Test Preparation Kit
Strategies • Samples • Further Reading

- Visual Speed and Accuracy
- Computation
- Mechanical Comprehension
- Symbolic Reasoning

A Guide to taking the Blue Battery – tests for the Mechanical job families
WELCOME! 2

HOW TO USE THIS MANUAL 2

ABOUT APTITUDE TESTS 3

GENERAL TEST TAKING STRATEGIES 3

STRATEGIES FOR VARIOUS QUESTION TYPES 5

DISCUSSION AND SAMPLES FOR TESTS IN THE BLUE BATTERY 6
MECHANICAL COMPREHENSION 6
COMPUTATION 9
SYMBOLIC REASONING 10
VISUAL SPEED AND ACCURACY 11

ANSWERS TO SAMPLE ITEMS 12

FURTHER RESOURCES 13
Welcome!

Congratulations! You are taking the first step to ensure your success on the tests and ultimately in your career at Sempra Energy utilities. The tests used at the Southern California Gas Company are designed to give you the opportunity to make the best use of your skills. This booklet will give you information about the procedures used to select employees who are qualified and likely to be successful in the job. These procedures include a series of tests which indicate how successful you are likely to be in the job for which you will apply.

This booklet gives you some tips for preparing for the tests, as well as suggestions on how to do your best. It also includes sample items so that you can practice for the actual tests.

GOOD LUCK!

How to Use This Manual

This manual is divided into four sections aimed at helping you become more successful on your tests.

- General test taking strategies applicable to all tests
- A brief discussion of each test
- Sample questions
- A list of resources that will provide sample tests and study materials

If you are a first time test taker, take time to read through this entire manual and familiarize yourself with the tests you will be taking. Also provided are book recommendations to assist you in studying for your exams.

If you are retaking a test, pay attention to the general test taking strategies, work through the sample problems, identify your weaknesses, and obtain one of the practice test guides described at the back of this manual. If you feel you need to “brush-up” on a subject there are books to help you do that as well.
About Aptitude Tests

Sempra Energy utilities uses aptitude tests for people applying to certain jobs. Rather than tests that try to recreate the job, these tests measure basic aptitudes or abilities that are related to success in the job in question. Examples of aptitudes include reading comprehension, computation, visual speed and accuracy, coding ability, and understanding of basic mechanical principles.

Consider the example of someone applying for a job in the Accounting department. He or she would be tested on the ability to do math instead of the ability to create a specific report. This approach is more efficient, more resistant to changes in the job, easier to manage, and, best of all, research has shown that ability in these basic aptitudes predict success in the job.

General Test Taking Strategies

The following discussion includes tips for taking a wide variety of tests and should be practiced alongside the tips provided for each individual test (provided in the following section).

Before the Test

- **Pace yourself.** If you choose to prepare for your test, review the material (books, practice problems, or study guide) in several relatively short periods rather than a few long periods. Studying in several 30-60 minute sessions allows you to absorb the material more easily than if you were to cram large quantities of information at once.

When You Begin

- **Be positive!** The tests are not designed to trick you or be unnecessarily difficult. In fact, if you’ve taken other tests in school or at work, you’ll probably find these very familiar. Start with a positive attitude and don’t give up! Try to remember the hints that are outlined in this booklet and don’t get discouraged if there are questions for which you don’t know the answer. Remember, each question counts the same as any other question. If you can’t answer one, don’t let that discourage you for the next items. Begin each section/test with the same positive attitude. No one is expected to get every answer right!

- **Read the directions and pay close attention to all test instructions!** Sometimes we assume we know what type of question we are answering, but many times test takers get answers wrong because they did not read the directions. An example of this would be the differences between *mark all that apply, answer only one,* and *mark the one that does not belong.*

- **Relax.** Feeling high amounts of stress or tension will cause you to forget what you know or think irrationally. Ways to reduce feelings of stress include preparing in advance, not talking with others who are stressed about the test immediately beforehand, making sure you understand the directions, and reviewing this guide.
During the Test

- **Complete the easiest questions or sections first.** Begin the test by identifying the areas in which you are strongest while remembering to mark the questions you skip. Complete these sections first and then move to the more difficult areas. Don't spend too much time on any one question - since any question is worth the same in scoring, it is always to your advantage to complete as many questions as you can!

- **Mark questions you skip for easy relocation.** If you find yourself in a situation where you do not understand the nature of the question or simply don’t know the answer, mark it on your answer sheet with your pencil and return to it later. Surprisingly, this is one of the most common mistakes made by test takers. Spending valuable time on a test item that you cannot answer simply gives you less time to complete other items you may know. It is far better to mark that item and continue forward, coming back to that item if time permits at the end. Marking your answer sheet when you skip an item can help you keep track of where you are on the test - some candidates have lost valuable time when they did not mark a skipped item and got off-track on the answer sheet.

- **Read each question carefully.** After reading each question, make sure you understand it clearly.

- **Do not make RANDOM guesses, but narrow down for the correct response.** Try to eliminate at least one wrong answer before guessing. If you are given four choices and randomly guess, you only have a 25% chance of guessing the right answer—or a 75% chance of guessing the WRONG answer. Further, if you can eliminate just one wrong answer you have boosted your chances to 33%. Obviously, if you can eliminate two wrong answers your chances have gone up to 50%. When all else fails, and you must make guesses:
  - Be aware of key words: “always,” “never,” “all,” or “none.” Consider these options carefully.
  - Trust your “gut”: Usually your first reaction is right.

- **Be aware of being tempted to pick wrong answers.** There are answers that test developers have created based upon simple common errors such as replacing the word “their” with “there.” Take your time to work through the problem if it involves numbers and to read actively if the question involves grammar and spelling situations.

- **Leave time for review.** If you complete the test before the time is up, don’t stop working - review your answers! Don’t look for patterns in the responses - the tests have been professionally developed and don’t necessarily have the same number of “A,” “B,” or “C” answers. If you find that you have answered mostly “A,” for example, trust your instincts and don’t assume that it must be wrong. Research has shown that many people who change answers during the review change right answers to wrong ones. Changes should be made only when you are certain the original answer is wrong. You can also use any extra time to make certain your answers are entered darkly and clearly. Be sure all your answer changes are erased completely and there are no stray marks on the answer sheet.
Strategies for Various Question Types

**True - False**

- If any part of the statement is false, the entire statement is false.
- Words such as “always,” “never,” “all,” and “none” are often, but not always, signals that a statement is false.

**Multiple Choice**

- Read the entire question and try to answer it *before* looking at your options.
- Even if you think you know the answer be sure to read through all of your options.
- If you are uncertain, begin by eliminating answers that are wrong, increasing your chances of being right.
Discussion and Samples for Tests in the Blue Battery

Mechanical Comprehension

The Mechanical Comprehension Test is designed to measure how much mechanical aptitude and intuition you have. It covers various areas such as pressure, sound, fluids, force, gravity, etc. You have 30 minutes to complete this test, so you should try to answer every one of the questions in the time allowed.

The test consists of 68 questions which are divided into 18 content areas:

- Acoustics
- Belt Drive
- Center of Gravity
- Centrifugal Force
- Electricity
- Gears
- Gravity and Velocity
- Heat
- Hydraulics
- Inertia
- Levers
- Optics
- Planes and Slopes
- Pulley Systems
- Resolution of Forces
- Shape and Volume
- Structures
- Miscellaneous

Below are examples of items from the Mechanical Comprehension Test.

1. If gear #1 is turning as indicated, which way will gear #3 turn? (Choose C if gears lock.)

A  B  C

[Diagram showing gears 1, 2, and 3 with arrows indicating rotation]
2. Two identical rollers have forces applied to them as shown below. Which force needs to be greater in order to roll them over the step? (Choose C if force is equal for both.)

A  B  C

3. Is the water flowing out faster from A or from B? (Choose C if same speed.)

A  B  C
4. The rod below has two weights attached to its ends: A is larger and heavier than B. The rod also has a pivot at its center allowing it to turn freely in a horizontal plane. If the car is moving in the direction indicated by the arrow, in which direction does the rod move? (Choose C if no movement.)

A  B  C
Computation

This test is designed to measure the ability to solve arithmetic problems involving operations with whole numbers, decimals, percents, and simple fractions. The test taker will read an arithmetic expression and select the correct answer from four choices or indicate that the correct answer is not listed. You will be given 5 minutes to solve as many problems as possible.

Below are examples of items from the Computation Test.

Solve each problem below and choose the correct answer or choose “X” if the correct answer is not available.

Division
1. \(1,600 \div 40 = \)  400 40 4 14 X
2. \(345 \div 10 = \) 34.5 3.45 13.45 9.6 X
3. \(3.5 \div 2 = \) 1.25 2.25 .75 1.5 X

Multiplication
4. \(25 \times 3 \) 100 75 65 50 X
5. \(7 \times 14 \) 108 88 78 68 X
6. \(35 \times 9 \) 350 351   125 315 X

Decimals
7. \(2.1 + 1.2 \)  3.3 2.3 3.2 3.4 X
8. \(10.5 \times 10.1 \) 106.05 105 105.5 116 X
9. \(30.2 - 20.3 \) 10 9.6 10.1 11.1 X

Percentages
10. 15% of 100 15 25 10 12.5 X
11. 75% of 300 175 225 250 245 X
12. 5% of 600 80 60 50 25 X

Fractions
13. \(\frac{1}{2} + \frac{1}{4} \)  \(\frac{3}{4} \) 2/6 1/6 2/4 X
14. \(\frac{7}{8} \) of 50 40 43\(\frac{3}{4}\) 35\(\frac{1}{2}\) 45 X
15. \(100 \div 3 \frac{1}{3} \) 30 35 33 25 X

Subtraction
16. \(1,350 - 785 \) 695 595 565 355 X
17. \(215 - 50 \) 175 185 165 155 X
18. \(97 - 31 \) 66 56 76 46 X
Symbolic Reasoning

This test consists of 30 problems, each containing a statement and conclusion. You will be given 5 minutes.

Mark “T” to indicate the conclusion is true, “F” to indicate it is false, or “?” to indicate that it is impossible to determine if the conclusion is true or false based on the information given in the statement. An important distinction that makes this type of test unique to other tests of general reasoning ability is its elimination of verbal instructions which reduces its loading on verbal ability.

Below are some example items from the Symbolic Reasoning test.

**Given the definitions below, mark T (true), F (false) or ? (Not enough info provided).**

= means “is equal to” ≠ means “is not equal to, and so is larger or smaller”
> means “is larger than” ‡ means “is not larger than, and so is equal or smaller”
< means “is less than” † means “is not less than, and so is equal or greater”

1. A = B = C, Therefore, A = C T F ?
2. A > B < C, Therefore, A = C T F ?
3. A > B < C, Therefore, A > C T F ?
4. A ‡ B < C, Therefore, A = C T F ?
5. A < B < C, Therefore, A < C T F ?
6. A > B = C, Therefore, A > C T F ?
7. A > B † C, Therefore, A = C T F ?
8. A ‡ B ‡ C, Therefore, A > C T F ?
9. A < B > C, Therefore, A = C T F ?
10. A < B > C, Therefore, A > C T F ?
Visual Speed and Accuracy

The ability to see details quickly and accurately is measured by this test. Test items consist of pairs of number series that may include decimals, letters, or other symbols. You will have 5 minutes to review as many pairs as possible.

Below are some example items from the Visual Speed & Accuracy test.

Look at the pairs of numbers below. If the pair is identical, mark S for same; if they are different, mark D for different.

1. 388 838  S   D  8. 48.256  48,256  S   D
2. 696  696  S   D  9. 700000  700000  S   D
3. 8888B88  8888888 S   D  10. 4447554  4447554 S   D
4. 127% 1.27%  S   D  11. 3713/4  3731/4  S   D
5. 111111  11111  S   D  12. 99699.9  96699.9  S   D
6. 3B67N  3B67N  S   D  13. 23.32.1.2  23.32.1.2  S   D
7. #CP-41A  #CP-14A  S   D  14. 7PXT67  7PXL677  S   D
Answers to Sample Items

Mechanical Comprehension Test

1. B. Since the gears are not interlocked, they will rotate if gear #1 turns. By turning gear #1 clockwise as indicated, gear #3 will turn clockwise as well (i.e., answer B).

2. A. Pushing the roller over a step requires a larger force than pulling the roller over the step.

3. C. The height of the surface above each hole is equal, so water will flow out with equal speed.

4. A. The heavier, larger weight will move away from the direction the car is moving.

Computation

1. 40  
2. 34.5  
3. X

4. 75  
5. X  
6. 315

7. 3.3  
8. 106.05  
9. X

10. 15  
11. 225  
12. X

13. ¾  
14. 43¾  
15. 30

16. 565  
17. 165  
18. 66

Symbolic Reasoning

1. T  
2. ?

3. ?  
4. F

5. T  
6. T

7. F  
8. F

9. ?  
10. ?

Visual Speed and Accuracy

1. D  
2. S

4. D  
5. D

7. D  
8. D

10. S  
11. D

13. S  
14. D

12. D
Further Resources

Note: Not all of the resources on the following pages will contain information that is relevant for the test you are taking. It is suggested that you find the material in each resource relevant to your test.

General Test Taking Strategies

For some test takers, especially those who are anxious about testing or those who are unfamiliar with testing environments, it is helpful to develop general test taking strategies for taking tests. Below are some books that may be helpful.

Mechanical and Spatial Skills

Books

Other Activities
Puzzles, games, and hobbies that involve mechanical and spatial skills (e.g., erector sets, building models, rockets, etc.)
Television shows or videos that teach concepts of the physical sciences (e.g., Bill Nye the Science Guy)
Websites and computer software that have interactive activities related to physics (e.g., www.easyphysics.net)
Seminars that teach specific skills (e.g., construction, electronics, mechanics, etc.)
College/trade school courses in physics and the sciences
Math Problem Solving and Computation

Books

Other Activities
Puzzles and games that involve math and computation skills (e.g., number games, flash cards, etc.)
Television shows or videos that teach math and arithmetic
Websites and computer software that have interactive activities related to arithmetic and math (e.g., www.math.com)
College/trade school courses in algebra or basic mathematics
Logic and Reasoning

Books

Other Activities
Puzzles, games, and hobbies that involve logic and reasoning (e.g., brainteasers, board games like Clue, etc.)
Television shows or videos that involve logic and reasoning
Websites and computer software that have interactive activities related to logic and reasoning (e.g., Sim City)
Visual Speed and Accuracy

Books

Other Activities
Puzzles, games, and hobbies that involve visually locating information quickly and accurately (e.g., word search games, etc.)