RED TEAM

BLUE TEAM

This book belongs to

_____

_____

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Table of Contents

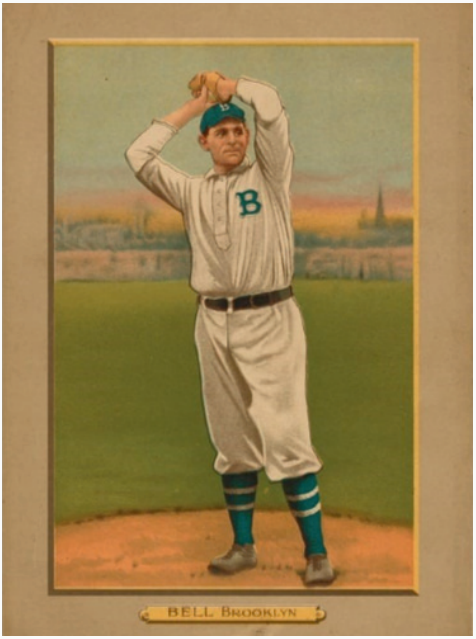
GIRL SCOUTS CAROLINAS PEAKS TO PIEDMONT

Science on the Sandlot

To earn your patch, you must attend a baseball game and complete one of the STEM challenges.

Purchase your patch today at bit.ly/3VWhv6F.
Share your thoughts on this program at bit.ly/4puu5HZ.
Your opinions will help us plan and enhance future programming.

The History of Baseball



The myth that Abner Doubleday invented baseball in 1839 in Cooperstown, New York is debunked as a story created by the town in the 1930s to promote itself as the hometown of baseball, leveraging the presence of the National Baseball Hall of Fame.

Baseball History

Did you know that baseball in the United States evolved from English sports such as cricket and rounders? Alexander Joy Cartwright, a founding member of the New York Knickerbocker Baseball Club established in 1845, was instrumental in formalizing the rules of baseball.

Over time, the formation of the National League in 1876 and the American League in 1900 marked significant milestones as they collaborated for the World Series in 1903. Baseball's popularity grew in the early 20th century, becoming a morale booster during World War II. Major League Baseball now has a global fanbase.

Get to Know the Sandlot

Object

Baseball is played by two teams of nine players each, who try to score more runs than their opponent by rounding the bases and crossing home plate as many times as possible.

The batting team stays up to bat until the fielding team puts out three batters.

Playing Area

The playing area is often referred to as a baseball diamond due to its shape. It consists of a pitcher's mound, four bases, an infield and outfield.

Equipment

Players need a bat, a glove, batting helmet, baseball and cleats.

Positions

The visiting team bats first while the home team starts out in the field on defense.

Batting

There is a batter's box on both sides of the home plate. The batter may choose which side of the plate to hit from, but both of their feet must be inside the box.

The batter will attempt to score runs by hitting the ball when it's pitched. The batter may continue to hit until the ball is hit in the territory, gets three strikes out or gets four balls.

Strike Zone

The Strike Zone is the area between the batter's shoulder and knees. A "strike" is called by the umpire when the batter:

- Fails to swing at a pitch that crosses the plate in strike zone
- Swings at a pitch and misses
- Hits the ball out of bounds with fewer than two strikes against them

Once the batter gets three strike they are out, and then the next batter is up to plate.

Balls

A "ball" is a pitch that crosses the plate outside of the strike zone that the batter does not swing at. If the batter receives four balls, they get to walk to first base.

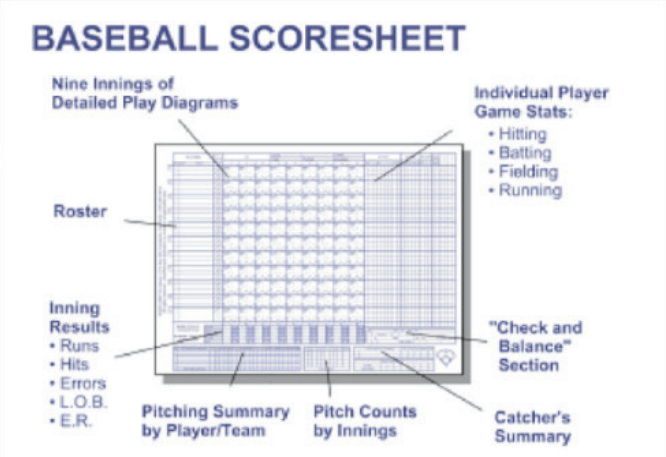
Runners

The batter becomes a runner when they hit the ball in fair territory and runs to first base or gets walked after four balls. A runner can move to the next base if the ball is overthrown or after a wild pitch.

A runner may overturn first base when they hit the ball as long as they turn out of bounds after they pass the base. Runners may not overrun any other base. If they do and are tagged while off base, they are out.

Score Keeping 101

Baseball can feel like an equipment heavy sport, but in its purest form you only need a glove, a ball and a bat. You do need a little more to play on an organized team, like a helmet and some cleats. Players like to be safe while they're having fun.



Description of a Scorebook Page

Each scorebook page consists of a left-hand column for player names, uniform numbers and position numbers. These names are listed in the order of batting order established by the coach prior to the game.

The larger middle of the page are nine columns, or one for each inning. The number of multiple columns to the far right is for tallying of game statistics. Use a separate page for each team and record the opposite team's pitchers in the pitching box below the team they pitch against.

The At-Bat Boxes

The majority of the page consists of identical squares containing baseball diamonds. Each square represents a single player's at bat and its results. There are also areas to indicate balls, strikes, outs and RBI's, although the exact layout depends upon the scorebook publisher.

Across the top of each box is usually a preprinted list of possible outcomes for each at bat: "1B" for a single, "2B" for a double, "3B" for a triple, "HR" for a home run and "BB" for a walk. This allows you to quickly circle an outcome in the case that a hitter gets on base.

Player Position Numbers

Players are referred to by position numbers by scorekeepers to save space and time. The positional numbers are as follows:

1. Pitcher
2. Catcher
3. First Baseman
4. Second Baseman
5. Third Baseman
6. Shortstop
7. Left Field
8. Center Field
9. Right Field
10. Designated Hitter (DH)

The position numbers are used to indicate what defensive players touched the ball in order to contribute to an out. Not only does this provide information about the play, this data also contributes to some player statistics, such as “assists” and “put outs.”

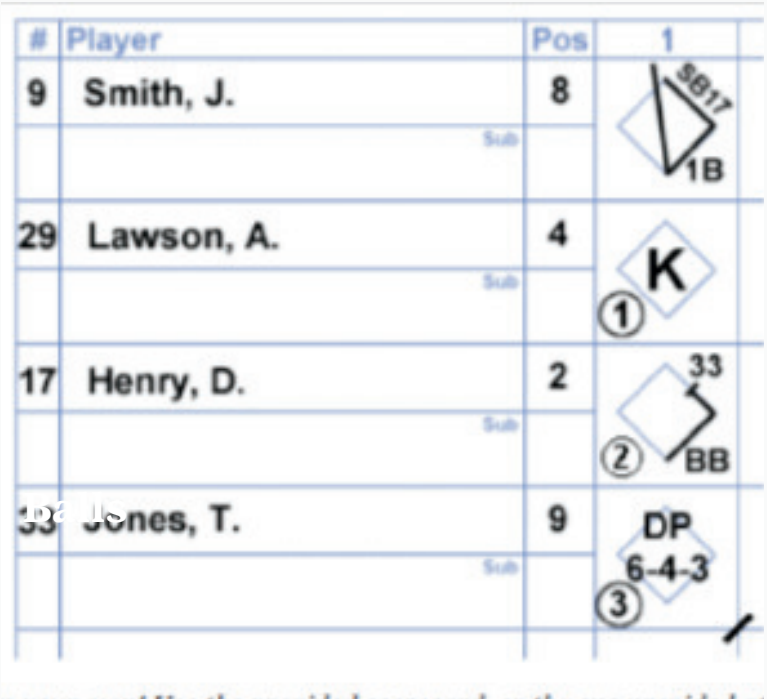
The numbers are often used in combination with initials to represent what type of hit a fielder handled, such as a “PU” for pop up, “FO” for flyout and “LO” for a line-out.

Recording The Play

Most squares contain a series of stacked boxes to the bottom left: two for strikes atop three for balls. Make a mark in each box as the umpire calls the pitch. If a hitter strikes out swinging, this is abbreviated by a large “K” inside the diamond area. If he strikes out because of a called strike, this is abbreviated by a large backward “K.” There is usually a circle to the bottom right in which the number of “outs” this at-bat represents, such as a “1.”

If the ball is put into play, draw a line in the approximate direction that the ball is hit, circle the appropriate outcome such as “1B” for a single and draw a line from home plate to first base.

When the next teammate comes to the plate and hits a double to right field, draw a line to the right field area, circle “2B” and draw a line from home to first and first to second. Since this play moved the first batter to either third base or to home plate to score a run, return to his box above to mark his progress around the baseball diamond. If he does score on his teammate’s double, return to that hitter’s box to indicate that he is responsible for one RBI.



Now try it on your own! Use the provided scorecard, or the one provided at the game, to keep score of the home team

Team: ◇ home ◇ away Opponent: Field:

Umpire: Date: Start Time: End Time:

#	Player	Pos	1	2	3	4	5	6	7	8	9	10	AB	R	H	RBI

Baseball Fun Activities

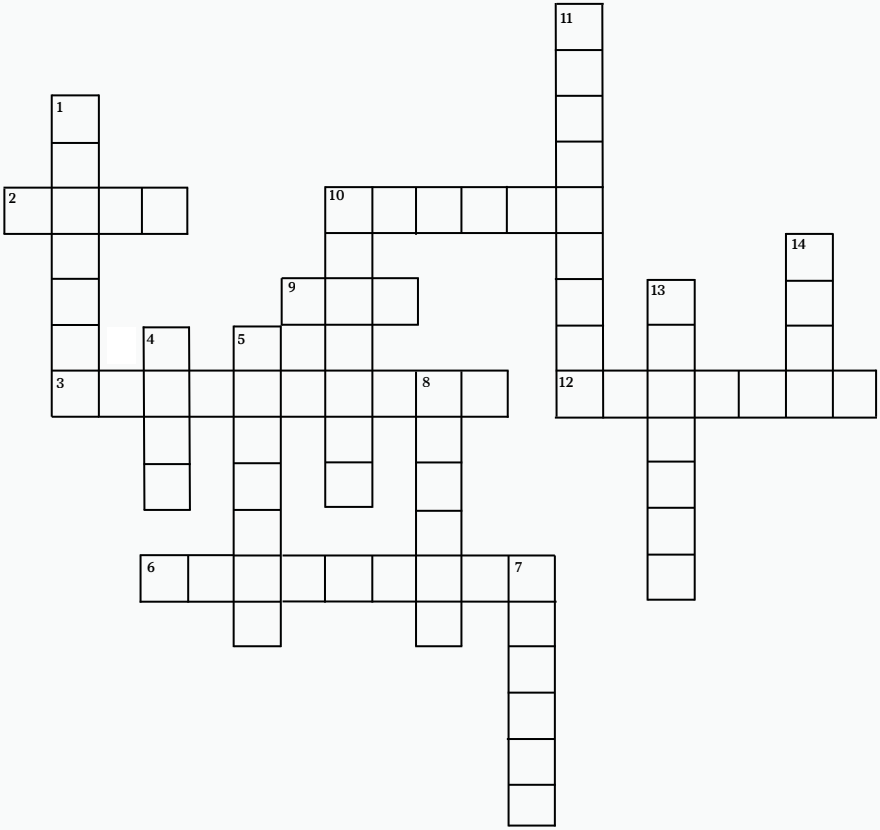
Baseball Bingo

Welcome to Baseball Bingo! The goal of this game is to stay alert and watch the baseball game closely. As you observe various plays and actions happening on the field, mark them on your Bingo card.

The first player to complete a line of five marked spaces either vertically, horizontally or diagonally wins the game.

Home Run	Curve Ball	A Fan Eating Peanuts	Strike Out	Ground Out
Single	Double Play	Fly Ball	Bunt	3 up 3 down
Fast Ball	Pick Off	Free Space	Double	Left Handed Batter
Team Huddle	Foul	Bases Loaded	Grand Slam	Error
Pitching Change	Triple	Stolen Base	Walk	Practice Swings

Baseball Crossword



Across

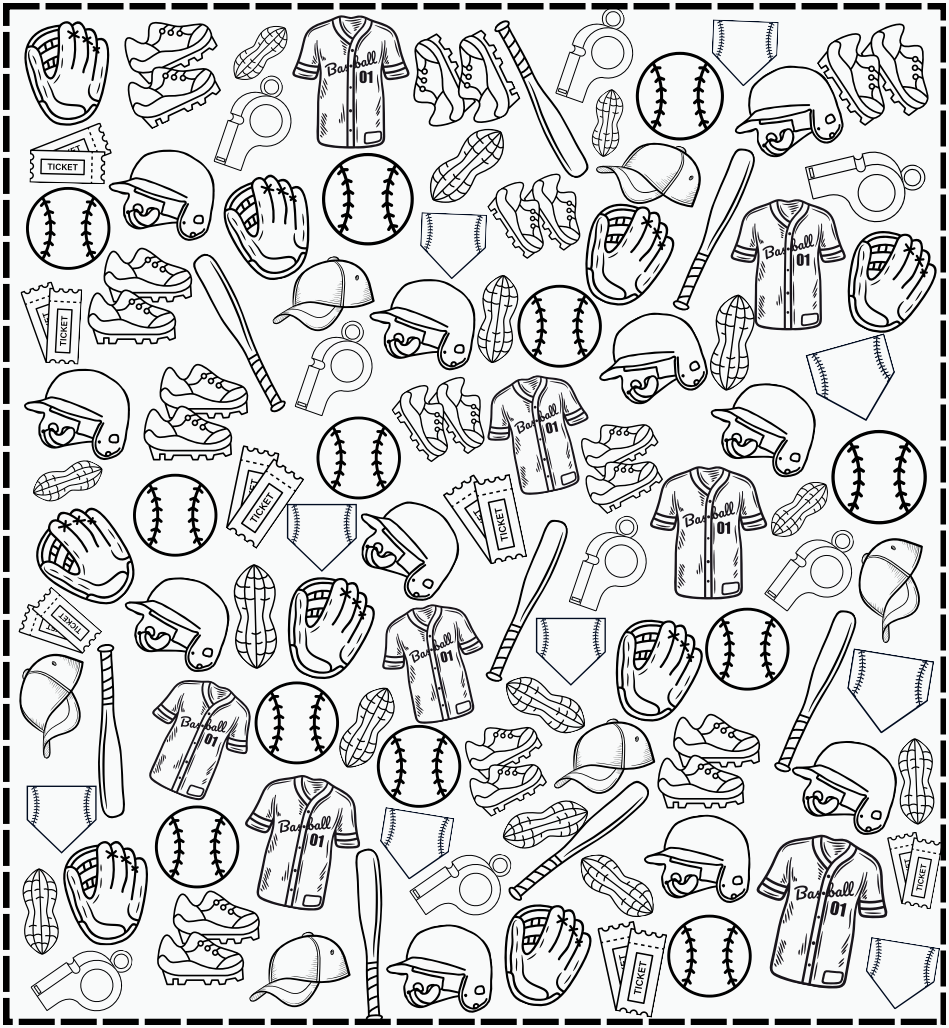
[2] What is a pitch called that is outside the strike zone and not swung at by the batter?
[3] What displays the game's progress in runs?
[6] Where do spectators sit to watch the game?
[9] What do players use to hit the ball?
[10] Where do players wait when they're not on the field or batting?
[12] What do you call the player who throws the ball to the batter?

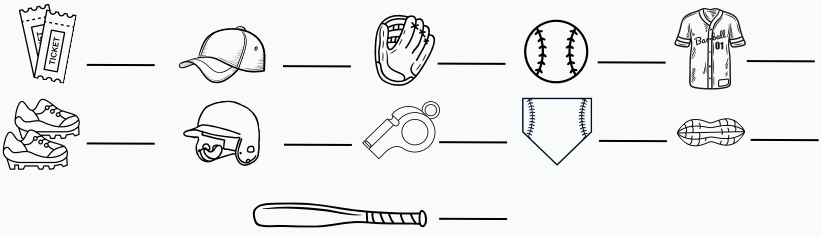
Down

[1] What's a popular salty snack at baseball games?
[4] What's it called when a ball is hit outside the field's boundaries?
[5] What protective gear do players wear on their heads?
[7] What is it called when the baseball player misses a ball between their shoulders and knees?
[8] What do you call the batter when they successfully hit the ball and run towards first base?
[10] What is the playing field commonly called?
[11] What position is represented by the number 6 in scorekeeping?
[13] Who stands behind home plate to catch pitches?
[14] Each team in baseball consists of how many players?

ISPY Coloring Page

Indicate the number of each item below.





Baseball Bracelet

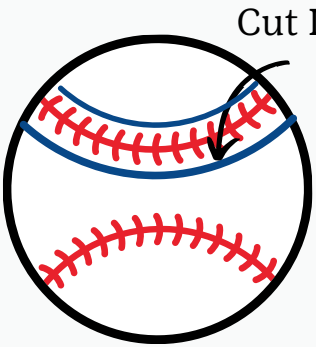
Supplies

Essential Items Required:

- Baseball (note: one baseball can yield two bracelets)
- Xacto knife

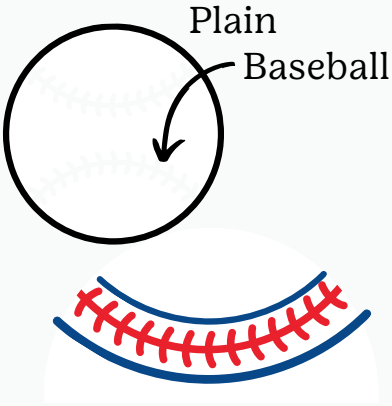
Step One

Start by slicing around the baseball stitches closely without cutting them. Cut around both the inner and outer parts. Trim uneven edges later.



Step Two

After you have removed both leather pieces, you should have the red threading piece with some excess space on each side.



Step Three

Now cut off any excess leather! Be careful not to cut the red thread. Now, measure the length of your wrist and then split it into two equal halves from your measurements.

Step Four

Start by finding where the stitching starts or ends along the seam. Then pull out the red thread until it is long enough to tie on your wrist

Step Five

Just tie or braid the ends together and voila! You've got yourself a cool homemade baseball bracelet!

Baseball STEM Activities

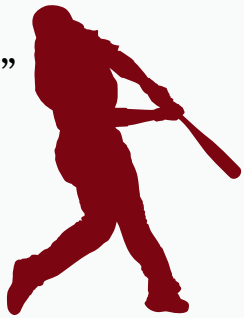
Baseball Math Fun

Introduction

This game is a fantastic way for kids to practice their math skills while enjoying a fun and interactive baseball-themed activity!

Materials Needed

- Index Cards
- Markers
- Two Dice
- A Friend or Family Member
- A Small Game Token (to serve as your placeholder for the game)
- 6 cards that say, “Single”
- 4 cards that say, “Double”
- 3 cards that say, “Triple”
- 3 cards that say, “HOMERUN!”
- 3 cards that say, “OUT!”



How to Play

1. Each player rolls both dice. The player with the highest roll will be the first to bat, while the player with the lowest roll will be the pitcher.

2. The first batter stands at home plate and selects a card from the pile.

3. The batter then rolls the dice. At this point, you can choose between an easy round or a challenge round.

4. **Easy Round:**
If the dice roll totals 4 and 5, the pitcher gets to decide the math problem. It can be any combination like 5-4, 5+4, 5×4 or even 4-5.

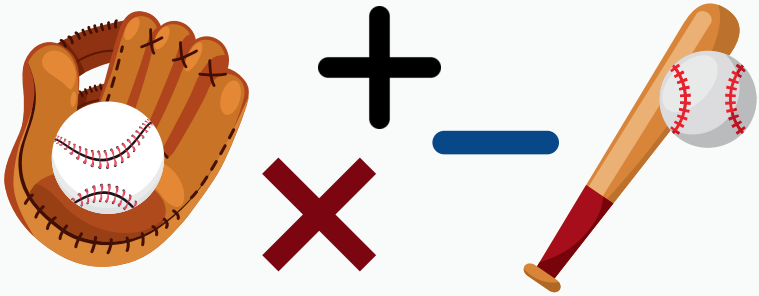
Challenge Round:
For a more complex game, the batter can roll both dice twice. For example, if the batter rolls a 5 and a 4, the total is 9. If they roll again and get a 3 and a 5, the total is 8. The pitcher can then decide whether to use 9+8, 9×8, 9-8 or even 8-9.

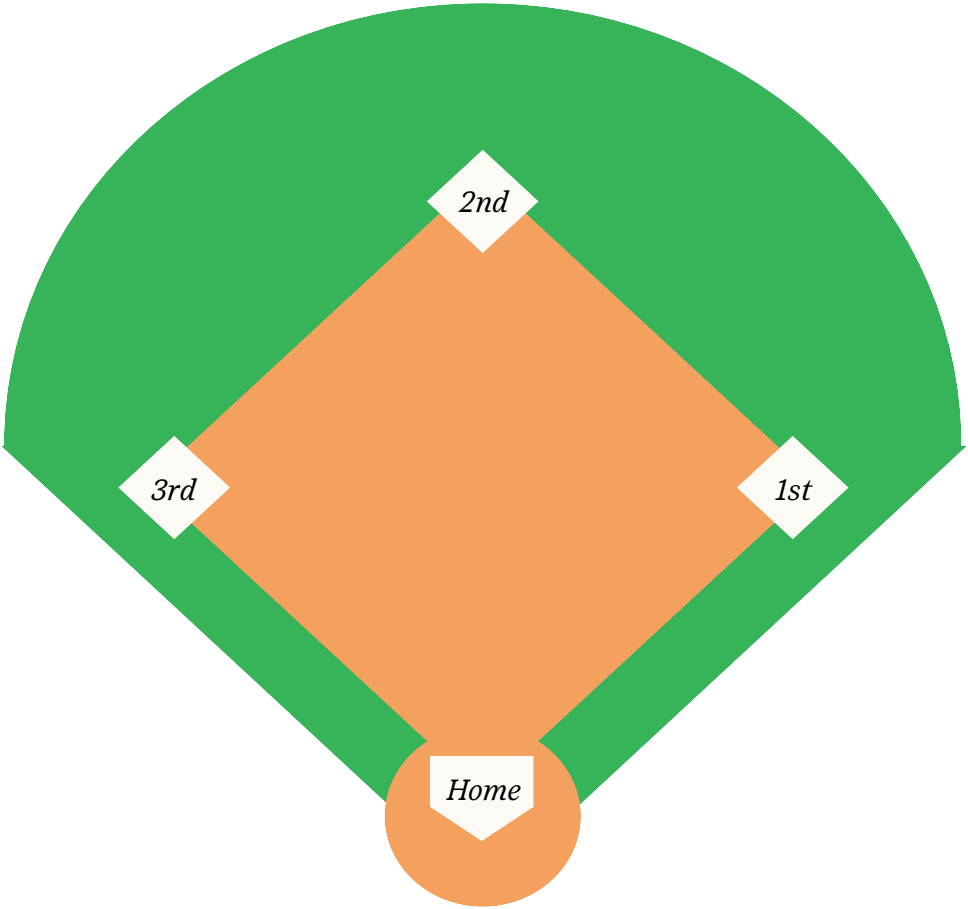
5. If the batter solves the problem correctly, they move the number of bases indicated by the card they picked. For example, if they picked a “Triple” card and answered correctly, they move to third base.

6. After three wrong answers or three outs, players must switch roles, with the batter becoming the pitcher and vice versa.

Game Options

- Each child can focus on different math facts or concepts. One child may work on addition while another focuses on subtraction.
- Create teams and keep score if you like to add more competition and excitement to the game.





Score Sheet

1st Inning	2nd Inning	3rd Inning	4th Inning	5th Inning	6th Inning	7th Inning

Exploring the Science of Bouncing Balls

Introduction

Ever wondered why some balls bounce higher than others? This activity will help you understand how elasticity affects how high a ball bounces. You'll get to experiment with different balls and learn a bit about science along the way!

Objectives

1. Observe and compare how different balls bounce when dropped from the same height.
2. Measure and record the bounce heights and calculate the average from three trials.
3. Discuss and make guesses about why different balls bounce differently based on their size, weight, design and what they're made of.

Materials Needed

- Baseball
- Softball
- Tennis Ball
- Tape Measure (10 feet)
- Notebook
- Pen or Pencil

Key Concepts

- Elasticity: The ability of an object to return to its original shape after being stretched or compressed
- Gravity: The force that pulls the balls towards the ground
- Variables: Different factors that can change the results of an experiment

Procedure

1. **Checking Elasticity of the Balls:** Gently squeeze each ball. Notice how hard or soft they are. Discuss what this might mean about each ball's elasticity.

2. **Drop the Balls:** From a fixed height, drop each type of ball onto a hard floor surface three times. Make sure to drop them and not throw!

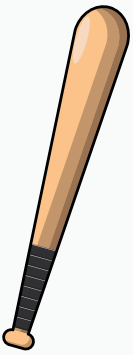
3 **Measure the Bounce:**
- Use the tape measure to record the height of the first bounce after each drop.
- Record how many times each ball bounces before stopping.

4 **Record Your Data:**
Fill in the provided table with your measurements. Calculate the average bounce height for each ball across the three trials.

5 **Analyze:**
Look at your data. Which ball bounced the highest on average? Which one had the most bounces? Discuss why this might be.

Discussion Questions

- Why do you think some balls bounce higher than others?
- How do you think the material of the ball affects its bounce?
- What could happen if you tried dropping the balls on different surfaces like carpet or grass?



Baseball:

Trial 1	Trial 2	Trial 3
Height:	Height:	Height:
Number of Bounces:	Number of Bounces:	Number of Bounces:

Softball:

Trial 1	Trial 2	Trial 3
Height:	Height:	Height:
Number of Bounces:	Number of Bounces:	Number of Bounces:

Tennis ball:

Trial 1	Trial 2	Trial 3
Height:	Height:	Height:
Number of Bounces:	Number of Bounces:	Number of Bounces:

Exploring the Magnus Effect

Materials

- A Baseball
- A Bucket of Water
- A Friend
- A Piece of Chalk

Instructions

1. First, take the piece of chalk and mark a small dot on one side of the baseball. This will help you track the ball's spin.

2. Next, dip the baseball into the bucket of water so that it gets slightly wet. Be sure it's not dripping, just a little damp.

3. Now, hold the baseball with the marked dot facing up and throw it to your friend. Try to throw it with a spin by flicking your wrist.

4 Have your friend catch the ball and observe the ball's path. Did it curve or follow a straight line?

5 Repeat the process a few times, varying the spin and observing how the ball's path changes.

What's Going On?

When you throw the baseball with a spin, you are creating a phenomenon known as the Magnus Effect. The dampness of the baseball makes it easier to see the spin and track the ball's movement. When a spinning ball moves through the air, it creates differences in air pressure on opposite sides of the ball due to the varying speeds of the air around it. The side of the ball spinning in the same direction as the motion will have lower air pressure, while the opposite side will have higher air pressure. This difference in pressure causes the ball to curve in the direction of the lower pressure, making it "swerve" in its path.

In baseball, pitchers use the Magnus Effect to throw curveballs, sliders and other pitches that change direction, making it more challenging for the batter to hit the ball.

Understanding Different Pitches

Introduction

Today, we're going to explore how different pitches work in baseball and the science behind them. You'll get to learn about various pitches and even try out a fun experiment to understand the physics that make them possible.

Introduction

Fastball

Description: The fast ball is one of the most common pitches. It's thrown the hardest and straightest.

Science: The speed of the ball creates less time for the batter to react. The backspin on the ball also helps it resist gravity longer, making it appear to 'rise' slightly.

CurveBall

Description: This pitch has a slower speed but curves downwards dramatically as it reaches the batter.

Science: The curveball's spin creates a difference in air pressure on either side of the ball, causing it to move in a curve.

Slider

Description: This pitch is faster than a curveball but has a less pronounced break. It slides laterally and downward.

Science: The combination of sideways and downward spin creates a more subtle but effective break.

Changeup

Description: This pitch looks like a fastball but is thrown much slower, tricking the batter's timing.

Science: The grip on the ball reduces its speed without changing the arm motion, making it deceptive

Objective

Understand how spin affects the trajectory of a baseball, how it can make you a better player and even help you appreciate the game more!

Materials Needed

- Baseball
- A marker
- A friend or family member to help

Step One

Mark the Ball: Use the marker to draw arrows on the ball to indicate the direction of spin.

Step Two

Throw a Fastball: Hold the ball with a standard grip and throw it straight. Observe how the ball travels in a straight line.

Step Three

Throw a Curveball: Grip the ball so that you can impart a spin (like turning a door knob). Throw it and observe the curved path.

Step Four

Throw a Slider: Hold the ball with a slightly off-center grip. Throw it and watch the subtle lateral movement.

Step Five

Throw a Changeup: Use a looser grip to reduce speed. Throw it with the same arm motion as a fastball and note the slower speed.

Discussion Questions

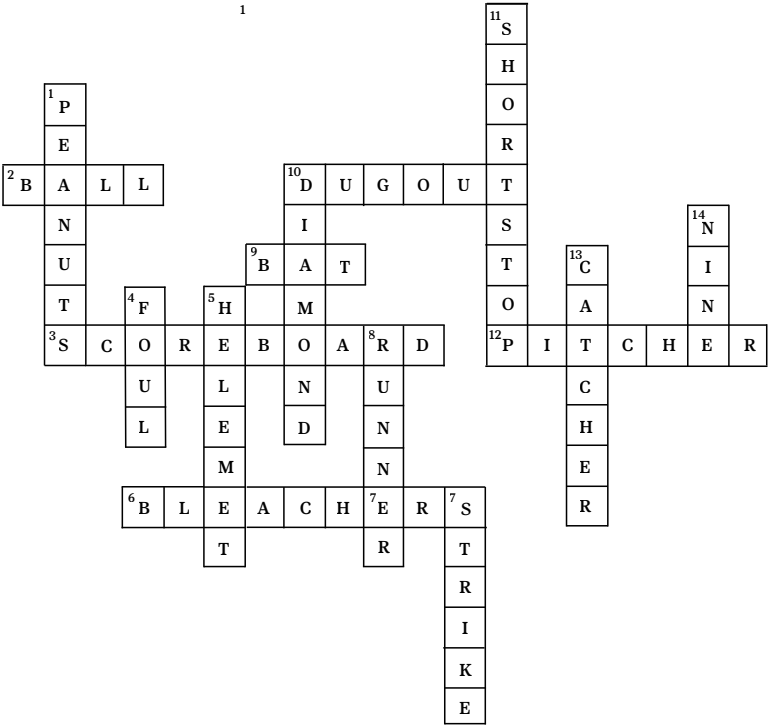
How did the different spins affect the ball's path?

Why do you think the curveball curved more than the slider?

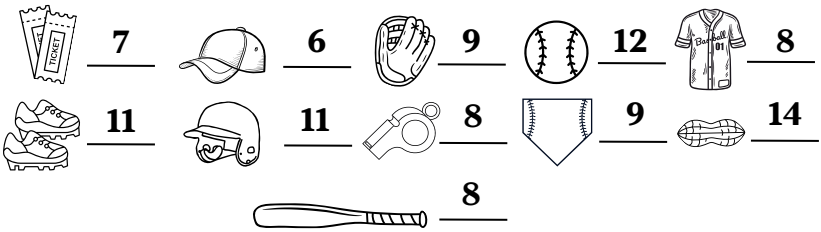
How could you use this knowledge to improve your pitching or hitting in a game of baseball?

Activity Sheet Key

Baseball Crossword

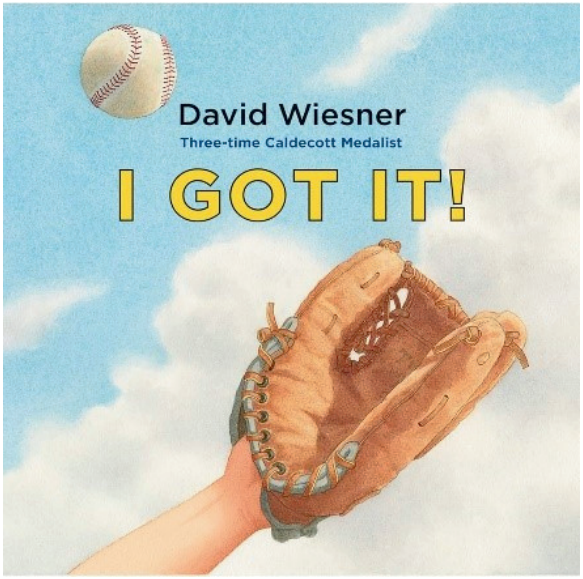


Baseball Crossword



Baseball Bookclub

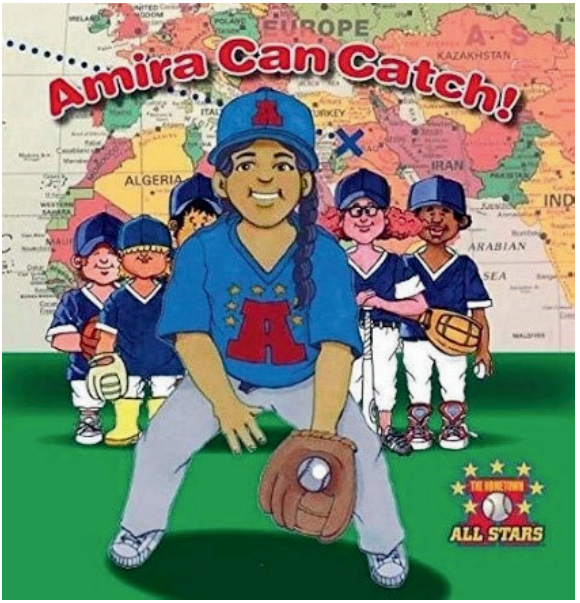
I Got It!
By David Wisner



"I Got It!" by David Wiesner is a captivating children's book where a young outfielder's brief moment in a baseball game turns into an epic adventure through vivid imagination. Despite humorous obstacles, he shows determination and courage, turning ordinary moments into extraordinary ones. The story offers readers a delightful journey in a few seconds on a baseball field.

Amira Can Catch!

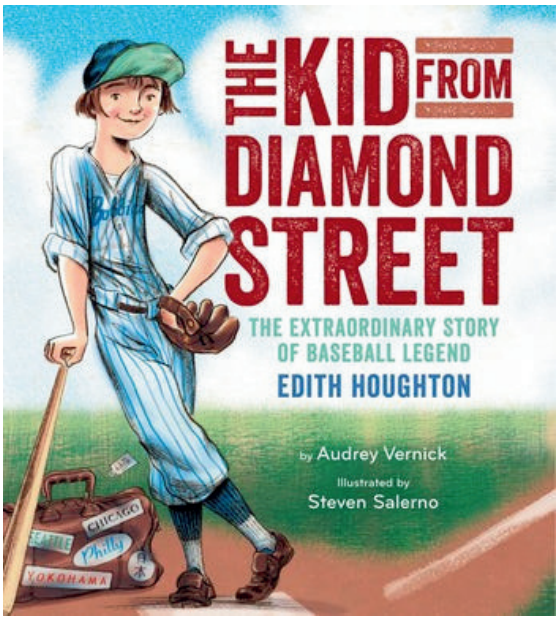
By Kevin Christofora



Amira, a Syrian girl new to a town, joins the All Star team, learning baseball basics and life skills, with a focus on having fun. The story blends coaching tips with imaginative storytelling, emphasizing learning before playing. The Hometown All Stars series aims to teach sports fundamentals in a fun and educational way, showcasing baseball spirit and a young girl's resilience in a new environment.

The Kid from Diamond Street

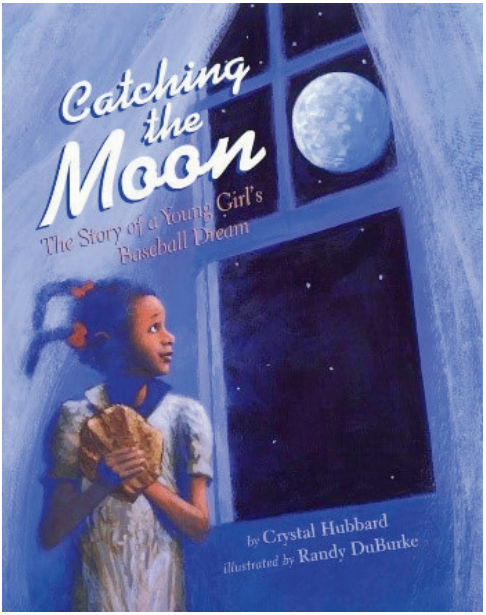
By Audrey Vernick and Steven Salerno



"The Kid from Diamond Street" by Audrey Vernick and Steven Salerno is a picture book telling the inspiring story of Edith Houghton, a ten-year-old who joined the Philadelphia Bobbies women's baseball team in 1922. Edith's talent and determination challenged gender norms in baseball, drawing attention and large crowds.

Catching the Moon

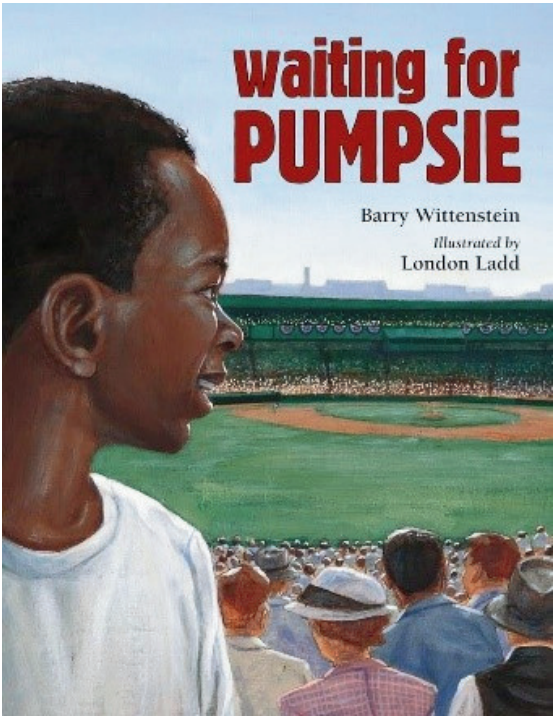
By Crystal Hubbard



"Catching the Moon" by Crystal Hubbard is a children's book based on the true story of Marcenia Lyle, a determined young African American girl in the 1930s, who overcomes gender and racial obstacles to pursue her passion for baseball. Her perseverance leads her to become the first woman to play for an all-male professional baseball team, inspiring readers to chase their dreams despite challenges. The book celebrates Marcenia's legacy and the power of resilience and breaking barriers.

Waiting for Pumpsie

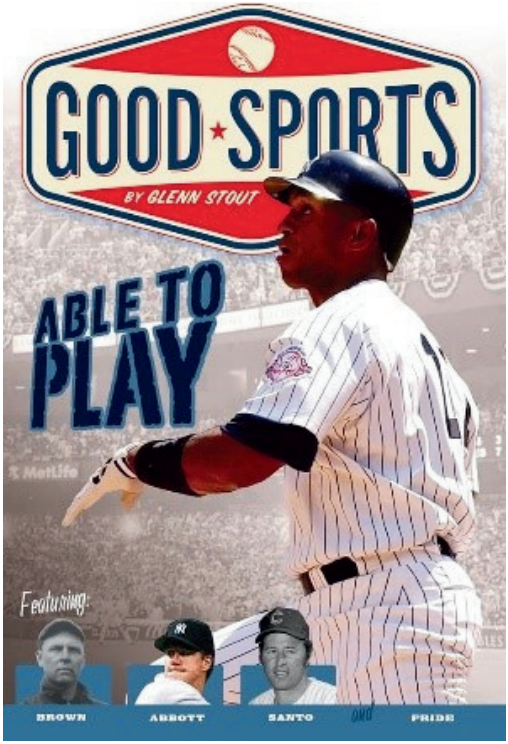
By Barry Wittenstein



In "Waiting for Pumpsie" by Barry Wittenstein, the Boston Red Sox team integrates with the arrival of Elijah "Pumpsie" Green in 1959. The story follows young Bernard and his family as they attend Pumpsie's first game, symbolizing hope for change during the Civil Rights Movement.

Able to Play

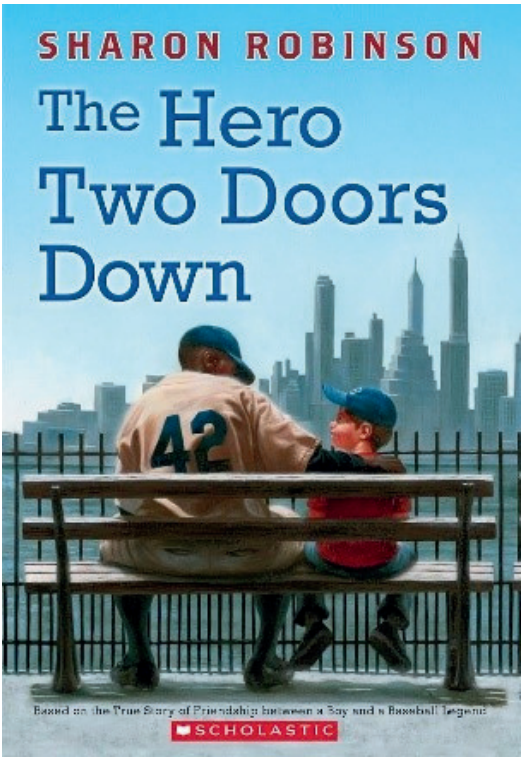
By Glenn Stout



"Able to Play" by Glenn Stout celebrates the inspiring stories of Mordecai "Three Finger" Brown, Ron Santo, Jim Abbott and Curtis Pride, who overcame physical challenges in baseball with determination and spirit, achieving greatness in the sport. It highlights their resilience and the triumph of the human spirit.

The Hero Two Doors Down

By Sharon Robinson



The Hero Two Doors Down by Sharon Robinson tells the story of Steven Satlow, an eight-year-old boy in Brooklyn who idolizes Jackie Robinson. When Jackie moves into his neighborhood in 1948, Steven's dream of befriending his hero comes true, making it a memorable baseball season for him.

Work Cited

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Further Research

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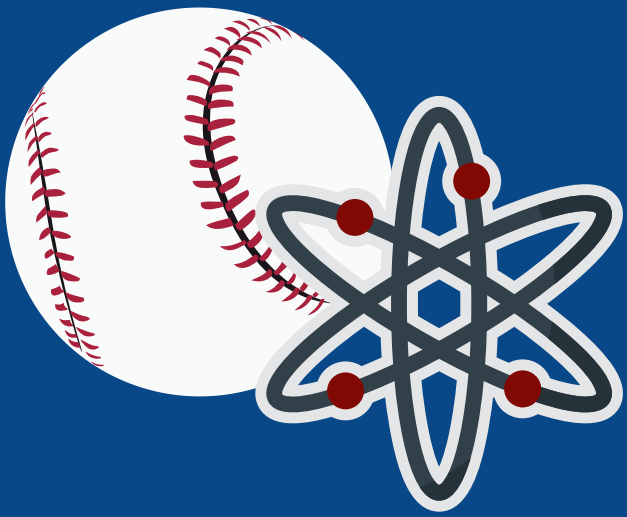
All-American Girls Professional
Baseball League: https://www.aagpbl.org/

STEM Education Presented by Washington
Nationals Major League Baseball:
https://www.mlb.com/nationals/community/stem-education



girl scouts
carolinas peaks
to piedmont