



Instructor's Corner

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Is it true that all the red stones curl more than the blue stones? And that the yellow stones on sheet 3 always win? How do I know if my rocks are any good?

—Rock N. Roll

Ah, stones: they get a bad rap, maybe #2 in line just behind the ice for causing missed shots. Curling stones are surrounded by a mythology as rich as the mysteriousness of the isolated island of Ailsa Craig from which many of them were mined. In this article, we'll discuss stones and what you can expect from them.

Curling stone basics

Curling stones are made of various types of granite that are suitable for the abuse and impact that must be endured during play. "Inserted" stones, such as the ones we use at Utica, are among the best kinds of stones for play. Our stones are made of Grey Trefor granite (mined in Wales), which is highly resistant to impact and chipping. You will note on the bottom of our stones, where they touch the ice, a disk of a different color granite has been epoxied into the stone. This is Blue Hone granite (from Ailsa Craig), which is very hard and non-porous. It is ideal for forming the running surface of the stone, as it has excellent wear characteristics and does not absorb water which could cause spalling during freeze-thaw cycles. The running surface is not flat, but cupped, so that the running band (where the stone touches the ice) is a small ring about 6 inches in diameter and 6 mm wide. On the side of the stone is the striking band—demarcated by its non-polished surface—and in a newly manufactured or refurbished stone this band is convex so that the stones will touch over a very small contact area. This geometry will make the stones rebound when they collide in a very lively manner. When the striking bands get flatter, the stones become "deader" on impact with one another. Curling stones must weigh between 38 and 44 pounds. At Utica, our stones vary from 38.25 to just over 40 pounds (without the handles). This weight difference (less than 5%, and most of our stones are much closer in weight than that) has very little impact on their behavior. Our stones have been matched by weight, so that the stone weight variation on any sheet is very small.

Texturing stones

To provide adequate curl, our stones are regularly "textured." That is, the stones are placed on a special jig and pushed, pulled, and/or rotated on silicon carbide sandpaper to put microscopic scratches on the running band. These scratches are about 50 μm deep, and are sufficient to cause the stones to "bite" into the ice and produce curl. Freshly textured stones will have curl and speed that is as closely matched for curl and speed as they can be. We texture our stones once or twice a year to maintain 3-4 feet of curl. Over time, as stones are repeatedly re-textured,

running bands will start to diverge, and some stones will retain some differences from one another even after fresh re-texturing. At this point stones will be re-matched, or if sufficiently diverse, re-profiled to bring running bands back into closer tolerance. When stones get this bad (and when your delivery is consistent enough to notice the differences in behavior) your rock book will be full of "cutters", "pigs", "gliders", and "straight stones."

Stone management

No matter how well-matched, no two stones are going to behave identically. If you believe stones are exactly alike, you are going to be disappointed. Rock management is a part of the game. However, most stones are insignificantly different, and any differences in curl or speed will be adjusted for by sweeping during each shot. As freshly textured stones naturally wear and smooth out as they pass over the ice during game play, they will generally curl less and become a little faster, and individual stones will start to show some slight differences in speed and/or curl from one another. Eventually, some stones will be different enough in speed or curl to significantly affect shot-making. This is when many players will make some notes in their rock book. Some skips like a pair of matched stones, while others enjoy having one "cutter" or one "fast" rock. It's another dimension to the game. Usually, demonstrably bad stones are given to the lead, sometimes the second. The idea is that there may be more shot tolerance for a lead throwing a bad rock for a guard than for your third to throw a critical freeze; or a second, who throws mostly takeouts, it doesn't matter so much if their rocks are slow or straight.

Evaluating stones

You are likely to hear varying opinions about stones on any given league night. Among my favorites is "the red stones curl more than the blue stones," often followed the next week by "the blue stones curl more than the red stones." While it is possible, even likely, that individual stones may start to show their differences over time, it would be fantastical if by random chance all the red stones on one sheet were to wear in such a way as to be systematically different from all the blue stones. All the stones are textured by one person at the same time using as nearly identical methods as is humanly possible—any variations in stones would therefore be due to random chance. For one set of 8 stones to be significantly and systematically different from another set of 8 stones would be like flipping a coin and getting 8 heads in a row followed by 8 tails in a row, which by my math is one chance in 65,536!

So what is going on here? It is important to realize that delivery mechanics are very important to stone behavior, especially release. An inside-out delivery or release will make stones appear to run straighter, while an outside-in release will result in an unnatural and large amount of "curl." And then there is rotation. If you don't throw a consistent 3 rotations with aggressively textured stones, don't expect consistent curl! If you throw 1 1/2 rotations (like you did when our stones were straight), watch out! Those 1 1/2 rotations coaxed some extra curl out of straight rocks, but with textured rocks, they are going to crank unpredictably when the rotation comes off at

the end. They may hook 2 feet or 5, flip a coin. So the team that finds that ALL of their rocks curl more than their opponents may be victims of throwing less rotation than their opponents. And if your team throws different amounts of rotation, you will find it challenging to ice their shots properly.

Also keep in mind that stones will behave differently on different ice conditions. On a fresh scrape and 25 second ice, a stone might behave very differently in terms of curl than it does on the 4th draw without a scrape on a humid, slightly frosty night where the ice is running 23 seconds. Even a rock that you know is normally a “cutter” might show different characteristics on a different ice surface.

I have a simple rule for designating a rock as anomalous in game play: I have to see the same behavior three times, preferably on different parts of the ice, before I label a rock a “pig” or “cutter”, etc. Otherwise, I normally make the assumption that it was me, not the stone. (“If you can’t swim, don’t blame the water.”) But if a stone repeatedly acts the same strange way compared to other stones, it earns a spot in the vaunted rock book. If I really suspect a stone is bad, I’ll make a note and throw it and some of its mates during a practice session to verify that it is different.

Matching stones

There is no simple way to determine if stones are matched. Pushing pairs of stones along the ice and seeing if one runs ahead of the other does not work to evaluate stone speed. (But you see it done all the time.) The problem with this method is that stones are not thrown this way, with no rotation for 3-5 feet of distance. The only way to determine stone behavior is to throw stones properly and observe them. To make sense of the results, you have to have a very consistent delivery, and apply proper rotation, no less than 2 ½ and no more than 3 ½ rotations. If you throw stones down the same path with the same weight and rotation, and the stones travel the same distance (within a foot or two) with the same amount of curl, then the stones are sufficiently matched. This method works best if you have a split timer speed trap or a partner to take split times for you.

To be honest, psychology may be more important to performance than rock-matching. I've had perfectly good skip stones taken away from me by a veteran third because I was not making my shots early in the game! I wasn't really convinced my stones were bad (I think I was just not shooting well or concentrating as well as I should) but after getting my new stones I started making my shots. That's a good third—deflecting my bad karma onto inanimate stones. I think a lot of this happens on many a league night or championship bonspiel game. If it works for you—great!

Final thoughts

Don't worry about stones too much. Concentrate on good delivery mechanics and proper rotation. When your delivery is consistent, you will be able to notice and take advantage of knowledge of stone differences. If you are really determined to match stones, throw them during practice sessions with a partner to split time. You will discover that most stones are pretty well matched, but there may be an occasional outlier.

*Good curling! Have a question for Instructor's Corner?
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