Learn about Statistics— Math League Baseball

Mitchell Rosenberg

I wanted an enjoyable but practical way to introduce concepts of statistics to my sixth graders while reinforcing fundamental arithmetic skills. This activity gives students hands-on experience in solving real-world problems while granting them the power to own and operate their own major league baseball team. The project took ten days and is easy to do.

The groups

The class is divided into six groups. Each group assembles a team of major league baseball players by drafting, in much the same way that professional sports teams conduct their drafts.

One student is chosen to act as the commissioner of "math league baseball." The duties of the commissioner include making general announcements and presiding over any discrepancies that may arise. The commissioner is an impartial party with no affiliation to any group.

The draft

1. Each group takes turns selecting a player for their team. To expedite this process, a draft list is given to each group. Only players on the draft list may be chosen (table 1).

2. Once a group selects a player, that player belongs exclusively to that group

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and may not be selected by another group.

3. Each group picks twelve players, one player for each of the eight positions and four extra players. The extra players may play any position. Pitchers are not used.

4. When all six groups have selected twelve players, the draft is completed. The players on the draft list who are not chosen are considered free agents and are available to be used throughout the duration of the game. If a group decides to add a free agent to its team, the group must cut a player from its roster. The released player is then a free agent.

5. When each group has completed its team roster, it selects a team name.

Each group drafts a team.

Charting the team

1. Each day, the group will complete the "Daily scoring form" (table 2), writing down the vital statistics—at bats, hits, runs, and runs batted in—for each player on its team. The group then totals the statistics. (Some students may need help at first finding their players in the newspaper.)

2. If a player's name does not appear in the newspaper, it is presumed that he did not play and the group will fill in zeros for all the vital statistics of that player.

3. When completed, the "Daily scoring form" is submitted to another group. This group checks the accuracy. (Have a checking system, such as passing forms to the group on the right.) If a discrepancy is noted in the statistical data, the commissioner decides which group erred. (It is possible that the checking team made the mistake.) The group in error loses one point from its final daily score.

4. Once the form has been checked, a member of the checking group writes the team's name on the form and signs it to verify its accuracy.

5. The checking group transfers the total figures of the "Daily scoring form" to the "Daily totals form" (table 3) and submits both papers to the commissioner.

Scoring

The totals from the "Daily totals form" are posted on the chalkboard. Points are awarded in five categories (at bats, hits, runs, runs batted in, and batting average) using the following point system:

First place — 5 points
Second place — 3 points
Third place — 1 points

On the final day of competition, the ten-day totals are tabulated and a five-point bonus is awarded to the winning team in each category.

Roster changes

After the scoring is tabulated each day, the groups have fifteen minutes to discuss trades and waiver moves. Any decisions regard-

TABLE 1

Draft list

1st baseman	(1B)
Jeff Bagwell	Astros
Will Clark	Giants
Kal Daniels	Dodgers
Cecil Fielder	Tigers
Mark Grace	Cubs
John Kruk	Phillies
Don Mattingly	Yankees
Fred McGriff	Padres
Hal Morris	Reds
Eddie Murray	Mets
John Olerud	Blue Jays
Rafael Palmiero	Rangers
Frank Thomas	White Sox
Mo Vaughn	Red Sox

2d baseman	(2B)
Roberto Alomar	Blue Jays
Carlos Baerga	Indians
Craig Biggo	Astros
Delino Deshields	Expos
Bill Doran	Reds
Pat Kelly	Yankees
Willie Randolph	Mets
Jody Reed	Red Sox
Harold Reynolds	Mariners
Billy Ripken	Orioles
Juan Samuel	Dodgers
Ryne Sandberg	Cubs
Steve Sax	White Sox
Lou Whitaker	Tigers

Shortstop	(SS)
Andujar Cedeno	Astros
Shawon Dunston	Cubs
Alvaro Espinoza	Yankees
Felix Fermin	Indians
Ozzie Guillen	White Sox
Barry Larkin	Reds
Spike Owen	Expos
Cal Ripken	Orioles
Ozzie Smith	Cardinals
Alan Trammel	Tigers

3d baseman	(3B)
Wade Boggs	Red Sox
Travis Fryman	Tigers
Charlie Hayes	Yankees
Greg Jefferies	Royals
Terry Pendleton	Braves
Chris Sabo	Reds
Garry Sheffield	Padres
Robin Ventura	White Sox
Matt Williams	Giants
Todd Zeile	Cardinals

Catchers	(C)
Steven Decker	Giants
Carlton Fisk	White Sox
Brian Harper	Twins
Todd Hundley	Mets
Lance Parrish	Angels
Tony Peña	Red Sox
Joe Oliver	Reds
Greg Olson	Braves
Ivan Rodriguez	Rangers
Benito Santiago	Padres
Mike Scioscia	Dodgers
Mickey Tettleton	Tigers

Outfielders	(OF)
Harold Baines	White Sox
Albert Belle	Indians
Bobby Bonilla	Mets
Ellis Burks	Red Sox
Brett Butler	Dodgers
Wes Chamberlain	Phillies
Eric Davis	Dodgers
Andre Dawson	Cubs
Bernard Gilkey	Cardinals
Juan Gonzales	Rangers
Ken Griffey, Jr.	Mariners
Tony Gwynn	Padres
Howard Johnson	Mets
Roberto Kelly	Yankees
Shane Mack	Twins
Brian McRae	Royals
K. McReynolds	Royals
Keith Mitchell	Braves
Kevin Mitchell	Mariners
Phil Plantier	Red Sox
Kirby Puckett	Twins
Darryl Strawberry	Dodgers
Rubin Sierra	Rangers
Danny Tartabull	Yankees
Robin Yount	Brewers
Dave Justice	Braves
Tim Raines	White Sox
Ricky Henderson	"A's"
Barry Bonds	Pirates
Vince Coleman	Mets

ing roster changes must be unanimous within the group.

Changes commence when the commissioner says, "Are there any trades?" The commissioner announces the trades, if any. The commissioner asks, "Are there any roster changes?" Changes commence in reverse order of the present standings, that is, the last-place team goes first. After the first-place team has been given an opportunity to make roster changes, the day's activities are complete.

Gathering and evaluating data

Each day of the contest, I make copies of the sports section of the newspaper for students to use in finding the players' performances. Many of the students cannot wait for mathematics class; they bring their own newspapers to school and chart their teams during lunch.

All mathematics work is done by hand, although others may wish to use calcula-

tors. The checking system assures that all students use caution in preparing their calculations. Although most students find tallying and adding the statistics to be quite routine, the dividing and rounding off of decimals required to compute batting averages teach students how mathematics can be translated into real-life situations. Students inevitably ask such questions as "If our team got eight hits and the Pro-Stars got seven hits, why do they have a higher batting average?" I then plan a mathemat-

Daily scoring form

Team Name: Blue Jays   Day # 1

Name	Pro Team	AB	R	H	RBI	
Mattingly	Yankees	4	0	0	0	1B
B. Ripken	Orioles	1	0	0	0	2B
Boggs	Red Sox	3	0	1	2	3B
Owen	Expos	2	0	0	1	SS
Peña	Red Sox	3	0	1	1	C
Canseco	A's	4	0	0	0	OF
Barnes	A's	0	0	0	0	OF
Strawberry	Dodgers	2	1	1	3	OF
R. Kelly	Yankees	3	0	2	0	Extra
Sierra	Rangers	3	0	0	0	Extra
Whitaker	Tigers	0	0	0	0	Extra
Larkin	Reds	4	1	0	1	Extra
Totals		29	2	5	8	

Checked by : Medina-Christy

Daily total form

Team Name: Pro-Stars

	AB	R	H	RBI	Average
Day 1	33	4	5	6	.152
2	10	2	2	1	.200
3	17	1	4	3	.235
4	30	5	10	5	.333
5	20	0	2	2	.100
6	26	4	8	6	.308
7	28	2	7	2	.250
8	24	7	12	5	.500
9	26	4	6	3	.231
10	24	4	7	3	.292
Totals	238	33	63	36	.265

ics lesson to discuss the correlation between hits and at bats that determines a batting average. The students conclude that statistical data are not always independent; results of some statistics can affect the outcome of others.

Another student claims, "Our team scores the most runs, but our batting average is the lowest. Therefore, we can afford to trade one of our run scorers for a guy who gets more hits to boost our batting average." Although this observation is astute, the students find that other groups are not so willing to part with certain players and that trading requires a great deal of negotiation and compromise; they have to give up quality to get quality.
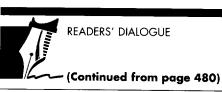
Culmination

When the game is completed, each student receives one pack of baseball cards so that they can discuss the statistics on each card. (A box of baseball cards contains thirty-six packs and can be found at card shows for about five dollars.) Now my sixth graders look forward to the month of April. April is baseball season—"math league baseball" season! ◆

ematics, even at this level, is a vibrant and ever-challenging science for those who seek to discover its many mysteries. It reminds me that all of us need to become more careful and diligent in our search for its many truths.

In NCTM journals

Readers of the *Arithmetic Teacher* might enjoy the following articles in this month's *Mathematics Teaching in the Middle School:*

- "Choice and Chance in Life: The Game of 'Skunk,' " Dan Brutlag
- "A Conceptual Model for Solving Percent Problems," Albert B. Bennett, Jr., and L. Ted Nelson
- "Mathematics Investigator: New York's Token Turns 40; Friday the 13th Club Meets Once in '93 Just for Good Luck," Ron Lancaster ◆