

# 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:

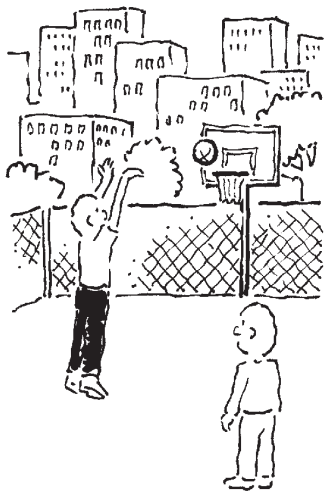
Hersey Hawkins scored 1,125 points in his senior season at Drake. He made 87 three-point shots. How many two-point shots did he make? (Hint: He scored 23 more points on free throws than he did on three-pointers.)

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](http://www2.ncaa.org). 317-917-6222.

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



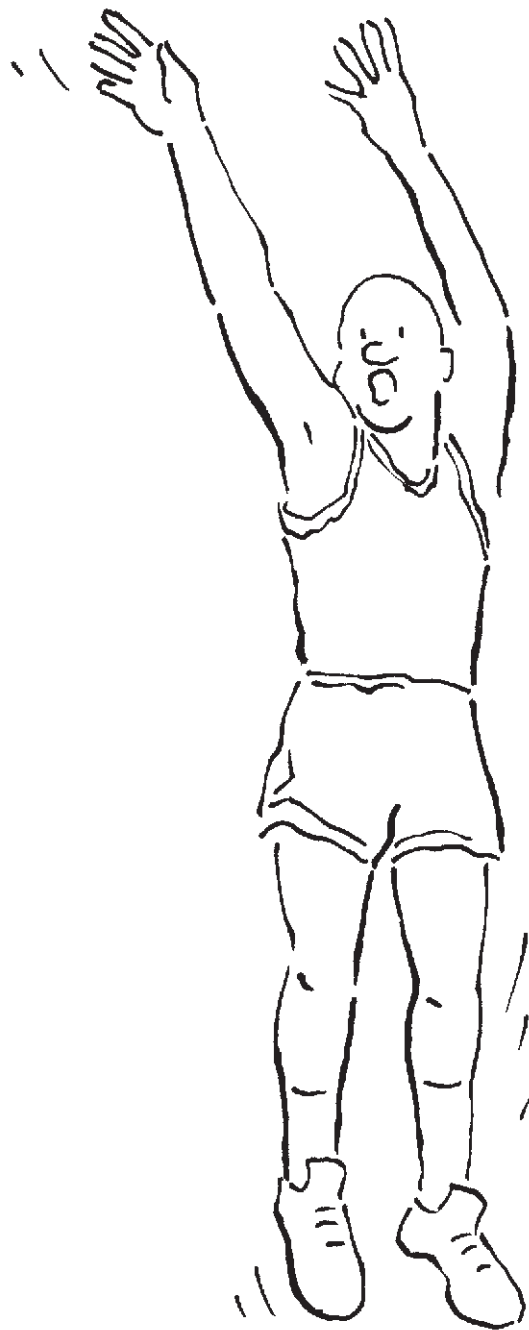
# Introduction for Students



**T**his 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.

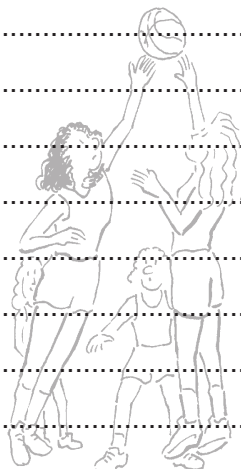
The material draws on and attempts to explain key aspects of the game of basketball. For example, you can see how defensive statistics are important. You will be given problems about defensive statistics to figure out for yourself. But you will enjoy the book much more if you also tackle the project 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 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 your friends to solve. You will already know the answers. Enjoy!

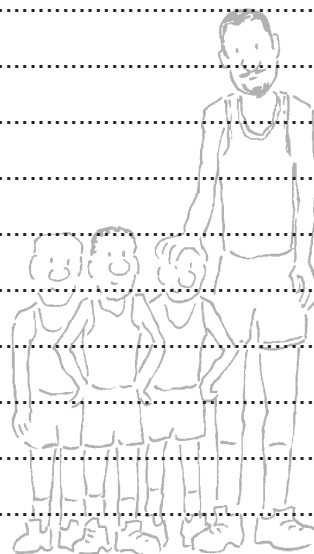
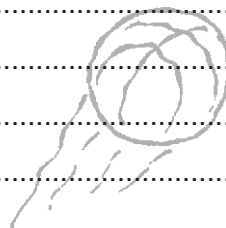


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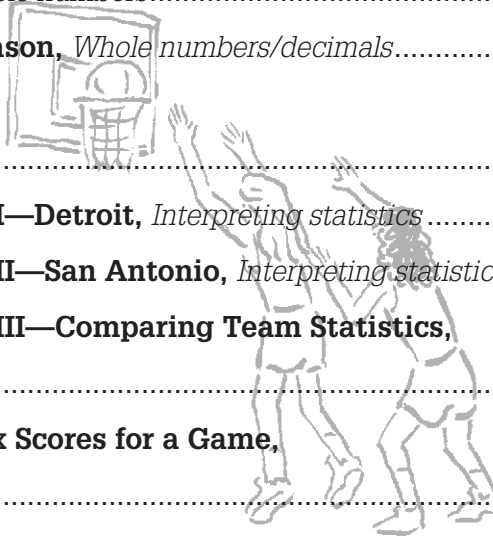
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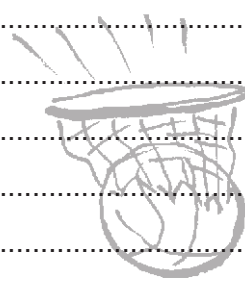
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# Creating a Dynasty

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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 Bulls 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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