

Slam-dunk Activities and Projects for Grades 4–8

Third Edition

Jack A. Coffland and David A. Coffland

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Introduction for Parents and Teachers

When giving students in grades 4–8 problems to solve, we must be certain that they have practiced a wide variety of problems. By the time students have finished eighth grade, they should be proficient with problem-solving techniques involving:

Whole-number Computation
Fraction Computation
Decimal Computation
Percent Computation

One problem classification system used by many mathematicians includes both "routine" and "nonroutine" problems. In other words, it is no longer appropriate to give students problems that simply review computational operations that have just been taught.

Routine Problems
"Routine" problems are defined as those problems that ask students to apply a mathematical process they have learned in class to a real-life, problem-solving situation. This book defines two types of routine problems:

1. Algorithmic problems
These are word problems (story problems) that ask children to read the problem, figure out the computational procedure required, and then apply that computational algorithm to solve the problem. For example:

Bobby scored 16 points in last night's game. Each shot he made was worth 2 points. How many baskets did he make in all?

2. Multistep problems
These are algorithmic problems that demand two or more computational steps in order to obtain the answer. For example:



Last year the Bruisers won three-quarters of their 12 games. This year they won 5 games. How many wins did they have over the two seasons?

Similar problems can be made with decimals or percents.

Nonroutine Problems
In recent years math educators have focused additional energy on "nonroutine" problems—those that challenge the learner in some way. The different types of nonroutine problems in this book are:

1. Challenge problems
Problems of this type are nonroutine in that the child does not know how to solve them from memory. They require the use of heuristics, the act of creating a new solution process. It is the true test of problem-solving ability. For example:

Hersey Hawkins scored 1,125 points in his senior season at Drake. He made 87 three-point shots. How many two-point shots did he make? (Hint: He scored 23 more points on free throws than he did on three-pointers.)

Challenge problems appear at the bottom of many of the activity pages.

2. Mini-project problems
Mini-project problems can often be done from one game's statistics. These projects often involve a "process";

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they are not simple story problems. They are often open-ended, in that different students may obtain different answers. The process is more important than the product; the process stresses such things as multiple steps, differences in answers, and discussing your considerations to see if everyone agrees. Mini-project problems can often be formed from game statistics. An example is:

How can we interpret and understand a basketball box score? Notice that this task depends upon several variables: Not every box score will be the same. Each will have different situations that must be explored. Solving mini-project problems teaches children that not all problems have simple answers, nor do all problems have one answer.

Long-term Projects

Finally, because this book is meant to capture the interest of students by combining mathematics and basketball, we have suggested season-long projects. These are not really math problems; they are projects that the student can undertake that require the use of math and a knowledge of basketball. They are meant to be fun and to make math and basketball the student's hobbies.

Problems of this type are the final challenge in math. We cannot quit until we have challenged children to invent or create solutions to problems. The professional scientist, engineer, or mathematician all work to create new ideas, not simply to rehash old ideas. But the myth of mathematics learning has always been that only people in these professions must solve problems. The truth of the situation is that every day the carpenter, the clerical worker, or the grocery store clerk also invent solutions to problems.

Resources

The NCAA issues record books each year for college athletics, listing records for the period of time that the NCAA has been the organizing association for basketball. Examples include:

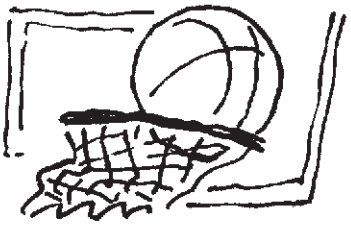
Official 2000–2001 NCAA Basketball: Records for All Divisions, Men's and Women's Basketball. NCAA, Indianapolis, Indiana. www2.ncaa.org. 317-917-6222.

The Internet has wonderful statistics. Use a search engine to locate them.



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Introduction for Students



This book is about basketball; it contains a great deal of interesting information about basketball—professional basketball and men's and women's college basketball. But it is also about math. It asks you to solve math problems that stem from basketball statistics, stories, and situations.

The material draws on and attempts to explain key aspects of the game of basketball. For example, you can see how defensive statistics are important. You will be given problems about defensive statistics to figure out for yourself. But you will enjoy the book much more if you also tackle the project on keeping track of defensive statistics for a game or a season. Collect all kinds of statistics on your favorite player; then see if you can figure out how he or she helps the team. Or, if you are playing basketball, keep track of your own statistics and rate yourself!

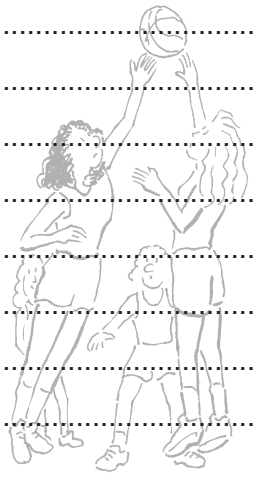
The book also contains a number of facts and figures about college and and professional basketball. For example, who holds the career scoring record for women's college basketball. What college team had the best record over the past ten years? The information is presented in the form of math problems—have fun solving them or give them to you friends to solve. You will already know the answers. Enjoy!



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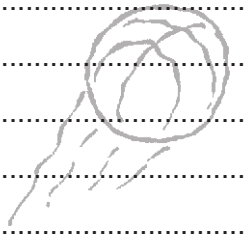
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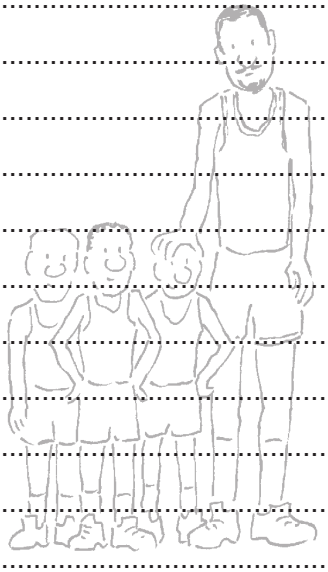




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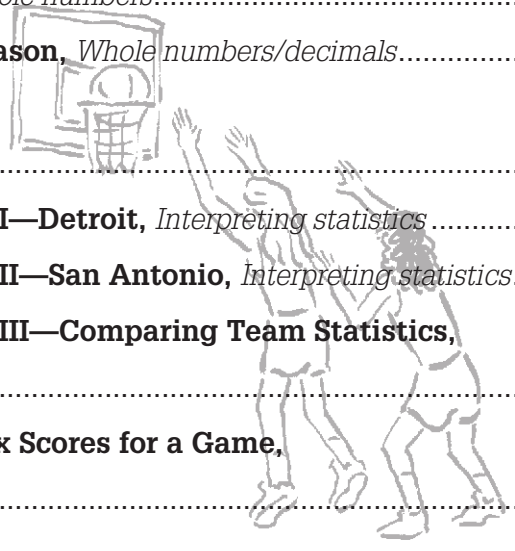




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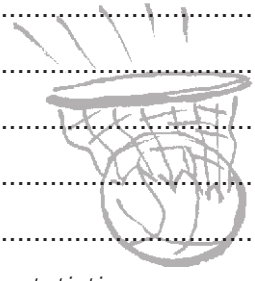
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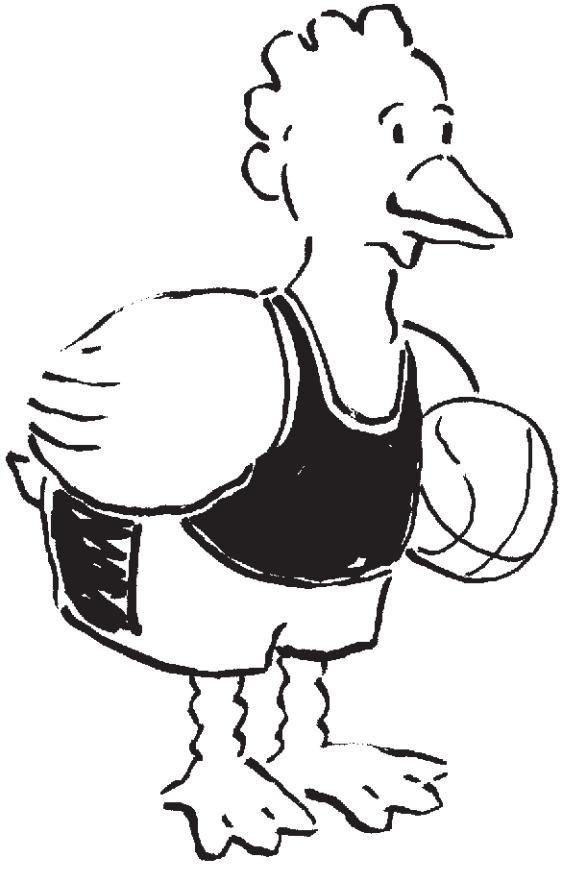
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Activities



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Creating a Dynasty

The dream of every coach and every team is to have a dynasty—to win several titles quickly. In more than 50 years how many NBA teams created a dynasty?

1. The first team to win several titles was the Minneapolis Lakers. From 1949 until 1954, the Lakers won five of six titles. During that stretch, the team failed to make the finals only once in 1951. How many years ago was the first NBA dynasty created?

   _____

2. The Boston Celtics created the longest and most dominant NBA dynasty ever. Boston's first title came in 1957 with Bill Russell playing and Red Auerbach coaching. In the next 13 years they won 11 titles; Bill Russell was a player and coach by then! Boston won 607 regular-season games in those years. It failed to win the title only in 1958 and 1967. If Russell was the winning coach for 102 games, how many coaching wins did Auerbach have?

   _____

3. Boston and Los Angeles divided eight of the nine titles from 1980 to 1988; Boston won three and Los Angeles won five. Only Philadelphia broke this two-team battle by winning the championship in 1983. Larry Bird led the Celtics and Magic Johnson led the Lakers. Bird scored 3,897 points in play-off games during his career; Johnson scored 3,701 points during his career. How many more points did Bird score? How many combined points did they have?

   _____

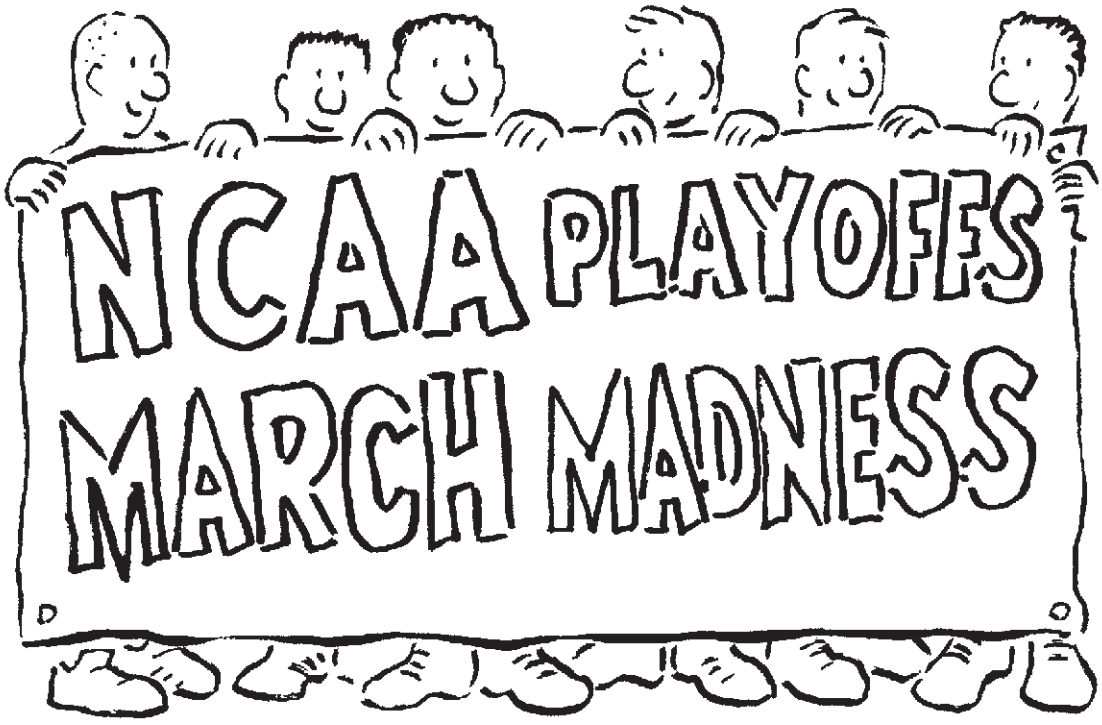
4. Michael Jordan and the Chicago Bills had the latest dynasty. From 1990 to 1998, Michael led the Bulls to six championships over the 9 years. (Houston won in 1994 and 1995, when Michael left to play baseball. Michael scored 529 points during the 1993 play-offs, 759 in the 1992 play-off games, and 666 during the 1993 play-offs. When he returned to the Bulls for the 1995–96 season, he scored 552 points in the play-offs. He finished his championship run by scoring 590 points and 680 during the play-off games of 1997 and 1998. How many play-off points did Michael Jordan score during Chicago's six championship seasons?

   _____

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March Madness

Solve the following problems.



1. Starting in the 2001 NCAA men's tournament, 65 teams participate. Before the first round, 2 teams from small conferences play to determine which one will enter the first round. How many games are now played in the first round with the 65 teams?

   _____

2. How many games are played in the third round? How many teams participate in this round?

   _____

3. How many rounds does it take to determine a champion?

   _____

Challenge problem

If there are about 370 Division I men's basketball teams, how many rounds would have to be played in order to invite every college to the tournament?

_____

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Women's Unbeaten Teams

The 1986 Texas women's basketball team was the first undefeated team in NCAA women's basketball. The team won 34 games, lost none, and won the women's basketball national championship. Connecticut was the second undefeated team; they had a 35 and 0 record in 1995, and they accomplished their second undefeated season in 2002. Tennessee became the third in 1998, going 39 and 0.

Solve the following problems.

1. The Texas team averaged 83.9 points per game and played 34 games. How many points did they score during the entire season? (Reasoning question: Should this number be a whole number or a decimal?)

   _____

2. The 1986 Texas women's team had the eighth highest "scoring margin" in NCAA women's basketball history. Now it is the twentieth. (The scoring margin is the difference between the winning team's score and the losing team's score.) If the Texas women averaged 83.9 points per game, and their opponents averaged 57.2 points per game, what was the average scoring margin for Texas in 1986?

   _____

3. Using the information given in problem 2, how many total points were scored (on the average) during each of the Texas women's team games?

   _____



4. Texas won the national championship in 1986. But during the year, they were ranked second the day they played Tennessee! The final score when these two teams played was Texas 88, Tennessee 74. How many points were scored in the game?

   _____

5. Texas made 1,162 field goals during its 34 games. How many field goals did it make, on the average, during each of those games?

   _____

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Men's Unbeaten Teams

Several men's basketball teams have enjoyed undefeated seasons, many of which resulted in a national championship. The following table shows those teams.

Team	Season	Won	Lost
North Carolina	1957	32	0
Indiana	1976	32	0
UCLA	1964	30	0
UCLA	1967	30	0
UCLA	1972	30	0
UCLA	1973	30	0
San Francisco	1956	29	0
North Carolina State	1973	27	0
Kentucky	1954	25	0
LIU–Brooklyn	1939	24	0
Seton Hall	1940	19	0
Army	1944	15	0

1. Obviously, because these teams all went undefeated, they lost no games. How many games were won by all of the teams put together?

   _____

2. Some of the undefeated teams did not play in the NCAA championships. During the early years, the NCAA championship was not as popular as it is today. For example, LIU–Brooklyn went undefeated in 1939, but the Oregon Ducks won the first NCAA championship ever played during that year. How many fewer games did the Brooklyn team win in 1939 than the most recent undefeated team—the Indiana Hoosiers?

   _____

3. UCLA, during its marvelous winning streak that resulted in ten national championships, had four undefeated teams. How many wins did the Bruins have during all of those undefeated seasons put together?

   _____

4. Indiana was the last undefeated men's basketball team. It achieved that honor in 1976.

   a. How many years has it been since there was an undefeated team in the NCAA?

   _____

   b. How many years have passed since the NCAA had its first undefeated team?

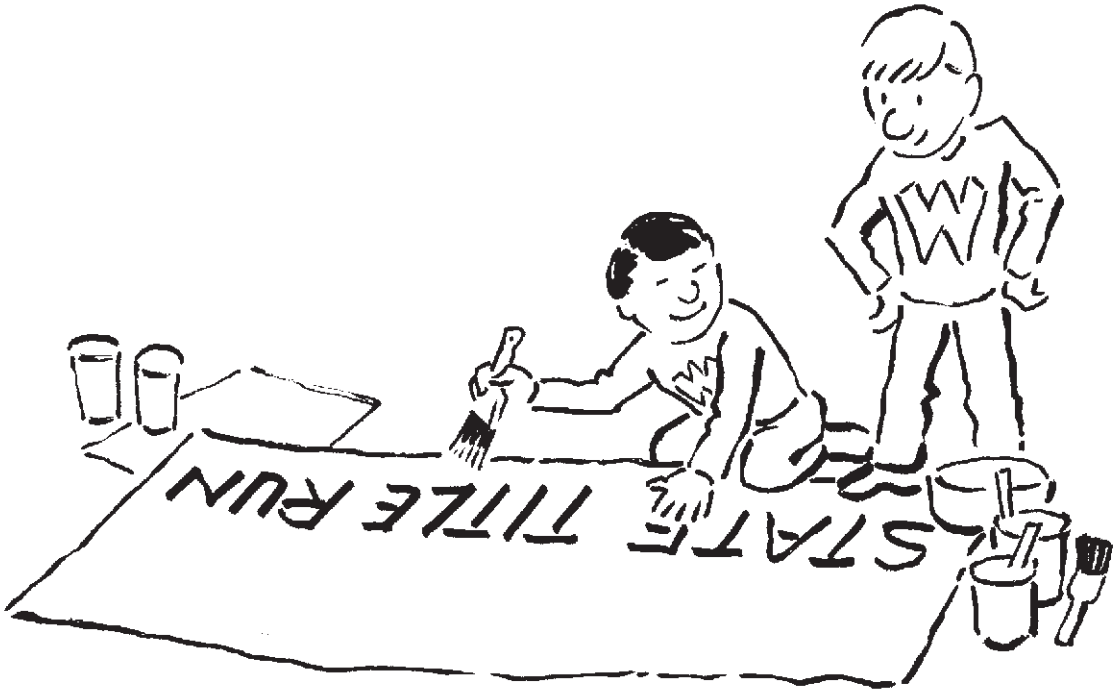
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The Warriors, State Champs

In order to win the state title, the Warriors had to win four straight games at the state tournament. The scores for each game are listed in the following table.

Warriors	83	Wolverines	59
Warriors	58	Comets	52
Warriors	73	Nighthawks	45
Warriors	60	Crusaders	52



1. What was the total number of points scored by the Warriors during the tournament? What was the total for all their opponents combined?

   _____

2. What was the average number of points scored by the Warriors? What was the average for all their opponents combined?

   _____

3. What was the margin of victory for each game?

   _____

4. What was the average margin of victory for the Warriors during the tournament?

   _____

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Women's Scoring Champions

Solve the following problems.

1. In both 1992 and 1993 Andrea Congreaves of Mercer led NCAA women's basketball with the highest scoring average. In 1992 she scored 925 points in 28 games. What was her average score per game?

   _____

2. In 1993 Andrea's scoring went down, but she still led the nation in scoring. During the 1993 season, she scored 805 points in 26 games. What was her average number of points scored per game that year?

   _____

3. Despite Andrea's tremendous scoring in 1992, she does not hold the women's NCAA record for single-season scoring. Patricia Hoskins of Mississippi Valley College earned that distinction. Patricia averaged 33.6 points per game for 27 games in 1989.

   How many points did she score during that year? (Remember this is total points scored, so you have to round off your answer to a whole number.)

   _____

Last Year	Player/Team	Games	Career Points
2001	Jackie Stiles, Southwest Missouri	129	3,393
1989	Patricia Hoskins, Mississippi Valley	110	3,122
1984	Lorri Bauman, Drake	120	3,115

4. Jackie Stiles holds the women's NCAA record for most points scored in a career. She scored 3,393 points for Southwest Missouri in a career that ended in 2001. Jackie passed Patricia Hoskins career record of 3,122 points scored for Mississippi Valley. How many more points did Jackie score than Patricia over their careers?

   _____

5. Which of these three players had the highest average number of points per game during their careers?

   _____

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The Big "O"

Two different basketball players have led the NCAA in scoring average for 3 years—Oscar Robertson of Cincinnati and Pete Maravich of Louisiana State. Both went on to have long careers in the NBA. The following chart shows Oscar Robertson's NCAA career statistics.

Oscar Robertson—6 ft., 5 in. guard

Year	Games	Field Goals	Free Throws	Total Points	Game Average
1958	28	352	280	984	35.1
1959	30	331	316	978	32.6
1960	30	369	273	1011	33.7

1. How many field goals did Oscar Robertson make in his NCAA career?

   _____

2. How many total points did Robertson score in the three seasons he played for Cincinnati? (He ranks seventh on the all-time list of career scorers.)

   _____

3. How many free throws did Robertson make in his NCAA career?

   _____



Challenge problem

Can you figure Robertson's average points over his entire NCAA career? Be careful; you can't use the game averages given in the table to calculate this. Do you know why?

_____

_____

_____

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"Pistol" Pete

Two different basketball players have led the NCAA in scoring average for three years—Oscar Robertson of Cincinnati and Pete Maravich of Louisiana State. Both went on to have long careers in the National Basketball Association. The following chart shows Pistol Pete Maravich's NCAA career statistics.

Year	Games	Field Goals	Free Throws	Total Points	Games Average
1968	26	432	274	1,138	43.8
1969	26	433	282	1,148	44.2
1970	31	522*	337	1,381*	44.5*

*Indicates record



1. How many field goals did Maravich make in his NCAA career?

   _____

2. How many total points did Pistol Pete score in the three seasons he played for LSU? (That number ranks Maravich first in NCAA "career points"—the statistical category for total points scored in a career.)

   _____

3. How many free throws did Maravich make in his NCAA career?

   _____

Challenge problem

Pistol Pete was criticized at times for shooting too much. Do you think points scored is the only statistic that is important? What other statistic might also be important when considering how many points a player scored?

_____

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Point Guards

One way to rate the effectiveness of a point guard is to calculate the assist/turnover ratio. The ratio is found by dividing the number of assists by the number of turnovers. If the point guard has a ratio larger than 1:1, then he or she is considered to be doing a good job.

Player	Assists	Turnovers	Ratio
Jason	27	12	:
Jeremy	30		2.5:1
Fred		40	1.5:1
Efrain	128	80	:

1. What is Jason's assist/turnover ratio?

   _____

2. How many turnovers did Jeremy commit during the season?

   _____

3. How many assists did Fred have for the season?

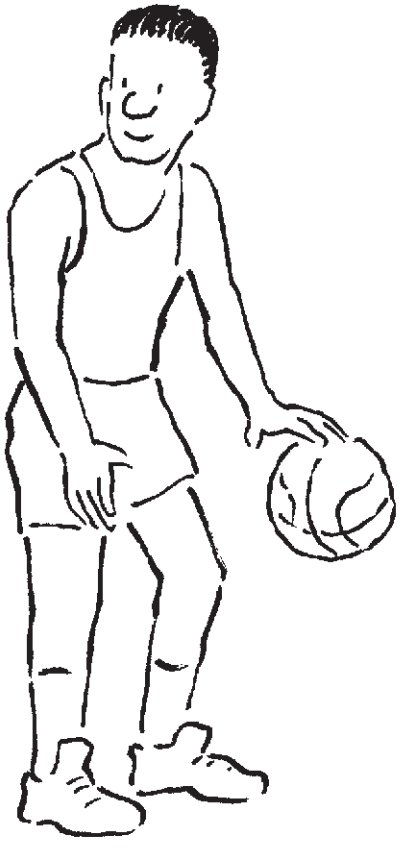
   _____

4. What was Efrain's ratio of assists to turnovers?

   _____

5. Which one of the players do you think started for the team? How did you choose your answer?

   _____



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Women's Field-goal Percentage Leaders

Scoring in basketball is an interesting problem. A player wants to score, but does not like to miss a shot. So, an interesting statistic is called "field-goal percentage." It tells the percent of shots that a player makes. Obviously, a player would like to score a lot of points and take very few shots. But some scorers take and miss a large number of shots. There is a point when a player is not helping his or her team if he or she misses too many shots.

The following table shows the six highest field-goal percentages in women's college basketball for an entire season. Obviously, these are very good shooters; they don't miss many! Can you complete the table? Remember, for example, that no player can take a half shot, so the number of field goals must come out to be a whole number. A field-goal percentage, on the other hand, should be computed to one decimal place.

Women's Field-goal Percentage Leaders

Player/Team	Season	Games	Field Goals	Attempts	Percentage (%)
Myndee Larsen, Southern Utah	1998	28	___	344	72.4
Chantelle Anderson, Vanderbilt	2001	34	292	404	__._
Deneka Knowles, SE Louisiana	1996	26	199	___	72.1
Barbara Farris, Tulane	1998	27	151	210	__._
Renay Adams, Tennessee Tech	1991	30	___	258	71.7
Regina Days, Georgia Southern	1986	27	234	___	70.5

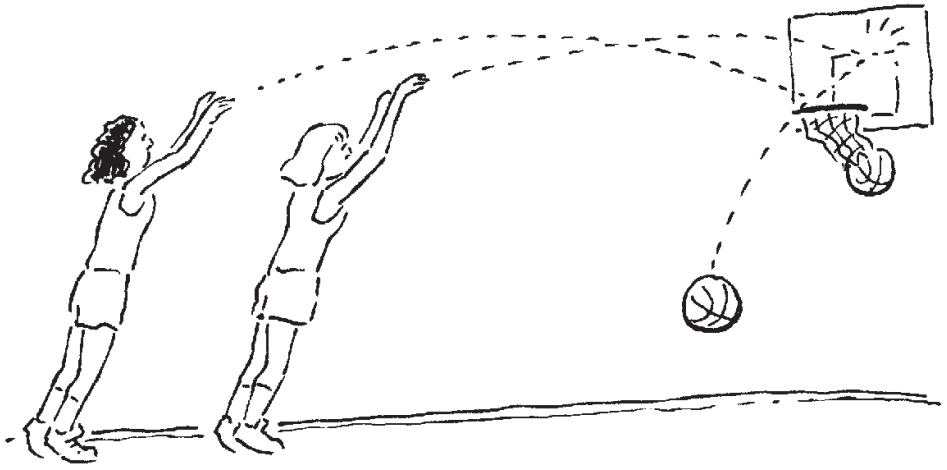


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Comparing Field-goal Percentages

The "field-goal percentage" statistic is important when you compare how making and missing a shot will help a team. Examine the statistical lines for two players.

Player	Field Goals Made	Field Goals Attempted	Shooting Percentage	3 FG Made	3 FG Attempted	Three-point Percentage
Angie	282	670	42.1	2	9	22.2
Becky	272	421	64.6	1	4	25.0



Compare these two players.
Angie scored more points, but:

1. How many times did Angie shoot the ball and miss?

   _____

2. If you assume a two-point field goal for each Angie miss, how many points did she cost her team?

   _____

3. How many times did Becky shoot the ball and miss?

   _____

4. If you assume a two-point field goal for each Becky miss, how many points did she cost her team?

   _____

Challenge problem

Figure the total points scored by each player. Then: Angie shot the ball a total of 670 times that her team had the ball. Becky shot the ball a total of 421 times her team had the ball. How many points were scored, on the average, for each time the player shot? (Remember, three-pointers are included in the total number of shots taken.)

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UCLA's Championships

The UCLA Bruins, under coach John Wooden, had an unbelievable string of national championships. No one has ever come close to UCLA's record. The following numbers show how fantastic the record is.

Year	Champion	Score	Second	Third	Fourth
1964	UCLA	98–83	Duke	Michigan	Kansas State
1965	UCLA	91–80	Michigan	Princeton	Wichita State
1966	UTEP	72–65	Kentucky	Duke	Utah
1967	UCLA	79–64	Dayton	Houston	N. Carolina
1968	UCLA	78–55	N. Carolina	Ohio State	Houston
1969	UCLA	92–72	Purdue	Drake	N. Carolina
1970	UCLA	80–69	Jacksonville	New Mexico State	St. Bonaventure
1971	UCLA	68–62	Villanova	Western Kentucky	Kansas
1972	UCLA	81–76	Florida State	N. Carolina	Louisville
1973	UCLA	87–66	Memphis State	Indiana	Providence
1974	N. Car. St.	76–64	Marquette	UCLA	Kansas
1975	UCLA	92–85	Kentucky	Louisville	Syracuse
1976	Indiana	86–68	Michigan	UCLA	Rutgers

1. How many years are covered in the chart above?

   _____

During this period of time:

2. How many first-place finishes did UCLA have?

   _____

3. How many third-place finishes did UCLA have?

   _____

4. How many times did UCLA fail to make the Final Four?

   _____

5. What was UCLA's average score during its championship games?

   _____

6. What was the second-place team's average score against UCLA?

   _____

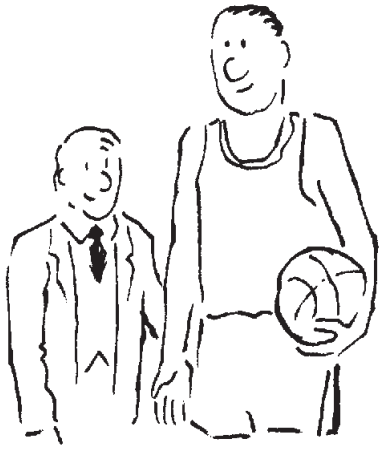
Challenge problem

Have the Bruins won a National Championship since Coach Wooden's dynasty?

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Duke's Championships

The only team who has even thought about returning to the Final Four several times in recent years has been the Duke Blue Devils. Their record for Final Four appearances in recent years is listed below. If you compare Duke's streak to UCLA's on page 13 you will see how truly fantastic the UCLA streak was. Why? Because Duke's Coach Mike Krzyzewski, known as Coach "K," is considered to have done quite well to have made the Final Four as many times as he did. Answer the following questions to examine Duke's string of appearances. They won again in 2001.



Year	Champion	Score	Second	Third*
1986	Louisville	72–69	Duke	Kansas and Louisiana State
1987	Indiana	74–73	Syracuse	Nevada–LV and Providence
1988	Kansas	83–79	Oklahoma	Arizona and Duke
1989	Michigan	80–79	Seton Hall	Duke and Illinois
1990	Nevada–Las Vegas	103–73	Duke	Arkansas and Georgia Tech
1991	Duke	72–65	Kansas	Nevada–LV and North Carolina
1992	Duke	71–51	Michigan	Cincinnati and Indiana
1993	North Carolina	77–71	Michigan	Kansas and Kentucky
1994	Arkansas	76–72	Duke	Arizona and Florida

* After 1981, no third-place game is played.

1. How many years are covered in the chart above?

   _____

2. How many first-place finishes did Duke have during this time?

   _____

3. How many second-place finishes did Duke have during this time?

   _____

4. How many times was Duke tied for third during this period?

   _____

5. How many times did Duke fail to make the Final Four during this period?

   _____

6. What was Duke's average score during its championship games? (Don't forget Duke losses!)

   _____

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NCAA Women's Championships



The NCAA took over women's basketball in the early 1980s, holding the first women's Final Four in 1982. The record of NCAA Division 1 college championships from 1990 to 2000 is shown in the table below.

Year	Champion	Score	Second	Winning Coach
1990	Stanford	88–81	Auburn	Tara VanDerveer
1991	Tennessee	70–67	Virginia	Pat Summitt
1992	Stanford	78–62	Western Ky	Tara VanDerveer
1993	Texas Tech	84–82	Ohio State	Marsha Sharp
1994	North Carolina	60–59	Louisiana Tech	Sylvia Hatchell
1995	Connecticut	70–64	Tennessee	Geno Auriemma
1996	Tennessee	83–65	Georgia	Pat Summitt
1997	Tennessee	68–59	Old Dominion	Pat Summitt
1998	Tennessee	93–75	Louisiana Tech	Pat Summitt
1999	Purdue	62–45	Duke	Carolyn Peck
2000	Connecticut	71–52	Tennessee	Geno Auriemma

What information can you summarize from this table? Consider the following questions:

1. Tennessee has four championships. Figure:
   a. its average score in those victories
   b. its opponent's average score
   c. the average margin of victory

2. Connecticut and Stanford both won two championships in this time period. For each team, figure:
   a. its average score in those victories
   b. its opponent's average score
   c. the average margin of victory

3. Louisiana Tech and Tennessee both finished second two times in the time period 1990–2000. That must have been difficult for the players to accept. They came so close, but they did not win the championships. What was Tennessee's average margin of defeat? What was Louisiana Tech's average margin of defeat?

4. Which teams have won only one championship?

Challenge problem

Build a new table for all of the championships since 2000.

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Sheryl Swoopes, 1993 MVP



During the 1993 Women's Basketball Division I Championship, Sheryl Swoopes from Texas Tech led her team to its first-ever national championship. Sheryl had the kind of tournament that most people only dream about. She led all players in eight different offensive categories; she was named as the unanimous choice for the Women's Final Four Most Outstanding Player. Examine her statistics to see what kind of a tournament she had.

As you can see, Sheryl led the tournament in eight categories. She also scored 47 points in the championship game (a championship game record), which Texas Tech won by a score of 84–82 over Ohio State. Obviously, Sheryl is a true champion. But to see how fantastic her tournament actually was, compute the rest of her statistics.

Games	5	Assists	11
Field goals	56*	Free throws	57*
Field goals attempted	110*	FT attempted	*
Field-goal percentage		FT percentage	93.4 %
Rebounds	48*	Total points	177*
Rebounds per game		Game Average	*

* = a record

1. What was Sheryl's field-goal shooting percentage?

   _____

2. How many free throws did Sheryl attempt? (Remember, your answer must be rounded to a whole number; she can't shoot half a free throw.)

   _____

3. How many rebounds did Sheryl average for each game?

   _____

4. How many points did Sheryl average for each game?

   _____

Challenge problems

1. Sheryl made some three-point shots as well. How many?

   _____

2. Sheryl played in the WNBA as well. Find her career statistics in the WNBA post-season.

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Hiding the Three-point Shots

Statistics can hide in a chart. Take a look, for example, at those in the following chart.

Selected Top Ten Single Game-scoring Performances in an NCAA Women's Tournament Game

Player/Institution vs. Opponent/Year	Round	FG	FT	Points
Lorri Bauman, Drake vs. Maryland, 1982	RC	21	8	50
Sheryl Swoopes, Texas Tech vs. Ohio State, 1993	C	16	11	47
Chamique Holdsclaw, Tenn. vs. Boston C., 1999	2nd	15	9	39
Kerry Bascom, Conn. vs. Toledo, 1991	2nd	13	8	39
Shannon Cate, Montana vs. Iowa, 1991	1st	16	2	36
Sheryl Swoopes, Texas Tech vs. Colorado, 1993	RC	10	15	36

Key: 1st=First Round, 2nd=Second Round, RC=Regional Championship, C=National Championship Game

What statistic is hiding here? The NCAA reports only field goals in this statistic; it does not reveal how many three-point shots the individual made. But if you compute the total points from the individual basket scores, you find that counting every field goal as a two-point basket and then adding in the free throws does not equal the total number of points. Therefore, some of the players listed above must have made three-point shots. How many? You figure it out. (Hint: Some players did not make any.)



Three-point Baskets
(Hint: Some players did not make any.)

Lorri Bauman=_____

Sheryl Swoopes (Ch. Game)=_____

Chamique Holdsclaw=_____

Kerry Bascom=_____

Shannon Cate=_____

Sheryl Swoopes (Colorado Game)=_____

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Mom's Challenge Problems

Mom asked, "Hey Karen, I've made up some brain teasers from Prescott's basketball games over the weekend. Do you want to try to solve them?"

"Sure," Karen replied. "Let's have them."

Here are the brain teasers for Karen—can you solve them?



1. Sade made the exact same number of free throws, two-point shots, and three-point shots. If she scored 30 points altogether in Friday's game, how many points did she score on three-point shots?

   _____

2. Loni scored 35 points in Saturday's game. She did not make any three-point shots, and she hit twice as many field goals as free throws. How many field goals and free throws did she make?

   _____

3. During Friday's game, Prescott scored 10 more than twice as many points as Sade scored. How many did Prescott score?

   _____

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Charity Stripe Stories

Free throws are taken when a player is fouled. For some, the shot is a reward. For others, it's like a punishment. Consider the following free-throw records.

Player	Year	FTM	FTA	Percentage Made
Calvin Murphy	1981	206	215	
Shaquille O'Neal*	2000	135	296	
Reggie Miller	2000	373	406	
Chris Dudley	1990	58	182	
Karl Malone	1986	195	405	
Karl Malone	2000	589	739	

*Shaq's statistics are for the 23 Laker playoff games only!
Key: FTM=free throws made, FTA=free throws attempted

1. Calvin Murphy holds the single-season record for the highest percentage of free throws made in one year. He set the record in 1981. What was his FTM percentage during that record year? Fill in the space in the table.

   _____

2. Shaquille O'Neal often has free-throw problems. His team—the Lakers—won the 2000 league championship and O'Neal was named the "Most Valuable Player." But opponents tried to beat the Lakers by fouling O'Neal at the end of a game—the "Hack-a-Shaq" strategy. Teams like Portland hoped to beat the Lakers if Shaq missed free throws. Compute Shaq's FTM percentage for the playoffs to see why.

   _____

3. Reggie Miller is one of the best free-throw shooters playing today. What was his FTM percentage during the 1999–2000 season?

   _____

4. Chris Dudley, a center (teams—Cleveland, New Jersey, Portland, and New York), is one of the worst free-throw shooters ever. His worst year for shooting free throws occurred in 1989–90 when he played for Cleveland and New Jersey. What was his FTM percentage during that year?

   _____

5. Karl Malone's record is interesting. He could be a role model for O'Neal and Dudley. Karl was a terrible free-throw shooter in 1986, his first year. But he improved steadily. The 1999–2000 season was his best ever. Find his FTM percentage for both years, then figure his percentage improvement over the 14 years.

   _____

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NBA Record Holders

The most cherished record for an NBA player is the "career record" for a category. That honor goes only to players who play very well for many years. Players who hold career records are special! An example: Kareem Abdul-Jabbar, one of the NBA's greatest centers, holds a number of career records.

All-time Scoring Leader
Kareem Abdul-Jabbar scored more points than anyone else in the NBA. Kareem came into the NBA in 1969 and played 20 seasons. During that time, he scored 38,387 points. (Did you know that he originally played for the Milwaukee Bucks as Lew Alcindor? He later changed his team and his name!) For his entire career, then, how many points did he average per year? (Note: Kareem had amazing health; he missed only 80 games during the 20 regular seasons.)

_____

All-time Playing Leader
Kareem also holds the record for career minutes played. He spent more time on the NBA court than any other player. His record is 57,446 minutes played. Robert Parrish holds the record for most seasons played in the NBA. During his record 21 years in the NBA, he played 45,704 minutes. How many more minutes did Kareem play?

_____

All-time Shot Leader
Kareem also holds the career record for "most field goals attempted" and "most field goals made." He attempted 28,307 shots and made 15,837 of them. First, get a calculator and figure his shooting percentage (shots made divided by total shots). Over his entire career he made more than 50 percent of his shots! On the other hand, he made only 1 of 18 three-point shots. What was his three-point shooting percentage? (This would hardly qualify for a record!)

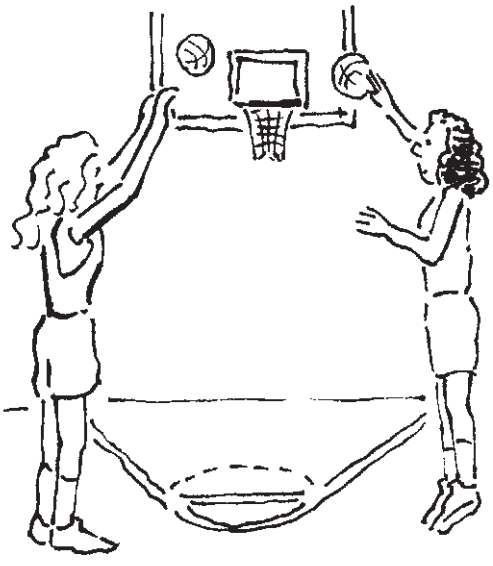
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Hot Shots

Carrie and Anji are racing for the scoring title in their teams' conference. With one week to go in the season, their statistics look like this:

Player	Games	Points	Average	Games Left
Carrie	18		16.0	2
Anji	19	305		1



Complete the table, and then answer the following questions.

1. Who has the higher average at this point in the season?

   _____

2. Who has scored the most points so far?

   _____

3. Carrie then scores 14 points in her next game. Is she ahead of Anji's total?

   _____

4. Anji scores 20 points in the final game of her season. What will be her point average per game for the whole season?

   _____

5. How many points will Carrie need to score in her last game to win the scoring title?

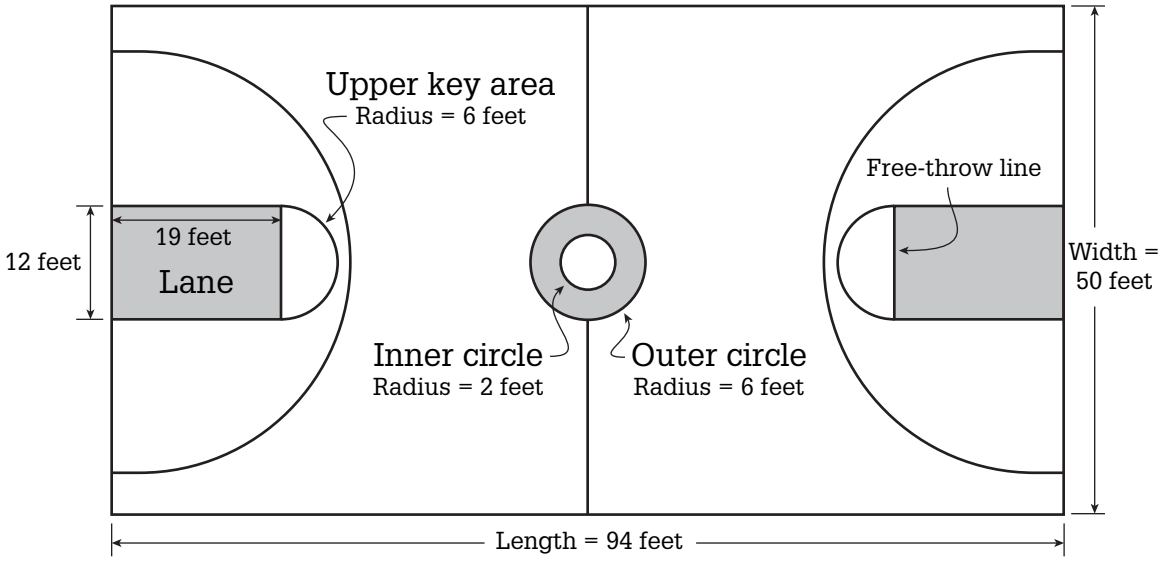
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Shooting for the Perimeter

When the painter gets ready to paint the court for a professional basketball team, he must use the diagram below to plan the job. The painter knows that he will have to put masking tape down before he paints each part of the court. He does this to prevent the workers from accidentally changing the lengths of the lines. In the following problems, assume that the painter puts tape on one side of each line.

Basketball Court Dimensions



1. How much tape will the painter need to go around the entire court?

   _____

2. If the painter has already painted the perimeter of the court, he won't need to repaint the part of the lane that is on the baseline. How much tape will he need to finish both sides of the lane and the free-throw line at one end of the court?

   _____

Challenge problems

1. What is the perimeter of the lane, including the semicircular area behind the free-throw line?

   _____

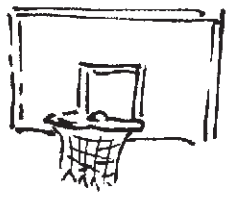
2. After the painter finishes painting the outer jump circle at the center of the floor, he wonders what the total length is around the edge of that circle. What is this length? (Hint: It is called the *circumference*.)

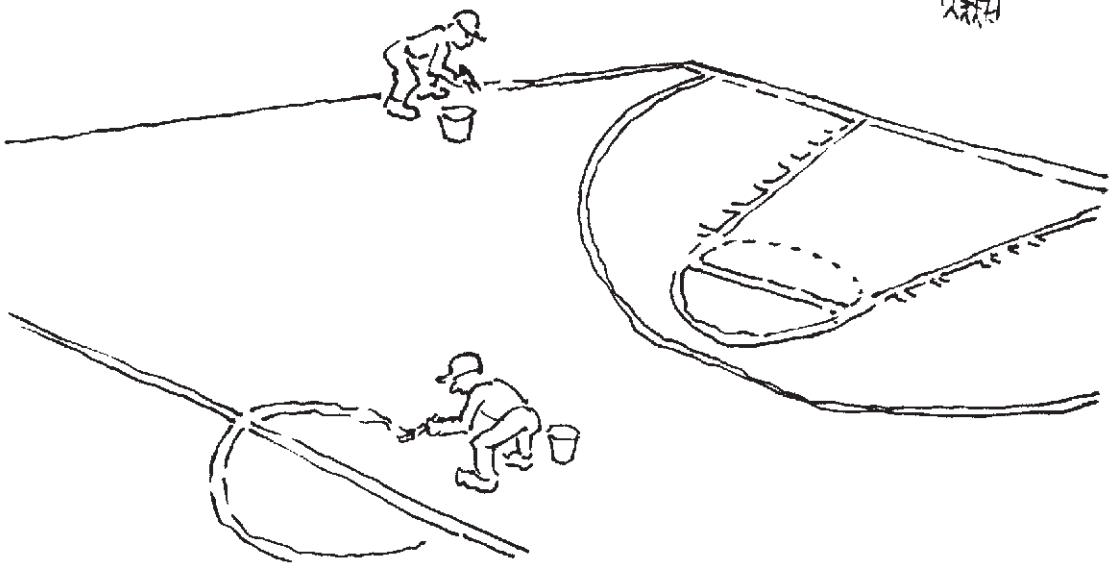
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Covering the Area

After painting all of the lines on the basketball court, the painter has to paint some sections of the floor in the team colors. The areas that usually get painted are the lanes and the jump circle. (Refer to the diagram on page 22.)





1. How many square feet will be painted in the lane on each end of the court? How much area will be covered in both lanes combined? (Note: The circular area behind the free-throw line is not part of the "lane.")

   _____

2. How many square feet are painted in the jump circle (the outer circle) at mid-court?

   _____

3. At the top of each lane, there is a half circle from which foul shots are taken. What is the area of one of these half-circles? What is the combined area of both of the half-circles?

   _____

4. After all of the painting is done, the painter must finish the job by applying a coat of varnish to the entire floor. What is the total area covered by the varnish?

   _____

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Famous Duos

Two famous players on the same team are often paired together to the point where it is difficult to think of one without the other. Examine the following problems to discover some interesting facts about four famous duos!

1. What famous player pair has played together for the longest time? John Stockton and Karl Malone are one possibility. Stockton's NBA career began in 1984 and Malone's in 1985. They played together through the 2002–03 season. Stockton held the career-assist record with 15,806 assists. Malone is second on the list of all-time scoring leaders with 36,928 points. Stockton and Malone each played 19 seasons. What is the average number of assists per season for Stockton? What is the average number of points per season for Malone? (Note: When Stockton retired, Malone played one additional season for the Los Angeles Lakers.)

2. What famous pair of very tall players led the San Antonio Spurs to the NBA championship in 1999? The Twin Towers—David Robinson and Tim Duncan! If Duncan scored 1,084 points during that year, and if Robinson scored 775 points that year, then how many more points did Tim Duncan score? (Note: These point totals are low because a strike shortened the season to 50 games that year.)

3. What famous pair led their team to the most NBA championships recently? Michael Jordan and Scottie Pippin led the Bulls to six NBA championships during the 1990s. Scottie's best year for total points was in 1991–92 when he scored 1,720. Michael's best year for total points in a championship season was in 1990–91 when he scored 2,580. How many points did they score when you combine their best point totals in a championship season? (Note: Jordan scored 3,041 points in 1986–87, but the Bulls did not win the championship that year.)

4. What pair became famous competing against each other? Larry Bird and Magic Johnson seemed to be playing against each other for the NBA championships during most of the 1980s. Magic's highest scoring total was 1,909 points in 1986–87. Bird's highest single-season scoring effort was 2,295 in 1984–85. How many more points did Larry score in his best season than Magic?

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The NBA All-star Team, 2004–05

The following chart shows the NBA All-star team for the 2004–05 season, along with the games played and the total number of points scored by each of the all-stars. Refer to the chart to answer the questions below.

2004–05 NBA All-star Team

	First Team			Second Team		
	Player	**Games**	**Points**	**Player**	**Games**	**Points**
F	Tim Duncan	66	1,342	LeBron James	80	2,175
F	Dirk Nowitzki	78	2,032	Kevin Garnett	82	1,817
C	Shaquille O'Neal	73	1,669	Amare Stoudemire	80	2,080
G	Allen Iverson	75	2,302	Dwyane Wade	77	1,854
G	Steve Nash	75	1,165	Ray Allen	78	1,867

1. Which team scored more total points, the first or second All-star team?

2. Compute the points per game for each player. (Note: Each had a different number of games, usually because of injuries. Therefore, you have to divide each player's total points by the number of games actually played.)

Read and compute

The normal NBA season includes 82 games. Who played in all of their team's games? Who played in the least number of games? How many games did each player miss? What was the difference between most games played and least games played?

Thinking question

Do you suppose a player would be named an all-star if he played in only 10 or 15 games during the year? Why or why not?

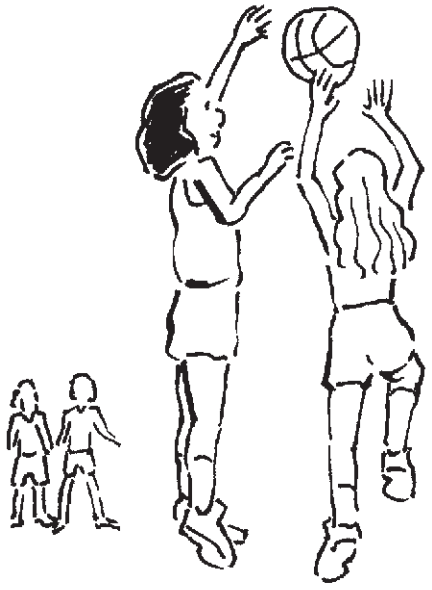
3. Some second-team players scored more than first-team players. Because the players are paired by position, you can compare them directly across. Which second-team all-star scored more points than the first-team all-star? Who had the greatest point difference? Figure this out for total points and points per game.

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Shot Blockers

Defensive statistics are becoming more important as people begin to understand the importance of playing strong defense. Consider the following chart showing the leading college women's shot blockers for several years.

Year	Player/Team	Games	Blocks	Average
1989	Michelle Willson, Texas Southern	27	151	_._
1992	Denise Hogue, Charleston	28	147	5.3
2003	Annie Williams, Jackson State	29	152	5.2
1991	Suzanne Johnson, Monmouth	23	117	5.1
1993	Chris Enger, San Diego	28	___	4.9



Note: Assume all blocked shots are two-point shots.

1. Consider what these statistics mean to their respective teams. Most shots are blocked close to the basket where the shooting percentages are very high. If all of the shots that Denise Hogue blocked had been good, how many more total points would Charleston's opponents have scored?

   _____

2. In that same manner, if all of the shots that Suzanne Johnson blocked had been good, how many more points would Monmouth's opponents have scored each game?

   _____

3. Michelle Wilson holds the record for "most blocked shots per game, average." What is her record? (Carry your answer out to one decimal point: that is the way the NCAA keeps its records.)

   _____

4. How many shots did Chris Enger block for San Diego in 1993? (Remember, you can't block half a shot; round off your answer to the nearest whole number.)

   _____

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Wanted for Stealing

Another defensive statistic is the "steal" category. This implies that a defensive player on one team steals the ball before the other team can shoot. Natalie White of Florida A&M holds several women's records for stealing the ball from the opponent. Consider her records.



Most Steals in a Game: 14, by Natalie White of Florida A&M vs. South Alabama on December 13, 1991 (now tied with four others).

Most Steals in a Season: Natalie White—191 steals in a 30-game season during 1995. In fact, Natalie also holds the second-best season record, with 172 steals in 28 games during 1994.

1. Consider what Natalie's steals meant to her team when they played South Alabama back in 1991. Then answer the following questions:

   a. Largest possible points prevented: Assume that South Alabama made three-point shots on every possession (14) where Natalie stole the ball. How many points did she prevent?

   _____

   b. More probable: If South Alabama made two-point shots on every possession where Natalie stole the ball, how many points did she prevent?

   _____

   c. Most probable: Assume South Alabama made half of its shots (all two-pointers) on the possessions where Natalie stole the ball. How many points did Natalie prevent?

   _____

2. Natalie's season record of 191 steals was made in 1995. Assume the "most probable" situation (described above): If her opponents kept the ball and made half of the shots, how many points did Natalie prevent the opponents from scoring during the entire season of 1995?

   _____

Challenge problem

Assume that a team wins a game by the score of 65 to 63 and one of its players steals the ball seven times. Do you think the player had an impact upon the final score? Why or why not?

_____

_____

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Very Famous Players Doing Other Things

Every basketball fan remembers Magic and Larry; people who don't even like basketball know Michael. Here are little-known facts about these players.



	Regular Season		Play-off Record	
Year	Wins	Losses	Wins	Losses
97–98	58	24	10	6
98–99	33	17	9	4
99–00	56	26	13	10

1. Magic Johnson delighted basketball fans for years. He led Michigan State to the NCAA championship and the Los Angeles Lakers to NBA championships. But did you know he also coached the Lakers for part of a season? As a coach, Magic's team won 5 games and lost 11. Can you compute his winning percentage for coaching? (Hint: As a player, he did better.)

   _____

2. Larry Bird played against Magic for years. Bird's Indiana State team lost to Johnson's team in the NCAA championship game, but Bird's Boston Celtics won NBA championships against Magic's Lakers. Bird was a fantastic player, but did you know that he also coached an NBA team?

   Larry coached the Indiana Pacers for 3 years, taking them to the NBA finals in 2000. (The Pacers lost to the Lakers in 6 games.)

   Find Larry's total number of wins and losses as a coach in the regular season.

   _____

   Then find his play-off record.

   _____

   Larry's total coaching record is:

   _____

3. Michael Jordan never coached in the NBA but he became general manager of the Washington Wizards in 2000. Mike had his work to do; he could have helped the Wizards by playing. In January 2001, during Michael's first whole season as GM, the Wizards lost five times as many games as they won. If they won only five games, can you figure out how many losses they had, how many total games they played, and what their winning percentage was?

   _____

   _____

   _____

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Play Like Mike

Michael Jordan is regarded as the best basketball player of all time, if not the best athlete of all time. As a result, every new NBA player with promise is eventually compared to Jordan—to see if they can "play like Mike." Use the following chart to answer the questions below.

Michael Jordan's Statistics for His First Four NBA Seasons

Year	Minutes	FGM	FGA	Percentage	FTM	FTA	Percentage	Total Points	Total Games
1	3,144	837	1,625	51.5	630	746	84.5	2,313	28.2
2	451	150	328	45.7	105	125	84.0	408	22.7
3	3,281	1,098	2,279	48.2	833	972	85.7	3,041	37.1
4	3,311	1,069	1,998	53.5	733	860	84.1	2,868	35.0

1. How many more points did Michael score in his first year in the NBA than in his second year?

   _____

2. The statistics obviously show that Michael Jordan didn't do much in his second year. The reason is that he played in only 18 games. If he played 451 minutes in 18 games, how many minutes per game did he play on the average?

   _____

3. What is the difference between Michael's highest total points figure for his first 4 years and his lowest?

   _____

   _____



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Do You Really Want to Hold This Record?

Not every record is something a player would like to hold. Consider the following questionable records.

Quickest Disqualification Ever

Anyone can have a bad day. But sometimes "bad" is really bad. On December 29, 1997, Bubba Wells of the Dallas Mavericks fouled out of a game after playing only 3 minutes. In other words, he collected 6 fouls in 3 minutes. Figure a ratio for this. If Wells was allowed to play all 48 minutes and he continued to foul at the same rate, how many fouls would he commit in the entire game?

_____

All-time Leader in Turnovers

Players have to be very good to set some questionable records. Why? To hold a negative career record, you have to play. And you have to play a long time. You can't set the record if you're sitting on the bench!

What player turned over the ball more than anyone? This player is the one who lost the ball to the opposing team more times than anyone else. Karl Malone is that player. In 19 seasons, Malone committed 4,524 turnovers. On the average, how many turnovers did he commit in a season?

_____

Most Fouls in One Game

Who holds the record for most fouls in one game? Two players hold this record. Jack Toomay had 8 fouls in a play-off game on March 26, 1949. Don Otten, playing in the NBA's first year, committed 8 fouls in one game. The game was held on November 24, 1949, between the Tri-Cities and Sheboygan teams. (Have you ever heard of these NBA teams?) Because a player now leaves the game after 6 fouls, this is a record to question!

_____

Research project

Can you find an old newspaper in the library to see how these record occurred?

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Amazing Championship Stories

The NCAA keeps detailed records for the championship play-offs. Each year 65 teams are selected to take part in the play-offs; over the years some truly amazing things have happened, and some great basketball players have been a part of the action. Consider the following stories.

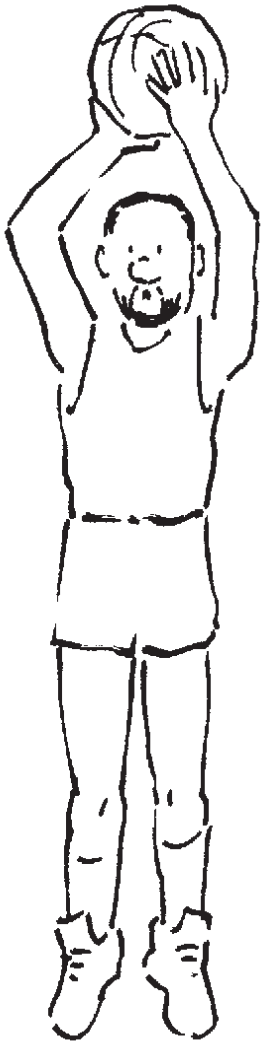
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1. Christian Laettner of Duke is the coholder of the highest field-goal percentage figure for one game; he shot 100%—ten shots taken, ten made—during Duke's 104–103 win over Kentucky in the regional final game in 1992. What is truly amazing was Laettner's last shot. Kentucky was ahead; Duke had time only to catch the in-bounds pass and shoot. But Laettner grabbed the pass, turned, and shot all in one motion. The shot, his tenth of the game, was perfect. Laettner scored, Kentucky lost, and Duke went on to the win the national championship. What was the total number of points scored in this exciting game?

   _____

2. North Carolina won the national championship in 1982, when both Michael Jordan and James Worthy played for the Tarheels. Even with these two great players, the Tarheels were locked in a title battle with Georgetown in the championship game. It was a close contest, but with seconds left, North Carolina went ahead of Georgetown by one point, 63 to 62. Now the Tarheels had only to keep Georgetown from scoring. Georgetown brought the ball down court. The pressure was tight. The Georgetown guard turned and passed the ball backward to a wide-open player. But it was not his teammate—it was James Worthy of North Carolina. Astonished, Worthy caught the ball and dribbled toward his basket. Time expired. North Carolina had won. Georgetown was distraught. But for one bad pass, the Hoyas might have been the national champions. How many total points were scored in this game?

   _____



Three Famous College Shot Blockers

Three very famous NBA centers hold all of the blocked shot records in the NCAA playoffs. None of the famous centers, however, could lead his team to the NCAA championship. Who are they? Read on and solve these story problems.



1. Shaquille O'Neal, the "Shaq," holds the NCAA championship series record for most blocked shots in one game. Louisiana State was playing Brigham Young in the first round of the 1992 play-offs. Brigham Young had several good big men, but Shaq was the master of the paint. He blocked 11 shots in one game. If Shaq could have done this every game for a 28-game season, how many shots would he have blocked over the entire season?

_____

2. Tim Duncan holds the record for most blocked shots in NCAA Tournament games. His Wake Forest team played 11 games during his career from 1994–97. During these games, Duncan blocked 50 shots. What was his average number of blocked shots per game in the tournament?

_____

3. Unitl 1997, Alonzo Mourning held the record for most blocked shots during a career. His Georgetown team made the NCAA play-offs every year from 1989 through 1992. During that time, he played in 10 games and blocked 37 shots. If he could do this over an entire 28-game season, how many shots would "Lo" block over the season?

_____

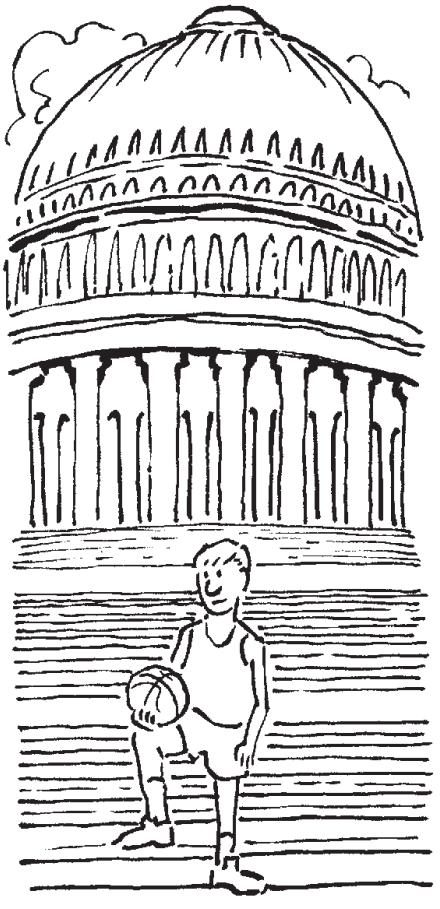
Challenge problem

Two of these questions ask you to compute a season's worth of shot blocks based upon a few games. What is wrong with using this reasoning to assume what the season record might be?

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Senator Bradley's Records

Some young people may not realize that former Senator Bill Bradley of New Jersey was at one time a star basketball player with the Princeton Tigers and the New York Knicks. In fact, Bradley still holds some NCAA play-off records. Read the following problems to learn more about these records.



1. Bill Bradley of Princeton is tied with a player from Wyoming named Fennis Dembo for having the highest free-throw percentage in one game. Both made 16 out of 16 free throws during a play-off game—Bradley against St. Joseph's in the first round of 1963 and Dembo against UCLA in the second round of 1987. How many years passed between these two record performances?

   _____

2. Bradley also held the career record for highest free-throw percentage during the NCAA play-offs until 1999 when it was broken by Arthur Lee of Stanford (58–62). Bradley's Princeton team was invited to the play-offs three years in a row, from 1963 through 1965. During that time, he made 87 out of 96 free-throw shots. To qualify for this record, a player must have attempted a minimum of 50 free throws. By how many attempts is Bradley over the minimum?

   _____

Challenge problem

A career record like Bradley's free-throw percentage record carries with it a minimum number of tries. Why do you think this is the case? Do you see how a record might be worthless without the minimum number of tries requirement?

_____

_____

_____

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The Long and the Short of It

In the 2000–01 season, the New York Knicks' roster looked like this:

Player	Height	Weight
Camby	6'11"	225 lbs.
Childs	6'3"	195 lbs.
Houston	6'6"	200 lbs.
Johnson	6'7"	235 lbs.
Knight	7'0"	235 lbs.
Longley	7'2"	260 lbs.
Postell	6'5"	215 lbs.
Rice	6'7"	215 lbs.
Sprewell	6'5"	190 lbs.
Strickland	6'3"	210 lbs.
Thomas	6'9"	230 lbs.
Ward	6'2"	190 lbs.

1. If the coach decided to put the five tallest players on the floor at once, who would they be?

   _____

   _____

   _____

   _____

   _____

2. How many total inches would that team add up to?

   _____

3. What would be the total height of the shortest team the coach could put on the floor?

   _____

4. What is the difference in height (in inches) between the tallest player and the shortest player on the team? (This number is called the "range in height.")

   _____

5. What is the average weight of the Knicks?

   _____

6. What is the range of weight for the team?

   _____

7. What are the total weights of the heaviest and lightest teams that the coach could put on the floor?

   _____

8. Is the lightest team composed of the same five players as the shortest?

   _____

Challenge problem

NBA rosters may change a lot in just a few years. Which of these players, if any, are still with the New York Knicks today? Which players now play for other NBA teams?

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Two Famous Malones

It is interesting to compare the statistics of two famous NBA players with the same last name: Moses Malone and Karl Malone. (There are other famous NBA players named Malone. Can you find one?)

Player	Years	Games	Minutes	Points	Rebounds
Karl	19	1,476	54,852	36,928	14,968
Moses	19	1,329	45,071	27,409	16,212

Karl Malone played almost his entire career as a power forward for one team—the Utah Jazz. Moses, on the other hand, played center for several teams. He started his career in the American Basketball Association (ABA) with the Utah Stars and moved to the St. Louis Spirits. After the ABA and NBA merger, Moses played for Buffalo, Houston, Philadelphia, and San Antonio. That's a lot of teams.

1. Karl was Utah's leading scorer for many years. How many more points has he scored than Moses?

   _____

2. Moses was known as a powerful defender. He blocked shots and swallowed up rebounds. How many more rebounds does he have than Karl?

   _____

3. When you examine his years in the league, Karl obviously plays more during each game. Using the statistics given, how many more minutes did Karl play?

   _____

4. Moses scored a total of 27,409 points, which included the record for most free throws made in a career. If he made 8,531 points on free throws, how many points did he make on field goals?

   _____

5. Karl Malone broke Moses Malone's record of career free throws made. Karl made 9,787 free throws in his career. How many more free throws did Karl make than Moses?

   _____

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Foul Play I

Every coach would like his or her team not to foul at all. A personal foul can send the opponent to the free-throw line for easy points. (Coaches call the foul line the "charity stripe" for a reason.) If a team doesn't foul the opponent, then the opponent doesn't get the "free" points. How good or bad have players been at following the coach's instructions of "Don't Foul!"?



1. In 1982 Loyola of Maryland set the women's record for most fouls in a season. The team was called for 942 personal fouls in 27 games. What was its "fouls per game" average?

   _____

2. The Boston University women's team holds the NCAA record for fewest fouls committed over a season. In 1987 the Boston U. women were called for only 261 fouls in 27 games. What was their "fouls per game" average?

   _____

3. How many more fouls did the Loyola women commit, on the average per game, than the Boston U. women?

   _____

4. Let's look at the men's figures. In 1987 the Providence College men's team was called for 966 fouls in 34 games. What was the team's "fouls per game" average?

   _____

5. In 1962 the Air Force team was called for only 253 fouls in 23 games. What was its "fouls per game" average?

   _____

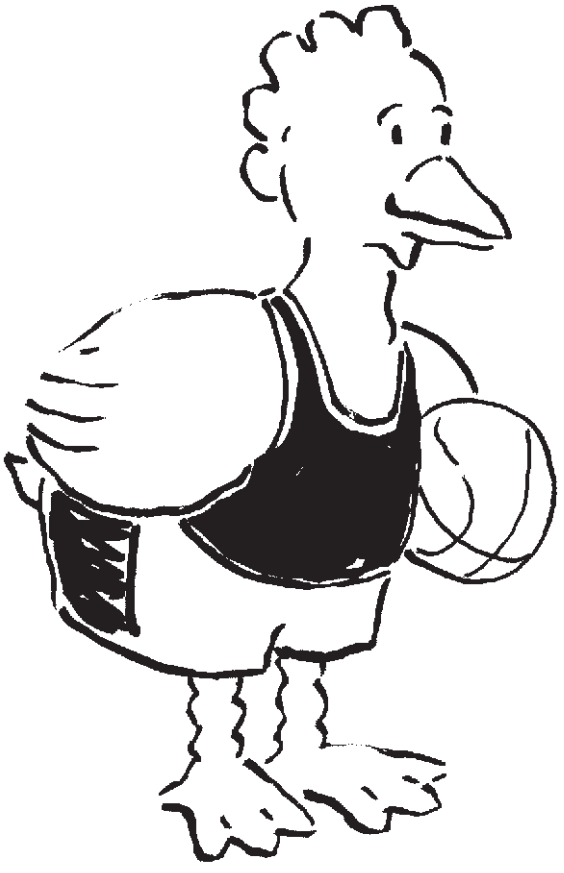
6. How many more fouls did the Providence players commit, on the average per game, than the Air Force players?

   _____

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Foul Play II

In high school and college basketball games, players are disqualified (sent to the bench for the rest of the game) when they receive their fifth foul. In the NBA, however, 6 fouls are required to send a player to the bench. Consider the NBA statistics contained in the following questions:



1. In 1976, Charlie Scott of Boston committed 35 fouls against Phoenix in a 6-game post-season series. In how many games did Scott foul out?

   _____

2. How close (in terms of fouls) did Scott come to fouling out in the next game?

   _____

3. The record for most fouls in a 7-game series is 37. If a player commits this many fouls, what is the smallest possible number of times that he could foul out?

   _____

Challenge problem

The record for most fouls in a 3-game play-off series is 18. It is jointly held by Charlie Share of St. Louis (1956) and Vern Mikkelsen of Minneapolis (1957). Do these two old-time players need to worry about losing their records? Why or why not?

Research question

Who tied this record in 1997?

_____

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Sharing the Ball

Every player likes to score but she or he has to get the ball first. This makes the person who passes the ball very popular with other players. Coaches also like a player who will distribute the ball to another player who is open. If the open player makes a shot, the passer is credited with an assist.

Who were the leading assist players for the WNBA during the 2000 season?

Player	Team	Assists per Game
Tichia Penicheiro	Sacramento	7.9
Teresa Weatherspoon	New York	6.4
Jennifer Azzi	Utah	6.1
Dawn Staley	Charlotte	5.9
Shannon Johnson	Orlando	5.3
Andrea Nagy	Washington	5.1
Cynthia Cooper	Houston	5.0

1 . Figure that each assist resulted in a two-point basket. How many points did each of the players help earn for her team per game? (Carry your answer out to one decimal point.)

_____

2. What if each of the baskets was a three-point shot? How many points would each player help her team earn? (Is this a logical assumption?)

_____

Challenge problems

1. Because it is not probable that each assist will lead to a three-point basket, then the true number of points added by each player must be somewhere between answers 1 and 2. Assume that each of the players had two assists that resulted in a three-point basket. How many points would they have assisted with?

2. Find these individual statistical leaders for the most recent WNBA season.

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Cleaning the Glass

Rebounding in the WNBA is just as important as it is for the men of the NBA. Who were the rebounding leaders in 2000 for the WNBA? (The figures in the table below are average rebounds per game for the 2000 WNBA season.)

Player	Team	Offensive	Defensive	Total
Natalie Williams	Utah	4.6	7.0	11.6
Yolanda Griffith	Sacramento	4.6	5.7	10.3
Lisa Leslie	Los Angeles	2.3	7.2	9.6
Tari Phillips	New York	2.8	5.2	8.0
Tina Thompson	Houston	2.1	5.5	7.7

1. Can you compute the average number of offensive rebounds and the average number of defensive rebounds for these five players? Which is higher? Why do you think this is the case?

_____

_____

2. Offensive rebounds usually result in more points for your team. This is because an offensive rebounder is usually in position to take a high percentage shot. If each offensive rebound resulted in 2 points for the team, figure how many extra points each player contributed to her team.

Natalie Williams_____
Yolanda Griffith_____
Lisa Leslie_____
Tari Phillips_____
Tina Thompson_____

3. Defensive rebounds usually prevent the other team from getting another shot. Therefore, if each defensive rebound prevented a 2-point basket, how many points did each player keep the other team from scoring?

Natalie Williams_____
Yolanda Griffith_____
Lisa Leslie_____
Tari Phillips_____
Tina Thompson_____

Challenge problem

Find these individual statistical leaders for the most recent WNBA season.

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Division by I, II, and III

One of the best things about college basketball is its popularity. Almost all colleges have a basketball team. Basketball is played at big colleges, medium-sized colleges, and very small colleges. The NCAA has three divisions, based on school size, in which colleges can compete. Championships are held in Divisions I, II, and III for both men and women. Records are kept for all three divisions. Consider the following records for most points in a game by a player playing against an opponent from the same division.

Year	Division	Player	School	Points
Men				
1954	II	Clarence "Bevo" Francis	Rio Grande	113
1991	I	Kevin Bradshaw	U.S. Int.	72
1998	III	Jeff Clement	Grinnell	77
Women				
1991	II	Jackie Givens	Ft. Valley State	67
1991	III	Ann Gilbert	Oberlin	61
1987	I	Cindy Brown	Long Beach State	60

1. How many points were scored, altogether, for the highest one-game men's totals? For the highest one-game women's totals? For both?

   _____ _____

   _____ _____

2. What is the average for the highest scores for men and women in Division I? Division II? Division III? For all three divisions combined?

   _____ _____

   _____ _____

3. "Bevo" Francis of Rio Grande is an interesting individual. He not only had the all-time highest game score in Division II with 113 points, but he also had the second-highest game score, with 84 points, and the third-highest game score, with 82 points—all during the 1954 season. In addition, during the 1953 season, he tied for the seventh highest all-time game score with 72 points. In 1954 Francis averaged 46.5 points per game for 27 games. How many points did he score during that season?

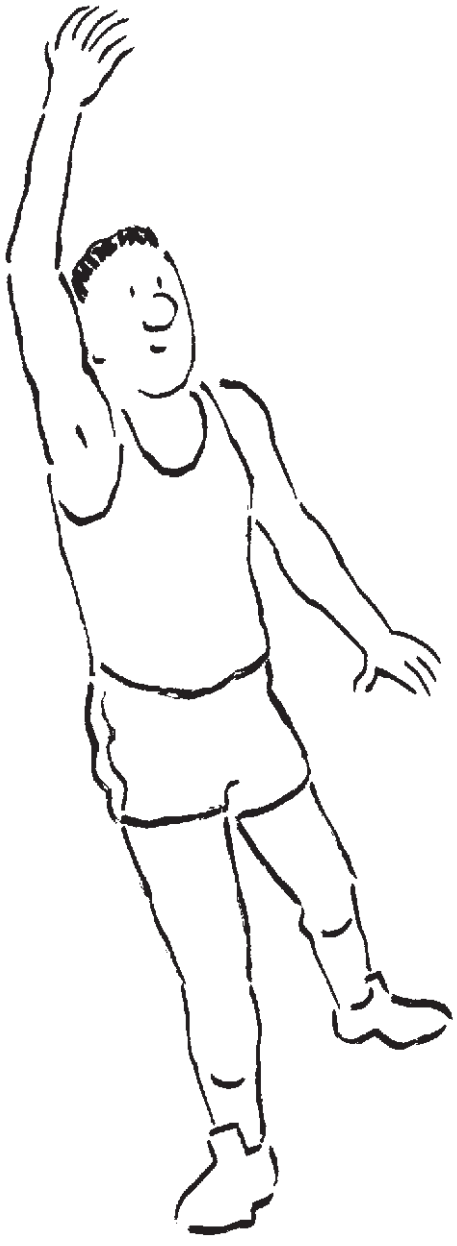
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On the Glass

During the play-offs, teams put extra effort into their defense. As a result, rebounding becomes very important during a play-off series. Records are kept for series that last from two to seven games.

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1. The record for rebounds in a three-game play-off series is 84, held by Bill Russell of Boston. He set the record in 1957 against Syracuse. How many rebounds did Russell average per game?

   _____

2. The second-best effort for rebounding in a three-game play-off is 69. Wilt Chamberlain recorded this total in 1961. How many more rebounds per game did Russell have than Chamberlain?

   _____

Challenge problem

Since the 1973–74 season, rebounds have been broken down into two categories: offensive and defensive. The record for offensive rebounds in a three-game series is 28, set by Moses Malone in 1982. The record for defensive rebounds is 43, set by Bob McAdoo is 1976. By comparing these records, is it possible that one of the new records would belong to Russell if offensive and defensive rebound totals had been counted in 1957? Is it possible that both records could belong to Russell?

Chairman of the Boards

The chart below shows rebounding records for a five-game play-off series.

	Player	Rebounds per Game	Total Rebounds
Total rebounds	Wilt Chamberlain—1967	32.0	
Offensive rebounds	Larry Smith—1987	7.2	
Defensive rebounds	Jack Sikma—1979	12.4	
	Karl Malone—1991	12.4	

1. Calculate the total rebounds for all four players during the five-game season on the chart above.

   _____

2. How many total defensive rebounds would Smith need to tie Chamberlain's mark?

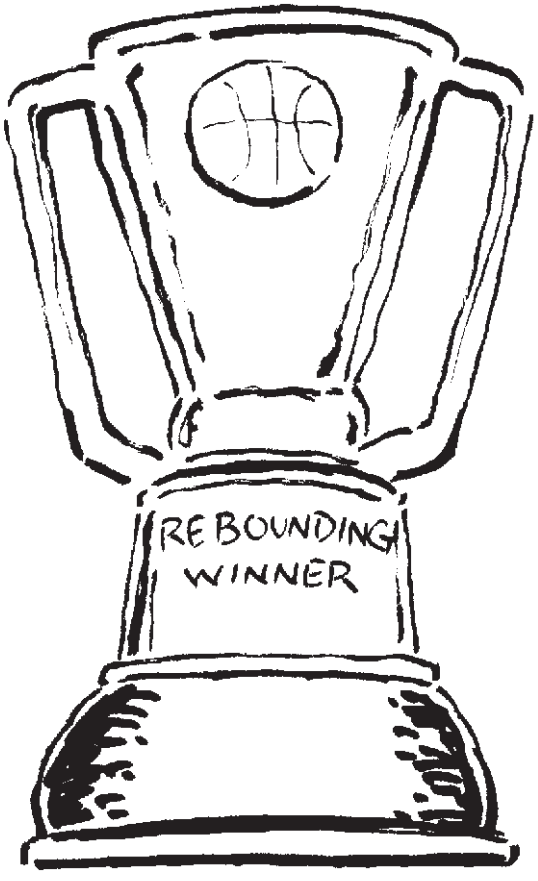
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3. How many total offensive rebounds would Malone need to tie Chamberlain's record for total boards?

   _____

Challenge problem

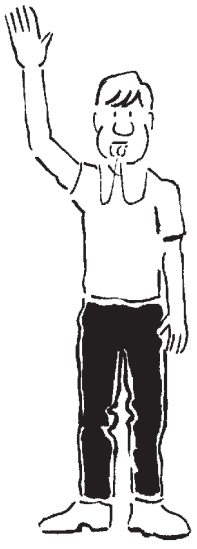
During the 1978–79 season, 77% of Sikma's rebounds were on the defensive glass. If this pattern held true in the play-offs, how many offensive boards per game did he pull down? (Round your answer to the nearest whole number.)



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Where's the Offense?

On November 22, 1950, the Fort Wayne Pistons played the Minneapolis Lakers. The final score was Pistons 19, Lakes 18. It was the lowest-scoring game in NBA history. Fort Wayne stalled most of the game to neutralize the Laker's height advantage. The league soon introduced the 24-second shot clock, eliminating stall tactics. The 24-second rule states that a team in possession of the ball must shoot within 24 seconds or it loses the ball.



1. The Pistons made 4 of their 13 shots from the field for a 31% average. How many points did they score from the free-throw line? (Remember that there was no three-point shot in 1950.)

   _____

2. If the Pistons missed four foul shots, how many total free throws did they attempt as a team?

   _____

3. The Lakers hit 10 of 17 from the charity stripe. How many field goals did they make?

   _____

4. Laker George Mikan scored five-sixths of his team's points. With how many points did he finish the game?

   _____

5. Mikan scored all of his team's field goals. He also missed as many shots as the rest of the Lakers combined. If Minneapolis attempted 18 shots, how many did Mikan miss?

   _____

6. John Oldham, a guard, led the Pistons with exactly one-third of Mikan's total number of points. How many points did this "high scorer" get?

   _____

7. At the end of three quarters, the score was Pistons 16, Lakers 17. How many points did each team score in the final period?

   _____

8. The length of the game was 48 minutes. Did the 7,021 fans get to see an average of at least one point scored per minute?

   _____

9. The lowest scoring game after the introduction of the shot clock resulted in a Boston victory over Milwaukee, 62–57. How many more points were scored in this game than in the Pistons–Lakers match-up?

   _____

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Where's the Defense?

The highest scoring game in NBA history took place on December 13, 1983, with the Denver Nuggets hosting the Detroit Pistons. The 1983 Pistons were nothing like the 1950 Fort Wayne Pistons, scoring 186 points to the Nuggets' 184. The game took three overtime periods to complete; six players from each team scored in double figures.

1. Detroit guards Isiah Thomas and John Long led the Pistons with 47 and 41 points, respectively. Did this duo score at least half of the Pistons' points?

   _____

2. Kiki Vandeweghe and Alex English led the Nuggets in scoring with 51 and 47 points, respectively. Did these two forwards account for half or more of the Denver total?

   _____

3. At the end of regulation playing time, the teams were tied at 135. How many points did Denver score in the three overtime periods? Detroit?

   _____

   _____

4. Although the teams combined for 370 points, only two three-point shots were made during the entire contest. If the teams combined for 84 points from the free-throw line, how many two-point field goals were made in the game?

   _____



5. Given that the two teams combined to make 84 free throws, and Denver made 10 more foul shots than Detroit, how many free throws did Denver convert? Detroit?

   _____

   _____

6. Including the three 5-minute overtime periods, how many minutes of playing time did it take to declare a winner? (Remember, pro games are 48 minutes long.)

   _____

7. If the game took 3 hours and 11 minutes to complete, how much time was spent waiting for the action to resume?

   _____

8. Did the teams combine for an average of more than 5 points per minute?

   _____

9. On any other night, Detroit forward Kelly Tripucka's 35 points might have led the team. He scored four-fifths of his points on field goals. How many points did Tripucka have from the foul line?

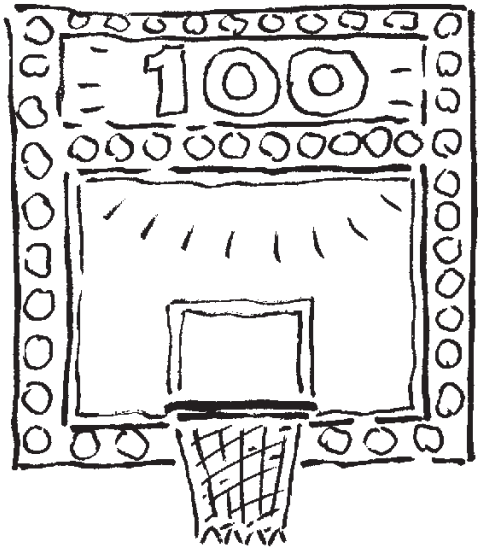
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Wilt's Big Night

On the night of March 2, 1962, the Philadelphia Warriors played the New York Knicks in Hershey, Pennsylvania. The star of the Warriors was Wilt "the Stilt" Chamberlain. Chamberlain had a reputation as a big scorer, but on this night he surpassed even his own high standards. He played every minute of the Warriors' 169 to 147 victory over the Knicks; at the end of the game, he had scored exactly 100 points. Chamberlain's quarter-by-quarter scoring appears below.

Quarters	1st	2nd	3rd	4th
Points	23	18	28	31



1. How many points did Chamberlain score in the first half of the game? The second half?

   _____

   _____

2. What was the difference between Wilt's best and worst quarter scores?

   _____

3. How many points did the rest of the Warrior team combine to score?

   _____

4. Chamberlain scored 72 points from the field. How many points did he score from the free-throw line?

   _____

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Defending the Big Guy

On the night Wilt Chamberlain scored 100 points for the Philadelphia Warriors, the New York Knicks also had a big offensive night. They scored 147 points, but they just couldn't stop the Warriors' big man. The Knicks' box score is shown below.

Player	Field Goal Attempts	Field Goals Made	Free Throws Attempts	Free Throws Made	Points
Naulls	22	9	15	13	31
Green	7	3	0	0	6
Imhoff	7	3	1	1	7
Guerin	29	13	17	13	39
Butler	13	4	0	0	8
Buckner	26	16	1	1	33
Budd	8	6	1	1	13
Butcher	6	3	6	4	10

1. Darrall Imhoff was the center for the Knicks. How many fewer points did he score than Chamberlain?

   _____

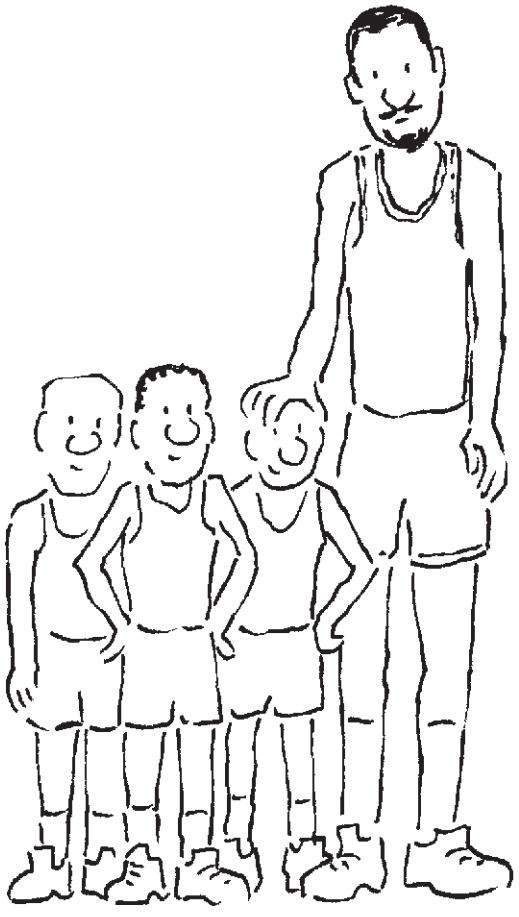
2. Did the three top scorers for the Knicks—Naulls, Guerin, and Buckner—surpass Chamberlain's total? What was their total?

   _____

   _____

3. How many points did the Knicks' "B-team" score? (The "B-team" comprises all of the players whose last name starts with the letter B.)

   _____



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Double-doubles

Ethan and Angela both play basketball for the Tigers. After an away game, they compared their statistics on the bus ride home. No one had totaled the stats, so they had to do the job themselves. Both players had done well in their games and each was interested to see if they earned a double-double. When a player reaches 10 in one statistic, he or she is said to have reached double figures. A double-double is scored when a player has reached double figures in two different statistical categories. Ethan's stats are shown below.

Quarter	Points	Rebounds	Assists	Blocks	Steals
1	4	3	1	2	0
2	4	2	0	0	1
3	5	1	3	1	1
4	2	4	2	1	0

1. The players added up Ethan's numbers. Did Ethan reach a double-double? In which statistical categories did he do the best?



_____

_____

Here are Angela's stats for her game.

Quarter	Points	Rebounds	Assists	Blocks	Steals
1	2	3	1	0	5
2	3	2	4	0	3
3	1	0	4	1	0
4	0	4	2	0	3

2. After Angela added up her points, she began to think she missed a double-double. Did she reach her goal in this game? What were her best categories?

_____

_____

Challenge problem

Try to make an educated guess about positions Angela and Ethan play.

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Triple-doubles

After their teams finished beating their arch-rivals, the two coaches called in the scores and statistics to the newspaper. Gracie had been the star of the girls' game while Cory had played well for the boys' team. The stats for each player are listed below.

Gracie

Quarter	Points	Rebounds	Assists	Blocks	Steals
1	4	5	1	1	2
2	6	4	7	2	1
3	12	3	3	4	3
4	7	4	3	0	2





Cory

Quarter	Points	Rebounds	Assists	Blocks	Steals
1	10	8	1	2	3
2	4	4	2	0	5
3	7	5	6	3	0
4	11	4	0	4	3

1. Did either player have a triple-double or a double-double? If yes, in which statistical categories did they reach double figures?

   _____

2. Did Gracie miss reaching double figures in a category by just one? Did she miss any categories by two?

   _____

3. If every assist that Gracie and Cory had led to a two-point basket, how many points did the pair score or create via the assist?

   _____

Challenge problem

Cory had a monster scoring night in the low post. From the stats provided, can you tell if Cory had a good game defensively?

_____

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Drawing the Crowd

During the regular season, each NBA team is seen by lots of fans. Some of these games are so important or interesting that they are moved to larger stadiums. Domed football stadiums, such as the old Silverdome in Detroit, were used for these "big games."

1. One of the biggest crowds ever to see a regular-season game was the 61,983 that packed the Silverdome to watch Boston play Detroit in 1988. Average attendance in Detroit's home court was 21,454 (in 1992–93). How many more fans were able to see the game held in the Silverdome?

   _____

2. If the Pistons had been able to pack the Silverdome all season long, what would their home attendance have been? (Remember, each team has 41 home games.) Use your calculator to find the answer.

   _____

3. Some teams have smaller stadiums that sell out for every game. Portland, for example, has had a streak of sellouts for some time. The Trailblazers' total attendance in the 1992–93 season was 528,408. If every game was sold out, how many fans attended each game?

   _____



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Keeping Time

The NBA has kept track of the number of games and minutes played for individual players since 1951. Many interesting times have been recorded since then. (Remember that a game = 48 minutes.)

1. In the 1961–62 season, Wilt Chamberlain played 3,882 minutes in 80 games. What is unusual about this statistic?

   _____

2. The record for most minutes played in one game belongs to Dale Ellis. He played 69 minutes for Seattle in 1989. What would be the smallest number of overtime periods possible in this game? (Overtime = 5 minutes.)

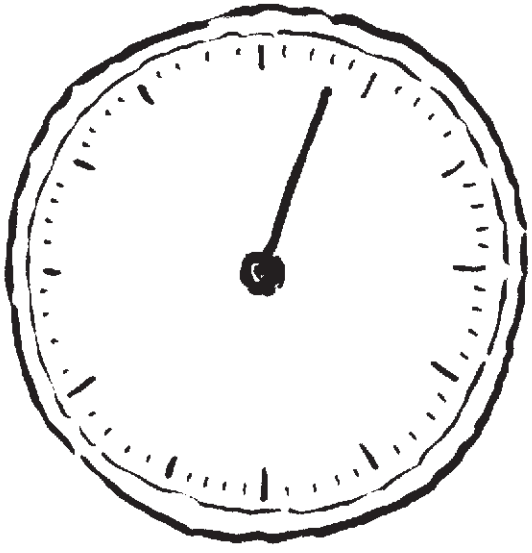
   _____

3. Kareen Abdul-Jabbar holds the record for most minutes played in a career. He played 57,466 minutes in his 20 seasons with the Milwaukee Bucs and the Los Angeles Lakers. How many days are equal to 57,446 minutes? Use your calculator to find the answer.

   _____

4. A. C. Green holds the NBA record for the most consecutive games played, with 1,192. (The number for this record ranges from 1,110 to 1,133 to 1,192, depending on the source. *The Guiness Book of World Records* lists 1,110.) Assuming there are 82 games in a season, how many seasons did this iron man play without missing a single game?

   _____



Challenge problem

In the 1968–69 season, Walt Bellamy played for New York and Detroit. Both of these teams played a regular 82–game schedule, yet Bellamy played in 88 games. This number, 88, is still the record for most games in one season. How could Bellamy have racked up this many games?

_____

_____

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NBA Trivia

Sports Trivia can be fun. All you have to know are a few isolated facts that not very many other people know, and you can stump all of your friends. Here are a few examples of trivia brainteasers.

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1. In the 1994–95 season, Toronto got a new NBA team, the Raptors. Is this the first Canadian team in the NBA?

   _____

2. What current team traces its roots to the Rochester Royals of 1948–49?

   _____

3. Before the re-alignment of the NBA divisions in the 2004–05 season, how many teams in the Pacific Division (Golden State, L.A. Clippers, L.A. Lakers, Phoenix, Portland, Sacramento, and Seattle) had won an NBA title in their franchise history?

   _____

4. Which team has the record for the most wins in the regular season?

   _____

5. What was the original name and location of the Washington Wizards? What was their new nickname the next year? What was their new city and name for the team's third season?

   _____

   _____

   _____



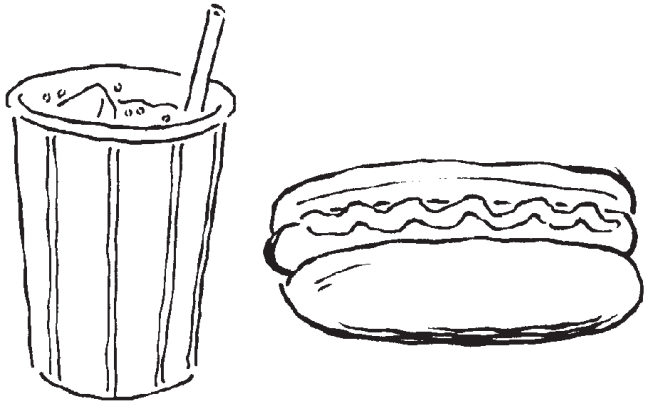
Challenge problem

Find a basketball information book and make up trivia questions of your own.

Snack Break

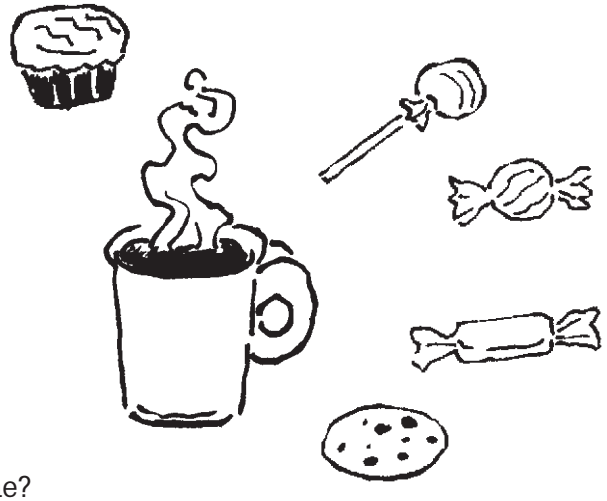
During the basketball season, each class in Hoopstown High School sold food to raise money. The seniors sold hot dogs and pop. The juniors sold sandwiches and coffee. The sophomores brought cakes and cookies to sell. The freshmen sold candy. To save paper, the classes put all their prices on one big poster. The prices are shown below.

Item	Price
Hot Dog	$1.00
Pop	.50
Sandwich	1.75
Coffee	.50
Cakes	3.50
Cookies	.25
Candy	.50



At the end of one evening, in which both the boys' and girls' teams won big, the classes counted up their sales. The following chart shows the quantity sold of each item.

Item	Sales
Cakes	11
Candy	48
Coffee	31
Cookies	98
Hot Dogs	76
Pop	119
Sandwiches	52



1. How much did each class make selling food at the basketball game?

Seniors_____

Juniors_____

Sophomores_____

Freshmen_____

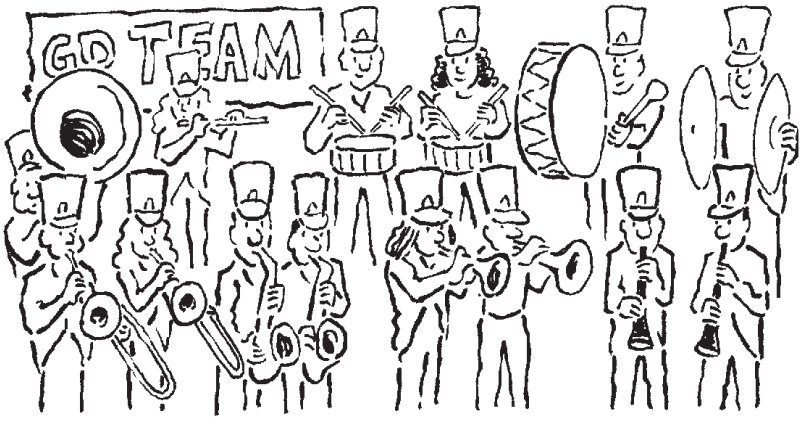
2. What were the total sales?

_____

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The Pep Band Blues

Solve the following problems.



1. The entire high school band cannot play at Killian High's home games. (Two hundred fourteen musicians in a small gym would make too much noise!) So, the pep band plays. If the pep band is made up of 27 musicians from the school band, how many school band members don't get to play at the basketball games?

   _____

2. When the band members take a break, they almost always buy a drink because their lips get so dry playing all those pep songs. If all 27 band members buy a lemonade for $1.25, how much do their refreshments cost?

   _____

3. Melinda, the band property officer, has to make small copies of the music to fit on the band members' instruments. If her counter says she made 486 reduced pages of music for the band, how many music sheets do each of the 27 players get?

   _____

Challenge problem

Kim, the lead trumpet player, has been in the pep band for 3 years. The team has 14 home games each season. If the pep band plays an average of 34 songs each night, how many songs has Kim played during her pep band career? Can you estimate how many times she has played "The Star Spangled Banner"? If so, how many?

_____

_____

_____

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Women's Leading Three-point Shooters

The following table shows the leading three-point shooters in women's college basketball.

Player/Team	Season	Years Played	Games	Three-point Field Goals
Erin Thorn, Brigham Young	2003	4	127	391
Kim MacMillan, Long Island/St. John's (N.Y.)	2004	4	117	379
Julie Krommenhoek, Utah	1998	4	117	362
Kelly Mazzante, Penn State	2004	4	133	357
Valerie King, Cincinnati	2004	4	126	338

1. How many points did the record holder, Erin Thorn, score on three-point plays? How many points did the other players listed score on their three-point baskets?

_____

_____

2. How many three-point baskets did Kelly Mazzante average during each of her games?

_____

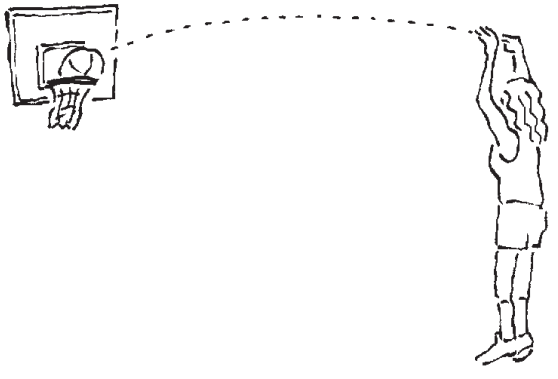
3. Are there players in the chart with more three-point baskets per game than Kelly Mazzante? If so, how many are there? List the players, if any, and the number of three-point baskets each averaged per game.

_____

_____

_____

_____



Challenge problem

Did you have to figure the average three-pointers per game for all of the other players, or could you figure out one that you did not have to compute the statistic for?

_____

_____

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Accuracy Counts

The preceding table on three-point shooters lists the total number of three-point shots made by the leading six women basketball long-distance shooters. But the percentage of shots made is also important. In the chart below, you will find five three-point shooters and their records of shots attempted and shots made.

Player/Team	Games	Three-point Field Goals	Three-pointers Attempted	Percentage
Karen Middleton, South Carolina	128	317	712	
Kathy Halligan, Creighton	115	309	680	
Julie Jones, Richmond	123	309	712	
Wendy Davis, Connecticut	127	279	635	
Kelly Savage, Toledo	92	273	708	

1. Before you start computing, can you predict whether Karen Middleton or Julie Jones will have the higher percentage-made figure? Why or why not?

_____

_____

_____

2. Compute the percentage-made figures for each woman.

_____

_____

_____

_____

_____

3. If the players were ranked by accuracy (the percentage-made figure), what would be the new order of players?

1. _____
2. _____
3. _____
4. _____
5. _____

Challenge problem

Find the list of women players with the all-time highest three-point shooting percentages. Are any of these players on the list?

_____

_____

_____



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The 2003–04 Connecticut Basketball Season—Men's Team



In the 2003–04 season, an event occurred that has never happened before in the history of NCAA basketball. The University of Connecticut won both the NCAA Men's National Championship and the NCAA Women's National Championship. Teams from the same university or college had never won both championships in the same year before then.

1. The men's team won 33 games and lost 6 games on their way to the NCAA championship. If they won 17 of their 18 home games, and 10 of 11 games were played on neutral sites, how many wins and losses did they have when they played on the opponent's home court?

   _____

2. The men's team lost only two games to non-conference opponents. Both teams played in the Atlantic Coast Conference. UConn lost to Georgia Tech in November by a score of 77–61. In January they lost to North Carolina by a score of 86–83. How many points did UConn score in these two games?

   _____

3. But UConn played Georgia Tech again. This time the game was for the national championship! UConn won that game by a score of 82–73. How many more points did they score against Georgia Tech during the second meeting of these two teams?

   _____

4. Three times during their championship season UConn scored more than 100 points. They beat Sacred Heart by the score of 111–64; they beat Iona by the score of 104–54; and they beat Ball State by the score of 101–62. In which game did they win by the most points?

   _____

5. The stars of UConn's national championship team were Emeka Okafor and Ben Gordon. Gordon led the team in scoring with 723 points; he played in all 39 games. Okafor was second in scoring with 634 points, but he played in only 36 games due to an injury. What was the "points per game" statistic for each player?

   _____

   _____

6. Over the entire season, UConn scored 3,073 points and their opponents scored only 2,493 points. What was the average number of points scored in a game by UConn? By their opponents? (Note: Problem 1 tells you how many games UConn played.)

   _____

   _____

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The 2003–04 Connecticut Basketball Season—Women's Team

In the 2003–04 season, an event occurred that has never happened before in the history of NCAA basketball. The University of Connecticut won both the NCAA Men's National Championship and the NCAA Women's National Championship. Teams from the same university or college had never won both championships in the same year before then.



1. The women's team won 31 games and lost 4 games on their way to the NCAA championship. If they won 14 of their 15 home games, and 7 of 8 games were played at neutral sites, how many wins and losses did they have when they played on the opponent's home court?

   _____

2. The women's team lost only one game to a non-conference opponent. That loss was to Duke by a score of 68 to 67. They lost to two conference opponents during the regular season; Notre Dame beat them 66–51 and Villanova beat them 59–56. The fourth loss of UConn's season came to a conference opponent in the Big East tournament at the end of the season; Boston College beat them 73–70. How many total points did UConn allow in the four losses?

   _____

3. But UConn played Boston College during the regular season as well. They beat Boston College by a score of 69–61 when the two teams met in Connecticut, and they beat BC by a score of 81–60 when the two teams met in Boston. What was UConn's average margin of victory for the two regular-season games?

   _____

4. Only once during their championship season did the UConn ladies score more than 100 points. They beat West Virginia 100–72. What was the margin of victory for this game?

   _____

5. The scoring leaders of UConn's ladies national championship team were Diana Taurasi and Barbara Turner. Taurasi led the team in scoring with 568 points; she played in all 35 games. Turner was second in scoring with 478 points; she also played in all 35 games. What was the "points per game" statistic for each player?

   _____

   _____

6. Over the entire season, UConn scored 2,642 points and their opponents scored only 1,884 points. What was the average number of points scored in a game by UConn? By their opponents?

   _____

   _____

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Keeping Data Organized

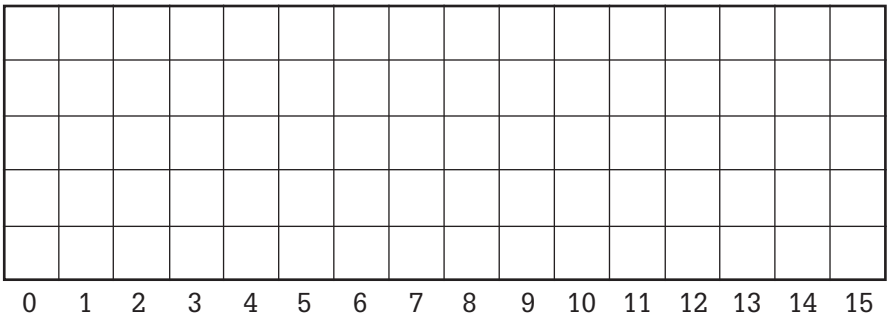
If you look at a box score from a basketball game, there are quite a few statistics listed for every player who entered the game. When you take into account all the games in a season, there are lots of statistics for players, fans, and coaches to keep organized. Fortunately, there are ways to organize individual game statistics in order to make sense of them. One way is to find the mean (or average) number of points that a player scored in her games. But the activities on page 64 show that sometimes the mean doesn't tell you everything you need to know.

Another way to organize the statistics for each game is called a *histogram*. A histogram is a special kind of bar chart that keeps track of how many times each score has been made.

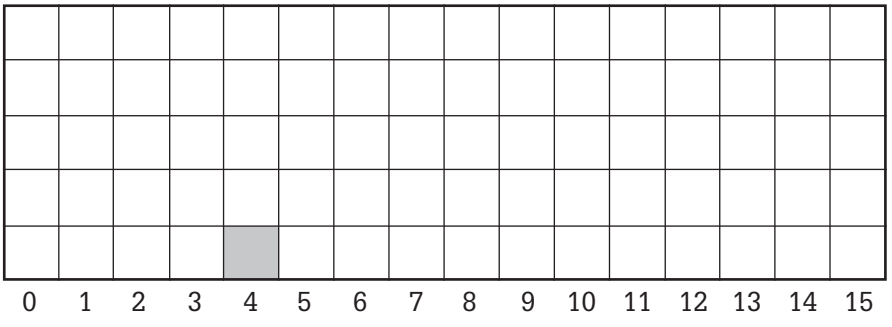
Here is an example: Michelle wants to keep track of her points scored in each game on a histogram. Her scores for her ten games are in the table below:

Game	1	2	3	4	5	6	7	8	9	10
Points	4	7	11	12	6	14	6	7	7	15

Using graph paper, Michelle makes a line going horizontally on the page and puts the numbers 1 to 15 under it. It looks like this.

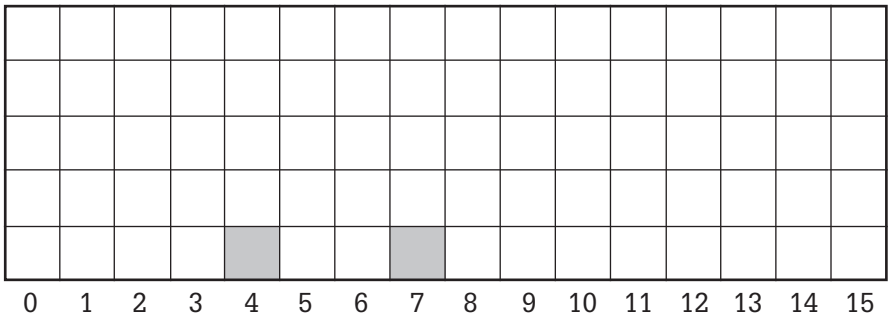


Next, Michelle looks at her points from the first game. She sees she scored 4 points so she shades in one box above the number 4 on her histogram.

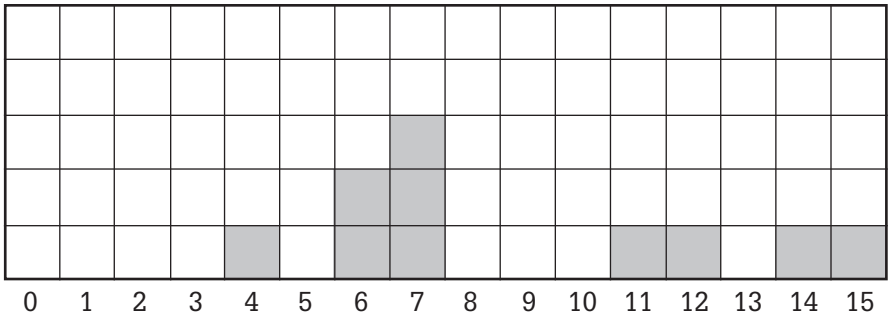


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In Michelle's second game, she improved and scored 7 points. She shades in the first box above the 7 in her chart like this:



She continues through all of her games and shades in one new box for each score. If she scored the same number of points in more than one game, she shades in the second or the third (or even higher) boxes over the correct number. After Michelle shades in one box for each of her ten scores, she is finished. Her histogram looks like this:



1. How many boxes high is the column over the number 7?

   _____

2. In how many games did Michelle score exactly 7 points?

   _____

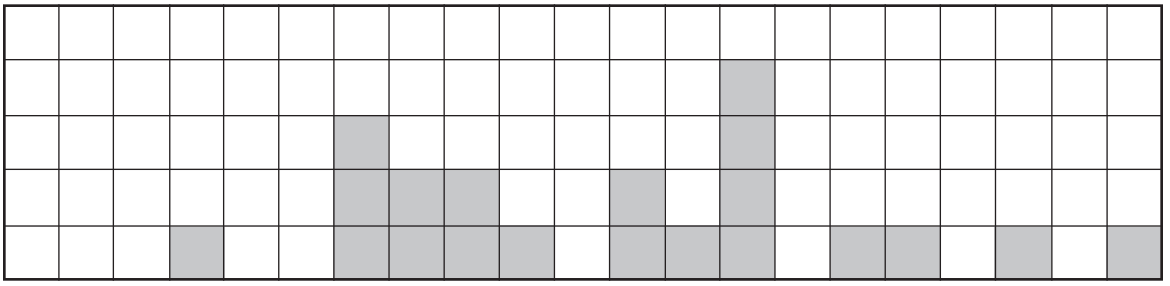
3. Draw histograms for three of Michelle's teammates. Use the data below.

Game	1	2	3	4	5	6	7	8	9	10
Abby	8	8	10	12	7	8	6	14	8	12
Doug	5	11	6	6	12	5	11	14	14	6
Wilson	3	4	3	2	1	5	12	4	4	5

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Reading a Histogram

After his season ended, Connor made a histogram of his scoring on graph paper. He showed his histogram to his cousin Seth and asked if Seth could figure out the answers to some questions.



1. What was the largest number of points Connor scored in one game?

   _____

2. What was the smallest number of points Connor scored in a game?

   _____

3. Did Connor score in the double digits more or less often than in the single digits?

   _____

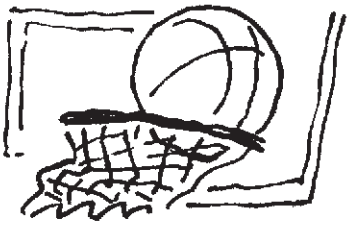
4. In how many games did Connor play?

   _____



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5. Did Connor ever have a game in which he was shut out from scoring?

   _____

6. What score did Connor get the most often?

   _____

7. What is another name for the score that happens most often? (See page 65 for this new word.)

   _____

8. What scores did Connor never score this season?

   _____

9. How many different scores did Connor get more than once?

   _____

What Is an Average Game? I

One of the statistics that coaches look at closely is points per game. This tells them how many points the player typically scores in a game. This statistic is often called the player's scoring average. However, the average has another name: the mean.

The mean is calculated by adding the number of points scored in each game and then dividing by the number of games. Here is an example.

Player	Game 1	Game 2	Game 3	Game 4	Game 5	Game 6	Game 7	Mean
Kyle	10	8	13	12	7	10	10	
Dirk	8	8	8	8	4	12	8	
Tyden	18	0	3	16	1	17	15	
Phillip	5	3	3	4	47	5	3	
Stanton	8	6	8	15	6	7	6	

1. Find the mean points per game for each of the players in the table.

_____

_____

_____

_____

_____

2. Who were the leading scorers for the team?

_____

_____

3. Does any player always score his mean number of points?

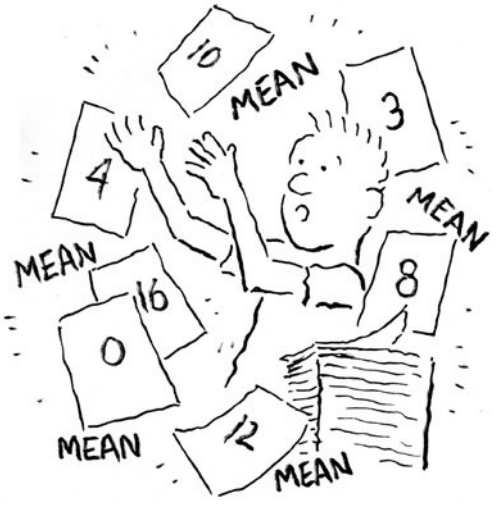
_____

4. Which player had the score furthest from his mean?

_____

5. Which player consistently scores closest to his mean?

_____



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6. Which player never scores close to his mean?

   _____

7. Look at Kyle's mean and compare it to Phillip's mean. What do you notice about them?

   _____

8. In how many games did Kyle score more points than Phillip?

   _____

9. How many times did Phillip score more points than Kyle?

   _____

10. What caused Phillip's mean to be so high?

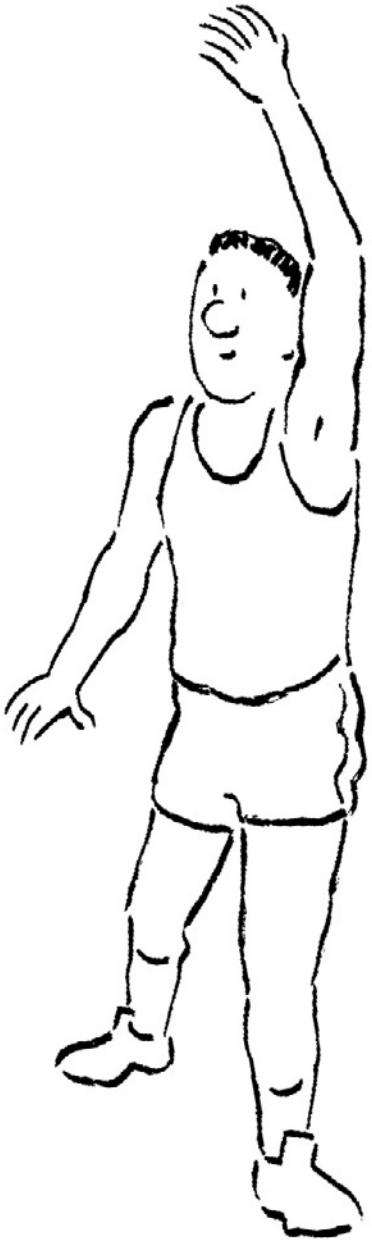
    _____

11. Which of the two players would you probably want on your team?

    _____

Challenge problem

In the first four games of the season, Conner scored a mean of 6 points per game. During the last eight games, he increased his mean points per game to 18. Does this mean that he averaged 12 points per game for the entire season?



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What Is an Average Game? II

When coaches look at the mean number of points per game, they realize the mean doesn't tell them everything about a player's contribution to the team. One big scoring night can change a mean dramatically. So some coaches look for other statistics to help them make decisions about who to put in a game.

One statistic that could be looked at is called the *median*. The median can be found by writing a player's scores in order from smallest to largest. Kyle's scores would be written like this:

Kyle	7	8	10	10	10	12	13

Out of Kyle's seven scores, the score of 10 is right in the middle. There are two scores that are higher than 10 and two scores that are lower than 10. Because there is an equal number of scores both higher and lower, Kyle's median score is 10.

Look at the table on page 62 to answer these questions.

1. Find the median scores for the rest of the team.

   _____

   _____

   _____

   _____

   _____

2. Who has the highest median score?

   _____

3. Who has the lowest median score?

   _____

4. Which player scores closest to his median score?

   _____

5. Do any of the players have the same mean and median? Are they the most or least consistent scorers?

   _____

   _____

6. Are the players with the biggest difference between their mean and median the most or the least consistent?

   _____

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What Is an Average Game? II (cont'd.)

Another way to find a player's "average" game is to calculate another statistic called the mode. The *mode* is the score the player gets most often. If there is no score that happens more than the others, the player is said to have no mode.

7. What is the mode for each player on the team?

   _____

8. Does Tyden have a mode?

   _____

9. Which player scores his mode the most often?

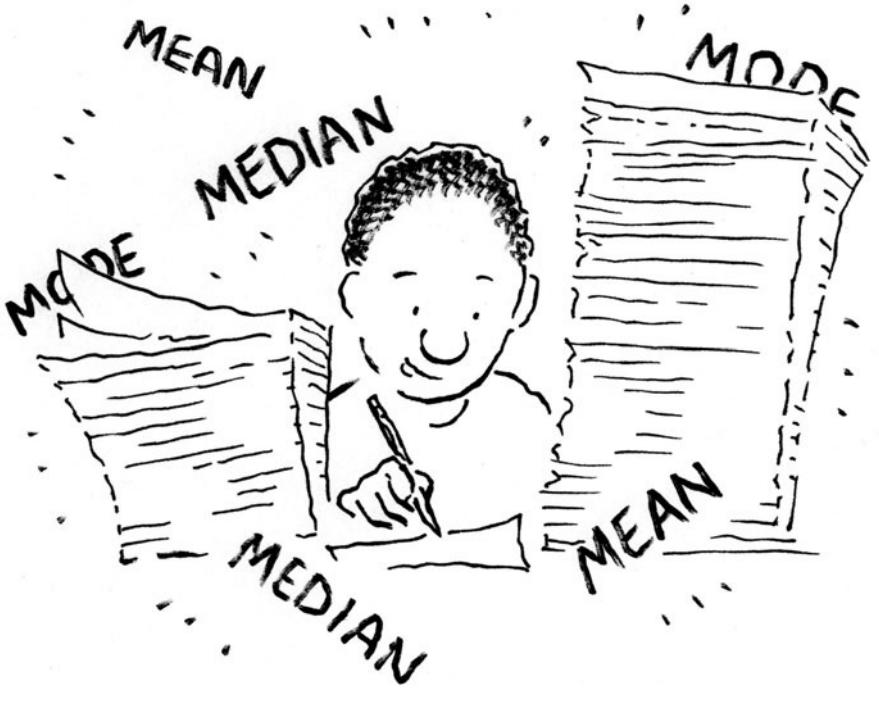
   _____

10. Are there any players whose mean, median, and mode are equal?

    _____

11. By looking at the mean, median, and mode, which players are the most consistent scorers?

    _____



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Basketball Families

Rick Barry played professional basketball during the 1960s and 1970s. He scored a total of 25,279 points as a professional basketball player, and in 1996 he was named one of the NBA's fifty greatest players. His four sons all played basketball; three in the NBA. Drew Barry played 3 years in the NBA, scoring 134 points. As of February 2006, Jon Barry had played 14 years in the NBA, scoring 5,041 points. Brent Barry played 11 seasons in the NBA, scoring 7,474 points. (Note: Jon and Brent were still playing in the 2005–06 season.)

1. How many total points did Rick Barry's three sons score altogether in the NBA?

   _____

2. How many more points did Rick Barry score than his three sons put together?

   _____

Ken Hays played center for the Oregon Ducks basketball team in the 1940s. One of his sons played basketball for the University of Montana, and his grandsons and granddaughters played college basketball (and other sports) as well.

3. Basketball scores were lower in the 1930s and 1940s. For example, the Oregon Ducks won the first NCAA championship ever in 1939. Oregon beat Ohio State by the score of 46 to 43. How many points were scored in the first NCAA championship game?

   _____



4. Ken's son Eric Hays starred on the University of Montana's greatest team. In 1975, Montana won its first ever NCAA play-off game, moving on to play UCLA. (UCLA won that year's national championship—its tenth in 12 years. See page 13 for more information on UCLA's string of national championships.) But Montana almost upset UCLA in 1975 in the West regional semi-final game, finally losing by the score of 67 to 64. Eric scored 35 points for Montana in that game. How many points did the rest of Montana's players score?

   _____

5. Ken's granddaughter Molly Hays played basketball at Idaho State University for two years. She made the Big Sky All-Star team as a freshman, leading ISU in points, rebounds, minutes played, and steals. If she scored 349 points and 435 points in her two seasons at ISU, how many total points did she score?

   _____

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Katie Smith's Record Season

Katie Smith, a guard for the Minnesota Lynx in the WNBA, had a record season in 2001. Most players would be happy to break one record in a season; Smith broke seven records in one year and tied another. Here are some of those records:

1. Smith broke the record for "most points in a season" in 2001, scoring 739 points. Cynthia Cooper held the previous record, scoring 686 points in a season for Houston. Smith broke Cooper's record by how many points?

   _____

2. Smith broke one of her own records in 2001; she played 1,234 minutes in basketball games during the season. She had set the previous record in 2000, when she played 1,193 minutes. How many minutes did she play in the two seasons combined?

   _____

3. Using your answer for Question 2, can you figure out how many hours Smith spent on the basketball court in 2000? In 2001? How many in both years combined?

   _____

   _____

   _____

4. Smith also set the record for most three-point field goals attempted, again breaking her own record. In 2000, she attempted 232 three-point shots. But during the 2001 season, she attempted 240 three-pointers. If she had made all 240 of those shots, how many points would she have scored?

   _____



5. Smith averaged 23.1 points per game during 2001. Using the fact that she scored 739 points during the season, can you figure out how many games she played in? (Note: You will have to round off your answer to a whole number; a basketball team cannot play half a game!)

   _____

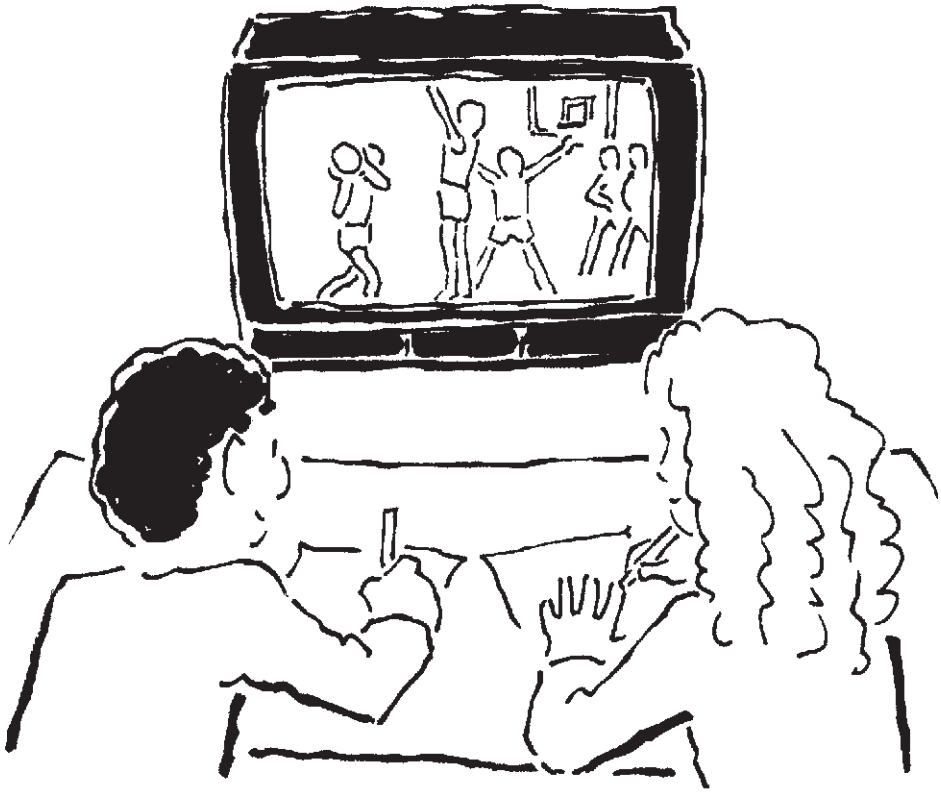
Challenge problems

It is interesting to note that while Smith set the record for most three-point shots taken during the 2001 season, she did not set the record for most three-point shots made during a season. Can you explain what that means?

NBA statistics have been collected for well over 50 years, while WNBA records have only been kept since 1998. Do you think this helped Smith break seven records and tie another during one season?

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Projects



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Interpreting Box Scores I—Detroit

The 2005 NBA championship between the Detroit Pistons and the San Antonio Spurs came down to a decisive seventh game in order to decide the winner. Here is the box score for game 1 of that series.

						Rebounds								
Detroit	**Pos.**	**Min.**	**FGM-A**	**3GM-A**	**FTM-A**	**O**	**D**	**T**	**AST**	**PF**	**ST**	**TO**	**Blks**	**Pts**
C. Billups	G	43	9–16	1–4	6–6	0	4	4	6	1	4	1	1	25
R. Hamilton	G	39	7–21	0–1	0–1	1	0	1	1	2	0	2	0	14
R. Wallace	F	33	2–5	0–0	0–0	3	4	7	1	4	2	1	6	4
T. Prince	F	32	4–12	0–0	3–4	2	3	5	4	2	1	3	0	11
B. Wallace	C	39	3–6	0–0	1–2	2	6	8	1	3	2	1	3	7
A. McDyess		23	1–8	0–0	0–1	1	6	7	0	2	1	1	0	2
L. Hunter		16	1–5	0–1	0–0	2	1	3	1	3	1	2	0	2
C. Arroyo		13	1–3	0–0	0–0	0	0	0	1	2	1	1	0	2
D. Ham		1	1–1	0–0	0–0	0	0	0	0	0	0	0	0	2
R. Dupree		1	0–0	0–0	0–0	0	0	0	0	0	0	0	0	0

1. The players who started the game are printed in boldface type above. The three columns under rebounds represent the offensive, defensive, and total number of rebounds. What fraction of Detroit's total rebounds were offensive rebounds? What fraction of the total were defensive rebounds?

2. The column labeled FGM-A lists the number of field goals a player made followed by his number of attempts. How many field goals did Detroit make in this game? How many times did they attempt field goals?

3. The AST column gives the number of assists that each player dished out during the game. Who were the two leaders in assists for the Pistons in this game?

4. Detroit is known as a very good defensive team. The columns for steals and blocked shots are labeled ST and Blks. How many steals and blocked shots did Detroit have as a team?

5. The FTM-A column provides information on how many free throws were made and attempted by each player. What were the team stats for free throws made and attempted? How many Pistons attempted at least one free throw? How many Pistons made at least one free throw?

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Interpreting Box Scores II—San Antonio

Below is the box score for the San Antonio Spurs for the same first game of the 2005 NBA Championship series.

						Rebounds								
San Antonio	**Pos.**	**Min.**	**FGM-A**	**3GM-A**	**FTM-A**	**O**	**D**	**T**	**AST**	**PF**	**ST**	**TO**	**Blks**	**Pts**
T. Parker	G	41	7–17	0–1	1–2	1	3	4	3	1	0	4	0	15
M. Ginobili	G	39	10–16	2–4	4–4	3	6	9	2	3	1	4	0	26
T. Duncan	F	41	10–22	0–0	4–5	6	11	17	2	2	0	3	2	24
B. Bowen	F	35	0–6	0–3	0–0	0	2	2	2	4	0	1	1	0
N. Mohammed	C	26	4–8	0–0	2–2	4	3	7	0	1	1	0	2	10
R. Horry		28	2–6	2–4	1–2	0	3	3	3	2	1	0	0	7
B. Barry		10	0–1	0–1	0–0	0	1	1	0	4	0	1	0	0
B. Udrih		7	0–0	0–0	0–0	1	0	1	0	0	0	1	0	0
D. Brown		6	0–1	0–0	0–0	0	2	2	0	0	0	1	0	0
G. Robinson		6	1–2	0–0	0–0	0	3	3	0	0	0	0	3	2
R. Nesterovic		1	0–0	0–0	0–0	0	0	0	0	0	0	0	0	0

1. The players who started the game are printed in boldface type in the box score. How many points did the San Antonio starters contribute? How many "bench points" (points by substitute players) did the Spurs have?

2. The column labeled 3GM-A lists the number of three-point field goals a player made followed by his number of attempts. How many three-pointers did San Antonio make in this game? How many times did they attempt three-point field goals?

3. One of the confusing things about three-point field goals is that have a column of their own and they are included in the FGM-A column as well. In order to find out how a player did on two-point field goals, you must subtract the three-point field-goal numbers from the regular field-goal statistics. How many two-point field goals did Manu Ginobili make? How many did the Spurs score as a team?

4. San Antonio is known as a very smart and disciplined team that practices all parts of the game. One of the ways that shows is in the team free-throw percentage. What was the free-throw percentage made by the team?

5. Bruce Bowen did not have a good game shooting the basketball. He missed all of his shots from the floor and never got to take a shot from the foul line. Yet the Min. column shows that he played for 35 minutes (out of 48) in the game. Why do you think the coach left him in so long?

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Interpreting Box Scores III—
Comparing Team Statistics

For the questions below, use the box scores for Detroit and San Antonio found on the preceding pages. It is important to remember that San Antonio won the game by 15 points.

1. In some games, the starters for the teams score about the same number of points, but the substitutes for one of the teams significantly outscores the other team's subs. When this happens, the extra "bench points" are decisive, and one team wins the game because it has a "deeper bench." Were the bench points a decisive factor in the final game of the 2005 NBA championship?

2. Some teams seem to cause their opponents to commit more fouls than others. They are said to "get to the foul line" more often than their opponents. How many times did each team get to the foul line? Could the difference in free throw attempts have been the difference in the game?

3. Some games see both teams take about the same number of free throws but one team makes far more than the other. Was the number of made free throws the deciding factor?

4. Another possible reason that a team might win a game is the number of shots they take. If two teams make about the same percentage of their shots but one team takes 20 more shots than the other, the team taking more shots will score more points. Was the total number of field goals attempted the critical factor for this game?

5. Points scored from outside the three-point line are sometimes critical in determining the winner of the game. Was there a difference between how many points scored on three-point shots between the teams? Was it important in determining the winner?

6. Finally, the rate at which teams make their shots may be very important. Most of the time, a team that makes 50% of its shots will beat a team that makes only 30% of its shots. Did one team make a higher percentage of all two-point field goals, three-point shots, and free throws? Do you think that had an effect on the outcome of the game?



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Finding Your Team's Box Scores for a Game

Now that you've seen what the information in the box score for a basketball game means, try doing the following.





1. Find the box score for your favorite basketball team. Can you identify what all the information means?

2. Compare the box scores for a college team and a professional team. Do they provide the same information? Can you think of any information that might be found in your paper's box scores but not another's?

3. Compare the winning team and the losing team. Who had more field goals? Who had more free throws? Who had more rebounds? Who had more offensive rebounds? Coaches often look at statistics such as these to help them figure out what their team is doing well—or not so well!

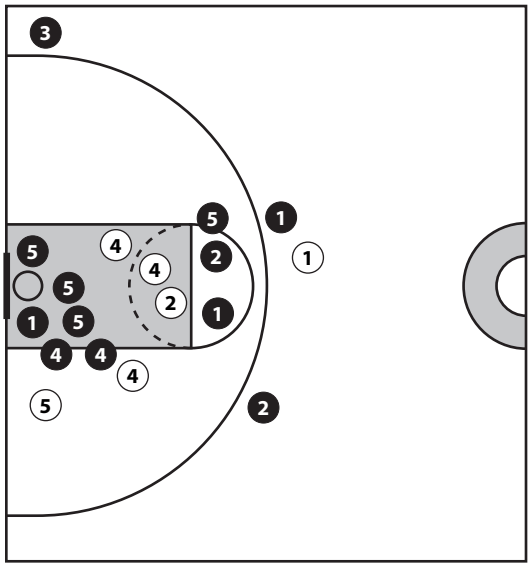
4. What other interesting information about the game can you find reported in the box score?

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Charting Shots

Coaches are concerned about where shots are taken and who takes them, so they do a shooting analysis as the game takes place. A basketball court diagram is placed on a clipboard. When a player shoots, the coach has someone write down the number of the player in the approximate position where the shot was taken. The individual circles the number if the shot is made. If the recorder needs more room close to the basket, he or she makes other marks just outside the court area, on the side where the shot was taken.

The diagram covers the first half of a game played by the Townville Tigers. Assume 5 players played, numbered 1 through 5; their shot record is shown on the chart.



Center: number 5. This player took five shots, made four. The player made a long shot from near the free-throw line and made three baskets close in; he or she missed one other shot close to the basket.

Forward: number 4. This player took five shots. He or she had three misses away from the basket and made two shots close to the left side of the basket.

Forward: number 3. This player took/made one shot—a three-pointer from the right corner.

Describe the shots for these last two players.

Guard: number 2

_____

Guard: number 1

_____

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Keeping a Shooting Chart

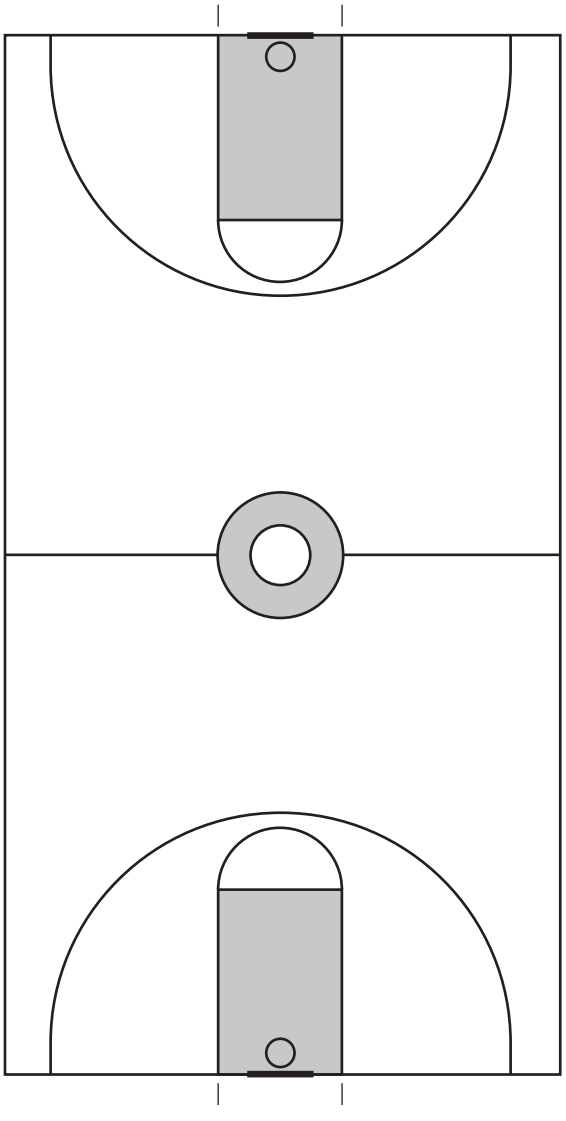
Watch a game on TV or better yet, go to a game in person and chart the shots. A blank chart is provided below. (Refer to the instructions on the previous page as needed.) After you have charted all the shots in a game, summarize your chart.

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1. Figure statistics:
   - How many shots were taken?
   - How many shots were made?
   - How many shots did each player take?
   - How many shot did each player make?
   - Calculate the shooting percentage for the team and for each player.

2. Examine the chart as a coach or player might examine it:
   - Did anyone take too many shots?
   - Who took shots from a place where he/she could not make them?
   - Who made almost all shots from a given area?
   - Did the team have enough "points in the paint" (meaning short, easy shots from inside the key)?
   - Did the team take very many three-pointers?
   - Who took three-point shots and made them? Missed them?

3. Make recommendations to the coach—for example:
   - "That forward can't make a shot more than 5 feet from the basket."
   - "That guard should not be shooting three-point shots. He missed them all."
   - "Pop that forward out for a long shot more often. She made them all."



Who Is Playing Which Position?

Over the last 20 years everyone concerned with the NBA has begun to use numbers to describe the five positions on an ideal NBA basketball team. Those numbers and the positions they refer to are:

Number	Position	Duties
1	Point Guard	Handle the ball and make assists
		Direct the team on offense
2	Shooting Guard	Score, especially with three-point shots
3	Small Forward	Score
		Run the floor on the fast break
4	Power Forward	Rebound and play defense
5	Center	The Big Man—dominate the middle
		Rebound and score
6	First Sub	Come off the bench and give the team a lift

Coaches often talk about role players and how five people who play as team win more games than five players striving for individual statistics. The best example of this idea team was the Boston Celtics during the 1980s when Dennis Johnson was the 1, John Havelick the 2, Larry Bird the 3, Kevin McHale the 4, and Robert Parrish the 5. A role-playing substitute, Bill Walton, would come off the bench to substitute at both the 4 and 5 positions.

1. Examine the box scores of your favorite team. Determine who is playing which position. (Today's example: Steve Nash and Tony Parker play the 1 position for Phoenix and San Antonio, respectively, while Tim Duncan is a 4 for San Antonio. Michael Jordon was a 2 for most of his career, as are Dwyane Wade and Kobe Bryant today. Shaq, of course, is a 5.)

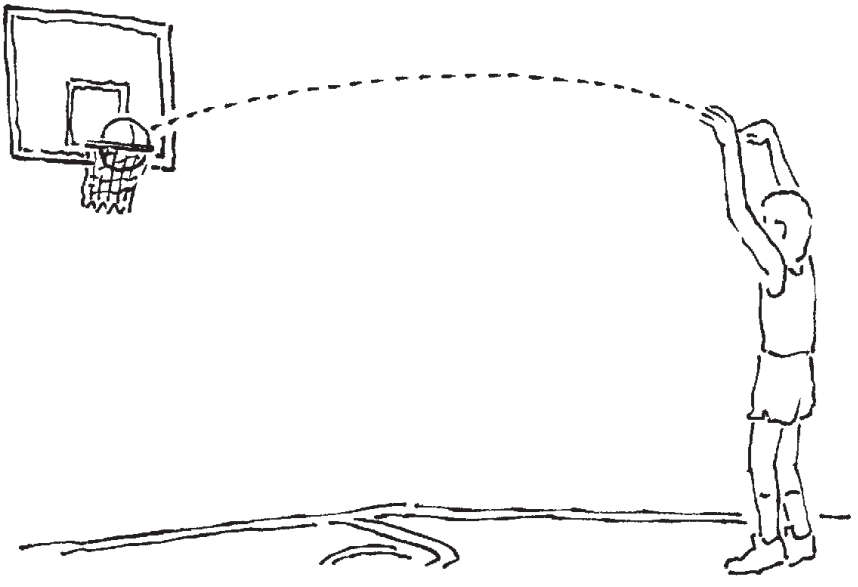
2. After you have determined the position each player fills, keep statistics in order to check to see if each player fulfills the job's traditional role. Some players do, some players don't. At the point guard position, for example, Steve Nash is the more traditional point guard while Allen Iverson is not.

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Shooting Treys

The three-point play was instituted to make the game of basketball more interesting. A defensive team can choose to "clog the lane" if it wants, but if all the defensive players are standing in the lane, close to the basket, the offensive team has the opportunity to shoot easy three-point baskets.

How does your favorite team use the three-point play? Watch a game and answer the following questions.



1. How many three-point shots did your favorite team attempt? How many did the other team attempt?

   _____

   _____

2. How many of those three-point attempts did your favorite team make? How many did the other team make?

   _____

   _____

3. Who scored the most points on three-point shots?

   _____

4. What happens if your favorite team cannot make a three-point shot? Does it change the defense that your team faces?

   _____

   _____

   _____

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Shooting from the Charity Stripe

Another vitally important statistic for a basketball team is the number of free-throw shots that it gets, and the number that it makes. To see how important free throws really are, consider the following.

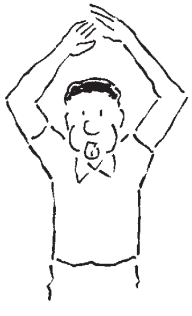
Some very good teams have lost championship games because they could not make free-throw shots. In the 1983 NCAA men's championship, for example, North Carolina State beat Houston. The University of Houston had an excellent team, including two future NBA All-stars: Houston's Hakeem Olajuwon and Portland's Clyde Drexler. But North Carolina State stole the championship game from the University of Houston because, at the end of the game, Houston could not make its free-throw shots. North Carolina State deliberately fouled Houston to get the ball back, and Houston could not convert those fouls into points.

Some teams seem to get a great many foul shots. Teams that shoot jump shots from a long distance never seem to get fouled, whereas those that drive to the basket always seem to get fouled. In the 1993 NCAA men's championship game, North Carolina beat Michigan. The Michigan team actually made more baskets than North Carolina, 30 to 27. But North Carolina made 18 of 23 free throws, while Michigan made only 6 of 7 free throws.

1. Keep track of the foul shots for your favorite team during a game. How many foul shots did it get? How many foul shots did it make? What was the percentage of "made" shots? How many foul shots did the opponent get? How many did it make? What was the percentage of "made" shots?

2. You might also keep track of "crunch time" statistics. If your team was ahead with 2 or 3 minutes to play, were they fouled a lot at the end of the game? How many of those free throws did the team make?

3. Is there a reason why your favorite team is fouled often? Or, conversely, is there a reason why your team doesn't seem to get fouled often?



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NBA Defensive All-star Team, 2004–2005

Many coaches value a player's defensive skills as well as, if not more than, the offensive skills. As a result, the NBA annually selects a defensive all-star team. These players are considered to be the best defensive players at their position. The positions, players, and the usual numbering system for the 2004–2005 season are shown here.

Position	Player
Guard	Larry Hughes
Guard	Bruce Bowen
Forward	Kevin Garnett
Forward	Tim Duncan
Center	Ben Wallace

Project

1. It is interesting to see the impact an all-star defender has on an opposing player. Does the all-star hold the opposing player to fewer points? Or, does he hold the opposing player to a lower shooting percentage? Or, does the all-star cause the opposing player to turn the ball over more often? Example: Allen Iverson was a leading scorer for Philadelphia. But what happened when Iverson faced Bruce Bowen? Did Iverson have fewer points than usual? Did Iverson have a lower shooting percentage? Or, did Iverson have more turnovers?

2. For a project, find the average points scored, shooting percentages, or turnovers in a game for a player. Then, when that player is defended by all all-star defender, check the game's box score to see what happened.

   Remember, you must make certain which player the all-star defender was actually guarding. In the example given, it is logical to assume that Bruce Bowen would guard Allen Iverson. Similarly, it would be logical to assume that Rasheed Wallace would be guarded by Tim Duncan, as they both play the power forward position. So, make certain you are checking the right player when you check statistics to see the impact of the all-star defender.

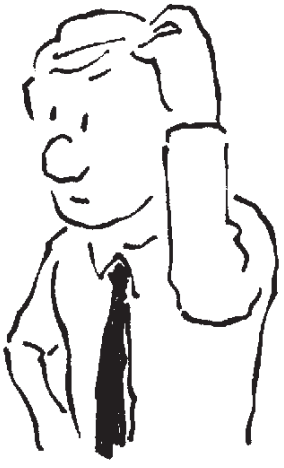
   (A caution: Players often rest for some of each game. The all-star defender may not be guarding the other player every moment of the game. To use the example, see how many points Allen Iverson scored when Bruce Bowen was actually defending against him; omit the points Allen scored when Bowen was on the bench.)

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Comparing Players

You can learn how to figure the "points per possession" statistic for a team. It might be interesting to see if individual players help or hurt their team's points per possession statistic.





1. The points are easy to find.

2. The possessions are not. You can calculate the number of possessions by adding the number of shots taken (both regular and three-pointers), the number of turnovers, and the number of foul shots that did not come after a made basket. (This last number can be hard to find; you may have to estimate the number of possessions that ended in free throws by dividing the free-throw attempts by 2.)

3. An individual player's points per possession, then, would be figured the same way as above. First, how many points did that player score? Second, how many possessions ended with this player handling the ball? You can estimate this by adding:

:

a. The number of shots attempted.

b. The number of turnovers.

c. The number of free-throw attempts divided by 2.

Third, divide the number of possessions into the number of points scored to find the average points per possession.

4. In the newspaper or Internet, find a box score for your favorite team. Calculate the points per possession for your team. Then, calculate the same statistic for one or more players. Did the player help the points per possession statistic by having a higher figure than the team, or did the player lower the points per possession statistic by having a lower figure than the team?

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Keeping Track of the Defense

Watch a basketball game on television or go to a game in person. Keep defensive statistics on your favorite team. You might want to use the following chart. It has room for twelve players.

Player	Position	Steals	Blocks	Turnovers Forced	Defensive Rebounds

See if you can find a pattern that allows you to answer these questions.

1. Which position or positions is (are) more likely to have blocked shots?

   _____

   _____

2. Which position or positions is (are) more likely to have steals?

   _____

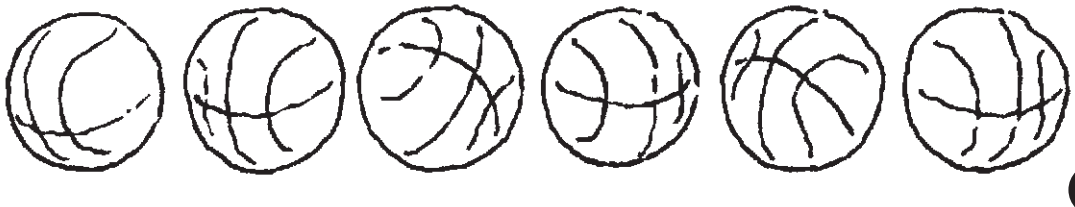
   _____

3. Who is more likely to force a turnover?

   _____

4. Who is more likely to get a defensive rebound?

   _____

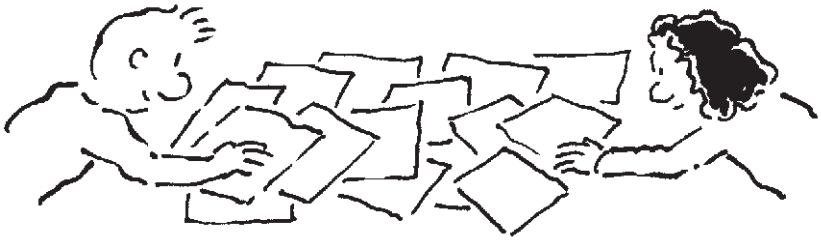


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Keeping Score for Your Favorite Team

Watch a basketball game on TV or go to one in person. While you watch, keep score for your favorite team. You might want to use the following chart. It has seven categories for you to fill in.

Use tally marks in each category as you watch, summarize them when the game is over.



Number	Name	Field Goals		Free Throws		Rebounds		Assists	Fouls
		Made	Attempted	Made	Attempted	Off.	Def.		

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Keeping Score for a Game

Of course, keeping score for one team is only half of the task. You need to keep score for both teams. Here's how you can do it.

Watch a basketball game on TV with a friend. Use two scorecards similar to the one provided on the previous page. You keep score for one team and your friend can keep score for the other team.

After the game, summarize your results to find total points scored by each player, total rebounds, and related information. Then check the paper for the next day's box score to compare your scorekeeping with the official scorekeeper's record.



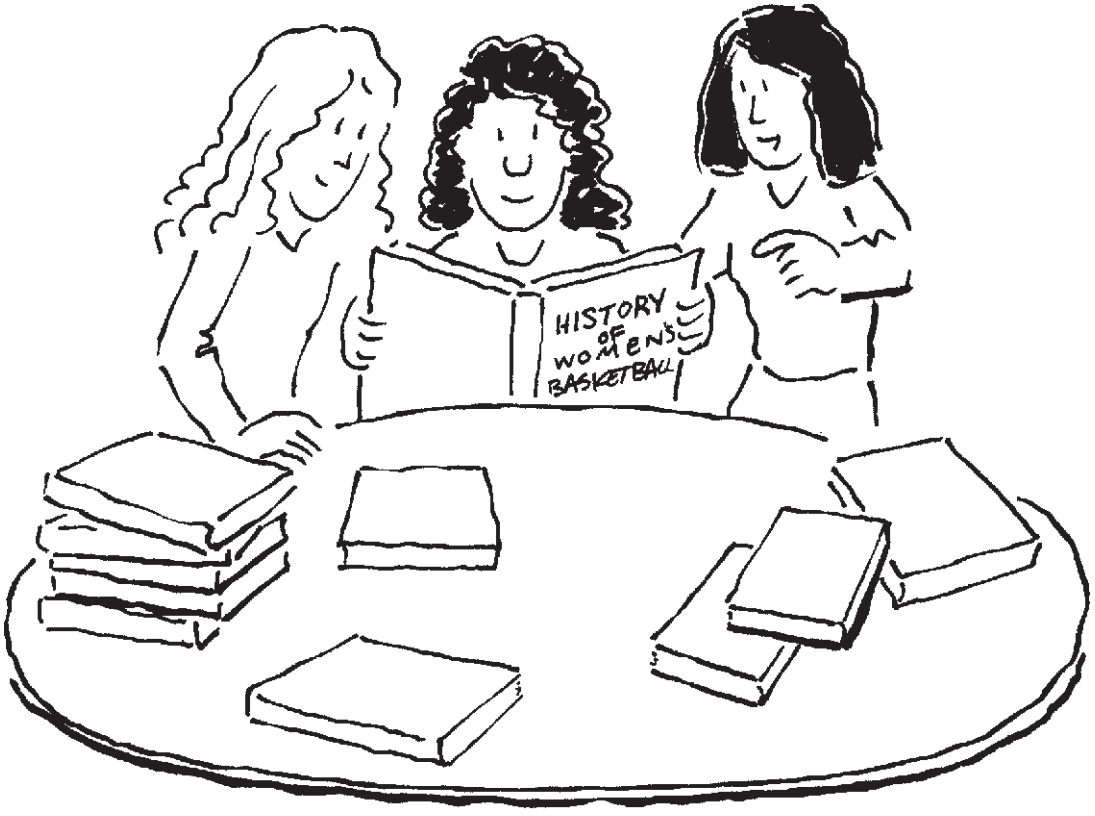
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Women's Basketball before the NCAA

All women's basketball records included in this book come from the NCAA, the National Collegiate Athletic Association. Official NCAA women's basketball records began with the 1981–82 season, the season in which the NCAA took over women's college sports. Changes in the law that occurred about that time required that colleges spend more money on women's athletics—in an effort to make them equivalent to men's athletic programs.

This does not mean, however, that women's basketball began in 1981. Nothing could be further from the truth. An active women's basketball program existed before that time. It organized national championships and named All-American teams, among other things.

Go to the library and look up information on women's basketball prior to 1981. Read through old newspapers and magazines to see what you can find. Women's sports were not widely publicized; even so, there were some famous players, in addition to a women's professional basketball league and women's Olympic basketball championships. Your research will turn up some interesting stories about women athletes who did not get the fame or fortune they deserved.



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Keeping Team Statistics

One of the most interesting projects you can undertake is to keep the season's statistics for your favorite team, whether that team is a high school team, a college team, or a professional team. You can get the information you need from the box scores for each game printed in your local newspaper. You can often check your statistics against the newspaper's statistics by finding out what day of each week the newspaper publishes its totals for the season to date.

What statistics should you keep? Consider the following list.

1. Scores for each game.

   What was the average margin of victory for your team? (Average all your team's winning scores, average all the other team's losing scores, and subtract to find the average difference. This is the average margin of victory.)

   What was the average margin of defeat for your team?

   How many more points did your team average when it won than when it lost?

2. Number of field goals attempted—for both your team and the opponent.

3. Number of field goals made—for both your team and the opponent.

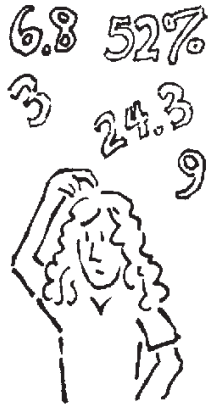
Average these figures to find out:

   Who shot more—your favorite team or the other team?

   Who made more shots?

   Who had the best shooting percentage?

   Were these figures different in the wins and losses?



Continue by answering the four questions in problem 3 for the following categories:

4. Number of free throws attempted—for both teams.

5. Number of free throws made—for both teams.

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Keeping Player Statistics

Another interesting season-long project is to keep statistics on your favorite player or players. Again, you can find the information you need in your daily newspaper; add up the figures to get the season-long statistics.

What statistics should you keep? Consider the following list:

1. Number of points in each game: Average to find the number of points per game. Average to find the number of points in winning and losing games. Is there a difference? Does your team win when your favorite player has a good one and lose when he or she fails to score?

2. Number of free throws in a game: Consider the number made and the number shot. Is your favorite player a good free-throw shooter? Examine the following information to help you decide:

   Making 90%—
   Outstanding: record performance

   Making 80% to 90%—
   Excellent free-throw shooter

   Making 70% to 80%—
   Good free-throw shooter

   Making 60% to 70%—
   Okay, but really not very good

   Making 60% or less—
   Needs work!

3. Number of field goals in a game: Again, consider the number made and the number shot. Is your favorite player an accurate shooter? Anything over 40% is okay in high school or college; professionals should do better than that. Anything over 50% is excellent for anyone. Remember that distance is often a factor; centers usually have better shooting percentages than guards.

4. Number of rebounds, steals, blocked shots, and so on: Consider your favorite player's position. If he or she is a guard, then you would expect fewer rebounds. If he or she is a center, you would expect more rebounds and blocked shots. Guards might have more steals than a center or forward.



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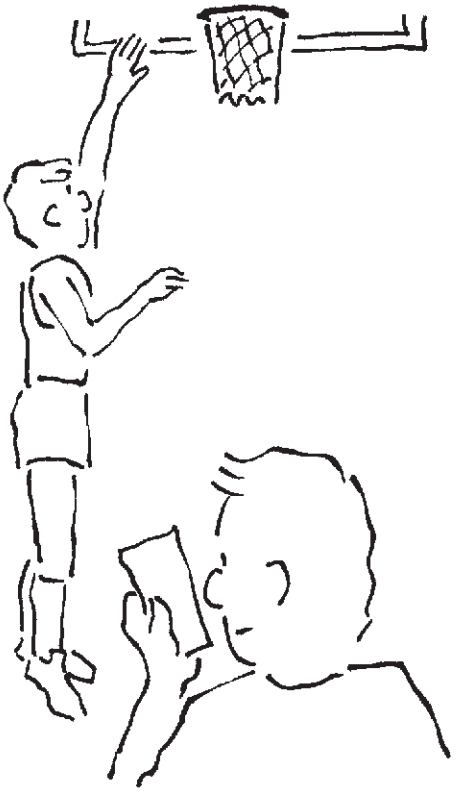
Second-chance Points

Rebounding is one of the keys to a winning basketball team. A team that protects the defensive boards (by rebounding most of the opponent's missed shots) prevents that opponent from getting second and third chances to score. Similarly, a team that gets offensive rebounds (getting the rebound after its own missed shots) has those second and third chances to score. When watching basketball games on TV, you will often see reports on second-chance points. Second-chance points are those points scored by your team (or the opposing team) after first missing a shot.

You can keep and interpret statistics on rebounding that will tell you about second-chance point possibilities. Consider the following:

1. A team took 80 shots. The team made 40 of those shots. With this information, you can figure the shooting percentage. The team shot 50%. That is excellent; you will win most games by shooting 50%.

2. Say you also know that the team collected 15 offensive rebounds. That probably means it got 15 second-chance shots. If so, the team actually had the ball 65 times. It made a basket 40 of those times. You can figure this percentage. It's much higher than your answer to number 1, isn't it? What can we learn from this? If your team collects offensive rebounds, it will score more points.



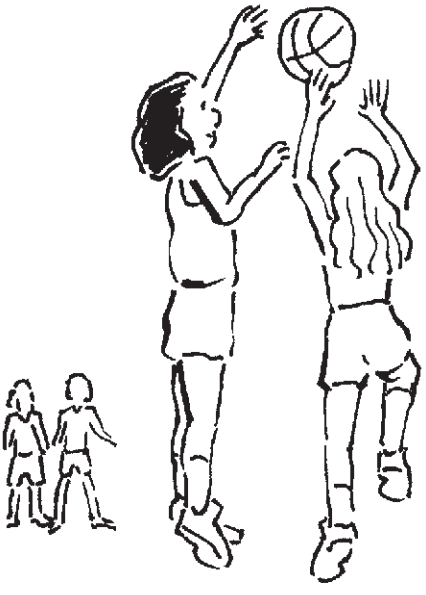
Collect offensive rebounding statistics for your favorite team over the course of a year. You might even want to collect offensive rebounding statistics for a good team (one with a winning record) and a poor team (one with a losing record). There is an excellent chance that the number of offensive rebounds will be greater for the winning team. Good luck with your research.

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Being Offensive

It is interesting to see which players are good offensive rebounders. Some players collect large numbers of rebounds, but very few are offensive rebounds; others, such as Ben Wallace, work hard to get offensive rebounds. Let's create a "being offensive" rebounding statistic.

Consider the following situation:
Sally plays for the Cougars. She gets 14 rebounds in a game. Four of these are offensive rebounds. What percentage of Sally's rebounds are offensive rebounds?



To answer the question, divide the number of offensive rebounds by the total number of rebounds. This gives you the "being offensive" statistic:

4/14 = 28%

Thus, 28% of Sally's rebounds were offensive rebounds.

Using this statistic along with the actual number of offensive rebounds can help you judge a player's ability to help his or her team with offensive rebounds.

Collect rebounding statistics for several players and then compute the "being offensive" statistic for them. Which of your players has the best percentage?

A statistic is worth more when it is collected over several games. Anyone can have a good or a bad night. But if you collect the rebounding figures for several games, you will have a statistic that gives you better information about your favorite players.

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Clutch Time Free Throws

Consider the following situation: The game is close. Your team is ahead by 3 points. There are only 15 seconds left. Your team has the ball. What will happen next?

Everyone knows the answer: Your opponent will try to foul your worst free-throw shooter. Maybe he or she will miss; the opposing team will get the ball back, and it will try to tie the score.

It's called "clutch time." Players have to make their free throws at the end of a game, in the "clutch," to protect the lead. Are they good at it? You can figure that out.

1. Watch your favorite team on TV or go to a local game. You can find a player's free-throw shooting percentage in the paper, or they are often shown on TV as well. Once you have this number, do the following:

   Wait until the last 3 minutes of a game. Then record:

   The number of foul shots each player gets

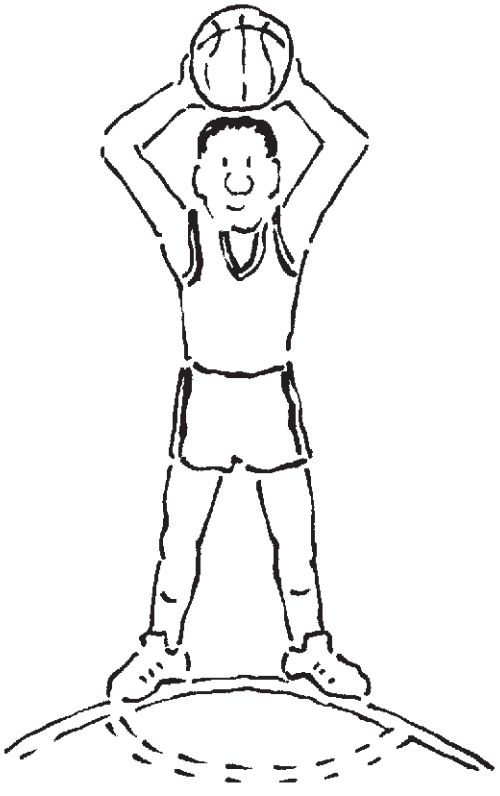
   Whether it is a "one and one" or not

   How many shots each player makes

   Then, figure out the free-throw percentage for "clutch time."

2. Which players shot better (than their regular free-throw percentage) at the end of the game? Which ones shot worse? Repeat this process for several games. What did you find?

3. Pretend you are the coach. If you were protecting a small lead, which players would you want in the game during the last few minutes?



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Are Teams Getting Taller?

As women's basketball becomes more popular, coaches are finding and training taller women to be basketball players. Many women's basketball teams now have players who are 6 feet 2 inches tall or taller. At one time, UCLA's men's basketball team, the men's national champions, played a 6-foot-1-inch forward. Today, you would never see a forward that "short" on a men's team, and you would find that most women's teams have players taller than that starting at forward and center.

How tall are the women's teams getting to be? Why don't you start a season-long project to find out?



1. Check to see when women's basketball games are broadcast in your area. Look for a local sports network on cable or satellite (Pacific Northwest, Sports, Sunshine Network, etc.). Or look in your TV guide for any national or regional games that might be on one of the major networks. Or, finally, see if you can find local broadcasts of your area's college teams.

2. Watch the first 5 minutes of the program, when the sportscasters announce the starting lineups. Usually, at that time, the player's vital statistics (height, position, scoring average, etc.) are also given.

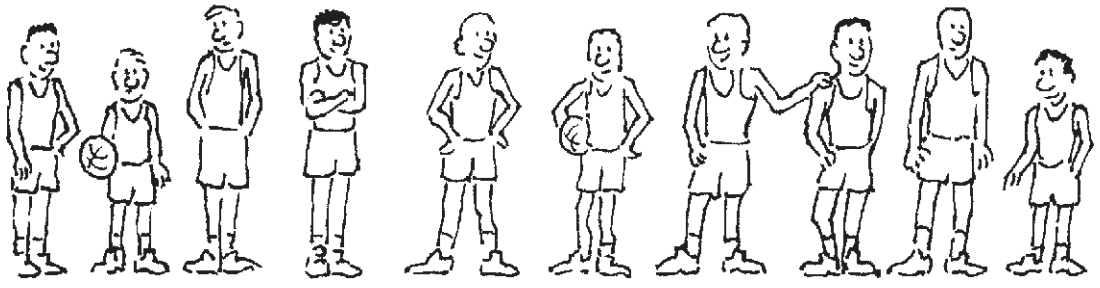
3. Keep a journal in which you record the tallest players for each team. See how many women players you can find who are 6 feet 2 inches or taller. After you are done collecting data, you might convert all the heights to inches and graph the tallest players by team. You might even compare the graphs from one season to the next. Are teams getting taller?

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Average Heights

Basketball players come in all sizes. In the NBA, Earl Boykins is only 5 feet 5 inches tall. By contrast, Yao Ming is 7 feet 5 inches tall. That is a difference of 2 feet 1 inch. There have even been NBA players who were taller than 7 feet 5 inches.

We often talk about how the "average height" of the players is getting taller. What does "average height" mean? If you add all the players' heights together, and divide by the number of players, you get the average height for a team. At one time, 25 years ago, teams might have an average size of only 6 feet 3 inches. Now, most professional teams are much taller than that, most college teams are much taller, and even many high school teams have a much taller starting lineup.



1. Locate the height information for your favorite team. It will be published in your newspaper; you might also find it in a basketball magazine or on the Internet.

2. Find the average height for your team. (You might even want to figure out the average height for the starting five players and then for the entire team.) Then find the average height for all of the teams in your league.

3. Who are the short teams and who are the tall teams in your league? Who wins the most games, the tall teams or the short teams? Who scores the most points, taller or shorter players? Why?

4. Has the three-point rule helped make shorter players more important in basketball?

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Being Defensive

As in almost every sport, the basketball team that plays better defense is the team that is more likely to win. Scoring may be spectacular, but defense is what wins the game. Here are the four major defensive statistics in basketball that show how the defensive team is doing.

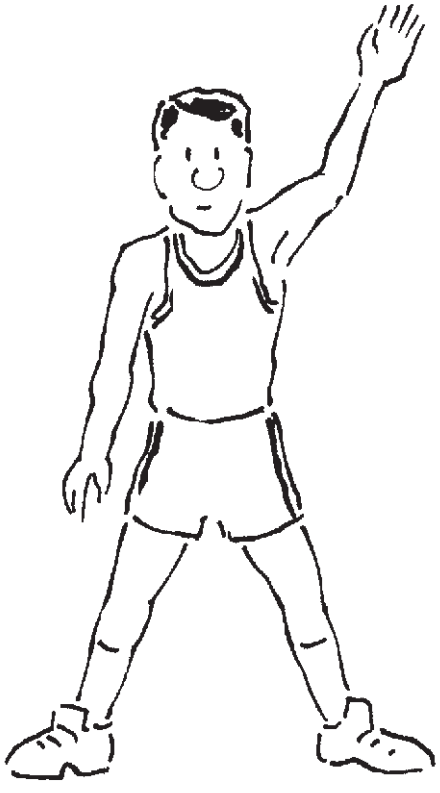
Defensive Rebounding: One of the most important aspects of playing defense is making certain that your opponent only gets one shot at the basket. If the opposing team misses, your team must rebound to prevent second-chance points.

Steals: If one of your players can steal the ball from an opposing player, then he or she can't score because you have the ball.

Blocked Shots: Again, if one of your players can block the opponent's shot, then the ball can't go in the basket and the opponent can't score.

Turnovers: If you can steal the ball, intercept a pass, or force the other team to lose the ball out of bounds, you have again prevented the opposing team from scoring.

Keep defensive statistics on your favorite team for a game or for a season. Or, compare two teams. Which one has the better defensive statistics? If you're comparing two teams that are actually playing one another, there is an excellent chance that the one with the better defensive statistics is the winning team.



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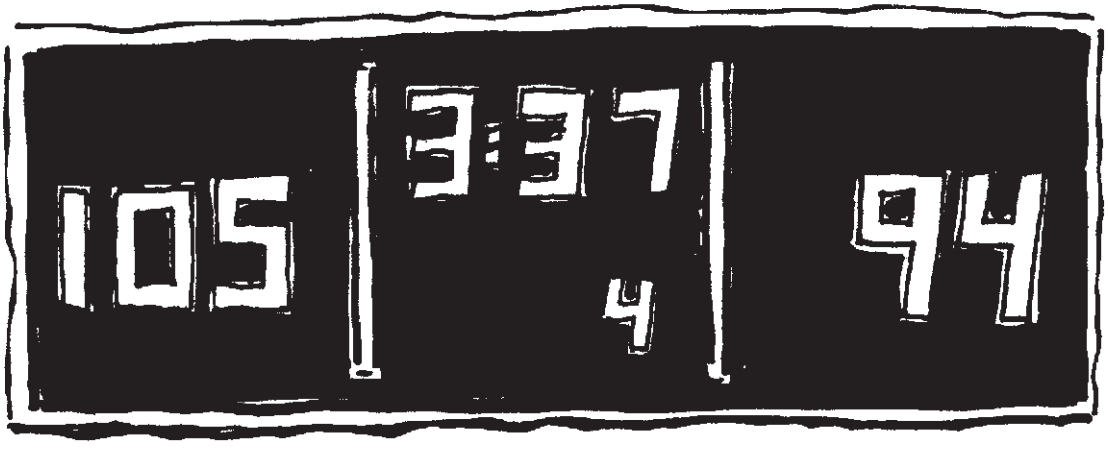
Who's My Nemesis?

Some teams seem to play particularly well against other teams. From 1991 to 1993, for example, the Chicago Bulls won three straight championships but had identical 1–5 records against San Antonio and Houston. Chicago never faced those teams in the play-offs, but if the regular-season records were any indication, they might have had trouble.

In the 1993–94 regular season, Seattle had the best record in the NBA but was only 2–2 against Denver. In the same year, Utah went 5–0 against San Antonio even though the Spurs had a better record overall. In both cases, the team with the better record lost to the underdog during the play-offs.

In recent years, the New York Knicks have been the Miami Heat's nemesis. New York eliminated Miami from the play-offs in three consecutive seasons—1997–98, 1998–99, and 1999–2000. This was true, even though in all three of those seasons, Miami won the Eastern Division title. In fact, Miami was the top-ranked team in the Eastern Conference one year, and New York was ranked eighth. So, despite the fact that New York barely made it into the play-offs, they still proved they were Miami's nemesis!

Keep track of your favorite team's records against the rest of the league. If you record the results of each night's game on a chart, by play-off time you will know the results of the season series between your team and any other team in the league.



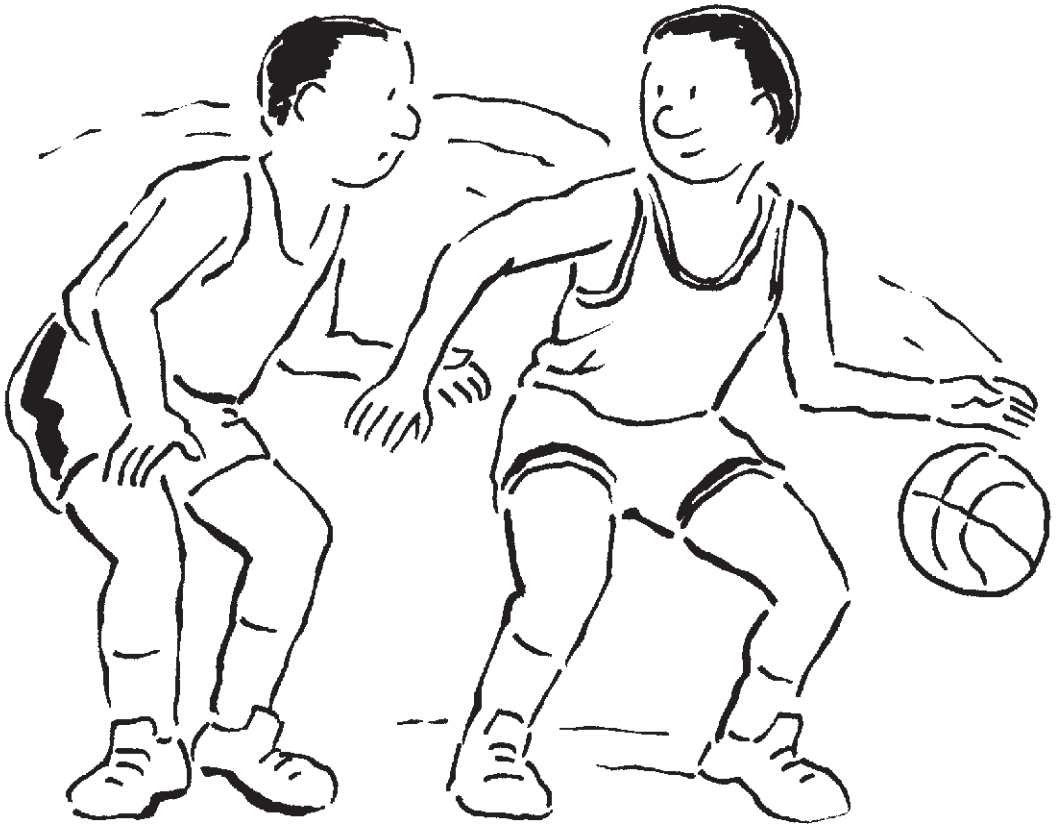
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Can You Play Defense?

Sometimes a basketball player will get a reputation for scoring a lot of points but not playing any defense. On a good night, such a player might score 28 points, while the man that he guards scores only 15. The coach will look at the box score the next day and be pleased that the player scored +13. On a bad day, the same player might score 20 points but give up 35 points. When the coach sees that the player allowed 15 more points than he scored, the player might see more time on the bench.

Before a game, choose a player who has a reputation for scoring a lot of points. Keep track of how many points that player scores. Also keep track of the point total for any player he guards. At the end of the game, decide whether the player works well at both ends of the court or is primarily a scorer.

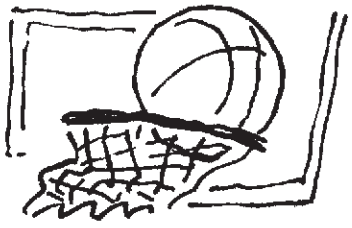
You might also look to see which player the high scorer is guarding. Is it the other team's leading scorer? Sometimes a coach will try to "hide" a weak defender by having him cover a player who doesn't shoot the ball very often. If the low scorer has a big night, you will know that the high scorer is mostly an offensive player with "no D."



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When Are You "Above Average"?

It seems to make sense that a basketball star would have his or her best games against weaker competition. Some players, however, seem to do better against the best teams and the best players. This type of player is called a "big-game player."





One way to see whether a given player is a big-game player is to compare that player's statistics in the important games of the year to his or her yearly averages. For example, if Shaquille O'Neal is averaging 30 points per game during the season, see how he does against another star player. If Shaq must face another superstar, how does he do? Keep track of the points, rebounds, and blocks each of the two big men get. By comparing these numbers against the season averages, you can see whether one of the players rises to the occasion of the big game. Don't fall into the trap of generalizing from one game, however. Try to get records over several games to see who does best in the long run.

Keep a chart of your favorite player's statistics in games in which he or she plays against other big-name stars. If you find the average of these games and compare it to the seasonal average, you will get a good idea of how that player handles first-rate competition.

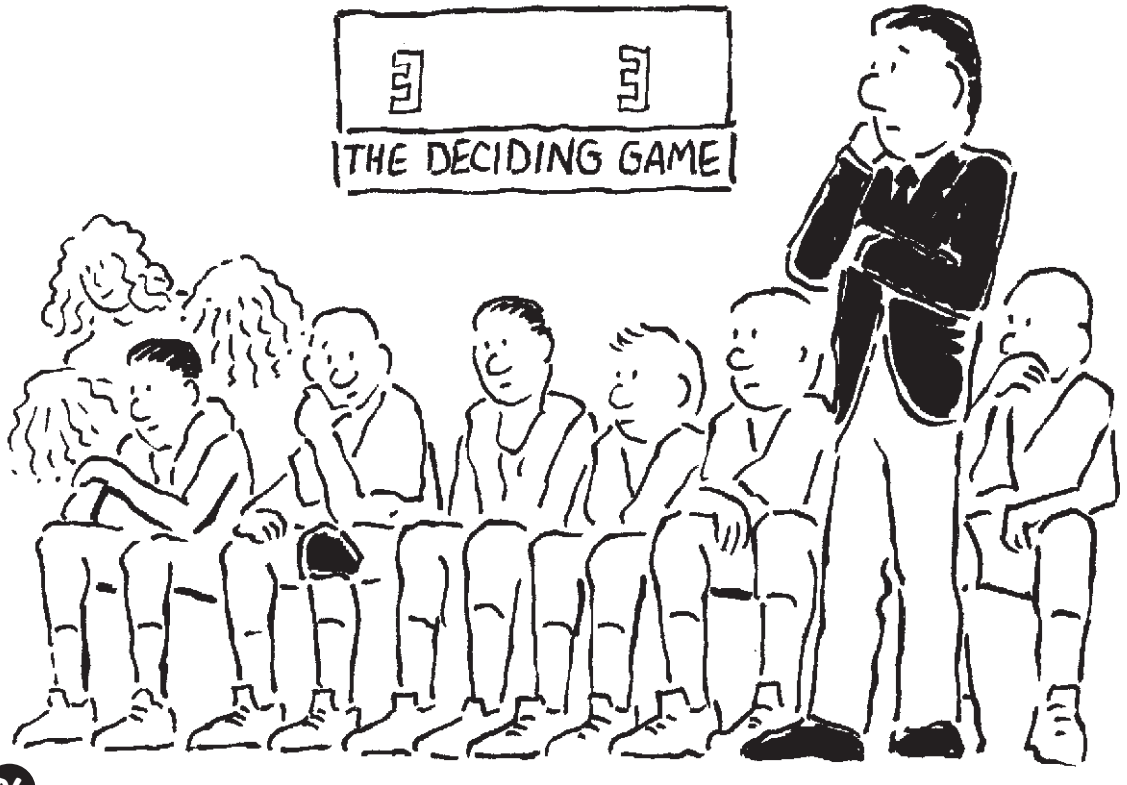
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Backs against the Wall

The NBA play-offs are a pressure cooker of excitement and tension. Coaches and teams worry about such things as home court advantage and adjustments made by the opposing team. Many teams go so far as to foul rather than allow an easy basket. The emotion can reach fever pitch.

When a play-off team is one game from elimination, it is said to have its back against the wall. That team will play as hard as it can because one loss will finish its season. Sometimes both teams are one loss from elimination. This only happens in the fifth game of a best-of-five series or the seventh game of a best-of-seven series. During these deciding games, the pressure goes through the roof. Watch a "backs against the wall" game and see who plays well and who does not, who scores a lot of points and who does not. In other words, see who plays well with his "back against the wall."

In the play-offs, wait for a deciding play-off game—one in which the winner advances and the loser goes home—to occur. After the game, look at the statistics for each player. Usually in a big game, one or two players will make big plays at the end of the game, while several others may have carried the team in the early or middle stages. These players are generally the unsung heroes unless they make some big plays late in the game. See if you can identify an unsung hero who plays best when his team has its back against the wall.



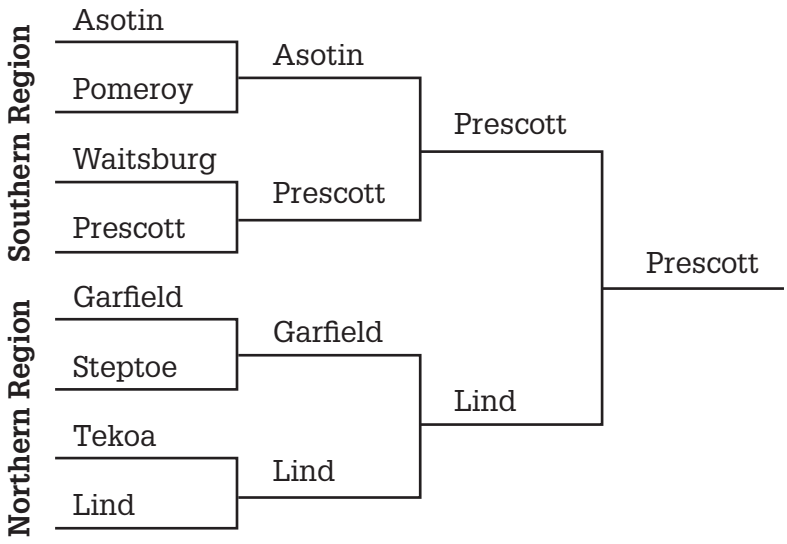
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Charting the Play-offs

One of the things that makes basketball exciting is the play-offs. College basketball has "March Madness," where both men's and women's teams are selected to play for the national championships. The NBA has an elaborate play-off system to determine its league champion. Even high schools in most states take part in play-offs to crown a state champion.



Play-off Chart



A sample play-off chart appears above. It records the eight high-school teams that started in the play-offs, located in two different brackets. Of the starting eight teams, four advanced to the second round because they won those first games. Of the four teams playing in the semifinal games, two advanced to the championship game, and of those two teams, only one won the championship. You can see here that the Prescott Tigers have won our mythical championship.

You will find the play-off charts in your local newspapers and online each spring when the college play-offs begin. Sixty-five teams are selected, assigned to four regions. In one region the sixty-fifth seeded team faces the sixty-fourth seeded team in what is called a "play-in" game. After that game, there are sixteen teams left in each of the four regions, and these will appear in a chart in your local newspaper or online. Cut out or print this chart and record all of the winners as the play-offs proceed. If you prefer, make a chart for your own high-school team as it moves through the state championship. Alternatively, you might make a chart showing the NBA play-offs. Fashion your handmade charts after the one pictured above.

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Ten NBA Players with the Highest Average "Points per Game"



Points per game is an interesting statistic. A player might play just one game, score 50 points, and then leave the NBA. As a result, he would hold the NBA record with "50 points per game," but most fans wouldn't even know his name. In order to qualify for this record, then, most leagues (NBA, NCAA Men, NCAA Women, or WNBA) specify that a player must appear in some minimum number of games. Fill in the following chart with information from the official NBA Web site (www.nba.com). Look for the page showing the players with the top ten scoring averages (points per game) for players appearing in at least 500 games.

Rank	Player	Games Played	Total Points	Points per Game
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

1. This list requires that a player appear in at least 500 games. In 2004, Allen Iverson qualified for the list. Are there other current players who are close to meeting the 500-game requirement and who have a scoring average high enough to make this list?

2. Compare this list to your list of players with the highest "total points"(page 100). Who is on both lists? Who isn't? How many more games must Shaquille O'Neal or Allen Iverson play in (assuming they keep the same scoring average) to make the top ten total points list?

3. Find the teams and positions of the players on this list who were not on the total points list. Also, find the years they played in the NBA.

4. You will find ten players who are the only ten people in the NBA record book who have played in at least 500 games and scored at least 25.0 points per game. Examine the NBA statistics for recent years after 2005–06 to see if any new players are averaging more than 25.0 points per game.

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Ten WNBA Players with the Highest Average "Points per Game"

Because the WNBA is fairly new, some of the original statistics or records for individuals and teams are set at rather low levels. They will be broken regularly over the next few years. Following is a chart. Fill it in with a list of players with the highest scoring averages at the end of the 2004 season. Go to the Web site www.wnba.com for this information.

Rank	Player	Games Played	Total Points	Points per Game
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				



1. A player must appear in at least 40 games to be eligible for this list. Find the player who has most recently qualified for the list. Are there other players currently playing who are close to meeting the 40-game requirement and who have a scoring average high enough to make this list?

2. Compare this list to the list of players with the highest total points. Who is on both lists? Who isn't?

3. Find the teams and positions of the players on this list who are not on the total points list. Also, find the years they played in the WNBA.

4. Because the WNBA is a fairly new league, the records for points and scoring averages can be expected to change dramatically over the next 5 years. Find this list of players with the highest scoring averages (in newspapers or the Internet) and watch it change. Then compare the number of changes to the NBA list. You will probably find the WNBA list changing more rapidly!

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The Ten NBA Players Who Have Scored the Most Points



It is one thing to lead the NBA in scoring during a single season; it is quite another to lead the league in total points scored over a career. Why? Players setting career records have been or were stars for many, many years! Fill in the following chart shows the top ten scoring leaders in NBA history. Go to www.nba.com for this information.

Rank	Player	Games Played	Points per Game	Total Points
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

1. What were the positions of each player? How many were guards, forwards, or centers?

2. Make a list naming the team or teams that each player played for? How many players played for just one team? How many played for more than one team? Which player played for the most teams?

3. Can you find the seasons when each player was in the NBA? Are any of these players in the NBA now? Who played most recently? Who was the first to play in the NBA? Who had the longest career? Could you have predicted that individual from any of the numbers in the chart given?

4. Which of these players played for teams that were NBA champions? Who played for the most championship teams? Did any of these players win championships with more than one team?

5. The "points per game" statistics are computed to only one decimal point. Using that limitation, two players seem to be tied for the "most points per game." Can you compute the statistic out to two or three decimal points in order to see who has the highest "points per game" average?

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Ten WNBA Players Who Have Scored the Most Points



Players setting career WNBA records have also been stars for many years. But because the WNBA began in 1999 and the WNBA plays fewer games per season, the number of games played and total points scored are much lower than those for NBA players. Fill in the following chart with the top ten scoring leaders in WNBA history as of the end of the 2004 season. Go to www.wnba.com for this information.

Rank	Player	Games Played	Points per Game	Total Points
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

1. What were the positions of each player? How many were guards, forwards, or centers?

2. Make a list naming the team or teams that each player played for. How many players played for just one team? How many played for more than one team? Which player played for the most teams?

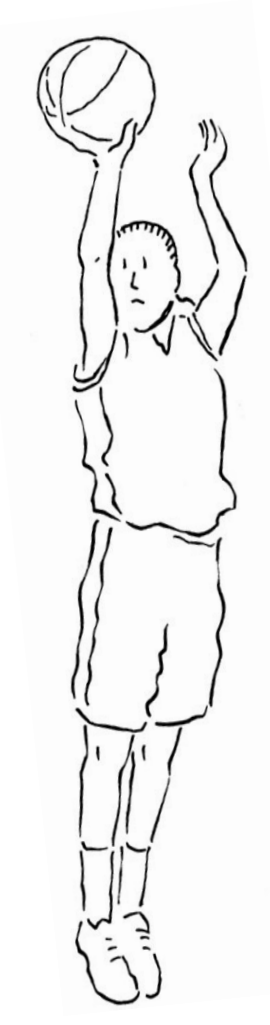
3. Can you find the seasons when each player was in the WNBA? Are any of these players in the WNBA now? Who was the first to play in the NBA?

4. Which of these players played for teams that were WNBA champions? Who played for the most championship teams? Did any of these players win championships with more than one team?

5. Because the WNBA is fairly new, this list will change rapidly in the next 5 years. Find the "total points leaders for career" statistic on the Internet. Which names are still on the list? Which names are gone?

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Top Ten WNBA Career Field-goal Percentage Leaders



In basketball it seems that players shooting short shots (centers, power forwards, etc.) most of the time seem to have higher made field-goal percentages than players shooting longer shots (guards or small forwards). The reasoning seems simple: It is easier to make a lay-up or a dunk than it is to make a three-point jump shot. Some argue that the same can be said for men's basketball over women's basketball; it is easier for men to make a higher percentage of their shots than women. Why? Well, some argue that only one woman has actually made a dunk shot in a basketball game, and that women will make ever fewer of their longer shots than men. Complete the following chart with information from the WNBA Web site (www.wnba.com).

Rank	Name	FGM	FGA	FG%
1				
2				
3				
4				
5				
6				
7				
8T				
8T				
10				

Challenge problems

1. Find the position for each of the players. How many of the players are centers, who shoot only very short shots? How many are guards, who are much more likely to take longer shots?

2. Will you be able to check this statistic in future years? Do the names on this list change as rapidly as the list of total points scorers? The list of points per game scorers? Can you explain why this list changes more or less often than the others?

3. Accuracy is especially important as you take more shots. Who took the most shots and made the most baskets?

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WNBA History Project

Basketball's history is much shorter than the history of other sports; Dr. James Naismith is credited for inventing basketball around 1900 so people could exercise indoors during the winter. The popular story is that he fastened peach baskets to the wall at both ends of a gym and told players to throw the ball into the peach baskets.

Similarly, the history of women's basketball is much shorter than men's; that is especially true for women's professional basketball. Several attempts were made to create a professional basketball league for women; the WNBA is the only league operating in 2005 and appears to be the most successful. Knowing the history of the WNBA can make everyone appreciate the players and the teams more.

Research the history of the WNBA and find answers to the following questions.

1. In what year was the WNBA formed? When was their first season?

2. How many divisions were the teams divided into? How many are there now?

3. How many teams were included in the original league? What teams are playing now? What teams dropped out of the league, and what teams were added? When did teams drop out of the league, and when were new teams added to the league?

4. When do WNBA teams play their games? How many games make up a season?

5. How many teams are included in the WNBA play-offs? How many games do two teams play to determine the winner of each series? How many games are played in the championship series?

6. Can you find a record of the WNBA champions for each year? Who won each championship? Who did each champion beat in the championship series? What were the scores for each of the games? How many games did each have to play in order to win the championship series? (Did the champion sweep the series, or did each team win some of the games?) (One final hint: To find all of the championship series, you should know that the Houston Comets beat the New York in the first championship game held in 1997.)



7. Which two teams played in each championship series? What was the score for each game in the championship series? How many games were played? How many points were scored in the games?

8. Who was voted "Most Valuable Player" each year in the WNBA?

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Tracking Data Project

On pages 58–61 you learned how to create and read a special type of bar chart called a histogram. From a histogram it is simple to see some facts about a player's statistics: minimum, maximum, and mode. If you create a histogram for one of your favorite player's statistics, you can keep track of those facts on a daily basis.



Here are some ideas to think about before you start your histogram.

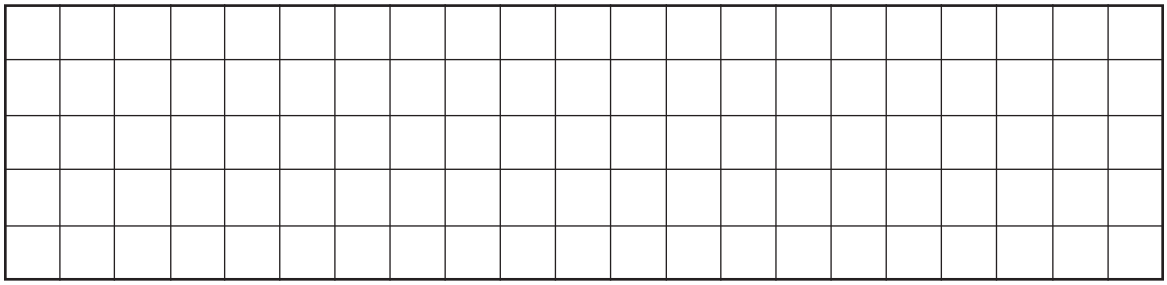
What statistic (points, rebounds, steals, blocks, etc.) will you keep track of?

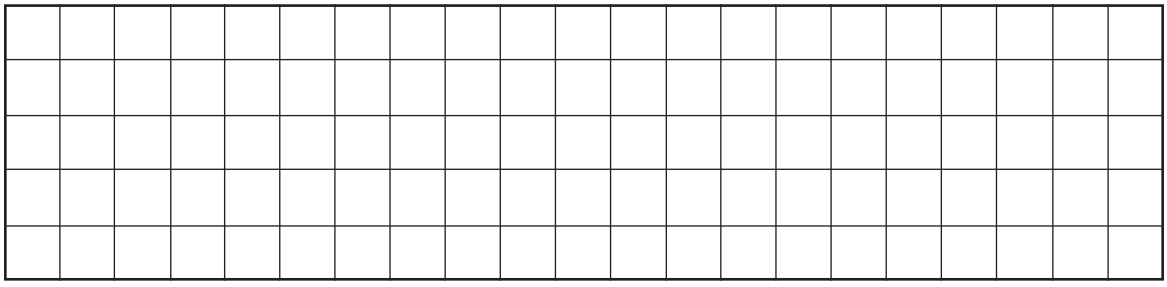
How wide should you make your histogram? Some players score as many as 50 points or more in games. Sometimes they score none. So a histogram for a big-time scorer would have to be pretty wide. However, even the best rebounders rarely go over 20 rebounds in a single game, so a rebound histogram doesn't need to be as wide as a scoring histogram.

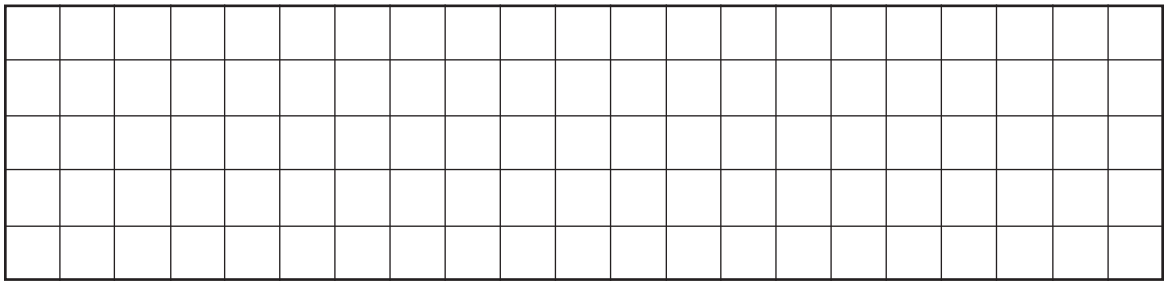
How tall should you make your histogram? High school teams usually play fewer games than college teams, who play fewer games than professional teams. Each team in the NBA plays 82 regular-season games, so a professional player's histogram might need to be a lot taller than a high-school player's histogram that covers only 20 regular-season games.

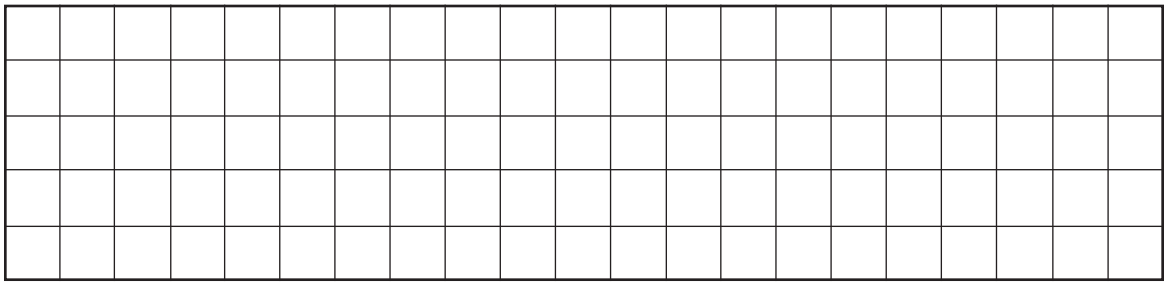
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Here are some blank histograms for you to use.









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Answer Key

Answers are provided for most activities.
For activities that do not appear here, answers vary.

Activities

2–Creating a Dynasty

1. Answers vary; for 2006 it was 57 years. Add more as years change.
2. 505
3. 196; 7,598
4. 3,776

3–March Madness

1. 33 games (including the extra game)
2. 8 games; 16 teams
3. 6 rounds
   Challenge problem: 9

4–Women's Unbeaten Teams

1. 2,853 points
2. 26.7 points per game
3. 141.1 points per game
4. 162 points
5. 34.2 field goals per game

5–Men's Unbeaten Teams

1. 323 games
2. 8 games
3. 120 wins
4. Answers for questions a and b vary by year.

6–The Warriors, State Champs

1. 274 points; 208 points
2. 68.5 points per game; 52 points per game
3. 24, 6, 28, and 8 points, respectively
4. 16.5 points per game

7–Women's Scoring Champions

1. 33.0 points per game
2. 31.0 points per game
3. 907 points
4. 271 points
5. Hoskins: 28.4 ppg
   Stiles: 26.3 ppg
   Bauman: 26.0 ppg
   (ppg=points per game)

8–The Big "O"

1. 1,052 field goals
2. 2,973 points
3. 869 free throws
   Challenge problem: He averaged 33.8 points per game. The team did not play the same number of games each season.

9–"Pistol" Pete

1. 1,387 field goals
2. 3,667 points
3. 893 free throws
   Challenge problem: Answers will vary. Examples: Field-goal percentage, shots per game, turnovers, etc.

10–Point Guards

1. 2.25:1
2. 12 turnovers
3. 60 assists
4. 1.6 to 1
5. Efrain, who had the most assists and turnovers, started.

11–Women's Field-goal Percentage Leaders

Larsen: 249 field goals
Anderson: 72.3%
Knowles: 276 attempts
Farris: 71.9%
Adams: 185 field goals
Days: 332 attempts

12–Comparing Field-goal Percentages

1. 388 times
2. 776 points
3. 149 times
4. 298 points
   Challenge problem: Player A's team made 0.9 points for every time she shot the ball. Player B's team made 1.3 points for every time she shot the ball.

13–UCLA's Championships

1. 12 years
2. 10 first-place finishes
3. 2 third-place finishes
4. 1 time
5. 84.6 points per game
6. 71.2 points per game
   Challenge problem: Yes

14–Duke's Championships

1. 9 years
2. 2 first-place finishes
3. 3 second-place finishes
4. 2 times
5. 2 times
6. 71.4 points per game

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15–NCAA Women's Championships

1a. 78.5 b. 66.5 c. 12
2a. Average score for Connecticut 70.5; Stanford 83
2b. Average score for opponents of: Connecticut 54.5; Stanford 71.5
2c. Average margin of victory for: Connecticut 16; Stanford 11.5
3. 12.5; 9.5
4. Texas Tech, Purdue, North Carolina

16–Sheryl Swoopes, 1993 MVP

1. 50.9%
2. **61 free throws**
3. 9.6 rebounds per game
4. 35.4 points per game

Challenge problem 1: She made 8 free-point shots.
2. Stats can be found for several years in the WNBA.

17–Hiding the Three-point Shots

Bauman = 0
Swoopes = 4
Holdsclaw = 0
Bascom = 5
Cate = 2
Swoopes = 1

18–Mom's Challenge Problems

1. 15 points
2. 14 field goals; 7 free throws
3. 70 points

19–Charity Stripe Stories

1. 95.80%
2. 45.60 (Shaq's play-off percentage)
3. 91.87%
4. 31.87%
5. 48.15% FTM percentage for 1985–86
   79.70% FTM percentage for 1999–2000
   31.55% improvement

20–NBA Record Holders

1. All-time scoring leader
   Points: 38,387
   Years: 20
   Points per year: 1,919.35
2. All-time playing leader
   Kareem's minutes: 57,446
   That is 11,742 more minutes than Parrish.
3. All-time shot leader
   Shots made: 15,837
   Shots attempted: 28,307
   Shooting percentage: 55.95%
   Three-point shooting percentage: 5.56%

21–Hot Shots

1. Anji does with 16.1 points.
2. Anji has.
3. No, she is not.
4. 16.25 points per game
5. 24 points

22–Shooting for the Perimeter

1. 288 feet
2. 50 feet

Challenge problems:
1. Perimeter = 68.8 feet
2. Circumference = 37.7 feet

23–Covering the Area

1. 228 square feet; 456 square feet
2. 113.0 square feet
3. 56.5 square feet; 113.0 square feet
4. 4,700 square feet

24–Famous Duos

1. Stockton
   Assists: 15,806
   Seasons: 19
   Average per season: 831.9

   Malone
   Points: 36,928
   Seasons: 19
   Average per season: 1,943.57
2. Duncan: 1,084
   Robinson: 775
   Duncan scored 309 more points.
3. Pippin: 1,720
   Jordan: 2,580
   Total: 4,300 combined points
4. Larry: 2,295
   Magic: 1,909
   Difference: 386

25–The NBA All-star Team 2004–05

1. First team's total points: 8,510
   Second team's total points: 9,793
   The second team scored more.
2. Points per game for the first team:

Player	Games	PPG
Duncan	66	20.33
Nowitzki	78	26.05
O'Neal	73	22.86
Iverson	75	30.69
Nash	75	15.53
James	80	27.19
Garnett	82	22.16
Stoudemire	80	26.00
Wade	77	24.08
Allen	78	23.87

Read and Compute
Only Kevin Garnett played in all of his team's 82 games.
Tim Duncan played in 66 games.
So: There was a difference of 16 games between the most and least played.

Misses
Duncan 16
Nowitzki 4
O'Neal 9
Iverson 7
Nash 7
James 2
Garnett 0
Stoudemire 2
Wade 5
Allen 4

3. James outscored Duncan by 833 points; his points-per-game was 6.86 higher.
   Stoudemire outscored O'Neal by 411 points; his PPG was 3.14 higher.
   Allen outscored Nash by 697 points; his PPG was 8.34 higher.
   First team all-stars Nowitzki and Iverson outscored the second team all-stars at their positions.

26–Shot Blockers

1. 294 more points, or 10.5 more points per game
2. 10.2 more points per game for the opposing team
3. 5.6 blocks per game
4. 137 shots

27–Wanted for Stealing

1. a. 42; b. 28; c. 14
2. 191 season points prevented
   Challenge problem: Yes. Seven steals had to result in fewer points for the other team.

28–Very Famous Players Doing Other Things

1. 31.25%
2. Larry's regular-season record: 147 wins, 67 losses
   His play-off record: 32 wins, 20 losses
   His total record: 179 wins, 87 losses
3. Lost games: 25
   Total games: 30
   Winning percentage: 17%

29–Play Like Mike

1. He scored 1,905 more points in his first year.
2. He averaged 25.06 minutes per game.
3. Highest: 3,041
   Lowest: 408
   Difference: 2,633

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30–Do You Really Want to Hold This Record?

1. Quickest disqualification ever: At that rate Bubba Wells would commit 96 fouls over a game.
2. All-time leader in turnovers: Karl Malone had 238.1 turnovers in an average season.
3. Most fouls: Research the record to see how it occurred.

31–Amazing Championship Stories

1. 207 points
2. 125 points

32—Three Famous College Shot Blockers

1. 308 shots
2. 4.5 shots
3. 104 shots
   Challenge problem: It would be impossible to have "record performances" for every game of the season.

33–Senator Bradley's Records

1. 24 years
2. 46 attempts
   Challenge problem: There might be many players who made 1 free throw and had only 1 attempt. This would be a "cheap record."

34–The Long and Short of It

1. Camby, Knight, Longley, Rice, Thomas
2. 420 inches
3. 379 inches
4. Longley to Ward = 12 inches of range in heights
5. 216.8 pounds
   (Total weight of all players: 2,602 pounds—divided by 12, the number of players.
6. Longley to Ward or Sprewell is 70 pounds (range in weight).
7. Heaviest: 1,185 pounds
   Lightest: 985 pounds
8. Yes, except Postell does not tie for this one.

35–Two Famous Malones

1. 9,519 more points
2. 1,244 more rebounds
3. 9,781 more minutes
4. 18,878 field-goal points
5. 1,256 more free throws

36–Foul Play I

1. 34.9 fouls per game
2. 9.7 fouls per game
3. 25.2 fouls per game
4. 28.4 fouls per game
5. 11.0 fouls per game
6. 17.4 fouls per game

37–Foul Play II

1. 5 games
2. 1 foul
3. 2 times
   Challenge problem: No, because 18 fouls (6 per game for 3 games) is the maximum number of fouls possible.

38–Sharing the Ball

Player	1. Points Earned	2. Points Earned	Challenge problem
Penicheiro	15.8	23.7	17.8
Weatherspoon	12.8	19.2	14.8
Azzi	12.2	18.3	14.2
Staley	11.8	17.7	13.8
Johnson	10.6	15.9	12.6
Nagy	10.2	15.3	12.1
Cooper	10.0	15.0	12.0

Answer Key (cont'd.)

39–Cleaning the Glass

1.

Offensive	Defensive
4.6 rebounds	7.0 rebounds
4.6 rebounds	5.7 rebounds
2.3 rebounds	7.2 rebounds
2.8 rebounds	5.2 rebounds
2.1 rebounds	5.5 rebounds
16.4 total	30.6 total
Average = 3.28	Average = 6.12

Defensive: It's easier to get a defensive rebound. You are between your opponent and the basket.

2.

Williams .....4.6 ....2 ... 9.2
Griffith .....4.6 ....2 ... 9.2
Leslie .....2.3 ....2 ... 4.6
Phillips.....2.8 ....2 ... 5.6
Thompson.....2.1 ....2 ... 4.2

3.

Williams .....7.0 ... 2... 14.0
Griffith .....5.7 ... 2... 11.4
Leslie .....7.2 ... 2... 14.4
Phillips.....5.2 ... 2... 10.4
Thompson....5.5 ... 2... 11.0

40–Division by I, II, and III

1. 262 points; 188 points; 450 points
2. Div. I = 66, Div. II = 90; Div. III = 69; combined = 75
3. 1,256 points

41–On the Glass

1. 28 rebounds per game
2. 5 rebounds per game
   Challenge problem: Yes. Russell had 13 more rebounds than McAdoo and Malone combined. This makes it possible for him to have both records.

42–Chairman of the Boards

1. 160 rebounds; 36 rebounds; 62 rebounds; 62 rebounds
2. 124 rebounds
3. 98 rebounds
   Challenge problem: 14 boards in the five-game series.

43–Where's the Offense?

1. 11 points
2. 15 free throws
3. 4 field goals
4. 15 points
5. 7 shots
6. 5 points
7. Pistons 3, Lakers 1
8. No they did not. They averaged .8 points per minute.
9. 82 points

44–Where's the Defense?

1. No, they did not.
2. Yes, they did.
3. Denver 49, Detroit 51
4. 140 field goals
5. Denver 47, Detroit 37
6. 63 minutes
7. 2 hours, 8 minutes
8. Yes, they did. Average = 5.87 points per minute.
9. 7 points

45–Wilt's Big Night

1. 41 points; 59 points
2. 13 points
3. 69 points
4. 28 points

46–Defending the Big Guy

1. 93
2. Yes, they did; 103 points
3. 64 points

47–Double-Doubles

1. Ethan: Points 15, Rebounds 10, Assists 6, Blocks 4, Steals 2
   Yes; points and rebounds
2. Angela: Points 6, Rebounds 9, Assists 11, Blocks 1, Steals 11
   Yes; assists and steals
   Challenge problem: Ethan is a center. Angela is a guard.

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48–Triple-Doubles

Gracie: Points 29, Rebounds 16, Assists 14, Blocks 7, Steals 8
Cory: Points 32, Rebounds 21, Assists 9, Blocks 9, Steals 11

1. Yes, both players had a triple double.
   Gracie—Points, rebounds, and assists
   Cory—Points, rebounds, and steals
2. Not by 1. Yes, she missed on steals by 2.
3. 46 points
   Challenge problem: Yes; he had lots of blocks and steals.

49–Drawing the Crowd

1. 40,529
2. 2,541,303
3. 12,888

50–Keeping Time

1. Chamberlain averaged more than 48 minutes per game, which is remarkable when one considers that 48 minutes is the length of a regular NBA game. Many of his games went into overtime.
2. 5 overtimes
3. 39.90 days
4. Just over 14 seasons
   Challenge problem: When Bellamy was traded, his original team had played 6 more games than his new team.

51–NBA Trivia

1. No. The Toronto Huskies played in 1946 and tied the Boston Celtics for last place in the Eastern Division.
2. The Sacramento Kings
3. 5 Teams
   a. Golden State in 1975
   b. L.A. Lakers in 1972, 80, 82, 85, 87, 88, 2000, 2001, and 2002 (and also as the Minneapolis Lakers in 1949, 50, 52, and 53)
   c. Portland in 1977
   d. Sacramento in 1951 (as the Rochester Royals)
   e. Seattle in 1979
4. Chicago Bulls in 1995–96. They had a record of 72 wins and 10 losses.
5. Chicago Packers, 1961–62; Chicago Zephyrs, 1962–63; Baltimore Bullets, 1963–64.

52–Snack Break

1. Seniors $135.50
   Juniors $106.50
   Sophomores $63.00
   Freshmen $24.00
2. $329.00

53–The Pep Band Blues

1. 187 members
2. $33.75
3. 18 sheets
   Challenge problem: Kim has played 1,428 songs. Yes, 42 times.

54–Women's Leading Three-point Shooters

1. Erin scored 1,173 points on three-point shots.
   Others:
   Kim had 1,137 points, Julie had 1,086 points, Kelly had 1,071 points, and Valerie had 1,014 points.
2. Kelly averaged 2.68 three-point baskets in each game.
3. Others:
   Erin averaged 3.08 baskets, Kim averaged 3.24 baskets, Julie averaged 3.09 baskets, and Valerie averaged 2.68 baskets.
   So: Erin, Kim, and Julie had more three-pointers per game than Kelly.
   Valerie is tied with Kelly at two decimal points, but Kelly has a slightly higher average at the third decimal point (2.684 to 2.682).

Answer Key (cont'd.)

55–Accuracy Counts

1. Yes, Middleton will be higher. She made more shots with the same number of attempts.
2. Middleton 44.5%
   Halligan 45.4%
   Jones 43.4%
   Davis 43.9%
   Savage 38.6%
3. Halligan
   Middleton
   Davis
   Jones
   Savage

57–The 2003–04 Connecticut Basketball Season—Men's Team

1. 6 wins and 4 losses came on opponents' courts.
2. 144 total points
3. 21 more points
4. 50-point difference in the win over Iowa
5. Okafer averaged 17.61 points per game.
   Gordon averaged 18.54 points per game.
6. UConn averaged 78.79 points per game.
   Their opponents averaged 73.92 points per game.

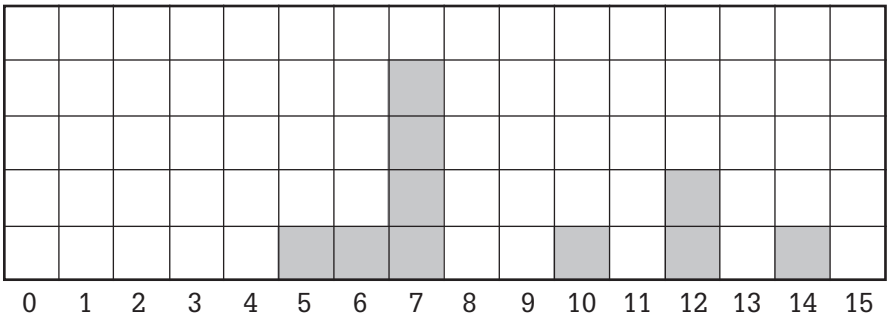
57–The 2003–04 Connecticut Basketball Season—Women's Team

1. 10 wins and 2 losses came on opponents' courts.
2. UConn allowed 266 points in the losses.
3. 14.5 was the average margin of victory.
4. 28-point difference in the win over West Virginia
5. Taurasi averaged 16.23 points per game.
   Turner averaged 13.66 points per game.
6. UConn averaged 75.49 points per game.
   Their opponents averaged 53.83 points per game.

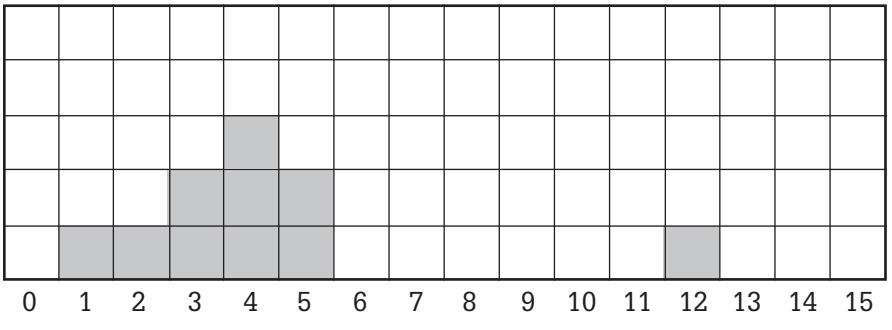
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58–Keeping Data Organized

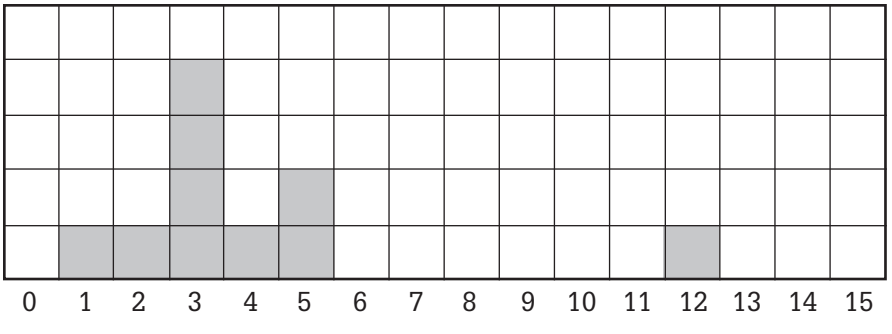
1. 3 boxes
2. 3 games
3. Abby:



Doug:



Wilson:



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Answer Key (cont'd.)

60–Reading a Histogram

1. 19 points
2. 2
3. More often
4. 20
5. No
6. 12
7. Mode
8. 0, 1, 3, 4, 9, 13, 16, 18, 20
9. 5 scores (5, 6, 7, 10, 12)

62–What Is an Average Game? I

1. Kyle 10, Dirk 8, Tyden 10, Phillip 10, Stanton 8
2. Kyle, Tyden, and Phillip
3. No
4. Phillip
5. Dirk
6. Tyden or Phillip
7. They are equal.
8. 6 games
9. 1 game
10. One big game with 47 points
11. Kyle, because he is more consistent.

Challenge problem:
No. In his first 4 games, Conner scored 24 points altogether. In his last 8 games, he scored 96 more points. Because he played in 12 games and scored a total of 120 points, Conner's mean for the whole season was 10 points per game.

64–What Is an Average Game? II

1. Dirk 8 points, Tyden 15 points, Phillip 4 points, Stanton 7 points
2. Tyden
3. Phillip
4. Dirk
5. Dirk and Kyle; most consistent.
6. Least consistent
7. Kyle 10 points, Dirk 8 points, Tyden no mode, Phillip 3 points, Stanton 6 points
8. Because Tyden always scored a different number of points, he has no mode.
9. Dirk
10. Kyle and Dirk
11. Kyle and Dirk

66–Basketball Families

1. 12,649 points
2. 12,360 points
3. 89 points
4. 29 points
5. 784 points

67–Katie Smith's Record Season

1. 53 points
2. 2,427 minutes
3. 2000 = 19.88 hours
   2001 = 20.56 hours
   Combined = 50.45 hours
4. 720 points on three-point shots.
5. 32 games

Challenge problems:

1. She was not the most accurate shooter. Someone else took fewer shots and made more.
2. Yes. The longer records are kept, the more difficult it is to break several records in one season. More players have had more time to set high levels in each of the categories.

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