

First One in the Ballpark

The Movie:

Lisa Winston reports the facts on baseball players by arriving early and keeping a close watch on statistics. Featured: Lisa Winston, sports reporter, USA Today. (Movie length: 2:11)



Background:

The essence of most sports is competition, which means there have to be ways to measure performance and decide who wins. Keep track of that information for an individual, a team, or a league for a game, a season or a lifetime and you have the stats. And while those stats may not say everything there is to say about what happens on the field, they do make the game a lot more interesting.

Curriculum Connections:



Fractions

1

One pitcher in a game pitched 21 strikes out of a total of 54 pitches. The pitcher for the other team pitched 16 strikes out of 46 pitches. Which pitcher threw a higher fraction of strikes?

Decimals

2

Batting average is computed by dividing the number of hits a batter gets by the number of times he was at bat. The answer is rounded to the nearest thousandth.

Batter A was at bat 42 times in his last season, and got 13 hits. Batter B was at bat 51 times and got 15 hits. Which had the better batting average for the season?

Percents

3

These are Babe Ruth's batting statistics in the year of his highest batting average, while playing for the New York Yankees in 1923:

At Bat	Hits	Doubles	Triples	Home Runs	Strikeouts	Batting Average
522	205	45	13	41	93	.393

- What percent of his hits were doubles? Triples? Home runs?
- What percent of his "at bats" were strikeouts?

Percents, Statistics (graphs)

4

This table shows the wins and losses of manager Sparky Anderson from 1971 to 1984.

Find the percent of wins for each season. Would you say he had a better record with Cincinnati, or with Detroit? Why?



Season	Team	#of games	Wins	Losses	Percent wins
1971	Cincinnati	162	79	83	.488
1972	Cincinnati	154	95	59	.617
1973	Cincinnati	162	99	63	.611
1974	Cincinnati	163	98	64	.605
1975	Cincinnati	162	108	54	.667
1976	Cincinnati	162	102	60	.630
1977	Cincinnati	162	88	74	.543
1978	Cincinnati	161	92	69	.571
1979	Detroit	106	56	50	.528
1980	Detroit	163	84	78	.519
1981	Detroit	57	31	26	.544
1982	Detroit	162	83	79	.512
1983	Detroit	162	92	70	.568
1984	Detroit	162	104	58	.642

Statistics (statistical measures)

5

Imagine that you have invented a new kind of baseball shoe. You decide to make 1,000 shoes in your first batch. The shoe can come in several different sizes, and you have to decide how many of each size to make.

1. What data would help you to make this decision?
2. How could you get that data?
3. You are going to spend a lot of money making your first batch of shoes. It's important that you make the right amount of each size. What could you do to make sure that the information you are using to make your decision is correct?

Write down your plan for solving this problem. Then carry out your plan.

Algebra

6

If a batter goes into a game with a seasonal batting average of S after a total of T times at bat, and gets K hits in that game for N times at bat, his new batting average is determined by this equation:

$$A = \frac{T \cdot S + K}{T + N}$$

1. Find the new batting average, A , for each batter in the line-up.

Batter	T	S	K	N	A
Jackie	25	0.240	1	3	
Willie	16	0.220	0	2	
Roger	13	0.310	1	4	
Mickey	32	0.190	2	4	

2. Find the missing number for each batter.

Batter	T	S	K	N	A
Jackie	28	0.250	?	4	0.250
Willie	18	0.196	1	?	0.216
Roger	?	0.296	2	3	0.352
Mickey	?	0.224	1	3	0.232

SPORTS TODAY AND TOMORROW

7

E-mail printout 10:48 a.m.

To: Research Team

From: Features Editor

Subject: 40 years from now

A lot of magazines have a feature like “40 years ago” where you can find out about things that happened in the past. But I want to do something a little different: “40 years from now.”

Please look at the data below, which gives Olympic winning times for various sports for the last 40 years or so, and work out what you think the times will be 40 years from now.

You can pick two out of the four sports.

I don’t just want your opinion on this—I need something that is mathematically accurate and I need an explanation of how you got your numbers so we can explain it to our readers. Your explanation should include diagrams or graphs if possible—readers like pictures.

By the way, I expect you will see some interesting patterns in these numbers. Let me know what they are, because we may want to do a separate story on that.

Janet

Winning Times				
	Women’s 500-meter speed skating (seconds)	Men’s 200-meter freestyle swimming (seconds)	Men’s 400-meter run (seconds)	Women’s long jump (meters)
1956	n/a	n/a	46.7	6.35
1960	45.0	n/a	44.9	6.37
1964	45.0	n/a	45.1	6.76
1968	46.1	1:55.2	43.8	6.82
1972	43.33	1:52.78	44.66	6.78
1976	42.76	1:50.29	44.26	6.72
1980	41.78	1:49.81	44.6	7.06
1984	41.02	1:47.44	44.27	6.95
1988	39.10	1:47.25	43.87	7.40
1992	40.33	1:46.70	43.5	7.14
1996	39.28 (1994)*	1:47.63	43.49	7.12

*The final speed skating figure is for the year 1994, not 1996.

Teaching Guidelines: Sports Today and Tomorrow
Math Topic: Algebra (patterns)

This project should be done by students individually or in teams of two.

Distribute the handout and discuss it. Ensure that students understand the assignment.

You may wish to leave it to the students to work out a technique for predicting future values, or work out the procedure in class discussion and have the students apply it.

For less advanced students, a good technique is to simply graph the given data (making sure the horizontal axis extends from 1956 to around 2050) and then extend the curve visually.

More advanced students should be instructed to come up with a specific function that most closely describes the given data, and use that to predict the value 40 years into the future.



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<i>Popcorn, Peanuts, Hot Dogs, #5007</i>	If your job is to feed 20,000 hungry fans at Yankee Stadium, your motto had better be "Be Prepared".
<i>Sports Photography, #4003</i>	Sports photography requires an expert's understanding of light, lenses and shutter speed.

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