Genetics and Cells Activity Bag

Looking at Traits: Student Activity Guide

Every living thing, including every person, has certain special features. For you, it could be hair or eye color, or the shape of your ears. We inherit these features, called traits, from our parents. Different traits might show up in the children of the same mother and father. *(To begin this activity, it is not necessary to understand this.)* You can see the traits in the person, such as dimples or a little dent in the chin. A trait that you can see is called a "phenotype." We are about to find and identify some of our own visible traits, determine whether the trait is dominant or recessive, and look for patterns of traits passed from parent to child.

These directions will get you started. Your teacher will be in contact to guide you and provide information.

Materials from the bag

- 1 Human Traits Document

Part 1: What Traits do I Have?

During this part, you will become familiar with a few traits then look and see what traits you have.

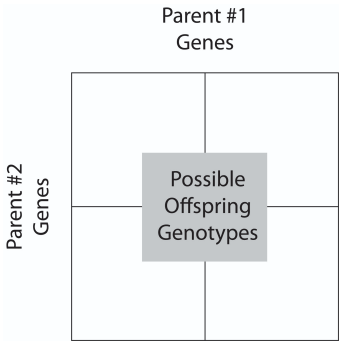
1. Look at the Human Traits document and look at the far left 3 columns.
2. Look through the different traits.
3. For each trait, identify which type you have, dominant or recessive. Fill out the column "me" with your results. (+) dominant, (-) recessive. A mirror may be helpful.

Part 2: What Traits do Others Have?

During this part, you will identify other peoples' traits. If possible, use people in your family to look for patterns in your family.

1. Make observations of different people and fill out the rest of the chart. Be sure to write the name of the person at the top of the column with their data.
2. Record results for at least 4 people other than yourself.
3. When the chart is complete, look for any interesting results or patterns. For example: Were the dominant traits always more common? Or were some recessive traits more common?

Punnett Square Extension

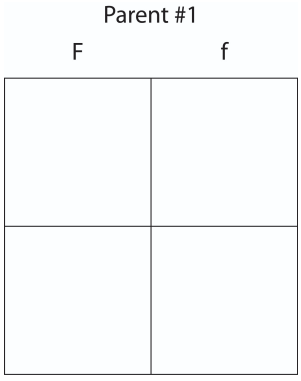


Often, we can predict which traits offspring will have using a Punnett Square. For humans, babies are the offspring. The **Punnett square** is a square diagram used to predict the possible offspring that can result from a pair of parents. Each of the four squares represents the possible genes that the offspring could have. One parent's genes will go across the top of the large square and the other parent's genes will go on the left side of the large square. See the punnet square example to the right. **Phenotypes** are the traits you see. For example the length of eyelashes, tongue rolling, or freckles. **Genotype** is the set of genes that an organism has, whether we see them expressed in the organism or not. In our example, genes are represented by different letters. Some examples include FF, ff, or Ff. The offspring's genotype determines whether they have a dominant or recessive trait.

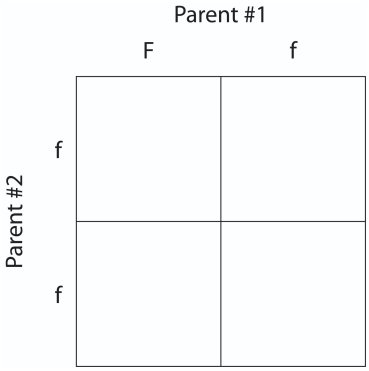
Let's look at an example. One of the traits you explored was free earlobes vs. attached earlobes. Free earlobes are the **dominant trait**, meaning **the trait will be seen in the offspring if it contains at least one dominant**

gene. We will represent a dominant gene with a capital letter (F). Attached earlobes are the **recessive trait** and **will only be seen if the offspring have both recessive genes**. We will represent a recessive gene with a lowercase letter (f). In our example, one parent has free earlobes with the genotype **Ff** and the other parent has attached earlobes with the genotype **ff**.

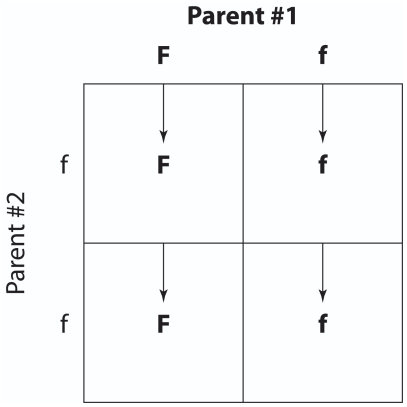
1. Place the first parent's genes (**Ff**) at the top of the box.



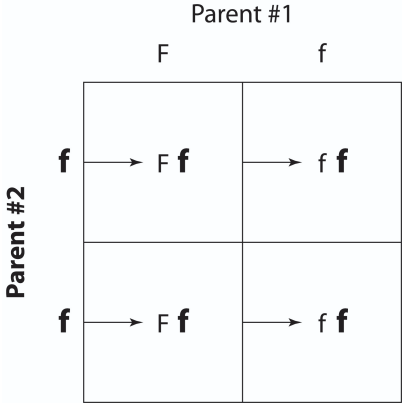
2. Place the second parent's genes (**ff**) to the left side of the box.



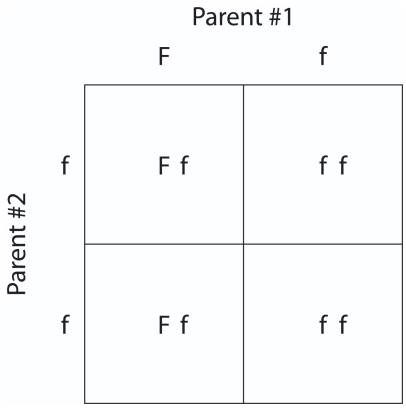
3. **Parent #1** can give the genes **F or f** to the offspring. The gene at the top of the square is placed in the boxes directly below it.



4. **Parent #2** will only give the gene **f** to the offspring. The gene on the side of the square is placed in the boxes directly to the right of it.



5. Each of the four squares represents a possible offspring that could result from these parents. The offspring can have the genotype **Ff or ff**. Two of the squares have a capital letter in their genes (Ff) and as a result, the offspring will have the free earlobes, the dominant trait. The two other squares **only** have lowercase letters (ff) and as a result, the offspring will have attached earlobes, the recessive trait. Free earlobes and attached earlobes are the phenotypes.



Using the steps above, *what are the possible genotypes and phenotypes of the offspring if one parent has free earlobes with the genes (FF) and the other parent has attached earlobes with the genes (ff)? What are the possible genotypes and phenotypes of the offspring if both parents have free earlobes with the genes (Ff)?*