



## **A guide to taking the Blue Battery Tests for Mechanical job families**

### **Test Preparation Kit**

Strategies • Samples • Further Resources

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

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## 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.

### **During the Test**

- Read each question carefully. After reading each question, make sure you understand it clearly.
- Complete the easiest questions or sections first. Begin the test by identifying the areas in which you are strongest, remembering to mark the questions you skip. 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!
- 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 and return to it later. Spending valuable time on a test item that you cannot answer simply gives you less time to complete other items you may know. Marking your answer sheet when you skip an item can help you keep track of where you are on the test.
- 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.

- Do not make RANDOM guesses, but narrow down for the correct response. 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.
- Leave time for review. If you complete the test before the time is up, 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. 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 Questions

### True/False Questions

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

### Multiple Choice Questions

- 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.

## 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 listen carefully 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 difference 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.



## Samples for Tests in the Blue Battery

### **Sample 1: Mechanical Comprehension**

This test is designed to measure how much mechanical aptitude and intuition you have. It covers 12 content areas which are listed below. The test consists of 36 questions. You will have 20 minutes to complete the test, so you should try to answer every one of the questions in the time allowed.

*Below are examples of questions from the Mechanical Comprehension test.*

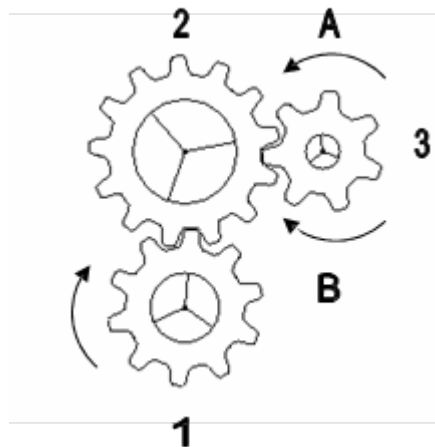
**Directions:** Circle the correct response.

### ***Content Covered***

- *Belt Drive*
- *Center of Gravity*
- *Centrifugal Force*
- *Gears*
- *Gravity and Velocity*
- *Hydraulics*
- *Lever*
- *Planes and Slopes*
- *Pulley Systems*
- *Resolution of Forces*
- *Structures*
- *Miscellaneous*

Follow the directions listed on the previous page to answer these problems.

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

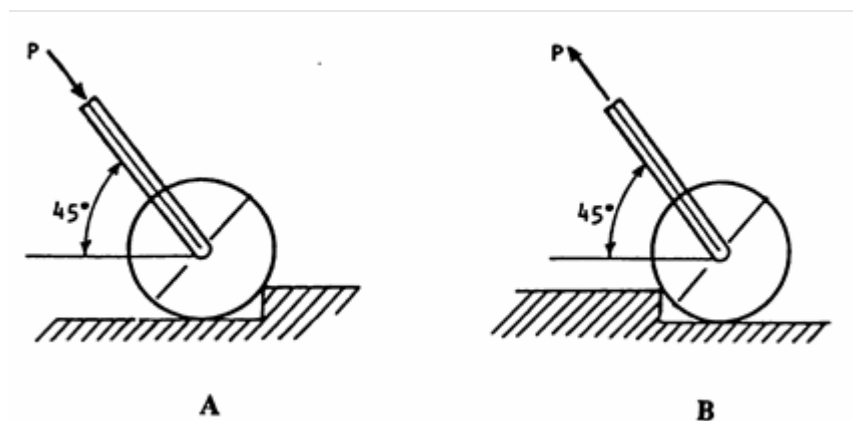


A.

B.

C.

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.)

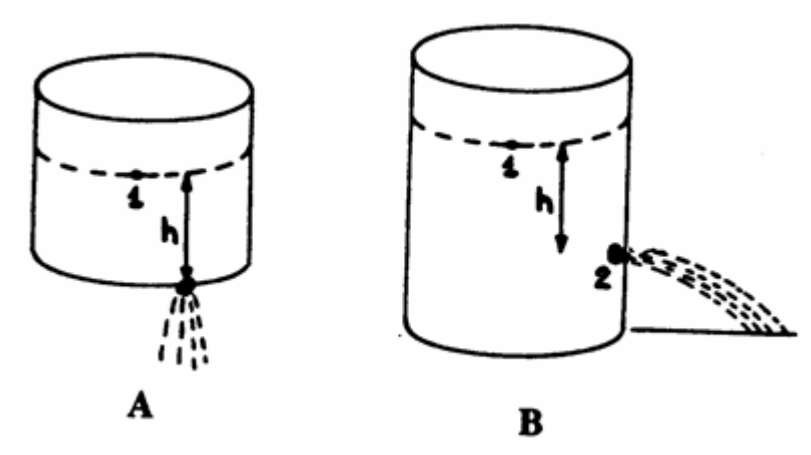


A.

B.

C.

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

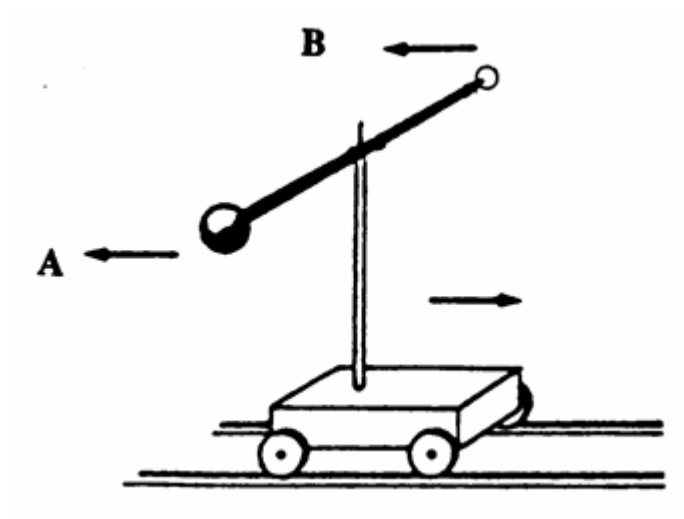


A.

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.

### Sample 2: Symbolic Reasoning

This test consists of 30 problems, each containing a statement and a conclusion. You will be given 5 minutes to complete the test. Mark “T” to indicate the conclusion is true, “F” to indicate it is false, or “N” to indicate that it is impossible to determine if the conclusion is true or false based on the information given.

*Below are examples of questions from the Symbolic Reasoning test.*

**Directions:** Given the definitions below, bubble in T (true), F (false), or N (not enough information provided).

#### Definitions

= means “is equal to”

> means “is larger than”

< means “is less than”

≠ means “is not equal to, and so is larger or smaller”

⋈ means “is not larger than, and so is equal or smaller”

⋉ means “is not less than, and so is equal or greater”

1.  $A = B = C$ , therefore,  $A = C$

T  F  N

6.  $A > B = C$ , therefore,  $A > C$

T  F  N

2.  $A > B < C$ , therefore,  $A = C$

T  F  N

7.  $A > B \not< C$ , therefore,  $A = C$

T  F  N

3.  $A > B < C$ , therefore,  $A > C$

T  F  N

8.  $A \not> B \not< C$ , therefore,  $A > C$

T  F  N

4.  $A \not> B < C$ , therefore,  $A = C$

T  F  N

9.  $A < B > C$ , therefore,  $A = C$

T  F  N

5.  $A < B < C$ , therefore,  $A < C$

T  F  N

10.  $A < B > C$ , therefore,  $A > C$

T  F  N

### Sample 3: 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. This is a speeded test.

*Below are examples of questions from the Computation test.*

**Directions:** Solve the problems below and bubble in the correct answer.

#### Division

1.  $1,600 \div 40 =$

- 400       40       4       14       Answer not listed

2.  $345 \div 10 =$

- 34.5       3.45       13.45       9.6       Answer not listed

3.  $3.5 \div 2 =$

- 1.25       2.25       .75       1.5       Answer not listed

#### Multiplication

4.  $25 \times 3 =$

- 100       75       65       50       Answer not listed

5.  $7 \times 14 =$

- 108       88       78       68       Answer not listed

6.  $35 \times 9 =$

- 350       351       125       315       Answer not listed

### Decimals

7.  $2.1 + 1.2 =$   
 3.3       2.3       3.2       3.4       Answer not listed
8.  $10.5 \times 10.1 =$   
 106.05       105       105.5       116       Answer not listed
9.  $30.2 - 20.3 =$   
 10       9.6       10.1       11.1       Answer not listed

### Percentages

10. 15% of 100 =  
 15       25       10       12.5       Answer not listed
11. 75% of 300 =  
 175       225       250       245       Answer not listed
12. 5% of 600 =  
 80       60       50       25       Answer not listed

### Fractions

13.  $\frac{1}{2} + \frac{1}{4} =$   
  $\frac{3}{4}$        3        $\frac{1}{6}$        2       Answer not listed
14.  $\frac{7}{8}$  of 50 =  
 40        $43\frac{3}{4}$         $35\frac{1}{2}$        45       Answer not listed
15.  $100 \div 3\frac{1}{2} =$   
 30       35       33       25       Answer not listed

### Subtraction

16.  $1,350 - 785 =$   
 695       595       565       355       Answer not listed
17.  $215 - 50 =$   
 175       185       165       155       Answer not listed
18.  $97 - 31 =$   
 66       56       76       46       Answer not listed

#### Sample 4: 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 examples of questions from the Visual Speed and Accuracy test.*

**Directions:** 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     | <input type="radio"/> S | <input type="radio"/> D |
| 2. 696      | 696     | <input type="radio"/> S | <input type="radio"/> D |
| 3. 8888B88  | 8888888 | <input type="radio"/> S | <input type="radio"/> D |
| 4. 127%     | 1.27%   | <input type="radio"/> S | <input type="radio"/> D |
| 5. 111111   | 11111   | <input type="radio"/> S | <input type="radio"/> D |
| 6. 3B67N    | 3B67N   | <input type="radio"/> S | <input type="radio"/> D |
| 7. #CP-41A  | #CP-14A | <input type="radio"/> S | <input type="radio"/> D |
| 8. 48.256   | 48,256  | <input type="radio"/> S | <input type="radio"/> D |
| 9. 7000000  | 700000  | <input type="radio"/> S | <input type="radio"/> D |
| 10.4447554  | 4447554 | <input type="radio"/> S | <input type="radio"/> D |
| 11. 3713/4  | 3731/4  | <input type="radio"/> S | <input type="radio"/> D |
| 12. 99699.9 | 96699.9 | <input type="radio"/> S | <input type="radio"/> D |

## Answers

### 1. Mechanical Comprehension

1. The answer is 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.
2. The answer is A. Pushing the roller over a step requires a larger force than pulling the roller over the step.
3. The answer is C. The height of the surface above each hole is equal, so water will flow out with equal speed.
4. The answer is A. The heavier, larger weight will move away from the direction the car is moving.

### 2. Symbolic Reasoning

- |      |       |
|------|-------|
| 1. T | 6. T  |
| 2. N | 7. F  |
| 3. N | 8. F  |
| 4. F | 9. N  |
| 5. T | 10. N |

### 3. Computation

- |                      |                       |                     |
|----------------------|-----------------------|---------------------|
| 1. 40                | 7. 3.3                | 13. $\frac{3}{4}$   |
| 2. 34.5              | 8. 106.05             | 14. $43\frac{3}{4}$ |
| 3. Answer not listed | 9. Answer not listed  | 15. 30              |
| 4. 75                | 10. 15                | 16. 565             |
| 5. Answer not listed | 11. 225               | 17. 165             |
| 6. 315               | 12. Answer not listed | 18. 66              |

### 4. Visual Speed and Accuracy

- |      |       |
|------|-------|
| 1. D | 7. D  |
| 2. S | 8. D  |
| 3. D | 9. D  |
| 4. D | 10. S |
| 5. D | 11. D |
| 6. S | 12. D |



## Further Resources

*Note: Not all of the resources listed below will contain information that is relevant to the test that you are taking. It is suggested that you find the material in each resource relevant to your test.*

### Mechanical and Spatial Skills

- Wiesman, J. (2003). How to Prepare for the Mechanical Aptitude and Spatial Relations Test. Hauppauge, NY: Barron's Educational Series, Incorporated.
- <https://www.apptitude-test.com/mechanical-aptitude.html>
- Try to engage in activities such as:
  - Games and puzzles that involve mechanical and spatial skills.
  - Visiting websites that have interactive activities and games related to physics.

### Logic and Reasoning

- Chesla, E. (2002). Reasoning Skills Success in 20 Minutes a Day. New York, NY: Learning Express.
- <https://www.kent.ac.uk/careers/tests/sequences.htm>
- Try to engage in activities such as:
  - Watching television shows or videos that involve logic and reasoning.
  - Putting together puzzles and/or playing games that involve logic and reasoning.

### Computation Further Resources

- Graham, A. (2002). Teach Yourself Basic Mathematics. New York: McGraw-Hill.
- Johnson, T. (2002). Teach Yourself Mathematics. New York: McGraw-Hill.
- <http://admissions.ucc.edu/Media/Website%20Resources/documents/ALC/math/011/review/index011.htm>
- Try to engage in activities such as:
  - Puzzles and games that involve math and computation skills (e.g. number games, flash cards, etc.)
  - Visiting websites and using software that has interactive activities related to arithmetic and math.

### Visual Speed and Accuracy Further Resources

- Bobrow, J., Orton, P.Z., & Covino, W.A. (2000). Barron's Civil Service Exams. New York: McGraw-Hill.
- [http://testingcentre.nicheconsulting.co.nz/visual\\_speed\\_tests.htm](http://testingcentre.nicheconsulting.co.nz/visual_speed_tests.htm)
- Try to engage in activities such as:
  - Puzzles, games, and hobbies that involve visually locating information quickly and accurately.