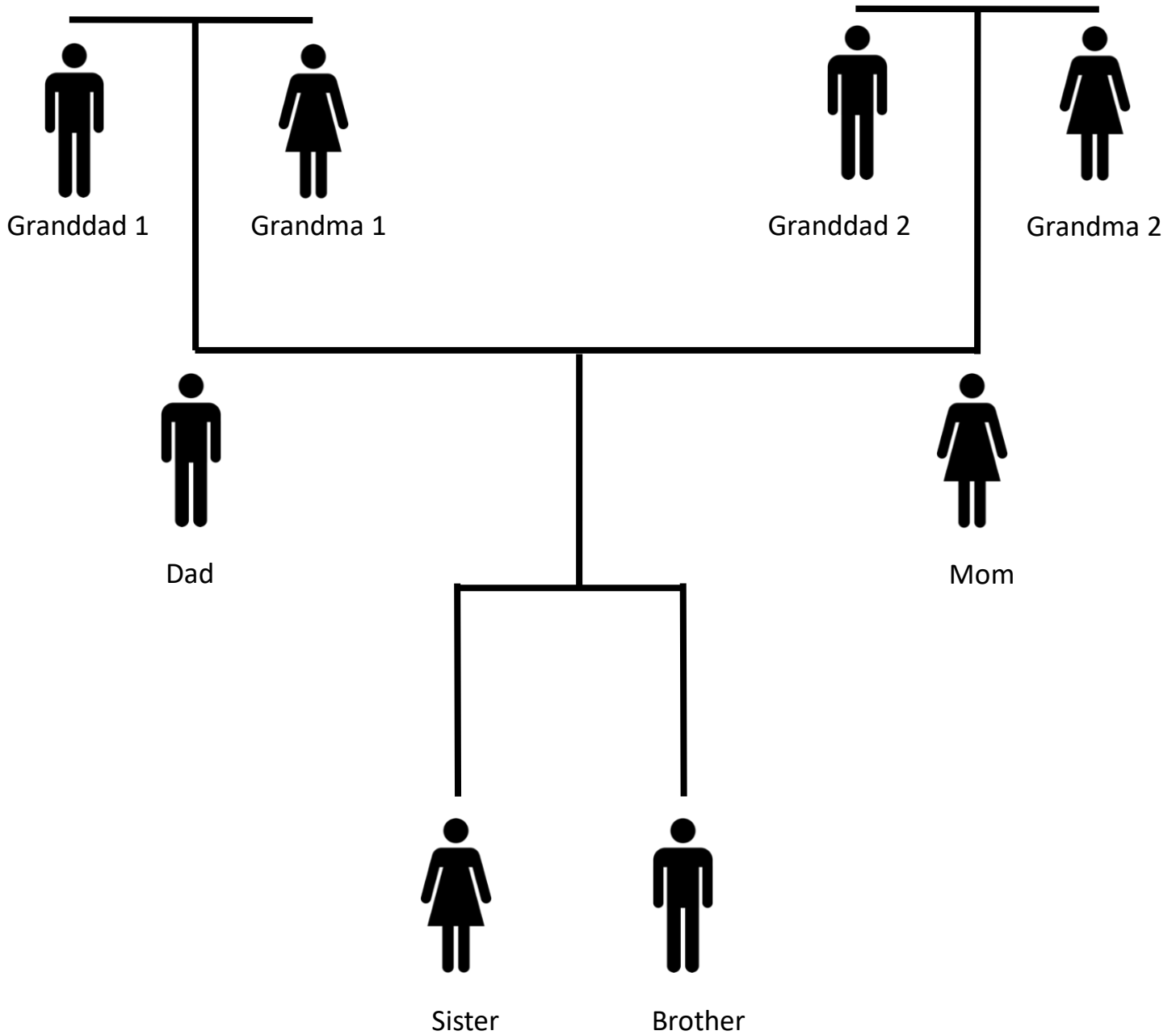


# How are DNA and traits inherited in a family?



**Teacher set up: Set up 4 small cups with lids with 12 M&Ms of red, green, red, yellow. You will need 4 empty cups without lids. Students should work in partners or small groups. They each need a coloring worksheet and the full page pedigree.**

**This is a pedigree. It is like a family tree.** We are going to **simulate** see how DNA is passed down from grandparents to parents to children. This is like performing an **experiment**. Work with your group.

Step 1:

In Grandad 1's cup put 12 red M&Ms. In Grandma 1's cup put 12 blue M&Ms.

In Grandad 2's cup put 12 green M&Ms. In Grandma 2's cup put 12 yellow M&Ms.

Color your worksheet for the grandparents.

Step 2:

Take 6 M&Ms from Grandad 1 and 6 M&Ms from Grandma 1 and put them in Dad's cup.

Take 6 M&Ms from Grandad 2 and 6 M&Ms from Grandma 2 and put them in Mom's cup.

**This simulates that children get half their DNA from their mom and half from their dad.**

Step 3:

Color your worksheet for Mom and Dad.

Mom has half her DNA from Grandad 2 and half her DNA from Grandma 2.

Dad has half his DNA from Grandad 1 and half her DNA from Grandma 1.

Step 4:

Put the lids on and shake the cups gently to mix up the M&Ms. **This simulates DNA Recombination. It's how DNA from grandparents mixes up in your parents to make you, you.**

Step 5:

Close your eyes so that you can choose randomly. **This simulates random assortment. This means the combination of your grandparents' DNA that you get from your parent is random.**

Take 3 M&Ms from Dad and put them in Sister's cup.

Take 3 M&Ms from Dad and put them in Brother's cup.

Q: Do Sister and Brother get the exact same DNA from Dad?

Step 6:

Take 3 M&Ms from Mom and put them in Sister's cup.

Take 3 M&Ms from Mom and put them in Brother's cup.

Q: Do Sister and Brother get the exact same DNA from Mom?

Q: Do Sister or Brother look identical to their parents?

Q: Is there a color of M&M that is missing in Brother or Sister? For example, did Sister get 4 green M&Ms and 0 Yellow M&MS?

Step 7:

Each person in the pedigree now has 6 M&Ms that represent their DNA. **Their DNA makes up their phenotypes, or traits.** Because they have different combinations of M&Ms they look similar but different.

Color in your worksheet for Sister and Brother.

Q: Do Sister and Brother have the exact same DNA?

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