

DNA and Genetics



DNA and Genetics Patch

Learn all about your genetic code as you earn your DNA & Genetics patches. Daisies and Brownies complete 3 activities. Juniors to Ambassadors complete 4.

Live Virtual Programs: Check out one or both of the amazing virtual programs we have available this month! You can register for these at our website.

Genetics of Dogs How can a chihuahua and a great dane be the same species when they look so different? Why do some dogs have squish faces and some don't? Join us as we take a journey into genetics to look at why our furry friends look so different from each other. We'll discover how behaviors and even sicknesses can be passed from one parent to their children and hear about the Morris Animal Foundation's partnership with the Golden Retriever Lifetime Study, which studies canine health over time. If you love science, you'll love this insider's look into "girl's best friend"!

Zoo Babies! Zoos aren't just places to connect with the stories of animals from faraway places - they also help to manage the genetics of those animal populations, including endangered species! Join us as we learn how population biologists make decisions about which animals will be good genetic parents, what they monitor for, and how traits are passed from parent to child. We even get to hear the story of three lion cubs that were recently born at Lincoln Park Zoo. (And we get to see all the baby pictures!)

Who Are You? Everything that makes you who you are was given to you through your parents' DNA through a process called heredity. Scientists can study this process to learn so much about things that we inherit. The study of this process is called genetics. Watch [THIS](#) video to learn a little more about heredity and genetics.

Connecting to Science through Fiction. Read a fiction or science fiction book in which a character has special physical traits or their traits were altered. Consider how these traits make their every-day experience different than yours. Share your thoughts with family and friends.

Stem Cells Many cells in the body are adapted for specific functions. *Neurons* for example, have long "legs" and a hexagonal body to help them connect to each other, while *ciliated cells* are shaped like small hairs and group into collections to help with movement of fluid (like a paintbrush moves paint around). Stem cells are unique specialized cells that can turn into *any other cells*. Modern scientific research has identified stem cells as a possible therapy for some diseases caused by genetic mutations (mistakes in the "code"). Check out [THIS](#) video to learn more about stem cells and how scientists might use them in disease treatment.

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cognitofrms.com/Girlscoutsalaska/GSAKPatchOrderForm

Dominant vs Recessive Genes: Have you ever noticed that you can roll your tongue but your friend can't? Or maybe you don't like bitter foods but your cousin doesn't seem bothered by them? Certain *traits* that run in families show up more often, while others disappear for generations at a time. (Learn more about traits in [THIS](#) video.) Genes for traits are paired together in our DNA. *Dominant* traits almost always the trait we see so long as you have at least one of them in your DNA pair, while a *recessive* trait only shows if both genes are recessive. Explore your dominant and recessive traits by making a genetic trait bracelet! (Instructions [HERE](#).)

Credit Where Credit is Due: Genetics is a field of scientific study with so many small, changing pieces that it would be impossible for a single scientist to discover every individual piece! This makes it especially important that scientists recognize all of the knowledge they get from the work of the scientists before them. Unfortunately, women scientists like Eunice Foot and Lise Meitner are often not credited for the work they did or the ideas they provided. Identify a skill or a fact that you've learned from someone else, and ask where they learned it. See how many people you can find that contributed.

DNA Structure: The structure of DNA, the double-helix, looks like a twisted ladder. In April of 1953, James Watson and Francis Crick published a paper on this structure. However, *many* scientists contributed to this discovery, especially Rosalind Franklin. She was the first scientist to take clear pictures of the double-helix structure. Follow [THIS](#) link to create your own double-helix strand (and create some 'deletions' of DNA by eating it afterward).

Family Ties: Genetics is only *one* way to define a family—not the only way! Families come in so many different shapes and sizes. Consider the people in your life then draw a map of the people you consider your family and the connections between each member. You can draw it as a picture map, a tree or something else completely—get creative with it!

DNA Extraction: Scientists that study DNA can't view all of the important pieces while the DNA is still in the cells of the living thing. In order to study specific markers and traits, they need to extract (or remove) the DNA from the cells of the organism. Did you know that you can extract DNA at home with a few simple tools? Check out [THIS](#) instruction sheet to extract DNA from strawberries!