

GENERAL SCIENCE

Test Your Science Aptitude

Thousands of high school seniors tried to answer the questions given here in tests to rate their potential scientific ability as part of the National Science Talent Search.

By WATSON DAVIS

► DO YOU have potential scientific talent? You can get some idea by taking this science quiz, made up of a sample of the questions in the two-and-one-half-hour Science Talent Search test, just completed by thousands of high school seniors throughout the country.

Each year since 1942 more than 15,000 high school seniors have attempted this test. Only about 2,000 have been able to complete the test and fulfill other qualifications each year. Of these, 40 come to Washington every spring to take part in the annual Science Talent Institute and compete for thousands of dollars in scholarships.

Another 260 receive honorable mention each year and most of these are offered scholarships by colleges and universities all over the nation. The Science Talent Search is supported by the Westinghouse Educational Foundation and conducted by Science Clubs of America, administered by SCIENCE SERVICE.

The task of seeking out potential science talent grows more urgent each year. Although the nation has doubled its number of scientists in the past 12 years, the demand for them still keeps well ahead of the supply. The need to stay ahead of the Soviets in technology makes imperative the training of still more scientists, technicians and engineers.

U.S.S.R. Progress

The Soviet Union has also made great progress in the number of scientists it has trained. Its progress has been good enough to deny this country complacency in our record of training new scientists.

The Science Talent Search represents a scientific method of seeking out each year those high school seniors with the greatest aptitude for scientific careers. But it does more. In high school after high school, records show, the very existence of the test, the interest manifested in it, serve as spurs impelling many students toward a study of the sciences.

When you try these questions, none of you, it can be confidently predicted, will answer them all correctly within the time limit. None of the thousands of high school seniors who will take the test in future years will ever make a perfect score. None ever has. Even the most brilliant scientists, firmly established in their careers, would most likely miss some of the questions on the full test.

If you decide the test is too tough for you, or if you start it and then do not finish it, you will react as many thousands of high school seniors did. The test is made especially difficult, partly in order to eliminate all but the persevering. Perseverance is a quality especially necessary in scientific research.

The test is designed to measure science aptitude, not legal aptitude, nor other kinds of aptitude. Failure, therefore, means only that your aptitude probably does not lie in science.

As a matter of fact, very few people are gifted with the special abilities which make good scientists. This nation now has only about 200,000 scientists. About 46,000 of these have earned Ph.D. degrees. In addition, there are about 500,000 engineers and about 300,000 physicians, veterinarians and others in the health field.

Very few of this group can be called research scientists, devoting their time to seeking out the answers to the fundamental questions proposed by nature.

Ready now to test yourself? There are three parts to the test. You should be able to answer the sample questions in not more than a half hour. These questions, on the average, are from the easier sections of the test, although 12 and 45 in Part A and 81 in Part B are among the toughest in the full test. Questions 1 and 2 in Part A are among the easiest.

Place an X next to the answer you think most nearly correct in each question in Part A. In Part B, first read the paragraphs that precede the questions and then use an X to indicate the answer in each question you think most nearly correct. Pick the correct answer in Part C.

Time yourself so you do not go over one-half hour and answer all the questions in one session.

After you have completed the test, score yourself, using the answers printed on p. 63.

SCIENCE QUIZ—Sample questions, taken from two-and-one-half-hour Science Talent Search examination given this winter, are now revealed on this and the opposite page. Try them yourself to find out whether you have potential scientific ability.

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. What are the missing words in the following sentence? "The terms, _____ and _____, refer to the workability of metals."

- () 1. ductile — hobbing
() 2. ductile — malleable
() 3. hobbing — toning
() 4. malleable — toning

PART A

2. Which of the following best defines the environment of an organism?

- () 1. its location in reference to material and social causes and effects
() 2. the land, air, or water on which or in which it lives
() 3. the locality where it lives
() 4. the surroundings and conditions in which it lives

3. This diagram is most likely to be found in a book on

- () 1. aeronautics
() 2. biometry
() 3. limnology
() 4. psychometry



4. Fluorides are added to drinking water in order to

- () 1. improve fertility
() 2. increase metabolism
() 3. prevent typhoid fever
() 4. reduce caries

5. The number of calories necessary to raise the temperature of 13 grams of water from 25° C to 34° C is

- () 1. 0.69
() 2. 9.0
() 3. 13.0
() 4. 117.0

6. Density may be measured in terms of

- () 1. coefficient of resistance
() 2. grams per square centimeter
() 3. impermeability to water
() 4. pounds per cubic foot

7. Which of the following is not a mammal?

- () 1. platypus
() 2. porpoise
() 3. turtle
() 4. whale

8. $\text{Ca}(\text{H}_2\text{PO}_4)_2$ is used in

- () 1. alloys
() 2. dentifrices
() 3. fertilizers
() 4. pigments

9. In general, the energy carried by a sound wave increases with the

- () 1. amplitude
() 2. complexity
() 3. period
() 4. wave-length

10. Thorium is a

- () 1. bone of mammals
() 2. food preservative
() 3. metallic element
() 4. satellite of Jupiter

11. What are the missing words in the following sentence? "Lenses in eyeglasses for far-sighted persons are _____, or _____."

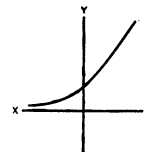
- () 1. concave — magnifying
() 2. concave — reducing
() 3. convex — magnifying
() 4. convex — reducing

12. Which of the following is found in the greatest quantity in automobile exhaust gases?

- () 1. carbon monoxide
() 2. carbon tetrachloride
() 3. sulfur trioxide
() 4. water

28. This curve is

- () 1. exponential
() 2. Gaussian
() 3. ogived
() 4. transcendental



45. This is a diagram of a

- () 1. catenary
() 2. catenoid
() 3. cissoid
() 4. hyperbola



PART B

SECTION B

Hunger, like the other appetites, is more powerful in impelling men to action when the means for its appeasement are difficult to procure and the possession of the means insecure over a period of time. In primitive cultures, therefore, hunger as a drive plays a more important role than in advanced societies. This distinction does not hold for all individuals in a society because societies do not advance as units. Nevertheless, a nutritive deficiency leading to hunger contractions is relatively less frequent among the unemployed in modern society than among those primitive groups which rely upon hunting for their sustenance.

QUESTIONS ON SECTION B

53. Which of the following inferences can most properly be made on the basis of the statements in the paragraph?
- () 1. Hunting is always a necessity, and never a sport, in primitive societies.
 - () 2. Members of advanced societies spend much less time thinking about food than members of primitive societies.
 - () 3. None of the other three conclusions given here can properly be inferred on the basis of the information given in the paragraph.
 - () 4. The hungriest people in advanced societies have, nevertheless, more to eat than the best fed members of primitive societies.
54. On the basis of the paragraph, which of the following statements is most tenable?
- () 1. A society is composed of individuals who do not respond differentially to the same drive.
 - () 2. Equally unsatisfied appetites are stronger drives in primitive societies than in modern societies.
 - () 3. Hunger is a more powerful drive to action than the other appetites.
 - () 4. Society is homogeneous in its changes.

PART C

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

105. Following is the average height in inches, and weight in pounds, of a given population.

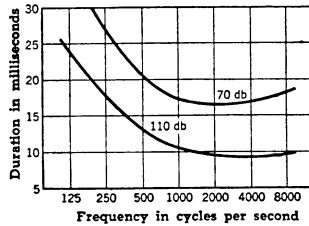
Height	Weight
74	164
73	163
72	162
71	160
70	157

Which of the following graphs — A, B, or C — is the correct representation of the data?

- () 1. A
- () 2. B
- () 3. C
- () 4. All are correct.

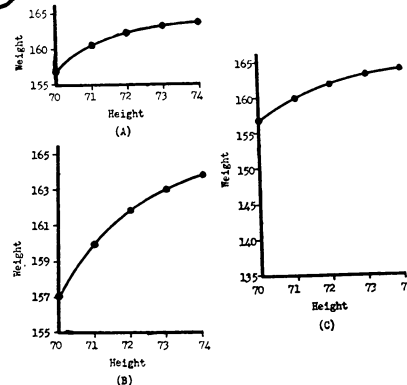
SECTION I

The diagram shows the minimum durations necessary for a tone to sound like a tone.



QUESTIONS ON SECTION I

80. According to the graph, which of the following statements is most nearly true?
- () 1. The higher the frequency of tones, the greater is the loudness, when duration is equal.
 - () 2. The pitch of tones is expressed in decibels.
 - () 3. Tones in the lower frequency range require greater duration to be heard than tones of higher frequencies.
 - () 4. Tones must last almost .010 seconds before they sound like tones.
81. The minimum durations shown were probably established on the basis of
- () 1. measurement of one complete sine wave
 - () 2. judgments of recognizing a tone or a click
 - () 3. measurement by means of a loudness meter
 - () 4. the logarithmic relationship of duration and pitch



The 40 high school seniors who come out on top will be in Washington Feb. 26 through March 2, for the Twelfth Annual Science Talent Institute. They will meet and talk with leading scientists, visit some of the extensive government research laboratories, hear scientific lectures and attend a final banquet when the winners of the \$11,000 in scholarships will be announced, and receive special gold Science Clubs of

America pins. The scholarships can be used at any accredited school selected by a winner.

The science aptitude test was compiled by two of the four judges of the Science Talent Search: Dr. Harold A. Edgerton, vice-president, Richardson, Bellows, Henry & Co., New York, and Dr. Stuart Henderson Britt, vice-president and director of research, Needham, Louis & Brorby, Inc., Chicago.

The other two judges of the Science Talent Search are Dr. Harlow Shapley of the Harvard College Observatory, president of SCIENCE SERVICE, and Dr. Rex E. Buxton, psychiatrist of Washington.

If you want to see the complete aptitude test used in the Twelfth Annual Science Talent Search, send ten cents in coin to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for the science aptitude test.

Science News Letter, January 24, 1953

The bat is the only winged mammal.

A new warmth fiber used in some boys' clothing is made from natural gas and common salt.

PUBLIC HEALTH

Long-Freezing of Pork Stops Painful Trichinosis

► THE HOME freezer or even the freezer compartment in the home refrigerator can be used to protect the family from trichinosis. This painful and serious disease comes from eating undercooked pork containing the worm-like parasites called trichinae.

Cooking kills these parasites, but the meat must be thoroughly cooked. Directions usually are to cook until the meat is white instead of pink.

Freezing also kills the parasites, but the temperature must be really low and held there for a considerable time. Dr. L. A. Spindler, parasitologist of the U. S. Department of Agriculture, has found that refrigeration for 20 days in a freezer at five degrees Fahrenheit will kill the trichinae when the meat is not more than six inches thick. If the meat is thicker than six inches, another 10 days at five degrees Fahrenheit is required to kill all the parasites. If the freezer can be set to 10 degrees below zero Fahrenheit, the trichinae will be killed within 10 days in a piece of meat six inches thick. At twenty degrees below, six to 12 days is enough.

Science News Letter, January 24, 1953

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