

## Genetics 3

Name \_\_\_\_\_



Go to [howaboutscience.com](http://howaboutscience.com), click on “Lessons and Units” and choose “Genetics 3.” Answer the questions as you explore the videos and links. Thanks to the “Amoeba Sisters!”

(the first video reviews concepts and terms from “Genetics 2.”)

Watch “**Monohybrids and Punnett Square Guinea Pigs**” and answer the questions.

1. Where is did the guinea pigs get their genes from?
2. What is an allele? What is used to represent an allele?
3. What is used to represent a recessive allele? What does recessive mean? What might allow a recessive trait to show up?
4. What is used to represent a dominant allele? If the dominant allele is present does the dominant trait always show up?
5. Why is a hairless guinea pig hairless?
6. What is a genotype?
7. What is the genotype of a hairless guinea pig? What is the genotype of a guinea pig with hair?
8. What does the prefix “homo” in homozygous mean?
9. What do we call HH? What do we call hh?
10. What does the root “hetero” in heterozygous mean?
11. What do we call Hh?
12. Can you tell the genotype of a guinea pig with hair just by looking at it? Why or why not?



13. Can you tell the genotype of a guinea pig without hair just by looking at it? Why or why not?

14. What is a monohybrid cross?

15. Draw a Punnett square. You will cross two heterozygous parents. Label your Punnett square appropriately for this cross. Fill out the square.

16. What percent of the offspring are HH? \_\_\_\_\_ Hh? \_\_\_\_\_ hh? \_\_\_\_\_

17. What is a phenotype? What phenotype are we examining with the guinea pigs?

18. What is the genotypic ratio of HH to Hh to hh?

19. What is the phenotype of a homozygous dominant guinea pig (HH)? What is the phenotype of a heterozygous guinea pig (Hh)? What is the phenotype of a homozygous recessive guinea pig (hh)?

| Genotype | Phenotype |
|----------|-----------|
| HH       |           |
| Hh       |           |
| hh       |           |

20. What is the phenotypic ratio of hairy to hairless guinea pigs?

21. What is the percentage of hairy to hairless guinea pigs?

22. There is a much greater chance of having guinea pigs with hair. Does this mean the offspring will always be hairy? Explain.



Watch “Punnett Squares and Sex-linked Traits” and answer the questions.

1. What are platelets?
2. What is hemophilia?
3. What causes hemophilia?
4. When we talk about sex linked disorders, we still use the terms dominant and recessive. But, where are these alleles located?
5. What are the sex chromosome?
6. What gender are you if you have two X chromosomes? What if you have an X and a Y chromosome?
7. Where are most sex linked traits found?
8. Hemophilia is a sex linked recessive disorder. What is the genotype for a woman with hemophilia?
9. What is the genotype of a woman without hemophilia?
10. What is the genotype for a man with hemophilia? What is the genotype for a man without hemophilia?
11. What is a carrier?
12. What are the chances of having a child with hemophilia if you cross two parents without hemophilia, but the woman is a carrier? Fill in Punnett square below and circle any child that will have hemophilia.

13. Will any of the girls have hemophilia? Why or why not?

|  |  |
|--|--|
|  |  |
|  |  |

14. What percentage of the boys will have hemophilia?



**Watch “Multiple Alleles and Punnett Squares” and answer the questions.**

1. Why is it important for people who receive blood to get the right blood type?
2. What are the phenotypes for the common blood types?
3. What do the letters stand for?
4. Why can a person with type B blood accept the blood from another person with type B?
5. Why can't you give a person with type B blood type A?
6. Is type AB safe to donate to a type B person? Why or why not?
7. Is type O safe to donate to a type B person? Why or why not?
8. Who can type O donate to? Why ?
9. Why can type O only receive from type O?
10. Why can type AB receive from anyone?
11. What is the Rh factor? If you are type A and have the Rh factor, what is your blood type?
12. What are the phenotypes and genotypes of the following blood types?

| Blood type | Phenotype | Genotype |
|------------|-----------|----------|
| A          |           |          |
| B          |           |          |
| AB         |           |          |
| O          |           |          |



13. If you have two parents with type A blood, can they have a child that has type B? Explain your answer.

14. If you have two parents with type A blood, can they have a child that has type O? Explain your answer.