Part 4 Meiosis

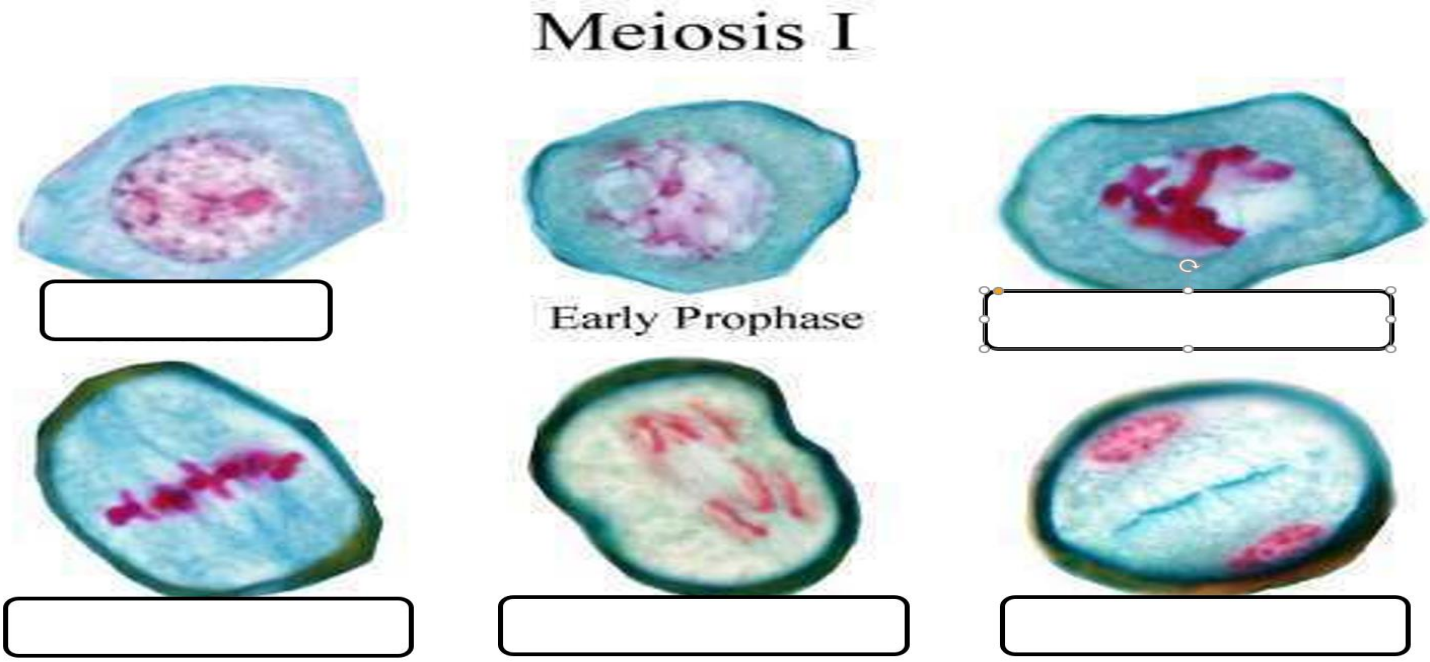
Name:

Due:

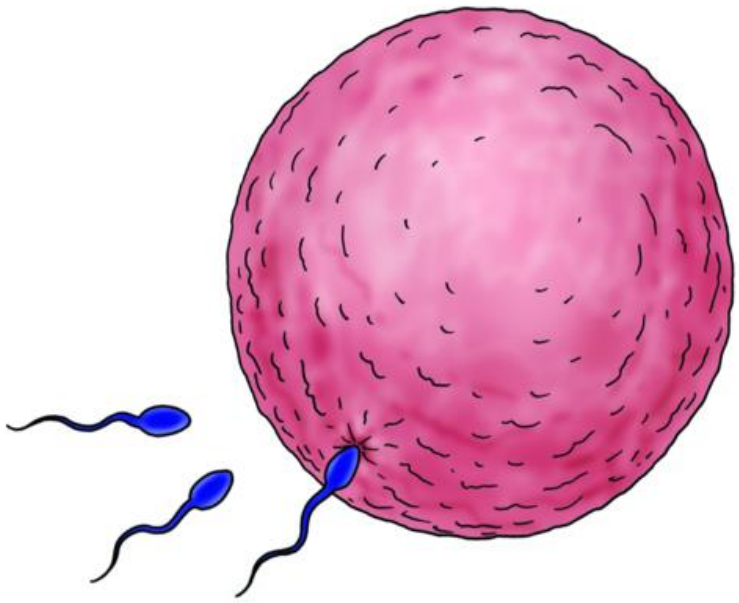
Part 4 Lesson 1 Sex Cells (Gametes)

Mitosis is 99.9% of your body's cells (Somatic Cells).
Meiosis occurs in your _____ cells (Gametes).

Meiosis I (First Part) has many similarities to mitosis. To refresh, name the phases of meiosis I below. Think iPPMAT!



Please name the two gametes below and please provide some information about them.
-How many chromosomes do they have?
-Are they haploid or diploid?
-List any terms



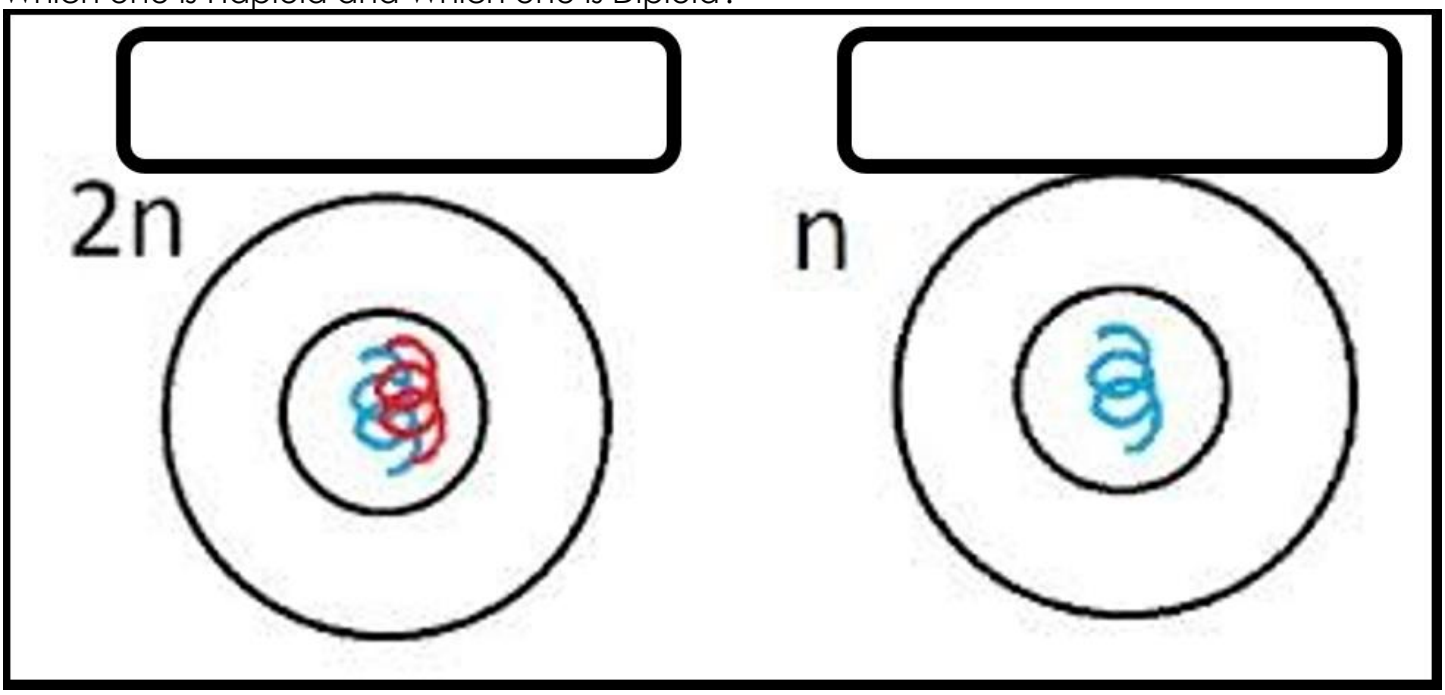
Step by drawing on a Sperm and Egg from the slideshow

Drawing of Male Spermatozoa	Drawing of Female Ova or Egg Cell

Name the number of chromosomes in each type of human cell below?

Brain Cell	Muscle Cell	Egg Cell	Liver Cell
Heart Cell	Nerve Cell	Skin Cell	Sperm Cell

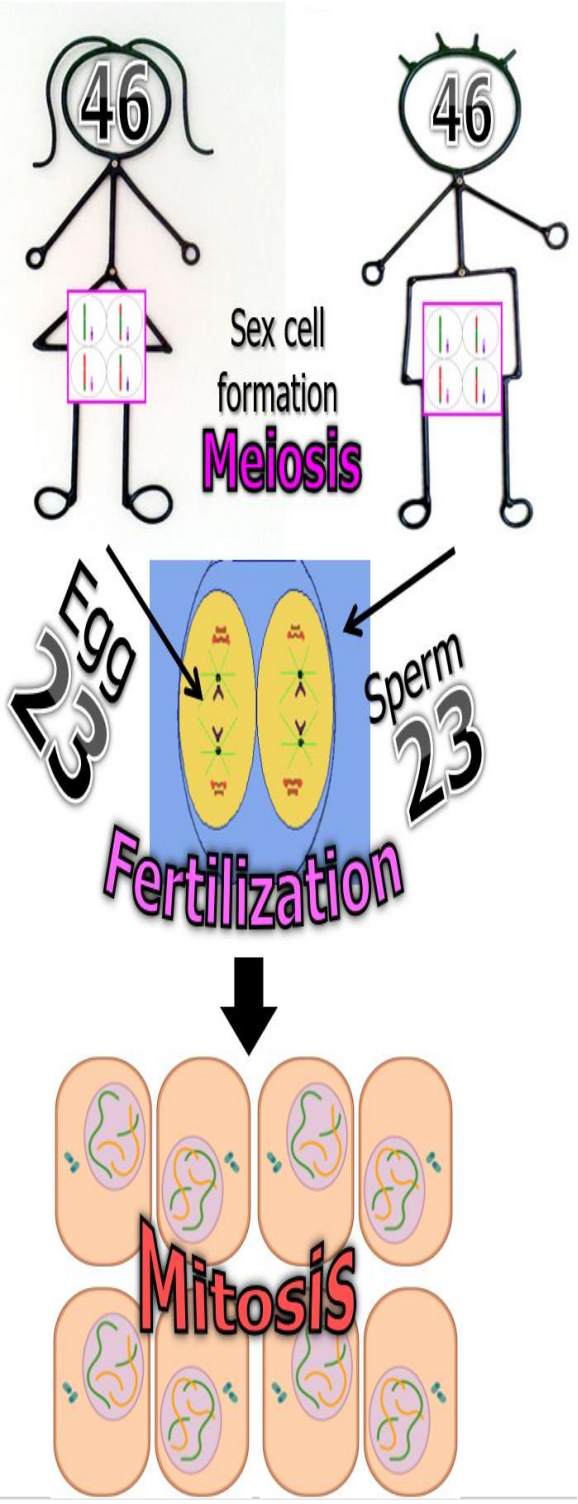
Which one is Haploid and Which one is Diploid?



Sexual Reproduction: Both parents provide _____ of the genetic information.

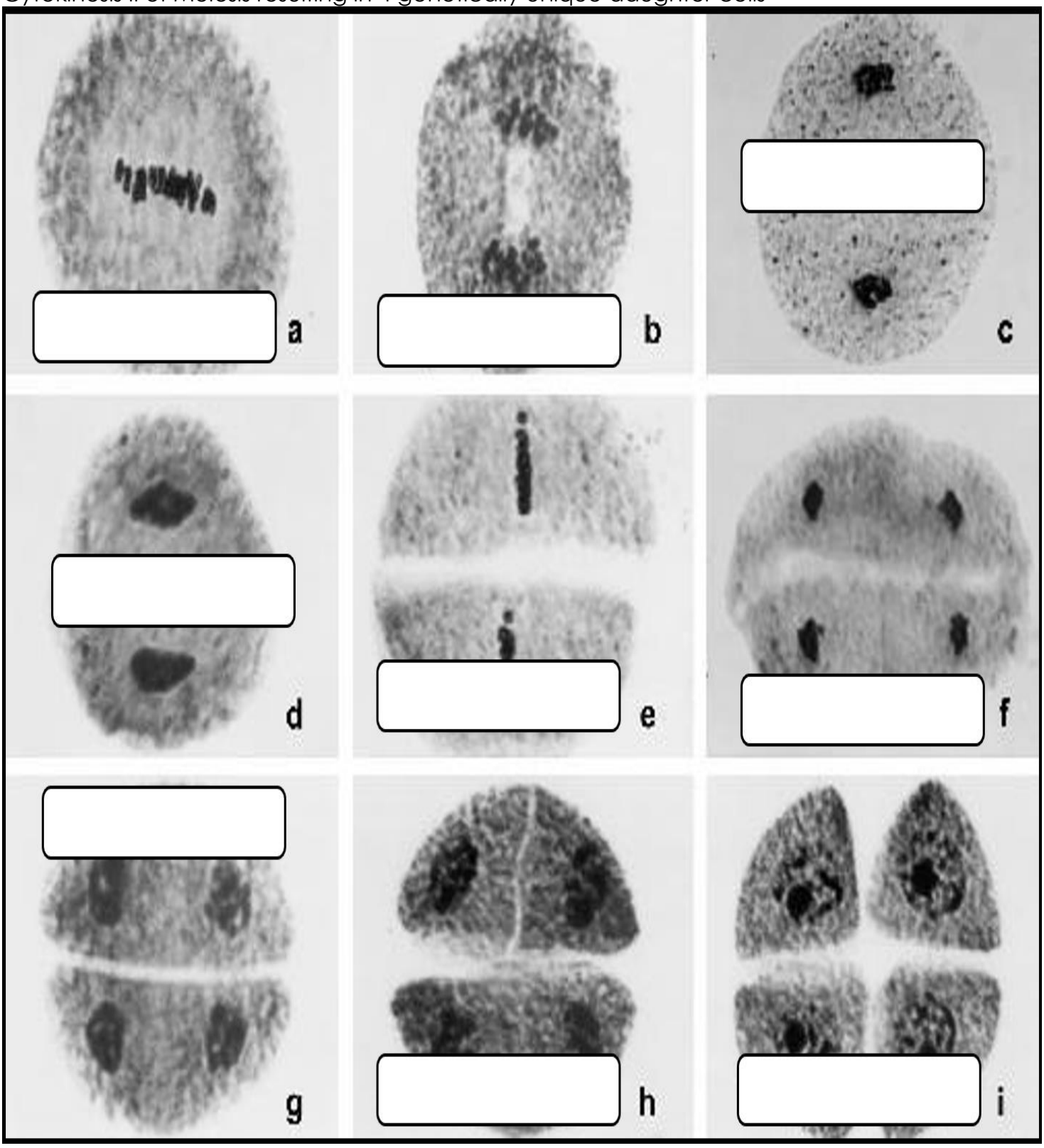
Using this diagram and your science words please…! How are babies made?

Words to use: Gametes, Sperm, Egg, Meiosis, Haploid, Fertilization, Diploid, Mitosis, Zygote



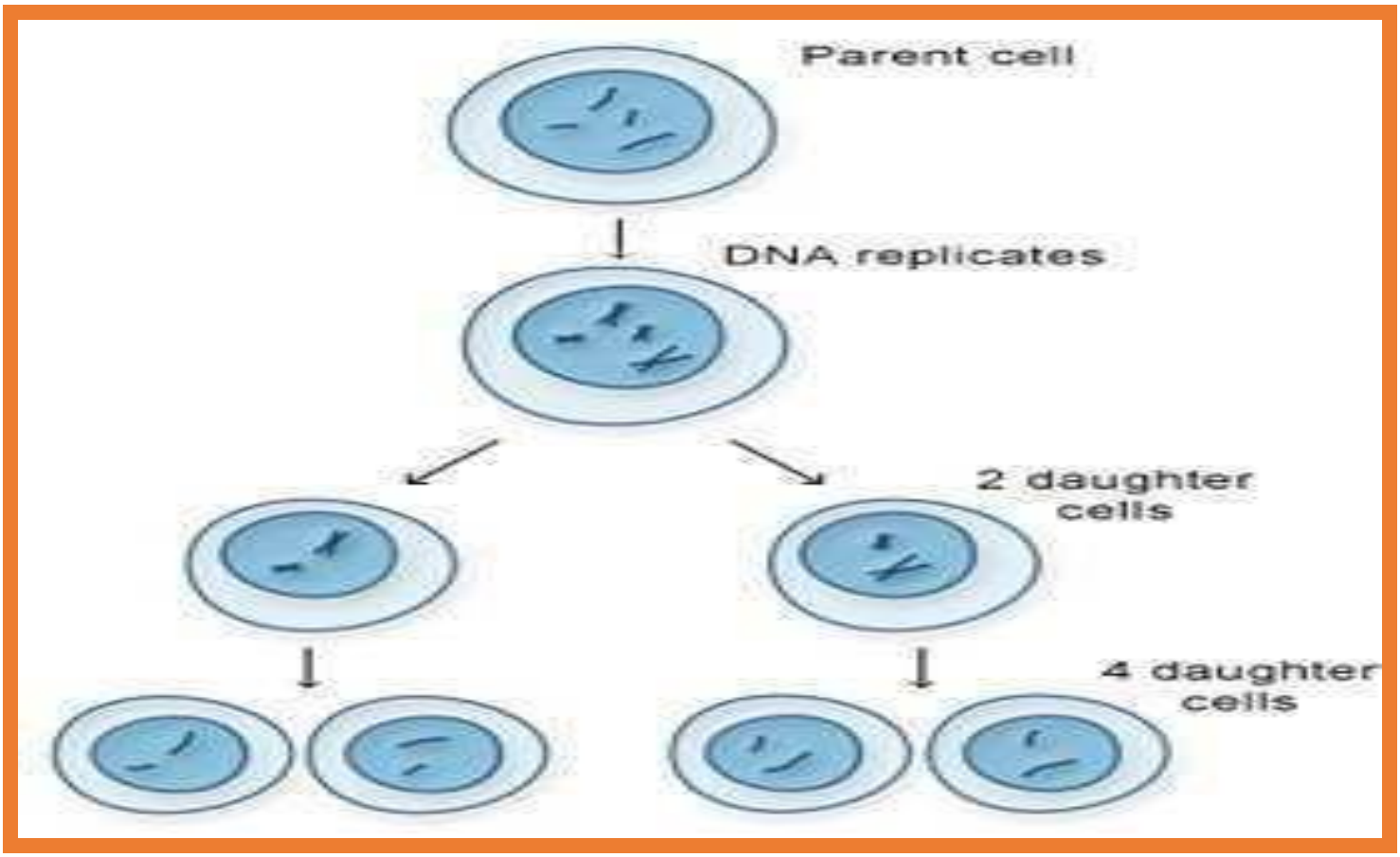
Part 4 Lesson 2 Meiosis

Please just write in the phases and some info below next to the correct picture.
(a) - Metaphase I of Meiosis (b) - Anaphase I of Meiosis (c) - Telophase I of Meiosis (d) - Telophase/Cytokinesis I of Meiosis (e) - Metaphase II of Meiosis (f) - Anaphase II of Meiosis (g) - Telophase II of Meiosis (h) - Late Telophase/Early Cytokinesis II of Meiosis (i) - Cytokinesis II of Meiosis resulting in 4 genetically unique daughter cells



Meiosis…

- -Has _____ cell divisions.
- -A _____ in the amount of genetic material.
  - -Results in _____ the number of chromosomes.



Homologous chromosomes: Chromosome _____ that are inherited from each parent.

_____: The pairing of two homologous chromosomes that occurs during meiosis.

- Allows for crossing over.

Crossing Over / Homologous Recombination: Genetic segments of information are _____during synapsis.

- Creates millions of possibilities

Independent orientation: Chromosomes _____ along the metaphase plate in metaphase I.

- _____ chromosome is inherited from your mother and the other from your father.
- Two possibilities; each pole has a ____% chance of inheriting one or the other.

Reduction of genetic information

- Produces _____ different germ cells (reproductive cells).

Scientists call the factors that control traits _____.
-The different forms in genes are called _____.

Mendel's law of segregation: Allele pairs _____ or segregate during gamete formation, and randomly unite at fertilization.
Organisms inherit _____ alleles for each trait when gametes are produced.
Allele pairs separate leaving each cell with a _____ allele for each trait.

Part 4 Lesson 3 Meiosis Wrap-Up

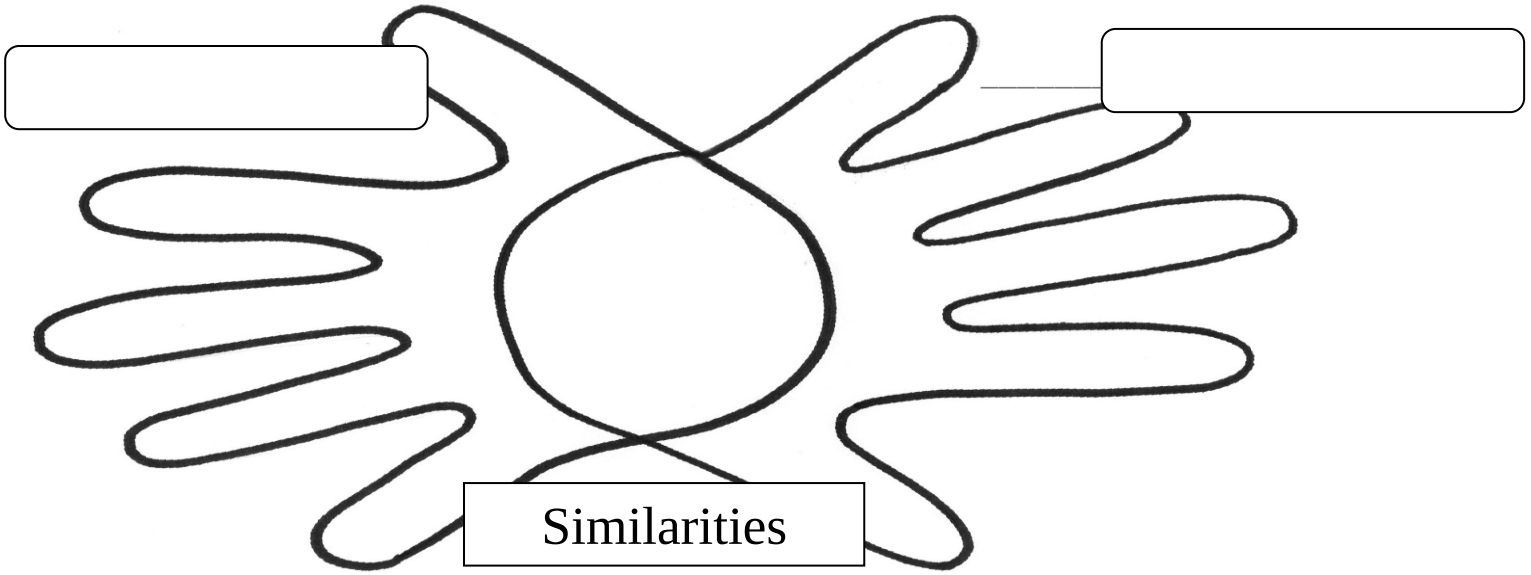
Important Events in Meiosis

- 1.) Two cell divisions that end without DNA replication. (leads to a reduction of genetic information)
- 2.) Pairing of homologous chromosomes that lead to crossing over creating genetic variation.
- 3.) Separation of homologous chromosomes (Anaphase I of Meiosis I)
- 4.) Separation sister chromatids (Anaphase II of Meiosis II).

Mendel's Laws of Heredity:

- 1) The Law of Segregation: Each inherited _____ is defined by a _____ pair. Parental genes are randomly separated to the sex cells so that sex cells contain only _____ gene of the pair. Offspring therefore inherit one genetic _____ from each parent when sex cells unite in _____.
- 2) The Law of Independent Assortment:_____ for different traits are sorted _____ from one another so that the inheritance of one trait is not _____ on the inheritance of another.
- 3) The Law of Dominance: An organism with alternate forms of a gene will express the form that is _____.

What are some similarities and differences between mitosis and meiosis? Use the Venn Diagram below to assist you.



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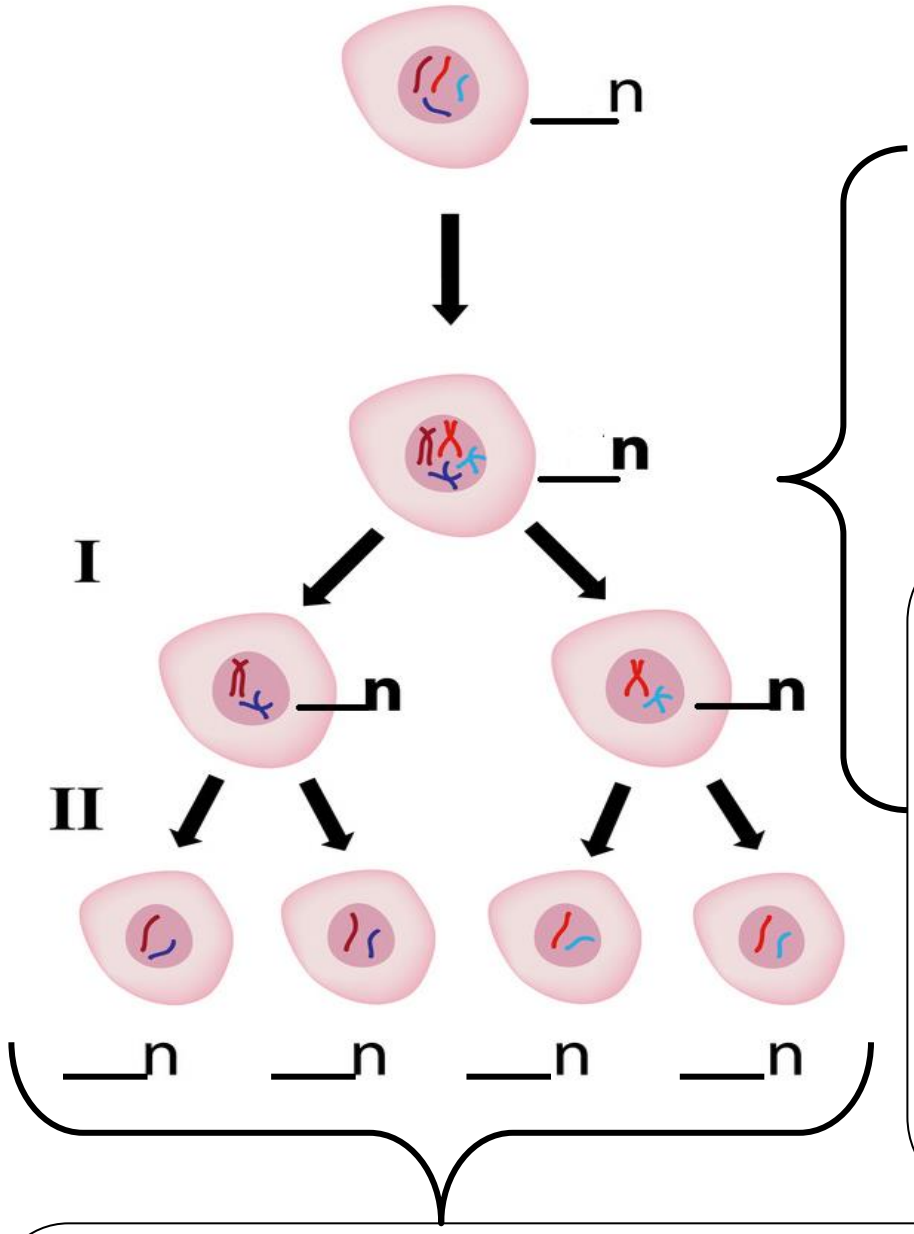
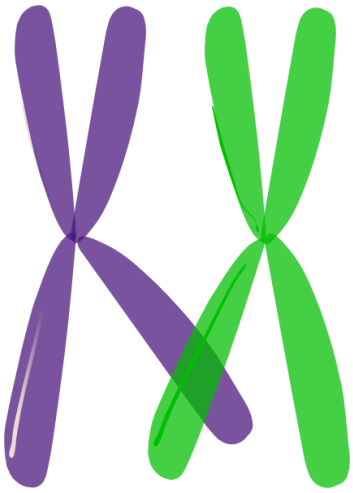
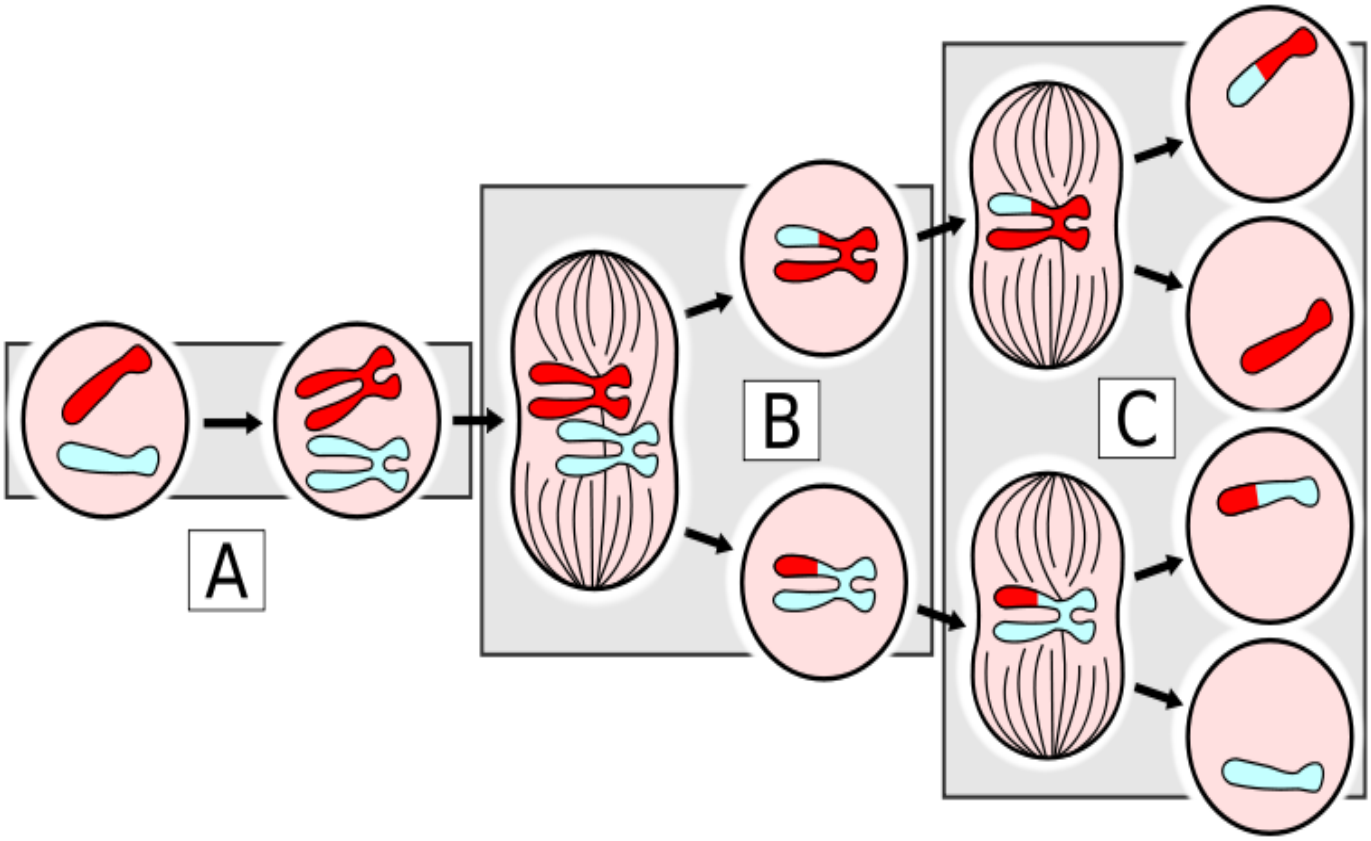
Is the ___n (1n or 2n / Haploid or Diploid)? Name some important events that occur in Meiosis? Describe these in the boxes below.





Please describe A, B, and C. How do these events create genetic variability (differences)?



A:_____

_____

_____

_____

B:_____

_____

_____

_____

C:_____

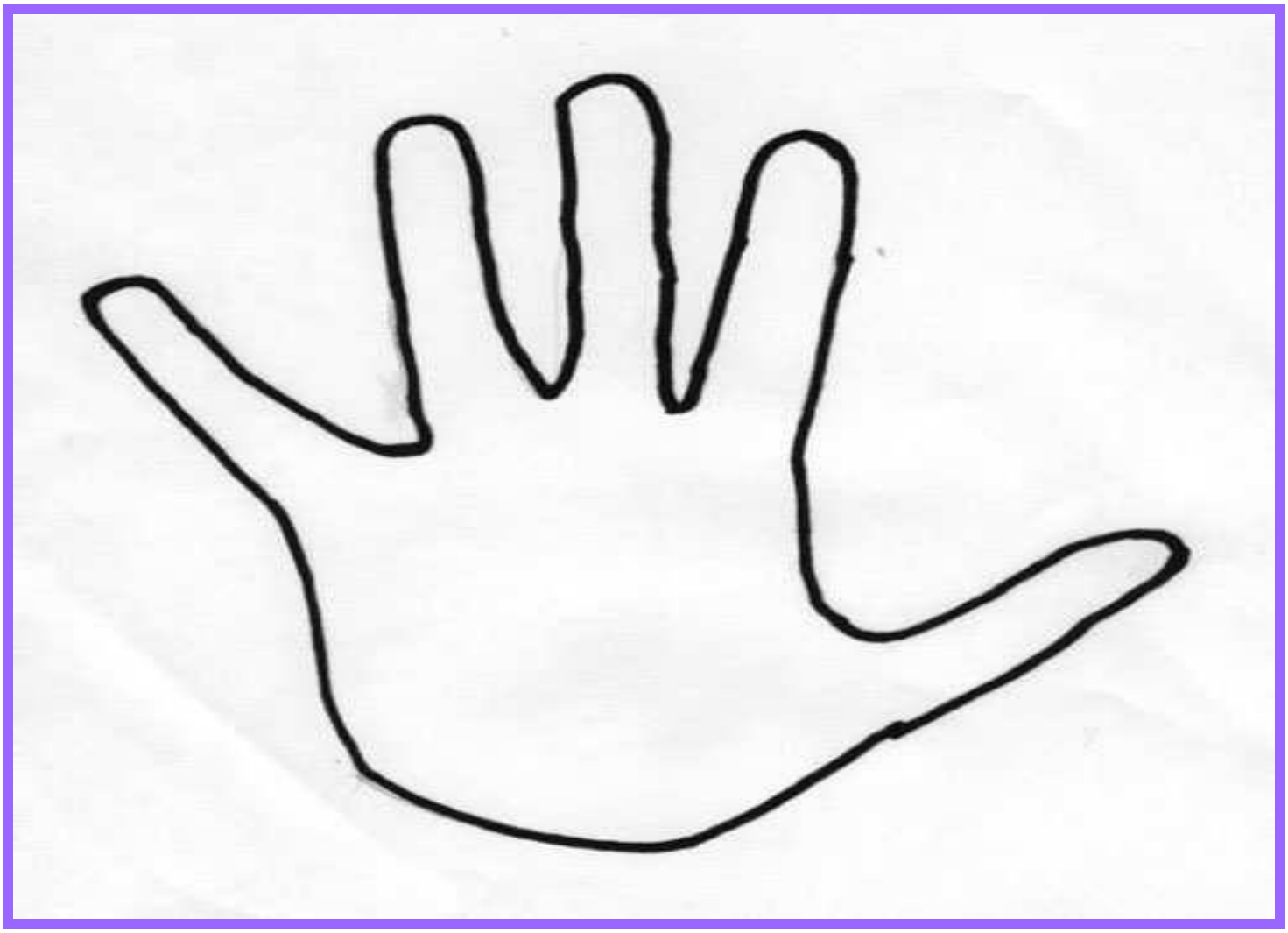
_____

_____

_____

Please record some notes about the 5 fingers of evolution below.

- http://www.youtube.com/watch?v=5NdMnlt2keE



Evolution is the change in the gene pool overtime.

Gene Pools can change when…

Populations can _____

- Diseases, extinctions, introduction of new better adapted species, predators.

Non-random _____

- Organisms choose strongest mate, ones in similar boundaries,

M_____ in the genes

- Genes can change. Some are good, some are bad.
- The environment will decide.

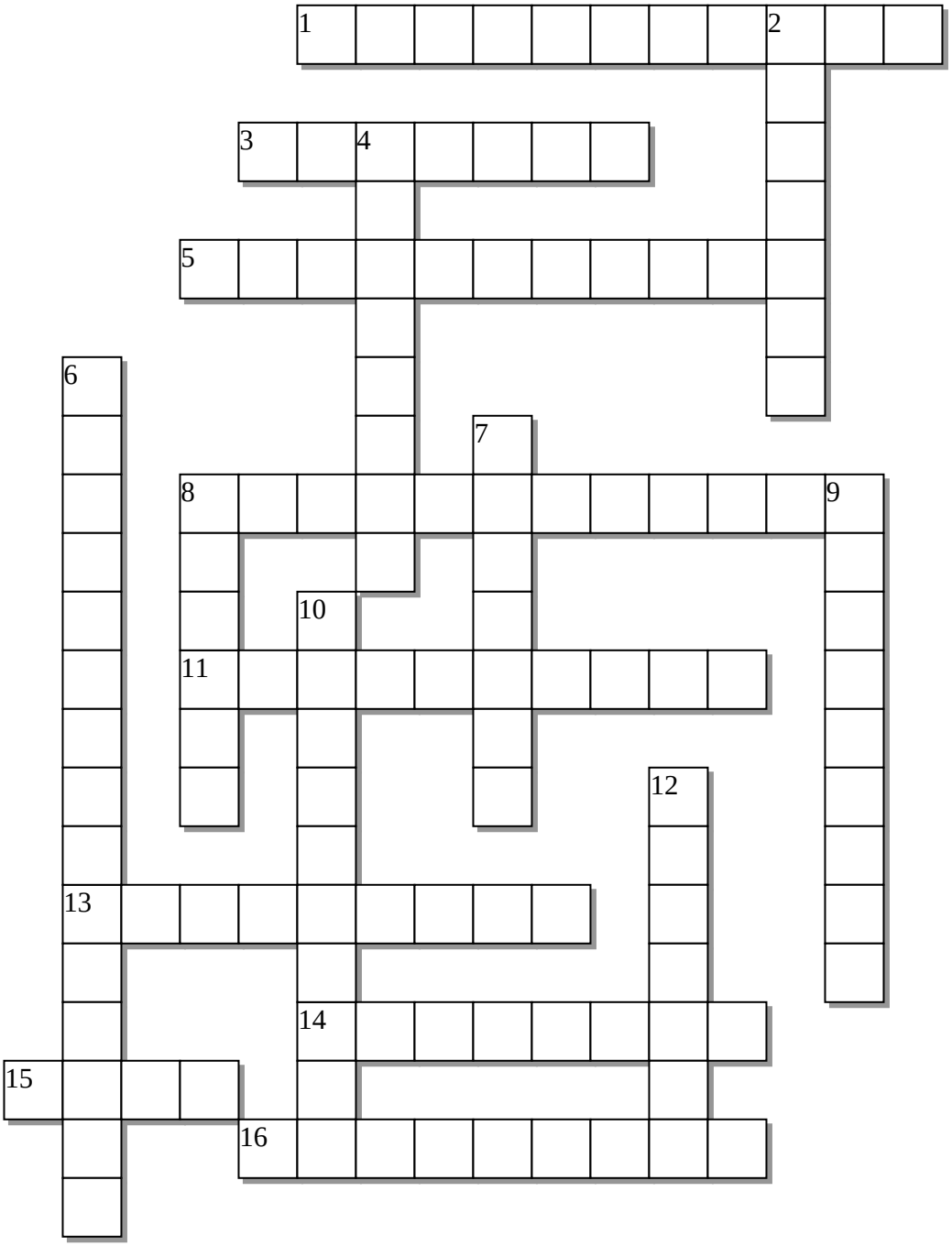
M_____ in and out of the population

- Immigration, gene flow.

N_____ _____

Adaptations to the environment that do well replace poor ones. Usually an advancement.

Mitosis and Meiosis Crossword

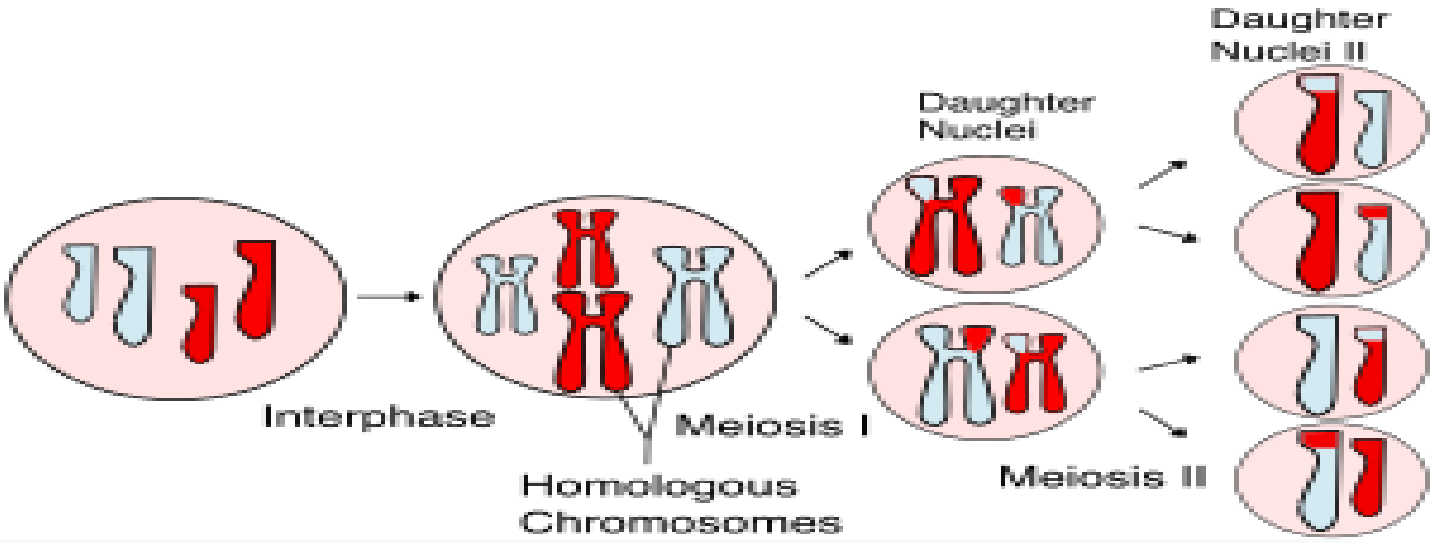


Across:
1 - These are not visible in the cell during interphase
3 - An Egg has 23 chromosomes. Is it haploid or diploid?
5 - This is when the cell breaks into two
8 - This term describes when genetic segments of information are swapped when the chromosomes are next to each other.
11 - Spindle fibers and microtubules attach to chromosome at the_____
13 - Chromosomes line up on equator of the cell during this phase of mitosis.
14 - Chromosomes get split at centromere
15 - Meiosis results in _____ the number of chromosomes
16 - Nuclear membrane begins to form during this phase

Down:
2 - This is the name for when one cell divides into two.
4 - Chromatin draws together to create chromosomes during this phase of mitosis
6 - This membrane breaks down during prophase.
7 - When a sperm an egg meet (46 chromosomes) . Is the cell haploid or diploid?
8 - This uncontrolled, unregulated cell growth and reproduction
9 - A _____ in the amount of genetic material occurs in Meiosis
10 - This phase of cellular division is most of the cells life.
12 - This is cell division that produces reproductive cells

Possible Answers:

Anaphase, Cancer, Centromere, chromosomes, CrossingOver, Cytokinesis, Diploid, Half, Haploid, Interphase, Meiosis, Metaphase, Mitosis, NuclearMembrane, Prophase, Reduction, Telophase



In meiosis, the chromosome or chromosomes duplicate (during interphase) and homologous chromosomes exchange genetic information (chromosomal crossover) during the first division, called meiosis I. The daughter cells divide again in meiosis II, splitting up sister chromatids to form haploid gametes. Two gametes fuse during fertilization, creating a diploid cell with a complete set of paired chromosomes.

Meiosis Review GAME

1-20 = 5 pts Lesson 4 Review Game

*20-*25 * = Bonus + 1 pt,

(Secretly write owl in correct space +1 pt) Score ____ / 100

Final Question = 5 pt wager

MY OATH IS	CROSSY ROAD	TIME TO REDUCE	MEIOSIS HODGE PODGE	CARTOON DOGS Bonus round 1 pt each
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

Final Question Wager ___ /5 Answer: _____

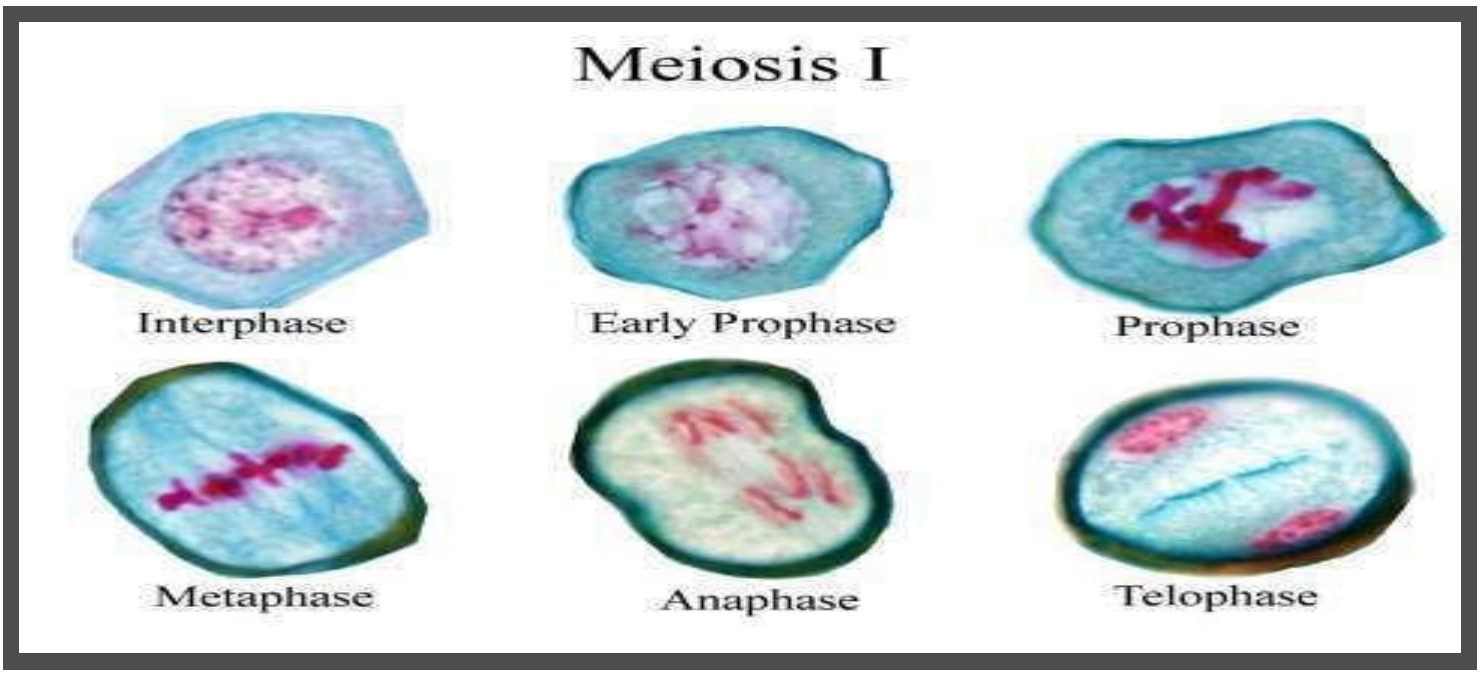
Part 4 Meiosis

Name:
Due:

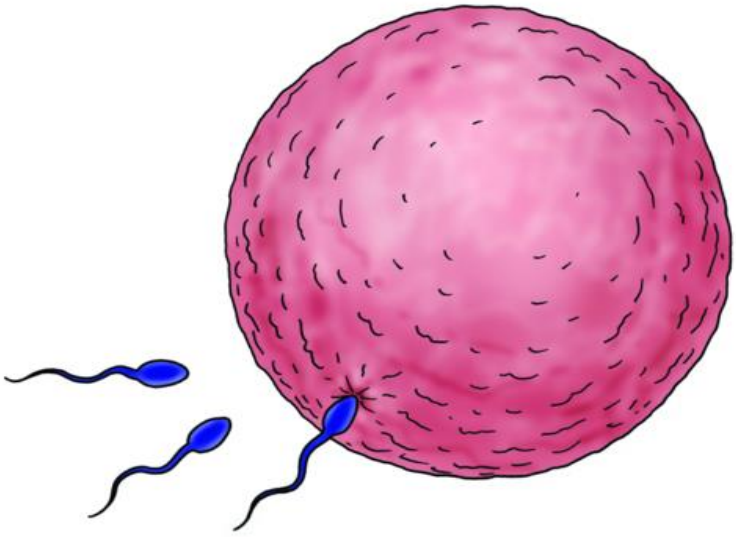
Part 4 Lesson 1 Sex Cells (Gametes)

Mitosis is 99.9% of your body's cells (Somatic Cells).
Meiosis occurs in your sex cells (Gametes).

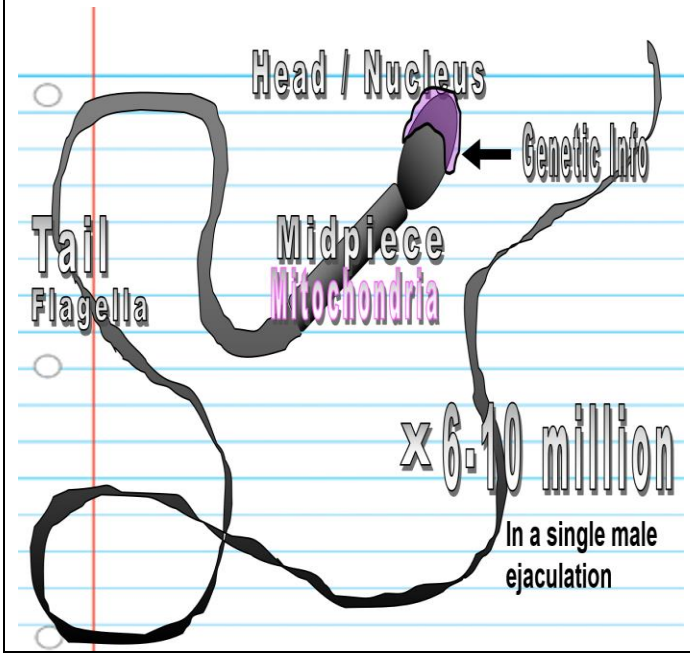
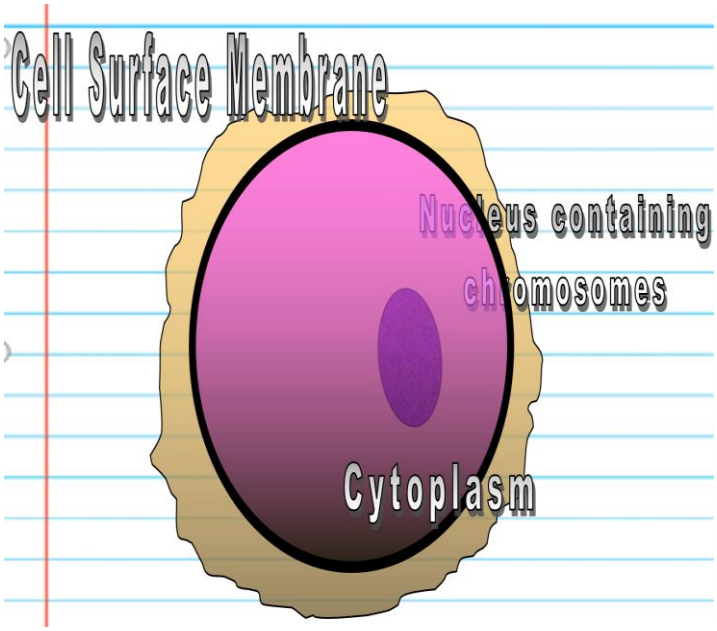
Meiosis I (First Part) has many similarities to mitosis. To refresh, name the phases of meiosis I below. Think iPPMAT!



Please name the two gametes below and please provide some information about them. The sperm (spermatozoa) and the egg or Ova
-How many chromosomes do they have? They're both haploid (23 chromosomes)
-Are they haploid or diploid? Haploid
-What's fertilization? the action or process of fertilizing an egg, female animal, or plant, involving the fusion of male and female gametes to form a zygote.



Step by drawing on a Sperm and Egg from the slideshow

Answer=	Answer=
	

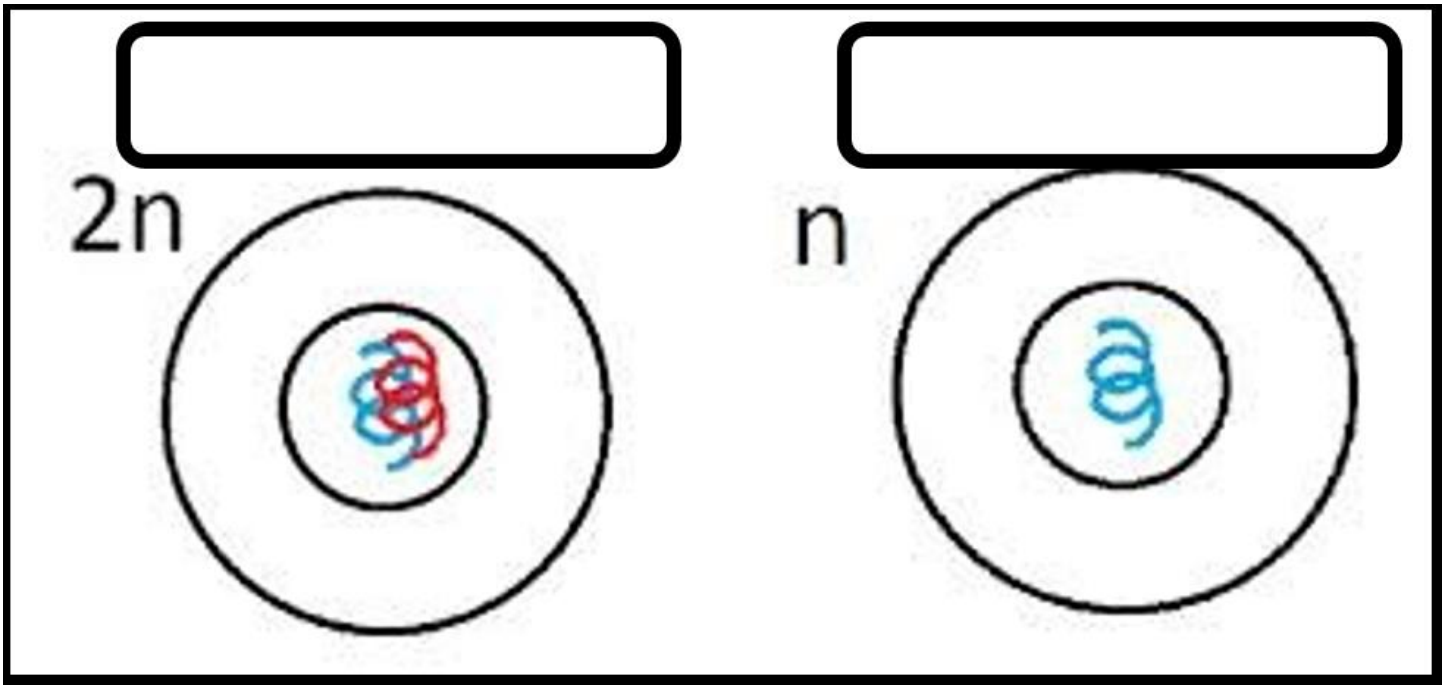
Name the number of chromosomes in each type of human cell below?

Brain Cell 46	Muscle Cell 46	Egg Cell 23	Liver Cell 46
Heart Cell 46	Nerve Cell 46	Skin Cell 46	Sperm Cell 23

Which one is Haploid and Which one is Diploid?

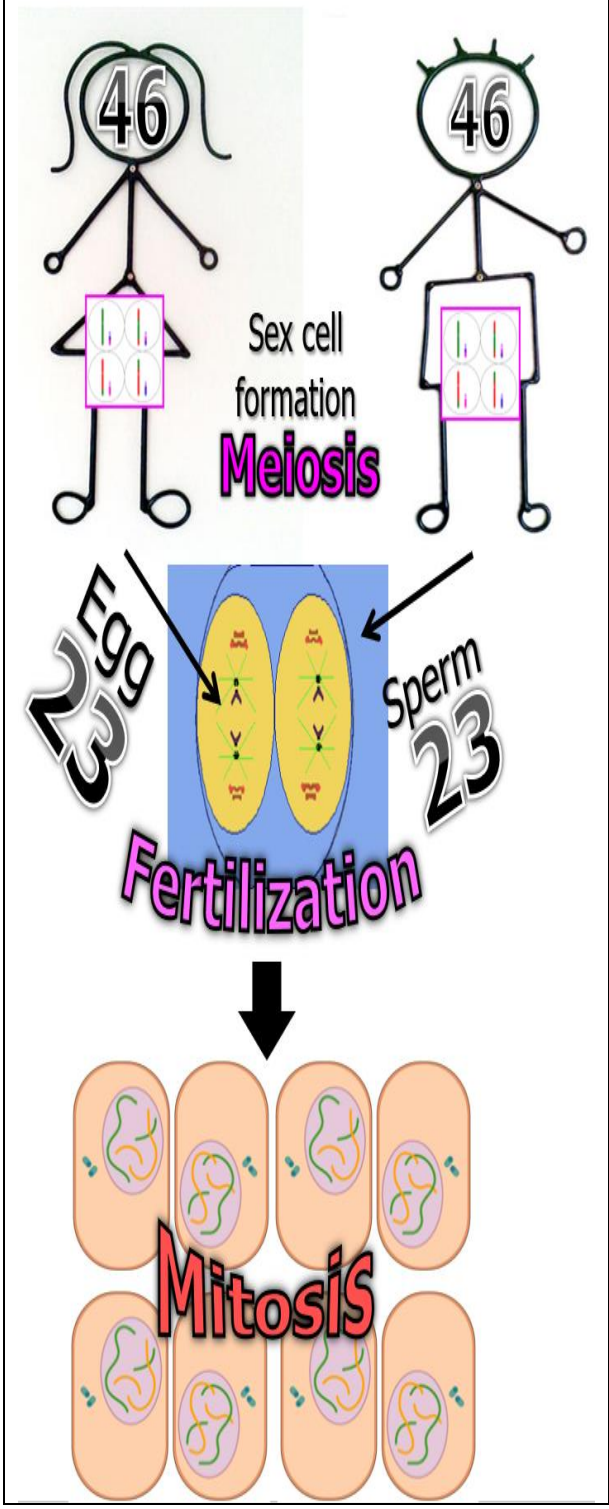
2n Diploid

1n Haploid



Sexual Reproduction: Both parents provide half of the genetic information.

Using this diagram and your science words please…! How are babies made? Words to use: Gametes, Sperm, Egg, Meiosis, Haploid, Fertilization, Diploid, Mitosis, Zygote	Example / Answers will vary. Babies are made from special sex cells called gametes. The male sex cell is called the sperm and is released though the penis. If the sperm can enter through the female vagina and can combine with the female sex cell called the egg, a process called fertilization will occur. Each of these cells is produced by a process called meiosis which makes cells containing half the information of the parent. The sperm and eggs are both haploid and unite to create a diploid zygote. Once united, the cells will divide through mitosis. Nine months later a baby will be born. This baby will make lots of poop and require diapers. Other Human reproduction is any form of sexual reproduction resulting in human fertilization. It typically involves sexual intercourse between a man and a woman. During sexual

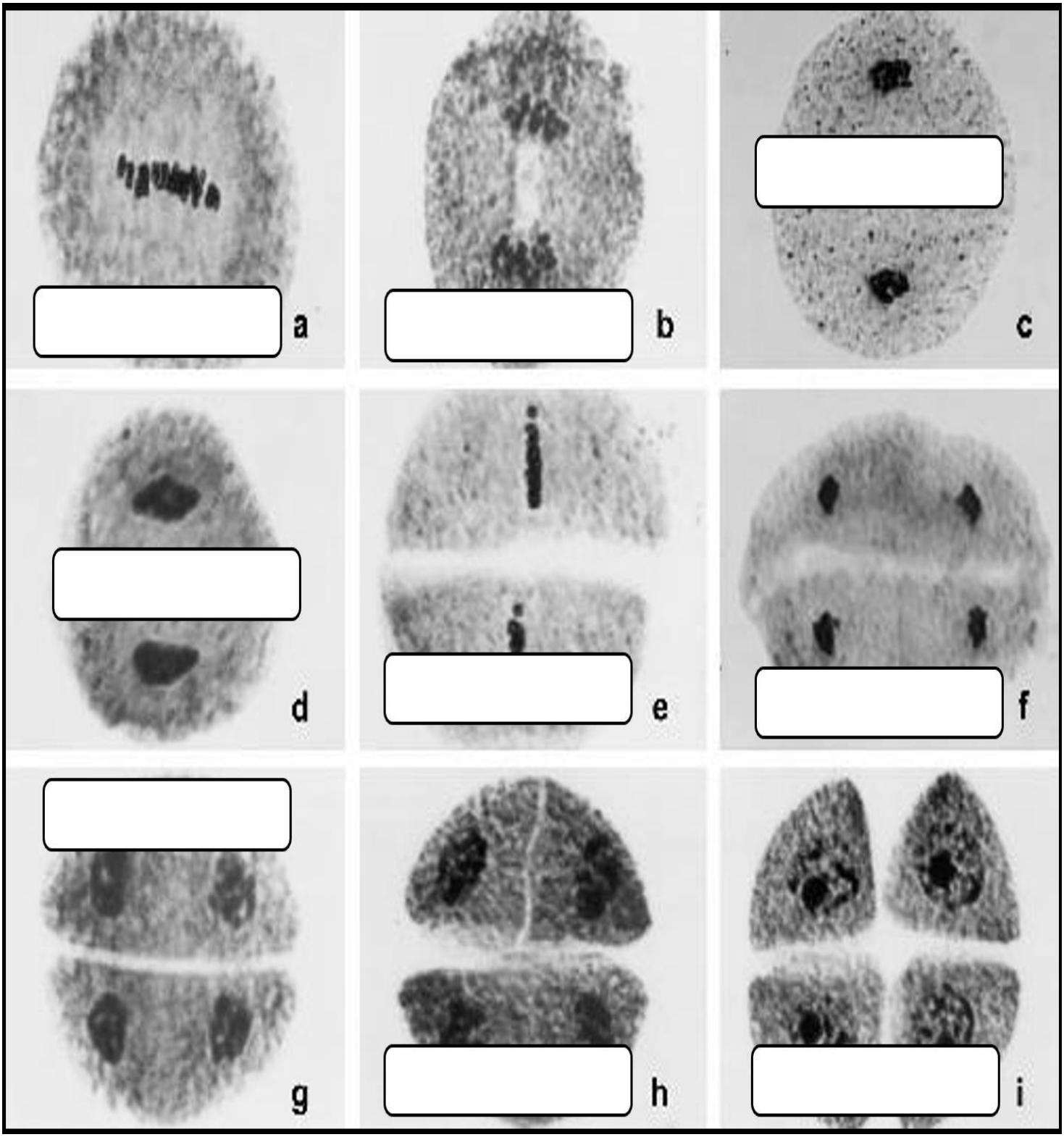


intercourse, the interaction between the male and female reproductive systems results in fertilization of the woman's ovum by the man's sperm. These are specialized reproductive cells called gametes, created in a process called meiosis. While normal cells contains 46 chromosomes, 23 pairs, gamete cells only contain 23 chromosomes, and it is when these two cells merge into one zygote cell that genetic recombination occurs and the new zygote contains 23 chromosomes from each parent, giving them 23 pairs. A typical 9-month gestation period is followed by childbirth.

Part 4 Lesson 2 Meiosis Students just write in each phase, Ex. a=metaphase 1

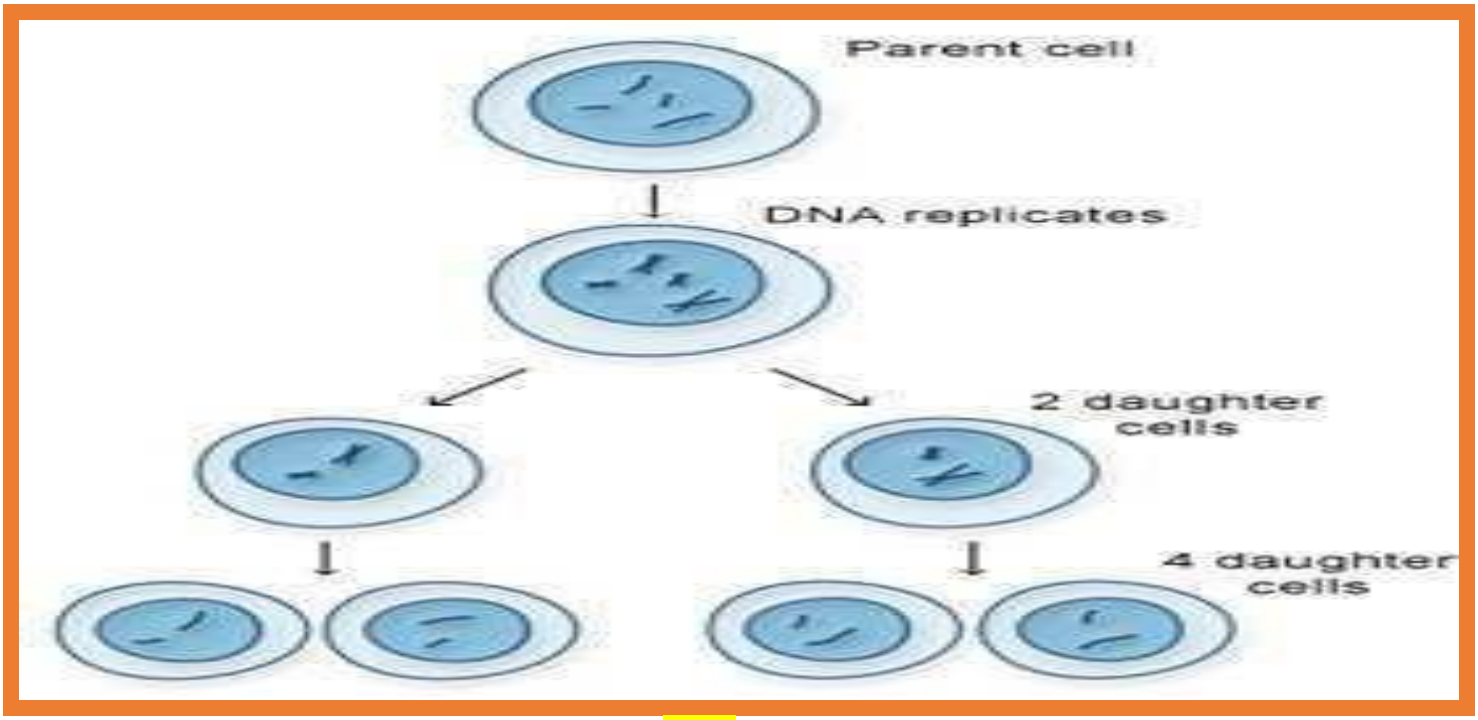
Please just write in the phases and some info below next to the correct picture.

(a) - Metaphase I of Meiosis (b) - Anaphase I of Meiosis (c) - Telophase I of Meiosis (d) - Telophase/Cytokinesis I of Meiosis (e) - Metaphase II of Meiosis (f) - Anaphase II of Meiosis (g) - Telophase II of Meiosis (h) - Late Telophase/Early Cytokinesis II of Meiosis (i) - Cytokinesis II of Meiosis resulting in 4 genetically unique daughter cells



Meiosis…

- -Has two cell divisions.
- -A reduction in the amount of genetic material.
  - -Results in half the number of chromosomes.



Homologous chromosomes: Chromosome pairs that are inherited from each parent.

Synapsis: The pairing of two homologous chromosomes that occurs during meiosis.

- Allows for crossing over.

Crossing Over / Homologous Recombination: Genetic segments of information are swapped during synapsis.

- Creates millions of possibilities

Independent orientation: Chromosomes align along the metaphase plate in metaphase I.

- One chromosome is inherited from your mother and the other from your father.
- Two possibilities; each pole has a 50% chance of inheriting one or the other.

Reduction of genetic information

- Produces four different germ cells (reproductive cells).

Scientists call the factors that control traits genes.

-The different forms in genes are called alleles.

Mendel's law of segregation: Allele pairs separate or segregate during gamete formation, and randomly unite at fertilization.

Organisms inherit two alleles for each trait when gametes are produced.

Allele pairs separate leaving each cell with a single allele for each trait.

Part 4 Lesson 3 Meiosis Wrap-Up

Important Events in Meiosis

- 1.) Two cell divisions that end without DNA replication. (leads to a reduction of genetic information)

- 2.) Pairing of homologous chromosomes that lead to crossing over creating genetic variation.
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Mendel's Laws of Heredity:

- 1) The Law of Segregation: Each inherited trait is defined by a gene pair. Parental genes are randomly separated to the sex cells so that sex cells contain only one gene of the pair. Offspring therefore inherit one genetic allele from each parent when sex cells unite in fertilization.
- 2) The Law of Independent Assortment: Genes for different traits are sorted seperately from one another so that the inheritance of one trait is not dependenent on the inheritance of another.
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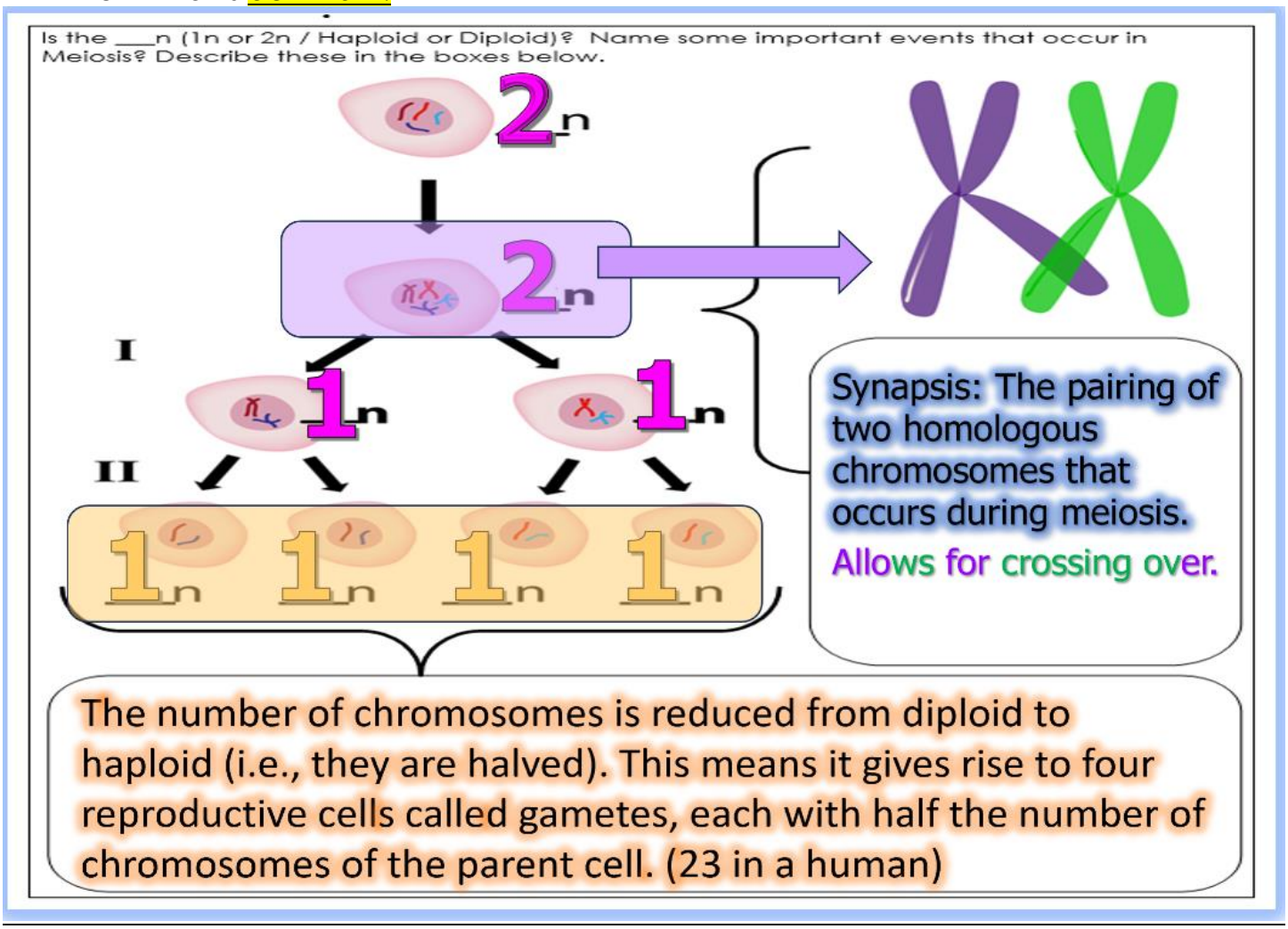
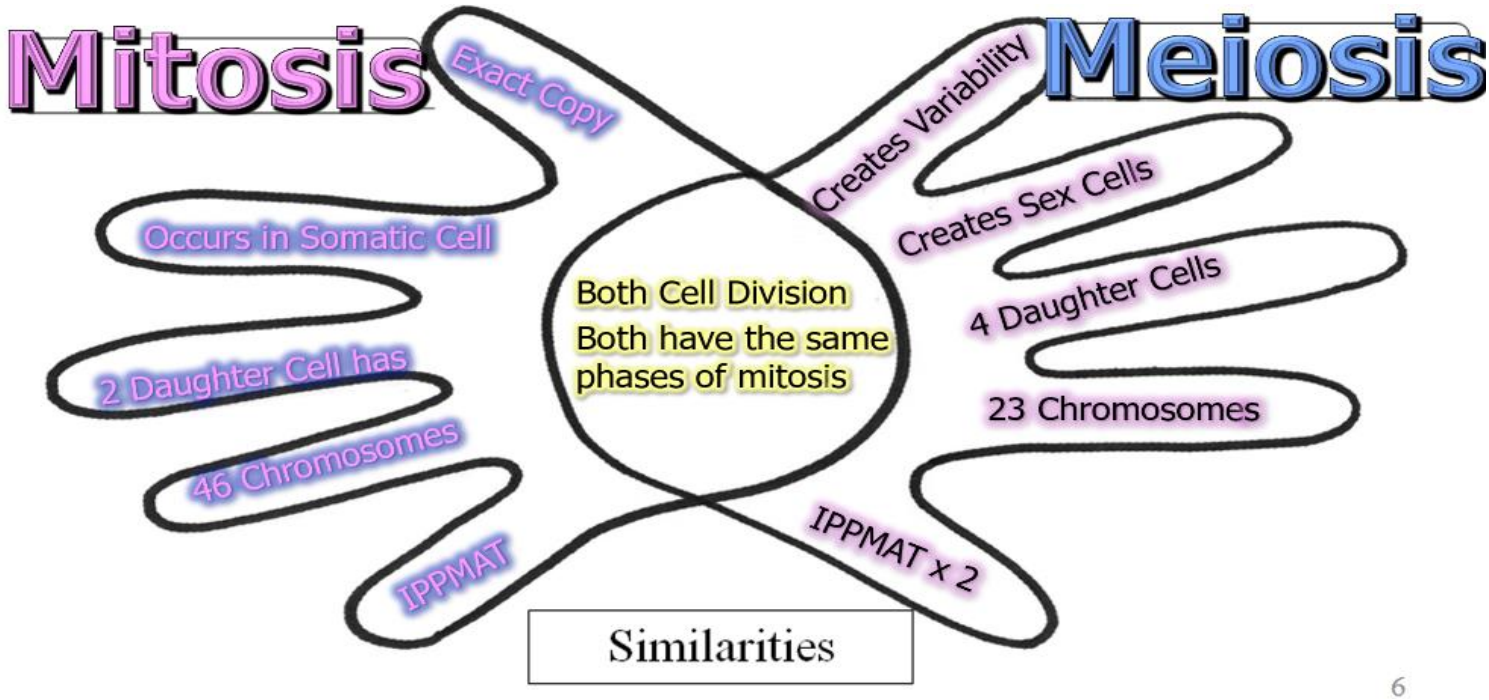


What are some similarities and differences between mitosis and meiosis? Use the Venn Diagram below to assist you.



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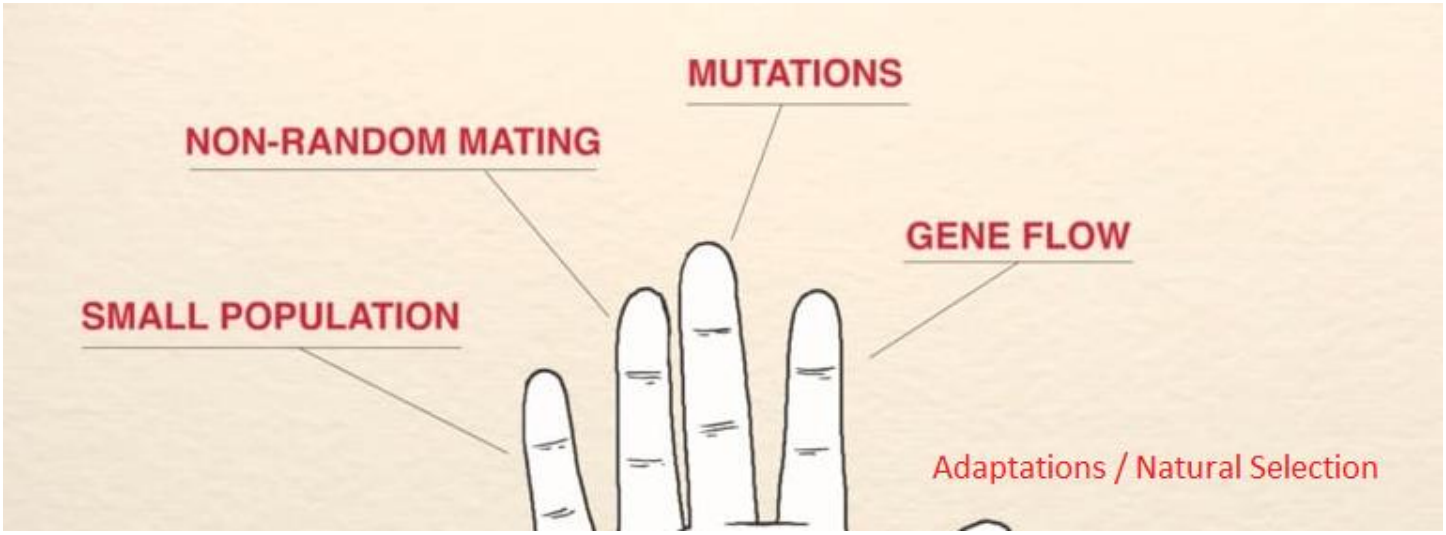

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Evolution is the change in the gene pool overtime.

Gene Pools can change when…

Populations can shrink

Diseases, extinctions, introduction of new better adapted species, predators.

Non-random mating

Organisms choose strongest mate, ones in similar boundaries,

Mutation in the genes

Genes can change. Some are good, some are bad.

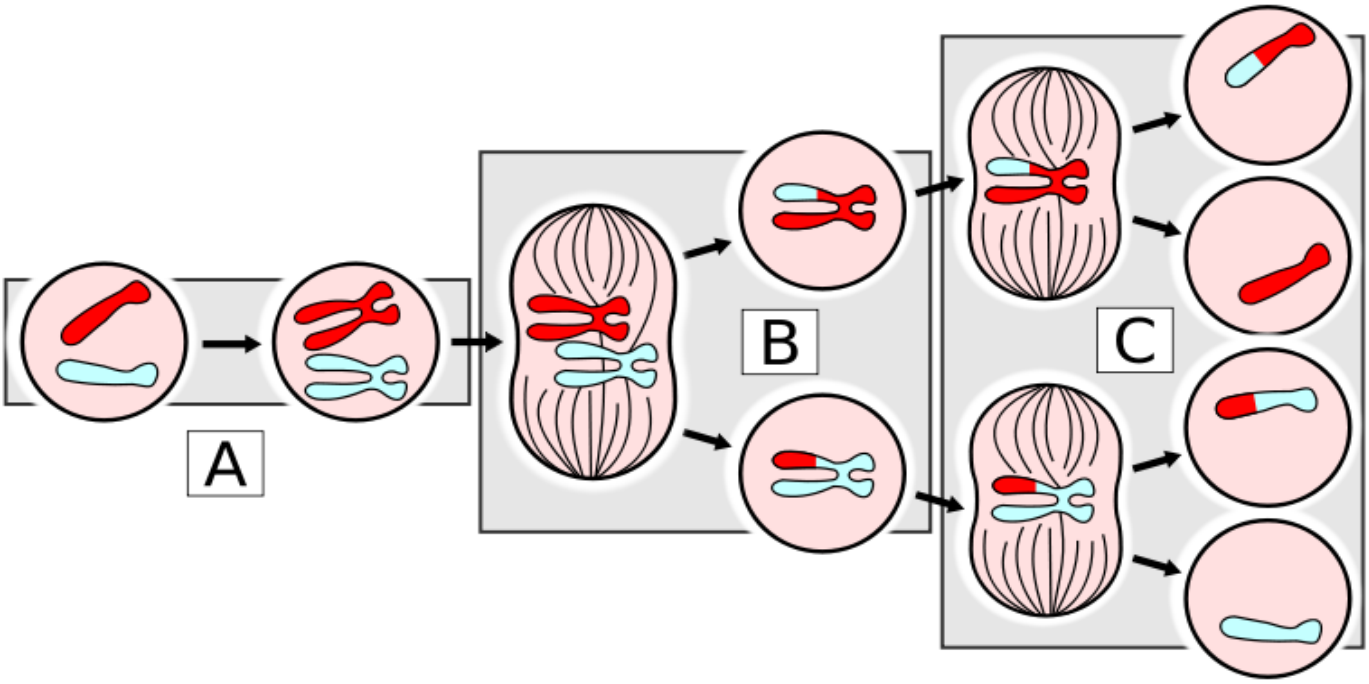
The environment will decide.

Movement in and out of the population

Immigration, gene flow.

Natural Selection Adaptations to the environment that do well replace poor ones. Usually an advancement.

Please describe A, B, and C. How do these events create genetic variability (differences)? Word Bank to help you with research: Meiosis II, Meiosis I, DNA Replication



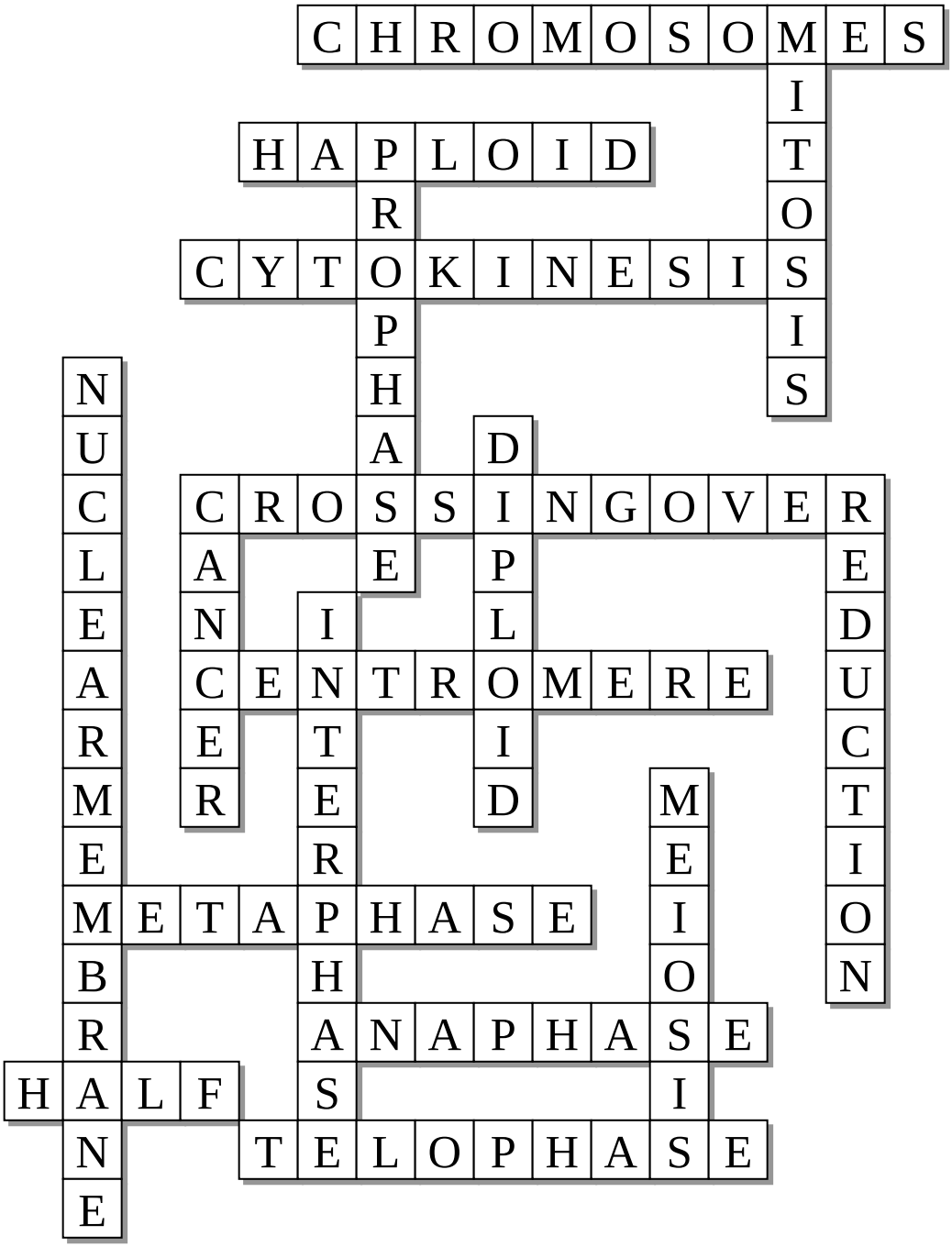
A: **DNA replication** is the process of producing two identical replicas from one original DNA molecule. This biological process occurs in all living organisms and is the basis for biological inheritance.

B: **Meiosis I,** chromosomes condense along the center of the nucleus (prophase I), and pair with their homologues during crossing over (metaphase I). Next, the pairs of chromosomes separate and move to opposite ends of the cell (anaphase I). . The cell divides for the first time producing two cells (telophase I). The two cells will undergo meiosis II wherein both of them divide further into two cells.

C: **Meiosis II:** The two cells produced from meiosis I divides further into two cells, each containing one of every chromosome's sister strands (chromatids), thus, producing four genetically different, haploid cells.

Name:_____
Date:_____

Mitosis and Meiosis Crossword


CHROMOSOMES
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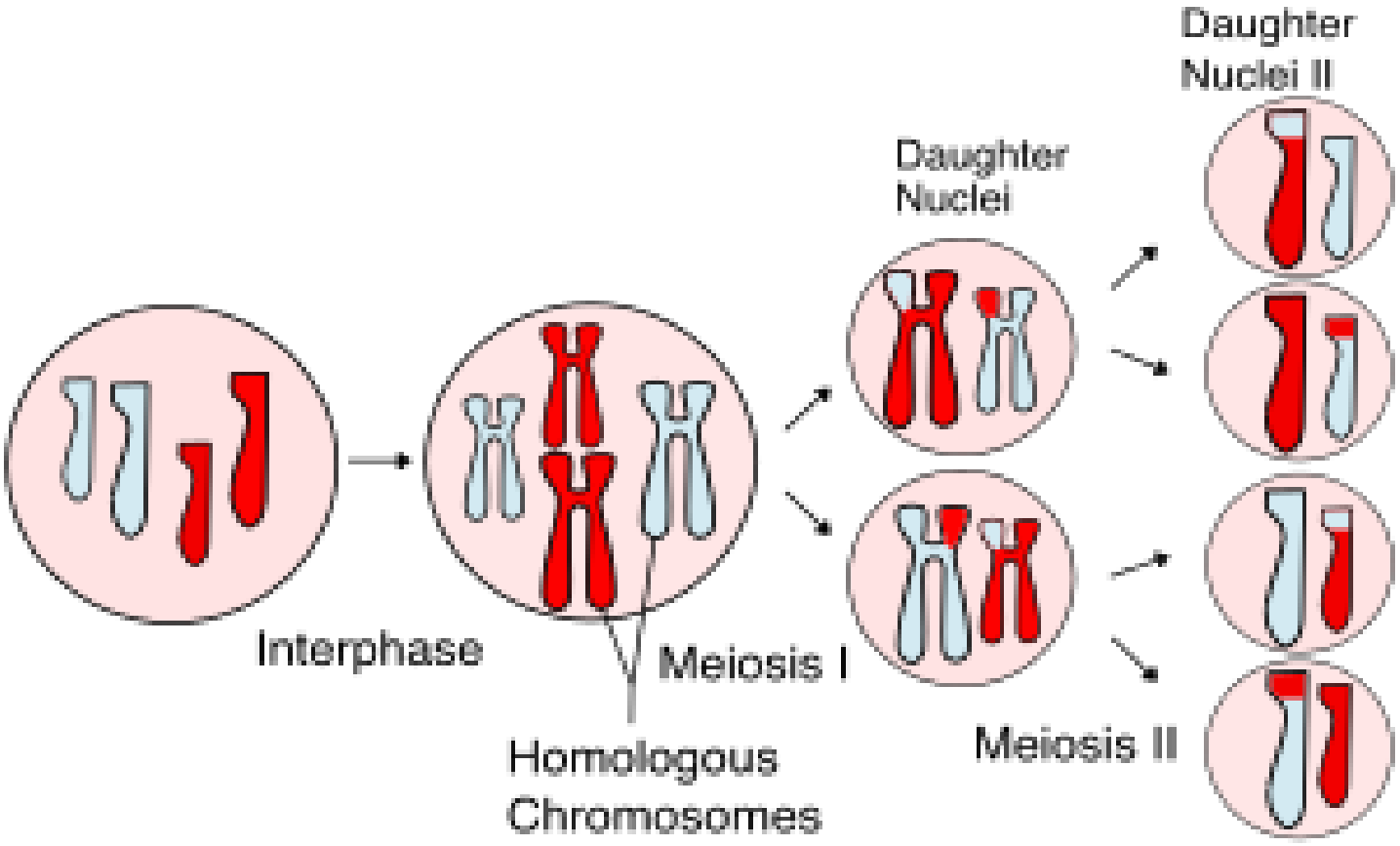

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Meiosis Review GAME

1-20 = 5 pts Lesson 4 Review Game
*20-*25 * = Bonus + 1 pt,
(Secretly write owl in correct space +1 pt) Score ____ / 100
Final Question = 5 pt wager

MY OATH IS	CROSSY ROAD	TIME TO REDUCE	MEIOSIS HODGE PODGE	CARTOON DOGS Bonus round 1 pt each
1) MITOSIS	6) C.) Homologous Chromosome	11) D.) Alleles	16) 23 Chromosomes	*21) *Astro from Jetsons
2) GAMETES	7) Crossing-Over/ Homologous Recombination	12) segregation	17) 46 Chromosomes	*22) *Santa's Little Helper From Simpsons
3) SPERM & EGG	8) A=Diploid B=Haploid	13) #4 is NOT A STEP	18) Mutations	*23) *Brian from Family Guy
4) MEIOSIS	9) Reduction	14) Orientation	19) Movement (in and out of population)	*24) Gromit from Wallace and Gromit
5) REDUCTION	10) Genes	15) #2 is Not Part of Mendel	20) Natural Selection	*25) McGruff the Crime Dog

- Final Question Wager ____/5 Answer: Not AN EVENT IN MEIOSIS= #1.) One cell division that ends with DNA replication. (leads to a copy of genetic information)