

UNDERSTANDING AND INTERPRETING YOUR SAFETY FUNDAMENTALS EXAMINATION SCORE



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BCSP created this publication to help you understand how BCSP sets the minimum passing score for the Safety Fundamentals examination and how you can interpret the official score report you received.

Safety Fundamentals Examination Structure

The purpose of the Safety Fundamentals examination is to measure whether candidates for the examination have demonstrated at least a minimum standard of knowledge of professional safety practice at the Associate Safety Professional® (ASP®) level. The current Safety Fundamentals examination structure is based on validation studies conducted in 2007 involving about 1,500 safety practitioners. Validation studies involve people in professional safety practice who identify and characterize the subject matter important in professional safety practice at the ASP level. The results from these studies are summarized in the Safety Fundamentals examination blueprint. The blueprint contains the subject matter found on the examination as well as the portion of the examination covered by each subject.

Safety Fundamentals Examination Minimum Passing Score

The Safety Fundamentals examination has a single minimum passing score against which all candidates are measured. The minimum passing score is based on a total score on the examination; therefore, candidates are not required to earn a minimum score in each subject area, or domain, of practice.

There were 200 items on your examination. As part of BCSP's item quality processes, BCSP placed 25 items on the examination for developmental purposes. These 25 items were not scored and did not count toward your total score, but BCSP obtains item performance information from these developmental items for use on future versions of the examination. Your examination score was based on how many of the 175 scored items you answered correctly. All scored items had the same weighting, and there was no penalty for selecting an incorrect answer.

How BCSP Sets the Minimum Passing Score

You may expect that the minimum passing score is 70% based on your experience in academic settings where the instructor

arbitrarily sets this value as the passing score on a test. Alternatively, you may be familiar with "grading on a curve" (called normative scoring) where the passing score on a test is determined by the instructor based on how well each student in the class performed on the test and then normalized so that 50-70% of the class pass, regardless of the raw scores earned by the students. These two approaches are not acceptable for accredited certification examinations as these two methods do not measure minimum competency objectively.

For nationally and internationally accredited certifications, such as the Certified Safety Professional® (CSP®) credentialing program, all candidates must have an equal opportunity to pass the credentialing examinations regardless of the population of candidates attempting the examinations. The purpose of the Safety Fundamentals examination is to assess whether each candidate has met the minimum standard of knowledge required of a safety professional at the ASP level. This minimum standard is represented by the minimum passing score on the examination. What this means is that if everyone within a given time period meets or exceeds this minimum passing score, everyone will pass.

BCSP uses the modified Angoff technique for setting passing scores for certification examinations. This criterion-referenced method is the most common approach for establishing examination standards. The technique requires convening one or more diverse panels of experts in safety to individually rate each item on the examination against the criterion of the minimally-competent, or minimally-qualified candidate. Once these ratings are obtained, further analysis of the items is performed to verify that the ratings derived by the panels of experts are consistent.

The modified Angoff technique results in a minimum passing score based on the aggregated difficulty of each item on the examination. With each examination revision, the passing score may change in response to the assessed difficulties of any new, scored items that are placed on the examination revision. In the end, the modified Angoff technique results in an objectively-established minimum passing score against which every candidate is measured, and which provides every candidate the same opportunity to pass the examination.

Table 1. Sample Official Score Report
 (This is not your actual score report.)

Official Score Report

Safety Fundamentals Examination

(Passing this examination is required to earn the interim Associate Safety Professional® designation.)

Candidate: Example Candidate	Your Score: 57.1% of scored items correct
Candidate ID No.: 9999887777	Minimum Passing Score: 59.4% of scored items correct
Examination Date: September 23, 2009	Your Result: Fail
Examination Location: Indianapolis, Indiana	

Refer to the examination blueprint found in the *Safety Fundamentals Examination Guide* for the full description of each topic and details on the knowledge contained in the domains and topics shown below. *The Safety Fundamentals Examination Guide* can be downloaded from the BCSP website at www.bcsp.org. In your detailed performance shown below, the percentages are rounded; however, your total score is exact. Also note that some items on the examination are unscored and do not count toward your total score. Your performance on unscored items does not affect your result.

	Max. % Possible	Your %
Domain 1: Recognizing Safety, Health, and Environmental Hazards	35.4%	21.7%
Topic 1: Biological Hazards.....	2.9%	2.3%
Topic 2: Chemical Hazards.....	6.3%	4.0%
Topic 3: Electrical Hazards.....	6.3%	4.0%
Topic 4: Natural Hazards.....	2.9%	1.7%
Topic 5: Radiation Hazards.....	2.3%	1.7%
Topic 6: Structural and Mechanical Hazards.....	5.1%	3.4%
Topic 7: Hazards Related to Fires and Explosions.....	5.7%	3.4%
Topic 8: Hazards Related to Human Factors and Ergonomics.....	4.0%	1.1%
Domain 2: Measuring, Evaluating, and Controlling Safety, Health, and Environmental Hazards	30.9%	18.9%
Topic 1: Measurement and Monitoring.....	6.9%	4.6%
Topic 2: Engineering Controls.....	8.6%	5.1%
Topic 3: Administrative Controls.....	6.3%	3.4%
Topic 4: Personal Protective Equipment.....	9.1%	5.7%
Domain 3: Safety, Health, and Environmental Training and Management	20.6%	7.4%
Topic 1: Training and Communication Methods.....	2.9%	1.1%
Topic 2: Management Processes.....	2.9%	1.7%
Topic 3: Inspections and Auditing.....	4.0%	1.7%
Topic 4: Group Dynamics.....	2.3%	1.1%
Topic 5: Project Management.....	2.3%	0.0%
Topic 6: Risk Management.....	3.4%	0.6%
Topic 7: Safety, Health, and Environmental Management Systems.....	2.9%	1.1%
Domain 4: Business Principles, Practices, and Metrics in Safety, Health, and Environmental Practice	13.1%	9.1%
Topic 1: Basic Financial Principles.....	3.4%	2.3%
Topic 2: Probability and Statistics.....	4.0%	2.9%
Topic 3: Performance Metrics and Indicators.....	5.7%	4.0%
EXAMINATION TOTAL	100%	57.1%

How to Interpret Your Examination Score

When you completed the Safety Fundamentals examination at the computer testing center, you received an unofficial pass/fail result. BCSP later provided you with your official score report showing how you performed within each of the domains of practice. A sample Safety Fundamentals official score report is shown in Table 1.

If you passed, you ought to be curious about how well you performed on the examination. Domains and knowledge topic areas in which your performance was weakest are the areas in which you may consider additional professional development.

If you failed the examination, you need to understand how you scored in each domain of practice and use that information to develop a mitigation strategy for further preparation before retaking the examination. Certification examinations are statistically reliable. If you retake the examination without sufficiently remedying your weaker knowledge areas, you will likely receive a similar score. The solution to this is directed study in the areas in which you are weakest.

The domains represent major professional safety functions at the ASP level. The next tier below the domains are the knowledge topics that make up the domain.

Your official score report shows the overall minimum passing score that must be met or exceeded to pass the examination. Your overall score is also shown. Within the body of the official score report is a diagnostic account describing how you scored within each of the domains and the knowledge topics making up that domain. The first column shows the maximum possible percentage in a particular domain or knowledge topic. The second column shows how you scored. The percentages shown in these columns are based on the total number of items within a particular domain or knowledge topic divided by the total number of scored items on the examination. Thus, in the first column (the maximum possible column), the percentages shown represent the proportion of the examination devoted to that particular domain or knowledge topic.

How to Use Your Score Report for Retaking the Examination

It is a bad idea merely to retake the examination without remedying your weaker areas. Doing this likely will not yield a passing score; in fact, the statistical reliability of the examination suggests that you will receive almost the same score. However, your score report is one of several essential tools you can use to develop a successful examination retake strategy.

Conduct a Self-evaluation of Your Knowledge. Now that you have completed the examination, evaluate your knowledge of each domain and knowledge topic covered in the examination. For this, it is essential that you have the latest edition of the *Safety Fundamentals Examination Guide* (download from www.bbsp.org).

Within this publication is a self-evaluation checklist and rating chart.

Remedying your weaker areas provides the best opportunity to improve your score on the examination.

Evaluate Your Strengths and Weaknesses from Your Score Report. Evaluate your examination performance from the information presented on your official score report. Identify the domains and knowledge topics where your performance was below that required to pass the overall examination. In other words, divide your percentage score by the maximum score possible for that domain or knowledge topic area. If your performance in that domain or knowledge topic area is less than the examination's overall minimum passing score, make a note of that domain or knowledge topic area as one of your weaker areas. This process is illustrated in Table 2.

Compare your self-evaluation with the above evaluation of your actual performance. Are they similar? Does this provide additional insight? Adjust your preparation strategy based on what you find.

Recollect Concepts and Theories from the Examination. Using the examination blueprint found in the *Safety Fundamentals Examination Guide*, stimulate your recollection of concepts and theories from the examination with which you struggled. Though it is impossible to memorize precisely everything you experienced on the examination, it is likely that there are some concepts and practices with which you were unfamiliar. The examination blueprint can help you remember these.

Write down as much as you can remember and feed that information into the self-evaluation of your knowledge and your actual performance on the examination. From these three exercises, you will have generated a customized study guide that you can use to prepare for retaking the examination.

The final step is to use the study tools you have at your disposal to help remedy your weaknesses based on your customized study guide. Your study tools likely will include BCSP-published documents, books related to practice, third-party examination preparation materials, and even Internet searches to assist you with understanding some of the concepts and theories with which you know you struggled. Spend time changing and enhancing your knowledge before retaking the examination.

Sample Score Report and Sample Analysis

The sample score report shown in Table 1 is an illustrative example of a Safety Fundamentals examination score report. **Table 1 is not your actual score report.** Note that there is some rounding used to display the score report on paper effectively; however, your pass/fail result and your overall score is based on the total number of scored items you answered correctly as compared against the minimum number of scored items that everyone must answer correctly to pass.

Table 2. Example Analysis of Examination Results (refer to sample official score report in Table 1)
(For illustration purposes only. All numbers are rounded for simplicity.)

	Data From Sample Score Report			Domain/Topic Performance			
	Max. % Possible	Your %	Overall Min. Passing %	Breakdown of Domain/Topic Performance At or Above Overall Min. Passing %		Breakdown of Domain/Topic Performance Below Overall Min. Passing %	
				Score Ratio	% Correct Within Domain/Topic	Score Ratio	% Correct Within Domain/Topic
Domain 1	35.4%	21.7%	59.4%	21.7 / 35.4	61%		
Topic 1	2.9%	2.3%		2.3 / 2.9	79%		
Topic 2	6.3%	4.0%		4.0 / 6.3	63%		
Topic 3	6.3%	4.0%		4.0 / 6.3	63%		
Topic 4	2.9%	1.7%		1.7 / 2.9	59%		
Topic 5	2.3%	1.7%		1.7 / 2.3	74%		
Topic 6	5.1%	3.4%		3.4 / 5.1	67%		
Topic 7	5.7%	3.4%		3.4 / 5.7	60%		
Topic 8	4.0%	1.1%				1.1 / 4.0	28%
Domain 2	30.9%	18.9%		18.9 / 30.9	61%		
Topic 1	6.9%	4.6%		4.6 / 6.9	67%		
Topic 2	8.6%	5.1%		5.1 / 8.6	59%		
Topic 3	6.3%	3.4%				3.4 / 6.3	54%
Topic 4	9.1%	5.7%		5.7 / 9.1	63%		
Domain 3	20.6%	7.4%				7.4 / 20.6	36%
Topic 1	2.9%	1.1%				1.1 / 2.9	38%
Topic 2	2.9%	1.7%		1.7 / 2.9	59%		
Topic 3	4.0%	1.7%			1.7 / 4.0	42%	
Topic 4	2.3%	1.1%			1.1 / 2.3	48%	
Topic 5	2.3%	0.0%			0.0 / 2.3	0%	
Topic 6	3.4%	0.6%			0.6 / 3.4	18%	
Topic 7	2.9%	1.1%			1.1 / 2.9	38%	
Domain 4	13.1%	9.1%	9.1 / 13.1	69%			
Topic 1	3.4%	2.3%	2.3 / 3.4	68%			
Topic 2	4.0%	2.9%	2.9 / 4.0	72%			
Topic 3	5.7%	4.0%	4.0 / 5.7	70%			

The example analysis process shown in Table 2 is based on the sample score report in Table 1. The analysis in Table 2 is not related to your actual performance. Your score report analysis must be based on the data shown in your actual score report.

Interpretation of Sample Analysis

Assume the examination had 175 items that count toward the total score. The 59.4% minimum passing score means that the candidate must correctly answer at least 104 of the 175 items to pass the examination. The overall score this example candidate earned is 57.1%. This corresponds to a raw item score of 100 correct out of the 175 scored items. Thus, the candidate missed passing the examination by 4 items.

From the analysis in Table 2, one can see that this candidate's weakest area is Domain 3 (Safety, Health, and Environmental

Training and Management). Not only did the candidate score well below the minimum passing score in this specific domain (36% correct within the domain as compared with the overall minimum passing score of 59.4%), the candidate's performance within all but one of the knowledge topic areas in this domain also was below the minimum passing score. This candidate's greatest opportunity for passing this examination lies in remedying his or her knowledge in this domain.

There exist some weakness in the candidate's performance in two specific knowledge topic areas in Domains 1 and 2, and the candidate should take note of these, too. However, the majority of the candidate's study time should be spent in Domain 3. It is in this domain that the best opportunity for increasing his or her score exists.