



Instructor's Corner

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I can never figure out where to hit a rock to get a double or the perfect roll? What am I doing wrong?

—Roland Wide

It's all about angles

When one curling stone strikes another curling stone, it's one round object hitting another round object. It would be easy to envision that this will not turn out well—to novices it seems almost unpredictable. Experienced curlers know just where to hit the rock to get a slash double or cross-house flop and freeze. What's the difference? Knowledge of angles. It's simpler than you think.

Visualizing angles

Two simple rules will help you plan and visualize angles when two rocks strike one another. Consider the accompanying diagram (Figure 1) in which two rocks are shown in contact. These could represent a pair of frozen rocks that could be struck on the nose, or they could represent a thrown rock (red) and a struck rock (yellow). The angles will be essentially the same either way. To figure out where the back (yellow) rock will go, draw an arrow through the center of both stones. To figure out where the front (red) rock will go, draw a tangent to the contact point. That's where the edge of the front rock will go. (The center of the rock will travel parallel to that line). That's it!

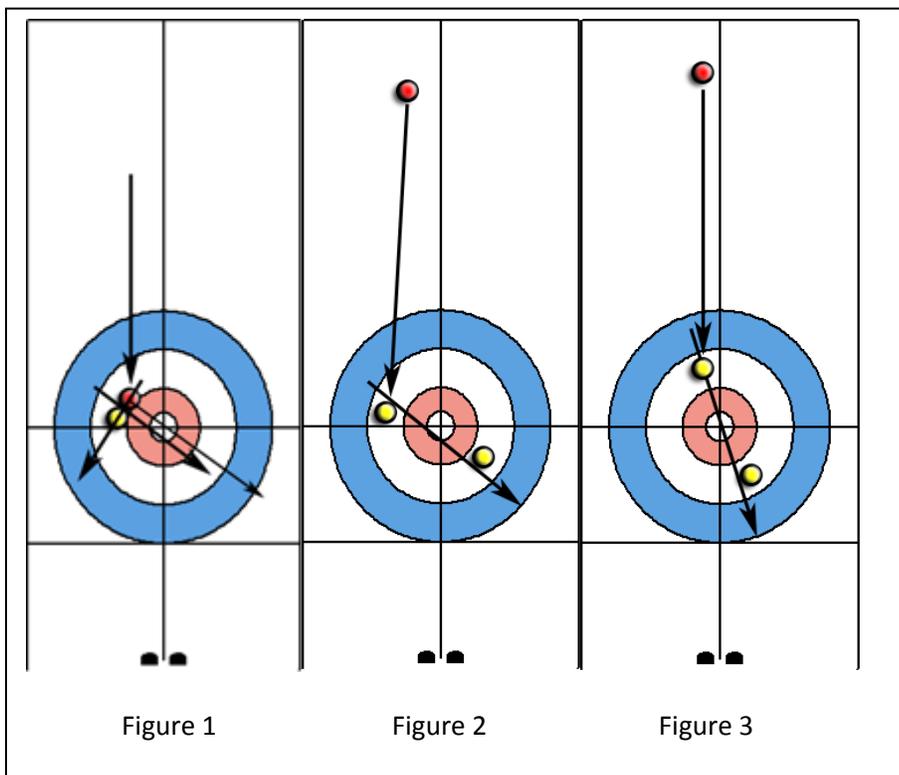


Figure 1

Figure 2

Figure 3

Let's set up a scenario for a cross-house double. Where do we need to hit the front rock to make the shot? Draw a line from the front edge of the top rock to the back edge of the back rock. When you have the line drawn out, you need to hit the top rock at where the line touches the top rock.

How about a slash double? Draw a line from the center of the front rock to the edge of the back rock. (We don't want to nose the back rock, so we want to hit it off-center to spin it out.) Where the line crosses the front of the top rock is where you need to hit it to make the shot.

If you want to practice lining up angles on the ice, you can use your broom handle as a straight-edge. (Don't do this during a game, however.)

Calling line to get the right contact point

So now you know how to line up the angles and get the right contact point. That's the easy part. The hard part is hitting the first stone at exactly the right point. If people were computers, we could just do some sines, cosines, and arctangents, calculate the stone trajectory and predict the exact contact point. Unfortunately people aren't computers, and no one can accurately calculate a trajectory very well. Fortunately, there is a much simpler way to do this. The first step is to visualize the contact point by setting up your angles as described above. Once you have done that, visualize how much the striking stone "overlaps" the struck stone when viewed from down low straight down the ice. If the center of the striking stone is aligned with the edge of the struck stone, then that's a 50% overlap, or "half a rock". If the overlap is thinner, say only 25% of the striking stone is overlapping with the struck stone, that's a "quarter rock." Commit the required overlap of your shot to memory. Now when the shot is delivered, monitor the overlap as the shot develops. It helps to get down low and well behind the rock to call line. Use your sweepers to slow the convergence of the stones as necessary to get the desired overlap at the time of collision. That is, if the two rocks are converging too quickly (so that you will have too much overlap by the time they collide) then sweep. If the two rocks are on track to achieve the desired overlap at the point of collision, or are too wide of each other, then get the sweepers off. It's all about the overlap, which you have already sized up. No trigonometry required. If you sized up your angles correctly, and visualized the right overlap, and hit that point, you will make the shot.

Some gotchas

There are a couple of extra things to consider when playing angles. One is the turn of the stone. If you throw a hit outside-in, and hit the target rock on the outside, the shooter will "spring" off the struck stone with good momentum because the spin of the stone is maintained after the collision. The thrown stone will spin off the struck stone at a slightly steeper angle than predicted by the method described above. (But probably not enough different to make you miss the shot.) If the shooter crosses over the center of the target stone, then its spin will reverse after the collision, which will kill a lot of the momentum of the striking stone. (In physics-speak, some of the stone's linear momentum is converted to angular momentum.) The shooter will come off the collision "deader" and a little "flatter" than you would otherwise predict.

The second gotcha deals with frozen stones. If they are struck off-center, you can get "drag" effects, which have been explained in a previous Instructor's Corner article. Watch out for drag effects when striking frozen or nearly frozen stones.

Try it out

Now you know how the pros do it. Next time you hear Glenn Howard on TV telling Wayne Middaugh they need to hit a “skinny half” to make that slash double, you’ll know what they are doing. And you can do it in your games, too.

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Good curling! Have a question for Instructor’s Corner?

Have a suggestion for an Instructor’s Corner article?

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Send an email to curlingschool@uticacurlingclub.org