



High Touch High Tech®

Science Experiences That Come To You

Right vs. Left

Ingredients & Supplies:

- pencil
- paper
- scissors
- ball, small (ex. tennis ball, baseball)
- ball, large (ex. soccer ball)
- coin
- paper towel tube
- phone
- stairs
- cup of water

Instructions:

If you use your right hand to write and draw, you are right-handed. If you use your left, you are left-handed. This is your *dominant* hand. Most people are right-handed. In fact, only 10% of the population uses their left hand to write. Scientists are unsure why most people favor one hand. Perhaps it is genetic, health-related, or environmental. The left-hand minority remains a mystery.

But, this isn't the only way to determine your "sidedness." You also have a dominant ear, eye, and foot. Usually if someone is right-hand dominant, he favors the right side of his body. But, this is not true for everyone. Sometimes, a person may write with his right hand, but throw a baseball with his left hand. This is called "mixed-handedness" or *cross-dominance*. If a soccer player favors her right foot, but draws with her right hand, this is also cross-dominance. When someone can use both sides of the body equally well, he or she is *ambidextrous*. This is a rare form of cross-dominance (about 1% of the population) because the person can write, throw, and kick with either the right or left side with skill.

Now you can experiment to find out which side is dominant for you, your friends, and your family! Everyone knows immediately if they are right-handed or left-handed. But, they may not realize that they use their left foot or their right eye more often.



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For this experiment, you can use a variety of different items to test hand, foot, eye, and ear dominance. Use the Right Side/ Left Side chart below to keep track of your findings. You can test 2 people, 10 people, or even more! Ask your friends and family if they would like to participate in your Right Side/ Left Side science experiment. On the Right Side/ Left Side chart, you will write, "LEFT" or "RIGHT" depending on which side they use to complete each task.

First, ask the participant to write her name on the Right Side/ Left Side chart. Observe which hand she used to write, and record the result. Ask the participant to use the scissors to cut a piece of paper, and record the result. Notice that each of these tasks test *hand dominance*. Next, give her a small ball, such as a baseball. Ask her to throw the ball. Which hand did she use? Record the result.

Next, you will test *foot dominance*. Ask the participant to kick a soccer ball. Did she use the right foot or left foot? Record the result. Place a small object, such as a coin, on the floor. Ask the participant to step on the coin. Which foot did she use? Record the result. Next, find a flight of stairs. (Just a few stairs will work, too.) Stand at the bottom of the stairs. Ask your participant to walk up the stairs. Observe which foot she steps up with first. Record the result. Did the participant use the same foot each time? Is her foot dominance similar or different to her hand dominance?

Now, you will test *ear dominance*. For this test, you need a phone. If you do not have a phone, use another object and pretend it is a phone. Ask the participant to pick up the phone as if she is answering a call. Which ear did she listen with? Record the result. Next, tell your participant to stand close to the wall. You are going to tap very lightly on the wall. The participant should lean in close to the wall, and place her ear against the wall to hear the taps. Which ear did she listen with? Was her ear dominance consistent for each task?

Finally, you will test *eye dominance*. You will need a paper towel tube or a toilet paper tube. Ask the participant to look out the window using the tube. Observe which eye she used to look through the tube. Record your result. Ask the participant to wink at you. Which eye winked? Record your result. Ask the participant to extend her arms out in front of her. She should make a triangle with her thumbs and forefingers. Ask her to bring the triangle towards her, close one eye, and look at an object in front of her. Which eye stayed open? This is the eye that she used for this test. Record the result. Was her eye dominance the same for each task?

Thank your volunteer for participating in your Right Side/ Left Side science experiment. Share the results with her. Was one side more dominant than the other? If she used her right hand, foot, eye, and ear consistently, she is right-side dominant. Or if she used the left side consistently, she is left-side dominant. However, if she used her right hand and



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her left foot, she has mixed dominance or cross dominant. If each side was equally used for all of the tasks, she is ambidextrous!

Ask more friends and family members to participate in your Right Side/ Left Side science experiment. Record the results. Do you find any similarities or differences? Do your siblings share sidedness? Do you have the same dominant side as a parent?

You can be creative with how you test dominance. You can use a variety of objects that test hand, foot, ear, and eye dominance. Have fun with your Right Side/ Left Side science experiment!

The Science Behind It:

It is a science mystery why only 10% of the population is left hand dominant. Favoring the left hand, however, can be very beneficial. In the world of sports, for example, left-handers often have an advantage. Sports that rely on face-to-face interaction often have outstanding lefties. Boxing, tennis, and fencing show a higher percentage of left-handed athletes. Those who are right-handed are surprised by their opponent's left swing! In baseball, pitchers that throw with their left hand are stand-outs!

Here is a list of some famous lefties:

Baseball: Babe Ruth, Lou Gehrig, "Shoeless" Joe Jackson, Randy Johnson (pitcher left, batter right), Barry Bonds, Ken Griffey, Jr., Reggie Jackson, "Neon" Deion Sanders, Andy Pettitte (pitcher)

Boxing: Rocky Balboa, Reggie Johnson,

Golf: Phil Mickelson, Arnold Palmer

Tennis: Martina Navratilova (ambidextrous), Monica Seles, Andres Gomez (Santos)

Historical Leaders: Joan of Arc, Napoléon Bonaparte, Julius Caesar, Alexander the Great, Charlemagne, King Louis XVI of France, Queen Victoria, Queen Mother, Prince William of England

Historical Figures: Aristotle, Henry Ford, Helen Keller, Benjamin Franklin, Mahatma Gandhi, Bill Gates

Scientists: Leonardo da Vinci, Sir Isaac Newton, Charles Darwin, Albert Einstein, Marie Curie, Edwin "Buzz" Aldrin (astronaut)



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Presidents: James A. Garfield, Herbert Hoover, Harry S. Truman, Gerald Ford, Ronald Reagan, George H.W. Bush, Bill Clinton, Barack Obama

Actors/ Actresses: Bart Simpson, Pierce Brosnan, Jim Carrey, Charlie Chaplin, Robert de Niro, Morgan Freeman, Keanu Reeves, Sylvester Stallone, Mark Wahlberg, Bruce Willis, David Letterman, Jay Leno, Whoopi Goldberg, Angelina Jolie, Marilyn Monroe, Julia Roberts, Oprah Winfrey

Artists: Leonardo da Vinci , M.C. Escher, Michelangelo, Raphael

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Right Side/ Left Side - Chart

	Task	Participant 1	Participant 2	Participant3
Hand dominance	Write their name?			
	Use scissors?			
	Throw a ball?			
Foot dominance	Kick a ball?			
	Step on a coin?			
	Step up on a stair?			
Ear dominance	Listen to a phone?			
	Listen on a wall?			
Eye dominance	Look through a tube?			
	Wink?			
	Look at an object?			

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