

Athenaeum Paper

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# **Baseball Ball**

## **Evolution of the Iconic Sphere**

The ball used in baseball has undergone substantial changes since its initial conception. From rough and ready, homemade versions to the sophisticated, precision-engineered balls we see in modern-day Major League Baseball (MLB), each iteration has contributed to shaping the sport as we know it today.

Despite its uncomplicated appearance, the baseball is in fact a precision-made object.

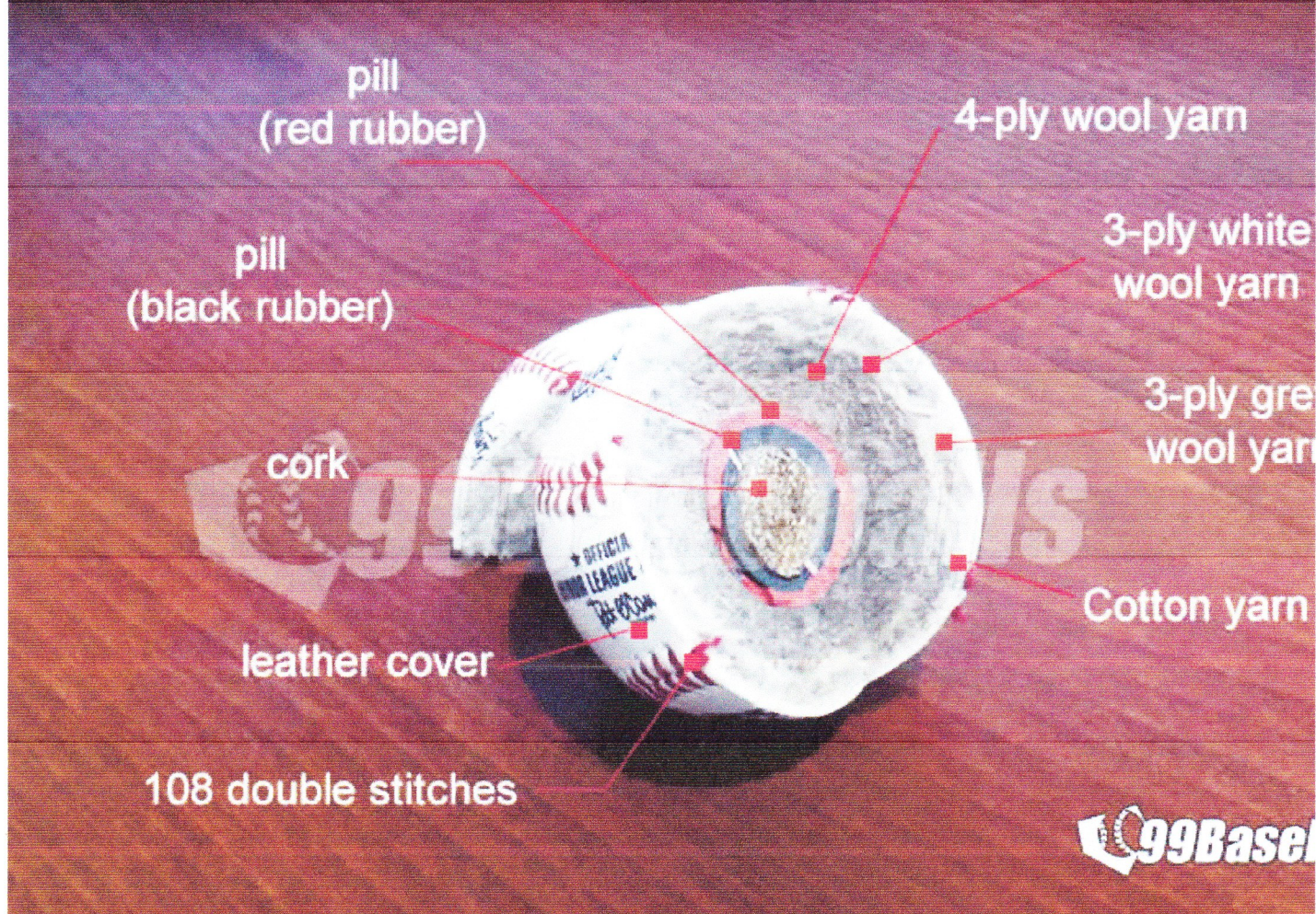
Today, Rawlings (founded in 1887) has had an exclusive contract to supply the major leagues with baseballs since 1977. The majority of Rawlings baseballs for the MLB are made in the Costa Rica plant which makes more than 900,000 baseballs a year (Rawlings China plants make 2 million + baseballs per year. The average baseball remains in play for only five to seven pitches in a Major League game!).

Overall Rawlings supplies about 1.8 million of them to the major and minor league teams. The remaining baseballs are sold to the public.

### **Anatomy of a Baseball**

Picture below is a brand new, dissected Minor League Baseball.

# Anatomy of a Baseball



*Anatomy of a Modern MiLB Baseball*

The materials used inside and outside the ball will vary, depending on the level of play and the league you play in. Excluding safety baseballs (made from rubber or foam), all recreation and tournament grade baseballs will have similar combination of these components that are found in MLB and MiLB baseballs:

- 108 double stitches
- leather cover
- pill (cork with either single layer of rubber “cushioned” or two layers of rubber “double cushioned”)
- One, two, or three layers of yarn
- Fourth layer – cotton thread for bonding between the core and the leather cover

## **Current Standard**

The current standard for a baseball is 9 to 9.25 inches in circumference and between 5 and 5.25 ounces (around 142 to 149 grams) in weight; in order to comply with MLB Rule 3.01.

This specification is according to the regulations defined by Major League Baseball (MLB). This weight standard has been in place for over a century, illustrating its integral role in shaping the game we know and love today.

## **Changes in Size, Weight, and Materials used in Making Baseballs**

Throughout history, small changes in the size, weight, and materials used to construct baseballs have had a profound impact on the game.

Let's explore the fascinating journey of how baseballs have evolved, from the early days of handmade spheres to the standardized, technologically advanced balls of today.

### **Early Baseballs (1800s)**

In the early years of baseball, the balls were often handmade. Often, individuals used what they had on hand to create these balls. A core made from scrap rubber materials was wrapped in yarn or string and then covered in horsehide leather. Often, local leather workers fashioned balls for the local teams.

# ***Lemon Peel Baseball*** ***(est. 1830)***



 99Baseballs

These baseballs lacked uniformity; their size, weight, and bounce varied significantly. Stitching was often crude and inconsistent.

The very first baseballs used in the 1840s had a “lemon peel” stitch pattern, a design with four sections stitched together using exterior seam welds, quite different from the figure-eight pattern we’re accustomed to today.

The size of lemon peel balls was small when compared to today’s baseball.

## **1857 – Adoption of Rubber Core**

Prior to 1857, baseballs were typically filled with cork or rubber-like materials. However, in 1857, the National Association of Base Ball Players officially adopted the rubber core, which provided greater consistency and durability to the ball.

## **1872 – The First Baseball Specifications**

In 1872, the National Association of Base Ball Players (NABBP) established the first formal baseball specifications.

The ball was required to have a circumference between 9 and 9.25 inches, weigh between 5.5 and 6 ounces, and each ball should be stitched with 108\_double\_stitches.

## **Baseball Manufacturers (1900s)**

The early 1900s is also marked by the “Dead Ball” era, creating boredom and malcontent among players and fans. The handmade era began to fade as factories started to produce baseballs.

This, “Dead Ball Era”, lasted until 1920 and saw balls made with a rubber core wrapped in yarn and encased in a leather cover.

The balls were softer and less tightly wound than you see today, which resulted in fewer home runs.

## **1901 – Formation of The American League**

Originally known as the Western League (1885-1900), the American League renamed itself on January 28, 1901 when League President Ban Johnson declared they were now a Major League. There were nine teams primarily in the Midwest. The original eight teams of the “new” American League were:

- Boston Americans (Boston Red Sox)
- Chicago White Stockings (Chicago White Sox)
- Cleveland Bluebirds (Cleveland Guardians)
- Detroit Tigers
- Baltimore Orioles
- Philadelphia Athletics (Oakland Athletics)
- Milwaukee Brewers
- Washington Senators (Minnesota Twins)

## **1903 – The National Agreement**

The National League (formed in 1876) and the American League (formed in 1901) cemented their cooperation with the National Agreement in 1903.

The agreement set the stage for an annual championship series (now known as the MLB World Series) between the champions of both leagues. The agreement also solidified the structure and legitimacy of professional baseball in the United States, laying the foundation for the modern era of the sport.

### **1909 – First Official Baseball Manufacturer**

In 1909, the Spalding Company became the first official baseball manufacturer for Major League Baseball (MLB). This marked the beginning of a long-standing partnership between MLB and Spalding.

### **1910 – Introduction to Cork Center**

In 1910, a crucial change was made to the baseball's design when the Spalding Company introduced a cork center in place of rubber.

The cork was lighter and allowed for a tighter wind of the yarn, resulting in a firmer ball. This adjustment ultimately led to more "lively" balls.

### **1920 – The Introduction of the Livelier Ball**

But the real livelier era started in response to a decline in offensive production. The National League made other changes to the baseball's composition, resulting in a much livelier ball after 1920.

The cork core was replaced with a cushioned cork center, making the ball more resilient and increasing offensive numbers.

### **1933 – Modern baseball standard implemented by the American league**

The American League settled on new ball manufacturing specifications that closely resembles the specification used to make modern baseballs.

The specifications of the ball called for a double cushioned cork center (weighing  $\frac{7}{8}$  ounces), 71 yards of blue gray woolen yarn to build up the core to  $7\frac{3}{4}$  inches in circumference, weighing  $3\frac{1}{8}$  ounces.

Next layer was formed by wrapping 41 yards of white woolen yarn to increase the circumference to  $8\frac{1}{4}$  inches with the weigh increasing to  $3\frac{7}{8}$  ounces.

A coat of special rubber cement was then applied, followed by 41 yards of blue-gray woolen, and the final 100 yards of 20/2 ply fine cotton, establishing  $8\frac{7}{8}$  inches in circumference and a weight of  $4\frac{3}{8}$  ounces.

Finally, another coat of rubber cement is applied to which an alum tanned horsehide weighing an 1/2 ounce and 5/100-inch-thick leather covers are sewn with a double stitch of four-strand red thread.

The finished ball is 9 to 9 1/8 inches in circumference and weighs 5 to 5 1/8 ounces.

Up until this time, this “baseball making recipe” was jealously guarded by the manufacturers.

### **1934 – Agreement on a Uniform Livelier Ball**

On January 6, 1934, the National League and the American league agreed to use a standardized baseball that was used in the American League in 1933.

The new standard ball is a medium between the “jackrabbit” of the American League and the slower, “reaction” ball of the National League, offering more lively ball than earlier baseballs, aimed at increasing offense and fan excitement in the National League.

### **1938 – Federal Scientists to test baseballs**

The president of the Senators (currently known as the Minnesota Twins) announced that he would ask the Bureau of Standards (now known as the NIST or National Institute of Standards and Technology) to test the National League’s “dead ball” and the American League’s “rabbit ball”.

### **1942 – Re-purposing golf pills into baseballs**

The War Production Board (WPB) reported that 720,000 baseballs of quality “equal to pre-war cork-centered baseballs” would be made by use of leftover insides of golf balls. These baseballs were intended for college, high-school and local leagues as the big leagues were believed to have enough leftover baseballs from the 1942 season to cover 1943.

((In 1942, sixteen major league clubs used approximately 1600 dozen baseballs per season (307,200 baseballs). By comparison the OVL, my last year as President, 12 teams used 500 dozen or 6000 baseballs.))

### **1943 – Putting “jack rabbit” back into the standard baseball**

Due to World War 2, previously used materials to construct baseballs were severely limited. The revised baseballs caused hitting to slump dramatically and players complained the ball had been deadened.

So, a three-man committee voted to adopt the 1939 “jack rabbit” ball standards in March for the 1943 season.

The revised ball specification called for the granulated cork center, surrounded by two layers of balata rubber. This center would not be as lively as the one used when top grade cork and rubber

were available before the war. To compensate, manufacturers increased the resiliency by changing the method of winding the yarn and using a different cover.

### **Livelier Baseballs (1950s)**

#### **1953 – Cooper Union alleges “Jackrabbit” ball**

According to Cooper Union, an institution specializing in scientific studies, alleged that the baseballs used in the major leagues in 1953, on average, could travel eight percent more than the previous year. That meant a regular 300-foot flyball in 1952 may turn into 324-foot home run in 1953.

AG Spalding, which made baseballs for both the American and National Leagues, responded that the age of 1952 baseballs may have skewed the results.

In 1953, baseballs averaged 143.7 grams to 147 grams (5 to 5.1 oz). Through the 1950s the average number of home runs was approximately 2,200 each year.

When questioned about a “lively ball” during a 1957 interview, an AG Spalding representative claimed that there had been no changes made to the ball since he joined the firm in 1919!

When reminded that he was under oath, the official mentioned the First, Fourth, Fifth, and Fourteenth Amendments as his response!

#### **1969 – Controversy over “distinctly livelier” ball**

The MLB ball standard is for it to have a circumference between 9 and 9 1/4 inches and weigh between 5 and 5 1/4 ounces.

The 1969 season ends with 3,119 total home runs, which is a 56% increase from the previous year, which caused fans and players to allege that the 1969 baseball was livelier than the one used in recent past.

However, it should be noted that:

- each league added two new teams (total of four new teams)
- rule changes were adopted to counteract the dominance of pitching (mound was lowered from 15 to 10 inches and the strike zone reduced to area over the plate between the armpits and top of the knees.)

Factoring these changes, MLB saw 36% increase in home runs compared to previous year.

The fifth Major League Baseball commissioner Bowie Kuhn told the press that he would thoroughly study the baseball’s resiliency by creating a new testing method and implement new standards next year.

The 1970 season ends with an even higher number of home runs (3,429), however, probably due to the league using leftover stock. Because the 1971 season ends with 2,863 home runs.

### **1974 – Cushioned Cork Center**

In 1974, MLB introduced a revised “cushioned cork center” ball. The ball featured a cushioned cork core surrounded by rubber, resulting in increased bounciness and greater offense. This change led to a stabilizing of home runs around 2600 in 1974, 1975, and 1976.

### **1976 – Rawlings becomes the official supplier of baseballs to MLB**

In 1976, Rawlings Sporting Goods became the official supplier of baseballs to MLB. The balls manufactured by Rawlings had to meet specific standards set by MLB, ensuring uniformity in weight, size, and performance.

The baseballs now featured a cushioned cork center, wound with nearly a mile of wool and poly/cotton yarn, and covered with premium cowhide leather, stitched together with precisely 108 double stitches.

### **1977 – Season ends with a massive 3,644 home runs**

In 1977, the American league added the Seattle Mariners and Toronto Blue Jays, increasing the total number of teams to 14 while the National League remains the same at 12 teams.

Remember Rawlings replaces Spalding, as the official supplier of baseballs to MLB, and 3,644 home runs were hit: more than a 1,000 more home runs than the previous year.

### **1987 – Season ends with another record: 4,458 home runs**

Fans allege another round of “juiced” balls as 4,458 home runs were hit in 1987. But many sportswriters defended the home run record as a byproduct of better athletes becoming hitters (rather than pitchers).

If the ball was not juiced, how come the 1988 season ended up with “only” 3,180 home runs which is more aligned with previous five years and next five years.

### **2000 – Using a Single Standard Baseball**

Previously, the American League and the National League remained as separate entities. During this time, American League balls came with red and blue stitching while the National League balls featured red and black stitching.

In 2000, both leagues legally merged into a single organization led by the Commissioner of Baseball and agreed to use identical baseballs that came with red stitches to maintain consistency. Some players also stated that they were able to see the ball better due to the use of red stitches.

## **2010 – “Juiced Ball” Controversy**

Many players, analysts, and fans noticed a significant surge in home runs during 2010, leading to speculation that the ball’s construction or composition had been modified.

While the exact cause of the offensive surge remained a topic of debate, investigations and studies suggested that changes in manufacturing processes and the use of different materials may have contributed to the increased power numbers.

The “juiced ball” controversy sparked discussions about the balance between offense and pitching, and MLB made efforts to address the issue by conducting studies and making adjustments to ball specifications in subsequent years.

## **2017 – Home Run spike raises questions**

The 2017 season ends with 6,105 home runs

## **2019 – “Juiced Ball” Controversy # 2**

Similar to the previous controversy, this debate centered around allegations that baseballs were intentionally altered to favor hitters, resulting in an increased number of home runs and higher offensive statistics where players and analysts agreed that there was unprecedented surge in power numbers. The 2019 total home runs were 6,776.

Again, the controversy sparked discussions about the game’s integrity and the delicate balance between offense and pitching.

MLB commissioned independent studies to examine the issue but found no definitive evidence of intentional alteration. MLB continued to monitor ball specifications and made adjustments in subsequent seasons to address the concerns surrounding the “juiced ball” phenomenon.

There were only 2,303 home runs in 2020 (COVID). Since 2021, there have been 5,940; 5,215; and 5,868 respectively. The current season is enroute to break 5,000 home runs again.

## **Takeaways**

Today’s modern baseball represents the culmination of a rich history of innovation and refinement. Through careful craftsmanship and technological advances, baseballs have evolved to meet the demands of the game.

From standardized specifications to enhanced performance, the modern ball embodies the delicate balance between offense and defense, providing a level playing field for players to showcase their skills. While baseballs have changed slightly through the years the big question remains were those changes enough to significantly alter the record books?

While controversies surrounding ball composition and its impact on the game persist, the ongoing pursuit of excellence and fair play ensures that the ball continues to be the iconic symbol of timeless tradition and excitement of baseball.