GENERAL SCIENCE

Super-Quiz for Science

Try questions thousands of high school seniors answered to rate scientific ability in national Science Talent Search. Test will tell you about your science skill.

By WATSON DAVIS

➤ HERE IS the science quiz of the year. You can get some idea of your aptitude for science by taking this test. It is a sample of a two and one-half hour test taken by thousands of high school seniors all over the country to determine who are the potential research scientists of the future.

The test is not meant to measure knowledge of science. It tries to determine who thinks as scientists do. Similar tests have been given to high school seniors for the past 11 years. Each year 40 young men and women who passed this and other hurdles have received a five-day trip to Washington and a chance at $11,000 in Westinghouse Science Scholarships.

Scientists for Defense

Seeking out potential scientists is an urgent task. It is necessary for the defense of the nation which is facing a drastic shortage of scientists, technicians and engineers needed to keep us technologically ahead of the potential enemy. This Science Talent Test, devised by SCIENCE SERVICE, has been called one of the best methods of discovering science talent.

It can be confidently predicted that 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 scientist of the day would most likely miss some of the questions on the full test.

If you look at the test and decide it is too tough for you, or if you start it and then do not finish it, you will react as many thousands of seniors did. The test is made especially difficult to find the persevering—a quality especially necessary to sometimes long unrewarding scientific research.

If you receive a poor mark, that does not necessarily mean that you are not bright. This is not an intelligence test. You might receive a much better mark on an aptitude test for potential lawyers, or writers.

Very few people are gifted with the special abilities which make up good scientists. This nation has only 600,000 scientists and engineers. Only a small percentage of that number can be called research scientists who seek out new knowledge of nature.

You cannot, of course, take your mark on this test, if it is a high one, and with it secure a position in a scientific laboratory. Being a scientist requires more than the potential ability, which this measures, it takes long years of study and hard work.

Ready now to test yourself? There are three parts to the test. You should be able to answer the sample questions, released here for the first time, in not more than a half hour. These questions, on the average, are from the easier sections of the test, although 27, 29 and 37 in Part A and 54 in Part B are among the toughest in the full test. Five and 35 in Part A and the second word choice in 109 in Part C are among the easiest.

Place an X next to the answer you think most 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. Either pick the correct answer in Part C or fill in the required information.

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

After you have completed the test, score yourself, using the correct answers printed on page 77.

Having taken the test, you can appreciate the abilities of the high school seniors from all over the nation who reach the top 40 each year. Colleges and universities appreciate that more than the top 40 are outstanding. Most of the 260 who receive honorable mention are offered substantial scholarships also.

Winners' Trip to Capital

The 40 winners will be in Washington, Feb. 28 through March 3, for the Eleventh 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 Science Talent Search is conducted by Science Clubs of America.

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

PART A

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.**

3. In an eclipse of the moon, the
( ) 1. earth passes between the moon and the sun
( ) 2. moon must be in new phase
( ) 3. moon passes between the earth and the sun
( ) 4. sun passes between the earth and the moon

5. When moisture in the air passes directly from the gaseous to the solid state and forms ice crystals on a cold surface, this is called
( ) 1. dew
( ) 2. frost
( ) 3. hail
( ) 4. sleet

18. A centipede is one kind of
( ) 1. bug
( ) 2. crustacean
( ) 3. insect
( ) 4. myriapod

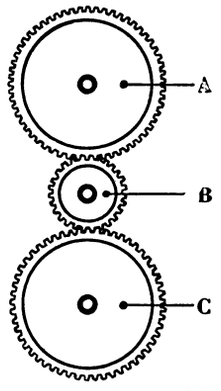
24. *Mach numbers* refer to the
( ) 1. diameters of synthetic fibers
( ) 2. electron patterns of radioactive isotopes
( ) 3. number system used by electronic computers
( ) 4. relationship of a given flight speed to the speed of sound

26. Which of the following is used for examining the ocean bottom?
( ) 1. baroscope
( ) 2. benthoscope
( ) 3. lithoscope
( ) 4. pantascope

27. Which of the following dates is closest to an equinox?
( ) 1. Christmas Day
( ) 2. Independence Day
( ) 3. Labor Day
( ) 4. Washington's Birthday

29. *Kenaf* is a basic material for the manufacture of
( ) 1. abrasives
( ) 2. ACTH
( ) 3. burlap
( ) 4. stock fattener

35. Gears A and C are identical in size. Which statement is true?



( ) 1. For each complete turn of wheel A, wheel C makes a complete turn.
( ) 2. Wheel A is necessarily the driver.
( ) 3. When wheel A turns clockwise, wheel C turns counterclockwise
( ) 4. When wheel C turns continuously, wheel A makes occasional stops.

SAMPLE QUESTIONS—Now revealed for first time, are these questions taken from the two and one-half hour Science Talent Search quiz. Try those shown on this page and the following one yourself to find out whether you might have potential scientific ability.

SECTION A

The animal is subjected to more or less prolonged ether anesthesia; there is an incision in the abdomen, and nerves and blood vessels are cut; there may be considerable hemorrhage. The organs in the upper abdomen are necessarily injured somewhat by manipulation, and the structures immediately adjacent to the pancreas are considerably damaged. In addition to all this, the dog is deprived of its most important digestive juice and of the pancreas.

"Dummy operations" were performed in which exactly the same procedure was followed, involving the same degree of anesthesia, trauma, and hemorrhage. The pancreas was traumatized but not removed. The abdominal incision was closed, and the dogs failed to develop diabetes.

QUESTIONS ON SECTION A

PART B

51. Development of diabetes seems related to
( ) *1.* deprival of digestive juice
( ) *2.* injury to organs in the upper abdomen
( ) *3.* injury of structures near the pancreas
( ) *4.* loss of the pancreas

52. Which of these statements is most completely *true*?
( ) *1.* Anesthesia is essential in an experiment of this kind.
( ) *2.* Complex statistical calculations had to be made.
( ) *3.* This is an example of a controlled experiment.
( ) *4.* The pancreas of the dog is similar to the pancreas of other animals.

SECTION B

The 1947 death rate for the United States was 1,007.8 deaths per 100,000 estimated total mid-year population, excluding armed forces overseas. The 1946 rate was 997.6 per 100,000. Deaths among the armed forces overseas and stillbirths are not included in these rates.

Almost a third, 31.9%, of deaths throughout the nation were due to diseases of the heart. Heart disease deaths increased during the year (1947) by 31,350 over the number of heart deaths the preceding year. Deaths from cancer, apoplexy, and diabetes also increased. The bright side of the picture is that there were fewer deaths from nephritis (kidney disease) and that the major infectious diseases set new record lows in deaths.

QUESTIONS ON SECTION B

53. According to the paragraphs, which of the following is most nearly *true*?
( ) *1.* Forecasts of death rates were not made.
( ) *2.* Nephritis will continue to decrease.
( ) *3.* The incidence of heart disease will continue to increase.
( ) *4.* There will be an increase in the death rate from cancer.

PART C

103 Suppose the following statements to be true:
Green-eyed students cannot be taught.
Students who cannot be taught do not love books.
Students who do not love books have no money.
Students who have no money have no neckties.
Students who have no neckties will not talk to teachers.

Which, then, of the following deductions can correctly be drawn?
( ) *1.* Any student who loves books can be taught.
( ) *2.* Green-eyed students will not talk to teachers.
( ) *3.* No students have money unless they are green-eyed.
( ) *4.* Students who cannot be taught have money.

54. Assuming an uncorrected death rate and a population of 140,000,000, about how many deaths from diseases of the heart were there in the nation in 1946?
( ) *1.* 321,000 ( ) *3.* 446,600
( ) *2.* 445,500 ( ) *4.* 1,380,000

SECTION H

It must be remembered that life as a parameter of unknown nature plays a part and is one of the great difficulties in any mathematical treatment of biological problems which attempts to rise above the physical explanation of special detailed phenomena. Living matter is intricate and complex, and an analysis of what in many instances may be oversimplified models thus suffers from severe limitations. This does not mean that the discovery of statistical laws of biological nature and behavior expressible in mathematical terms is impossible, but it is very discouraging to be confronted with the possibility that the great weakness of biological studies over the centuries—namely, their almost purely descriptive nature—will infiltrate the mathematical analyses to the point where mathematics becomes only a technique employed for a new symbolic type of description. It would appear that the important contribution of a "mathematical" biophysics is not to "unify the natural sciences," but first to find or lead to the discovery of purely biological principles, and then to discuss them in a mathematical way in order to elucidate their nature and interpret their consequences. It is not enough to describe specific events, although a certain amount of important information can be, and already has been, gained in this way.

QUESTIONS ON SECTION H

76. According to the paragraph, the chief function of a mathematical biophysics is to
( ) *1.* furnish more adequate experimental designs
( ) *2.* help to develop biological principles
( ) *3.* simplify biological concepts
( ) *4.* unify all of science

77. According to the paragraph, the greatest weakness of biological studies has been
( ) *1.* disregard of information and principles of other sciences
( ) *2.* lack of statistical techniques
( ) *3.* their existence as descriptive science
( ) *4.* their inadequate symbolism

104. Which of the following statements is true?
( ) *1.* Cancer of the stomach can be cured by proper dieting.
( ) *2.* Color blindness is more frequent in adulthood than childhood.
( ) *3.* Habitual use of alcohol hardens the arteries.
( ) *4.* There is a negative correlation between obesity and longevity.

109. Fill in the missing words:
Currently the atom is visualized as a_____ consisting of protons and neutrons, surrounded by _____.

111. From one point of view, foods may be classed as carbohydrates, proteins, and fats. Below is a list of foods. Indicate the classification for each food by writing C if it is primarily carbohydrate, P if primarily protein, or F if primarily fat.

( ) *1.* bread		( ) *6.* cream	
( ) *2.* cheese		( ) *7.* avocado	
( ) *3.* milk		( ) *8.* beef	
( ) *4.* molasses		( ) *9.* eggs	
( ) *5.* oatmeal		( ) *10.* peanuts	

search, Needham, Louis & Brorby, Inc., Chicago.

If you want to see the complete aptitude test used in the Eleventh Annual Science Talent Search, send a self-addressed, business-sized envelope with six cents in postage to Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the science aptitude test.

Science News Letter, February 2, 1952

CHEMISTRY

Detect Spray Residue

➤ A FAST, economical and easy method for detecting the residue of sprays of the new, fast-acting chlorinated insecticides on fruit and vegetables has been developed by Harold Gordon of the University of California's College of Agriculture, Berkeley.

The detection method involves changing the chlorine in the insecticide to common table salt and analyzing for the chlorine in the salt.

As little as one hundred-millionth of an ounce of such insecticides as lindane, chlordane and toxaphene can be detected by this method. Up to now no easy and accurate analysis has been found for these three compounds. Aramite, methoxychlor, and even DDT residues can also be analyzed with this system.

Up to 50 samples can be run per day. Older analysis methods take one day per sample and involve complicated, expensive equipment. Insecticides left in excessive amounts on crops are likely to endanger those who eat the food.

Science News Letter, February 2, 1952

PSYCHIATRY

If Head Aches, Check Your Love-Hate Balance

➤ MIGRAINE HEADACHES are caused by a disruption of the equilibrium between love and aggressive or hate instincts. The frequency of migraine, now estimated to afflict one out of every 12 persons, can be reduced by a change in parental attitudes toward children.

These new ideas on migraine are announced by Dr. A. R. Furmanski, of Van Nuys, Calif., associated with the Ross-Loos Medical Group, Los Angeles.

"The adjusting of parental attitudes to the individual child's needs will be attacking migraine at its source," Dr. Furmanski declares.

"A parent who is undemonstrative of affection, who demands an inhibition of aggressiveness in the family, or who is rigid and strict in discipline and training in the nemesis of a child with an innately strong need for love and self-assertiveness," he says.

Dr. Furmanski reports his study of 100 migraine sufferers to fellow physicians in the ARCHIVES OF NEUOLOGY AND PSYCHIATRY (Jan.) published by the American Medical Association.

Science News Letter, February 2, 1952