Name: _____ Date: _____ Period: _____

The Life and Times of Snurfles! PAP

Go to **www.biologybynapier.com** , go to the "**January 7 – january 24 Meiosis and Genetics Unit Page**" in the left margin. Scroll down to the "**Click here for Snurfles**" Link. When the Bioman page opens, Click on **Genetics and Meiosis** in the left margin, then **Snurfle Meiosis and Genetics**, Click **Start a New Game**, Click **Meiosis Interactive** to begin.

Having problems? Troubleshoot! →

If website is not playing, click its "Home" button for newest edition.
Can't find simulation? Click on Genetic and Meiosis in the left Margin of the Bioman site.

Answer the following questions as you play:

1. Interphase comes _____ Meiosis.
2. What must happen to the DNA before Meiosis can occur?
3. What is the purpose of meiosis?
4. What are homologous chromosomes?
5. What is a sister chromatid?
6. What is a pair of homologous chromosomes (4 sister chromatids) called?
7. What happens during crossing over?

In this simulation – there is no color change to show crossing over but remember that once crossing over occurs, no single chromatid is the same.

8. After crossing over, how does each single chromatid compare to each other?

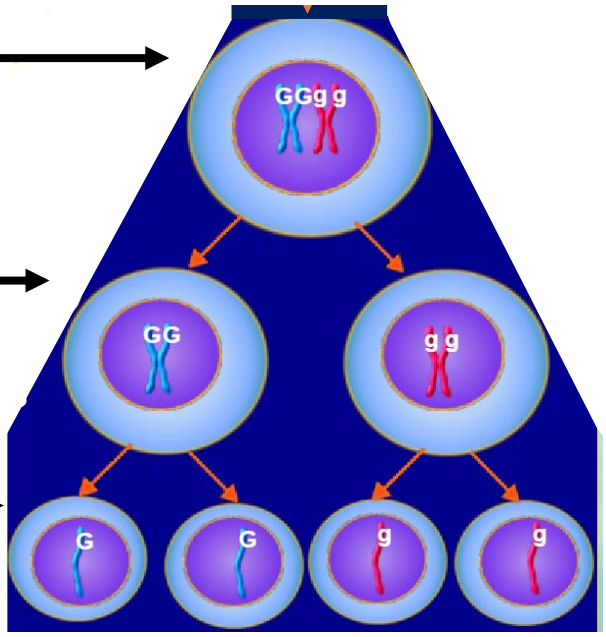
During Anaphase 1 it is completely by chance as to how the genes separate. It could be Gg and Gg moving to each end or they could separate as GG and gg as they did in this simulation.

9. Do Tetrads form (do chromosomes double) in Prophase 2?
10. Does crossing over occur in Prophase 2?
11. Where do SINGLE chromatids move during Anaphase 2?
12. What happens to each chromosome (chromatid) during Telophase 2?
13. Are the cells at the end of Telophase 2/Cytokinesis 2 diploid or haploid?

During Interphase, DNA replicates to give you this.

At the end of Meiosis 1 you had 2 cells like these, different from each other.

At the end of Meiosis 2 you had 4 Haploid cells (gametes) like these, different from each other.



14. What are the gametes called in females?

15. What are the gametes called in males?

16. How many cells result from Meiosis?

17. What is the ploidy (haploid of diploid) of these final cells?

18. Why do they only contain half the number of the organism's chromosomes?

Click on “Genetics and Meiosis” in the left menu. Scroll down to:

Snurfle Meiosis and Genetics 2

- Click on Start a new game
- Click on Continue
- Click on Continue
- Click on the sections listed below. (you may need to double click) As you go through the tutorial, read and follow the directions on the screen AND answer the questions.

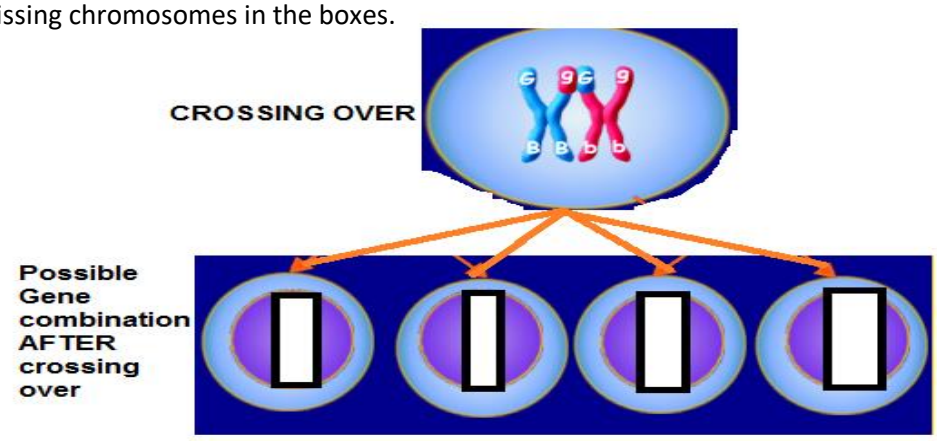
Crossing Over

1. What process in cells undergoing meiosis increases genetic diversity?
2. How many cells are produced by meiosis?
3. In the interactive activity, what are the possible phenotypes for fur color and what gene represents each?
4. In the interactive activity, what are the possible phenotypes for wings and what gene represents each?
5. What are the phenotype possibilities for the gametes in question 3 given this information?
6. What do you call two genes that are often inherited together?
7. What phase of meiosis will crossing over occur?
8. What is crossing over?
9. Draw what the chromosomes would look like AFTER crossing over.

Before crossing over **After crossing over**

10. In crossing over, do sister chromatids or homologous chromosomes exchange genetic information?

11. Draw in the missing chromosomes in the boxes.



12. How many varieties of gametes are produced by meiosis with crossing over?
13. What is another term for the chromosomes that result from crossing over?
14. Is crossing over random on non-random?
15. Does crossing over occur for every chromosome every time gametes are produced?

Independent Assortment

1. When does Independent Assortment occur?
2. The way each chromosome lines up during metaphase I is _____.
3. Which of the following statements is true as a result of independent assortment?
    a. The allele 'G' will ALWAYS be passed on with the allele 'F' in the example cell shown.
    b. The alignment of the top pair of chromosomes will NOT affect the alignment of the bottom pair.
    c. Green fur must ALWAYS be passed on with the fin trait.
    d. All of these are true.
    e. None of these are true.
4. How many different genetic combinations are possible in the first part of meiosis because of independent assortment?
5. What separates during anaphase II of meiosis II?
6. How does independent assortment affect genetic diversity?

Random Fertilization

1. What are the two types of gametes?
2. What process occurs when the sperm and egg combine?
3. For human beings there are _____ possible sperm and _____ possible eggs which can be produced which results in _____ possible genetic combinations.
4. A genetic cross that looks at two traits is a _____ cross.
5. What goes inside the boxes of a Punnett square?
6. How many gene combinations are possible in gamete production for a dihybrid cross? Why so many?
7. What is the term for a fertilized egg?
8. The genotypes in a Punnett square can be read to determine the _____ of a possible offspring.

 Click on Take the Quiz! And **Record Your Scores.**

Overall Score: _____ Crossing Over: _____

Independent Assortment: _____ Random Fertilization: _____ Quiz: _____