

Meiosis and Genetics: Combining Traits

KEY TO CHARACTERISTICS:

Orange: brown eyes

Blue: blue eyes

Both: Hazel eyes

White: MUTATION—eyes have little color when paired with orange or blue, the color given by orange or blue is seen

Red: Can roll tongue

Both: Can roll tongue

Black: Cannot roll tongue

Purple: X chromosome

Yellow: Y chromosome

Two purple=girl

One purple, one yellow=boy

Look at the pipe cleaners in your bag. Record what characteristics you have.

Now, untwist the twisted pipe cleaners. From each pair, randomly pick one to give to your partner. Record which one you are giving away and which one you are keeping

Giving Away

Keeping

Swap pipe cleaners with your partner. Record the new characteristics you have

What you have just done is this: by separating your ALLELLES in the first step, your cell has undergone MEIOSIS, to give you ONE of each ALLELE in the resulting pile; a cell with only ONE of each ALLELE is called HAPLOID. When you switch with your partner, you then combine the ALLELLES to make a DIPLOID cell. DIPLOID cells have two of each ALLELE; this is how all cells in your body (except for GAMETES) are normally.

The white ALLELE gives you a no color mutation—can this be seen in the new pairs made? What might happen if there were more white ALLELES and you swapped with somebody else in the class?

Reminders: ALLELLES are also commonly called GENES. If somebody tells you that you have two different ALLELLES, that means you have two slightly different versions of the same GENE. In reality, a whole cell has two copies of each CHROMOSOME. A CHROMOSOME consists of many GENES and some DNA which does not code for GENES (we will talk more about this later). A GAMETE has only one copy of each CHROMOSOME and is called HAPLOID. When two GAMETES combine the resulting cell is once again DIPLOID.