



Your Sneak Peek:

The MCAT[®] 2015

Judene Wright, M.S., M.A. Ed.

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CONTENTS

INTRODUCTION.....	2
MCAT ²⁰¹⁵ : HOW AND WHY?.....	3
WHAT IS THE MCAT?.....	3
STRUCTURE OF THE MCAT: CURRENT MCAT VS. MCAT ²⁰¹⁵	4
Current MCAT.....	4
MCAT ²⁰¹⁵ — The Highlights.....	5
MCAT ²⁰¹⁵ — The Sections.....	5
SCORING	6
SUMMARY: COMPARISON OF MCAT 2013-2014 AND MCAT ²⁰¹⁵	8
TIMELINES	8
PREPARING FOR THE TEST.....	11
Suggested Coursework.....	11
Suggested Plan.....	11
PREPARING FOR AND TAKING THE MCAT: EVERYTHING YOU NEED TO KNOW TO BE READY	14
Preparation Specifics.....	14
Concentration/Alertness on Test Day	15
Materials Available from the AAMC.....	16
Materials Available from The Princeton Review.....	16
APPENDIX: SKILLS AND CONTENT KNOWLEDGE NEEDED FOR MCAT ²⁰¹⁵	16
Skills Being Tested	16
Scientific Inquiry and Reasoning Skills	17
Critical Analysis and Reasoning Section [CARS] Skills.....	18
SECTION DETAIL: PSYCHOLOGICAL, SOCIAL, AND BIOLOGICAL FOUNDATIONS OF BEHAVIOR.....	19
SECTION DETAIL: BIOLOGICAL AND BIOCHEMICAL FOUNDATIONS OF LIVING SYSTEMS.....	22
SECTION DETAIL: CHEMICAL AND PHYSICAL FOUNDATIONS OF BIOLOGICAL SYSTEMS.....	25
SECTION DETAIL: CRITICAL ANALYSIS AND REASONING SKILLS	28
BASIC MATH TO KNOW FOR THE SCIENCE SECTIONS.....	29
CITATIONS	30

Introduction

In the spring of 2015, the Association of American Medical Colleges (AAMC) will launch MCAT²⁰¹⁵, the biggest change to the MCAT since 1991.

Why are they doing it? What does it mean to you? How will it affect your preparation? You've come to the right place for the answers to your questions.

The healthcare system of tomorrow will require a different kind of physician: not only one who understands how the body works in health and disease, but one who also understands the significant role that society, culture, and mental outlook play in health and well-being. That's why the MCAT is getting a big makeover in 2015—to help medical schools better identify students who will be the best doctors of tomorrow. New content, a new format, and a significant increase in testing time are just a few of the revisions planned.

This Sneak Peek includes a summary of the key test changes and what they might mean for you, depending on your year in school. We know that when it comes to the MCAT, no matter when you take it, you'll want to be prepared. Our team of subject matter experts has years and years of experience preparing students for the MCAT and for success in medical school; if you've got questions, we're here to support you every step of the way.

A final reminder: the MCAT is a marathon, not a sprint. To maximize your score, you need to put in a substantial amount of prep time. The truth is that top scorers are known to spend hundreds of hours getting ready for this notoriously grueling exam. With over thirty years of a proven track record helping millions of students to achieve their goals, The Princeton Review is the only company with the expertise and resources to guide you to MCAT greatness.

MCAT²⁰¹⁵: HOW AND WHY?

The AAMC reviewed the MCAT over a period of three years, reaching out to a wide variety of sources (such as medical school faculty, medical students, residents, and various medical advisory committees) to determine which concepts in the natural sciences were most critical to success in medical school. These topics were subsequently included in the recommendations for MCAT²⁰¹⁵. For more information about the review process, go to <https://www.aamc.org/initiatives/mr5/>.

The Writing Sample section (found in the MCAT prior to 2013) was found to be the least useful in predicting success and was therefore removed from the exam. A section on Behavioral Sciences will be added, along with an increased emphasis on biochemistry. The MCAT will be longer in 2015; increasing by approximately 30% in each existing section. The combination of longer existing sections and the addition of the new Behavioral Sciences section increases the total testing time by approximately 50%; the current MCAT is a 4 ½ hour test, but MCAT²⁰¹⁵ will be a 7 ½ hour test. The increase in the number of questions and testing time helps to increase confidence in the accuracy of scores when comparing applicants.

The next section of our Sneak Peek will introduce you to the current MCAT and discuss what will change on the new test in 2015. If you don't know much about the MCAT or might have a choice of which test to take, please read on.

WHAT IS THE MCAT?

“MCAT” stands for “Medical College Admission Test.” The exam is part of the overall application process for medical school. The MCAT is written, administered, and overseen by the AAMC, the Association of American Medical Colleges. It is a rigorous exam that tests significant scientific content knowledge and the ability to apply that knowledge, as well as the ability to read, understand, and reason about complex material.

Medical schools often use the combination of an applicant's GPA and MCAT scores to make initial cuts from their applicant pool. Indeed, MCAT scores and GPA are reliable predictors of academic success in medical school. (If you are interested, you can find more information about this on the AAMC's MCAT Research website at www.aamc.org/mcatguide.) Thus, good MCAT scores and a high GPA can make it a little easier to get your foot in the door. Of course, final acceptance into medical school depends on a wide variety of factors, including (among other things) the difficulty and depth of your undergraduate coursework, letters of recommendation, extracurricular activities, medically-related work experience, research, and so on; the MCAT should not be your only focus.

STRUCTURE OF THE MCAT: CURRENT MCAT VS. MCAT²⁰¹⁵

Current MCAT

The 2013–2014 MCAT consists of three scored sections (Physical Sciences, Verbal Reasoning, and Biological Sciences) and one unscored voluntary section. This voluntary section can include questions in psychology, sociology, and biochemistry and is used by the AAMC to gather information and other data to prepare for the inclusion of the Behavioral Sciences section on MCAT²⁰¹⁵. Test takers who complete the voluntary section will be compensated by the AAMC with a \$30 Amazon gift card.

At a glance,

- The Physical Sciences section tests concepts in physics and general chemistry equally; approximately half are physics questions and half are general chemistry questions.
- The Verbal Reasoning section tests your ability to understand and evaluate complex information presented in a passage, apply that information to new situations, and use new information to analyze the passage. No content knowledge of any kind is required in this section; all questions can be answered solely from the information in the passage.
- The Biological Sciences section tests concepts in biology and organic chemistry, with greater emphasis on biology. Approximately 70–80% of the questions are biology-based, and the remaining 20–30% are based on organic chemistry.

Most of the questions (about 75%) in the Physical Sciences and Biological Sciences sections are “passage-based,” meaning that they are associated with a chunk of text that typically describes a scientific phenomenon, situation, or experiment. Often there is data to analyze within the passage. The remaining 25% of the scientific questions are “freestanding,” meaning that they are not associated with any additional text or information. All of the questions in the Verbal Reasoning section are passage-based.

Each section of the test contains seven passages (with 5–7 questions each), and the Physical Sciences and Biological Sciences sections also include three sets of freestanding questions that are interspersed with the passages at random.

The MCAT is a computer-based test (CBT) that is *not* adaptive. Adaptive tests base your next question on whether or not you answer your current question correctly. The MCAT is *linear*, or *fixed-form*, meaning that the questions are in a predetermined order and do not change based on your answers. However, there are many versions of the test; on a given test day, different people will see different versions.

YOUR SNEAK PEEK: THE MCAT²⁰¹⁵

Each section on the current MCAT is separated by a 10-minute break:

Section	Time
Test Center Check-In	Variable, can take up to 40 minutes if center is busy
Tutorial	10 minutes
Non-Disclosure Agreement	10 minutes
Physical Sciences	70 minutes
<i>Break</i>	10 minutes
Verbal Reasoning	60 minutes
<i>Break</i>	10 minutes
Biological Sciences	70 minutes
Void Option	5 minutes
<i>Break</i>	10 minutes
Voluntary Unscored Trial	45 minutes
Survey	10 minutes
TOTAL (not including check-in time)	5 hours and 10 minutes

The survey investigates your satisfaction with the overall MCAT experience, including registration and check-in, and asks how you prepared for the test.

MCAT²⁰¹⁵ — The Highlights

The five major changes to the MCAT are:

1. An entire, brand new section testing Behavioral Sciences will be added
2. There will be a greater emphasis on biochemistry
3. Chemistry and physics concepts will be tested in the context of biological systems
4. Natural science and technology topics will no longer be included in the Critical Analysis and Reasoning Skills section (in the current MCAT, the Verbal Reasoning section), and
5. The test will be about two hours longer

MCAT²⁰¹⁵ — The Sections

MCAT²⁰¹⁵ will consist of four scored sections.

Chemical and Physical Foundations of Biological Systems

This section will cover concepts in physics, general chemistry, organic chemistry, and biochemistry. It will test your knowledge of the basic physical and chemical principles inherent in the functions of the human body. This section will also test your ability to apply your knowledge of these general principles to living systems.

Biological and Biochemical Foundations of Living Systems

This section will cover concepts in biology, biochemistry, and organic chemistry. It will test your knowledge of the fundamental concepts governing the unique processes in living systems (growing, reproducing, responding, metabolizing, and adapting). At the same time, it will test your understanding of how cells, organs, and organ systems work together to accomplish these processes as well as your ability to reason about these processes.

Psychological, Social, and Biological Foundations of Behavior

This section will test concepts in psychology, sociology, and biology as how they apply to the socio-cultural and behavioral aspects of health and well-being. You will also be tested on research methods and statistics, and on your ability to apply your knowledge to understand how social and behavioral factors influence health.

Critical Analysis and Reasoning Skills

This section will require you to analyze information from a wide variety of humanities-based disciplines. No prior content knowledge is required, and all questions will be answerable from the provided material.

Each of the three science-based sections will have 67 questions, and you will have 95 minutes to complete each section. The Critical Analysis and Reasoning section will have 60 questions and you will have 90 minutes to complete it. We believe this will result in each section having 9–10 passages, with the science sections including approximately four freestanding question sets each. Note that *the number of questions and minutes is approximate*; this may still be changed by the AAMC before launch date.

SCORING

The MCAT is a scaled exam, meaning that your raw score will be converted into a scaled score that takes into account the difficulty of the questions. There is no guessing penalty. Each section of the current MCAT (PS, VR, and BS sections) is scored on a scale from 1–15, and the AAMC has stated that each section of MCAT²⁰¹⁵ will be scored and scaled similarly. However, because the current MCAT has only three scored sections, the highest possible total score for MCAT 2013–2014 is 45; MCAT²⁰¹⁵, with four scored sections, will have a possible high score of 60. Since different versions of the test have varying levels of difficulty, the scale will be different from one exam to the next. Thus, there is no “magic number” of questions to get right in order to get a particular score. Plus, some of the questions on the test are considered “experimental” and do not count toward your score; they are there simply to be evaluated for possible future inclusion in a test.

At the end of the test, you will be asked to choose one of the following two options, “I wish to have my MCAT exam scored” or “I wish to VOID my MCAT exam.” You have five minutes to make a decision. If you do not select one of the options in that time, the test will automatically be scored. If you choose the VOID option, your test will not be scored (you will not now, or ever, receive a numerical score for this test), medical schools will not know you took the test, and no refunds will be granted. You cannot “unvoid” your scores at a later time.

Even though we can't tell you a specific number of questions to get right in order to receive a particular score, we can tell you the percentile numbers that the scores correspond with in the current MCAT. The percentile numbers tell you what percent of examinees scored lower or higher than you. For example, if you are in the 90th percentile, then 90% of examinees scored lower than you did, and 10% scored higher. It is likely that MCAT²⁰¹⁵ will have similar percentile numbers.

MCAT Scores and Percentiles					
Score	Physical Sciences Percentile*	Verbal Reasoning Percentile*	Biological Sciences Percentile*	Total Score	Percentile*
15	100%	100%	100%	42-45	100%
14	100%	100%	99%	39	99%
13	96%	99%	96%	36	95%
12	92%	97%	92%	33	84%
11	82%	93%	81%	30	64%
10	67%	75%	62%	27	40%
9	51%	54%	37%	24	22%
8	36%	35%	22%	21	11%
7	22%	21%	11%	18	5%
6	10%	13%	7%	15	2%
5	4%	6%	3%	12	1%
4	1%	4%	2%	9	0%
3	1%	1%	1%	6	0%
2	0%	1%	0%	3	0%
1	0%	0%	0%		
	Avg score 9.4, std dev 2.3	Avg score 9.0, std dev 2.1	Avg score 9.9, std dev 2.1		Avg score 28.2, std dev 5.5

*Data from *The Official Guide to the MCAT Exam*, Third Edition, © 2012 Association of American Medical Colleges.

So, what's a good score? Most people would agree that since the average total score on the current MCAT is about 28, you want to at least hit that number. To be competitive, you really want scores in the low 30s; for the top-ranked medical schools, you'll want scores in the high 30s to low 40s. If your GPA is on the low side, you'll need higher MCAT scores to compensate; if you have a strong GPA, you can get away with lower MCAT scores. But the reality is that your chances of acceptance depend on a lot more than just your MCAT scores. It's a combination of your GPA, MCAT scores, undergraduate coursework, letters of recommendation, experience related to the medical field (such as volunteer work or research), extracurricular activities, your personal statement, etc. Medical schools are looking for a complete package, not just good scores and a good GPA. For more information about medical school applications, see <http://www.princetonreview.com/medical-school-advice.aspx>.

Summary: Comparison of MCAT 2013–2014 and MCAT²⁰¹⁵

	MCAT 2013–2014	MCAT ²⁰¹⁵
Length of Test Day	Approximately 5 ½ hours	Approximately 7 ½ hours
Breaks	Optional 10-minute breaks between sections	Optional 10-minute breaks between sections; may include a longer break for lunch
Sections, Questions, and Timing	<ul style="list-style-type: none"> Physical Sciences (PS), 52 questions, 70 minutes Verbal Reasoning (VR), 40 questions, 60 minutes Biological Sciences (BS), 52 questions, 70 minutes Voluntary Unscored Trial Section, 32 questions, 45 minutes 	<ul style="list-style-type: none"> Chemical and Physical Foundations of Biological Systems, 67 questions, 95 minutes Psychological, Social, and Biological Foundations of Behavior, 67 questions, 95 minutes Biological and Biochemical Foundations of Living Systems, 67 questions, 95 minutes Critical Analysis and Reasoning, 60 questions, 90 minutes <p><i>*Number of questions and minutes is approximate</i></p>
Scoring	Test is scaled. Several forms per administration. PS, VR, and BS receive scaled scores of 1–15.	Test is scaled, and scores will likely be reported on the same 1–15 scale as the current MCAT.

TIMELINES

If you're planning to graduate in the class of 2014 or 2015, the changes to the MCAT likely won't impact you. But if you're in the class of 2016, read on.

Classes of 2014 and 2015: You can still take the current MCAT, and we recommend this. It's a shorter test and does not include Behavioral Sciences.

Class of 2016: You can actually take EITHER the current MCAT or MCAT²⁰¹⁵. Most medical schools will accept MCAT scores from the last three years; if you plan to start medical school in 2016, then you will be applying in 2015 and can use 2014 test scores in your application. You will have to decide if your content knowledge is strong enough to take the MCAT in 2014, or if you'd rather wait. You should also check with the medical schools you are interested in to get the final word on their policy about older MCAT scores.

Class of 2017: You should plan on studying for and taking MCAT²⁰¹⁵.

YOUR SNEAK PEEK: THE MCAT²⁰¹⁵

Here are some visual guides for students graduating in 2014–2017.

CLASS OF 2014

The Changes to the MCAT Shouldn't Impact You			
Take the MCAT	Final Chance for the MCAT	Apply to Medical School	Attend Medical School
Spring 2013	Summer 2013	Ideally June 2013 [as late as September 2013]	Fall 2014

CLASS OF 2015

The Changes to the MCAT Shouldn't Impact You			
Take the MCAT	Final Chance for the MCAT	Apply to Medical School	Attend Medical School
Spring 2014	Summer 2014	Ideally June 2014 [as late as September 2014]	Fall 2015

CLASS OF 2016

The Changes to the MCAT WILL Impact You				
Learn about the Test Changes	Take the MCAT	Final Chance for the MCAT	Apply to Medical School	Attend Medical School
Take Psych & Soc course as electives	Spring 2015	Summer 2015	Ideally June 2015 (as late as September 2015)	Fall 2016
2014				

CLASS OF 2017

The Changes to the MCAT WILL Impact You				
Learn about the Test Changes	Take the MCAT	Final Chance for the MCAT	Apply to Medical School	Attend Medical School
Take Psych & Soc course as electives	Spring 2016	Summer 2016	Ideally June 2016 (as late as September 2016)	Fall 2017
2014-2015				

PREPARING FOR THE TEST

The MCAT is a test of both content knowledge and application of that knowledge. You must have the basic science background to effectively answer test questions. We suggest that you take the following courses according to the timeline below.

Suggested Coursework

- General Biology or Cell Biology
- 1 semester of Biochemistry
- Molecular Biology
- Genetics
- Physiology or Anatomy/Physiology
- Biology Lab
- 1 semester of Organic Chemistry
- Organic Chemistry Lab
- 2 semesters of General Chemistry
- General Chemistry Lab
- 2 semesters of Physics
- Introductory Psychology
- Introductory Sociology
- Any course that requires you to read deeply and thoroughly: Literature, History, Humanities, etc.

Suggested Plan

Freshman Year

- General Biology
- General Chemistry
- Biology or Chemistry Lab
- Humanities or Literature Courses
- Math, if necessary

Extracurricular:

- Explore all the various specialties of medical practice.
- Begin a health care-related volunteer job or internship.
- Research academic societies, premed clubs, and other student organizations and consider joining one.

Other:

- Visit your school's premed advisor, review course requirements, and create a premedical game plan.
- Continue investigating medicine. Is it right for you? Develop personal and academic goals. Write them down.
- Build relationships with professors who can later serve as mentors, offer you the opportunity to participate in research, or write recommendations on your behalf.

Sophomore Year

- Cell Biology
- Molecular Biology
- Genetics
- Organic Chemistry and Lab
- Physics
- Humanities or Literature Courses
- Begin cultivating relationships that will lead to good letters of recommendation: go to office hours, talk to your professors, etc.

Extracurricular:

- If you had a positive experience your freshman year, continue with the same extracurricular activity; if you didn't enjoy it or were not sufficiently challenged, begin a new one immediately.

Other:

- Toward the end of the year, begin researching medical school programs.
- Continue seeking relationships with professors and begin a list of those who might write your recommendations.

Junior Year

- Biochemistry
- Physiology or Anatomy/Physiology
- Upper Level Biology Lab (e.g., Physiology Lab, Biochem Lab, etc.)
- Introductory Psychology
- Introductory Sociology
- If you had a positive experience in your sophomore year, continue with the same extracurricular activity; if you didn't enjoy it or were not sufficiently challenged, begin a new one immediately.
- Consider shadowing a doctor in your specific field of interest.
- **OPTION 1:**
 - Take an MCAT prep course with The Princeton Review! You can start this second semester, with the goal of taking the MCAT over the summer. See below for MCAT preparation options.
- **OPTION 2:**
 - Delay MCAT preparation until next year, with the intent of taking a year off between undergraduate studies and medical school.

IF YOU CHOOSE OPTION 1 ABOVE, THEN START YOUR APPLICATIONS:

- Begin drafting your personal statement in early spring.
- Request applications from non-AMCAS medical schools in April.
- Collect letters of recommendation to send in September of your senior year.
- Over the summer, you should complete primary medical school applications. You may start this process as soon as April and, ideally, you should complete it by June or July. As the vast majority of medical schools review applications as they come in and assign interview spots on a rolling basis, your chances of scoring an interview are significantly higher if you apply early. If you want to be considered seriously for a position, you'll want to submit all application material no later than September. Your chances of acceptance go down steadily after June and July and rapidly after September.

Senior Year

- Microbiology (optional)
- Other upper-division Biology or Biochemistry courses, other courses as needed for your major
- Continue cultivating those relationships: consider doing some undergrad research
- Continue your extracurricular activities.
- Consider shadowing a doctor in your specific field of interest
- **OPTION 1:**
 - Apply to medical school.
- **OPTION 2:**
 - Take an MCAT prep course with The Princeton Review! You can start this second semester, with the goal of taking the MCAT over the summer. See below for MCAT preparation options.

IF YOU CHOSE OPTION 1 (IN YOUR JUNIOR YEAR AND ABOVE), THEN CONTINUE WITH YOUR APPLICATION PROCESS:

- Do more comprehensive research about the medical schools to which you applied.
- Complete secondary applications and send in letters of recommendation between September and January.
- Submit FAFSA.
- Prepare for interviews and wait for invitations to interview. Interviews typically take place in the fall, winter, and, at some schools, early spring.
- Interview and wait for letters!

IF YOU CHOSE OPTION 2 (IN YOUR JUNIOR YEAR AND ABOVE), THEN START YOUR APPLICATIONS:

- Begin drafting your personal statement in early spring.
- Request applications from non-AMCAS medical schools in April.
- Collect letters of recommendation to send in September of your senior year.
- Over the summer, you should complete primary medical school applications. You may start this process as soon as April and, ideally, you should complete it by June or July. As the vast majority of medical schools review applications as they come in and assign interview spots on a rolling basis, your chances of scoring an interview are significantly higher if you apply early. If you want to be considered seriously for a position, you'll want to submit all application material no later than September. Your chances of acceptance go down steadily after June and July and rapidly after September.
- Research financial aid options.

Post-Senior Year

- **IF YOU CHOSE OPTION 1 ABOVE:** Go to medical school!
- **IF YOU CHOSE OPTION 2 ABOVE:** Continue with your application process.
 - Do some volunteer work: join the Peace Corps, Doctors Without Borders, etc. Get some real-world experience that will help your application.
 - At the very least, continue your extracurricular activities, consider shadowing a doctor in your specific field of interest.
 - Do more comprehensive research about the medical schools to which you applied.
 - Complete secondary applications and send in letters of recommendation between September and January.
 - Submit FAFSA.
 - Prepare for interviews and wait for invitations to interview. Interviews typically take place in the fall, winter, and, at some schools, early spring.
 - Interview and wait for letters!

PREPARING FOR AND TAKING THE MCAT: EVERYTHING YOU NEED TO KNOW TO BE READY

Preparation Specifics

Premed students often underestimate the amount of time it takes to fully prepare for the MCAT. A recent survey of people considering MCAT preparation, current MCAT prep students, and MCAT prep alumni revealed that while people considering MCAT preparation anticipated spending around 200 hours to prepare, current MCAT students actually spend about 300 hours preparing. Perhaps most revealing was the report that MCAT prep alumni wished they had spent around 400 hours preparing for this test!! You should consider preparing for the MCAT the equivalent of work you would do for college credit and set aside significant time each week for study, review, and practice work.

Make sure you include practice tests in your MCAT preparation, however don't neglect or hoard up practice tests until the end of your MCAT prep! Studies have shown that the number of practice tests taken correlates with higher test scores. Take your practice tests exactly as you would the real MCAT; try to set aside time during the day at the same time that your actual test is scheduled. Take all sections of the practice tests, and use your breaks in the way you anticipate using them on test day. Experiment with snacks to fuel your brain and stretches or movement to boost circulation so that you can maximize your performance on test day. By the time you get to the real exam, it will feel familiar and be less stressful.

Concentration/Alertness on Test Day

On test day, you need to be comfortable and alert, but not too comfortable. Wear loose-fitting clothing, but give the test some importance by dressing up for it a bit, so that just glancing at your clothes reminds you that you are taking this seriously. In other words, don't show up in a suit and tie, but don't wear sweats that you relax in at home, either. The important thing is to maintain a mental edge throughout the test. If you are in the excellent habit of taking your shoes off and wiggling or stamping your feet occasionally to restore circulation when you feel sleepy or tired, then you should consider wearing thicker socks, double layers of socks, or socks and sandals to the test. This arrangement leaves you free to kick off your shoes or wiggle your toes without the cold floor distracting you.

Some tips for the week before your MCAT:

- **Sleep:** If you want to sleep a few extra hours before the test to get a mental boost, don't do it the night before, but instead do it three nights before your test day. This way you will avoid the residual sleepiness people feel the day after they have slept significantly longer than what they usually do.
- **Exercise:** Light aerobic exercise the week of your test (breaking a sweat for a half-hour or less), followed by a quick swim or shower can increase your alertness. However, unless you have been exercising for weeks leading up to the test week, last-minute heavy exercise may actually decrease your alertness on the test, so be wary of it.
- **Food and drinks:** You are prohibited from bringing food or drinks into the actual testing room, but you can leave food in the locker in the lobby. Choose items that have a mix of fats and proteins (e.g., peanut butter crackers) so that they will not cause a sugar rush and subsequent crash. Consider whether you want a caffeine-containing drink or not. Experiment with different foods and drinks during your practice tests at home; don't bring something to the test center you haven't eaten before. You don't want to be dealing with an upset stomach while trying to take the MCAT.
- **A quality pre-test meal:** As mentioned above, avoid the sugar rush and crash. Eat foods with enough protein to keep you going through the first part of the test. You will be able to access your locker during the breaks in-between test sections.

Finally, when it comes to test day, we have one word of advice: relax. The MCAT is a test of your endurance as much as it is a test of your knowledge—take a minute at the beginning of the exam to close your eyes, find your focus, and tell yourself, I am ready for this. More than likely, you've spent years preparing for this test and while it's only one milestone on your road to becoming a doctor, it's a pretty important one. Believe in yourself and the work you have done to be ready for this moment. After all, the experience of taking a rigorous standardized test will eventually seem like a walk in the park compared to the responsibility of holding a person's life in your hands. If you've got what it takes to be a doctor, you can start by showing that in your confidence and focus on test day.

Materials Available from the AAMC

AAMC Practice Tests: The AAMC has stated that it will release a new MCAT²⁰¹⁵ practice test in the fall of 2014, and a second MCAT²⁰¹⁵ practice test in the fall of 2015. At this time, they are planning to retire the current MCAT practice tests in early 2015.

The AAMC is also planning to release a new version of *The Official Guide to the MCAT Exam*, likely in mid- to late 2014. This book includes much information about the test itself (test day, registration, scoring, etc.) as well as chapters designed to help prepare you for the test (descriptions of the sections, types of passages, practice passages/questions, and solutions).

You can find more information at the AAMC website, www.AAMC.org. The more you know about the test, the better prepared you'll be for the actual experience.

Materials Available from The Princeton Review

The Princeton Review will have a complete preparation course for MCAT²⁰¹⁵, including top-notch books to review content, thousands of online practice questions and passages, full-length practice tests, diagnostic exams to assess your strengths and weaknesses, and teachers who are subject-matter experts. We are developing our course to fully address the new Behavioral Sciences section as well as the changes in the other test sections. You can count on us to continue to deliver the best, most comprehensive MCAT preparation available, both live in-person and live online!

How you choose to prepare for the MCAT is up to you, of course. The Princeton Review offers a variety of prep options as mentioned above, as well as personalized, one-on-one tutoring programs. You can find more information on our website, www.princetonreview.com, or by calling us at 1-800-2REVIEW.

APPENDIX: SKILLS AND CONTENT KNOWLEDGE NEEDED FOR MCAT²⁰¹⁵

Skills Being Tested

The AAMC *Preview Guide for the MCAT²⁰¹⁵ Exam*, Second Edition, describes in detail the necessary skills for success in both the science sections and in the Critical Analysis and Reasoning Skills (CARS) section. Because that document can be overwhelming, we've culled the most important parts (see boxed text) and assembled that here for you. As you review the information below (and in the next section) about the skills and content that will be tested, make a check mark next to items (skills OR content) that your classes have covered. Put a "+" next to anything you know is an area of strength for you, then circle or underline topics that you either haven't studied yet or that you know you'll need extra help with.

From the *Preview Guide*:

Scientific Inquiry and Reasoning Skills

Knowledge of Scientific Concepts and Principles:

- Demonstrating an understanding of scientific concepts and principles
- Identifying the relationships between closely related concepts

Scientific Reasoning and Problem Solving:

- Reasoning about scientific principles, theories, and models
- Analyzing and evaluating scientific explanations and predictions

Reasoning About the Design and Execution of Research:

- Demonstrating an understanding of important components of scientific research
- Reasoning about ethical issues in research

Data-Based and Statistical Reasoning:

- Interpreting patterns in data presented in tables, figures, and graphs
- Reasoning on and drawing conclusions from data

In other words, you will be tested on your understanding of scientific concepts as well as the ability to apply that knowledge to new situations, while demonstrating an understanding of research principles and data analysis.

Most test takers are reasonably comfortable with their understanding of the science concepts being tested, especially after doing some review. Most test takers are also reasonably comfortable with data analysis and research principles...you remember those chemistry, physics, and biology lab classes, right? It's the *application of this knowledge* to new and unfamiliar situations that is challenging. To get an idea of the way the MCAT tests application of knowledge, take a look at our MCAT²⁰¹⁵ Sneak Peek Mini-Test.

As you move through your undergraduate course work, take the time to work actively to apply the topics you're learning. There are study questions at the end of the chapters in virtually every basic science college textbook. They typically fall into two main categories: memory-style questions that just ask you to regurgitate facts or word problems and more robust "reasoning"-style questions. These are typically titled "Critical Thinking" questions or "Challenge" questions. Make sure to look at and think about those questions...*that's* the way the MCAT wants you to think about and apply your science knowledge.

From the *Preview Guide*:

Critical Analysis and Reasoning Section (CARS) Skills

Foundations of Comprehension:

- Understanding the basic components of the text
- Inferring meaning from rhetorical devices, word choice, and text structure

Reasoning Within the Text:

- Integrating different components of the text to increase comprehension

Reasoning Beyond the Text:

- Applying or extrapolating ideas from the passage to new contexts
- Assessing the impact of introducing new factors, information, or conditions to ideas from the passage

In other words, you will be tested on your ability to:

1. Understand complex written material, including any implied meaning
2. Evaluate the logic, plausibility, and soundness of the material and its arguments
3. Either apply the information in the material to new situations OR consider how new information might affect the logic, plausibility, and soundness of the material and its arguments

Did you suffer through that required English, literature, or humanities class? Many of these skills are the ones you should have been developing there. It's not too late: you can still prepare for this section of the test by continuing to read and think critically about high-level material. Read broadly and from sources with significant content. Consider joining a book club, or a debate team, where you have to analyze, discuss, and debate content that requires high-level thought. To get started, here are some suggested books. Note that this is by *no means* a comprehensive list! There is a lot of excellent material out there to choose from.

Suggested Supplemental Reading List

1. Bate, Walter Jackson (1991), *The Burden of the Past and the English Poet*
2. Campbell, Joseph (1949), *The Hero with a Thousand Faces*
3. Durant, Will (1935), *The Story of Civilization*
4. Giroux, Henry A. (1988), *Schooling and the Struggle for Public Life: Critical Pedagogy in the Modern Age*
5. Gould, Stephen Jay:
 - (1981) *The Mismeasure of Man*
 - (1997) *Questioning the Millennium: A Rationalist's Guide to a Precisely Arbitrary Countdown*
6. Haraway, Donna (1989), *Primate Visions: Gender, Race, and Nature in the World of Modern Science*
7. Lakoff, George and Johnson, Mark (1980), *Metaphors We Live By*
8. Panofsky, Erwin (1955), *Meaning in the Visual Arts*
9. Welleck, Rene and Warren, Austin (1955), *Theory of Literature*

SECTION DETAIL:

PSYCHOLOGICAL, SOCIAL, AND BIOLOGICAL FOUNDATIONS OF BEHAVIOR

Overview

- ✓ 67 questions, 95 minutes
- ✓ 9–10 passages
- ✓ 3–4 sets of freestanding questions (approximate estimates)

This is the new section for MCAT²⁰¹⁵; it requires test takers to have a basic understanding of the principles taught in introductory psychology and sociology courses. An understanding of the fundamental principles guiding behavior is important to the study and practice of medicine, since cultural and social differences can influence access to health care and overall well-being. The passages in this section are also designed to test concepts in statistics and research methods, so most will be based on experiments and data.

The *Preview Guide for the MCAT²⁰¹⁵ Exam*, Second Edition, indicates that questions in this section will be drawn from **five foundational concepts**:

1. Biological, psychological, and socio-cultural factors influence the ways that we, as individuals, perceive, think about, and react to the world.
2. Biological, psychological, and socio-cultural factors influence behavior and behavioral change.
3. Psychological, socio-cultural, and biological factors influence the way we think about ourselves and others.
4. Cultural and social differences influence well-being.
5. Social stratification and access to resources influence well-being.

Some of the topics associated with these foundational concepts are listed below.

Foundational Concepts and Topics

1. Biological, psychological, and socio-cultural factors influence the ways that we, as individuals, perceive, think about, and react to the world.

Topics for this concept include

- Sensory processing
- Vision
- Hearing
- Other senses
- Perception
- Attention
- Cognition
- Consciousness
- Memory
- Language
- Emotion
- Stress

2. Biological, psychological, and socio-cultural factors influence behavior and behavioral change.

Topics for this concept include

- Biological bases of behavior (neurons, CNS, neurotransmitters, endocrine system, behavioral genetics, environmental effect on behavior, human development)
- Personality
- Psychological disorders
- Motivation
- Attitudes
- Effect of others' presence on individual behavior
- Group processes
- Culture
- Socialization
- Habituation and dishabituation
- Associative learning
- Observational learning
- Theories of attitude and behavior change

3. Psychological, socio-cultural, and biological factors influence the way we think about ourselves and others.

Topics for this concept include

- Self-concept and identity
- Formation of identity
- Attributing behavior to persons or situations
- Prejudice and bias
- Processes related to stereotypes
- Elements of social interaction
- Self-presentation and interaction with others
- Social behavior
- Discrimination

4. Cultural and social differences influence well-being.

Topics for this concept include

- Theoretical approaches to social structure
- Social institutions
- Culture
- Demographic structure of society
- Demographic shifts and social change

5. Social stratification and access to resources influence well-being.

Topics for this concept include

- Spatial inequality
- Social class
- Health disparities
- Health care disparities

SECTION DETAIL:

BIOLOGICAL AND BIOCHEMICAL FOUNDATIONS OF LIVING SYSTEMS

Overview

- ✓ 67 questions, 95 minutes
- ✓ 9–10 passages
- ✓ 3–4 sets of freestanding questions (approximate estimates)

This section effectively replaces the Biological Sciences section of the current MCAT, significantly downplaying organic chemistry and significantly enhancing biochemistry. It also appears that some general chemistry concepts will creep in (colligative properties, osmotic pressure, concentration cells, Nernst equation). Much of the organic chemistry currently in the Biological Sciences section is moving to the new Chemical and Physical Foundations of Biological Systems section.

Topics and Subtopics Being Added/Increased in Depth

- Protein structure and folding, posttranslational modification
- Protein separation techniques
- Enzyme classification
- Uncompetitive inhibition
- Regulatory enzymes
- DNA replication details
- Wobble rules
- Ribozymes
- Importance of introns
- DNA methylation
- Recombinant DNA/Biotechnology lab techniques
- Gluconeogenesis
- Pentose phosphate pathway
- Glycogenesis/glycogenolysis
- Fatty acid oxidation
- Biosynthesis of macromolecules
- Steroids/waxes, terpenes/terpenoids
- Prions/viroids
- Cancer
- Regenerative capacity in some species
- Senescence/aging
- Henry's law
- Autoimmune diseases
- Enteric nervous system
- Muscle fibers and contractile velocity

The *Preview Guide for the MCAT²⁰¹⁵ Exam*, Second Edition, indicates that questions in this section will be drawn from **three foundational concepts**:

1. Biomolecules have unique properties that determine how they contribute to the structure and function of cells and how they participate in the processes necessary to maintain life.
2. Highly organized assemblies of molecules, cells, and organs interact to carry out the functions of living organisms.
3. Complex systems of tissues and organs sense the internal and external environments of multicellular organisms, and through integrated functioning, maintain a stable internal environment within an ever-changing external environment.

Some of the topics associated with these foundational concepts are listed below.

Foundational Concepts and Topics

1. Biomolecules have unique properties that determine how they contribute to the structure and function of cells and how they participate in the processes necessary to maintain life.

Topics for this concept include

- Amino acids
- Protein structure
- Non-enzymatic protein function
- Enzyme structure and function
- Control of enzyme activity
- Nucleic acid structure and function
- DNA replication/repair of DNA
- Genetic code
- Transcription
- Translation
- Eukaryotic chromosome organization
- Control of gene expression in prokaryotes
- Control of gene expression in eukaryotes
- Recombinant DNA and biotechnology
- Mendelian concepts
- Meiosis and genetic variability
- Analytic methods in genetics
- Evolution
- Principles of bioenergetics
- Carbohydrates
- Glycolysis, gluconeogenesis, pentose phosphate pathway
- Principles of metabolic regulation
- Citric acid cycle
- Metabolism of fatty acids and proteins
- Oxidative phosphorylation
- Hormonal regulation and integration of metabolism

2. Highly organized assemblies of molecules, cells, and organs interact to carry out the functions of living organisms.

Topics for this concept include

- Plasma membrane
- Membrane-bound organelles
- Cytoskeleton
- Tissues formed from eukaryotic cells
- Cell theory
- Classification/structure of prokaryotes
- Growth and physiology of prokaryotes
- Genetics of prokaryotes
- Viral structure and life cycles
- Mitosis
- Biosignalling
- Reproductive systems
- Embryogenesis
- Mechanisms of development

3. Complex systems of tissues and organs sense the internal and external environments of multicellular organisms, and through integrated functioning, maintain a stable internal environment within an ever-changing external environment.

Topics for this concept include

- Nervous system structure and function
- Nerve cells
- Electrochemistry
- Biosignalling
- Lipids
- Endocrine system: hormones and sources
- Endocrine systems: mechanisms of hormone action
- Respiratory system
- Circulatory system
- Lymphatic system
- Immune system
- Digestive system
- Excretory system
- Reproductive system
- Muscular system
- Muscle cell
- Skeletal system
- Skin system

SECTION DETAIL:

CHEMICAL AND PHYSICAL FOUNDATIONS OF BIOLOGICAL SYSTEMS

Overview

- ✓ 67 questions, 95 minutes
- ✓ 9–10 passages
- ✓ 3–4 sets of freestanding questions (approximate estimates)

This section somewhat replaces the Physical Sciences section on the current MCAT, although the amount of physics is decreasing and virtually all of organic chemistry has moved to this section. Additionally, the style in which these topics will be tested is significantly different; instead of having, say, a physics passage about forces and tensions in a pulley system, there may be a physics passage about forces and tensions in skeletal muscles during running. The passage and questions are significantly more slanted toward biology.

Topics and Subtopics Being Removed from Physics

- Much of mechanics (forces, motion, gravitation, uniform circular motion, friction, etc.)
- Translational/rotational equilibrium
- Momentum and collisions
- Some waves and periodic motion (although sound waves will remain)
- Properties of solids/materials responses to stress

Topics and Subtopics Being Added to Physics

- PV diagram
- Shock waves
- Venturi effect/pitot tube
- Metallic/electrolytic conductivity
- Pauli exclusion principle
- Paramagnetism/diamagnetism
- Heisenberg uncertainty principle
- Photoelectric effect
- Mass spectrometry

Topics and Subtopics Being Removed from General Chemistry

- Electron quantum numbers
- Electron configuration for noble gases and transition metals
- Coulomb's law
- Lattice energy
- Much of colligative properties

Topics and Subtopics Being Added to General Chemistry

- Mass spectrometry
- Heisenberg uncertainty principle
- Photoelectric effect
- Chemical characteristics of alkaline earths, halogens, noble gases

Topics and Subtopics Being Removed from Organic Chemistry

- Physical properties of hydrocarbons
- Ring strain/radical stability
- Free radical halogenation
- Nucleophilic substitutions
- Elimination reactions
- Formation of alkyl halides
- Reactions of alkenes and alkynes
- Aromatic compounds
- Wolff-Kishner reaction
- Haloform reactions
- Wittig reaction
- Cycloaddition reactions
- Reactions of monosaccharides

Topics and Subtopics Being Added to Organic Chemistry

- Lactams, lactones, enamines, and cyanohydrins
- Resolution of enantiomers
- Protection of alcohols
- Mesylates and tosylates
- Kinetic and thermodynamic enolates
- Transesterification
- HPLC
- Electrophoresis
- Strecker and Gabriel syntheses of amino acids
- Sulfur linkages in amino acids
- Keto/enol tautomerism of monosaccharides
- Nucleic acid chemistry

The *Preview Guide for the MCAT²⁰¹⁵ Exam*, Second Edition, indicates that questions in this section will be drawn from **two foundational concepts**.

1. Complex living organisms transport materials, sense their environment, process signals, and respond to changes using processes that can be understood in terms of physical principles.
2. The principles that govern chemical interactions and reactions form the basis for a broader understanding of the molecular dynamics of living systems.

Some of the topics associated with these foundational concepts are listed below.

Foundational Concepts and Topics

1. Complex living organisms transport materials, sense their environment, process signals, and respond to changes using processes that can be understood in terms of physical principles.

Topics for this concept include

- Translational motion
- Equilibrium
- Work
- Energy
- Fluids, including circulatory system
- Gas phase
- Electrostatics
- Circuit elements
- Electrochemistry, including nerve cell
- Sound
- Light/electromagnetic radiation
- Molecular structure and absorption spectra
- Geometrical optics
- Atomic nucleus
- Electronic structure
- The periodic table: classification of elements
- The periodic table: variations by group/row
- Stoichiometry

2. The principles that govern chemical interactions and reactions form the basis for a broader understanding of the molecular dynamics of living systems.

Topics for this concept include

- Acid/base equilibria
- Ions in solutions
- Solubility
- Titration
- Covalent bond
- Liquid phase intermolecular forces
- Separations and purifications

- Nucleotides and nucleic acids
- Amino acids, peptides, proteins
- Three-dimensional protein structure
- Non-enzymatic protein function
- Lipids
- Carbohydrates
- Aldehydes and ketones
- Alcohols
- Carboxylic acids
- Acid derivatives (anhydrides, amides, esters)
- Phenols
- Polycyclic and heterocyclic aromatic compounds
- Enzymes
- Principles of bioenergetics
- Phosphorus compounds
- Thermochemistry/thermodynamics
- Kinetics/equilibrium

SECTION DETAIL:

CRITICAL ANALYSIS AND REASONING SKILLS

Overview

- ✓ 60 questions, 90 minutes
- ✓ 9–10 passages
- ✓ No freestanding questions (approximate estimates)

This section effectively replaces the Verbal Reasoning section on the current MCAT; however, it will no longer include passages based on the natural sciences or technology. No content knowledge is necessary for this section; all questions can be answered utilizing information from the passage.

Topics Being Removed from Critical Analysis and Reasoning Skills

- Natural sciences
- Technology and engineering

Topics Being Added to Critical Analysis and Reasoning Skills

- Dance
- Ethics
- Geography
- Cultural studies
- Population health

The *Preview Guide for the MCAT²⁰¹⁵ Exam*, Second Edition, indicates that questions in this section are designed to assess the following **broad skills**:

Foundations of Comprehension:

- Understanding the basic components of the text
- Inferring meaning from rhetorical devices, word choice, and text structure

Reasoning Within the Text:

- Integrating different components of the text to increase comprehension

Reasoning Beyond the Text:

- Applying or extrapolating ideas from the passage to new contexts
- Assessing the impact of introducing new factors, information, or conditions to ideas from the passage

BASIC MATH TO KNOW FOR THE SCIENCE SECTIONS

MCAT math does not go beyond Algebra II, basic trigonometry, and vector addition and subtraction. An understanding of calculus is not required. No calculators are permitted or required, so the math that does show up is straightforward and can be fairly easily completed or estimated. The general concepts you need to know are

1. How to analyze data from graphs, tables, and other figures, including linear and logarithmic graphs, and slope calculation
2. Basic statistics as used to determine if data is meaningful (e.g., standard deviation, mean, correlation, etc.)
3. Significant digits and numerical estimation
4. The metric system and the ability to convert between metric and standard systems (conversion factors are provided if needed)
5. Ratios and proportions, percents, square root estimates, probability
6. Natural and base ten logarithms, scientific notation
7. Basic and inverse trigonometry functions (sine, cosine, tangent), values of these functions at 0, 90, and 180 degrees, right triangles
8. The right-hand rule, vector addition and subtraction

CITATIONS

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