

Boomerang Beginner Instructions

Nils van Veen

July 3, 2023
v1.1.0



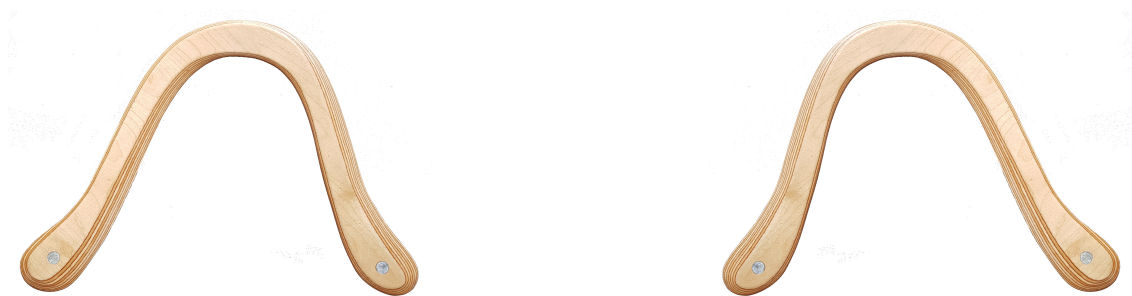
1 Overview

This document explains the following steps:

1. Left or right-handed
2. Wings
3. Grip
4. Wind direction
5. Layover
6. Wind speed
7. Catching
8. Throwing
9. Tuning

2 Left or right-handed

A two-winged boomerang is left-handed if it looks like figure 1a and right-handed if it looks like figure 1b. Note that the profiles are not on the same side.



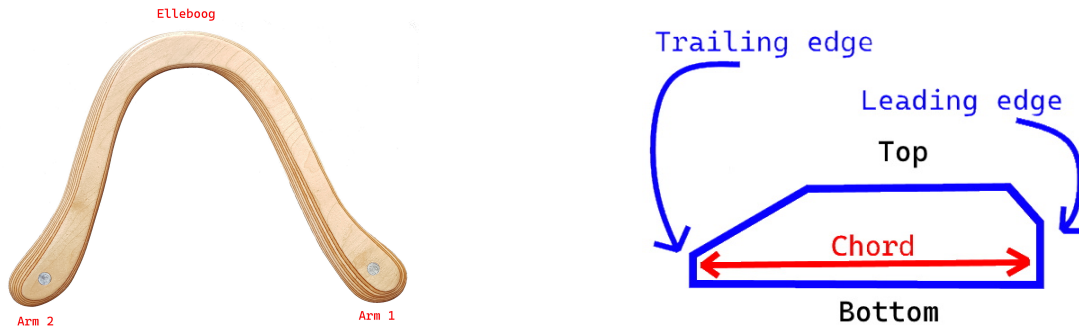
(a) Left-handed boomerang

(b) Right-handed boomerang

Figure 1: Left- and Right-handed boomerangs next to each other

3 Wings

In two-winged boomerangs, there are two arms: Arm 1 and Arm 2. See figure 2. Arm 1 is called the leading wing, and Arm 2 is the trailing wing.



(a) Arm notations

(b) Profile notations

Figure 2: Notations for a right-handed boomerang

4 Grip

Hold the boomerang with the top side (see figure 2b) facing towards your face, which is often the colored side. The bottom side is usually very flat.

It doesn't matter whether you hold Arm 1 or Arm 2. I recommend beginners to use Arm 1. Once you can successfully catch the boomerang, then you can try using Arm 2.

In figure 3, the process of how to hold a right-handed boomerang using a pinch grip is shown. In words:

- (a) Make a fist.
- (b) Place the boomerang between your fist and thumb. Squeeze now.
- (c) With the other hand, pull the boomerang towards your arm.
- (d) Rotate your wrist towards your arm.



(a) Step 1.



(b) Step 2.



(c) Step 3.



(d) Step 4.

Figure 3: Step-by-step guide on how to hold a boomerang

In figure 3, the pinch grip is used. There are also two other common grips: the pistol grip and the full-hand grip. See figure 5. If a boomerang feels too heavy or if you have trouble throwing it (for example, if the boomerang slips out of your hand too quickly during the throw), then try the pistol grip. I often throw wooden boomerangs with at least a pistol grip. The full-hand grip can generate a lot of power, but it is more difficult to generate spin, especially for beginners.



(a) Pistol grip



(b) Full-hand grip

Figure 4: Two types of grips

I personally use two other types of grips that are not commonly used or mentioned: the double pistol grip and the thumb grip. The double pistol grip is a step between the pistol grip and the full-hand grip. The thumb grip is an unusual grip that I started experimenting with this year. If the chord length (see figure 2b) is small enough, you can exaggerate putting your thumb around the boomerang, which allows you to grip harder and generate more spin while also getting more grip and making it easier to throw at a consistent height. Not recommended for beginners.



(a) Double pistol grip



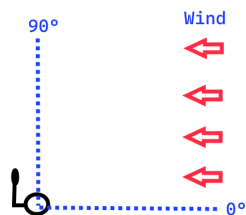
(b) Thumb grip

Figure 5: Two less common types of grips

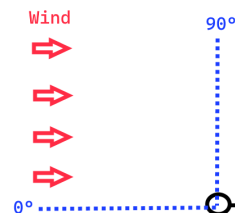
5 Wind Direction

In general, the following applies:

For right-handed throwers, the wind should come from the left side of the head. For left-handed throwers, the wind should come from the right side of the head. Throw between 0° and 90° . Start by throwing at 45° from the wind direction. If the boomerang lands in front of you, throw more towards 0° . If it lands too far behind you, throw more towards 90° . These rules don't always apply, but they serve as a good guideline for beginners. The angles can be seen in figure 6.



(a) Left-handed angles

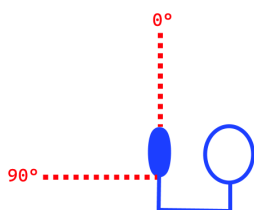


(b) Right-handed angles

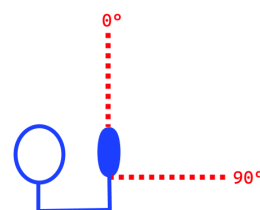
Figure 6: Wind angles for left-handed and right-handed throwers. Top view.

6 Layover

Layover is the angle from the vertical axis to the horizontal axis. Try to experiment with it. Start with a 0° layover (so the boomerang is vertical!) and compare it to, for example, 30° . At a 90° layover, the boomerang is horizontal with the top facing the sky. Too much layover (a too horizontal throw, like a frisbee) and the boomerang won't come back, which is very unsafe. Most boomerangs will fly back well when the layover angle is between 0° and 30° . See figure 7.



(a) Left-handed layover angles



(b) Right-handed layover angles

Figure 7: Layover angles for left-handed and right-handed throwers

7 Wind Speed

Wind speed is crucial for the return of a boomerang. Some boomerangs are designed for light wind, some for moderate wind, and some for strong wind. Pay attention to this before you throw. If a boomerang ends up too far in front of you in light wind, it probably needs more wind. If it ends up far behind you, it probably needs less wind.

8 Catching

You catch a boomerang like a pancake or a crocodile. At the end of the flight (for beginner boomerangs), the boomerang is often horizontal. Try to keep one hand above it and the other hand below it. Bring the hands together and sandwich the boomerang between your hands. Sometimes catching can hurt your hands, in that case, wear a glove on your non-throwing hand

and use that hand to absorb most of the impact during the catch. If you think the boomerang is not returning safely, do not catch it.

9 Throwing

Before you throw, ensure that there is enough space around the throwing location (watch out for trees, people, etc.). Also, make sure that other people are not in danger from the boomerang flying in the air.

Warming up is essential. Without proper warm-up or a moderate warm-up, you may encounter problems. Additionally, warm-up helps improve performance.

There are two important components in the throw: spin and power. Make sure that the throwing motion is smooth. Start with the arm (almost fully) extended behind your body and rotate the shoulder (and hips!) during the throw. I often see beginners making a half or quarter throwing motion, and they don't get the boomerang back correctly. I also frequently see children who have little power but can generate a lot of spin, and they get the boomerangs back successfully.

Throw the boomerang (in general!) at eye height. Some boomerangs need to be thrown lower and some higher, so it's up to you to experiment.

10 Tuning

Tuning a boomerang is a time-consuming process. Take notes when you work on a boomerang, and you'll quickly build up a repertoire of possible improvements for a boomerang.

Think about bending (upward and downward) the wings: dihedral/anhdral. Bend the wings clockwise (or counterclockwise): Angle of Attack. Add drag to make a profile less efficient, using items like coins, Velcro, flaps, and secure them with insulation tape, for example.

I would advise beginners to keep it simple. Only try non-permanent modifications.