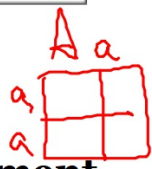


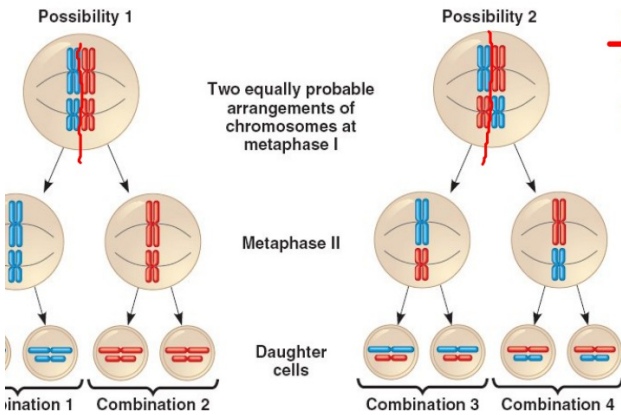
This picture shows

Crossing Over
 Independent Assortment
 Fertilization



Which of the following does NOT increase genetic variation?

Crossing Over
 Independent Assortment
 Random Fertilization
DNA Replication



This picture shows different possibilities of gametes because of the way the chromosomes lined up in metaphase. This is known as:

Crossing Over
Independent Assortment
 Fertilization

$2n = 20$

If the diploid number is 20, what is the haploid number?

$n = 10$

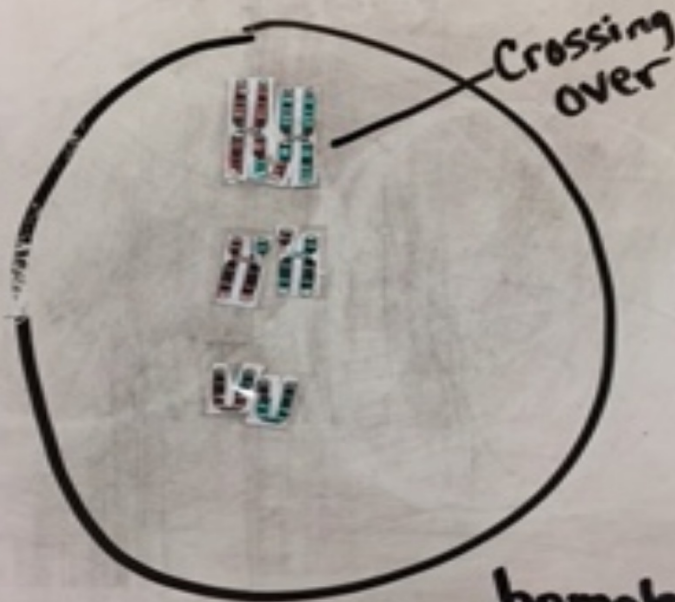
Objective: The student will be able to identify how the chromosomes are sorted in meiosis

**Agenda: Warm up
Meiosis Review
Exit Card Quiz on myMCPS**

Homework: Unit test on Tuesday



Meiosis



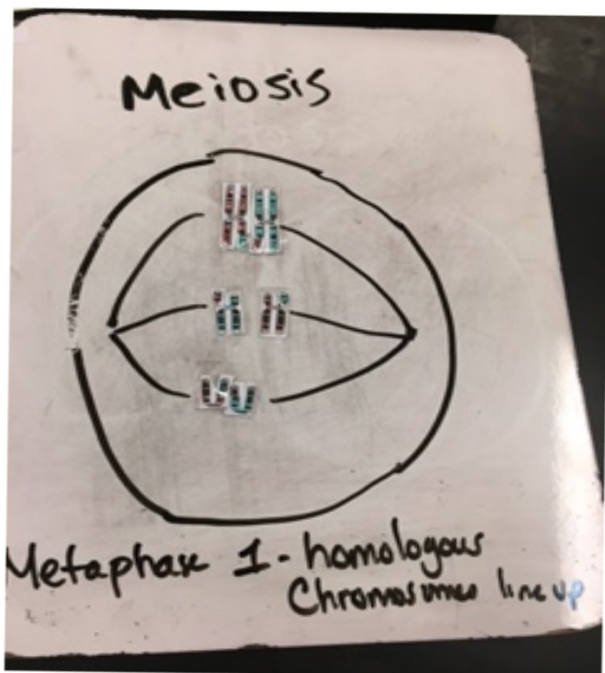
Crossing over

Prophase

1

homologous
Chromosomes
form tetrads
& Cross over

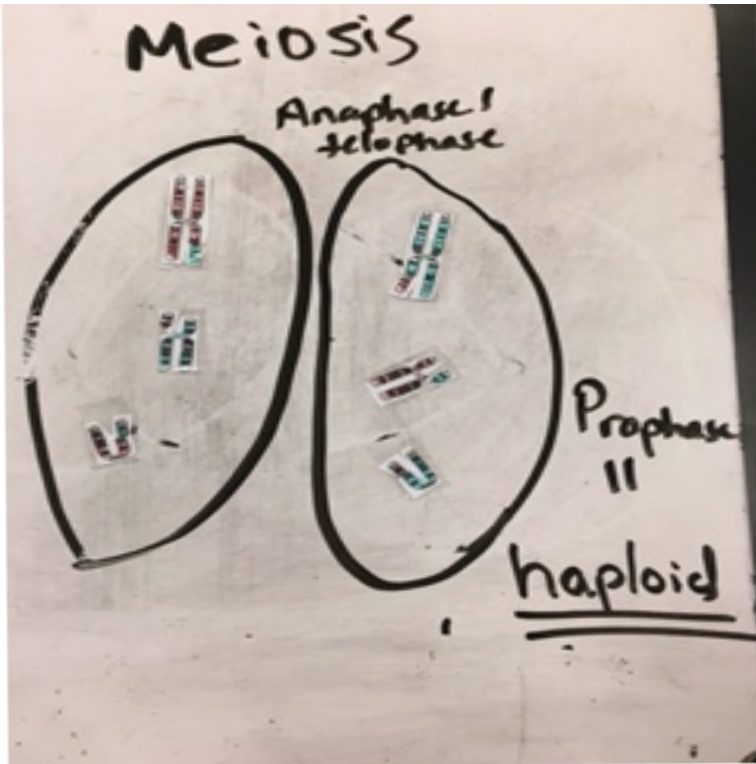
Get out
What's Buggin
you lab



Homologous chromosomes line up.

**Independent assortment:
It is random the order that the chromosomes line up.**

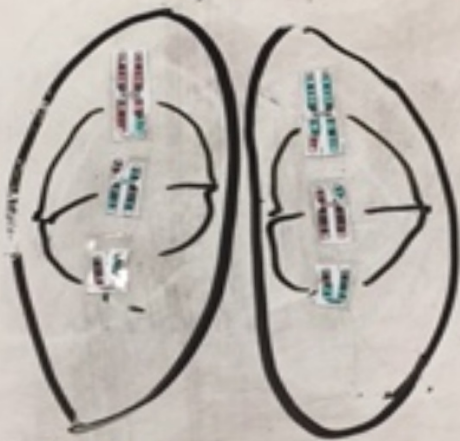
NOT all of the "mom" versions line up on one side and the "dad" versions line up on the other side. It IS MIXED.



**Homologous
Chromosomes
Separate**

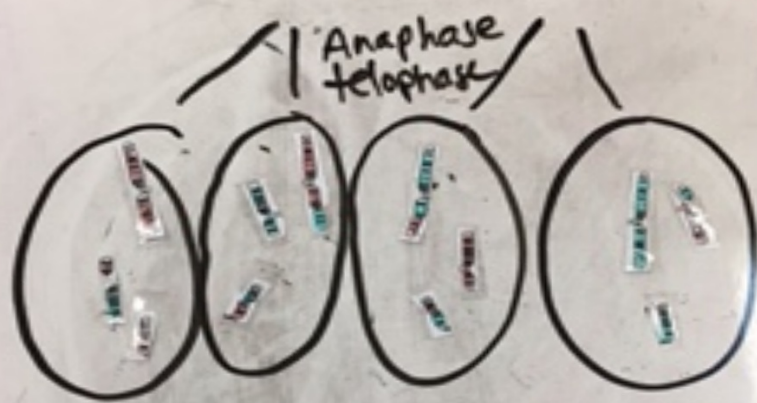
**New cells are now
HAPLOID**

Meiosis



Metaphase 2 -
Non-identical Sister Chromatids
will Split

Meiosis



4 haploid
gametes that are
unique

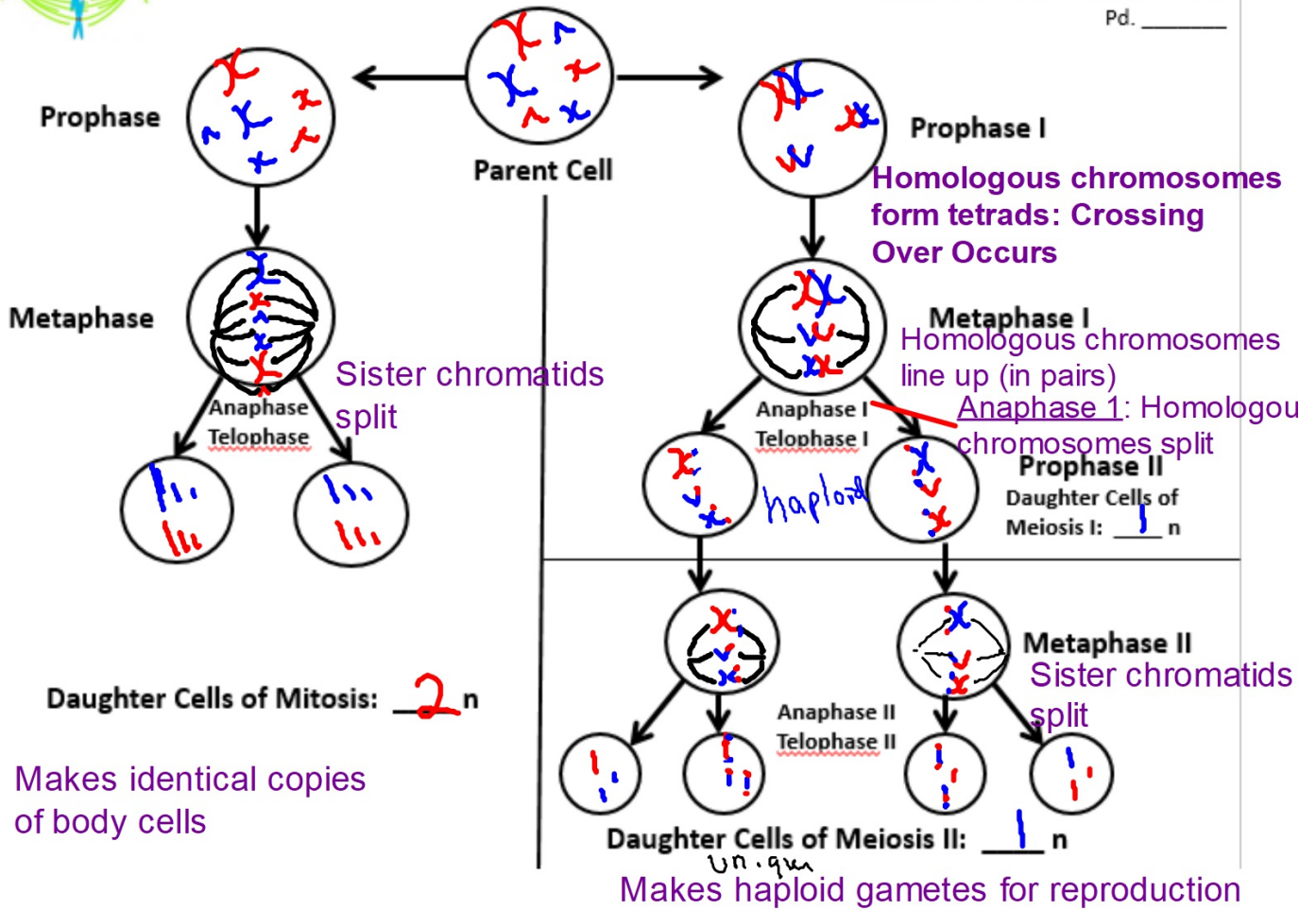


Mitosis VS. Meiosis

Name: _____

Date: _____

Pd. _____



Part 2: Modeling MEIOSIS

1. Use the columns of chromosomes on the back labeled for **meiosis**.
2. Color the homologous chromosomes. One color will represent the chromosomes of the mother and the other color represents the chromosomes of the father. Remember, these chromosomes need to be colored at random.

Mother's color: Red Father's color: Blue

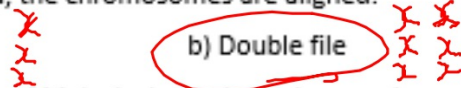
3. Using a large piece of paper, draw one large circle to represent the cell. Place your chromosomes as they would be in **metaphase I** of meiosis.
 - A. How many chromosomes at this point? 6 2
 - B. How many copies of each chromosomes at this point? 2
 - C. Is the cell haploid or diploid?
4. Cut your chromosomes apart as they would be separated during **anaphase I** of meiosis. Draw two smaller circles on your large paper to represent the two daughter cells. Place your chromosomes in the daughter cells as they would appear in **metaphase II**.
 - A. How many chromosomes at this point? 3 1
 - B. How many copies of each chromosomes at this point? 1
 - C. Is the cell haploid or diploid?
5. Cut your chromosomes apart as they would be separated during **anaphase II** of meiosis. Draw four smaller circles on your large paper to represent the four daughter cells. Place your chromosomes in the daughter cells.
 - A. How many chromosomes at this point? 3
 - B. How many copies of each chromosomes at this point? 1
 - C. Is the cell haploid or diploid?

Analysis Questions

_____ 6. During **metaphase I**, the chromosomes are aligned:

a) Single file

b) Double file



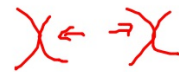
_____ 7. During which phase of Meiosis do the **homologous chromosomes** separate from each other?

a) Metaphase I

b) Anaphase I

c) Metaphase II

d) Anaphase II



_____ 8. During which phase of Meiosis do the **sister chromatids** separate from each other?

a) Metaphase I

b) Anaphase I

c) Metaphase II

d) Anaphase II



9. During which phase of Meiosis do tetrads form? _____

Prophase I

10. If **diploid cells** in a porcupine have 34 chromosomes, how many chromosomes will the **gametes** have?

17

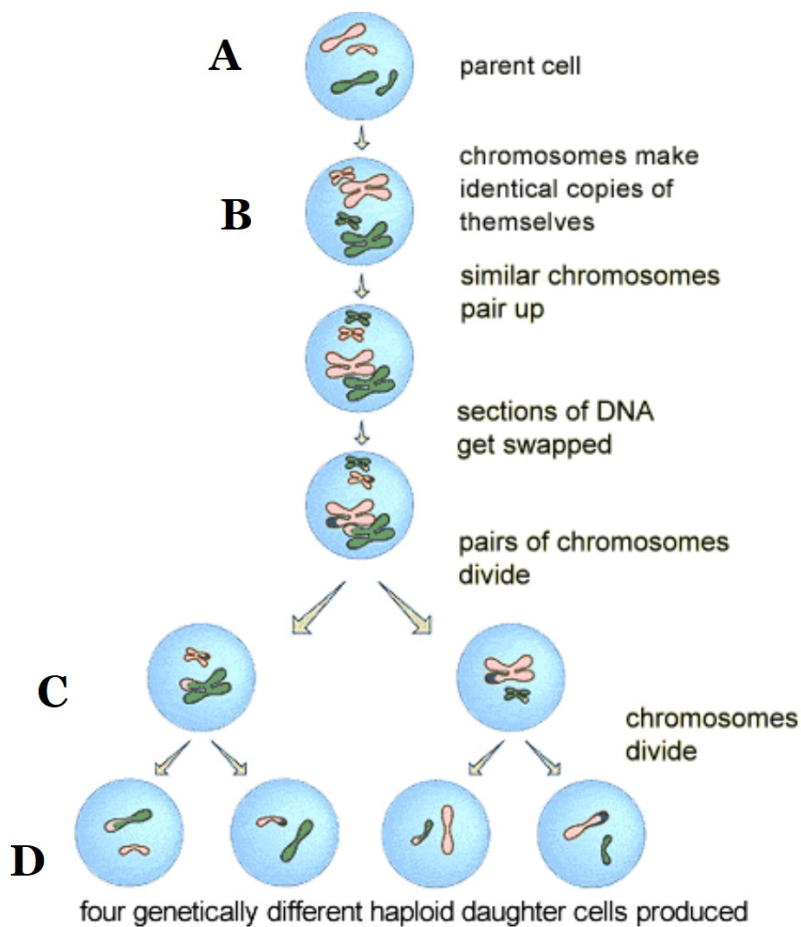
$2n = 34$

$n = 17$

	MITOSIS	MEIOSIS
# of Divisions	1	2
# of Daughter Cells	2	4
Genetically Identical?	Yes	No
Does Crossing Over Occur?	No	Yes
Chromosome # in daughter cell compared to parent cell	Same	Half
Daughter Cells Diploid or Haploid	Diploid	Haploid
Where?	Body Cells	Testis or Ovaries
When?	All of life	After Puberty
Role	Growth replace worn out cells	Preparation for reproduction
Name of Cells	Somatic Cells	Gametes - Sperm, Egg



Sperm, Egg



Which cells are diploid?

Which cells are haploid?

Which cells are gametes?

Which cell has homologous chromosomes but NOT sister chromatids?

Fun with math

20 chromosomes in a body cell. How many are each gamete?

$$2n = 20 \quad n = 10$$

20 chromosomes in a sperm cell. How many are in the zygote?

$$n = 20 \quad 2n = 40$$

20 chromosomes are in a body cell. How many are in a zygote?

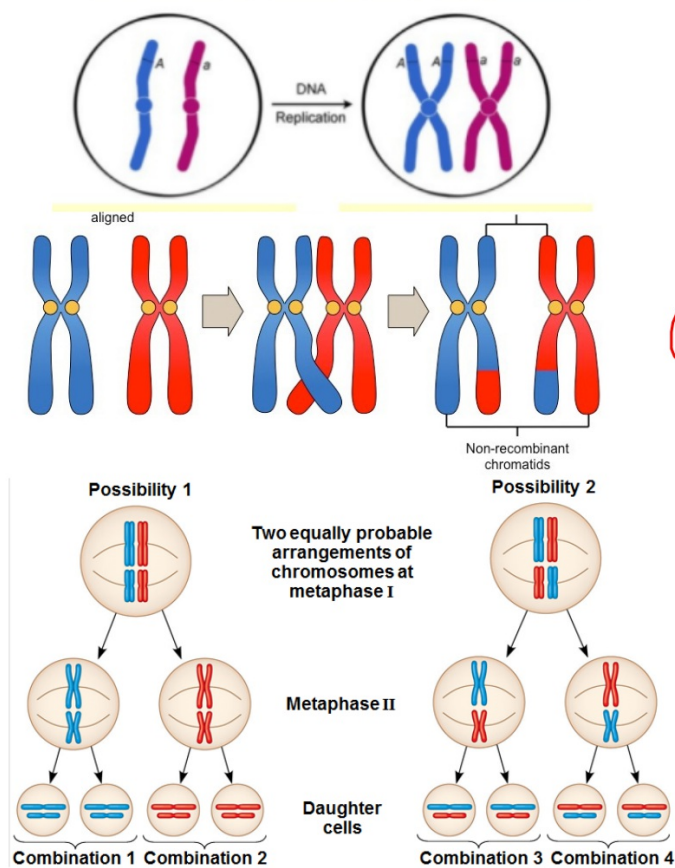
$$2n = 20 \quad 2n = 20$$

How does the number of chromosomes change during meiosis?

$$\frac{1}{2}$$

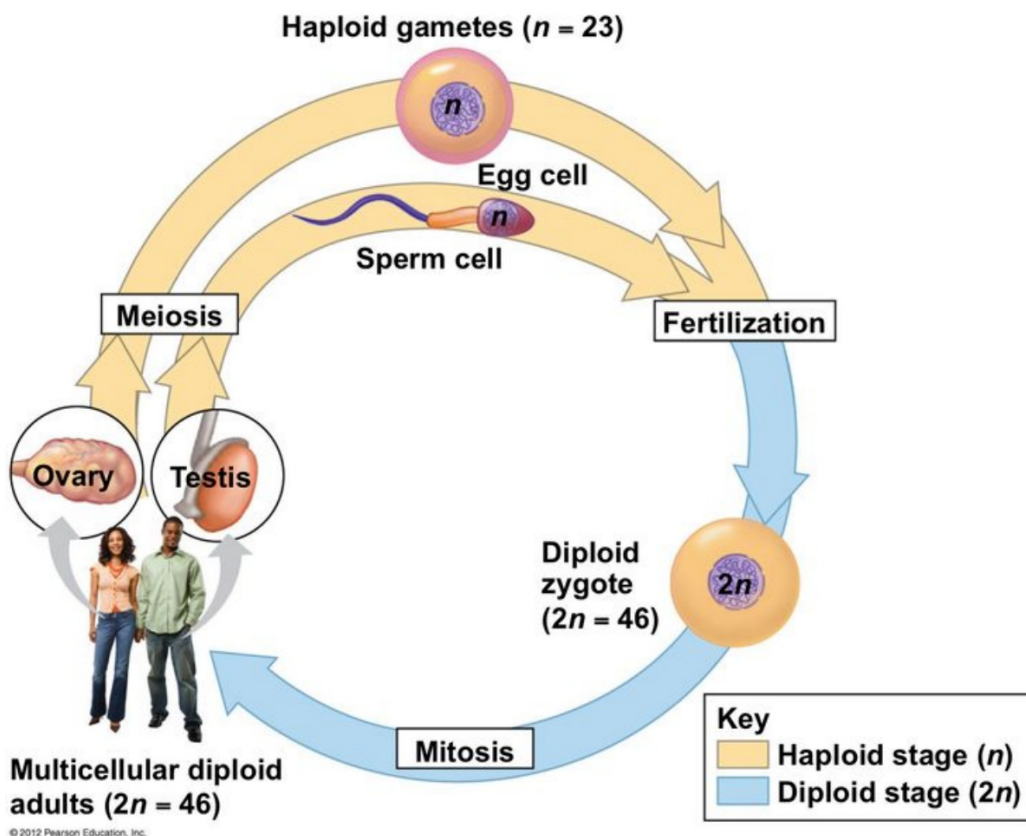
What is the purpose of changing the number of chromosomes in meiosis?

What things happen during meiosis?



Crossing Over

Independent Assortment



How does fertilization change the number of chromosomes?



As you watch the video pay attention to what happens in each phase of meiosis.

Get out your study guide for the test:

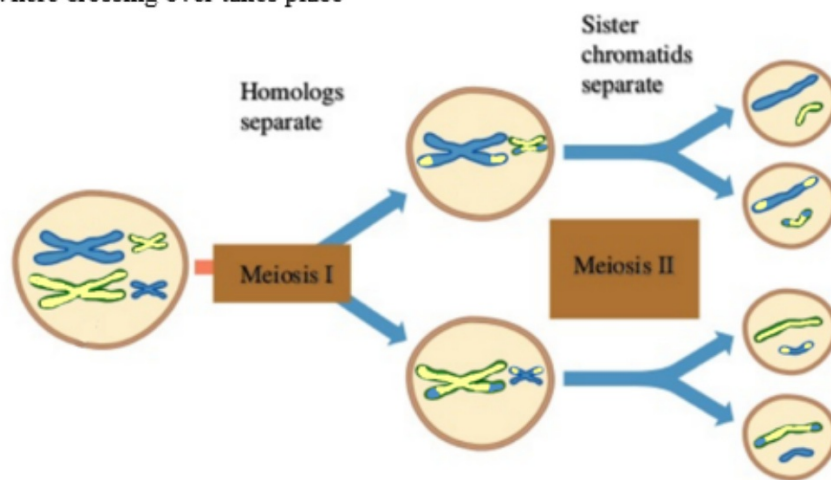
Answer questions 32-46

Meiosis:

32. What is Meiosis? What is the final result? _____
33. Define "Diploid". _____
34. Define "Haploid". _____
35. What kind(s) of cells are diploid in the human body? _____
36. What kinds(s) of cells are haploid in the human body? _____
37. How many times does the cell divide in meiosis? _____
38. What is crossing over? What is the result? What process is it a part of?
39. Which of the following leads to greater variation? (Crossing Over, Independent Assortment, Random Fertilization, DNA Replication) (can be more than one answer)

40. The following diagram shows Meiosis. On this diagram, label:

- i. all cells as haploid or diploid
- ii. Gametes
- iii. Where crossing over takes place



41. What is fertilization? _____

42. What is the end result of fertilization? _____

43. Label cells as haploid or diploid, and label zygote, male gamete, female gamete. Write in chromosome number for humans.



44. If an organism's skin cells have 40 chromosomes, how many chromosomes are in its:

a. Sperm cells: _____

d. Zygote: _____

b. Gamete: _____

e. Brain cells: _____

c. Egg cells: _____

Mitosis vs Meiosis

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

46. Mitosis, meiosis or both:

i. Creates skin cells: _____ Includes two cell divisions: _____











ii. Creates sperm cells: _____ Creates variation in offspring: _____

iii. Creates cancer cells: _____ Type of cell division: _____

iv. Creates gametes: _____

Take myMCPS Quiz on Meiosis

03 DNA and Protein Synthesis

  23 myMCPS H Meiosis Exit Card Quiz 7 pts		
  myMCPS DNA Structure and Replication and RNA Exit Card 5 pts		
  Mrs. McGaffin's weebly page ↗	