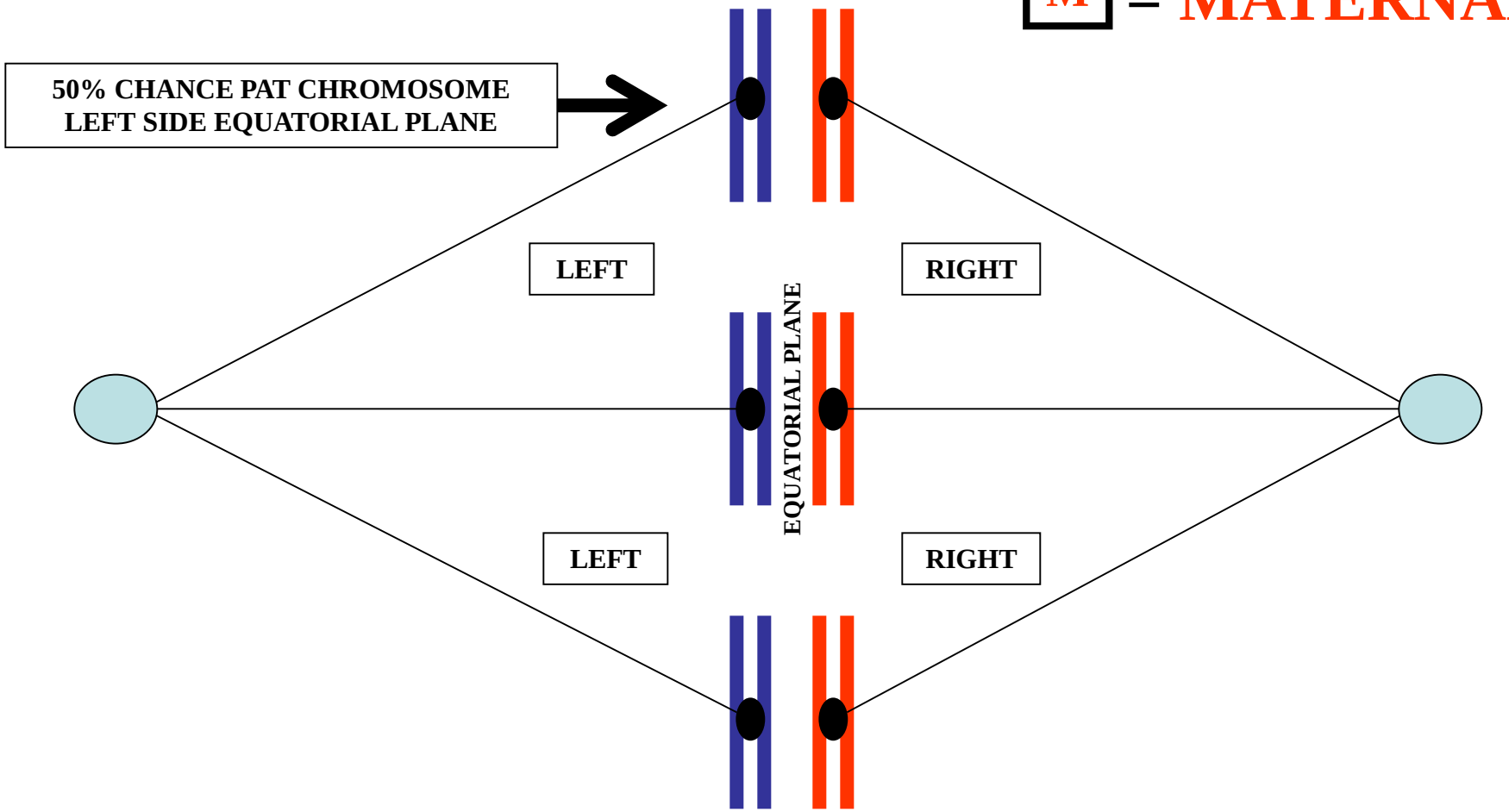


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL



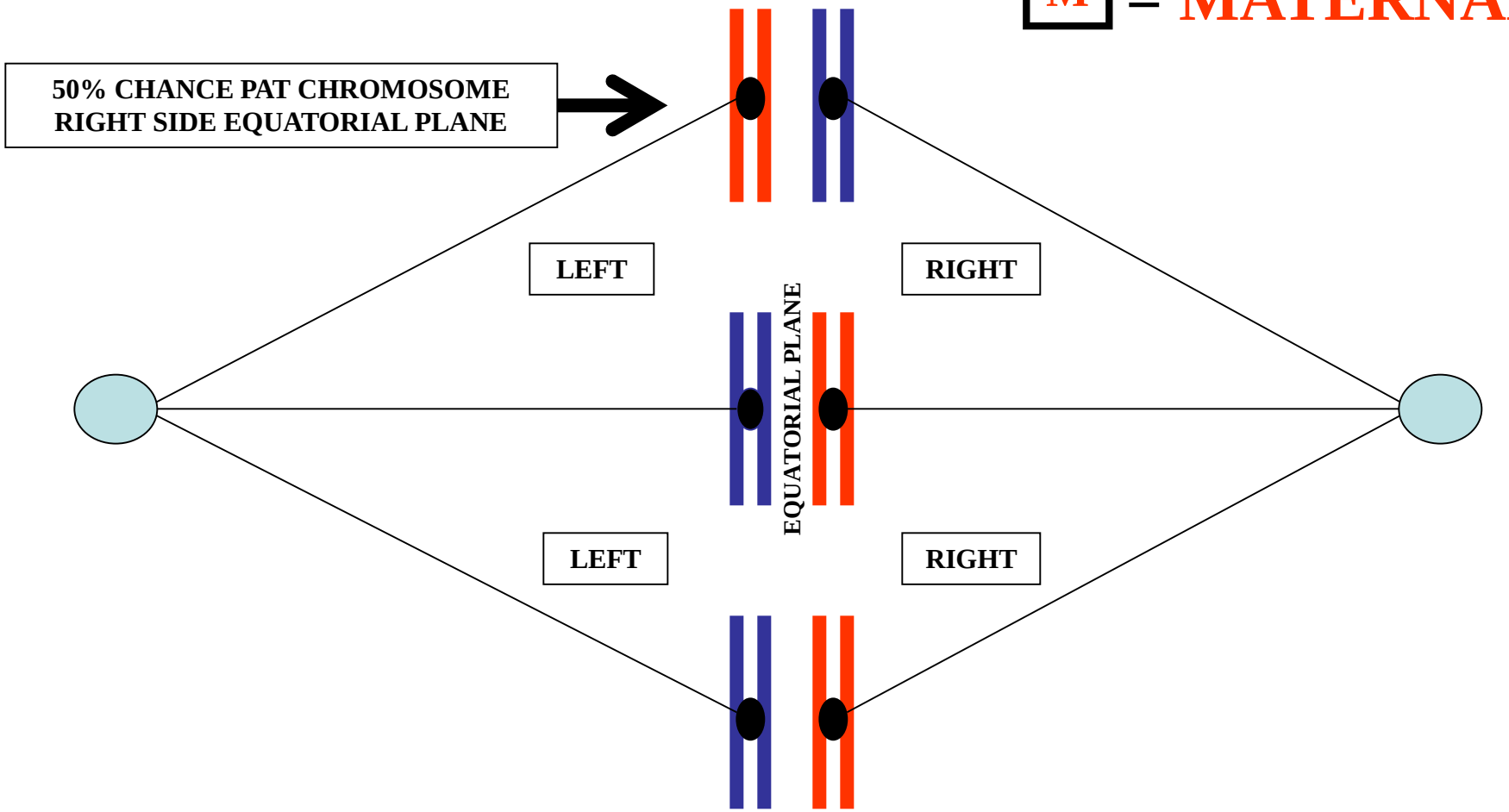
INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

1 +



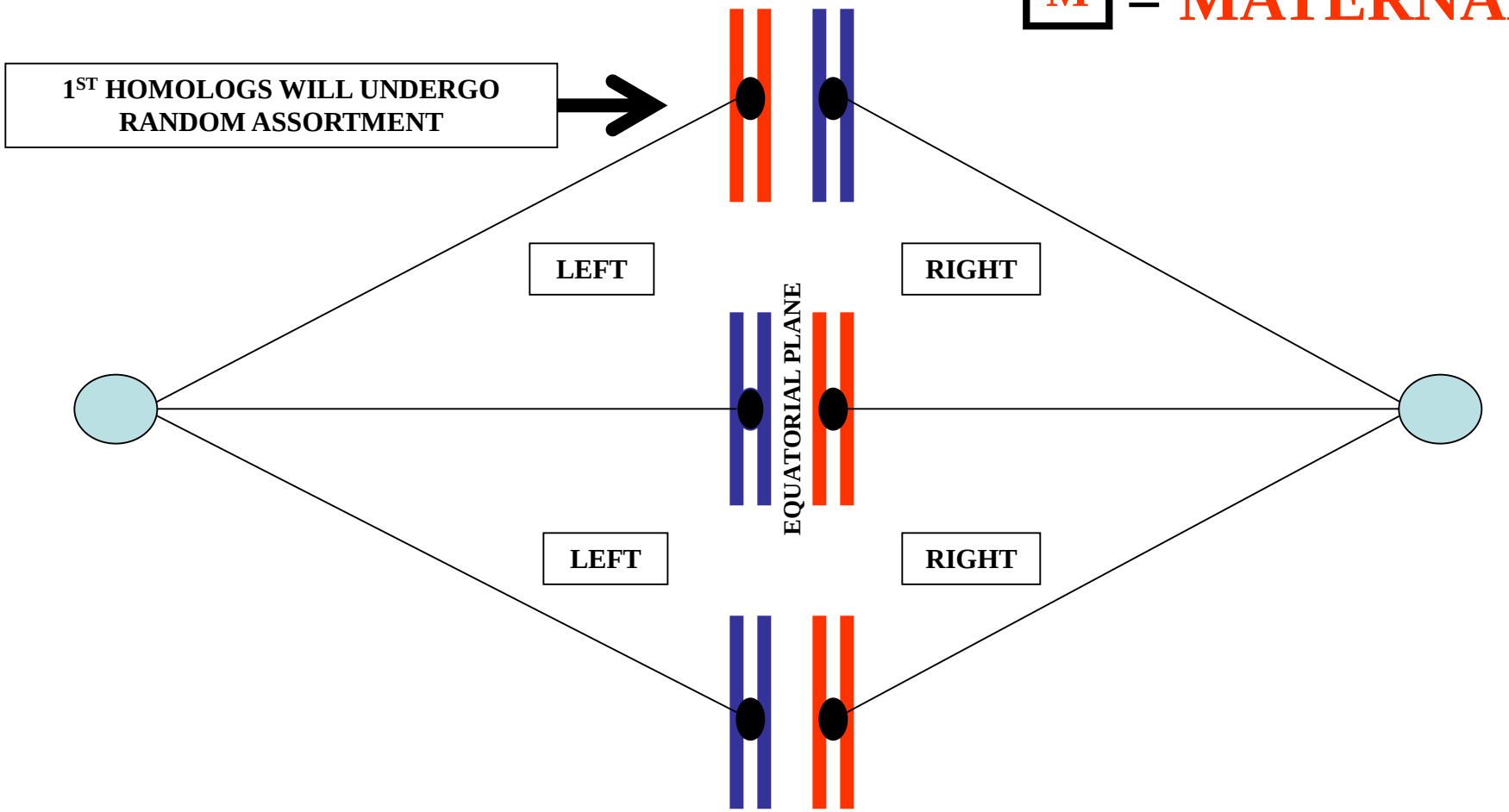
INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

W I

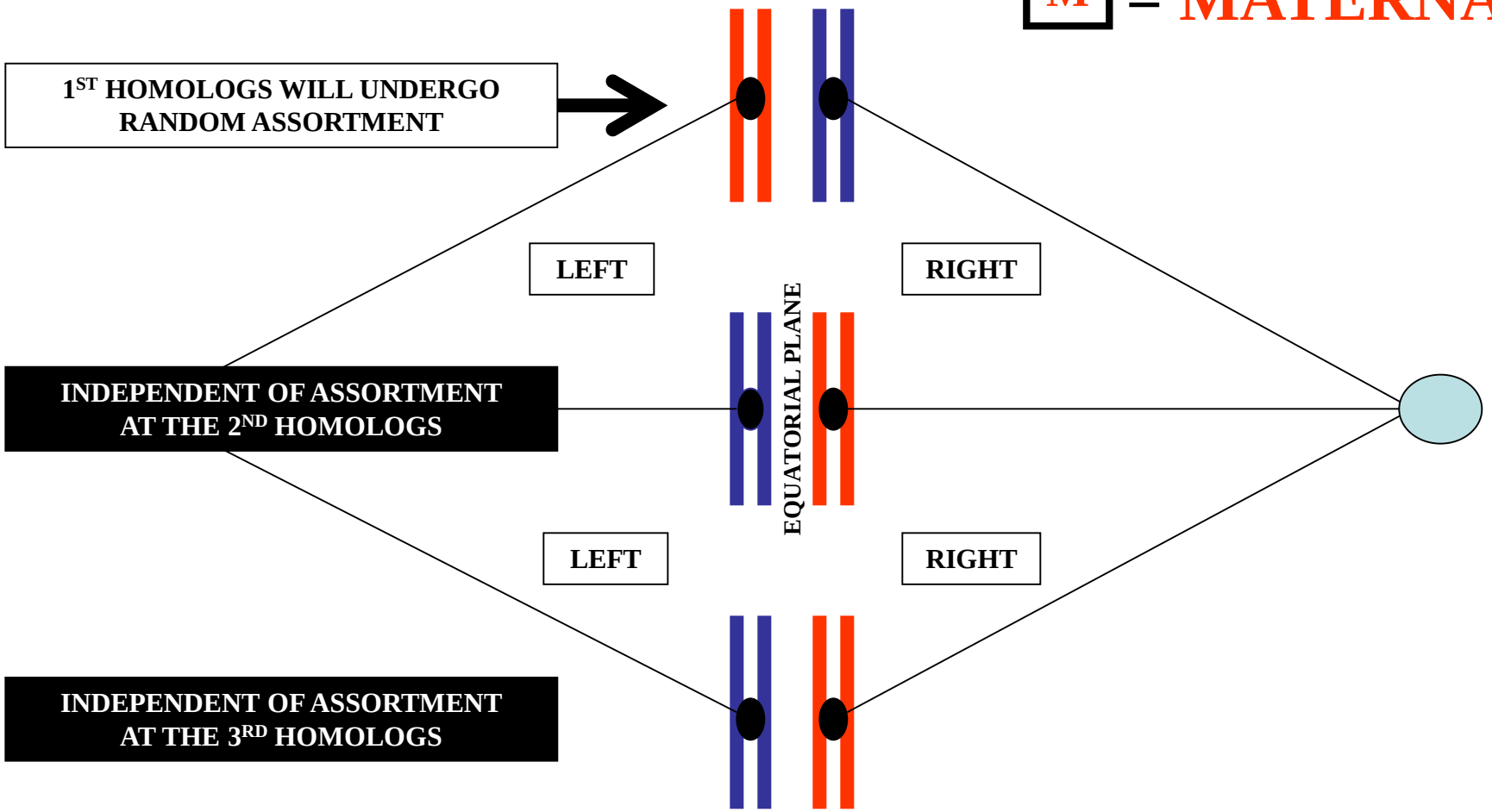


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

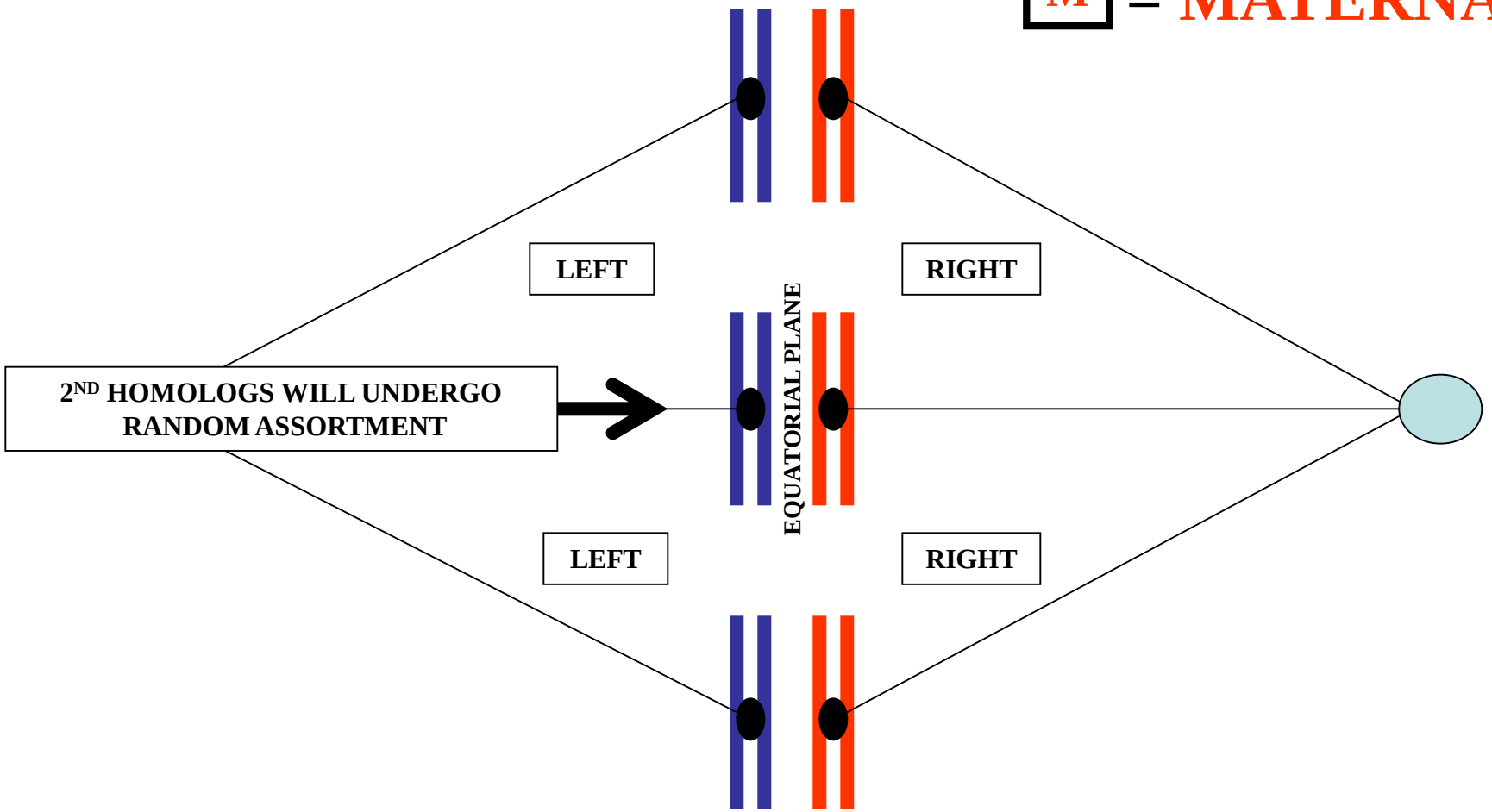


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

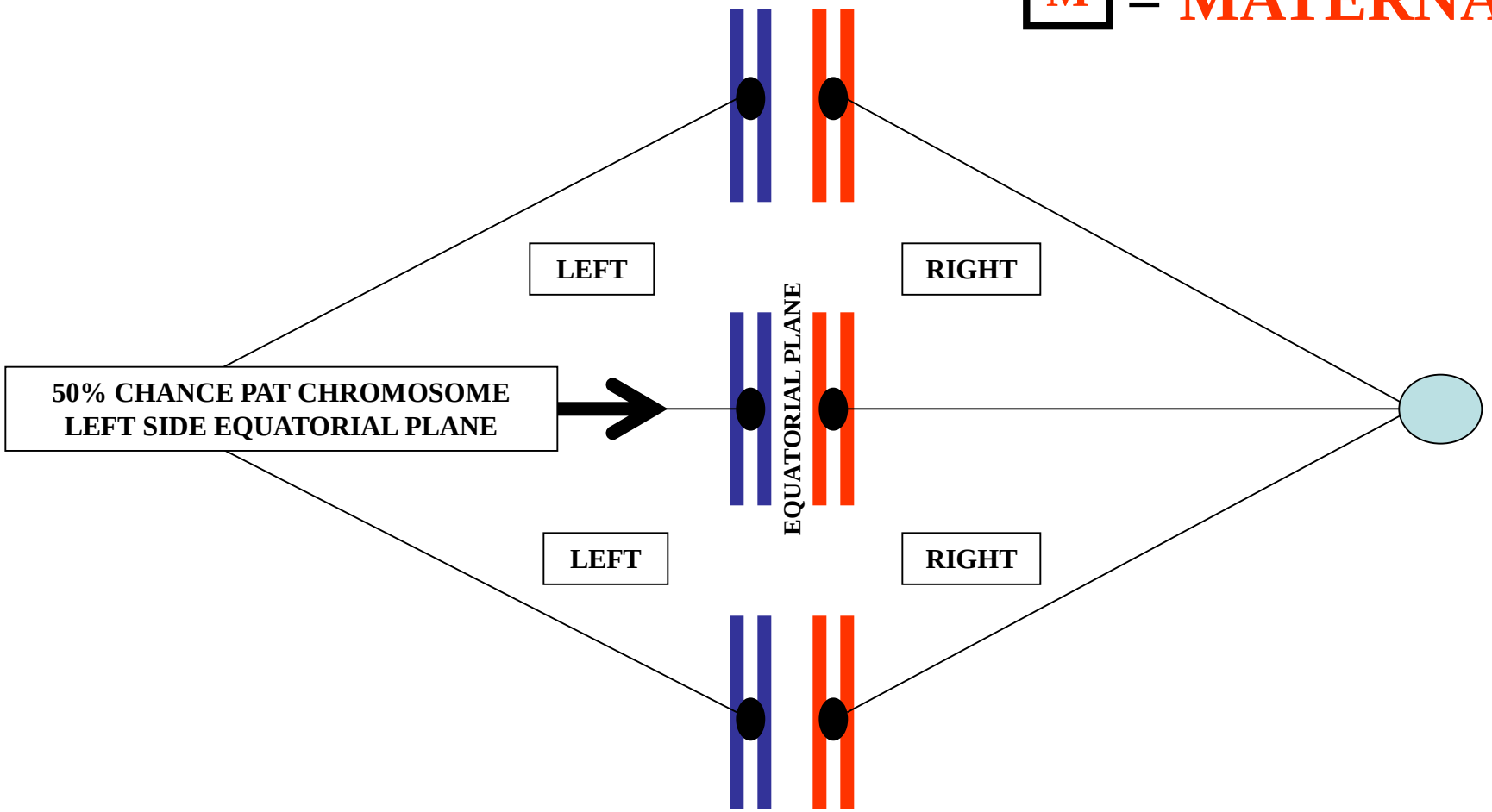


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL



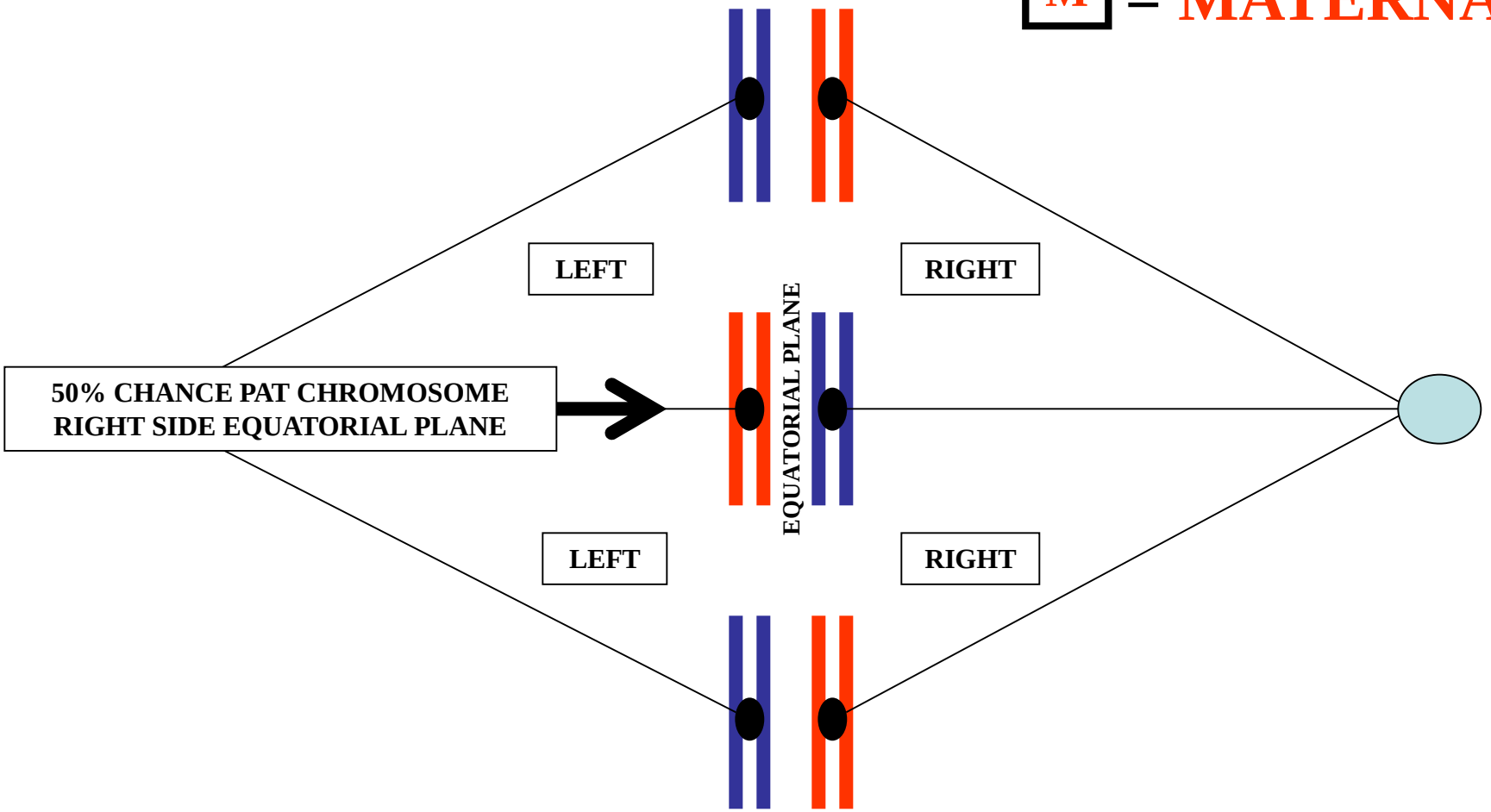
INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

2 +



INDEPENDENT ASSORTMENT

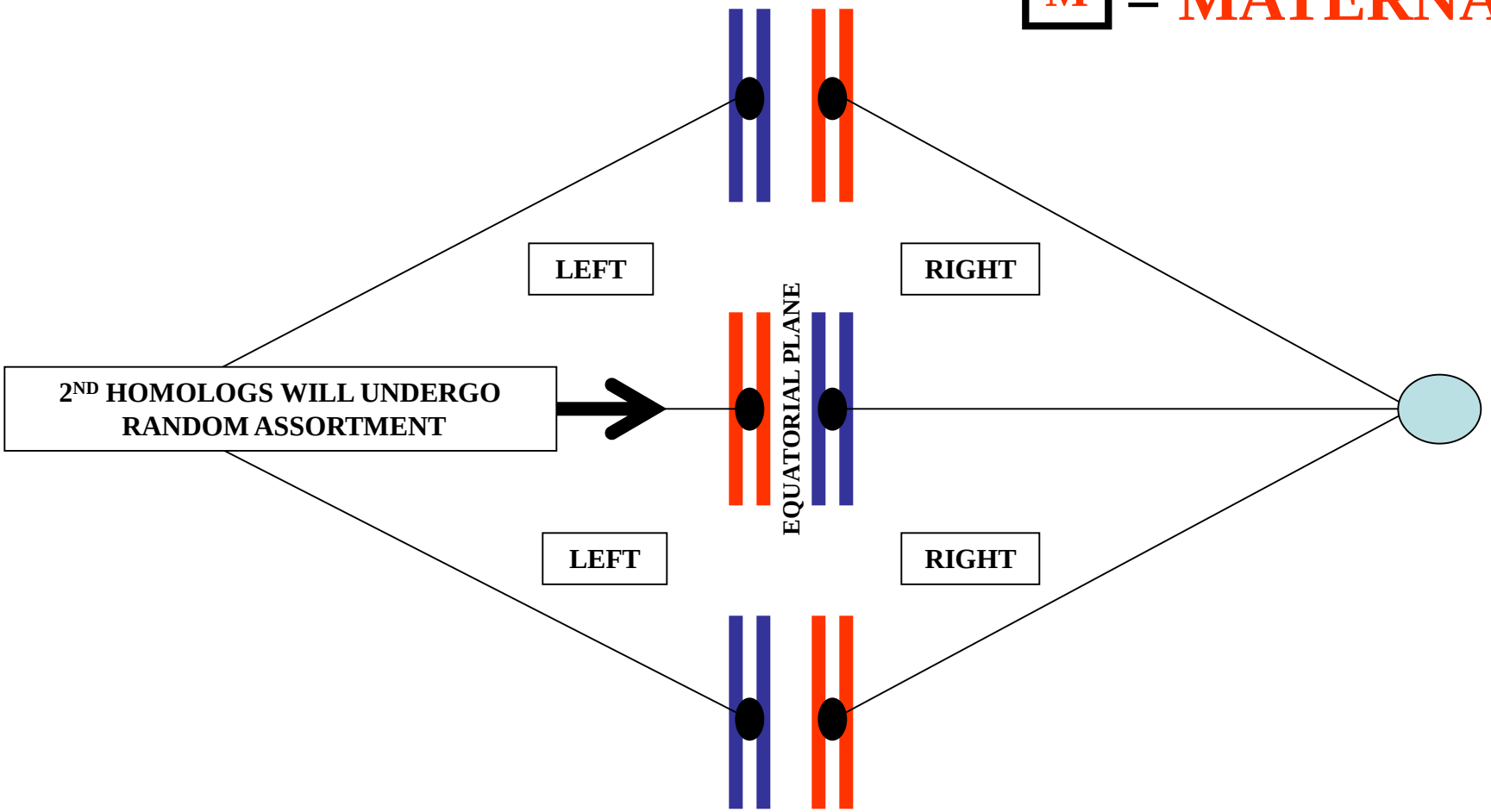
METAPHASE - I

P = PATERNAL

M = MATERNAL

W

I

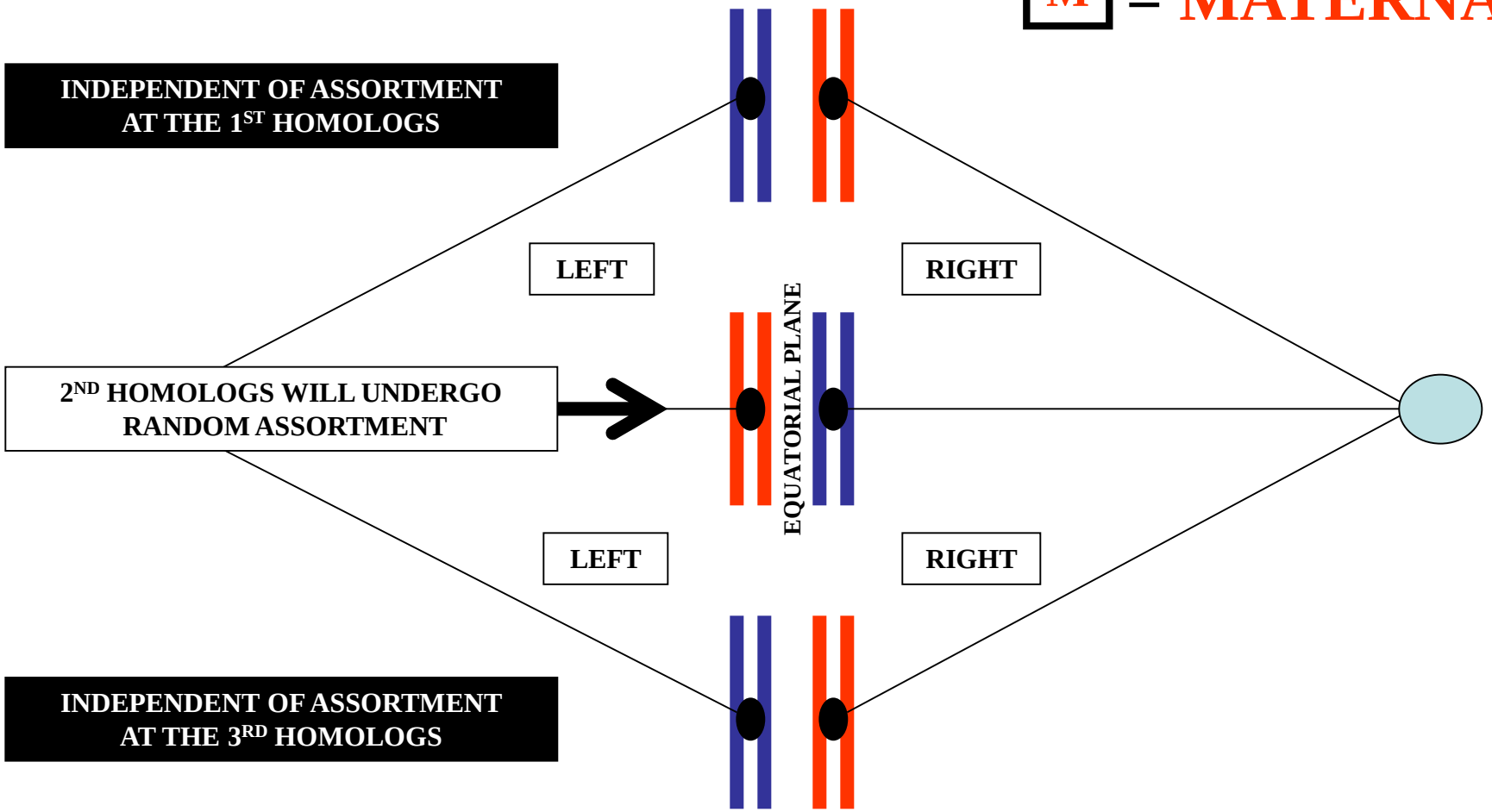


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

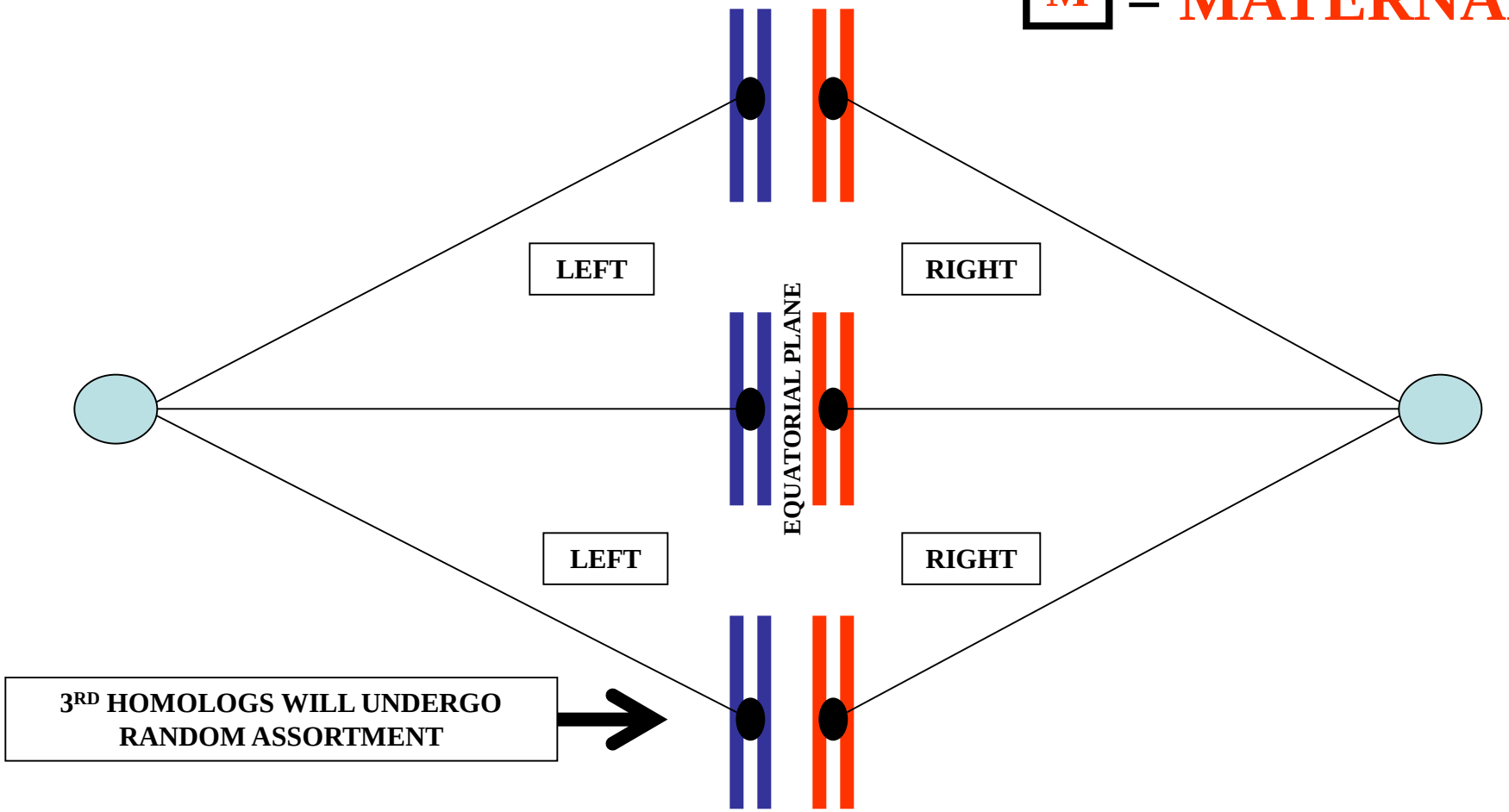


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

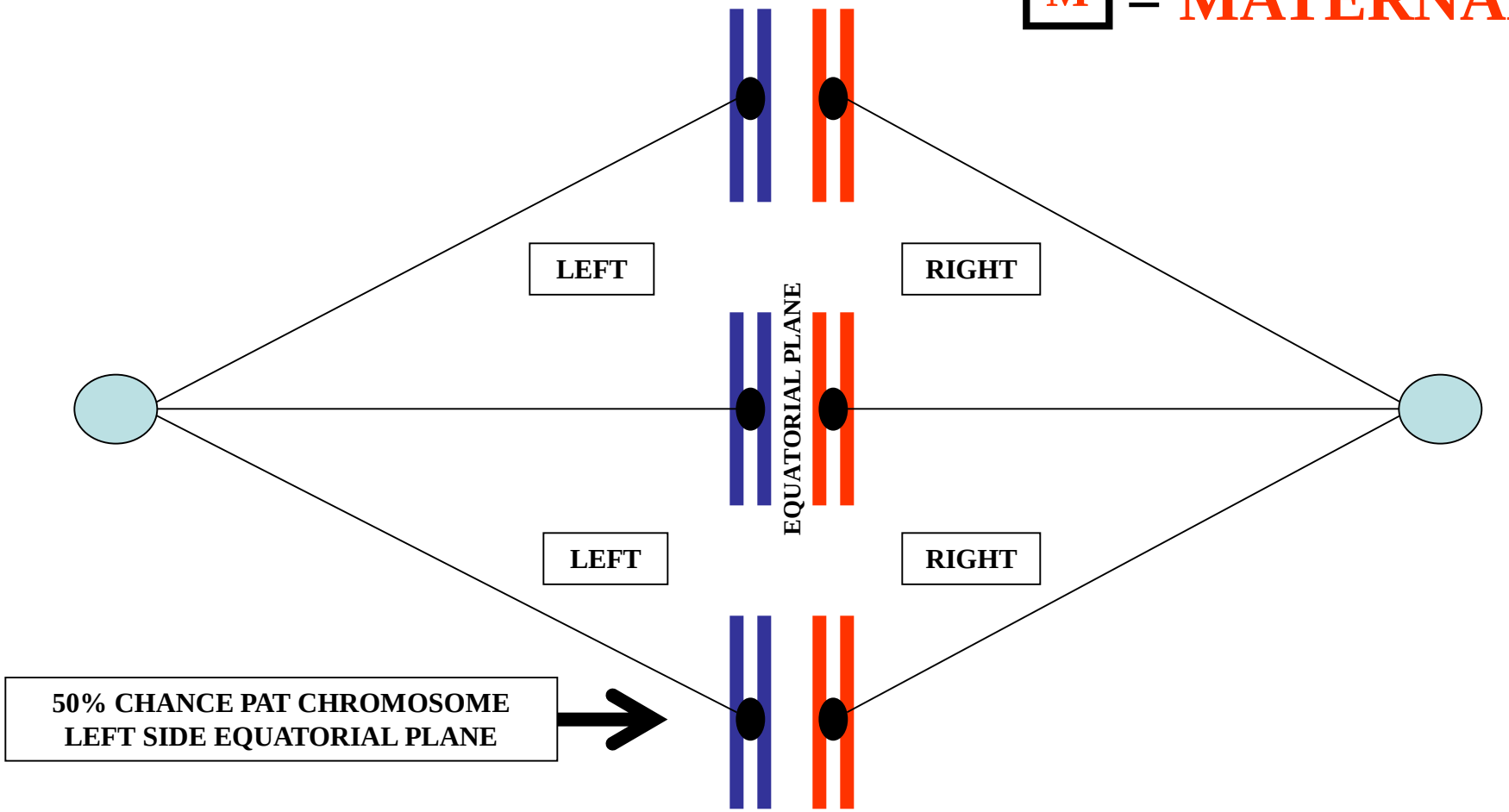


INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL



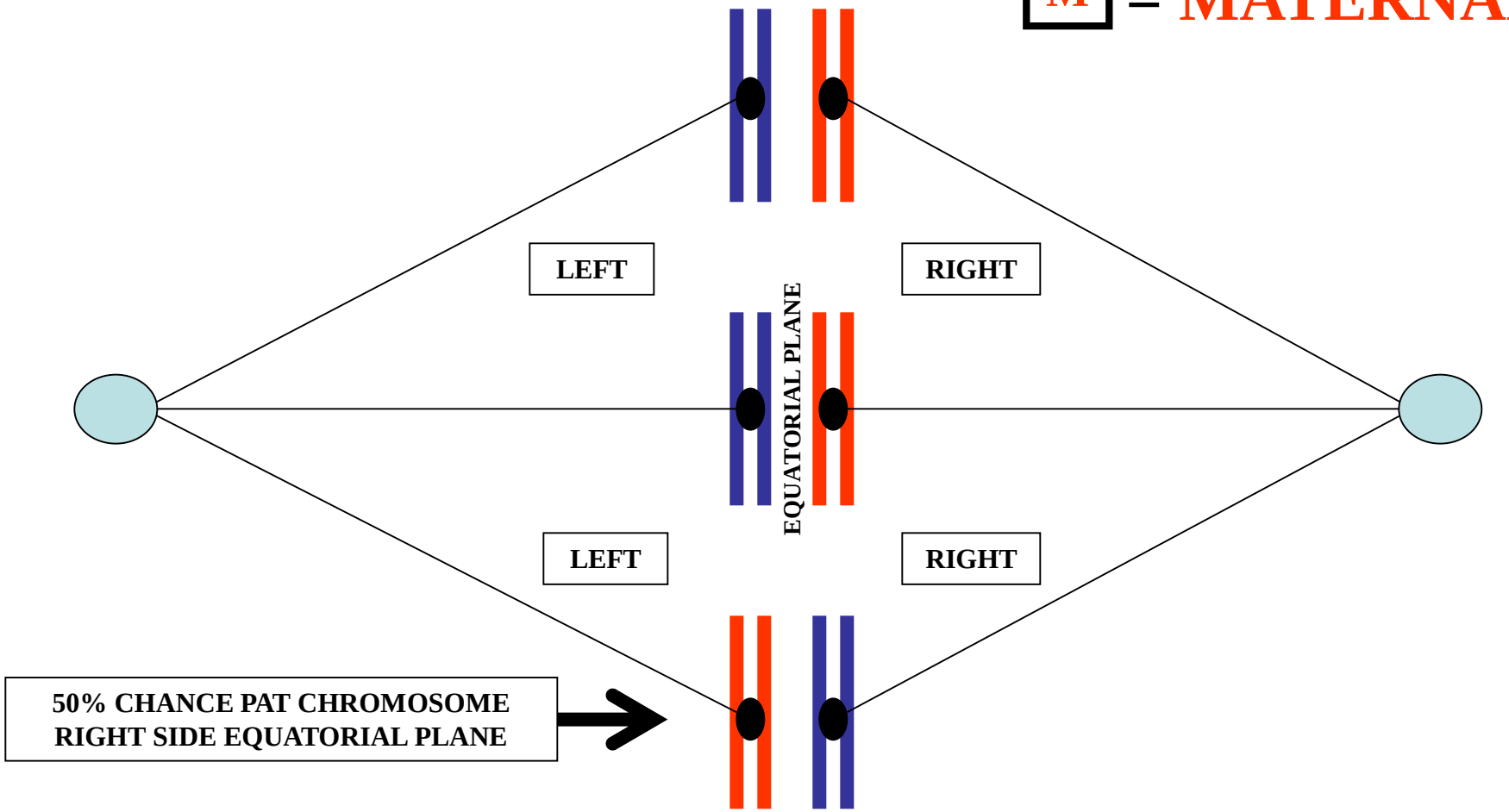
INDEPENDENT ASSORTMENT

METAPHASE - I

P = PATERNAL

M = MATERNAL

3 +



INDEPENDENT ASSORTMENT