



Fall Line Putt Reader

Make More Makeable Putts



Some Putt Reading Facts

Putting Confidence

- The ability to judge correctly the way the putting surface slopes, and by how much, allows you to putt with greater confidence and commitment to your line. Indecision about which way your ball will break at the hole undermines your confidence and leads to a tentative stroke.
- You are better off with the wrong read with a lot of confidence than with the right read, but with a lot of doubt. Indecision as to the line and speed is often the main cause of the poor execution of your stroke.
- Whatever your read, trust your instincts and commit to your putt.

Length of Putts

- The most common putts in a round of golf are in the range of 4 to 5 feet with some break to them.
- Putts in the 4 to 5 feet range are the result of chipping and pitching from off the green and from a long lag putt while on the green. Most of these putts are makeable, but are frequently missed as a result of a misread.
- The majority of all putts are not level. On short putts with only a slight break, aim to keep the ball inside the hole on the side from where it will break.

Misreads

- Unless you have correctly assessed the line and the speed of your putt, your putt will miss, no matter how smooth your stroke.
- Bad strokes are responsible for only a small proportion of missed putts. Most makeable putts are missed as a result of a misread. What you see as the break is not how the ball breaks.
- Always see some break even on a short putt to increase your concentration and improve your margin of error by making the target at the hole smaller and more precise.
- Most misreads of breaking putts finish on the low side of the hole as golfers typically under-read their putts.

(See Chapter 7 Green-Reading – Dave Pelz's Putting Bible)

Successful Putt Reading

- The ability to read a putt correctly separates good putters from the rest of golfers.
- To become a good putter you must be able to read how your ball is going to react over the surface it has to travel. The speed of your ball as it approaches the hole will determine how much or how little it will eventually break.
- Successful Putt Reading is a combination of Knowledge and Skill.
- Knowledge to understand how much and in what direction the green surface slopes within a 2 to 3 feet radius of the hole.
- Skill to deliver the ball to the hole at a consistent speed. Matching the speed to the read is a must in making putts.

Lowering Your Score

- It is on the green, more than anywhere else, that you can improve your score. Missing makeable putts leads to frustration that can feed back into the rest of your game.
- If you putt well, you are more likely to score well. By training your eye to see the [Fall Line](#) at the hole you can putt with greater freedom as your ball will react how you expect it to react.

- The **Fall Line Putt Reader** highlights through colour-coding the Physics of Break. It can definitely help your putting by eliminating any need to second-guess which way your ball will break

Putting Aids

Putting Aids that help you to judge the Direction and Degree of the Slope of the green at the hole are not new. Patents go back to 1901.

There are a number of Green/Putt Reading Aids to choose from and you should compare the benefits of each product.

Judging the Break?

There is no scientific way to determine precisely how much a putt will break or where the ball will begin to break as every green and every putt is different.

- Most golfers have difficulty in reading the break of a putt. This is because green speeds are getting faster and slopes at the hole are becoming more subtle to read.
- The average golfer has trouble in determining which way the slope runs at the hole and in which direction the ball will break at the cup. Faster green speeds have added to this difficulty, as they tend to multiply any error in the judgement of distance and break.
- The only real way to determine the slope at the hole accurately is through training your eye to see the **Fall Line**.

Slope

- The slope of the green surface (however measured) is the biggest single factor in how much a putt will break. It determines if the ball travels right to left, left to right, or straight. Get the Direction and Severity of the slope right, and you are well on your way to making the putt.
- The slope of a green can be expressed either as a percentage rise over a certain distance or run (e.g. 4%), or in degrees, in other words the angle of the slope, (e.g. 2.3°).
- There are no dead-flat greens as a flat green would cause water to pool rather than run off. Between 1% (0.57°) and 1.5% (0.86°) is the minimum slope required for surface drainage. Typically most greens are slightly sloped towards the fairway in order to hold approach shots better.
- The degree of slope can be ranked as Mild (less than 1° degree of slope), Moderate (between 1° and 2° degrees of slope) and Severe (greater than 2° degrees of slope).
(See Chapter 2 Mastering Green Reading – Dr Craig Farnsworth's See it & Sink it)
- The angle of most slopes today at the hole will fall between a fairly narrow range of 1° to 3° degrees. This is because too much slope doesn't work for high-stimp greens as the ball won't stop rolling at the hole.

- Slope has the effect of causing the ball to slow down more quickly when going uphill, or speed up down the hill.
- A slope near the start of the putt will have less effect than when the slope is near the hole.

Green Characteristics

- Green speed is determined by a number of conditions. They are the height of the grass, its texture, the moisture it contains, the grain, the slope, the surface dampness, and the wind if it is more than a mild breeze.
- Firm greens are faster than soft greens.
- Bent greens are faster than Bermuda greens.
- The shorter the cut of the grass, the more the slope will affect the break because the ball's speed is slower.
- Moist grass will be slower than dry turf at any height.

Grain

- Grain is nothing more than the direction in which grass grows, as grass seldom grows straight up. Grain is sometimes referred to as nap.
(See Chapter 6 Reading the Green – Todd Sones Lights-Out Putting)
- Grain either speeds up or slows down the speed of the ball. Rarely will it add or reduce a break that is due to slope by more than 10%.
- A moderate or severe slope will always have the grain growing with the slope because of the drainage.
- Grain is one of the most common deterrents to the uniformity of speed. Typically the direction of mowing is changed for every cut to help reduce the grain.
- Grain is not much a factor as it was previously owing to new strains of grasses and improved mowing practices.
- By examining the cup of the hole, you can check the direction of the grain. If you are putting from the smooth side of the cup, you are putting with the grain. From the rough side of the cup, you are putting against the grain.
(See Page 108 'Success on the Green' by Steve Hosid for an illustration)

Wind

- Wind doesn't affect the roll of a ball much on normal-speed greens. It has its greatest effect on super-fast greens.
- Wind can affect your putting stroke because it challenges your balance.

Increasing Green Speeds

- Better mowing equipment with more precise settings, built-for-speed grasses, and a gradual reduction in mowing heights to satisfy a desire among golfers for faster and more consistent greens have seen a gradual increase in Stimpmeter readings
- The Stimpmeter, created by Edward S. Stimpson in the mid 1930's, is a 36 inch extruded metal bar with a V-shaped groove the use of which makes it possible to place a number on the speed of a green.
- The USGA introduced a modified version to course superintendents in late 1970's as a way to maintain consistency in green speeds.
(See [www.franklygolf.com /Speak/stimpmeter.asp](http://www.franklygolf.com/Speak/stimpmeter.asp))
- Because of the faster greens speeds, certain sections of old-styled putting greens no longer provide a fair hole location. This has led to modern greens being built larger, and with less slope, to maximise the number of possible pin placements.
- The typical slope around the hole is now less severe, and now not as easy to see.

USGA Specification

- The USGA specification for pin locations recommends that the cup be a minimum of five paces from the edge and that an area 2 to 3 feet in radius around the hole should be as nearly level as possible and of uniform grade. This should result in an area immediately around the hole being flattish and not too severe in slope.
(See www.usga.org for information and articles on green related topics such as hole location, green speed, grain etc)
- The pin placement guidelines suggest it is unfair to locate the pin without allowing any putt to that location to be stopped within 2 feet of the hole.
- Knowing the speed of the green will help in determining if a pin location is fair or unfair.
- A green so fast, or a hole cut in such a position, that a ball cannot be stopped near the hole from any point on the green, is an unfair challenge.
- A rule of thumb is to position the hole in the centre of a 3-foot diameter area that is on the same flat, but tilted plane.

Fall Line (Zero Break)

- If you want to understand how the ball will break at the hole, you must train your eye to see the [Fall Line](#).
- The [Fall Line](#) is the line that connects the highest point on the rim of the hole with the lowest point. It is the true downward direction of the slope.

- Decision 16/6 of the Rules of Golf states that when cutting a hole on a slope, the hole should be cut vertically, regardless of the slope. Therefore on a sloping surface the hole will have one and only one high point.
- You should always look at the cut of the hole and the area around the hole. The Rules of Golf state that when a liner is inserted in the hole, it must be sunk at least one inch below the putting green surface. The amount of ground above the liner on the high side of the cup will indicate the slope.
- Once you know the direction of the **Fall Line**, you will know in which direction your putt will break at the hole.
- The only putts that don't break are those straight uphill or downhill putts along the **Fall Line**.
- A ball that is located to the right of the **Fall Line** will always break right to left, irrespective if the putt is uphill or downhill.
- A ball located to the left of the **Fall Line** will always break from left to right, irrespective if the putt is uphill or downhill.
- As a ball slows down in a breaking putt, the pull of gravity draws its direction closer and closer to that of the **Fall Line**.
- The line that is 90 degrees to the **Fall Line** is known as the Axis of Tilt. Putts that are less than 5 feet from the hole and are located on the Axis of Tilt will have the maximum break.
- After determining the **Fall Line**, the next consideration in reading the putt is to judge the speed with which the ball is likely to roll.
- Imagine a putt of the same length along the Axis of Tilt to find the maximum break. How far would a putt at optimal speed curl below the hole before it crossed the **Fall Line**?
- Then use the same measurement of distance to establish the aim point on the **Fall Line** above the hole.

(See the article 'See the Spider' by Geoff Mangum on www.puttingzone.com)

Critical Zone

- The slope close to the hole has more effect on the break than slopes farther away. Putting successfully means managing the last few feet of the putt.
- Good putters pay particular attention to the grass and contour of the green within a 2 to 3 feet radius of the hole as it is in this area that most of the break occurs.
- For downhill putts always look at the putt from the low side as this will give you a better sense of the severity of the slope, especially beyond the hole.

Speed

- The speed or pace on a level green depends on the length of the grass, the moisture condition of the green, and the direction of the grain.
- The speed a ball rolls across the putting surface will determine its break. Except for straight putts, there will never be a single correct line of putt.
- An important consideration in reading a putt is deciding how firmly you want to hit the putt. This is because a firmly struck putt breaks less than a ball hit at a slower speed.
- When the ball starts to slow down, the green's characteristics of slope and grain will have more effect on how it breaks.
- The speed of the green is not a constant and can vary over the course of a day. For example, it could roll faster as the green loses its moisture, or slower as the grass grows.

Optimal Speed

- Always do your own thinking on putts. No one else knows how hard you are going to hit the ball, so there is no way they can determine your line. The easier you hit a putt, the more it will break. That is why fast greens break more than slow greens.
- Good putters have the ball going into the hole at the same rate of rolling speed every time, and from any length. This makes their reading of the line of their putts more reliable. Most amateurs are too line-conscious, and don't pay enough attention to the speed of their putt.
- Your chances of making a putt are better if your speed is such that the ball is dying at the hole as this makes more of the hole available for capturing the ball. If the putt misses, it avoids long comebacks.
- A faster putt is less susceptible from being knocked off line by defects in the putting surface. However, the faster the ball rolls as it crosses the lip, the less time it has to drop into the cup before it reaches the back wall.
- If you have any doubt about how much a putt will break, err on the high side. As long as the ball is above the cup when it starts to die, it has a chance of going in. It also has more of the cup to catch if it is coming in high and from the side, rather than low and from the front.

Distance

- Speed and distance are synonymous. A consistent speed makes reading the line of putts more reliable.
- The most important thing about putting is control of distance. Most three putts are the result of hitting the first putt very long or very short, rather than too far to the left or right of the hole.

Breaks

- Break, sometimes referred to as borrow, is a combination of the degree of surface slope, green speed, and the rolling speed of the ball.
- Most golfers under-read breaks as they fail to appreciate that a putt will always break more as it starts to slow down than when it is travelling faster.
- Downhill putts break a little more than uphill putts. However, side-on putts break the most, and tend to sling the ball farther left or right than golfers expect.

Gravity

- The slower the arrival speed of your ball, the more time there is for gravity to influence its roll. The expression 'hitting your putt through the break' implies that your ball was travelling too fast for the line you chose.
- To understand how gravity influences your ball requires an insight into the significance of the [Fall Line](#) through the hole.
- Once you can appreciate how the [Fall Line](#) is pivotal in judging the Direction of the Break relative to the position of your ball, you will be better equipped to striking the ball with confidence.
- Gravity pulls downhill putts to run parallel to the [Fall line](#), and uphill putts in towards the [Fall line](#).
- Putts seldom break much in the first two-thirds or so of the roll. This is because the ball is moving too fast for gravity to have much effect on it. In the dying phase of the putt as the ball begins to roll more slowly, there is more opportunity for gravity to work.
- There is less initial break in an uphill putt because the ball only begins to break as it starts to slow down. Because it slows down faster as well, it tends to break more sharply at the end.
- On a downhill putt gravity takes over the ball earlier in its run to the hole. You need, therefore, to allow more break and less speed. Because a downhill putt does not slow down quickly, it does not break as sharply as an uphill putt at the end.
- The aim spot of a breaking putt is always above the hole. The pull of gravity towards the [Fall Line](#) in a downhill putt tends to help direct the ball to the hole. Because of this downhill breaking putts can be viewed as somewhat easier than uphill breaking putts so long as the speed is well managed.

Phases of Ball Roll

- The force of your putter stroke is the determining factor on how far the ball will roll. The actual roll can be divided into 3 phases. The first phase is the accelerating phase when initial speed of the ball causes it to overcome gravity

and the friction of the putting surface. There is not much break as the ball is moving at its fastest.

- The second phase is when the ball appears to be running at a constant speed. However, gravity and the friction of the putting surface are starting to influence the line and speed of the ball.
- The final phase is the deceleration phase. At this point near the hole, the ball is coming to a stop. As it slows down, gravity and friction of the putting surface are taking over.
- In an uphill putt the acceleration phase is much longer. This is because more energy must be applied to the ball to get it to roll uphill. The second phase is shorter, and the deceleration phase is even shorter because gravity and the friction of the putting surface slow the ball very quickly.
- In a downhill putt the acceleration phase is short because very little energy is needed to get the ball rolling. It takes a long time for the friction of the putting surface to overtake gravity and so the deceleration phase is extremely long.

Green Reading

- Green Reading is an art of awareness and skill of assessment, not an exact science of measurement and analysis.
- Green Reading is assessing the overall contour and firmness of the green, and the drainage pattern of water.
- Green Reading is not the same as Putt Reading. It only gets you started on accurately reading the putt. In Putt Reading, the only green surface that matters is the surface the ball will roll over from address into the cup.

Putt Reading

- On any breaking putt your goal should be to narrow the margin of error and maximise the chances of success.
- Putt Reading involves determining the local [Fall Line](#) through the hole and from this knowledge assessing the amount of break from different locations. This is because the direction of approach to the hole influences the amount of break.
- An important consideration in reading a putt is to judge the speed with which the ball is likely to roll, and from that assessment decide how hard you should strike the ball.
- You should read the putt with a consistent end-of-putt delivery speed in mind in order to maximise the ball capture, and to avoid long comebacks.
- In reading a putt you should pay particular attention to the grass and slope of the putting surface within a 2 to 3 feet radius of the hole.
- You should always read a putt from behind the hole when the hole is located on a surface lower than your feet.

- Check your line for any ball marks, little stones and anything that could knock your ball off line.
- Examine the rim of the cup to see if one side is showing slight damage. This could have been caused by a number of putts breaking towards that side of the hole.
- The lower your elevation view, the more clearly you will see the undulations of the putting surface.

Fall Line Putt Reader

- In reading a putt you are initially trying to find the local **Fall Line** and the degree of the slope.
- It is not always easy to see the **Fall Line** especially when the slope is subtle or mild. This is where practice with the **Fall Line Putt Reader** can help to train your eye.
- You should always practise reading a putt first by trying to identify the **Fall Line** and then testing your read by placing the **Fall Line Putt Reader** at the hole.
- Place the **Fall Line Putt Reader** at the rim of the hole with the 6 arrow pointing directly at the ball.
- Next rotate the unit and line up the bubble with the 12 on the clockface.
- The 12 to 6 **Fall Line** now indicates the true downhill direction of the slope.
- The degree of the slope can be gauged by how far the bubble has moved away from the central level circle.

Plumb-bobbing

- A number of golfers swear by plumb-bobbing as a way to read a putt.
- It is a technique that is fraught with error as it depends on how and where you stand, and how you sight along the putter shaft.
- The general view of putting experts about plumb-bobbing is that plumb-bobbing executed correctly at best only gives you an indication of the slope of the green.
(See *Plumb Bobbing is Plumb Crazy ... Mostly by Geoff Mangum on www.puttingzone.com*)

Mapping the Green

Mapping helps you to build up a mental picture of the each green.

- Sketch a rough outline of the green and draw a rectangular box around it. Divide the box into 6 sections, front, middle, back, and left and right. In each section there will be a number of possible pin locations.
- Find the most likely pin locations in each section and mark them in pencil as dots on your green map. You can find a number of these locations by looking for

old hole plugs. Your course superintendent may have location plan for pin rotation.

- Determine the **Fall Line** at each pin location of the slope at the cup by placing the **Fall Line Putt Reader** within a foot of the pin location.
- Draw a small arrow in pencil through each dot representing the direction of the **Fall Line**. Next to each arrow show the degree of slope on a scale of 1 to 3 (optional).
- You will usually find that the pin locations in one area have similar **Fall Lines**. You can simplify your green map by showing only one **Fall Line** in this area.
- Collate the green maps for the 18 holes into a small booklet that you can use as a handy reference during future rounds and competition.