

Which Side Are YOU On?

Explore how brain dominance affects your physical abilities.

You probably know whether you're right- or left-handed, but have you ever thought about whether you're right- or left-footed? How could you find out? Try these experiments to see what you can discover!

HERE'S WHAT YOU'LL NEED:

- Access to a mirror
- Access to a gym or basketball court
- Kickball or soccer ball
- Basketball
- Footstool
- Pencil and paper
- Stopwatch, timer or clock with a second hand
- Tape
- Meter stick or tape measure



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WARMUPS

We'll begin by conducting some simple tests to learn more about brain dominance.

Start by considering your hand dominance:

- Which hand do you use to write?
- Which hand do you primarily use to drink?
- Which hand do you use to brush your teeth?

Is the answer to all of these questions the same hand, or do you use different hands for different primary actions? **Make a table where you can start recording your findings.**

Next, try these activities to help determine your foot dominance:

- Kick a ball three or four times in a row without thinking about it too much. Which foot did you primarily use to kick the ball?
- Step up onto a footstool three or four times in a row. Did you make the first step up onto the stool with one foot more often than the other?

Record your findings in your table. Do your results indicate that you have a dominant foot? Is it the same as your dominant hand?

Lastly, test your eye dominance:

- Wink at yourself in the mirror a few times. If you found yourself winking naturally with one specific eye, try winking with the other eye. Does it feel awkward or harder or can you wink easily with both eyes?
- Stretch both of your arms straight out and make a triangle with your thumbs and index fingers. With both eyes open, look through the triangle and focus on something specific across the room, like a doorknob or light switch. Close your left eye. Did the object remain in view? Open both eyes and now close your right eye. What happened to your vision of the object this time?

Record your observations for these activities in your table. Note whether you have a dominant eye, and whether it's the same side as your dominant foot or hand.

Thinking about your results so far, what have you learned about your brain dominance? Do you have a dominant hand, foot, and eye, or do you find that you can use both of each with equal ease? Were you surprised by which of your eyes or feet turned out to be dominant?

Some people are completely left or right side dominant, while others have a mix (that is, you might be right-handed but

left-footed.) If you find that you have a mix of dominant sides that means you are **cross-dominant**. Some people are even **ambidextrous**, which means they can use the left and right sides of their body equally well! Let's take a moment to compile all our data into workable knowledge. Collaborate with your fellow students and make a master chart showing everybody's dominant hand, foot, and eye. **What do the results show when you compare your class' results? Is there a majority in hand, foot, or eye dominance within your class? How common is cross-dominance? Is there a specific dominance that nobody has?**



GAME TIME

Now it's time to ramp it up and see how our new-found discoveries about dominance can relate to sports performance on the basketball court. Make a new chart for these experiments to keep your data separate.

Have someone time you for 10 seconds as you dribble a basketball with your right hand while standing still. Then, switch to your left hand and dribble for another 10 seconds. **How did using your non-dominant hand affect your ability to connect with the ball and keep a consistent rhythm? Record your observations from this experiment in your table.**

Repeat the activity walking as you dribble the ball, and then try it while running. **Record your observations about the differences in your ability to dribble with both your dominant and non-dominant hand. How does your ball control compare while moving and standing still?**

Next, see how your foot dominance affects your basketball leap. Choose a line on the court or mark a starting line with tape. Take a running start and when you reach the line, push off and leap with your right foot. Have a friend mark your landing spot with a piece of tape. Measure and record the distance. Repeat the leap three times. Now repeat this activity taking off from your left foot. **How does the distance of your jump compare when you launch from your dominant foot as opposed to launching with your non-dominant foot? Record these results in your table.**

Let's see how your eyes affect your shot. Choose a spot on the court and shoot a basketball towards the goal with your left eye closed. Repeat the same shot another five times.

Now try the shot test six times with your right eye closed. (Aim for a specific spot on a wall if you don't have access to a basketball hoop.) **How did you using your non-dominant eye affect your accuracy in your shots? Record your data from this experiment in your table.**



ANALYZE THE REPLAY

What happened?

Compare your data from doing the basketball experiments with that of your classmates. How did your experiences differ?

What effect do you think having specific side dominance might have on your ability to play basketball? Would there be an advantage to being right side dominant or left side dominant? In baseball, left-handed batters have an advantage due to the way they stand while at home plate batting—their bodies are angled closer to first base, giving them a shorter distance to run than right-handed batters. **Can you think of any similar advantages or disadvantages being left side dominant or right side dominant might have in basketball?**



OVERTIME

Let's take it further

Want to keep experimenting with your brain dominance and sports prowess? Try standing at the 3-point line and shooting the basketball with your dominant hand first and then your non-dominant hand. **Were you able to make either shot?**

Compare your success passing a basketball back and forth with a friend while closing first your left and then your right eye. **Did you notice a difference in your passing ability?**



In the “Warm-Up” portion of experiments we used basic dominance tests to determine hand, foot, and eye dominance in each student. The science behind brain dominance is still being researched and is not yet wholly understood. Scientists know that the right hemisphere of the brain controls the left side of the body, and vice versa. Your dominant side is determined by which hemisphere of your brain is more active during certain functions.

Roughly 10-15% of the population is left-handed, and that percentage has never really grown or shrunk throughout history. One popular explanation as to why there are predominantly more right-handed people than left-handed is based on the importance of communication through written language to the development of the human species. Scientists believe that most people have speech and language control in the left hemisphere of the brain—the same hemisphere that controls the right side and right hand. This connection between language development in the left hemisphere and better motor control for writing and communicating in the right side of the body has developed into a seemingly genetically biased species.

Why certain people are left-handed, though, is still being discovered and studied. There are possible genetic causes that would lead to left-handedness, but societal pressures or allowances seem to factor into this brain dominance, as well.

In the “Game Time” section we discovered the affect certain brain dominances can have on athletic ability. Different sports can favor different brain dominances. As mentioned, being a left-handed batter carries great benefits in baseball. Difference in brain dominance causes figure skaters to spin and jump either clockwise or counter-clockwise. Right- or left-handed players in hockey can dominate in different positions during the game. In basketball, making a successful shot in basketball requires so much precision—the right stance, the right grip on the ball, the right visualization of an arc from your hands and ball to the basket, the right follow-through. As a result sports analysts are currently discussing how cross-dominance affects basketball players.

DO YOU WANT TO LEARN MORE?
Research: laterality, cross-dominance, brain dominance, handedness

OKLAHOMA ACADEMIC STANDARDS - SCIENCE

STANDARD		3 RD GRADE	4 TH GRADE
LS3-1	Heredity: Inheritance and Variation of Traits	●	
LS3-2	Heredity: Inheritance and Variation of Traits	●	
LS3-1	From Molecules to Organisms: Structure and Processes		●