

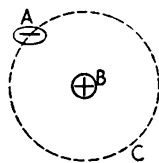
**DIRECTIONS:** Four possible answers are given for each question. Put an X in the parentheses in front of the number corresponding to that answer which you think is most nearly correct.

1. Plasmagene is a new term introduced into  
 1. astronomy  
 2. biology  
 3. geology  
 4. physics

2. In this diagram of the hydrogen atom,

⊖ represents

1. a proton  
 2. a proton's charge  
 3. an electron  
 4. an electron's orbit

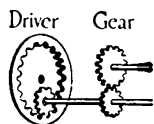


3. An icosahedron is a  
 1. form of electron tube  
 2. Mesozoic rock formation  
 3. pendent mass of ice  
 4. solid with twenty faces

4. Two kinds of devices—the spring scale and the balance—could possibly be used for measuring the mass of an object. Which one should be used?

1. either  
 2. neither  
 3. the balance  
 4. the spring scale

5. If the driver turns clockwise, the gear will  
 1. move back and forth  
 2. not turn  
 3. turn clockwise  
 4. turn counterclockwise



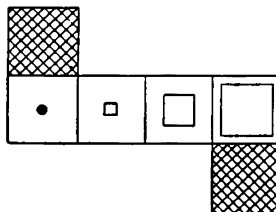
6. The simplest animals are  
 1. bacteria  
 2. crustacea  
 3. polyps  
 4. protozoa

7. Rh factor is a term used in  
 1. astronomy  
 2. biochemistry  
 3. radiography  
 4. psychology

8. Each of three containers has a volume of 2,500 cc. One container is a sphere, one a cube, and one a cylinder whose diameter equals its height. Each container is made of glass of .08 cm. thickness. Which container has the least surface?  
 1. all have equal surfaces  
 2. the cube  
 3. the cylinder  
 4. the sphere

9. The basic formula for atomic energy was devised by  
 1. Karl T. Compton  
 2. Albert Einstein  
 3. Henry D. Smyth  
 4. J. R. Oppenheimer

10. From the pattern



which of the figures can be made?

1.  3.   
 2.  4.

11. Which of the following normally flow from the cathode to the anode in a gaseous rectifier tube?

1. electrons  
 2. neutrons  
 3. positrons  
 4. protons

12. What is the missing word in the following sentence? "An emulsion is a mixture of two or more—liquids in which separation takes place very slowly."

1. concentrated  
 2. miscible  
 3. non-miscible  
 4. saturated

13. Amines are—of ammonia in which there is replacement of one or more—of ammonia by an—group, e.g., methyl or ethyl, or by an—group, e.g., phenyl or naphthyl. Which is the correct order for the four missing words?

1. derivatives—hydrogens—alkyl—aryl  
 2. derivatives—hydrogens—aryl—alkyl  
 3. hydrogens—derivatives—alkyl—aryl  
 4. hydrogens—derivatives—aryl—alkyl

14. Radioactive carbon, C<sup>14</sup>, with a measured half-life of 5,000 years, is

1. not normally present in living tissue  
 2. present in all living things  
 3. present only in animals having a skeleton  
 4. present only in green plants

**PART A**

**QUESTIONS FOR SECT**

83. Which graph best illustrates distance? (Distance and speed on the ord

1.   
 2.

84. About how many tin the 100-yard dash th

1. 14  
 2. 15  
 3. 25  
 4. 50

85. About what would b

1. 10 miles pe  
 2. 15 miles pe  
 3. 20 miles pe  
 4. 25 miles pe

**DIRECTIONS:** Four poss of the questions 101-105. front of the number corr you think is most nearly

101. Which of the followi

1. rayon  
 2. the incande  
 3. the mercur  
 4. the safety |

102. Which of the follow

1. bakelite  
 2. fountain pe  
 3. gyroscope  
 4. helicopter

103. Which of these chem

1. barium  
 2. calcium  
 3. hydrogen  
 4. iodine

104. About what year v

1. 1910  
 2. 1920  
 3. 1930  
 4. 1940

105. Which of the follow or development?

1. diesel engi  
 2. disk plow  
 3. electric loc  
 4. military t

There are three classe  
 Class A—The fulcrum resistance.

Class B—The resista fulcrum.

Class C—The effort fulcrum.

Write the letter A, B, of the following to indic

106. Crowbar  
 107. Nutcracker  
 108. Oar  
 109. Pliers

**SECTION K:** World's records for running are as follows:

- 100 yards— 9.4 seconds  
 220 yards—20.3 seconds  
 440 yards—46.4 seconds  
 880 yards— 1 minute 49.2 seconds  
 mile — 4 minutes 1.4 seconds  
 2 miles — 8 minutes 42.8 seconds  
 3 miles —13 minutes 32.4 seconds

**SECTION D:**

The diagram shows a pump.

**PART B**

**SCIENCE APTITUDE TEST**—This sample contains typical questions taken from the original three-hour examination given to high school seniors in the Eighth Science Talent Search conducted by Science Clubs of America, administered by Science Service. The test was devised by Dr. Harold A. Edgerton, and Dr. Steuart Henderson Britt, psychologists of New York City. If you want to see the complete aptitude test used, send two three-cent stamps to Science Service, 1719 N St., N. W., Washington 6, D. C. and ask for the science talent test.

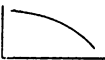
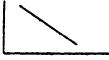




GENERAL SCIENCE

### Test Your Science Ability With Sample Problems

**ANSWERS FOR SECTION K:**

1. graph best illustrates the relation between speed and distance? (Distance is measured from left to right, speed on the ordinate.)

1.  ( ) 3. 
2.  ( ) 4. 

2. how many times faster (speed) is the record for 100-yard dash than for the mile?

1. 1 1/2
2. 15
3. 25
4. 50

3. what would be the speed for the half-mile run?

1. 10 miles per hour
2. 15 miles per hour
3. 20 miles per hour
4. 25 miles per hour

**ANS:** Four possible answers are given for each question 101-105. Put an X in the parentheses in a number corresponding to that answer which is most nearly correct.

101. of the following was invented first?

1. rayon
2. the incandescent lamp
3. the mercury thermometer
4. the safety pin

102. of the following is the most recent invention?

1. bakelite
2. fountain pen
3. gyroscope compass
4. helicopter

103. of these chemical elements was first discovered?

1. barium
2. calcium
3. hydrogen
4. iodine

104. what year was the autogyro invented?

1. 1910
2. 1920
3. 1930
4. 1940

105. of the following is the most recent invention in development?

1. diesel engine
2. disk plow
3. electric locomotive
4. military tank

106. of the three classes of levers:

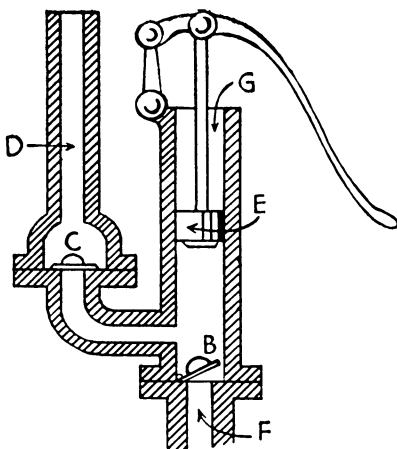
**A**—The fulcrum is between the effort and the resistance.

**B**—The resistance is between the effort and the fulcrum.

**C**—The effort is between the resistance and the fulcrum.

107. Write the letter A, B, or C in the parentheses for each drawing to indicate which class of lever it is.

- Crowbar ( ) 110. Scissors
- Nutcracker ( ) 111. Tweezers
- Oar ( ) 112. Wheelbarrow
- Pliers



**QUESTIONS FOR SECTION D:**

61. In the operation of the pump, when the handle is raised,









- ( ) 1. valve B is closed and valve C is closed
- ( ) 2. valve B is open and valve C is closed
- ( ) 3. valve B is closed and valve C is open
- ( ) 4. valve B is open and valve C is open

Below are two lists. Each item in Column I is a prefix used in scientific terms. In Column II are listed the meanings of these and other prefixes. For each prefix in Column I, put the number of its meaning (from Column II) in the parentheses.

- | Column I         | Column II          |
|------------------|--------------------|
| ( ) 113. ab-     | 1. across          |
| ( ) 114. brachy- | 2. away from       |
| ( ) 115. cata-   | 3. behind          |
| ( ) 116. dys-    | 4. being           |
| ( ) 117. ecto-   | 5. close to        |
| ( ) 118. histo-  | 6. distortion      |
| ( ) 119. iso-    | 7. downward        |
| ( ) 120. juxta-  | 8. equal           |
| ( ) 121. lalo-   | 9. external        |
| ( ) 122. myo-    | 10. healthy        |
| ( ) 123. neo-    | 11. imperfect      |
| ( ) 124. onto-   | 12. long           |
| ( ) 125. para-   | 13. muscle         |
| ( ) 126. retro-  | 14. new            |
| ( ) 127. syn-    | 15. pulse          |
| ( ) 128. trans-  | 16. reasoning      |
| ( ) 129. uni-    | 17. short          |
|                  | 18. single         |
|                  | 19. small          |
|                  | 20. speech process |
|                  | 21. through        |
|                  | 22. tissue         |
|                  | 23. together       |
|                  | 24. toward         |
|                  | 25. without        |

**PART C**

Below are two lists. Each item in Column I is a symbol. In Column II are listed the meanings of these and other symbols. For each symbol in Column I, put the number of its meaning (from Column II) in the parentheses.

- | Column I   | Column II                                     |
|--|---|
| ( ) 130.  | 1. approaches equality as a limit             |
| ( ) 131.  | 2. equals                                     |
| ( ) 132.  | 3. is approximately equal to                  |
| ( ) 133.  | 4. is equivalent to, in terms of some modulus |
| ( ) 134.  | 5. is greater than                            |
| ( ) 135.  | 6. is identical with                          |
| ( ) 136.  | 7. is less than                               |
| ( ) 137.  | 8. is less than or (at most) equal to         |
|  | 9. is more than or (at least) equal to        |
|  | 10. is not equal to                           |
|  | 11. is not greater than                       |
|  | 12. is not less than                          |

► HERE is science's super-quiz of the year. You can try it on yourself or your friends. It will tell you whether you have reasoning ability such as a scientist needs to make new discoveries and inventions.

Thousands of seniors of the nation's high schools, some of them your neighbors, have just taken the full three-hour science test, of which these questions are a part.

These young scientists were competing in the Eighth Annual Science Talent Search for the Westinghouse Scholarships and their papers are now being scored by the judges. Results will be announced shortly. The questions up to now have been kept secret.

Not even the most brilliant or successful scientist would be expected to get all the questions right. The questions do require the use of scientific aptitude or the ability to think things through to a logical and successful conclusion.

You may discover in taking the test that you have abilities that you did not realize you have. Not everyone should expect to have the abilities necessary for success in scientific research as only a very small percentage of our population can do creative investigational work.

In any event, trying the test will give you some idea of what abilities are necessary in a scientist. Don't worry if the test seems difficult.

Want to try the test? First, *don't* peep at the answers. Next, arrange to spend about 40 minutes of time during which you will not be interrupted. Finish all the questions in one sitting. When you are through, turn to the answers on page 78.

There are three kinds of questions. Answer all questions in Part A by putting an X in the answer box corresponding to the number of the answer which is most nearly correct. In the case of Part B, first read each paragraph and then answer in a similar way each of the questions based on the information given. In Part C answer as directed.

Now a few more hints about taking the test.

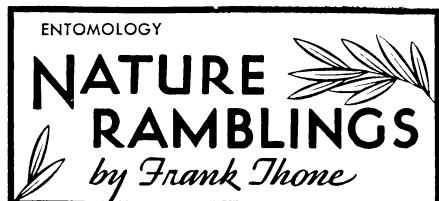
Don't expect to make a perfect score. No one of the thousands of boys and girls who have taken Science Talent Search examinations has ever made a perfect score. They are not expected to do so. Neither are you.

You may start in on the test and then not finish. Or you may take one look at it and say: "That is too tough for me." That is your privilege. No one is making you take the test.

The high school seniors were not required to take the test. They could walk out on it—and many of them did, thus withdrawing from the competition.

The test is made quite difficult intentionally in order to eliminate the persons

(Turn to page 78)



### Useful Pariah

► FRIENDLESS in a cold world, the coyote skulks the plains and foothills, seeking the scraps and leavings that make his meager living. He is the Ishmael of the four-footed world, the hunter of waste places, always raiding and thieving yet never prospering. Nobody ever saw a really fat coyote.

Coyotes are in ill repute with ranchers and stockmen because they occasionally make off with lambs and stray calves. Similarly, rangers and wardens of wildlife preservation areas sometimes feel impelled to cut down their numbers.

Not for the poor coyote, however, are the determined hunts with dogs and guns that have all but exterminated their bigger cousins, the wolves, from the continental United States. Traps and poison baits are all he is likely to get, to help him out of a world that neither appreciates nor loves him.

Newest among the trap mechanisms, and nearest the coyote is apt to get to the dignity of death by gunshot, is a short-barreled firearm that goes off when he grabs a tempting bait. But instead of discharging a bullet, it only belches a charge of poison into his mouth.

Although every man's hand is against him, the coyote is far from useless. His very way of life, as a snapper-up of un-

considered trifles, gives him high usefulness as a natural instrument of control over rabbits, prairie dogs and smaller rodents that would otherwise get completely out of hand and devour so much of the range that nothing would be left for the livestock.

Moreover, since the coyote will eat anything he can get his teeth into, he is about the most effective disposer of carrion there is in the West—better even than buzzards and crows. A bear will eat more carrion than a coyote because a bear is bigger; but there aren't as many bears as there are coyotes, and bears don't wander the plains.

Finally, although we refuse to associate with the coyote while he is alive, we are not too proud to wear his castoff clothing after we have killed and stripped him. During the hey-day (or hey-hey-day) of collegiate fur coats a couple of decades ago, they were always called 'coonskin—but most of them were doctored-up coyote skin. And how many of today's luxurious "Siberian wolf" coats actually originate on the plains of Wyoming and Colorado must be left as a trade secret of the furriers.

Science News Letter, January 29, 1949

### From Page 73

who do not have perseverance to finish a job. This ability to finish what is started is a prime requisite for solving scientific problems, whether they be in atomic energy, disease control, industrial technology or in everyday life. Sometimes those who quit have reasoning ability, but it isn't useful to them unless they use it.

Doing well on this sample of the full test (which takes three hours to do) is creditable, but it does not mean that you can quit what you are doing and become a scientist. To be a professional scientist requires many years of study and preparation as well as native ability. But there are many situations in your daily work and life that require the same kinds of ability that scientists need.

Again don't look at the answers until you have finished the whole test. When you have finished, score the questions right or wrong. Count the number that are right. That is your score. You can rate yourself by comparing your score with interpretations given at the end of the answers.

After you have done the test you will appreciate the abilities of the boys and girls, 14 to 18 years of age, who win honors in the Science Talent Search.

These test questions are some of those used in one step in selecting the winners and honorable mentions of the Eighth Science Talent Search, conducted by Science Service as one of the activities of Science Clubs of America.

Forty top Science Talent Search winners from all parts of the nation will arrive in Washington March 3 for a five-day meeting with leading scientists at which thousands of dollars in scholarships will be awarded. An additional 260 contestants are

being given honorable mentions and recommended to colleges, universities and technical schools as top-notch scientists of the future. In 18 states additional prizes and scholarships are being awarded to state winners.

The science aptitude test is only one of the techniques used in selecting boys and girls who are scientifically gifted. In addition each contestant filled out a personal data blank and wrote an essay describing some scientific project he has done or wishes to do. Teachers filled out a recommendation form and principals reported scholarship.

Taking the test and competing in the search comes as a culmination of high school science study and science club activity for thousands of boys and girls of America's public, private and parochial secondary schools.

Don't read further. Cover up the following paragraph until you have taken the test.

Correct answers to Part A are: 1, 2; 2, 3; 3, 4; 4, 3; 5, 4; 6, 4; 7, 2; 8, 4; 9, 2; 10, 4; 11, 1; 12, 3; 13, 1; 14, 2.

For Part B, Section K: 83, 2; 84, 1; 85, 2. Section D: 61, 2.

Part C: 101, 3; 102, 4; 103, 3; 104, 2; 105, 4; 106, A; 107, B; 108, B; 109, A; 110, A; 111, C; 112, B; 113, 2; 114, 17; 115, 7; 116, 11; 117, 9; 118, 22; 119, 8; 120, 5; 121, 20; 122, 13; 123, 14; 124, 4; 125, 6; 126, 3; 127, 23; 128, 1 or 21; 129, 18; 130, 10; 131, 8; 132, 9; 133, 12; 134, 6; 135, 3; 136, 1; 137, 4.

Your score is the number you answered correctly. If your score is 35 or better, you may have a real talent for science. Average science aptitude is indicated by scores ranging from 21 to 34.

None of the questions was answered correctly by more than 90% of the high school seniors. The easiest ones were 1, 2, 5, 10, 11, 107, 109, 110, 111 and 112. Questions on chronology and scientific prefixes were the most missed. The "toughies" included 13, 14, 83-85, 105, 108, 114-122, 124-128 and 134-137.

If your score disappointed you, remember that this examination was not given to all high school seniors, only those with an interest in science. Most of them rank in the upper one-fourth of their classes.


Science News Letter, January 29, 1949

*Sawdust* is a good mulch for small fruits, especially blueberries.

One important industrial use of *silver* is in photographic films in which silver nitrate is the light-sensitive element.

Norway, a country in which *match-making* is a big business, is having a match shortage, although present production is greater than prewar output; exports to match-hungry nations are blamed for the local condition.

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