It’s been happening to you, and you’ve been doing it since you were very young—being tested and taking tests.

When you were born, the doctor administered the APGAR to assess your Appearance (or color), Pulse (or heart rate), Grimace (or response to stimulation), Activity (or muscle tone), and Respiration (or respiration). You were also screened (and it’s the law in almost every state) for certain types of metabolic disorders (such as PKU or phenylketonuria)—and that may have been tests number one and two.

Then there may have been personality tests (see Chapter 15), spelling tests (see Chapter 14), statewide tests of educational progress (see Chapter 20), the ACT (American College Test) or the SAT (which actually is not an acronym—see Chapter 16 for more on this), and maybe even the GRE (Graduate Record Exam). Along the way, you might have received some career counseling using the SVIB (Strong Vocational Interest Blank) and perhaps a personality test or two such as the MMPI (Minnesota Multiphasic Personality Inventory) or the Myers-Briggs Type Inventory.

My, that’s a lot of testing, and you’re nowhere near done.

You’ve still probably got a test or two to complete once you graduate from school, perhaps as part of a job application, for additional studies, or for screening for a highly sensitive job as a secret agent.

Testing is ubiquitous in our society, and you can’t pick up a copy of the New York Times, Chicago Tribune, or Los Angeles Times without finding an article about testing and some associated controversy.

The purpose of *Tests & Measurement for People Who (Think They) Hate Tests & Measurement* is to provide an overview of the many different facets of testing, including a definition of what tests and measurement is as a discipline and why it is important to study;
the design of tests; the use of tests; and some of the basic social, political, and legal issues that the process of testing involves. And when we use the word test, we are referring to any type of assessment tool, assessing a multitude of behaviors or outcomes.

This first part of Tests & Measurement for People Who (Think They) Hate Tests & Measurement will familiarize you with a basic history of testing and what the major topics are that we as teachers, nurses, social workers, psychologists, parents, and human resource managers need to understand to best negotiate our way through the maze of assessment that is a personal and professional part of our lives.

Let's start at the beginning and take a brief look at what we know about the practice of testing and how we got to where we are.

A FIVE-MINUTE HISTORY OF TESTING

First, you can follow all this history stuff by using the cool time line for what happened when, beginning at the bottom of this page and appearing throughout the chapter. Here's a summary.

Imagine this. It's about 2200 years BCE (Before the Common Era), and you're a young citizen living in a large city in China looking for work. You get up, have some breakfast, walk over to the local “testing bureau,” and sit down and take a test for what we now know as a civil service position (such as a mail carrier). And at that time, you had to be proficient in such things as writing, arithmetic, horsemanship, and even archery to be considered for such a position. Must have been an interesting mail route.

Yep—testing in one form or another started that long ago, and for almost 3,000 years in China, this open (anyone could participate), competitive (only the best got the job) system proved to be the model for later systems of evaluating and placing individuals (such as the American and British civil service systems that started around 1889 and 1830, respectively).

Interestingly, this system of selection was abandoned in China around the turn of the 20th century, but we know from our own experience that the use of testing for all different purposes has grown rapidly.
How Much to Take That Test? Testing is on the increase by leaps and bounds (see Chapter 20), and it’s not getting any cheaper. The Brookings Institution Washington think tank estimates that $1.7 billion was spent on assessment for only the K–12 crowd—no college-level testing included. That’s a ton of money, and the entire endeavor is expected to get even more expensive as the federal government moves toward expanding standardized testing to more grades in the near future.

Not much of a formal or recorded nature occurred before the middle of the 19th century, and by about the end of the 19th century, along comes our friend Charles Darwin, whom you may know from some of your other classes as the author of the Origin of Species (available in the first edition for only about $185,000 at the time of this writing). This book (of which only 11 copies of the first edition have survived) is a groundbreaking work that stressed the importance of what he called “descent with modification” (which we now call evolution). His thesis was that through the process of variation, certain traits and attributes are selected (that is, they survive while others die out), and these traits or attributes are passed on from generation to generation as organisms adapt.

So why are we talking about Charles Darwin and biology in a tests and measurement book? Two reasons.

First, Darwin’s work led to an increased interest in and emphasis on individual differences—and that’s what most tests examine. And second, Darwin’s cousin (how’s that for a transition?) Francis Galton was the first person to devise a set of tools for assessing individual differences in his anthropometric lab, where one could have all kinds of variables measured, such as height, weight, strength, and even how steady you can hold your hands. His motto was “Wherever you can, count.” And by the way, Sherlock Holmes’s motto was “Data! Data! Data!” They must have been very busy guys.

Once physical measurements were being made regularly, it was not long before such noted psychologists as James Cattell were working on the first “mental test.” Cattell was a founder of the Psychological Corporation in the early 1920s, now known as one of the leading publishers of tests throughout the world.
When we get to the 20th century, testing and measurement activity really picks up. There was a huge increase in interest devoted to mental testing, which shortly became known as intelligence testing and also included the testing of cognitive abilities such as memory and comprehension. More about this in Chapter 17.

A major event in the history of testing occurred around 1905, when Alfred Binet (who was then the Minister of Public Instruction in Paris) started applying some of these new tools to the assessment of Parisian schoolchildren who were not performing as well as expected. Along with his partner, Theodore Simon, Binet used tests of intelligence in a variety of settings—and for different purposes—beyond just evaluating schoolchildren's abilities. Their work came to America in about 1916 and was extended by Lewis Terman at Stanford University, which is probably why one of the most commonly used modern intelligence tests is named the Stanford–Binet.

As always, necessity is the mother and father of invention, and come World War II, there was a huge increase in the need to test and classify accurately those thousands of (primarily) men who were to join the armed services. This occurred around World War I as well, but with nowhere near the same amount of scientific deliberation.

And as always, intense efforts at development within the government usually spill over to civilian life, and after the war (World War II, that is), hundreds of different types of tests were available for use in the civilian sector and made their way into hospitals, schools, and businesses. Indeed, we have come a long way from spelling tests.

While all these mental and ability tests were being developed, increased attention was also being paid to other dimensions of psychological functioning, such as personality development (see Chapter 15). People might be smart (or not smart), but psychologists also wanted to know how well adjusted they were and whether they were emotionally mature enough to assume certain important responsibilities. Hence, the field of personality testing (around World War I) got started in earnest and certainly is now a major component of the whole field of tests and measurement.

But our brief history of testing does not stop with intelligence or personality testing. As education became more important, so did evaluating achievement (see Chapter 14). For example, in 1937, the then-called Stanford Achievement Tests (or SATs) became required for admission to
Ivy League schools (places such as Brown, Yale, and Princeton)—with more than 2,000 high school seniors taking the exam. Another example? In 1948, the Educational Testing Service (known as ETS) opened, almost solely to emphasize the assessment of areas other than intelligence. They are the folks that bring you today's SAT, GRE, and the always popular and lovable Test of English as a Foreign Language (or TOEFL)—all taken by hundreds of thousands of students each year.

Now thousands upon thousands of high school students take standardized tests at the beginning of their senior year, and so do college seniors trying to gain admission to medical, law, and other graduate programs.

It’s no wonder that services offering (and sometimes guaranteeing) success began to proliferate around 1945 with Stanley Kaplan. A very smart New Yorker (who was denied admission to medical school), he started tutoring students in the basement of his home for $0.25 per hour. His success (and it’s still a hotly debated issue whether you can indeed raise people’s scores through instruction) led him to create an empire of test centers (sold off for a bunch of millions to a big test company) that is still successful today.

Today, thousands and thousands of tests (and hundreds of test publishers—see Appendix B) measure everything from Advanced Placement Examination in Studio Art, which is designed to measure college-level achievements in studio arts, to the Health Problems Checklist, which is used to assess the health status and potential health problems of clients in psychotherapy settings.

And a new emphasis on the study of neuroscience has led to new evaluative efforts that explore and assess the impact of brain behavior on performance and an intense look at the role and function of testing—not without a great deal of controversy about topics such as online testing, fair testing using a common core as the basis for educational valuation, high-stakes testing, and more.

**SO, WHY TESTS AND MEASUREMENT?**

This question has a pretty simple answer, but simple does not mean lacking in complexity or significant implications.

No matter what profession we enter, be it teaching, social work, nursing, or any one of thousands more, we are required to make
judgments every day, every hour, and in some cases, every few minutes about our work. We do it so often that it becomes second nature. We even do it automatically.

In the most straightforward of terms, we use a test (be it formal or informal) to measure an outcome and make sense of that judgment. And because we are smart, we want to be able to communicate that information to others. So if we find that Russ got 100% on a spelling test or a 34 on his ACTs, we want everyone who looks at that score to know exactly what it means.

For example, consider the teacher who records a child's poor grade in math and sends home some remedial work that same evening; the nurse who sees a patient shivering and takes his or her temperature; or the licensed clinical social worker who recognizes client has significant difficulties concentrating and administers a test to evaluate that client's ability to stay on task and, based on the score, designs an intervention. These people all recognize a symptom of something that has to be looked into further, and they take appropriate action.

What all these professionals have in common is that in order for them to take action to help the people with whom they work, they need to first assess a particular behavior or set of behaviors. And to make that assessment, they use some kind of formal test (such as a standardized test in the case of the nurse) or informal test (such as in the teacher's case) to complete an assessment. Then, based on their training and experience, they make a decision as to what course of action to take.

For our purposes here, we are going to define a test as a (pick any of the following) tool, procedure, device, examination, investigation, assessment, or measure of an outcome (which is usually some kind of behavior). A test can take the form of a 50-question, multiple-choice history exam or a 30-minute interview of a parent's relationships with his or her children. It can be a set of tasks that examine how good someone is at fitting together blocks into particular designs, or whether they prefer multigrain Cheerios® to plain Cheerios®. We use tests that come in many different forms to measure many different things.

What We Test

We test many, many different things, and the thousands of tests that
are available today cover a wide range of areas. Here’s a quick review of some of the content areas that tests cover. We’ll go into greater detail in each of these in Part IV of *Tests & Measurement for People Who (Think They) Hate Tests & Measurement*.

We’ll define these different general areas here, and in Table 1.1 you can see a summary along with some real-world examples.

**Achievement tests** assess an individual’s level of knowledge in a particular domain. For example, your midterm in history was an achievement test.

**Personality tests** (covered in Chapter 15) assess an individual’s unique and stable set of characteristics, traits, or attitudes. You may have taken an inventory that determined your level of introversion or extraversion.

**Aptitude tests** (covered in Chapter 16) measure an individual’s potential to succeed in an activity requiring a particular skill or set of skills. For example, you may take an aptitude test that assesses your potential for being a successful salesperson.

**Ability or intelligence tests** (covered in Chapter 17) assess one’s level of skill or competence in a wide variety of areas. For example, intelligence tests are viewed as measures of ability (but don’t be fooled by the name of a test—there are plenty of intelligence tests that are also seen as being aptitude tests—see the following box!).

**Neuropsychological tests** (covered in Chapter 15) assess the functioning of the brain as it relates to everyday behaviors, including emotions and thinking.

Finally, **vocational or career tests** (covered in Chapter 18) assess an individual’s interests and help classify those interests as they relate to particular jobs and careers. For example, you may have taken a vocational test that evaluates your level of interest in the culinary arts or the health care professions.

**Just What Test Is That?** There is always a great deal of overlap in the way people categorize particular types of tests and what they assess. For example, some people consider intelligence to be an ability (and would place it under aptitude tests), whereas others think of it as an achievement test because it tests one’s knowledge about a particular area of information. Or aptitude tests can end up as ability tests as well as personality tests, or they can stand all on their own.
### Table 1.1  An Overview of What We Test and Some Examples of Such Tests

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>What It Measures</th>
<th>Some Examples</th>
</tr>
</thead>
</table>
| Achievement               | Level of knowledge in a particular domain                                        | • Closed High School Placement Test  
• Early School Assessment  
• Norris Educational Achievement Tests  
• Test of Basic Adult Education |
| Personality               | Unique and stable set of characteristics, traits, or attitudes                   | • Achievement/Motivation Profile  
• Aggression Questionnaire  
• Basic Living Skills Scale  
• Dissociative Features Profile  
• Inventory of Positive Thinking Traits |
| Aptitude                  | Potential to succeed                                                              | • Differential aptitude tests  
• Scholastic Aptitude Scale  
• Aptitude Interest Category  
• Evaluation Aptitude Test  
• Wilson Driver Selection Test |
| Ability or intelligence   | Skill or competence                                                                | • Wechsler Intelligence Scale for Children  
• Stanford–Binet Intelligence Test  
• Cognitive Abilities Test  
• General Clerical ability tests  
• School Readiness test |
| Performance               | Basic performance of particular tasks                                             | • Achenbach System of Empirically Based Assessment  
• Assessment in Nursery Education  
• Functional Communication Profile  
• The Egan Bus Puzzle Test |
| Vocational or career      | Job-related interests                                                              | • Adaptive Functioning Index  
• Career Interest Inventory  
• Pre-vocational Assessment Screen  
• Rothwell-Miller Interest Blank  
• Vocational Adaptation Rating Scales |
| Neuropsychological tests  |                                                                                   | • Boston Naming Test  
• Cognitive Symptoms Checklist  
• d2 Test of Attention  
• Kaplan Baycrest Neurocognitive Assessment  
• Ruff Figural Fluency Test |

*Note:* You can find out more about many of these tests by going to the Buros Center for Testing.
So what’s right? They are all right. The way we classify tests is strictly a matter of organization and convenience, and even a matter of how they are used. The definitions and examples given here reflect the current thinking about tests and measurement. Others feel differently. Welcome to the real world.

Why We Test

Now you know that there are different forms of tests and that there are many different areas of human performance and behavior that are tested regularly. But for what purpose? Here’s a summary of the five main purposes (and there are surely more) for which tests can be used.

Tests are used for selection. Not everyone can be a jet pilot, so only those men or women who score at a certain level of performance on physical and psychological assessments will be selected for training.

Tests are used for placement. Upon entering college, not everyone should be in the most advanced math class or in the most basic. A placement test will determine where the individual belongs.

Tests are used for diagnosis. An adult might seek out psychological counseling, and the psychologist may administer a test or group of tests that helps diagnose any one of many different mental disorders. Diagnostic tests are also used to identify individual strengths and weaknesses.

Tests are used for hypothesis testing. A hypothesis is simply an “if . . . then” statement. For example, if children get extra reading help throughout the week, then they will score better on a reading test of comprehension than will children who do not get extra help. One important part of testing this question is using a test that measures reading comprehension accurately.

Finally, tests are used to classify. Want to know what profession might suit you best? One of several different tests can provide you with an idea of your aptitude (or future potential) for a career in the culinary arts, auto mechanics, medicine, or child care.
SOME IMPORTANT REMINDERS

You’ll learn many different things throughout Tests & Measurement for People Who (Think They) Hate Tests & Measurement (at least we sure hope you will). And with any vibrant and changing discipline, there are always discussions both pro and con about different aspects of the subject. But there are some constants as well, as presented below.

1. Some behaviors can be observed more closely and more precisely than others. It’s pretty easy to measure one’s ability to add single digits (such as $6 + 5 = ?$), but to understand how one solves (not if one can solve) a quadratic equation is a different story. The less obvious behaviors take a bit more ingenuity to measure, but that’s part of the challenge (and delight) of doing this.

2. Our understanding of behavior is only as good as the tools we use to measure it. There are all kinds of ways we try to measure outcomes, and sometimes we use the very best instruments available—and at other times, we may just use what’s convenient. The development and use of the best tools takes more time, work, and money, but it gives us more accurate and reliable results. Anything short of the best forces us to compromise, and what you see may, indeed, not be what you get.

3. Tests and measurement tools can take many different forms. A test can be paper and pencil, self-report, observation, or performance and often gives us very similar information on some outcome in which we are interested. And in some cases, tests are restricted by what they are measuring. For example, most achievement tests are paper and pencil, and most tests that look at performance of motor skills are just that, performance. The lesson here is to select the form of test that best fits the question you are asking.

4. The results of any test should always be interpreted within the context in which they were collected. In many communities, selected
junior high students take a practice Scholastic Assessment Test. Although some of these students do very, very well, others perform far below what you would expect a high school junior or senior to do; perhaps these younger children simply have not yet had the course work. To interpret the results of the younger children using the same metric and scoring standards as for the older children would surely not do either group any justice. The point is to keep test scores in perspective—and of course, to understand them within the initial purpose for the testing.

5. Test results often can be misused. It doesn’t take a rocket scientist to know that there have been significant controversies over how tests are used. You’ll learn more about this in Part V of Tests & Measurement for People Who (Think They) Hate Tests & Measurement, but many of you know how non-English-speaking immigrants who tried to get sanctuary in the United States were turned away in the 1930s based on their test scores. To use tests fairly and effectively, you need to know the purpose of the test, the quality of the test, how it is administered and used, and how the results are interpreted. We’ll do all that in Tests & Measurement for People Who (Think They) Hate Tests & Measurement.

6. Many tests, especially achievement tests, have as their goal distinguishing between those who know the material and those who do not. We want the biology student to understand evolution and the sixth grader to know something about American and world history.

HOW TESTS ARE CREATED

We can suggest several books that are all about the theory and mechanics of test construction, and this is not one of them. But rather than reading 400 pages about this important topic, we’re going to offer a summary of how, in general, a test is designed and which steps are part of the process.

The entirety of the process shown in Table 1.2 is linear; that is, step 2 always follows step 1, but within each step there is some evaluation of whether it is time to move on to the next step. Let’s take a look.
Table 1.2 A Broad Description of the Steps in the Development of a Test

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Idea, trait, or characteristic to be tested</td>
</tr>
<tr>
<td>2</td>
<td>Best method (paper and pencil, performance, survey, interview) to assess the focus of the test</td>
</tr>
<tr>
<td>3</td>
<td>The development of items</td>
</tr>
<tr>
<td>4</td>
<td>The pilot testing of items</td>
</tr>
<tr>
<td>5</td>
<td>The evaluation and revision of items that are not satisfactory</td>
</tr>
<tr>
<td>6</td>
<td>The pilot testing of items</td>
</tr>
<tr>
<td>7</td>
<td>Final determination of items</td>
</tr>
<tr>
<td>8</td>
<td>Development and revision of</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1964</th>
<th>1966</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Rights Act</td>
<td>Equality of Education Report from James Coleman</td>
</tr>
</tbody>
</table>
Chapter 1 ♦ Why Measurement?

So What's New?

Up to now, the development of most tests falls within a classical test theory (or CTT) model. The CTT model (and most of this book discusses the various aspects of that model) primarily looks to increase the accuracy of predicting a test taker's true score or the actual value of a trait, characteristic, level of knowledge, or any other domain. As you will learn later, true scores are theoretical in nature, because it is impossible to rule out all sources of error in test taking (such as bad instructions, ill-prepared test takers, etc.) and get a totally, 100% accurate true score. All these sources of error contribute to an individual's final score.

At least one alternative to CTT is item response theory (or IRT), which places the emphasis not on the individual's performance and the accompanying sources of error but on the items and how item difficulty is not a constant and can change.

---

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>National Assessment of Educational Progress</td>
</tr>
<tr>
<td>1974</td>
<td>Family Educational Rights and Privacy Act</td>
</tr>
</tbody>
</table>
We’ll distinguish between CTT and IRT (as well as some other new approaches) in Chapter 6. All you need to know for now is that, as in almost all disciplines, new ideas and techniques are always being developed, almost always interesting, and surely always ripe for discussion and friendly differences among experts, colleagues, and students as to what’s best.

WHAT AM I DOING IN A TESTS AND MEASUREMENT CLASS?

There are probably many reasons why you find yourself using this book. You might be enrolled in an introductory tests and measurement class. You might be reviewing for your comprehensive exams. Or you might even be reading this on summer vacation (horrors!) in preparation and review for a more advanced class.

In any case, you’re a tests and measurement student whether you have to take a final exam at the end of a formal course or whether you’re just in it of your own accord. But there are plenty of good reasons to be studying this material—some fun, some serious, and some both.

Here’s a list of some of the things my students hear at the beginning of our introductory tests and measurement course.

1. Tests and Measurement 101 or Introduction to Testing or whatever it’s called at your school looks great listed on your transcript. Kidding aside, this may be a required course for you to complete your major. But even if it is not, having these skills is definitely a big plus when it comes time to apply for a job or for further schooling. And with more advanced courses, your résumé will be even more impressive.

2. If this is not a required course, taking a basic tests and measurement course sets you apart from those who do not. It shows that you are willing to undertake a course that is above average in regard to difficulty and commitment.

3. Basic information about tests and measurement is an intellectual challenge of a kind that you might not be used to. A good deal of thinking is required, as well as some integration of ideas.
and application. The bottom line is that all this activity adds up to what can be an invigorating intellectual experience, because you learn about a whole new area or discipline.

4. There's no question that having some background in tests and measurement makes you a better student in the social, behavioral, and health sciences. Once you have mastered this material, you will have a better understanding of what you read in journals and also what your professors and colleagues may be discussing and doing in and out of class. You will be amazed the first time you say to yourself, “Wow, I actually understand what they’re talking about.” And it will happen over and over again, because you will have the basic tools necessary to understand exactly how scientists reach the conclusions they do.

5. If you plan to pursue a graduate degree in education, anthropology, economics, nursing, medicine, sociology, or any one of many social, behavioral, and health sciences fields, this course will give you the foundation you need to move further.

6. Finally, you can brag that you completed a course that everyone thinks is the equivalent of building and running a nuclear reactor.

TEN WAYS TO USE THIS BOOK
(AND LEARN ABOUT TESTS AND MEASUREMENT AT THE SAME TIME!)

Yep. Just what the world needs—another tests and measurement book. But this one is different. It’s directed at the student, is not condescending, is informative, and is as simple as possible in its presentation. It assumes only the most basic information at the start, and if you don’t have that, you can go to Appendix A and get it.

However, there has always been a general aura surrounding the study of tests and measurement that it’s a difficult subject to master. And I don’t say otherwise, because parts of it are challenging. On the other hand, millions and millions of students have mastered this topic, and you can, too. Here are a few hints to close this introductory chapter before we move on to our first topic.

<table>
<thead>
<tr>
<th>1979</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truth in Testing Legislation</td>
<td>No Child Left Behind Act</td>
</tr>
</tbody>
</table>
• You’re not dumb. That’s true. If you were, you would not have gotten this far in school. So treat tests and measurement like any other new course. Attend the lectures, study the material, and do the exercises in the book and from class, and you’ll do fine. Rocket scientists know how to use this stuff, but you don’t have to be a rocket scientist to succeed.

• How do you know tests and measurement is hard? Is this topic difficult? Yes and no. If you listen to friends who have taken the course and didn’t work hard and didn’t do well, they’ll surely volunteer to tell you how hard it was and how much of a disaster it made of their entire semester, if not their lives. And let’s not forget—we always tend to hear from complainers. So I suggest that you start this course with the attitude that you’ll wait and see how it is and judge the experience for yourself. Better yet, talk to several people who have had the class and get a good general idea of what they think. Just don’t base your opinion on one spoil-sport’s experience.

• Form a study group. This is one of the most basic ways to ensure some success in this course. Early in the semester, arrange to study with friends. If you don’t have any who are in the same class as you, then make some new ones or offer to study with someone who looks to be as happy about being there as you are. Studying with others allows you to help them if you know the material better, or to benefit from others who know the material better than you do. Set a specific time each week to get together for an hour and go over the exercises at the end of the chapter or ask questions of one another. Take as much time as you need. Find a coffee shop and go there with your study buddy. Studying with others is an invaluable way to help you understand and master the material in this course.

Stay on Task and Take One Thing at a Time. Material about testing and measurement can be tough to understand, especially if you have never heard any of these terms before or thought about any of these ideas. Follow the guidelines mentioned here and talk with your teacher as soon as you find yourself not understanding something or falling behind.
• **Ask your teacher questions, and then ask a friend.** If you do not understand what you are being taught in class, ask your professor to clarify it. Have no doubt—if you don’t understand the material, then you can be sure that others do not as well. More often than not, instructors welcome questions. And especially because you’ve read the material before class, your questions should be well informed and help everyone in class better understand the material.

• **Do the exercises at the end of a chapter.** The exercises are based on the material and the examples in the chapter they follow. They are there to help you apply the concepts that were taught in the chapter and build your confidence at the same time. How do the exercises do that? An explanation for how each exercise is solved accompanies the problem. If you can answer these end-of-chapter exercises, then you are well on your way to mastering the content of the chapter.

• **Practice, practice, practice.** Yes, it’s a very old joke:

  Q. How do you get to Carnegie Hall?
  A. Practice, practice, practice.

Well, it’s no different with basic statistics. You have to use what you learn and use it frequently to master the different ideas and techniques. This means doing the exercises in the back of the chapter as well as taking advantage of any other opportunities you have to understand what you have learned.

• **Look for applications to make it more real.** In your other classes, you probably have occasion to read journal articles, talk about the results of research, and generally discuss the importance of the scientific method in your own area of study. These are all opportunities to look and see how your study of tests and measurement can help you better understand the topics under class discussion as well as the area of beginning statistics. The more you apply these new ideas, the better and more full your understanding will be.

• **Browse.** Read the assigned chapter first, then go back and read it with more intention. Take a nice leisurely tour of *Tests & Measurement for People Who (Think They) Hate Tests & Measurement* to see what’s contained in the various chapters. Don’t rush yourself. It’s always good to know what topics lie ahead, as well as to familiarize yourself with the content that will be covered in your current statistics class.

• **Have fun.** This indeed might seem like a strange thing for you to read, but it all boils down to your mastering this topic rather than letting the course and its demands master you. Set up a study schedule and
follow it, ask questions in class, and consider this intellectual exercise to be one of growth. Mastering new material is always exciting and satisfying; it’s part of the human spirit. You can experience the same satisfaction here. Just keep your eye on the ball and make the necessary commitment to stay current with the assignments and work hard.

- **Finally, be easy on yourself.** This is not material that any introductory student masters in a matter of hours or days. It takes some thinking and some hard work, and your expectations should be realistic. Expect to succeed in the course, and you will.

### About Those Icons

An icon is a symbol. Throughout *Tests & Measurement for People Who (Think They) Hate Tests & Measurement*, you’ll see a variety of different icons.

Here’s what each one is and what each represents:

- **This icon represents information that goes beyond the regular text**. It might be necessary to elaborate on a particular point, and that can be done more easily outside the flow of the usual material.

- **In Tech Talk, I discuss some more technical ideas and tips to inform you about what’s beyond the scope of this course.** You might find these interesting and useful.

- **Every now and then, but not often, you’ll find steps like the ones you see here.** This indicates that there is a set of steps coming up that will direct you through a particular process. These steps have been tested and approved by whatever federal agency approves these things.

- **That finger with the bow is a cute icon, but its primary purpose is to help reinforce important points about the topic you just read about.** Try to emphasize these points in your studying, because they are usually central to the topic.

### The Famous Difficulty Index

For want of a better way to give you some upfront idea about the difficulty of the chapter you are about to read, we have developed a
highly secret difficulty index using smileys. This lets you know what
to expect as you begin reading.

<table>
<thead>
<tr>
<th>How Hard Is This Chapter?</th>
<th>Look at Mr. Smiley!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very hard</td>
<td>☹</td>
</tr>
<tr>
<td>Hard</td>
<td>☹☹</td>
</tr>
<tr>
<td>Not too hard, but not easy either</td>
<td>☹☹☹</td>
</tr>
<tr>
<td>Easy</td>
<td>☹☹☹☺</td>
</tr>
<tr>
<td>Very easy</td>
<td>☹☹☹☹☺</td>
</tr>
</tbody>
</table>

Bolded terms in the text are included in the glossary at the back of
the book.

**SUMMARY**

Now you have some idea about what a test is and what it does, what areas
of human behavior are tested, and even the names of a few tests you can
throw around at tonight’s dinner table. But most of all, we introduced you
to a few of the major content areas we will be focusing on throughout Tests &
Measurement for People Who (Think They) Hate Tests & Measurement.

**TIME TO PRACTICE**

1. What are some of your memories of being tested? Be sure to include (if
you can) the nature of the test itself, the settings under which the test
took place, how prepared or unprepared you felt, and your response
upon finding out your score.

2. Go to the library (not to the Internet) and identify five journal articles in
your area of specialization, such as teaching math or nursing or social
work. Now create a chart like this for each set of five.

<table>
<thead>
<tr>
<th>Journal Name</th>
<th>Title of Article</th>
<th>What Was Tested</th>
<th>What Test Was Used to Test It?</th>
</tr>
</thead>
</table>
a. Were most of the tests used developed commercially, or were they developed just for this study?

b. Which test do you think is the most interesting, and why?

c. Which test do you think got the closest to the behavior that the authors wanted to measure?

3. Ask your parent, child, professor, colleague, or classmate what he or she believes are the most important reasons for testing and what types of tests he or she can identify.

4. One of the things we did in this opening chapter was identify five different purposes of tests (see page 11). Think of at least two other ways that tests might be used, and give a real-world example of each.

5. Interview someone who uses tests in his or her work, as either an assessment or a research tool, and try to get an idea of the importance he or she places on being knowledgeable about testing and what role it plays in his or her research and everyday professional career. Is he or she convinced that tests assess behavior fairly? Does he or she use alternatives to traditional testing? Does he or she find the results of tests useful for helping students?

6. Extra credit and extra imagination. Use your favorite search engine and search on five different topics related to testing in general, such as fairness in testing, use of computerized testing, how tests are developed, and so on. Use your imagination and search as broadly as possible. Summarize the results of these searches and propose some directions you think testing might be taking in future activities.