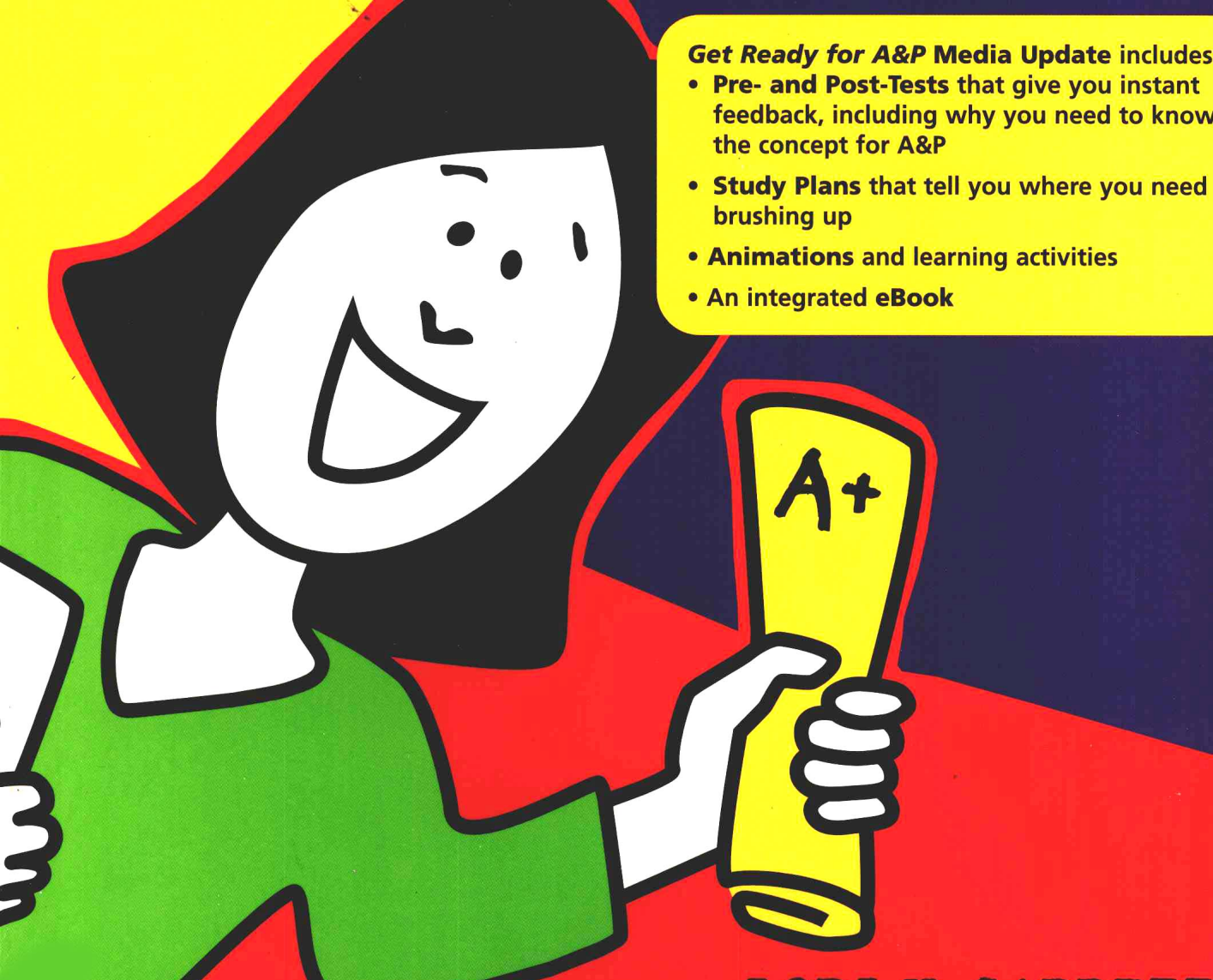

***Get Ready for A&P* Media Update includes**

- **Pre- and Post-Tests** that give you instant feedback, including why you need to know the concept for A&P
- **Study Plans** that tell you where you need brushing up
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LORI K. GARRETT

Get Ready for A&P

- Sharpen Your Study Skills
- Brush up on Math & Science
- Quiz Yourself

LORI K. GARRETT
Danville Area Community College

Get Ready for A&P

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DEDICATION

This book is for all my students,
who continually educate me about life and love,
and who make teaching so very enjoyable.

I also dedicate this book and the tip of my left pinkie
to John Hoagland for taking care of me, believing in me,
and always being there.

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Learning Styles Assessment on pages 5–7

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Welcome to the fascinating world of anatomy and physiology! Most students take A&P because they have to—it's a required part of their educational curriculum. But I hope you quickly discover how amazing the human body is and become intent on learning all that you possibly can about it. After all, you *are* one!

For many reasons, students sometimes do not succeed in their first anatomy and physiology class. If you're reading this Preface, you probably have a strong desire to succeed, and you know the competition for admission into numerous educational programs is increasing. You are likely keenly aware that you can't just pass your classes—you need to do quality work and truly master the course content. This book offers you the opportunity to enhance your performance in this rigorous course. It is designed to help you gear up to be successful.

You may be using this book before your course officially begins. Your instructor may have assigned it to you as homework during the first week or two of class. Perhaps you are using it on your own and will come back to it periodically throughout the semester as you move along in your course. However you use it, the purpose of the book remains the same. The goal is to help you get a strong start in anatomy and physiology, and to master the material not just for exams, but for your future as well. *Get Ready for A&P* contains six relatively short and interactive chapters that engage you every step of the way. You'll read, but you'll also frequently do activities.

The book starts with basic study skills in **Chapter 1**. As with any course, you will get out of A&P what you put into it, and it will take significant time and effort on your part to succeed. This chapter helps you focus and manage your time so you can first find time to study, then use your study time effectively. After exploring different learning styles you can assess which style best fits you, then discover specific study strategies that compliment your preferred style. You'll assess your current habits as a student and learn specific tips and strategies to help you study better. Specific tips will help you write your notes, read textbooks, and take tests.

Chapter 2 covers basic math skills. Anatomy and physiology are sciences, and all science involves at least some math. This chapter takes you from basic math operations through reading and interpreting numerical information in graphs and tables—the math you'll need for a head start in your course.

Many of the words in your A&P class will sound foreign to you, and well they should! Most of the terms come from Latin or Greek. Knowing the terms underlies all aspects of learning in this class. In **Chapter 3**, Terminology, we look at how the words are built and learn some simple tricks that will rapidly expand your A&P vocabulary and have you talking like a pro!

The second half of the book gets more specific and parallels some of what you will cover in the first few chapters of your A&P textbook. In **Chapter 4**, we cover body basics: some general biological principles that guide how the body works, and a quick overview of each organ system. You'll begin to understand how your body is arranged and how the different systems function.

In **Chapter 5**, we tackle some basic chemistry. This chapter gives you the basics, from atoms to organic molecules. We discuss some

neat tricks for gaining information from the Periodic Table, and see how atoms join together to form molecules. If you can understand bumper cars, you can understand bonding!

Finally, in **Chapter 6**, we explore cells. We are made of trillions of them, and almost everything that happens in our bodies occurs inside our cells. We discuss basic cell structure, the cell life cycle, and cell reproduction.

Now that you know the roadmap for this book, let's explore the stops you'll find along the way. Here are the special features in each chapter, designed to keep you involved and to make you a better student in A&P:

- ***Your Starting Point*** tests your grasp of the chapter content before you start. Answers are provided for all of these except in Chapter 1, where the answers are personal.
- ***Quick Check*** asks you to recall or apply what you just read, to keep your eyes from scanning the page while your brain is on vacation. The answer is provided on the same page.
- ***Picture This*** asks you to visualize scenarios and then answer questions about them to help you better understand the topics.
- ***Time to Try*** is a simple experiment or quick assessment in which you perform an active exercise.
- ***Why Should I Care?*** highlights the relevance of the material so you understand its importance in the big picture.
- ***Reality Check*** assesses whether you really "got" the material.
- ***Keys*** highlight main themes or statements for reinforcement and easy review.
- ***Running Words*** list key terms from the chapter to help you start your own running vocabulary list by writing each term in a notebook, then defining it.
- ***What Did You Learn?*** end-of-chapter quizzes may include short answer, multiple choice, or matching exercises. The answers appear at the end of the book.
- ***Web Resources*** provide links to useful Internet sites at which you can learn more or practice what you've learned. Many of these provide additional activities or quizzes as well.

Finally, check out the online component of *Get Ready for A & P* at **www.myaandp.com** or **www.anatomyandphysiology.com**, where you can study and quiz yourself with interactive tutorials, quizzes, animations, flashcards, and an audio glossary.

I wrote *Get Ready for A&P* in a conversational tone because that is how I teach and because science is too often turned boring by boring presentation. Science shouldn't be stuffy—it should be fun! Learning should be peppered with giggles, salted with silliness, and dotted with *AhHA!* moments. Sometimes it seems the terminology alone can put you in a trance, so why should the style?

Now it is time to dig in. So get comfortable, and *Get Ready for A&P!*

Acknowledgments

Ah, where to begin? This project began with what seemed a harmless email from Assistant Editor Jessica Brunner, asking if I would consider submitting a sample chapter for a new workbook. I took the bait. It has been a whirlwind of frenzied activity from that moment, and never have I worked on a project for which the team was more important. To make this book possible, an amazing group pulled together, taking on lots of "other duties as assigned," and ignoring conventional wisdom. I thank Wendy Earl for coming up with a new "Production Paradigm" to make this book happen on an incredibly accelerated schedule, for her rapid turnarounds on copyediting, and for developing a schedule we, surprisingly, found we could almost live with! I thank Randall Goodall for designing the text and keeping it user-friendly, and for so kindly making all our picky revisions. I thank all the gang with him at Seventeenth Street Studios, especially Richard and Valerie, for their work on the paging and art. I thank Kevin "Kartoon" Opstedal for his wonderful cartoon illustrations that kept this book fun, the way science *should* be. And I thank Travis Amos for so quickly getting us just the right photos.

I especially thank the editorial team at Benjamin Cummings. Jessica, thanks for making that initial contact, for all the shipments you sent to me, for being the one left behind when others were traveling, and for all the assorted details you tended to both in and out of my direct line of fire. I wholeheartedly thank Claire Alexander. Claire—I chuckle as I think of you now! I will miss our daily laughs, the lengthy phone chats, and the silliness that kept us both going. And I will always be grateful for the coffee beans—a guaranteed way to help meet tight deadlines. And with greatest respect, I thank Serina Beauparlant for remembering me from previous work and giving me this super opportunity. Serina, you have always made me feel invaluable and been remarkably accommodating. I truly appreciate how closely you followed this project, staying in touch from the road, checking in regularly just to be sure I was happy, and giving me such freedom. I especially thank you for recognizing the need for this project, valuing my skills and knowledge, and pulling together this fantastic and fun team that worked against all odds and that ever-ticking clock to do the impossible. Thanks for my best publishing experience ever.

I also want to extend special thanks to Judy Megaw of Indian River Community College, who took charge of the online component, ensuring a robust website that fully supports this book.

I would be remiss if I didn't thank the many reviewers, listed on the following page, who carefully considered these chapters and gave me their candid feedback—the book is stronger because of their input.

Finally, I gladly acknowledge the home team here at Danville Area Community College. I thank my students for being so supportive and for doing their jobs well so I look good in mine. I thank Donna Davis for getting all those last-minute overnight shipments out the door. I thank Dean Janet Redenbaugh for her constant support of me and all my undertakings, and I thank John Hoagland for putting up with all the insanity and chaos.

—Lori Garrett

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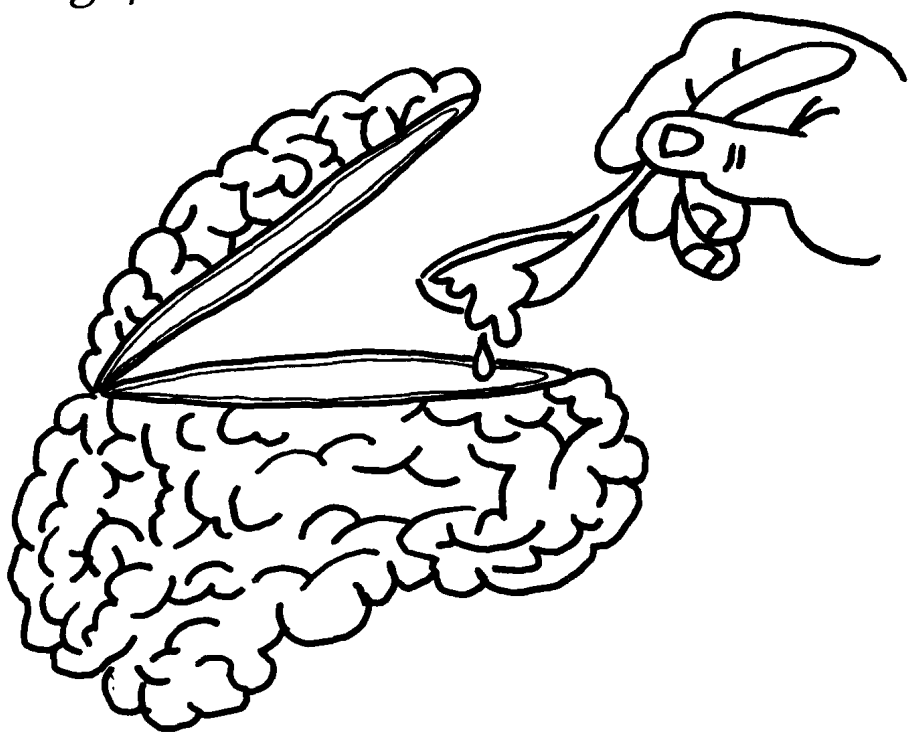
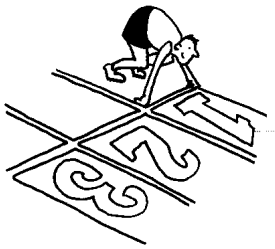
1 Study Skills

The Proper Care and Feeding of a Human Brain



When you complete this chapter, you should be able to:

- Understand your preferred learning style and study strategies that emphasize it.
- Have skills that will help you get the most benefit from lectures, labs, and readings.
- Have a written schedule that includes adequate study time.
- Know how to prepare well for an exam.
- Understand that you are ultimately accountable for your own success or failure.



Your Starting Point

Answer the following questions to assess your study habits.

1. How often do you read a course textbook? _____
2. How many days of the week do you study for one course? _____
3. Do you study hard the day before an exam, but rarely between exams? _____
4. Where do you study? _____
5. How long should you spend studying outside of class? _____
6. Do you schedule your study time and stick to it? _____
7. Do you study hard or hardly study? _____
8. Do you mostly memorize when studying for a test? _____
9. Do you have a good support group of family and friends who encourage you? _____
10. Do you quiz yourself when studying? _____

Welcome to the exciting and sometimes challenging world of anatomy and physiology! You will quickly discover how amazing the human machine truly is—a curious marvel of complexity that is simultaneously surprisingly simple. I hope you will be fascinated by learning how your own body is built (anatomy) and how it works (physiology). Interest in your subject matter always makes it much easier to learn.

Still, no matter how exciting your anatomical explorations may be, your course may, at times, seem rigorous and demanding. You've taken a great first step by turning to this book to jump-start your studies. This book is meant to help you enter the course with a well-planned strategy

Answers: Answers will be individualized, except for #5—you should spend 2–3 hours studying for each hour of class time.

for success and with confidence in your basic science knowledge. The purpose of this chapter is to help you "train your brain" to make your learning process easier and more efficient.

Why Should I Study Anatomy and Physiology?

Most students take anatomy and physiology because it is required for their educational programs. Sometimes when something is required, we do it only because we have to without considering what benefits the task might hold for us. Unfortunately, some students use that approach for anatomy and physiology. Certainly it is easier to study something if you understand why it matters, and this course is no exception.

PICTURE THIS

Until recently your car has run perfectly, but now the engine occasionally quits running and is difficult to restart. Assuming you have little knowledge of auto mechanics, you are not likely to solve the mystery or make repairs yourself. You take it to an auto mechanic, who will consider how your car is malfunctioning—its symptoms, if you will—and then fix it. What knowledge will the mechanic need to accomplish that goal? _____

_____

_____

In what ways are people in health- and medical-related fields similar to the auto mechanic? _____

_____

Why do they need to fully understand anatomy and physiology?

_____

_____

Now consider your own future—what is your planned career?

_____

Why will you need to know anatomy and physiology?

_____

_____

Many anatomy and physiology students plan careers in a medical or health field. Others may be heading into kinesiology, athletic or personal training, perhaps biomechanics or bioengineering, and many other fields. These career areas share a common thread—anatomy and physiology form the foundation on which they are all built. Now, back to our example. To understand your malfunctioning car, the mechanic must first fully understand the parts of your car—how they fit together and how they normally function, just as you will need to understand the parts of the human body and their normal functions. Finally, there is a simpler reason why you should care about learning anatomy and physiology. The human body is an amazing machine, and you own one. Anatomy and physiology are your owner's manual.

To Thine Own Self Be True: **Learning Styles**

What *is* the best way to learn these subjects? A tremendous amount of research has explored how people learn, and there are many opinions. One common approach considers which of the senses a learner relies on the most—sight, sound, or touch:

- Visual learners learn best by *seeing.*
- Auditory learners learn best by *hearing.*
- Tactile (kinesthetic) learners learn best by *doing.*

TIME TO TRY

Let's uncover your learning style.

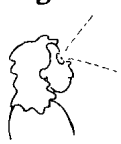
1. Look at **Table 1.1**. Read an activity in the first column, then read each of the three responses to the right of that activity.
2. Mark the response that seems most characteristic of you.
3. After doing this for each row, you are ready for your totals. Simply add all the marks in each column and write the total in the corresponding space in the bottom row.

4. Next look at your numbers. You will likely have a higher total in one column. That is your primary learning style. The second highest number is your secondary learning style.

My primary learning style is: _____

My secondary learning style is: _____

TABLE 1.1 Assessing your learning style.

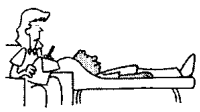
Activity	Column 1	Column 2	Column 3
1. While I try to **concentrate** . . . 	I grow distracted by clutter or movement, and I notice things in my visual field that other people don't.	I get distracted by sounds, and I prefer to control the amount and type of noise around me.	I become distracted by commotion, and I tend to retreat inside myself.
2. While I am **visualizing** . . . 	I see vivid, detailed pictures in my thoughts.	I think in voices and sounds.	I see images in my thoughts that involve movement.
3. When I **talk to someone** . . . 	I dislike listening for very long.	I enjoy listening, or I may get impatient to talk.	I gesture and use expressive movements.
4. When I **contact people** . . . 	I prefer face-to-face meetings.	I prefer speaking by telephone for intense conversations.	I prefer to interact while walking or participating in some activity.

▶

TABLE 1.1 Assessing your learning style, continued.

Activity	Column 1	Column 2	Column 3
5. When I **see an acquaintance** . . . 	I tend to forget names but usually remember faces, and I can usually remember where we met.	I tend to remember people's names and can usually remember what we discussed.	I tend to remember what we did together and may almost "feel" our time together.
6. When I am **relaxing** . . . 	I prefer to watch TV, see a play, or go to a movie.	I prefer to listen to the radio, play music, read, or talk with a friend.	I prefer to play sports, make crafts, or build something with my hands.
7. While I am **reading** . . . 	I like descriptive scenes and may pause to imagine the action.	I enjoy the dialogue most and can "hear" the characters talking.	I prefer action stories, but I rarely read for pleasure.
8. When I am **spelling** . . . 	I try to see the word in my mind or imagine what it would look like on paper.	I sound out the word, sometimes aloud, and tend to recall rules about letter order.	I get a feel for the word by writing it out or pretending to type it.
9. When I **do something new** . . . 	I seek out demonstrations, pictures or diagrams.	I like verbal and written instructions, and talking it over with someone else.	I prefer to jump right in to try it, and I will keep trying and try different ways.

TABLE 1.1 Assessing your learning style, continued.

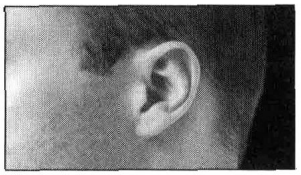
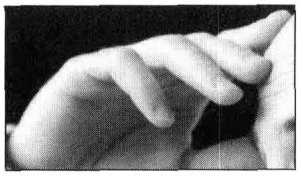
Activity	Column 1	Column 2	Column 3
10. When I **assemble something** . . . 	I look at the picture first and then, maybe, read the directions.	I like to read the directions, or I talk aloud as I work.	I usually ignore the directions and figure it out as I go along.
11. When I am **interpreting someone's mood** . . . 	I mostly look at his or her facial expressions.	I listen to the tone of the voice.	I watch body language.
12. When I **teach others how to do something** . . . 	I prefer to show them how to do it.	I prefer to tell them or write out how to do it.	I demonstrate how it is done and ask them to try.
TOTAL:	**Visual:** _____	**Auditory:** _____	**Tactile/Kinesthetic:** _____

[Source: Courtesy of Marcia L. Conner, www.agelesslearner.com]

Now that you know your primary and secondary learning styles, you can design your study approach accordingly, emphasizing activities that use your preferred senses. Look closely at your scores, though. If two scores are rather close, you already use two learning styles well and will benefit from using both of them when studying. If your high score is much higher than your other scores, you have a strong preference and should particularly emphasize that style. Most people use a combination of learning styles.

In addition, information coming in through different senses reaches different parts of your brain. The more of your brain that is engaged in the learning process, the more effective your learning will be, so try strategies for all three styles and merely emphasize your preferred style over the others. You'll know which strategies work best for you. We'll consider some strategies that you might try for each style; these ideas are summarized for you in Table 1.2.

TABLE 1.2 The three learning styles and helpful techniques to use in your studies.

	Visual	Auditory	Tactile
Techniques to use	❑ Sit close to the teacher. ❑ Take detailed notes. ❑ Draw pictures. ❑ Make flow charts. ❑ Use flash cards. ❑ Focus on the figures, tables, and their captions. ❑ Try coloring books and picture atlases. ❑ Use visualization.	❑ Listen carefully to your teacher's voice. ❑ Read the textbook and your notes out loud. ❑ Tape record lectures and listen to them later. ❑ Listen during class instead of writing notes. ❑ Work in a study group. ❑ Discuss the material with others.	❑ Highlight important information while reading. ❑ Write your own notes in class and while reading the textbook. ❑ Transfer your notes to another tablet or type into your computer. ❑ Doodle and draw as you read. ❑ Build models of anatomical structures. ❑ Create and conduct your own experiments. ❑ Hold your book while reading. ❑ Walk or stand while reading. ❑ Use anatomy coloring books. ❑ Use flash cards.