

What is a Golf Ball?

GRADES 6-8

The Golf Ball Evolved

Like many sports, the landscape of the game of golf has changed significantly over the years. Yet golf has evolved more than most sports because of its long history. What are some of the most significant changes? Moreover, have these changes improved or hurt the game?

During the game's four-hundred-year history (1618), the process of developing the golf ball has changed considerably, such as:

The first balls used during competition were constructed from pieces of horse or cowhide, filled with goose feathers, and stitched.

In turn, water was used to harden the leather-like exterior to create a harder and heavier ball to hit the ball further and straighter.

However, this was a time-consuming process, in addition to creating challenges to create a durable club that did not damage the ball over several rounds; this entailed both irons and woods (now composed of metal and graphite) made of wood. Furthermore, this process of creating golf balls was costly.

The most significant update to the ball did not take place for another two hundred years (1848). This process involved use of "rubbery sap" from tropical trees; heat was applied to

generate a very solid, round product that could be struck hard by the club; society referred to this ball as "guttie" (from the term gutta percha). Fortunately, unlike the original designed ball made of leather and feathers, it was less expensive to produce. In addition, to yield a better flight model, the ball was

outlined with a design to track flight characteristics. By the late 1800s, rubber-based company Dunlap got involved and began mass production. During this time, production included adding round bumps to the ball, forming a more durable ball.

By the late 1800's to early 1900's, Coburn Haskell introduced a ball composed of a solid rubber core – encompassed by a rubber wrap – inside the gutta percha (rubbery substance made from the sap of

tropical trees). This was essentially the greatest step in golf innovation, as it added an average of 20 yards for players from the tee box. This excitement generated the need for mass production through the invention of a thread-winding machine of the "Haskell ball," named for the creator of this newly developed ball with a rubber core and dimple outline — ascertaining a ball that enhanced trajectory and length. These golf balls were used during play for the first time in 1905.

While players supported this change, it

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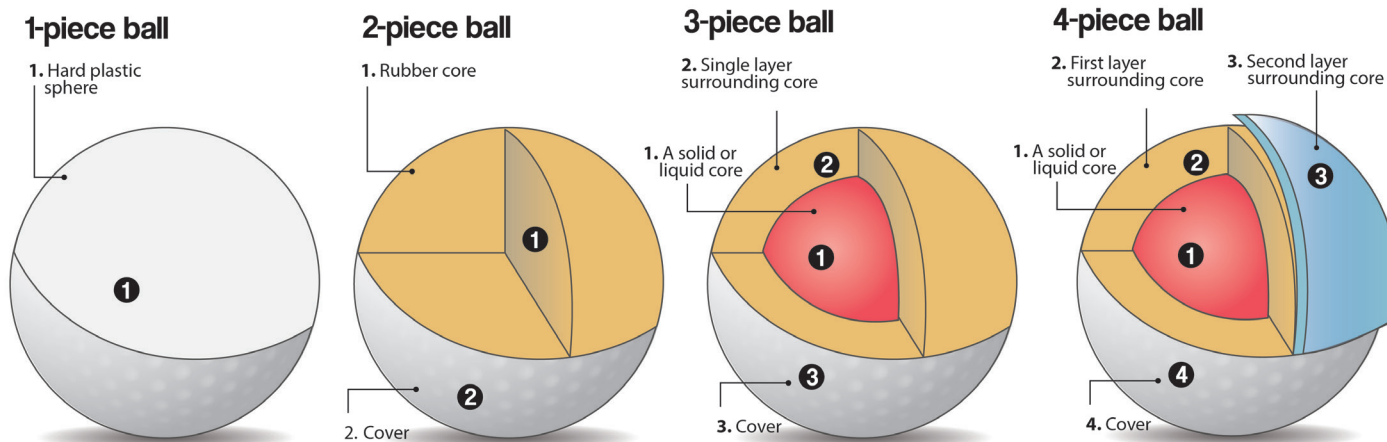
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Anatomy of Golf Balls



was important the USGA (United States Golf Association) and other international governing bodies establish protocol for the weight and size of the golf ball in the 1920s. However, specifications (size and weight) of the golf balls between the U.S. and other countries differed until 1990. In turn, recognition of the game's global presence led to amendments, so specifications were equal globally.

Today, there are a litany of golf balls and brands in the market. Why? Because no one player performs the same. Some players hit the ball extremely far yet with less control. While others hit the ball less far yet with more accuracy and precision. The below breakdown and model provide a good example of how engineering and technology has played a role in the game:

- Two-piece ball: a larger and more forgiving ball to improve distance; less spin to effectively hit the ball straighter.

- Three and four-piece ball: players that control the ball well and with a high swing speed; these balls have a thinner layer covering the ball.
- Five-piece ball: players that control the ball with a high rate of club head speed, looking for greater distance based on a soft inner core and outer layer. A high-performance ball, popular amongst professional golfers.

The above diagram demonstrates how comprehensive the game has become to suit both the amateur and professional golfer. It also exhibits immense transformation of the game. Based on technological advancements to-date, what will the next four hundred years look like? What effect will designers and engineers have on the game?

Information based on *The Evolution of Golf Balls* by Brian Hill for *Golfweek*

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What were some of the constraints for the first golf ball? Why did golfers feel the need to make changes?

How has the anatomy of golf balls changed over time? What drove this change?

What criteria and constraints did golf industry engineers need to consider in the early 1900's?

Why are there multiple golf balls in today's golf game?

Why do you think it was necessary for the international golf governing bodies to regulate the mass and size of the golf ball? Support your claim with evidence and reasoning.

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What is the author's purpose of this article? Provide text evidence to support your claim.

Using the article and classroom discussion, fill in the following criteria and constraints table.

Criteria	Constraints

	Qualitative Observations	Quantitative Observations
<p>Callaway Golf® Supersoft Golf Ball (2-piece ball)</p>		
<p>Callaway Golf® ERC Soft Golf Ball (3-piece ball)</p>		
<p>Callaway Golf® Chrome Soft Golf Ball (4-piece ball)</p>		

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Trial # _____

	Distance of Putt 1	Distance of Putt 2	Distance of Putt 3	Distance of Putt 4	Distance of Putt 5	Number of putts to hit the target
Tennis Ball						
Ping Pong Ball						
Callaway Golf® Supersoft Golf Ball (2-piece ball)						
Callaway Golf® ERC Soft Golf Ball (3-piece ball)						
Callaway Golf® Chrome Soft Golf Ball (4-piece ball)						

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Complete the following statement and support your claim with evidence from the article and experiment, and support it with reasoning regarding the criteria and constraints.

“Ball number ___ is the best technologically engineered ball for the game of golf.”