

## Baby Dragon Punnett Squares

### Materials:

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Colored pencils: Blue, Green, Red, White

Beads: 3-blue, 1-green, 2-white, 2-red, 4-gold

1 - Cup

**Lesson:** *Once upon a time in a land far far away baby dragons were being born to very happy Dragon Parents. Some of the dragon parents however, wished to know what their **offspring** (babies) might look like before they even had them.*

Today you have the unique opportunity to become a "Dragon Genetic Counselor." **Genetic Counselors** use genetics to predict what **traits** offspring can **inherit** from their parents. Human Genetic Counselors are more concerned with what genetic diseases or disabilities children might inherit from their parents, while Dragon Genetic Counselors only care about what physical traits, also known as **phenotypes**, baby dragons could end up with. To predict what **traits** a dragon baby could have you will need to know the parents' **genotypes** are for each trait.

Genotypes are genes that offspring can inherit from their parents and these genotypes predict what traits the offspring could have. **Genetic Counselors** cannot always predict with 100% accuracy what traits will show up in the offspring but can predict what percent chance a trait will be inherited.

Today your job as a Dragon Genetic Counselor is to help a lovely Dragon Couple determine the possibility of several different traits which could be inherited by their offspring. Both parents have identical (the same) genotypes for the scale color trait which is **Bg**. Each parent will give the offspring one **gene**. The first gene in the genotype is **B**, which is the **dominant gene** and represents blue scale color. The second gene is **g** which is **recessive** and represents the green scale color trait. Each genotype has two genes which determine what trait (in this case scale color) the baby dragon will receive. The dominant gene determines which trait will be present in the offspring. For instance, gene **B** is dominant for blue scales, so if one of the two genes in the genotype is **B**, then the dragon baby will always have blue scales. Both dragon parents have the genotype **Bg**, which means they also "carry" a gene for green scales. The only way their baby dragon can have green scales is if it inherits a **g** from both parents.

To figure out how likely the baby dragon is to have green or blue scales we must create a **Punnett Square** using the parent's genotypes. A Punnett Square is a diagram used to predict the genotypes of offspring. Below is the Punnett Square you will use for predicting the baby dragon's scale color. The recessive gene will always be a lower-case letter, and the dominant gene will always be a capital letter. Parent 1's genotype is above the square and Parent 2's genotype is on the left side of the Punnett Square. The possible baby dragon genotypes will combine one gene (letter) from each parent. The first two possible genotypes are filled in for you in **red**. See if you can figure out the other two possible offspring genotypes for scale color.

		Parent 1	
		<b>B</b>	<b>g</b>
Parent 2	<b>B</b>	<b>BB</b>	
	<b>g</b>	<b>Bg</b>	

### Genes:

**B** = Blue scales

**g** = green scales

Answer the following questions using the Punnett Square that you completed above for scale color:

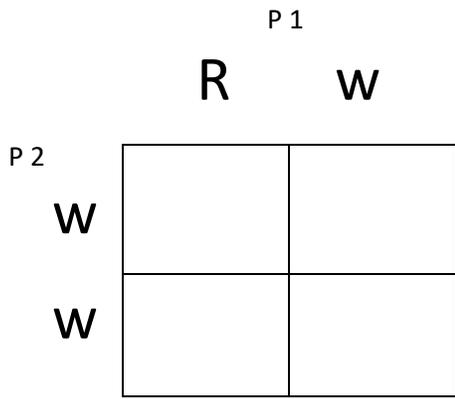
- Each of the genotypes in the four boxes above represent a possible genotype for one baby dragon. Lightly color each of the four boxes with the color that would show up if the baby dragon gets that genotype. Make sure not to color so dark that you cannot see the genotypes. Keep in mind that **B** is dominant, and if **B** is present in the box then the box will be blue.
- What is the chance that the baby dragon will have green scales? \_\_\_\_\_ (This will be a fraction)
- What color scales do the parent dragons have? \_\_\_\_\_

Now let us pretend the actual dragon baby is born! Put **3** blue beads and **1** green beads in a cup and shake it up. Without looking pull out one bead. The bead color represents the phenotype your baby dragon ended up with. The bead does not represent the genotype. Therefore, the color you pulled out is the color of the baby dragons scales.

- What color scales does the baby dragon have? \_\_\_\_\_
- What percent chance was it that the baby dragon would get this color scales? \_\_\_\_\_
- What are the possible genotypes your baby dragon could have based on the color bead you pulled out?  
\_\_\_\_\_

Now that we know what color scales our baby dragon has, lets figure out what color wings it will have. Below is a Punnett Square based off the same Parents genotypes for wing color. **R** is dominant in this case and represents the gene for red wings. The recessive gene is **w**, which represents the trait for white wings. Notice that this time the parent dragons have different genotypes for wing color. Fill in the Punnett Square below for wing color. (The Dominant gene letter always comes before the recessive gene letter when present in a genotype).

**Genes:**  
**R** = Red wing color  
**w** = white wing color



**Answer the following questions using the Punnett Square that you completed above for wing color:**

- Lightly color each of the four boxes with the color wings the baby dragon will have if it has that genotype.
- What is the percent chance that the baby dragon will have white wings? \_\_\_\_\_
- What color wings did each parent have? \_\_\_\_\_

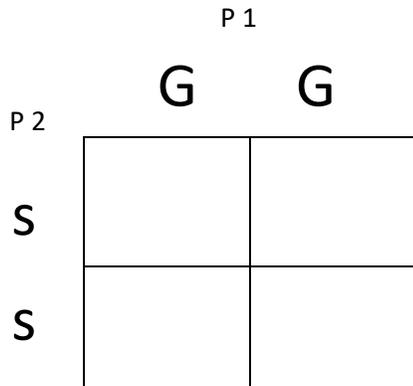
Now pretend an actual baby dragon is born from these two parents. This time put **2** red beads and **2** white beads in a cup. Without looking pull out 1 bead.

- What color wings did your baby dragon get based on the bead color you pulled out? \_\_\_\_\_
- What percent chance was it that the baby dragon would get this color wings \_\_\_\_\_
- What genotype does your baby dragon have based on the color bead you pulled out? \_\_\_\_\_

Lastly, let us do one more cross. This time we will determine if the baby dragon will have a horn or not. **G** is the dominant gene and indicates that the baby dragon will have a horn. The recessive gene, **s**, means the baby will not have a horn.

Fill in the Punnett Square below and then answer the following questions:

**Genes:**  
**G**= Has a horn  
**s** = does not have a horn



1. Each of the genotypes in the four boxes above represent a possible genotype for one baby dragon. What is the percent chance that the baby dragon will have a horn? \_\_\_\_\_
2. Did Parent 1 have a horn? \_\_\_\_\_
3. Did Parent 2 have a horn? \_\_\_\_\_

Now pretend an actual baby dragon is born from these two parents.

4. What color beads would you put in the cup this time? \_\_\_\_\_
5. Was it possible that your baby dragon would ever be hornless from this parent cross? \_\_\_\_\_
6. What 2 genotypes would Parent 1 need for a chance that a hornless baby dragon could have been born?  
 \_\_\_\_\_

**Congratulations! Below is your baby dragon!!! Fill in the traits your baby got from the bead picks. Then color the baby dragon using the results. Do not forget to add a horn if your baby dragon has one.**

**Baby Dragon Traits:**  
**Scale Color** \_\_\_\_\_  
**Wing Color** \_\_\_\_\_  
**Horn type** \_\_\_\_\_

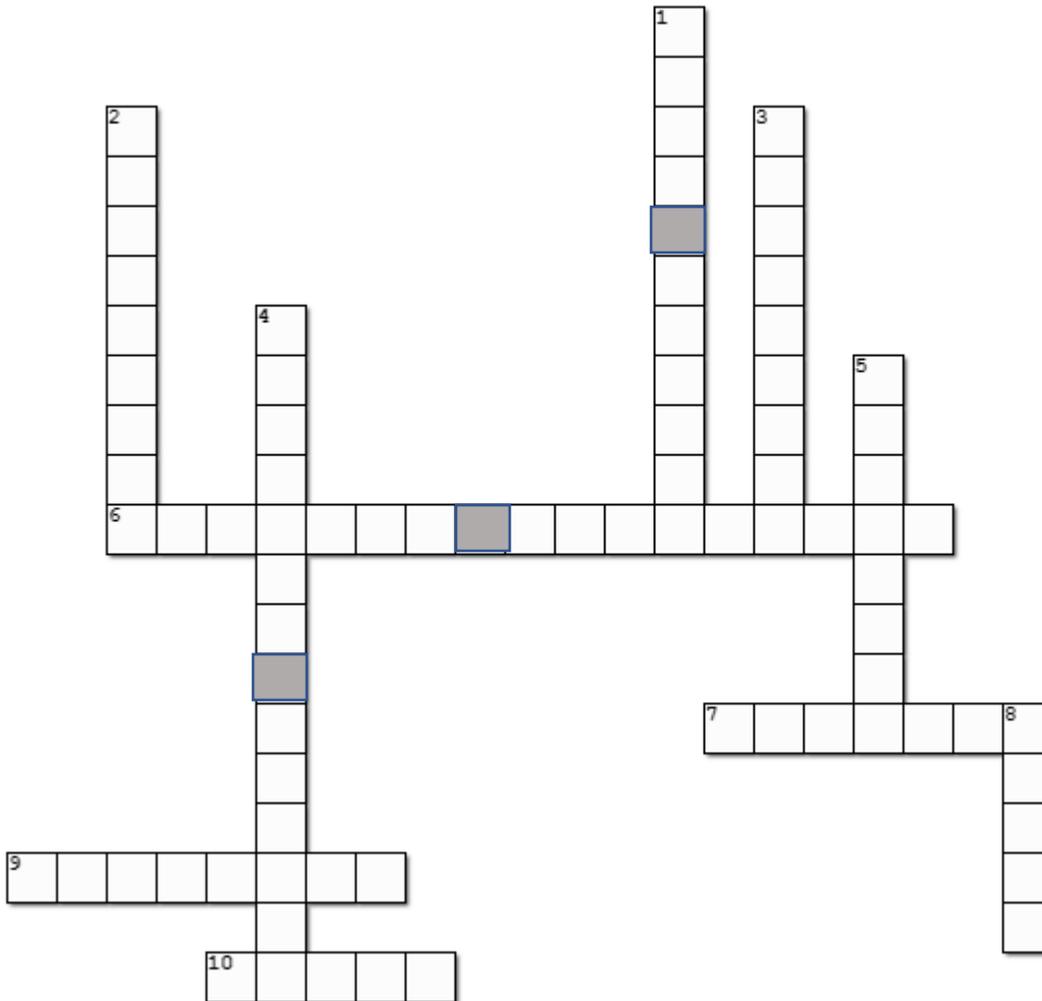


Vocabulary for Crossword:

Offspring	Genetic Counselor
Trait	Punnett Square
Inherit	Dominant
Genotype	Recessive
Genes	Baby Dragon

## Baby Dragon Punnett Square

Complete the crossword puzzle below



Created using the Crossword Maker on TheTeachersCorner.net

Across:	Down:
6. A health care professional that specializes in inheritance.	1. The offspring of two parent dragons is called a _____
7. An animal will _____ its genes from its parents	2. An animal's baby or babies
9. The form of a gene that will always show up in the offspring	3. The opposite of Dominant
10. _____ can be dominant or recessive	4. A diagram box that is used to determine the probability of trait inheritance
	5. The genetic makeup of an organism
	8. A characteristic determined by a genotype