



# Lefty or Righty? (3-7)

Wild Pack Preparation Activity

## At a glance

Students conduct an observational investigation at school to determine whether more students are left or right-handed.

## Grades

Grades 3 to 7

## Time requirement

One session of 60 minutes

## Materials

Copies of datasheets (one per pair)

Hand stamps and inkpads

OR pen/pencils (one per pair)

## Goals

1. To learn about handedness
2. To practice inquiry skills

## Objectives

1. Students will be able to define handedness.
2. Students will be able to explain why using one hand instead of the other for fine motor skills is beneficial.
3. Students will be able to conduct an observational investigation.

## Theme

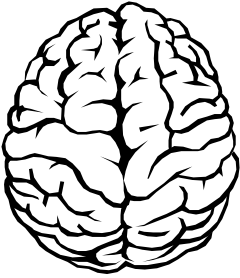
Being left or right-handed lets us master handy skills while using up the least brainpower.

## Academic standards - Science

Ohio Science Academic Content Standards	Life Science - Diversity & Interdependence of Life (3:2) (4:2) - Evolutionary Theory (8:3) Scientific Inquiry - Doing Scientific Inquiry (3:2, 3,5) (3:6) (4:3-6) (5:2,3) (5:6) (6:1) (7:7) (8:3) Scientific Ways of Knowing - Ethical Practices (6:2) (7:2) (8:2) - Nature of Science (8:1)
Kentucky Core Content - Science	Biological Sciences - Unity & Diversity (SC-EP-3.4.3) (SC-04-3.4.1) (SC-06-3.4.2) Unifying Concepts - Interdependence (SC-04-4.7.1)
Indiana Science Standards	Nature of Science and Technology - The Scientific View of the World (4.1.1) (5.1.1) - Scientific Inquiry(3.1.2-4 (4.1.2) (5.1.2) (6.1.3) (7.1.2-3) - The Scientific Enterprise (3.1.5) (4.1.3) (5.1.3) (8.1.4) Scientific Thinking - Critical Response Skills (5.2.8) - Communication Skills (6.2.5-6) (7.2.7) (8.2.8) The Mathematical World - Reasoning and Uncertainty (7.5.4)

## Background

Most people prefer to use one hand over the other for fine motor skills such as writing and holding utensils. Scientists believe that this preference, called handedness, is a result of brain lateralization. The brain is divided into two halves, or cerebral hemispheres. Each side of the brain is responsible for controlling certain tasks. Fine motor skills such as writing are complex and require a lot of brainpower. Mastering these fine motor skills with one hand is much more efficient than using up brainpower to develop equal skills in both hands.



As babies grow into toddlers and then preschoolers, a hand preference develops as they practice and master fine motor skills. By four years old, most kids prefer one hand over the other. It turns out that the hand control

center for right-handed people is located on the left hemisphere. Left-handers' hand control centers are on the right side of the brain.

There may be a correlation between language and handedness whereby the control of fine motor skills is centered in the opposite hemisphere to that which controls language. In most people, the left brain controls language and speaking. Thus, most people are right-handed (up to 90%), having left-brain language and hand control. However, this does not seem to apply in reverse as many left-handed people also have left-brain language control.

What explains left-handedness in about 10% of the population? No one quite knows. Some suggest that left-handedness is the result of something gone wrong in the womb and it had been proposed that left-handers are more likely to be physically and mentally disadvantaged. Another theory hypothesizes that being in the minority can actually be an advantage by providing a different perspective when looking for food or evading predators, for example. This theory may account

Lefty or Righty? 2010

for such exceptionally-talented left-handers as Babe Ruth and Bill Clinton. Left-handedness has also been linked to an increased level of testosterone, which may explain why there are more left-handed males than females.

As primates, we are closely related to apes and monkeys. Primates are mammals that have large brains, good eyesight, and hands and feet with opposable thumbs. Thanks to their opposable thumbs, primates can grasp objects better than other animals, allowing them to easily perform tasks that would be hard or otherwise impossible. Humans have larger, stronger, and more flexible thumbs than other primates, which allow us to better hold and manipulate things. Like us, other primates use their hands for lots of things, including picking up food, scratching, throwing, playing with toys, and hanging from trees.



Studies show that other primates also show hand preferences. Interestingly, it seems that the earlier, more primitive primates like lemurs tend to be left-handed and our closer relatives like chimps tend to be right-handed.

Most scientists believe that non-primate animals also show a preference for using left or right side body parts, whether they are hands, feet, paws, or fins. This is called asymmetrical behavior, and it has been demonstrated in species from toads to cats to parrots.

## Vocabulary

*Ambidextrous*—Being equally skilled at using the left and right hand

*Asymmetrical behavior*—An animal's preferential use of body parts on one side of the body over the other

*Brain lateralization*—Division of the brain into two hemispheres, each of which controls certain functions

*Handedness*—Preference for using one hand over the other for fine motor skills such as writing

## Activity

### Getting ready

Make enough copies of the datasheets so that each pair of students will have one. If available, collect enough hand stamps and inkpads for each pair to have one. Otherwise, each pair can simply use a pen or pencil for data collection.

### Doing the activity

Let the students know that they will soon be visiting the Zoo and conducting an investigation to find out whether primates are left or right-handed.

Begin with a discussion about hands. How do we use our hands? Our hands are fabulous adaptations that allow us to hold and manipulate things in our environment. Our thumbs, in particular, are important. Ask them to imagine what life would be like without an opposable thumb. Have them try tying their shoes or picking up a glass of water without using their thumbs.

### Handedness Investigation

Discuss what it means to be left or right-handed. Why do they think we're better at doing certain things like writing and holding a fork with a particular hand? Does it help us out in some way? Wouldn't it be better to be able to be ambidextrous, that is, equally skilled with both hands? Why or why not?

Ask the right-handed students to raise their hands. Most people are right-handed. Does this hold true for the students at your school? Let's do an investigation to find out!

As a class, make a list of things that people do with one hand. The list may include behaviors such as:

- Writing
- Tying shoes
- Holding a fork or spoon
- Buttoning or zipping a jacket
- Throwing a ball



Divide the class into pairs. Each pair will collect its own data, which will then be pooled together as an entire class. Give each pair a datasheet and a stamp and inkpad or a writing instrument.

Go to the schoolyard at recess. For five minutes, have the groups record how many times they see students using their left and right hands by marking the appropriate column on the datasheet with a stamp or tally mark. Repeat the data collection during lunch in the cafeteria, gym class, or other activity as often as you like.

Return to the classroom and pool all of the data together on the board. (Either simply add up the totals or calculate an average.) Then graph the results as a bar graph with left or right hand categories on the x-axis and number of times on the y-axis.

Were most of the students left or right handed? Is that what you thought would happen? Why do you think it turned out that way? Any ideas why the right hand is preferred over the left hand and not the other way around? Is being right-handed better in some way? If so, then why isn't everyone right-handed?

### *Wrap-up*

We are primates, just like our close relatives, the apes and monkeys. Other primates also use their hands for lots of things. Do you think apes and monkeys have a preference for using one hand over the other, too? Let's do an investigation at the Zoo to find out!

### **Extensions**

1. Investigate whether pet cats and dogs prefer using a left or right paw when batting at a toy or shaking a paw with its owner's hand.
2. Handedness goes beyond just hands and can apply to legs, ears, and other physical attributes. Among your students, do they have preferences for kicking with one leg over the other? How about for crossing one leg over the other when sitting? Can they hear or see better out of one ear or eye better? Do they chew their food more on the left or right side of their mouths? Are these preferences linked to whether they are left or right-handed?

### **Assessment**

Have each pair summarize the steps of their investigation in a report, including the question they asked, how they collected data, the results, and what the results mean.

*Unsatisfactory*—Report is incomplete.

*Satisfactory*—Report includes all required sections.

*Excellent*—Excellent report includes all required sections above and beyond.

### **Resources**

Handedness Research Institute at [www.handedness.org](http://www.handedness.org)

Further investigations and readings related to Wild Pack topics are supported at [www.WildResearch.org](http://www.WildResearch.org)



# Lefty or Righty? Datasheet



Place a mark in this box  
each time someone  
uses a **LEFT** hand.



Place a mark in this box  
each time someone  
uses a **RIGHT** hand.