



Certification Handbook

American Society for Quality

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Introduction to ASQ Certification Programs

Since 1968, when the first ASQ certification exam was given, more than 120,000 individuals have become certified through ASQ, including many who have attained more than one designation. In addition, an increasing number of companies, 125 at last count, have formally recognized ASQ's certifications as verification of an individual's knowledge of quality theory and techniques. A recent search on monster.com, an Internet job listings site, resulted in more than 300 job postings either requiring an ASQ certification or listing it as a preferred quality of a prospective employee. These statistics demonstrate the increasing value of ASQ certification as perceived in the marketplace.

It is important to understand that ASQ certification is not a license or registration. It is peer recognition that an individual has demonstrated proficiency in, and comprehension of, a particular quality area at a specific point in time. ASQ certification is awarded to those who meet three criteria: Candidates must 1) have a specified level of education and/or experience, 2) provide proof of professionalism, and 3) pass a standardized exam in the certification area.

For many, the certification process remains something of a mystery. Frequently asked questions come up about how the exams are created, how they are scored, and how best to prepare for taking a test. We will address these issues in this handbook.

The Exams and the Questions

ASQ certification exam development relies heavily on the efforts of ASQ certified members. During the course of a year, approximately 300 subject-matter experts are involved in some phase of exam development. Volunteers travel to ASQ headquarters in Milwaukee, WI, for two-day workshops to engage in exam-development related activities. These are intense sessions with considerable discussion and interaction and, during this time, the volunteers put in fast-paced days that may keep them occupied for up to 10 hours in a day.

Workshop activities include development of a body of knowledge (BOK) or writing exam questions, and otherwise ensuring the validity of an exam through a variety of review processes. In return, the volunteers broaden their knowledge and skills through networking with peers from a variety of services and industries. They also come away with the knowledge that they have contributed to the development of many areas of the quality field.

The ASQ Certification Board has oversight responsibility for the exams, and its top priority is to ensure the integrity of the exam development process. Toward that end, the board has mandated that anyone involved in the development of an exam must refrain from helping certification candidates prepare for a test, either formally or informally, for a period of two years after their last involvement in the process.

The Many Phases of Exam Development

To ensure that ASQ certification retains its status as a hallmark of excellence, the Certification Board uses continuous improvement processes and formally reexamines each certification program on a five-year cycle. This ensures the continued relevance of the exams in the global marketplace.

Job Analysis and Survey – Creates the foundation for an exam

Whether a program is new or has been available for many years, the starting point for the exam development process is with a job analysis. This tool is developed as a survey and is used to identify the skills and knowledge areas currently being used in the field to be tested.

Advisory Committee – Identifies job responsibilities and knowledge of the field

To create an appropriate survey instrument, an advisory committee is appointed by the sponsoring ASQ division. This committee, and all of the subsequent exam development committees, is composed of ASQ members who are already certified and who work in the area to be tested. In the case of brand-new certification exams, ASQ volunteers who serve on the committee are subject-matter experts in the field to be tested.

The volunteers for the advisory committee meet for two days, and their primary goal is to identify typical job responsibilities (what people do on the job), and the knowledge required (what people need to know to perform their job). The result of



this meeting is a questionnaire that asks respondents to rate each item in the survey in terms of criticality (How important is this task or knowledge?) and frequency (How often is this task performed or knowledge used?).

Member Input – Decides what will be in the BOK

Once the survey instrument has been approved by the advisory committee, it is sent to a sample of certified or otherwise qualified ASQ members who either work in the area to be tested (as identified by job title) or supervise employees who perform the tasks identified in the survey. Except for the deliberate job-title selection, the 2,000 plus certified ASQ members who receive the survey are randomly selected across geographic locations and industry types to ensure that no one industry or region skews the results of the survey. The data from the survey are analyzed and a set of recommended tasks and knowledge areas are presented to the sponsoring division for approval. This same report is then submitted to the Certification Board for final approval.

Although the sponsoring division and the Certification Board approve the results of the job analysis, the ASQ members who answer the survey determine what should be in the BOK and, ultimately, the material that will be covered in the exam.

Body of Knowledge Committee – Organizes the content

After the approval process of the survey report, a BOK committee is formed. This committee includes some members of the advisory committee and other qualified subject-matter experts, who together represent a wide demographic of the industry and service spectrum.

The BOK committee meets for two days, and its primary task is to translate the job analysis results into meaningful categories that can be tested. As part of this process, the committee determines how many test questions will be tested in each area of the BOK, basing this on the importance of the topic as indicated in the job analysis, and the depth of testable material for each subtopic.

Question-Writing Committee – Writes the exam questions

The next step is the actual writing of the exam questions. This task is accomplished by a group of 16 certified volunteers during a two-day question-writing workshop. The volunteers are given extensive training in a variety of exam development issues, including how to avoid writing trick questions and how to develop thought-provoking questions and answers.

The processes used in this and other exam development workshops are driven by standards that are internationally recognized for the development of assessments. In keeping with these standards and as a means of ensuring the validity of the exam, each question must be linked to a book from a list of references for that certification. The reference list for each exam can be viewed by visiting <http://www.asq.org/certification/prepare.html>. Click on the exam you are researching and then scroll down the page to click “Books”. This required link means that the question writers must document support for the correct answer, down to the specific page number, in the reference data provided for each question. Once a question writer or team has finished writing a complete test question, other members of the team review it for completeness, accuracy, and appropriateness. The item is then reviewed by ASQ Test Development staff.

After approval by multiple reviewers at the question-writing workshop, the information is data-entered into the exam bank as a “raw” test question.

Question Review Committee – Verifies and reviews each question

The next stage in the exam development process is to convene a panel of 12 subject-matter experts/volunteers who meet for two days to review those raw questions, verify the references and the BOK classifications, and, most important, agree that there is only one answer to a question.

The additional, intensive processes of review, revision, and rework are designed to ensure that all language ambiguities have been eliminated and that all questions have been phrased and presented as clearly as possible. The questions are also reviewed to ensure that they are not biased in favor of any particular industry. A question can be selected for use in a test only after passing through these two initial phases of development.

Exam Review Committee – Takes the test – The last question check before the exam

The next phase in the process is the exam review meeting in which another 12 subject-matter experts are asked to participate by actually taking the exam, and then submitting their answers to Test Development personnel, along with comments about the questions and answers.

They then come to the meeting to discuss the test and their work on it, reviewing each question for clarity and correctness after having actually taken the exam.

At the end of this exam review process, each question on the test has been reviewed and approved by dozens of qualified professionals.



Exam Statistics – Post-exam question verification

Despite the best efforts of all of these individuals, there are questions on a test that do not perform well. These problem items are identified through a statistical analysis that is conducted after each administration of a test. Also, written comments from examinees who took the test and from the proctors at the test sites are used to identify any problematic questions (i.e., confusing terms used, questions with more than one correct answer, etc.). These problem items are reviewed by the exam program's Certification Board chair and other subject-matter experts, in conjunction with Certification Offerings Test Development staff members. If a question is determined to be unfair or inaccurate, all examinees are given credit for that question on the exam.

Grading Process – ASQ's exam grading process

Just as great care is taken in developing an exam, ASQ goes to great lengths to ensure that the grading process provides an accurate assessment of a candidate's proficiency.

ASQ uses procedures that meet the Standards for Educational and Psychological Testing that were developed jointly by the American Educational Research Association (AERA), the American Psychological Association (APA), and the National Council on Measurement in Education (NCME).

See page 9 and succeeding pages for extensive information on the ASQ grading process.



Candidates' Frequently Asked Questions

How do I decide which certification is right for me?

Each ASQ certification has specific education and experience requirements. The more work-related experience you have for a specific BOK, the better qualified you are to take the exam. To determine which exam is right for you, visit www.asq.org/certification/right-for-you.html.

How do I apply for an exam?

Once you have decided which certification is right for you, you can apply online, or mail or fax your application to ASQ headquarters.

To apply online, visit www.asq.org/certification/apply.html.

To obtain an application, visit www.asq.org/certification/downloadable-apps.html or call ASQ headquarters.

- From Canada and the United States **1-800-248-1946**
- From Mexico **001-800-514-1564**
- From other international sites **+1-414-272-8575**

Mail your completed application to:

American Society for Quality
P.O. Box 3005
Milwaukee, WI 53201-3005
USA

or

American Society for Quality
600 North Plankinton Ave.
Milwaukee, WI 53203
USA

Fax your completed application to **1-414-272-1734**

Are the exams available in languages other than English?

Some of the exams have been translated into other languages. These versions are provided only outside of the United States. For more information about the translated exams, visit

<http://www.asq.org/pdf/global/global-resources-brochure.pdf> or <http://www.asq.org/global/training-certification/translated-exams.html>.

How should I prepare for an exam?

We should say at the outset that preparing to take an exam is a personal matter and highly dependent on an individual's personal learning methods. For some candidates, a careful reading of some of the texts in the reference bibliography will be most helpful, while others may find value in purchasing study guides, taking a local ASQ section refresher course, or forming a study group with other quality professionals. All certification candidates are responsible for their own study and preparation for the exam. No specific set of courses or curriculum of study is required as part of the certification process. Likewise, ASQ makes no representation that completion of any specific course or program of study will significantly enhance a person's chance of passing a certification exam.

How should I prepare for an exam? continued

Successful candidates have shown that they study a wide variety of materials from the reference list, in addition to relying on their experiences in the workplace. It is important to understand that each BOK is comprehensive and that candidates should not rely on any single source of information to prepare for an exam.

As a starting point, read the BOK for the exam and pay special attention to the subtext for the area, as well as the cognitive levels that are assigned to those areas. Both of these are intended to help you determine exactly what will be tested for that topic area, as well as the depth of knowledge that is required for that topic area. (For an in-depth exploration of the cognitive levels, see Appendix B, pages 16-17, of this handbook.) After becoming familiar with the BOK, review it to identify areas you may need to study further to feel confident in the topic.

References

Once you have identified study topics, it is important to refer to the reference list that is published on www.asq.org/ to determine which resources may help you with your studies. The reference list for each program contains the resources that support the exam program; the test question pool for the program has been developed using these references. While it may seem daunting to see that some exam programs have extensive reference lists, it is important to remember that each BOK encompasses information relevant to all of its topics and levels. For this reason, it is recommended that you first determine the topic areas to study and then determine which references to use for study material.

The reference books are listed alphabetically, by author, and no single reference can be recommended to use for studies. It should be your own, individual decision as to which references will be most helpful for your study needs. Since it would be difficult to decide which books to study from, based on title alone, the following tips may help you determine which books to use.

- Ask co-workers and other candidates who have passed the exam which books they found most helpful for specific areas of the BOK.
- From this Web site, www.asq.org/certification/prepare.html of the online ASQ Certification pages, click the program of your certification studies and then click either "references" or any book title. Books in those online reference lists have a link to the online ASQ bookstore. For some of these books, the bookstore has sample chapters to view online. Reading these samples may help you decide if a particular book will be appropriate for your studies.
- If it isn't possible to purchase the references, call your local library and ask if it has the books. If the library doesn't carry technical books, it should be able to request them from other libraries through the inter-library loan system.
- Consider checking with the local ASQ section about whether it has a library. Some sections keep a library for their members to use to study for the exams.

Study Groups

Another option for preparing for an exam is to join or create a study group. In a study group, each individual has an area of expertise and can assist others of the group with those areas. In return, each individual receives information from the other members of the group about their area of expertise.

One technique used by some study groups is to assign each individual in a group a specific area of the BOK to research and to report back to the group. By reporting back to the group, the individual teaches the other members the content for that topic area. This technique not only reduces the amount of research and study time required for each topic area by an individual, but the individuals learn more about each topic and have more opportunities to apply what they learn by having to teach others. Combining studying with teaching is a very effective learning technique.

How should I prepare for an exam? continued

Study Plans

To determine the time blocks you need to set aside to study for an exam, it may be wise to create a study plan. Doing so will allow you to determine the amount of personal time that can be appropriated for study as well as the amount of time to be allocated to each topic.

The following tips may help you begin your study plan.

- Decide which topic areas to study and approximate the amount of study time you will need to master these topic areas. Then determine the knowledge you currently have about a topic in comparison to the amount that is needed, based on the exam. Both the BOK and any past score report(s) will help you determine the gap.
- Identify your best time to study. Do you have more energy in the morning or in the evening? Low energy times should be allocated to tasks such as laundry or washing dishes. High energy times should be allocated to studying.
- Schedule time to study into your weekly schedule, ensuring that there is also time for personal activities—family, friends, and socializing—and your general health—eating and sleeping. Be sure that the schedule is flexible enough to adjust for last minute changes that won't affect your study periods.
- Study at the same time every day. When studying becomes a routine activity, the time spent studying will be used more efficiently and you will be less likely to procrastinate.
- Set aside study periods of 60–90 minutes, or study in shorter time blocks with short breaks in between. During the break time, the brain is still processing information learned during the study period.
- Plan weekly reviews of the topic that you studied that week. This will reinforce what you learned and help you retain more information.

For more information on study plans and strategies, visit the Study Guides and Strategies (www.studygs.net/) and How to Study (www.howtostudy.org) Web sites. These sites are very helpful resources for creating study plans, overcoming typical study obstacles, and providing time management suggestions.

Other Resources

If you would like to learn more about how others have studied for the certification exams, several articles have been published by ASQ, written by members who are sharing their experiences of studying and taking ASQ exams. The following are a few that are available online.

Free articles

- "Certification Exam Tips, Trips, and Traps," by James J. Rooney is available as a pdf at www.asq.org/pub/qualityprogress/past/1004/qp1004rooney.pdf or as a webinar by logging on to <http://www.asq.org/certification/prepare.html> and clicking the "Certification Tips, Tricks, and Traps" dialog box.
- "Quality in the First Person: Combining Exams With Travel and Fun," by Darrell Ashworth, is available at <http://www.asq.org/quality-progress/2008/09/quality-in-the-first-person/quality-in-the-first-person-the-main-event.html>.
- "Quality in the First Person: Rocky Start," by Tamara L. Payne, is available at <http://www.asq.org/quality-progress/2008/08/quality-in-the-first-person/rocky-start.html>.
- "ASQ's Black Belt Certification: A Personal Experience," by Don Cochran and Praveen Gupta, is available at <http://www.asq.org/data/subscriptions/qp/2002/0502/qp0502cochrane.pdf>.

How should I prepare for an exam? continued

- *Quality Progress 2009 Salary Survey* can be found at <http://www.asq.org/quality-progress/2009/12/salary-survey/salary-survey-2009-part-1-section-4-salary-by-asq-and-rabqsa-international-certification.pdf>.
- “12 Keys to Career Success,” by John Ottesvig, is available at <http://www.asq.org/data/subscriptions/qp/2006/1006/qp1006ottesvig.html>.

How is the cut score (passing score) determined for a test?

Since the whole point of taking an ASQ certification exam is to pass it, there are many questions about how the passing grade for any exam is determined and what adjustments are made to ensure that one version of an exam is no harder, or easier, than another.

The cut score for an ASQ exam is established each time a BOK is created or revised. For this process, a panel of 12 to 15 subject-matter experts, also called judges, is convened. The panel’s first task is to set the performance standard for the exam. Through consensus, they determine a set of characteristics that they expect of a minimally qualified or “borderline” candidate in relation to the BOK. The distinction regarding borderline candidates is key to understanding the cut-score process, as it ultimately draws a very fine line between candidates who are qualified to be certified and those who are not. The expectations for performance, therefore, need to be clearly stated and agreed to by all of the participants in the cut-score study.

Once that list of characteristics is developed, the subject-matter experts use it as a guide to rate each question on the first test administered for a given BOK. They rate each question in terms of what proportion of 100 borderline candidates will answer the question correctly. For example, the judges may agree that borderline candidates will know a particular topic in the BOK very well when a question asks for a definition. Therefore, they may estimate that 85-90 percent will answer correctly. However, the same candidates may be much more challenged in that topic when required to apply a specific formula to get the correct answer, resulting in the judges’ estimation of 35-45 percent answering correctly.

The results of this two-day cut score study are presented to the Certification Board. Along with the written expectation of performance the panel has developed, the summary of the judges’ combined estimated difficulty of the exam is presented as the recommended cut point for the exam. Once the raw cut-score point is established by board approval, it is converted to a scaled score (550), which becomes the minimum score necessary to earn certification in that BOK.

Why are scaled scores used instead of raw scores?

A new form or version of an exam, based on the BOK, is used for each exam administration. We recognize that each of these test versions can prove to be more difficult or easy than the test on which the cut score was set. To be fair to the candidates and consistent in maintaining the standard of performance from one test to another, we analyze the results after every administration and adjust the cut-point on the raw score (the actual number of questions answered correctly) of the test. For more information about how this adjustment is determined, read the next section of this handbook, **How is the difficulty level of a test determined to create the scaled scores?**

If raw cut scores were reported, different passing scores could be shown for each version of the test, resulting in confusion for everyone. Instead, we use scaled scores to allow comparisons to be made between various versions of the test. A scaled score is a conversion of the number of questions answered correctly. The scaled scores range from 200 to 750 and reflect your performance level, taking into account the difficulty level of the test.

Here is an example of a scaled score conversion for two versions of a test. This example is for a hypothetical 100-question test.



Why are scaled scores used instead of raw scores? continued

In this example, test A was slightly more difficult than test B, so the individuals who took test A were not required to answer as many questions correctly as the individuals who took test B. In the comparison table, the scores of 68 for test A and 70 for test B reflect the same minimum level of performance required to become certified. The scaled score of 550 is used to represent the minimum level as it is reported to the examinees.

The use of scaled scores for reporting purposes also helps you determine your score in relation to the minimum standard of performance for a test. Since the standard of performance is represented by a scaled score of 550, you can determine your performance compared to that standard. Likewise, if you took a test at two different administrations, your two scaled scores can be used to determine how much your performance has improved between the two administrations.

It is important to note that those who pass the test will not receive a scaled score because those candidates have met or exceeded the standard of performance.

Test A		Test B	
Raw Score	Scale Score	Raw Score	Scale Score
65	530	67	540
66	540	68	540
67	540	69	540
68	550	70	550
69	550	71	550
70	560	72	550
71	560	73	560
72	560	74	560

How is the difficulty level of a test determined to create the scaled scores?

Although the raw cut score is established for a specific number of questions answered correctly under a BOK, the scaled score is what is reported to the candidates. This scaled score allows adjustments to be made for exam difficulty on subsequent forms of the test, while maintaining a scaled score of 550. The scaled score of 550 is the minimum standard of performance for all ASQ certification exams.

The goal of ensuring that two versions of the same exam have the equivalent degree of difficulty is achieved through a process known as common item equating. Here, ASQ selects a set of questions from the previous exam and embeds them in the next exam. This set of questions, called equators, is a kind of mini-exam in that the questions are representative of the previous exam's difficulty level (some easy questions, some hard, some in the middle) and cover areas of the BOK proportionately. ASQ then develops the rest of the test with different questions, some new and some previously used. This way, ASQ can administer almost entirely new tests each time and still maintain the established standard of performance.

The common items (equators) between the two tests are analyzed after the new test is administered to determine whether the new test is more or less difficult than the previous version. If the analysis of the equators determines that the new test is more or less difficult than the previous test, the cut score is adjusted so that the standard of performance is maintained over time.

For example, if one version of a test is administered in March and the mean score of the candidates is 80, and another version of that test is administered in October and the mean score of the candidates is 75, does that mean that the test administered in March was easier than the October test? Or were the candidates who took the test in March better prepared than those who took the test in October?



How is the difficulty level of a test determined to create the scaled scores? continued

Before determining whether there was a difference in the tests and before making any adjustments to the cut point based on those differences, more information is needed about the two candidate groups. To gather that information, comparisons are made between the performances of the two groups on the common items (equaters) in the two tests. Here is an illustration of how an analysis of the common items can determine whether the October test was more difficult.

March Exam	October Exam
Total Exam Mean Score = 80	Total Exam Mean Score = 75
Is there a difference in the tests or a difference in the groups?	
Common Items Mean Score = 20	Common Items Mean Score = 20

Since the two groups performed equally well on the common items (the mean score for both administrations on the common items is 20), it can be concluded that the two candidate groups were equally well prepared to take the test. Therefore, the expectation is that these two candidate groups would perform the same on the tests overall, i.e., display the same total test mean score if the two tests were equivalent in terms of difficulty. Since the overall mean score for October was lower than the mean score for March, it is safe to conclude that the test administered in October was, in fact, more difficult than the test administered in March.

As a result of this analysis, the cut point for the October test is adjusted to offset the effects of being a more difficult exam. Using this method ensures that both tests will fairly assess the candidates' abilities while maintaining a consistent scaled score of 550 to pass.

How are the constructed response papers for the Certified Manager of Quality/Organizational Excellence (CMQ/OE) exam scored?

The CMQ/OE test contains 150 multiple-choice questions as well as three (3) constructed response (essay) questions. Candidates are asked to choose and respond to two (2) of the three (3) constructed response questions.

The constructed response papers are scored by Certified Managers of Quality/Organizational Excellence who have been trained in the evaluation techniques used for the scoring process. In addition, all of the judges score the papers against a standard of performance that is specific to each essay question. That standard is neither arbitrary nor subjective, but has been developed on the basis of sound quality practices, as described and prescribed in major textbooks in the field of quality testing. Prior to being included in an exam, the essay questions are pre-tested on a group of Certified Managers of Quality/Organizational Excellence, so the development of the question includes a reality check to make sure that the committee's expectation of performance for each essay question matches actual responses.

Two judges provide a score for each response. If the scores from the two judges are more than one point apart, the judges must discuss the scores they gave based on the standard of performance for that essay question. This process is designed to provide the most appropriate score for each response.

The final scores for the essays are added to the total of correct multiple choice answers, and the sum is converted to a scaled score and reported on the score report. The diagnostic details (alpha codes) on the score report are designed to indicate how a candidate performed on the constructed response portion of the test.

When will I receive my exam results?

Exam results for pilot exams and an exam with an updated body of knowledge are mailed within four weeks after the exam is taken. Otherwise, exam results are mailed about two weeks (three and one-half weeks for CMQ/OE results) after the exam date. For international mail, allow up to six weeks to receive the mailed results.

In addition to the mailed results, you will receive an e-mail notification approximately six (6) to seven (7) business days after the exam, notifying you that your results are online. If you are an ASQ member and want to review your results online, log on to the ASQ Web site at www.asq.org. Click “[Training and Certification](#)” in the left column, and then “[Log In for Your Certifications](#)” in the Certification block on the right. There will be a gray box on the right side of the next page, showing the question “[Did You Pass?](#)” Click “[Check the lists now!](#)” and scroll to the name and date of the exam you took. Click on the exam and look for your name in the page that opens.

If you are a registered user of the Web site or a nonmember, you can view your results online by linking to the e-certification application through the actual e-mail notification letter.

We recognize that prompt notification of exam results is important, and make every effort to provide results as soon as possible. Results are not given over the phone. Information about certification is never divulged to third parties except at the written request of the person who took the exam. Your exam results are kept in strict confidence.

If you pass the exam, you will receive a letter of congratulations from the Certification Board, a wallet card, and a certificate showing your certificate number. Your name will be published on www.asq.org and your local ASQ section will be notified. Your name may be published by your section and division as well. If you are certified as a CMQ/OE, CQE, CQA, CSQE, CSSBB, CRE, CHA, CBA, CCT, or CPGP, you must participate in the Maintenance of Certification program to keep your certification current. The recertification journal provided with your certificate gives complete details.

ASQ certification is not a license. It is peer recognition of proficiency within the prescribed BOK. To avoid misunderstanding of this point, the Certification Board requires that certified persons always refer to ASQ in citing their certification, e.g., “ASQ Certified Manager of Quality/Organizational Excellence.”

ASQ may withdraw formal recognition and any current ASQ certification for falsification of credentials and/or unethical behavior. This action may be taken by the Certification Board or, in the case of an ethics action, by the ASQ Board of Directors or its designee. In such cases, due process will be afforded to the individual against whom the action is directed. A copy of the ASQ Code of Ethics is supplied to all certified persons. By applying for this certification, you pledge to uphold this code. You can view the Code of Ethics at www.asq.org/about-asq/who-we-are/ethics.html.

What if I do not pass an ASQ exam?

If you do not pass the exam, you will receive a score report that provides an analysis of the exam that will assist you in further studies. You can retake the exam within two years of your last attempt for a reduced fee. (See page 14 for more information on this process. The retake fees are shown on the exam application.) Also view www.asq.org/certification/faq/retake-policy.html.

What does my score report tell me?

The score report provides your scaled score, ranging from 200 to 540 points in intervals of 10 scaled score points. A scaled score of 550 or above is required to become certified. (See Appendices D and E for examples of score reports.)

Your score report also includes the number of questions you answered correctly in each subject area, and the average number of items correct for only those candidates who passed the exam.

Constructed Response Portion of the CMQ/OE: If you took the Certified Manager of Quality/ Organizational Excellence (CMQ/OE) exam, specific diagnostic codes are provided for each of the two constructed response essays that you answered. (See Appendices D and E for examples of score reports.)

How do I interpret my score report?

Your score report is designed to help you analyze your results and decide in which areas of the BOK you have strengths or weaknesses. Comparing the number you had correct in each subject area to the average number correct for the passing group of candidates will help you assess your knowledge level for each area of the BOK.

The first piece of information in your score report is your scaled score. ASQ scaled scores range from 200 to 750 and the passing scaled score is 550. Your score alone will help you determine how close you may be to passing the exam.

The second piece of information in your score report is a table (shown below) that presents the total number of questions that are tested in each BOK area, the number of questions you answered correctly, and the average number correct for the candidates who passed the exam (i.e., those candidates who obtained a score of 550 and above) for that exam administration. This information can be used to determine in which areas of the BOK you performed the same as those who passed, and in which areas you will need further study.

Example of a Score Report Table:

BOK AREAS	Total Questions	Number You Had Correct	Average*
I.	20	12	15
II.	21	8	15
III.	19	12	15
IV.	21	17	17
V.	9	9	8
VI	10	6	8

*The average is computed on the total number of responses from only those who passed.

When should I retake an exam?

If you would like to retake an exam, it is important to choose a date that will allow you enough time to prepare. Some candidates are able to retake an exam within six months while others may need more time to study and should take the exam again a year later. The time period between tests depends on a candidate's individual need for preparation. However, the exam must be re-taken within two years or the candidate will be required to submit a new application and pay full fees. To determine the length of time you need to study for a retake exam, it may be wise to create a study plan. (Study plans are discussed on page 8.)

How can I prepare to retake an exam?

It is best to use score reports from any past exams to determine the areas in which improvements can be made. As you review these areas, read the BOK for the exam and pay attention to the subtext for each area, as well as the cognitive levels that are assigned to those areas. Both of these assessment methods are intended to help you more closely determine what will be tested in a particular topic area, and to understand the depth of knowledge required for that topic area. An in-depth explanation of the cognitive levels is provided in Appendix B of this handbook.

See pages 6-9 of this handbook for information about preparing to take an exam.

How do I sign up to retake an exam?

You must retake the exam within two years of your past attempt if you wish to pay a reduced fee and bypass submitting a new application. If you do not retake the exam within this two-year period, you must submit a new application and pay the full fee.

You can sign up to retake an exam by completing the form on the bottom of your score report and returning it to ASQ headquarters or by calling ASQ Customer Care at **800-248-1946** or **414-272-8575**.

You can also sign up online to retake an exam.

Members:

Log in to the ASQ Web site at www.asq.org and click "[Training and Certification](#)" in the left column. On the next page, click the "[ASQ Certification](#)" link in the right column. Click "[Apply for Certification](#)" on this page and then "[Apply Online Now!](#)"

Nonmembers and Registered Users:

Follow the instructions printed immediately above for members. Option for nonmembers and registered users are offered on the same page.

There is no limit to the number of times you may retake an exam. However, you will be charged a fee each time.

Use the information provided on your score report to decide which areas of the BOK require additional studies. Comparing your score to that of those who passed, as well as considering the actual BOK, should help you to determine which strategies to use to prepare for re-taking the exam.

Appendix A

Test-Taking Tips

Test takers are advised to keep in mind these general pointers about standardized exams.

- Read all of the questions on the first page of the test so you realize that you do know the material. In other words, relax.
- Read each question thoroughly. Do not assume you know what is being asked.
- Eliminate implausible answers and move quickly past the obviously wrong choices.
- Keep in mind that an answer may be a correct statement in itself but may not answer the question.
- Two answers may give exactly the opposite information or may be very similar. Read them again to decide what makes one correct and the other wrong.
- ASQ does not subtract points for incorrect answers. Answer every question. There is no penalty for guessing, and you have a 25 percent chance of choosing the right answer.
- Read each question and answer the ones you know. Then go back and read those you are unsure of. Mark those you are still uncomfortable with. You will narrow the field to just a few questions that you need to spend more time on. These are the questions you might want to use your reference books for.
- Be aware of the time available for the exam and the time remaining as you work through the exam.
- Do not select more than one answer for a question. If you do, it will be scored as a “blank.” For example, you think that both A and C are correct answers. Select only one answer. When you’ve finished the exam, use the comment sheet supplied with your test to explain why you think both A and C are correct. Your comments will be reviewed before results are reported.

Appendix B

Levels of Cognition: Based on Bloom's Taxonomy – Revised (2001)

Each body of knowledge (BOK) contains content, specific within its subtext, for each topic as well as a cognitive level to indicate the intended **complexity level** of the test questions for that topic. These levels are based on the "Levels of Cognition" (from Bloom's Taxonomy – Revised, 2001) and are presented below in rank order, from least complex to most complex.

Remember

Recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles, etc.

Understand

Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations, etc.

Apply

Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc.

Analyze

Break down information into its constituent parts to recognize their relationship to one another and how they are organized. Identify sublevel factors or salient data from a complex scenario.

Evaluate

Make judgments about the value of proposed ideas, solutions, etc., by comparing the proposal to specific criteria or standards.

Create

Put parts or elements together in such a way as to reveal pattern or structure that was not clearly there before. Identify which data or information from a complex set is appropriate to examine further, or from which supported conclusions can be drawn.

These levels of cognition are not intended to rank the topic areas by difficulty, but rather to help candidates determine how much knowledge they need about the topic to meet the standard of performance for the exam. For example, if a topic area has a cognitive level of "Apply," the candidates will be expected to remember, understand, and apply the concepts and topics for that area. A question for this area could be a definition (Remember), or it could be a math calculation

(Apply). If a topic area has a cognitive level of "Evaluate," the candidates will be expected to be able to remember, understand, apply, analyze, and evaluate the concepts (make a judgment) for that area. Likewise, if a topic area has a cognitive level of "Remember," the candidates will be expected only to remember the topics (basic rote, definition knowledge).

The following are example test questions for each level of cognition.

Remember

Who makes the final determination regarding the distribution of the audit report?

- (A) The lead auditor
- (B) The audit group manager
- (C) The auditee
- (D) The client

This is a "Remember" question because it requires candidates to recall who is responsible for the report distribution.

Understand

Producer's risk is defined as the probability of:

- (A) rejecting a good lot
- (B) rejecting a bad lot
- (C) accepting a good lot
- (D) accepting a bad lot

This is an "Understand" question because it requires candidates to understand the concept of producer's risk well enough to know its result.

Apply

Purchasing orders are to be checked for correctness during the audit of a purchasing department. Which of the following sampling strategies would be most appropriate?

- (A) Review 10% of all purchase orders
- (B) Randomly sample an amount of orders processed on the day of the audit
- (C) Review the first 10 orders processed on the day of the audit
- (D) Use MIL-STD 105 to establish a sampling plan

This is an "Apply" question because it requires candidates to use their knowledge of the difference between how samples can be selected and what a published sampling plan is.

Appendix B continued

Analyze

Cases containing 24 bottles of antibiotics are shipped to drug stores. A pharmacist has doubts about the potency of the drugs and decides to have five (5) bottles from a case tested. What is the probability that the contents of none of the bottles tested will prove to hold defective drugs when, in fact, there are 10 bottles in the case with defective drugs?

- (A) 0.0010
- (B) 0.0059
- (C) 0.0471
- (D) 0.2375

This is an “Analyze” question because it requires candidates to understand the theories of probability to determine the correct answer. Determining the answer requires more than a simple probability calculation because there are many factors that must be considered before using the data to calculate the correct answer.

Evaluate

A lot of 500 units is submitted by a supplier whose past history indicates that about 1 percent defectives should be expected. A random sample of 30 units is collected from the lot. Which of the following probability distributions could be best used to make predictions about the lot?

- (A) Normal
- (B) Weibull
- (C) Poisson
- (D) Exponential

This is an “Evaluate” question because it requires candidates to use the information provided about the lot, as well as their knowledge of the various distributions, to determine which distribution is most appropriate to use.

Create

A supplier evaluates all characteristics of a sample of 75 components that is taken twice a day. Each component is then recorded as either conforming or nonconforming. What type of control chart would be used for evaluating this data?

- (A) MR chart
- (B) c chart
- (C) u chart
- (D) p chart

This is a “Create” question because it requires candidates to understand the type of data that is required for each of these charts. The candidates must then determine which chart will allow the data to be categorized as pass/fail. The information in the test question provides a typical situation when evaluating components. The candidates need to understand which of the data elements that are provided should be used, and then “create” the correct chart to use.

Using cognitive levels for study purposes

When preparing to take an ASQ exam, it is important for candidates to read the subtext in the BOK in light of the cognitive level that is assigned for that area. By understanding the level of cognition for a particular topic area, candidates can determine if they need to develop a deeper understanding of a topic level than what they already have.

The following is an example of subtext from the Certified Quality Improvement Associate BOK.

- Define various improvement cycle phases (e.g., PDCA, PDSA) and use them appropriately. (Analyze)

On the basis of this subtext, candidates know that they should be able to define what the improvement cycles are and understand their phases enough to know when and how they should be used in various situations. The cognitive level is “analyze,” so test questions in this area could be definitions of terms, an understanding of terms (What is the “Plan” phase of PDCA?), and the application and analysis of the cycle (Which method should a team use to improve a process?).

Appendix C

Top 10 Myths

Myth: *If an answer is obvious, it must be a trick question.*

Fact: Just because an answer is obvious to you does not mean it is obvious to everyone. Do not let the fact that this is a test question get in the way of your knowledge. Answer it and move on. Do not read more into the question in an effort to make it harder.

Myth: *Guessing wrong can hurt your score more than leaving an answer blank.*

Fact: There is no penalty for guessing, and you have a 25 percent chance of getting it right. Although some tests use “formula scoring” methods, ASQ certifications do not. You get one point for each question you answer correctly and zero points for those you get wrong or leave blank.

Myth: *The passing score for all ASQ exams is 70 percent.*

Fact: The passing score for each ASQ exam is established as a minimum performance standard during the cut-score process, which is detailed on pages 9-11.

Myth: *Taking a section refresher course or buying ASQ exam prep material is a sure way to pass.*

Fact: Section refresher courses and the self-directed products are excellent ways to prepare for the exams, but using them does not guarantee that you will pass. Refresher courses are meant to renew your knowledge, not to instruct you in areas that are not familiar to you. Questions from the self-directed products will help you become familiar with how to answer certain questions, but they are not the same questions you will see on the exams. Individual study is also a critical element for success.

Myth: *If you do poorly on one area of the BOK, you automatically fail the test.*

Fact: Your total score on the exam determines whether you pass or fail, not your score on any one portion of the test. Even in the CMQ/OE exam, it is possible to pass if you do poorly on the constructed response portion as long as your overall score is at or above the passing grade.

Myth: *ASQ limits the number of people who pass.*

Fact: Anyone who meets or exceeds the passing score (cut point) passes the exam. ASQ does not set a passing rate.

Myth: *The grading of the constructed response portion of the CMQ/OE exam is very subjective.*

Fact: The constructed response portion of the exam is designed to test the candidate’s ability to respond to real-world situations. The responses are scored by Certified Managers

of Quality/Organizational Excellence who have been trained in the evaluation techniques used for the scoring process. In addition, all of the judges score the papers against a standard of performance that is specific to each essay question. That standard is neither arbitrary nor subjective, but is developed on the basis of sound quality practices, as described and prescribed in major textbooks in the field of quality. The essay questions are pre-tested on a group of CMQ/OEs, so the development of each question includes a reality check to ensure the committee’s expectation of performance matches actual responses.

Myth: *It takes a long time to receive exam results.*

Fact: ASQ works very hard to provide exam results as quickly as possible and is aware that candidates are anxious to learn if they have passed. In general, exam results are mailed within two weeks of the exam date. CMQ/OE exams require three and one-half weeks due to the scoring of the essay questions. Candidates can also sign in to the ASQ Web site (www.asq.org) as soon as one week following the exam date to receive their score.

Results are reported more slowly when the exam is a pilot for a new BOK or when the BOK has been rewritten. In those cases, results will be mailed within six weeks.

Prior to sending out the results, there are many steps to be completed, verified, and checked: The answer sheets are sent back to ASQ headquarters and scanned. Statistics are then calculated and reviewed by the test development staff and appropriate volunteers. The results are then scored, verified, and uploaded to the computer before any result letters can be generated. ASQ works continuously to reduce this cycle time.

Myth: *Test questions are deliberately tricky.*

Fact: ASQ uses an extensive, multi-level process to ensure that exam questions are as accurate, clear, and concise as possible. (Pages 3-5 of this handbook provide more information regarding the creation of exam questions and exams.)

Myth: *I cannot learn from my mistakes if I do not get my scored test back.*

Fact: Because of its policy to reuse exam questions, ASQ cannot release copies of the exams. Releasing tests would give the retake applicants an unfair advantage over candidates taking the exams for the first time. The integrity of the exam process is of paramount importance to ASQ. It would not support the underlying premise of the certification program for candidates to just study the questions they got wrong, as it would not ensure that they would understand the material any better. It is more appropriate for the retake candidates to use the diagnostic information to identify the areas where they are weak and improve their knowledge in those topic areas.

Appendix D

Example Score Report

January 21, 2010

EXAM DATE

June 4, 2011

December 3, 2011

EXAM DEADLINE

April 15, 2011

October 14, 2011

63389564

Lou Doe
166 Main St.
Anytown, FL 33333

Dear Mr. Doe:

An analysis of the ASQ Certified Quality Technician exam you recently wrote indicates that you did not achieve the required passing score of 550.

Your Score: 520

A diagnosis of your performance is listed below. PLEASE SEE THE ENCLOSED LETTER FOR CLARIFICATION.

BOK AREAS	Total Questions	Number You Had Correct	Average*
I.	20	12	15
II.	21	8	15
III.	19	12	15
IV.	21	17	17
V.	9	9	8
VI.	10	6	8

*Average computed on total number of responses from only those who passed.

To retake the exam, please complete the information below. To register via phone, please contact ASQ Customer Care at **800-248-1946** or **414-272-8575**.

Sally M. Harthun
Certification Manager

Please schedule me to retake the CQT exam to be held _____ in Section # _____.

Enclosed is the retake fee of \$ _____

My MasterCard/VISA/American Express card number is _____

Expiration Date _____

Name _____

Member # _____

Appendix E

Example Score Report for the CMQ/OE Exam

January 21, 2011

EXAM DATE	EXAM DEADLINE
June 4, 2011	April 15, 2011
December 3, 2011	October 14, 2011

63389564

Lou Doe
166 Main St.
Anytown, FL 33333

Dear Mr. Doe:

An analysis of the ASQ Certified Manager of Quality/Organizational Excellence exam you recently wrote indicates that you did not achieve the required passing score of 550.

Your Score: 500

A diagnosis of your performance is listed below. PLEASE SEE THE ENCLOSED LETTER FOR CLARIFICATION.

MULTIPLE-CHOICE PORTION

BOK AREAS	Total Questions	Number You Had Correct	Average*
I.	20	12	15
II.	21	8	15
III.	19	12	15
IV.	21	17	17
V.	9	9	8
VI.	10	6	8

*Average computed on total number of responses from only those who passed.

CONSTRUCTED RESPONSE PORTION

The constructed response questions are graded on content, not format. Responses are assigned a score by each of two independent members of the Quality Management Division.

Problem A (Feedback Loop)	H
Problem B (Supplier Certification)	X
Problem C (Control Chart)	–

To retake the exam, please complete the information below. To register via phone, please contact ASQ Customer Care at **800-248-1946** or **414-272-8575**.

Sally M. Harthun
Certification Manager

Please schedule me to retake the CMQ/OE exam to be held _____ in Section # _____.

Enclosed is the retake fee of \$ _____

My MasterCard/VISA/American Express card number is _____ Expiration Date _____

Name _____ Member # _____

Appendix F

CR DIAGNOSTIC CODES

ALPHA CODE	Diagnostic Statement:
G	The problem statement asked for four (4) elements in the response and you provided only one or two of the elements.
H	The problem statement asked for three (3) elements in the response and you focused on one element.
I	Illegible handwriting; the paper was graded but was very difficult to read.
J	Elements of the response contained erroneous conclusions or inappropriate tools.
K	The recommended actions in your response were generic and did not relate to the specific problem presented.
L	The response you provided did not contain sufficient detail or lacked focus on key elements of the specific problem presented.
M	The response you provided did not include strategic impact.
P	No response was provided; blank answer sheet.
X	Provided a satisfactory response; scored at mid-level of points possible.
Y	Provided a more than satisfactory response; scored above the mid-level of points possible.
Z	Provided a response that was scored at the highest level of points possible.
—	The problem was the one (out of three presented) that you chose not to answer.