PSAT/NMSQT® | CollegeBoard / NATIONAL MERIT SCHOLARSHIP CORPORATION

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Fall 2018

# PSAT/NMSQT®

Preliminary SAT/National Merit Scholarship Qualifying Test

# Student Guide

- PSAT/NMSQT® information
- Test-taking advice and tips
- An official practice test

FLIP THIS BOOK OVER

FOR INFORMATION ABOUT THE NATIONAL MERIT® SCHOLARSHIP PROGRAM

## The College Board

The College Board is a mission-driven not-for-profit organization that connects students to college success and opportunity. Founded in 1900, the College Board was created to expand access to higher education. Today, the membership association is made up of more than 6,000 of the world's leading educational institutions and is dedicated to promoting excellence and equity in education. Each year, the College Board helps more than seven million students prepare for a successful transition to college through programs and services in college readiness and college success—including the SAT® and the Advanced Placement Program®. The organization also serves the education community through research and advocacy on behalf of students, educators, and schools. For more information, visit **collegeboard.org**.

## National Merit Scholarship Corporation (NMSC)

NMSC is an independent, not-for-profit organization that operates without government assistance. NMSC conducts the National Merit® Scholarship Program, an annual academic competition for recognition and college scholarships. The PSAT/NMSQT is the screening test for high school students who wish to participate in the National Merit Scholarship Program.

If you have questions about any aspect of the National Merit Scholarship Program, including student participation requirements, the selection process, and awards offered, see the NMSC section on the flip side of this publication.

## The PSAT/NMSQT®

The Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT®) is cosponsored by the College Board and National Merit Scholarship Corporation. It is administered for the College Board and National Merit Scholarship Corporation by Educational Testing Service (ETS). Contact the PSAT/NMSQT office if you have suggestions, questions, or comments about test registration, administration, or score reports. If you wish to withdraw your answer sheet from scoring, or if you wish to report test administration irregularities, you must notify the test coordinator or the PSAT/NMSQT office immediately.

### PSAT/NMSQT Office

**WRITE:** PSAT/NMSQT
P.O. Box 6720
Princeton, NJ 08541-6720

**EMAIL:** **psathelp@info.collegeboard.org**

**CALL:** 866-433-7728 (U.S.)
+1-212-713-8105 (International)
609-882-4118 TTY
8 a.m. to 4 p.m. ET

**FAX:** 610-290-8979

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**Full-Length Practice Test**

Separate pull-out insert. If you don't have a practice test, ask your counselor for one.


# The PSAT/NMSQT: What Do You Need to Know?

## When?

Here are the test dates for 2018:

- **Primary Test Date:** Wednesday, October 10
- **Saturday Test Date:** Saturday, October 13
- **Alternate Test Date:** Wednesday, October 24

## Who?

Most students take the PSAT/NMSQT at their high school in 10th or 11th grade. If you are homeschooled, or if your school is not offering the test, you can sign up to take it at another school nearby.

## Why?

The PSAT/NMSQT is great practice for taking the SAT. It can qualify you for scholarship programs. Also, it can give you insight into which AP® courses you may be ready to take.

After you take the PSAT/NMSQT, you can get a free, tailored practice program for the SAT—based on your personal test results—through Khan Academy® (see **satpractice.org**). You also get free access to the Roadmap to Careers online tool from Roadtrip Nation to explore majors and careers that reflect your interests (see **collegeboard.roadtripnation.com**).

## How Much?

The fee for the 2018 PSAT/NMSQT is $16, but you might not have to pay it—some schools cover all or part of the cost for their students. Schools sometimes charge an additional fee for administrative costs.

Juniors from low-income families may be able to get fee waivers from the College Board.

## Questions?

Your counselor will have the answers to most of your questions. For further help, see contact information on the previous page for the PSAT/NMSQT office or National Merit Scholarship Corporation (NMSC).

## What Else?

Read on for everything you need to know about taking the test, scholarship opportunities, accommodations for students with disabilities, score reports, and more.

## Checklist: What to Bring on Test Day

- ☐ No. 2 pencils with erasers (mechanical pencils are not allowed)
- ☐ Acceptable calculator (see page 27)
- ☐ If your school needs you to provide it, your Student ID number
- ☐ Your email address (optional)

**NOTE:** *Your school may choose to have you fill in your identifying information (name, email address, etc.) before test day.*

- ☐ Current and valid school- or government-issued photo ID, if you are not testing at the school you normally attend (more information about IDs is available at **sat.org/id-requirements**)

# Taking the PSAT/NMSQT

## What to Do If...

**You know in advance that you cannot take the test on the date your school offers it:** Tell your counselor as soon as possible that you have a conflict, such as a religious observance. You may be able to take the test at a nearby school that has selected a different test date. If you test at another school, be sure to take your school code and an acceptable photo ID with you. For information about what types of ID are acceptable, see **https://collegereadiness.collegeboard.org/sat/taking-the-test/id-requirements**.

**You are homeschooled and want to take the PSAT/NMSQT:** Make arrangements in advance with your local high school or another nearby school that is administering the test. (For a list of schools in your area, go to **ordering.collegeboard.org/testordering/publicSearch**.) If this is not possible, contact the PSAT/NMSQT office (see inside cover).

**You will be studying in another country when the test is given:** Contact the PSAT/NMSQT office and provide the name of the city and country and, if known, the name and address of the school you will be attending when the test is given. The PSAT/NMSQT office will send you instructions.

**You missed the test but want to enter scholarship and recognition programs:** For information about another route of entry to the National Merit Scholarship Program, see the box on page 7 of the flip side of this *PSAT/NMSQT Student Guide*.

## How to Prepare

The PSAT/NMSQT measures the knowledge and skills you have developed in reading, writing and language, and math. This test is not about memorizing words and facts you will never use again. Instead, it focuses on what you have already learned in school and what you will need to succeed in college. It measures your reasoning and critical-thinking skills, which will be important to you through high school, college, and beyond.

This guide includes the following to help you prepare:

- Advice, sample passages, and questions for the Reading Test and the Writing and Language Test
- Advice, sample questions, and calculator information for the Math Test
- A full-length PSAT/NMSQT practice test (Practice Test #2)
- Information about the National Merit Scholarship Program (on the flip side)

You can also go online for more help and information:

- Go to **collegeboard.org/psatpractice** for additional sample questions, practice test answer explanations, and another full-length practice test (Practice Test #1).
- Go to **psat.org/scoring** for more information about scoring and personalized practice from Khan Academy.

## PSAT/NMSQT Scores

### When You Will Receive Your Scores

You will be able to access your scores online in December. (If you provide your email address on the answer sheet, you'll receive an email letting you know when your scores are ready.) A few weeks later, your school will also give you a paper copy of your PSAT/NMSQT Score Report.

If you have not received your score report by mid-January, see your counselor. Your school will be able to print a copy for you.

### What Scores You Will Receive

Your score report will include a total score, section scores, test scores, cross-test scores, and subscores. You'll be able to see not only how you did overall, but also where your strengths are and where you need to improve. Once you get your score report, visit **studentscores.collegeboard.org** to learn more about what these scores mean.

Your score report will also include the NMSC Selection Index score, which NMSC uses as an initial screen of entrants to its National Merit Scholarship Program. For further information about the Selection Index score, see the National Merit Scholarship Program section on the flip side of this guide.

### Who Else Receives Your Scores and Personal Information

Please refer to "Use and Distribution of Scores and Student Information" in the "Privacy and Safety" section (pages 6–7) to learn more about who receives your scores and other personal information from your answer sheet.

## Other Notes About Scores

We occasionally pretest new questions to determine if they should be included in a future PSAT/NMSQT test form. In such instances, these questions may appear in any of the test sections, and testing time will be extended by 20 minutes so test takers have time to answer them. These questions will not be included in computing test takers' scores. Students must complete all sections of the test. If you leave before dismissal, your scores will be canceled.

As part of scoring, every test goes through an equating process. Equating is a statistical process we use to adjust scores from multiple forms of a test so the reported scores mean the same thing no matter which version of the test you take or when you take it.

# Student Search Service

The College Board's Student Search Service can connect you with information about educational and financial aid opportunities from nearly 1,700 colleges, universities, scholarship programs, and educational organizations. Here's how it works:

- You may choose to participate in Student Search Service as part of taking the PSAT/NMSQT. There will be a place to choose "Yes" while filling out your answer sheet before the test.
- You will be asked to provide information about yourself on your answer sheet. You may also provide additional information on the College Board's college planning website, BigFuture™ (**bigfuture.org**). If you opt in to Student Search Service, participating eligible organizations can use that information to see whether you might be a good fit for their communities and programs.
- The most searched items are expected high school graduation date, cumulative grade point average (GPA), and intended college major.
- The search criteria can include any response from the answer sheet and any information that you provide on **bigfuture.org**. However, we never share phone numbers, actual test scores, or information about disabilities or parental education.

**Keep the following points in mind about Student Search Service:**

- Being contacted by a college does not mean you have been admitted. You need to submit an application in order to be considered for admission. The colleges and organizations that participate want to find students who might be a good fit for their environment, classes, programs, scholarships, and special activities. Student Search Service is simply a way for colleges to reach prospective students like you and provide information about available opportunities.
- Student Search Service will share your contact information only with colleges and qualified nonprofit educational or scholarship programs that are recruiting students. The College Board does not share this information with marketing firms, test prep companies, or other retailers/commercial entities.

**Student Search Service communications are sent by outside colleges, scholarship programs, and educational opportunity organizations.** See "Privacy and Safety" later in this section to learn how we protect your privacy.

If you have questions or concerns about Student Search Service or want more information about the program, please go to **collegeboard.org/student-search-service** or call 866-825-8051.

# Scholarships and Opportunities

You already know that taking the PSAT/NMSQT can enter you into the National Merit Scholarship Program. But do you know about the other opportunities available to you by taking the test?

If you take the PSAT/NMSQT as a junior and qualify for participation, the following programs may help you prepare for college. If you do not want your name, scores, and other information released to them, write to the PSAT/NMSQT office by October 31, 2018 (see inside cover for address).

- **The National Hispanic Recognition Program** (NHRP) identifies outstanding Hispanic/Latino students and shares information about them with interested colleges and universities. To be eligible, you must be at least one-quarter Hispanic/Latino (as defined by the NHRP), meet a minimum PSAT/NMSQT cutoff score for your state, and have a minimum grade point average.

  The College Board
  National Hispanic Recognition Program
  250 Vesey Street
  New York, NY 10281-6992
  877-358-6777

- **The National Scholarship Service** (NSS) offers a free college advisory and referral service for students who plan to attend two-year or four-year colleges. Scores will be sent for juniors who

indicate on their answer sheets that they are African American or black.

National Scholarship Service
980 Martin Luther King Drive SW
P.O. Box 11409
Atlanta, GA 30310

- **Telluride Association** is a program offering summer seminars in the humanities and social sciences to highly gifted juniors.

  Telluride Association
  217 West Avenue
  Ithaca, NY 14850
  607-273-5011

The College Board also partners with several other scholarship providers, connecting eligible students to over $220 million in scholarships. Help them find you by opting in to Student Search Service® (see previous page) when you take the PSAT/NMSQT.

## Our Scholarship Partners

The following organizations are scholarship partners as of April 2018; please check **psat.org/scholarships** for updates.

- American Indian Graduate Center (**aigcs.org**)
- Asian & Pacific Islander American Scholarship Fund (**apiasf.org**)
- Cobell Scholarship (**cobellscholar.org**)
- Daniel's Fund (**danielsfund.org**)
- Hispanic Scholarship Fund (**hsf.net**)
- Horatio Alger Association (**horatioalger.org**)
- Jack Kent Cooke Foundation (**jkcf.org**)
- Jackie Robinson Foundation (**jackierobinson.org**)
- Ron Brown Scholar Program (**ronbrown.org**)
- TheDream.US (**thedream.us**)
- United Negro College Fund (**uncf.org**)
- Washington State Opportunity Scholarship (**waopportunityscholarship.org**)

## How It Works

When you take the PSAT/NMSQT or the PSAT 10 and say "yes" to the free Student Search Service, the College Board connects you with our scholarship partners, which could mean money for college. It is ultimately up to you to decide whether you want to apply to the scholarship program.

Our scholarship partners use PSAT/NMSQT and PSAT 10 information to identify and recruit students who opted in to Student Search Service, and want to be connected with potential scholarship opportunities. These scholarship partners can search by the demographic information that you provide on the answer sheet to meet their criteria for eligibility. For example, you may identify with more than one race/ethnicity, which increases your eligibility for multiple programs. For instance, if you list Hispanic and black on the answer sheet it may increase your eligibility for multiple programs. You may now hear from the National Hispanic Recognition Program, Hispanic Scholarship Fund, The Jackie Robinson Foundation, or United Negro College Fund, among others. However, information regarding disability, phone number, or actual test score is never shared.

To learn more about scholarship opportunities, please visit **psat.org/scholarships**.

# Students with Disabilities

For students with disabilities, the College Board provides testing accommodations such as braille and large-print test books and extended time options. If you have a disability and have not already been approved for accommodations by the College Board, speak to your counselor or teacher right away to determine whether a request for accommodations should be submitted. If so, your school's SSD coordinator can help you request the accommodations that meet your needs. (Epinephrine auto-injectors [e.g., EpiPens] are permitted in the testing room without the need for accommodations. They must be placed in a clear bag and stored under the student's desk during testing.)

- After the accommodations request has been submitted, it may take up to seven weeks for you to receive a decision letter. If you are approved for accommodations, save this letter because it also indicates your eligibility for accommodations on other College Board tests, such as the SAT and Advanced Placement Program (AP) Exams. With limited exceptions, the accommodations will remain in effect until one year after your graduation. If you move to a new school, ask your counselor at your new school to transfer your SSD online record.
- If you are interested in participating in the National Merit Scholarship Program and did not receive accommodations for which you were approved or did not receive approval in time for the test, please contact NMSC immediately but no later than November 15, 2018 (see inside cover for contact information).

Practice tests in MP3 audio and assistive technology compatible formats are available on the College

Board's website at **collegeboard.org/psatpractice**. If you are approved for another format, such as braille, a practice test may be sent to your school, or you can call 212-713-8333 to request a practice test in a specific format.

## Test Regulations

When you take the test, you will be asked to sign a certification statement indicating that you will abide by the test guidelines and regulations. Those guidelines are detailed in this *Student Guide*, so please read it carefully. Standard rules and regulations give all students the same opportunity and prevent any student from having an unfair advantage. If you do not follow these test regulations or any instructions given by the test, your scores may be canceled. You can read more about grounds for score cancellation in the next section. The following policies apply to all students, unless the College Board has approved an exception as an accommodation for a disability:

- You must mark your answers on the answer sheet. You will not receive credit for anything written in the test book. Scratch paper is not allowed; you may use only your test book for scratch work.
- You may not leave the room with your test book.
- You may use an acceptable calculator (see "Acceptable Calculators" on page 27) only during the Math Test – Calculator portion of the PSAT/NMSQT. You may not have a calculator on your desk for any other part of the test, and you may not share a calculator during the test or during breaks. You may use only one calculator at any given time—if you bring a second one for backup, it must be kept under your desk.
- You are not allowed to use protractors; compasses; rulers; cutting devices; earplugs; scratch paper; notes, books, dictionaries, or references of any kind; pamphlets; pens, mechanical pencils, highlighters, or colored pencils; listening, recording, copying, or photographic devices; or any other aids.
- You may bring snacks or drinks to have during a break. They must be placed under your desk during testing.
- You may not use phones or other prohibited electronic devices during the test or breaks. Prohibited devices include, but are not limited to phones; audio players/recorders, tablets, laptops, notebooks, or any other personal computing devices; timers; cameras; and any devices (including smartwatches) that can be used to record, transmit, receive, or play back audio, photographic, text, or video content. These devices must be powered off and placed under your desk, unless they are collected by your school before the test. If your watch has an alarm, you must turn that off as well. If your phone makes noise, or you are seen using it at any time (including breaks), you will be dismissed immediately, your scores will be canceled, and the device may be collected and its contents inspected.
- You may not give or receive assistance or disturb others during the test or breaks.
- You cannot skip ahead or go back to a previous test section while taking the test.
- You may take the PSAT/NMSQT only once each school year. If you begin a test, you are considered to have taken it.
- All students in your school must take the test at the same time. (Exceptions may be approved for students with disabilities.)
- If you become ill or must leave during the test, or if for any other reason you do not want your test scored, you may ask the proctor or test coordinator to withdraw your answer sheet from scoring before you leave the testing room. After you leave the testing room, if you decide to withdraw your answer sheet from scoring you must report your decision immediately to the test coordinator or the PSAT/NMSQT office. (See the inside cover for contact information.)
- Members of your household or immediate family may not serve as PSAT/NMSQT coordinators or proctors, even at a different school, during the year that you take the test.
- **You may not discuss the contents of the test with anyone, or share them through any means, including but not limited to emails, text messages, and the internet, until after score reports have been distributed.**

## Grounds for Score Cancellation

To report scores that accurately reflect performance, ETS, on behalf of the College Board and NMSC, maintains test administration and security standards designed to give all students the same opportunity to demonstrate their abilities and to prevent any student from gaining an unfair advantage. ETS reviews irregularities and test scores believed to have been earned under unusual circumstances.

- Students may be dismissed from the testing room if they fail to follow test regulations or instructions given by the proctor or test coordinator. ETS reserves the right not to score

the answer sheet of a student who engaged in misconduct or was involved in a testing irregularity.

- ETS reserves the right to cancel scores if there is reason to doubt their validity. Before acting, ETS will inform the student of the reasons for questioning the scores and will give the student an opportunity to provide additional information, to confirm the scores by taking another PSAT/NMSQT, or to cancel the scores. The student may also request arbitration in accordance with ETS's Standard Arbitration Agreement. If before, during, or after a review of questionable scores, ETS finds that misconduct has occurred in connection with a test, these options will not be available even if previously offered.
- In some instances, scores may be issued for guidance purposes only. This means that the test was not administered in accordance with testing policies described in the *PSAT/NMSQT Coordinator Manual*. Therefore, the resulting scores cannot be considered for some scholarship competitions. When scores are provided for guidance purposes only, a message will appear below the NMSC Selection Index score on your score report directing you to follow up with the test coordinator at your school to learn more about the reason for the "guidance purposes only" report. Students who are otherwise eligible and who are interested in entering the National Merit Scholarship Program should turn to page 7 of the National Merit Scholarship Program portion of this guide to learn how to request information about another route of entry to the 2020 competition.
- Score reviews are confidential. If it is necessary to cancel reported scores, ETS will notify score users, but the reasons for cancellation will not be disclosed. This policy does not necessarily apply in group cases.
- ETS will forward all reports of misconduct or testing irregularities to NMSC, which reserves the right to make its own independent judgment about a student's participation in the National Merit Scholarship Program.

# Privacy and Safety

## Use and Distribution of Scores and Student Information

When you take the PSAT/NMSQT and sign the answer sheet, you acknowledge that you understand how your scores and personal information will be used.

As cosponsors of the PSAT/NMSQT, the College Board and NMSC receive the scores of students who take the test as well as the information that students provide on their answer sheets.

Some schools, districts, and states receive PSAT/NMSQT scores with other information about their students. In addition, scores for students who qualify for programs described in the section "Scholarships and Opportunities" (page 3) are given to those programs. The PSAT/NMSQT Program does not report scores to colleges or commercial entities.

If your school participates in the PSAT/NMSQT through a bulk registration process, the College Board may receive your personal information, including first name, last name, sex, date of birth, mailing address, email address, and mobile phone number, from your school. This information will be kept secure and added to your permanent College Board record to be used for score reporting purposes as well as the other purposes outlined in this guide. By taking the PSAT/NMSQT and signing the answer sheet, you acknowledge that your school has provided this information to the College Board and that you consent to the College Board retaining this information.

## Student Search Service and Protecting Your Privacy

Colleges participating in Student Search Service never receive student scores or phone numbers. Colleges can ask for names of students within certain score ranges, but their exact scores are not reported.

All entities that receive student information from Student Search Service are required to maintain strict confidentiality. We actively monitor these entities to ensure adherence to our guidelines. The frequency and mode of communications based on search results are determined by the entity that receives the student's name. Every communication from individual entities is required to contain specific instructions on how to unsubscribe from that particular institution. To unsubscribe from the entire Student Search Service program, go to **collegeboard.org/student-search-service**, call 866-825-8051, or write to:

The College Board
11955 Democracy Drive
Reston, VA 20190-5662
Attention: Student Search Service

## Telemarketing and Internet Scams

We sometimes receive reports of phone scams when callers posing as employees of the College Board try to sell test-preparation products or request sensitive, personally identifying information, such as credit card and Social Security numbers. The College Board does not make unsolicited phone calls or send emails to students or families requesting this type of information. This type of activity, known as telemarketing fraud, is a crime. Should you have a question about the origin of a phone call you have received in which the caller claimed to be from the College Board, contact the PSAT/NMSQT office (see inside cover for contact information).

# Test Fairness Review

All new PSAT/NMSQT test questions and complete new editions of the tests are reviewed by external, independent educators from throughout the United States. These reviews help ensure that the questions are unambiguous and relevant and that the language used is not offensive to or inappropriate for any particular group of students based on race/ethnicity or gender. Assessment staff ensure that the test as a whole includes references to men and women as well as to individuals from varied racial, ethnic, and cultural backgrounds. Statistical procedures are used to identify questions that are harder for a group of students to answer correctly than would be expected from their performance on other questions in the test; these questions are excluded from appearing on tests.

# Questioning a Test Question

If you find what you consider to be an error or an ambiguity in a test question, tell the test coordinator immediately after the test. You may also write to:

Assessment Design and Development
The College Board
250 Vesey Street
New York, NY 10281

Or send an email to **psatquestion@collegeboard.org**.

In your inquiry, provide your name and mailing address, the date you took the PSAT/NMSQT, the name and address of the school where you took the test, the test section, the test question (as well as you can remember), and an explanation of your concern about the question.

The PSAT/NMSQT Program will send you a written response after your inquiry has been reviewed thoroughly by subject-matter specialists.

**NOTE:** *We will not respond via email, so be sure to include your full name and mailing address.*

# Additional Policies

Except as otherwise indicated in this guide, the College Board, including its co-sponsor and subcontractors, will not be liable for any damages including direct, indirect, special, or consequential damages, arising out of your testing. Other than score validity investigations where a student can request arbitration in accordance with ETS's Standard Arbitration Agreement (discussed earlier in this guide) or infringement of the College Board's intellectual property rights, all disputes against the College Board and/or any or all of its contractors and co-sponsor, that relate in any way to registering for or taking the PSAT/NMSQT, including but not limited to requesting or receiving test accommodations, score reporting, and the use of test taker data, shall exclusively be resolved by a single arbitrator through binding, individual arbitration administered by the American Arbitration Association ("AAA"), under the AAA Consumer Arbitration Rules in effect at the time a request for arbitration is filed with the AAA. Copies of the AAA Rules can be located at **www.adr.org**. Unless the parties mutually agree otherwise, the seat and the place of the arbitration shall be New York, New York. The parties agree that the Federal Arbitration Act ("FAA"), 9 U.S.C. § 1 et seq. governs this provision, and it is the intent of the parties that the FAA shall pre-empt all State laws to the fullest extent permitted by law. No arbitration may be maintained as a class action, and the arbitrator shall not have the authority to combine or aggregate the disputes of more than one individual, conduct any class proceeding, make any class award, or make an award to any person or entity not a party to the arbitration, without the express written consent of the College Board. By agreeing to arbitration in accordance with this section, you are waiving your right to have your dispute heard by a judge or jury. Each party will be responsible for its own fees and expenses incurred in connection with the arbitration, regardless of its outcome. For purposes of this provision, each College Board contractor or co-sponsor is a third party beneficiary of this section, is entitled to the rights and benefits hereunder, and may enforce the provisions hereof as if it were a party hereto.

# College Major Codes

When you fill out the PSAT/NMSQT answer sheet, indicate the college major that best matches your interests by entering the code from the list that follows. (This list will also be provided for your reference when you are filling out that section.) Your online score report will include information to help you learn more about this major and others.

If you say "Yes" to Student Search Service, colleges and universities that offer degrees in your areas of interest can send you information about their programs.

**Agriculture, Agriculture Operations, and Related Sciences—100**

- Agricultural Business and Management—101
- Animal Sciences—103

**Architecture and Related Services—120**

- Architecture—121
- City/Urban, Community, and Regional Planning—123
- Landscape Architecture—125

**Area, Ethnic, Cultural, Gender, and Group Studies—140**

- Area Studies—141
- Ethnic, Cultural Minority, Gender, and Group Studies—142

**Biological and Biomedical Sciences—160**

- Biochemistry—162
- Biology/Biological Sciences, General—161
- Biophysics—163
- Biotechnology—164
- Cell/Cellular Biology and Anatomical Sciences—166
- Ecology—167
- Genetics—168
- Marine Biology and Biological Oceanography—169
- Microbiological Sciences and Immunology—170
- Molecular Biology—171
- Neuroscience—185
- Zoology/Animal Biology—175

**Business Management, Marketing, and Related Support Services—200**

- Accounting and Related Services—201
- Actuarial Science—202
- Business Administration, Management, and Operations—204
- Fashion Merchandising—208
- Finance and Financial Management Services—209
- Hospitality Administration/Management—211
- Hotel, Motel, and Restaurant Management—225
- Human Resources Management and Services—212
- International Business—214
- Management Information Systems and Services—217
- Marketing/Marketing Management—218
- Meeting and Event Planning—230

**Communication, Journalism, and Related Programs—250**

- Communication and Media Studies—252
- Digital Communication and Media/ Multimedia—253
- Journalism—254
- Public Relations, Advertising, and Applied Communication—270
- Radio and Television—257

**Computer and Information Sciences and Support Services—300**

- Artificial Intelligence—301
- Computer Programming—302
- Computer Science—303
- Computer Systems Networking and Telecommunications—306
- Information Sciences/Studies—308

**Education—400**

- Early Childhood Education and Teaching—407
- Elementary Education and Teaching—417
- Secondary Education and Teaching—430
- Special Education and Teaching—432

**Engineering—450**

- Aerospace, Aeronautical, and Space Engineering—451
- Agricultural Engineering—452
- Architectural Engineering—453

Bioengineering and Biomedical Engineering—454
Chemical Engineering—455
Civil Engineering—456
Computer Engineering, General—457
Electrical and Electronics Engineering—459
Engineering Physics/Applied Physics—461
Engineering Science—462
Environmental/Environmental Health Engineering—463
Geological/Geophysical Engineering—464
Industrial Engineering—465
Materials Engineering—466
Mechanical Engineering—467
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Nuclear Engineering—470
Petroleum Engineering—472
Polymer/Plastics Engineering—475

**Engineering Technologies—500**
Computer Engineering Technology—501
Drafting/Design Engineering Technologies—502
Telecommunications Technology/Technician—509

**English Language and Literature/Letters—520**
Creative Writing—522

**Family and Consumer Sciences/ Human Sciences—540**
Foods, Nutrition, and Wellness Studies—542

**Foreign Languages, Literatures, and Linguistics—550**
Classics and Classical Languages, Literatures, and Linguistics—553
Comparative Literature—554
East Asian Languages, Literatures, and Linguistics—555
French Language and Literature—556
German Language and Literature—557
Linguistics—559
Russian Language and Literature—560
Spanish Language and Literature—561

**Health Professions and Related Programs—600**
Allied Health Diagnostic, Intervention, and Treatment Professions—602
Athletic Training/Trainer—603
Clinical/Medical Laboratory Science/Research and Allied Professions—605
Communication Sciences and Disorders—606
Dental Hygiene/Hygienist—607
Dietetics and Clinical Nutrition Services—610
Nursing—619
Predentistry Studies—627
Premedicine/Premedical Studies—628
Preoccupational Therapy Studies—678
Prepharmacy Studies—629
Prephysical Therapy Studies—682
Preveterinary Studies—630

**History—700**

**Homeland Security, Law Enforcement, Firefighting, and Related Protective Services—890**
Criminal Justice/Law Enforcement Administration—892
Forensic Science and Technology—894
Homeland Security—897

**Legal Professions and Studies—710**
Prelaw Studies—712

**Liberal Arts and Sciences, General Studies, and Humanities—720**
Humanities/Humanistic Studies—722
Liberal Arts and Sciences/Liberal Studies—723

**Mathematics and Statistics—740**
Applied Mathematics—741
Mathematics—742
Statistics—743

**Military Technologies and Applied Sciences—360**

**Multi/Interdisciplinary Studies—770**
Biological and Physical Sciences—771
International/Global Studies—772
Mathematics and Computer Science—773

**Natural Resources and Conservation—790**
Environmental Science—791
Environmental Studies—792

- Fishing and Fisheries Sciences and Management—793
- Forestry—794
- Wildlife, Fish, Wildlands Science/ Management—796

**Parks, Recreation, Leisure, and Fitness Studies—800**

- Parks and Recreation Facilities Management—802
- Sport and Fitness Administration/ Management—803

**Personal and Culinary Services—810**

**Philosophy and Religious Studies—820**

- Philosophy—821
- Religion/Religious Studies—822

**Physical Sciences—830**

- Astronomy—832
- Astrophysics—833
- Atmospheric Sciences and Meteorology—834
- Chemistry—836
- Geological and Earth Sciences/Geosciences—837
- Materials Science—854
- Physics—843

**Psychology—870**

**Public Administration and Social Services—880**

- Human Services, General—881
- Public Administration—882
- Public Policy Analysis—883
- Social Work—884

**Social Sciences—900**

- Anthropology—901
- Archaeology—902
- Criminology—903
- Economics—904
- Geography—905
- International Relations and Affairs—906
- Political Science and Government—907
- Sociology—908

**Theology and Religious Vocations—920**

**Visual and Performing Arts—940**

**Art History, Criticism, and Conservation—941**

- Arts, Entertainment, and Media Management—960
- Dance—942
- Drama and Theater Arts—943
- Fashion/Apparel Design—945
- Film/Video and Photographic Arts—946
- Fine and Studio Art—947
- Game and Interactive Media Design—970
- Graphic Design—948
- Interior Design—949
- Music—950
- Photography—954
- Technical Theater/Theater Design and Technology—955

**OTHER—990**

**UNDECIDED—999**

# Evidence-Based Reading and Writing

The Evidence-Based Reading and Writing section is composed of two tests that assess different but related skills and knowledge. The Reading Test asks you to read passages and show how well you understand them. The Writing and Language Test asks you to revise and edit text.

Both tests in this section have these distinctive features:

- **Emphasis on words in context:** Both tests measure your understanding of the meaning and use of words and phrases in the context of extended passages.
- **Emphasis on command of evidence:** Questions on both tests require you to demonstrate your understanding of how authors use evidence to support and develop their claims and points.
- **Inclusion of informational graphics:** On both tests you will find data presented in tables, graphs, charts, and the like, which you must interpret and integrate with information in a passage.
- **Variations in text complexity:** The passages on both tests range in difficulty from those found in grades 9–10 to those found in college-entry, credit-bearing postsecondary courses.

## Reading Test Overview

The Reading Test gives you a chance to show how well you understand what you read.

- **Total questions:** 47 questions with multiple-choice responses
- **Time allotted:** 60 minutes
- Calculators may not be used or be on your desk.

### About the Passages

Reading passages range in length from about 500 to 750 words, and they are taken from a variety of fields, including U.S. and world literature, history/social studies, and science. Some passages are accompanied by informational graphics such as tables, graphs, or charts; questions ask you to interpret data and to synthesize information presented graphically with that in the associated passage. (Mathematical computation is not required to answer these questions.) Passages that have similar subject matter are sometimes paired and accompanied by questions that require you to make important connections between the passages as well as to understand each passage on its own.

### Tips for the Reading Test

To answer each question, consider what the passage(s) say directly, and use careful reasoning to draw supportable inferences and conclusions from the passage(s). The best answer to each question is derived from what is stated or implied in the passage(s) rather than from prior knowledge of the topics covered. All the questions are passage based.

- Reading carefully is the key to finding the best answer to each question. The information you need to answer each Reading Test question is always in the passage(s). Don't be misled by an answer that looks correct but is not supported by the actual text of the passage(s).
- The questions do not increase in difficulty from easy to hard. Instead, they are presented as logically as possible, with general questions about central ideas and themes, point of view, overall text structure, and the like coming early in the sequence. After that come more specific questions about such matters as facts, details, and words in context.
- Stay with a passage until you have answered as many questions as you can before you proceed to the next passage. Do not jump from passage to passage.
- The questions often include references to help direct you to relevant part(s) of the passage(s). You may have to look elsewhere in the passage, however, in order to find the best answer to the question.
- In your test booklet, mark each question you skip so that you can easily go back to it later if you have time in this section.
- Remember that all questions are worth one point regardless of the type or difficulty. You do not lose points for guessing wrong, so it's to your advantage to answer each question as best you can.

### Sample Reading Test Materials

On the following pages are samples of the kinds of Reading Test passages and questions that may appear on your test. For each set of sample materials:

- Read the passage carefully.
- Decide on the best answer to each question.
- Read the explanation for the best answer.

The directions provided match what you will see on the actual test.

**DIRECTIONS**

Each passage or pair of passages below is followed by a number of questions. After reading each passage or pair, choose the best answer to each question based on what is stated or implied in the passage or passages and in any accompanying graphics (such as a table or graph).

**Questions 1-4 are based on the following passage.**

This passage is adapted from Edith Wharton, *Ethan Frome*, originally published in 1911. Mattie Silver is Ethan's household employee.

Mattie Silver had lived under Ethan's roof for a year, and from early morning till they met at supper he had frequent chances of seeing her; but no moments in her company were comparable to those when, her arm in his, and her light step flying to keep time with his long stride, they walked back through the night to the farm. He had taken to the girl from the first day, when he had driven over to the Flats to meet her, and she had smiled and waved to him from the train, crying out, "You must be Ethan!" as she jumped down with her bundles, while he reflected, looking over her slight person: "She don't look much on housework, but she ain't a fretter, anyhow." But it was not only that the coming to his house of a bit of hopeful young life was like the lighting of a fire on a cold hearth. The girl was more than the bright serviceable creature he had thought her. She had an eye to see and an ear to hear: he could show her things and tell her things, and taste the bliss of feeling that all he imparted left long reverberations and echoes he could wake at will.

It was during their night walks back to the farm that he felt most intensely the sweetness of this communion. He had always been more sensitive than the people about him to the appeal of natural beauty. His unfinished studies had given form to this sensibility and even in his unhappiest moments field and sky spoke to him with a deep and powerful persuasion. But hitherto the emotion had remained in him as a silent ache, veiling with sadness the beauty that evoked it. He did not even know whether any one else in the world felt as he did, or whether he was the sole victim of this mournful privilege. Then he learned that one other spirit had trembled with the same touch of wonder: that at his side, living under his roof and eating his bread, was a creature to whom he could say: "That's Orion down yonder; the big fellow to the right is Aldebaran, and the bunch of little ones—like bees swarming—they're the Pleiades . . ." or whom he could hold entranced before a ledge of granite thrusting up through the fern while he unrolled the huge panorama of the ice age, and the long dim stretches of succeeding time. The fact that admiration for his learning mingled with Mattie's wonder at what he taught was not the least part of his pleasure. And there were other sensations, less definable but more exquisite, which drew them together with a shock of silent joy: the cold red of sunset behind winter hills, the flight of cloud-flocks over slopes of golden stubble, or the intensely blue shadows of hemlocks on sunlit snow. When she said to him once: "It looks just as if it was painted!" it seemed to Ethan that the art of definition could go no farther, and that words had at last been found to utter his secret soul. . . .

As he stood in the darkness outside the church these memories came back with the poignancy of vanished things. Watching Mattie whirl down the floor from hand to hand he wondered how he could ever have thought that his dull talk interested her. To him, who was never gay but in her presence, her gaiety seemed plain proof of indifference. The face she lifted to her dancers was the same which, when she saw him, always looked like a window that has caught the sunset. He even noticed two or three gestures which, in his fatuity, he had thought she kept for him: a way of throwing her head back when she was amused, as if to taste her laugh before she let it out, and a trick of sinking her lids slowly when anything charmed or moved her.

**1**

Over the course of the passage, the main focus of the narrative shifts from the

A) reservations a character has about a person he has just met to a growing appreciation that character has of the person's worth.

B) ambivalence a character feels about his sensitive nature to the character's recognition of the advantages of having profound emotions.

C) intensity of feeling a character has for another person to the character's concern that that intensity is not reciprocated.

D) value a character attaches to the wonders of the natural world to a rejection of that sort of beauty in favor of human artistry.

| **Estimated Difficulty:** Medium | **Key:** C |
|---|---|

**Choice C** is the best answer. The first paragraph traces the inception of Ethan's feelings for Mattie: Ethan "had taken to the girl from the first day" (lines 7-8) and saw her arrival as "like the lighting of a fire on a cold hearth" (lines 15-16). The second paragraph (lines 22-55) focuses on "their night walks back to the farm" (line 22) and Ethan's elation in perceiving that "one other spirit . . . trembled with the same touch of wonder" that characterized his own (lines 34-35). In other words, the main focus of the first two paragraphs is the intensity of feeling one character, Ethan, has for another, Mattie. The last paragraph shifts the focus of the passage to Ethan's change in perception; he sees Mattie in a social setting interacting with other men, wonders "how he could ever have thought that his dull talk interested her" (lines 59-60), interprets her seeming happiness as "plain proof of indifference" toward him (line 62), and sees betrayal in the "two or three gestures which, in his fatuity, he had thought she kept for him" (lines 65-67).

*Choice A* is incorrect because while Ethan acknowledges that Mattie "don't look much on housework" (lines 12-13), the first paragraph also notes that Ethan "had taken to the girl from the first day" (lines 7-8); therefore, there is no support for the notion that Ethan's "reservations" about Mattie lasted for any length of time or ever constitute the main focus of the narrative.

*Choice B* is incorrect because while Ethan does exhibit ambivalence about his sensitive nature, seeing it as a "mournful privilege" (line 33), the main focus of the narrative does not shift to his recognition of the advantages of having profound emotions. Indeed, in the last paragraph, Ethan's profound emotions give him only grief, as he sees Mattie seemingly rejecting him.

*Choice D* is incorrect because while the second paragraph (lines 22-55) does discuss in depth the value Ethan attaches to natural beauty, nothing in the passage signifies that he has rejected natural beauty in favor of human artistry. The closest the passage comes to this is in line 52, in which Mattie is said to have likened a natural scene to a painting, an assertion with which Ethan agrees.

**2**

In the context of the passage, the author's use of the phrase "her light step flying to keep time with his long stride" (lines 5-6) is primarily meant to convey the idea that

A) Ethan and Mattie share a powerful enthusiasm.

B) Mattie strives to match the speed at which Ethan works.

C) Mattie and Ethan playfully compete with each other.

D) Ethan walks at a pace that frustrates Mattie.

| **Estimated Difficulty:** Easy | **Key:** A |
|---|---|

**Choice A** is the best answer. The author uses the phrase mainly to introduce a topic discussed at length in the second paragraph (lines 22-55)—namely, the growing connection Ethan sees himself forming with Mattie over the course of many evening walks during which they share similar feelings for the wonders of the natural world. In the context of the passage, the phrase evokes an image of two people walking eagerly and in harmony.

*Choice B* is incorrect because while the phrase literally conveys Mattie's attempts to keep up with Ethan's pace, the phrase relates to times of leisure during which Ethan and Mattie walk arm-in-arm (see lines 1-7) rather than times of work. Moreover, the phrase is used primarily in a figurative way to suggest shared enthusiasm (see explanation for choice A).

*Choice C* is incorrect because while the phrase literally describes Mattie's attempts to keep up with Ethan's pace, the context makes clear that Mattie and Ethan are not in competition with each other; instead, they are enjoying times of leisure during which the two walk arm-in-arm (see lines 1-7). Moreover, the phrase is used primarily in a figurative way to suggest shared enthusiasm (see explanation for choice A).

*Choice D* is incorrect because while the phrase in isolation could be read as conveying some frustration on the part of Mattie, who had to expend extra effort to keep up with Ethan's pace, the context makes clear that Mattie is not annoyed with Ethan but is instead enjoying times of leisure during which the two walk arm-in-arm (see lines 1-7). The phrase is used primarily to suggest shared enthusiasm (see explanation for choice A).

**3**

The description in the first paragraph indicates that what Ethan values most about Mattie is her

A) fitness for farm labor.
B) vivacious youth.
C) receptive nature.
D) freedom from worry.

| **Estimated Difficulty:** Easy | **Key:** C |
|---|---|

**Choice C** is the best answer. Lines 9-16 mention many of Mattie's traits: she is friendly ("smiled and waved"), eager ("jumped down with her bundles"), easygoing ("she ain't a fretter"), and energetic ("like the lighting of a fire on a cold hearth"). However, the trait that appeals the most to Ethan, as suggested by it being mentioned last in the paragraph, is her openness to the world around her: "She had an eye to see and an ear to hear: he could show her things and tell her things, and taste the bliss of feeling that all he imparted left long reverberations and echoes he could wake at will" (lines 17-21).

*Choice A* is incorrect because the passage suggests that Ethan does not actually view Mattie as particularly well suited to farm labor. When first seeing Mattie, Ethan thinks to himself, after "looking over her slight person," that "she don't look much on housework" (lines 12-13).

*Choice B* is incorrect because the passage suggests that Mattie's youth is not what Ethan values most about Mattie. Although the passage does note that "the coming to his house of a bit of hopeful young life was like the lighting of a fire on a cold hearth" (lines 14-16), the narrator goes on to note that "the girl was more than the bright serviceable creature [Ethan] had thought her" (lines 16-17), indicating that Ethan values something more in Mattie than simply her vivacity.

*Choice D* is incorrect because although Ethan acknowledges that Mattie "ain't a fretter" (line 13), there is no evidence that Mattie's freedom from worry is what Ethan values most about Mattie. The first paragraph lists several positive traits that Mattie has, with the most emphasis being placed on her openness to the world around her (see explanation for choice C).

**4**

Which choice provides the best evidence for the answer to the previous question?

A) Lines 1-7 ("Mattie . . . farm")
B) Lines 7-13 ("He had . . . anyhow")
C) Lines 13-16 ("But it . . . hearth")
D) Lines 17-21 ("She had . . . will")

| **Estimated Difficulty:** Easy | **Key:** D |
|---|---|

**Choice D** is the best answer. Lines 17-21 explain that Mattie "had an eye to see and an ear to hear: [Ethan] could show her things and tell her things, and taste the bliss of feeling that all he imparted left long reverberations and echoes he could wake at will." In other words, Mattie is open, or receptive, to ideas and experiences, and the placement of this point at the end of the list of traits Ethan admires ("But it was not only . . .") suggests that her openness is most important to him. Therefore, these lines serve as the best evidence for the answer to the previous question.

*Choice A* is incorrect because lines 1-7 only describe Ethan and Mattie's living situation and indicate that Ethan enjoys walking with her in the evenings. They do not indicate which quality of Mattie's Ethan values the most. Therefore, these lines do not serve as the best evidence for the answer to the previous question.

*Choice B* is incorrect because lines 7-13 only indicate Ethan's first impression of Mattie. Mattie comes across as generally friendly and enthusiastic in their first encounter, but it is not these qualities that Ethan values the most. Therefore, these lines do not serve as the best evidence for the answer to the previous question.

*Choice C* is incorrect because lines 13-16 only convey that there was something special about Mattie beyond her friendliness and enthusiasm. They do not indicate what Ethan values the most about Mattie. Therefore, these lines do not serve as the best evidence for the answer to the previous question.

**Questions 5-9 are based on the following passage and supplementary material.**

This passage is adapted from Ed Yong, "Turtles Use the Earth's Magnetic Field as Global GPS." ©2011 by Kalmbach Publishing Co.

In 1996, a loggerhead turtle called Adelita swam across 9,000 miles from Mexico to Japan, crossing the entire Pacific on her way. Wallace J. Nichols tracked this epic journey with a satellite tag. But Adelita herself had no such technology at her disposal. How did she steer a route across two oceans to find her destination?

Nathan Putman has the answer. By testing hatchling turtles in a special tank, he has found that they can use the Earth's magnetic field as their own Global Positioning System (GPS). By sensing the field, they can work out both their latitude and longitude and head in the right direction.

Putman works in the lab of Ken Lohmann, who has been studying the magnetic abilities of loggerheads for over 20 years. In his lab at the University of North Carolina, Lohmann places hatchlings in a large water tank surrounded by a large grid of electromagnetic coils. In 1991, he found that the babies started swimming in the opposite direction if he used the coils to reverse the direction of the magnetic field around them. They could use the field as a compass to get their bearing.

Later, Lohmann showed that they can also use the magnetic field to work out their position. For them, this is literally a matter of life or death. Hatchlings born off the sea coast of Florida spend their early lives in the North Atlantic gyre, a warm current that circles between North America and Africa. If they're swept towards the cold waters outside the gyre, they die. Their magnetic sense keeps them safe.

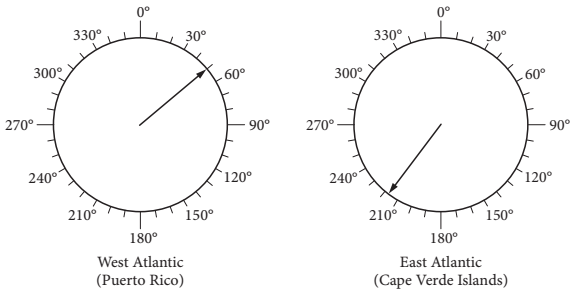
Using his coil-surrounded tank, Lohmann could mimic the magnetic field at different parts of the Earth's surface. If he simulated the field at the northern edge of the gyre, the hatchlings swam southwards. If he simulated the field at the gyre's southern edge, the turtles swam west-northwest. These experiments showed that the turtles can use their magnetic sense to work out their latitude—their position on a north-south axis. Now, Putman has shown that they can also determine their longitude—their position on an east-west axis.

He tweaked his magnetic tanks to simulate the fields in two positions with the same latitude at opposite ends of the Atlantic. If the field simulated the west Atlantic near Puerto Rico, the turtles swam northeast. If the field matched that on the east Atlantic near the Cape Verde Islands, the turtles swam southwest. In the wild, both headings would keep them within the safe, warm embrace of the North Atlantic gyre.

Before now, we knew that several animal migrants, from loggerheads to reed warblers to sparrows, had some way of working out longitude, but no one knew how. By keeping the turtles in the same conditions, with only the magnetic fields around them changing, Putman clearly showed that they can use these fields to find their way. In the wild, they might well also use other landmarks like the position of the sea, sun and stars.

Putman thinks that the turtles work out their position using two features of the Earth's magnetic field that change over its surface. They can sense the field's inclination, or the angle at which it dips towards the surface. At the poles, this angle is roughly 90 degrees and at the equator, it's roughly zero degrees. They can also sense its intensity, which is strongest near the poles and weakest near the Equator. Different parts of the world have unique combinations of these two variables. Neither corresponds directly to either latitude or longitude, but together, they provide a "magnetic signature" that tells the turtle where it is.

Orientation of Hatchling Loggerheads Tested in Magnetic Fields




Adapted from Nathan Putman, Courtney Endres, Catherine Lohmann, and Kenneth Lohmann, "Longitude Perception and Bicoordinate Magnetic Maps in Sea Turtles." ©2011 by Elsevier Inc.

Orientation of hatchling loggerheads tested in a magnetic field that simulates a position at the west side of the Atlantic near Puerto Rico (left) and a position at the east side of the Atlantic near the Cape Verde Islands (right). The arrow in each circle indicates the mean direction that the group of hatchlings swam. Data are plotted relative to geographic north (N = 0°).

**5**

The passage most strongly suggests that Adelita used which of the following to navigate her 9,000-mile journey?

A) The current of the North Atlantic gyre
B) Cues from electromagnetic coils designed by Putman and Lohmann
C) The inclination and intensity of Earth's magnetic field
D) A simulated "magnetic signature" configured by Lohmann

| **Estimated Difficulty:** Easy | **Key:** C |
|---|---|

**Choice C** is the best answer. The first paragraph describes the 9,000-mile journey that Adelita made and raises the question, which the rest of the passage tries to answer, of how this loggerhead turtle was able to "steer a route across two oceans to find her destination" (lines 6-7). The answer comes most directly in the last paragraph, which presents Putman's belief that loggerhead turtles "work out their position using two features of the Earth's magnetic field that change over its surface" (lines 61-63): its inclination and its intensity. It is reasonable, therefore, to infer from the passage that this was the method that Adelita used.

*Choice A* is incorrect because there is no evidence in the passage that Adelita used the current of the North Atlantic gyre to navigate her 9,000-mile journey. The passage does discuss the North Atlantic gyre but only as the place where loggerhead turtle hatchlings "born off the sea coast of Florida spend their early lives" (lines 27-28).

*Choice B* is incorrect because there is no evidence in the passage that Adelita navigated her 9,000-mile journey with the aid of cues from electromagnetic coils designed by Putman and Lohmann. The passage does say that Putman and Lohmann use electromagnetic coils as part of their research on loggerhead turtles, but the coils are part of tanks used in a laboratory to study loggerhead hatchlings (see lines 16-19).

*Choice D* is incorrect because there is no evidence in the passage that Adelita navigated her 9,000-mile journey with the aid of a simulated "magnetic signature" configured by Lohmann. The passage does describe how Lohmann and Putman manipulate magnetic fields as part of their research on loggerhead turtle hatchlings (see, for example, lines 16-23), but there is no indication that the two scientists used (or even could use) the kind of equipment necessary for this project outside of laboratory tanks or with Adelita in the wild.

**6**

Which choice provides the best evidence for the answer to the previous question?

A) Lines 1-3 ("In 1996 . . . way")
B) Lines 32-34 ("Using . . . surface")
C) Lines 58-60 ("In the wild . . . stars")
D) Lines 70-73 ("Neither . . . it is")

| **Estimated Difficulty:** Medium | **Key:** D |
|---|---|

**Choice D** is the best answer because in lines 70-73 the author indicates that "together, [inclination and intensity] provide a 'magnetic signature' that tells the turtle where it is." Therefore, these lines serve as the best evidence for the answer to the previous question.

*Choice A* is incorrect because in lines 1-3 the author establishes that Adelita made a 9,000-mile journey but does not explain how she navigated it. Therefore, these lines do not serve as the best evidence for the answer to the previous question.

*Choice B* is incorrect because in lines 32-34 the author indicates that Lohmann is able to "mimic the magnetic field at different parts of the Earth's surface" in his laboratory but does not explain how Adelita navigated her 9,000-mile journey or suggest that Lohmann had any influence over Adelita's trip. Therefore, these lines do not serve as the best evidence for the answer to the previous question.

*Choice C* is incorrect because in lines 58-60 the author notes that loggerhead turtles "in the wild" may make use of "landmarks like the position of the sea, sun and stars" but does not indicate that Adelita used such landmarks to navigate her 9,000-mile journey. Therefore, these lines do not serve as the best evidence for the answer to the previous question.

**7**

As used in line 3, "tracked" most nearly means

A) searched for.
B) traveled over.
C) followed.
D) hunted.

| **Estimated Difficulty:** Easy | **Key:** C |
|---|---|

**Choice C** is the best answer because the context makes clear that Nichols followed Adelita's "epic journey with a satellite tag" (line 4).

*Choice A* is incorrect because while "tracked" sometimes means "searched for," it would make little sense in context to say that Nichols searched for Adelita's "epic journey with a satellite tag" (line 4). It is more reasonable

to conclude from the passage that Nichols knew about Adelita and her journey and used a satellite tag to help follow it.

*Choice B* is incorrect because while "tracked" sometimes means "traveled over," it would make no sense in context to say that Nichols traveled over Adelita's "epic journey with a satellite tag" (line 4).

*Choice D* is incorrect because while "tracked" sometimes means "hunted," it would make no sense in context to say that Nichols hunted Adelita's "epic journey with a satellite tag" (line 4).

**8**

The author refers to reed warblers and sparrows (line 53) primarily to

A) contrast the loggerhead turtle's migration patterns with those of other species.
B) provide examples of species that share one of the loggerhead turtle's abilities.
C) suggest that most animal species possess some ability to navigate long distances.
D) illustrate some ways in which the ability to navigate long distances can help a species.

| **Estimated Difficulty:** Easy | **Key:** B |
|---|---|

**Choice B** is the best answer because the author indicates that reed warblers and sparrows, like loggerhead turtles, had previously been known to have "some way of working out longitude" (line 54).

*Choice A* is incorrect because although the author notes that loggerhead turtles, reed warblers, and sparrows are all "animal migrants" (line 52), he offers no specifics about the migration patterns of reed warblers and sparrows, and the only connection he draws among the three animals is their recognized ability of somehow "working out longitude" (line 54).

*Choice C* is incorrect because the author only mentions three "animal migrants" by name (loggerhead turtles, reed warblers, and sparrows) and indicates that "several" such migrants had previously been known to have "some way of working out longitude" (lines 52-54). He makes no claim in the passage that most animal species have some long-distance navigation ability.

*Choice D* is incorrect because although the author indicates that reed warblers and sparrows, like loggerhead turtles, are "animal migrants" (line 52), he offers no specifics about how the ability to navigate long distances might help reed warblers and sparrows (nor, for that matter, much information about how this ability might help loggerhead turtles).

**9**

It can reasonably be inferred from the passage and graphic that if scientists adjusted the coils to reverse the magnetic field simulating that in the East Atlantic (Cape Verde Islands), the hatchlings would most likely swim in which direction?

A) Northwest
B) Northeast
C) Southeast
D) Southwest

| **Estimated Difficulty:** Hard | **Key:** B |
|---|---|

**Choice B** is the best answer. The passage notes that Lohmann, who studied loggerhead turtle hatchlings "in a large water tank surrounded by a large grid of electromagnetic coils" (lines 17-19) capable of manipulating the magnetic field around the turtles, discovered that the hatchlings would start "swimming in the opposite direction" when he "reverse[d] the direction of the magnetic field around them" (lines 20-22). The graphic (whose caption establishes that geographic north is represented by 0 degrees) indicates that loggerhead hatchlings tested in a magnetic field that simulates a position at the east side of the Atlantic near the Cape Verde Islands would normally travel in a southwesterly direction (around 218 degrees). Given the above information, it is reasonable to infer that if the magnetic field were reversed, the turtles would travel in a northeasterly direction.

*Choice A* is incorrect because information in the passage and graphic suggests that the loggerhead turtle hatchlings would travel in a northeasterly, and not a northwesterly, direction if scientists reversed the magnetic field simulating a position at the east side of the Atlantic near the Cape Verde Islands.

*Choice C* is incorrect because information in the passage and graphic suggests that the loggerhead turtle hatchlings would travel in a northeasterly, and not a southeasterly, direction if scientists reversed the magnetic field simulating a position at the east side of the Atlantic near the Cape Verde Islands.

*Choice D* is incorrect because information in the passage and graphic suggests that the loggerhead turtle hatchlings would travel in a northeasterly, and not a southwesterly, direction if scientists reversed the magnetic field simulating a position at the east side of the Atlantic near the Cape Verde Islands. The graphic indicates that the hatchlings travel southwesterly under the normal (nonreversed) simulated conditions.

# Writing and Language Test Overview

In the Writing and Language Test, you will be asked to make revision and editing decisions to improve the text within a passage.

- **Total questions:** 44 passage-based revision and editing questions with multiple-choice responses
- **Time allotted:** 35 minutes
- Calculators may not be used or be on your desk.

## About the Passages

Writing and Language Test passages are well-written pieces ranging in length from about 400 to 450 words and covering topics related to careers, history/social studies, the humanities, and science. As in the Reading Test, some passages are accompanied by informational graphics such as tables, graphs, and charts; some questions require you to revise or edit a passage in light of the information conveyed graphically. (Again, mathematical computation is not required to answer these questions.)

## Tips for the Writing and Language Test

The test comprises a series of passages and associated multiple-choice questions that put you in the role of someone revising or editing the work of an unspecified writer. You are revising the passages for development, organization, and effective language use as well as editing the passages to ensure that they follow the conventions of standard written English grammar, usage, and punctuation.

- Each page of the actual Writing and Language Test is divided into two columns. Passages appear across multiple pages in the left-hand column, while associated questions appear in the right-hand column of each page.
- Rote recall of language rules is not tested, nor are any questions based on short snippets of text taken out of context. The best answer to each question represents how a writer should develop, organize, and use language in a multiparagraph passage. You are demonstrating that you can make context-based improvements to the text.
- The most common format for the questions offers three alternatives to an underlined portion of the passage along with the option of not changing the passage's original wording. Remember to answer these questions in the context of the whole passage.

## Sample Writing and Language Test Materials

On the following pages are samples of the kinds of Writing and Language Test passages and questions that may appear on your test. For each set of sample materials:

- Read the passage carefully.
- Decide on the best answer to each question.
- Read the explanation for the best answer.

The directions provided match what you will see on the actual test.

**DIRECTIONS**

Each passage below is accompanied by a number of questions. For some questions, you will consider how the passage might be revised to improve the expression of ideas. For other questions, you will consider how the passage might be edited to correct errors in sentence structure, usage, or punctuation. A passage or a question may be accompanied by one or more graphics (such as a table or graph) that you will consider as you make revising and editing decisions.

Some questions will direct you to an underlined portion of a passage. Other questions will direct you to a location in a passage or ask you to think about the passage as a whole.

After reading each passage, choose the answer to each question that most effectively improves the quality of writing in the passage or that makes the passage conform to the conventions of standard written English. Many questions include a "NO CHANGE" option. Choose that option if you think the best choice is to leave the relevant portion of the passage as it is.

**Questions 1-5 are based on the following passage.**

**Dong Kingman: Painter of Cities**

A 1954 documentary about renowned watercolor painter Dong Kingman shows the artist sitting on a stool on Mott Street in New York City's Chinatown. A crowd of admiring spectators watches as Kingman squeezes dollops of paint from several tubes into a tin watercolor box. From just a few primary colors, Kingman creates dozens of beautiful hues as he layers the translucent paint onto the paper on his easel. Each stroke of the brush and dab of the sponge transforms thinly sketched outlines into buildings, shop signs, and streetlamps. The street scene Kingman begins composing in this short film is very much in keeping with the urban landscapes for which he is best known.

[1] Kingman was keenly interested in landscape painting from an early age. [2] In Hong Kong, where Kingman completed his schooling, teachers at that time customarily assigned students a formal "school name." [3] His interest was so keen, in fact, that he was named after it. [4] The young boy who had been Dong Moy Shu became Dong Kingman. [5] The name Kingman was selected for its two parts: "king" and "man," Cantonese for "scenery" and "composition." [6] As Kingman developed as a painter, his works were often compared to 1 paintings by Chinese landscape artists dating back to CE 960, a time when a strong tradition of landscape painting emerged in Chinese art. [7] Kingman, however, 2 vacated from that tradition in a number of ways, most notably in that he chose to focus not on natural landscapes, such as mountains and rivers, but on cities. 3

In his urban landscapes, Kingman captures the vibrancy of crowded cities. His fine brushwork conveys detailed street-level activity: a peanut vendor pushing his cart on the sidewalk, a pigeon pecking for crumbs around a fire 4 hydrant, an old man tending to a baby outside a doorway. His broader brush strokes and sponge-painted shapes create majestic city skylines, with skyscrapers towering in the background, bridges connecting neighborhoods on either side of a river, and enormous ships docking at busy urban ports. To art critics and fans alike, these city scenes represent the innovative spirit of twentieth-century urban Modernism.

During his career, Kingman exhibited his work 5 internationally. He garnered much acclaim. In 1936, a critic described one of Kingman's solo exhibits as "twenty of the freshest, most satisfying watercolors that have been seen hereabouts in many a day." Since Kingman's death in 2000, museums across the United States and in China have continued to ensure that his now-iconic landscapes remain available for the public to enjoy.

## 1

A) NO CHANGE
B) Chinese landscape artists
C) painters of Chinese landscapes
D) artists

| **Estimated Difficulty:** Medium | **Key:** A |
|---|---|

**Choice A** is the best answer because it creates a comparison between like terms: "works" by Kingman and "paintings by Chinese landscape artists."

*Choice B* is incorrect because it creates a comparison between unlike terms: "works" by Kingman and "Chinese landscape artists."

*Choice C* is incorrect because it creates a comparison between unlike terms: "works" by Kingman and "painters of Chinese landscapes."

*Choice D* is incorrect because it creates a comparison between unlike terms: "works" by Kingman and "artists."

## 2

A) NO CHANGE
B) evacuated
C) departed
D) retired

| **Estimated Difficulty:** Hard | **Key:** C |
|---|---|

**Choice C** is the best answer because "departed" is the most contextually appropriate way to indicate that Kingman had deviated from the tradition of Chinese landscape painting in a number of ways.

*Choice A* is incorrect because while "vacated" does offer some sense of "leaving," it would be awkward and unconventional to say that a person was vacating from a tradition in a number of ways.

*Choice B* is incorrect because while "evacuated" does offer some sense of "leaving," it would be awkward and unconventional to say that a person was evacuating from a tradition in a number of ways.

*Choice D* is incorrect because while "retired" does offer some sense of "leaving," it would be awkward and unconventional to say that a person was retiring from a tradition in a number of ways.

## 3

To make this paragraph most logical, sentence 3 should be placed

A) where it is now.
B) before sentence 1.
C) after sentence 1.
D) after sentence 4.

| **Estimated Difficulty:** Easy | **Key:** C |
|---|---|

**Choice C** is the best answer because placing sentence 3 after sentence 1 makes the paragraph most cohesive. Sentence 3 refers to Kingman's "interest" being "so keen," a continuation of the idea in sentence 1, which says that "Kingman was keenly interested in landscape painting from an early age."

*Choice A* is incorrect because leaving sentence 3 where it is now creates a sequence of sentences that lacks sufficient cohesion. Keeping sentence 3 in its current location disrupts the link between sentence 2 (which describes the concept of "school names" in Hong Kong) and sentence 4 (which reveals that Dong Kingman was the school name of Dong Moy Shu).

*Choice B* is incorrect because placing sentence 3 before sentence 1 creates a sequence of sentences that lacks sufficient cohesion. Putting sentence 3 at the beginning of the paragraph would offer a poor introduction to the paragraph, in large part because sentence 3 builds directly on a point made in sentence 1.

*Choice D* is incorrect because placing sentence 3 after sentence 4 creates a sequence of sentences that lacks sufficient cohesion. Putting sentence 3 after sentence 4 would disrupt the link between sentence 4 (which mentions that Dong Moy Shu was given the school name Dong Kingman) and sentence 5 (which explains what the two parts composing the name Kingman mean in Cantonese).

**4**

A) NO CHANGE
B) hydrant—
C) hydrant:
D) hydrant

| **Estimated Difficulty:** Easy | **Key:** A |
|---|---|

**Choice A** is the best answer because a comma after the word "hydrant" separates the phrase "a pigeon pecking for crumbs around a fire hydrant" from the phrase "an old man tending to a baby outside a doorway." A comma is also consistent with the punctuation choice made to separate the first two phrases in the series following the colon in the sentence.

*Choice B* is incorrect because a dash is not a conventional choice for punctuating items in a series.

*Choice C* is incorrect because although a colon can be used to introduce a series, it is not a conventional choice for separating items within a series.

*Choice D* is incorrect because it fuses together two items in the series. Separating the phrases "a pigeon pecking for crumbs around a fire hydrant" and "an old man tending to a baby outside a doorway" requires punctuation (and could also involve a coordinating conjunction).

**5**

Which choice most effectively combines the sentences at the underlined portion?

A) internationally, and Kingman also garnered
B) internationally; from exhibiting, he garnered
C) internationally but garnered
D) internationally, garnering

| **Estimated Difficulty:** Medium | **Key:** D |
|---|---|

**Choice D** is the best answer because it combines the sentences logically and efficiently, with the original second sentence becoming a participial phrase describing Kingman.

*Choice A* is incorrect because it creates a wordy and awkward construction and because it fails to link the acclaim Kingman received with the exhibition of his work.

*Choice B* is incorrect because it creates a repetitive and awkward construction.

*Choice C* is incorrect because "but" suggests contrast or exception, neither of which makes sense in the context of the sentence.

**Questions 6-12 are based on the following passage and supplementary material.**

**A Life in Traffic**

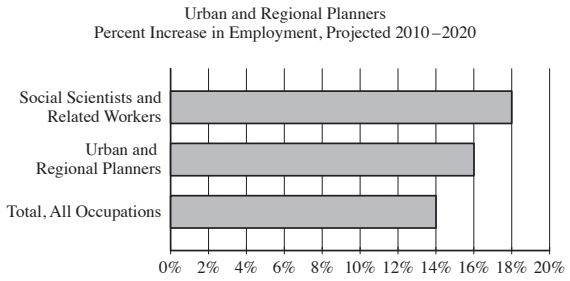
A subway system is expanded to provide service to a growing suburb. A bike-sharing program is adopted to encourage nonmotorized transportation. **6** To alleviate rush hour traffic jams in a congested downtown area, stoplight timing is coordinated. When any one of these changes occurs, it is likely the result of careful analysis conducted by transportation planners.

The work of transportation planners generally includes evaluating current transportation needs, assessing the effectiveness of existing facilities, and improving those facilities or **7** they design new ones. Most transportation planners work in or near cities, but some are employed in rural areas. Say, for example, a large factory is built on the outskirts of a small town. Traffic to and from that location would increase at the beginning and end of work shifts. The transportation **8** planner's job, might involve conducting a traffic count to determine the daily number of vehicles traveling on the road to the new factory. If analysis of the traffic count indicates that there is more traffic than the current design of the road can efficiently accommodate, the transportation planner might recommend widening the road to add another lane.

Transportation planners work closely with a number of community stakeholders, such as government officials and other interested organizations and individuals. **9** Next, representatives from the local public health department might provide input in designing a network of trails and sidewalks to encourage people to walk more. **10** According to the American Heart Association, walking provides numerous benefits related to health and well-being. Members of the Chamber of Commerce might share suggestions about designing transportation and parking facilities to support local businesses.

11 People who pursue careers in transportation planning have a wide variety of educational backgrounds. A two-year degree in transportation technology may be sufficient for some entry-level jobs in the field. Most jobs, however, require at least a bachelor's degree; majors of transportation planners are varied, including fields such as urban studies, civil engineering, geography, or transportation and logistics management. For many positions in the field, a master's degree is required.

Transportation planners perform critical work within the broader field of urban and regional planning. As of 2010, there were approximately 40,300 urban and regional planners employed in the United States. The United States Bureau of Labor Statistics forecasts steady job growth in this field, 12 projecting that 16 percent of new jobs in all occupations will be related to urban and regional planning. Population growth and concerns about environmental sustainability are expected to spur the need for transportation planning professionals.




Adapted from United States Bureau of Labor Statistics, Employment Projections program. "All occupations" includes all occupations in the United States economy.

**6**

Which choice best maintains the sentence pattern already established in the paragraph?

A) NO CHANGE
B) Coordinating stoplight timing can help alleviate rush hour traffic jams in a congested downtown area.
C) Stoplight timing is coordinated to alleviate rush hour traffic jams in a congested downtown area.
D) In a congested downtown area, stoplight timing is coordinated to alleviate rush hour traffic jams.

| **Estimated Difficulty:** Medium | **Key:** C |
|---|---|

**Choice C** is the best answer because it most closely maintains the sentence pattern established by the two preceding sentences, which begin with noun and passive verb phrases ("A subway system is expanded," "A bike-sharing program is adopted").

*Choice A* is incorrect because it does not maintain the sentence pattern established by the two preceding sentences. Rather, it begins the sentence with an infinitive phrase.

*Choice B* is incorrect because it does not maintain the sentence pattern established by the two preceding sentences. Rather, it begins the sentence with a gerund phrase.

*Choice D* is incorrect because it does not maintain the sentence pattern established by the two preceding sentences. Rather, it places a prepositional phrase, "in a congested downtown area," at the beginning of the sentence.

**7**

A) NO CHANGE
B) to design
C) designing
D) design

| **Estimated Difficulty:** Easy | **Key:** C |
|---|---|

**Choice C** is the best answer because "designing" maintains parallelism with "evaluating," "assessing," and "improving."

*Choice A* is incorrect because "they design" does not maintain parallelism with "evaluating," "assessing," and "improving."

*Choice B* is incorrect because "to design" does not maintain parallelism with "evaluating," "assessing," and "improving."

*Choice D* is incorrect because "design" does not maintain parallelism with "evaluating," "assessing," and "improving."

**8**

A) NO CHANGE
B) planner's job
C) planners job,
D) planners job

| **Estimated Difficulty:** Easy | **Key:** B |
|---|---|

**Choice B** is the best answer because it correctly uses an apostrophe to indicate possession and does not introduce any unnecessary punctuation.

*Choice A* is incorrect because while it correctly indicates the possessive relationship between "transportation planner" and "job," it introduces an unnecessary comma after the word "job."

*Choice C* is incorrect because it does not indicate the possessive relationship between "transportation planner" and "job" and because it introduces an unnecessary comma after the word "job."

*Choice D* is incorrect because it does not indicate the possessive relationship between "transportation planner" and "job."

**9**

A) NO CHANGE
B) For instance,
C) Furthermore,
D) Similarly,

| **Estimated Difficulty:** Medium | **Key:** B |
|---|---|

**Choice B** is the best answer because the transitional phrase "For instance" logically indicates that what follows provides an example related to the previous sentence. "Representatives from the local public health department" is an example of the kinds of people with whom transportation planners work.

*Choice A* is incorrect because the transitional word "Next" indicates sequence, which is not logical given that what follows provides an example related to the previous sentence.

*Choice C* is incorrect because the transitional word "Furthermore" indicates addition, which is not logical given that what follows provides an example related to the previous sentence.

*Choice D* is incorrect because the transitional word "Similarly" indicates comparison or likeness, which is not logical given that what follows provides an example related to the previous sentence.

**10**

The writer is considering deleting the underlined sentence. Should the sentence be kept or deleted?

A) Kept, because it provides supporting evidence about the benefits of walking.
B) Kept, because it provides an additional example of a community stakeholder with whom transportation planners work.
C) Deleted, because it blurs the paragraph's focus on the community stakeholders with whom transportation planners work.
D) Deleted, because it doesn't provide specific examples of what the numerous benefits of walking are.

| **Estimated Difficulty:** Medium | **Key:** C |
|---|---|

**Choice C** is the best answer because it identifies the best reason the underlined sentence should not be kept. At this point in the passage and the paragraph, a general statement about the benefits of walking only serves to interrupt the discussion of the community stakeholders with whom transportation planners work.

*Choice A* is incorrect because the underlined sentence should not be kept. Although the sentence theoretically provides supporting evidence about the benefits of walking, the passage has not made a claim that needs to be supported in this way, and including such a statement only serves to interrupt the discussion of the community stakeholders with whom transportation planners work.

*Choice B* is incorrect because the underlined sentence should not be kept. Although the American Heart Association could theoretically be an example of "other interested organizations" with which transportation planners work, the sentence does not suggest that this is the case. Instead, the association is merely the source for the general statement about the benefits of walking, a statement that only serves to interrupt the discussion of the actual community stakeholders with whom transportation planners work.

*Choice D* is incorrect because although the underlined sentence should be deleted, it is not because the sentence lacks specific examples of the numerous benefits of walking. Adding such examples would only serve to blur the focus of the paragraph further with general factual information, as the paragraph's main purpose is to discuss the community stakeholders with whom transportation planners work.

## 11

A) NO CHANGE
B) People, who pursue careers in transportation planning,
C) People who pursue careers, in transportation planning,
D) People who pursue careers in transportation planning,

| **Estimated Difficulty:** Easy | **Key:** A |
|---|---|

**Choice A** is the best answer because "who pursue careers in transportation planning" is, in context, a restrictive clause that should not be set off with punctuation. "Who pursue careers in transportation planning" is essential information defining who the "people" are.

*Choice B* is incorrect because it incorrectly sets off the restrictive clause "who pursue careers in transportation planning" with commas as though the clause were nonrestrictive or not essential to defining who the "people" are.

*Choice C* is incorrect because it incorrectly sets off the essential sentence element "in transportation planning" with commas as though the phrase were not essential to the meaning of the sentence. "In transportation planning" is essential information defining what the "careers" are.

*Choice D* is incorrect because it introduces an unnecessary comma after the word "planning," incorrectly setting off the subject of the sentence ("people who pursue careers in transportation planning") from the predicate ("have a wide variety of educational backgrounds").

## 12

Which choice completes the sentence with accurate data based on the graph?

A) NO CHANGE
B) warning, however, that job growth in urban and regional planning will slow to 14 percent by 2020.
C) predicting that employment of urban and regional planners will increase 16 percent between 2010 and 2020.
D) indicating that 14 to 18 percent of urban and regional planning positions will remain unfilled.

| **Estimated Difficulty:** Hard | **Key:** C |
|---|---|

**Choice C** is the best answer because it completes the sentence with an accurate interpretation of data in the graph. The graph displays projections of how much growth in employment there is expected to be between 2010 and 2020 for "social scientists and related workers," for "urban and regional planners," and in "all occupations" in the U.S. economy. According to the graph, the employment of urban and regional planners is expected to increase 16 percent between 2010 and 2020.

*Choice A* is incorrect because the data in the graph do not support the claim that 16 percent of new jobs in all occupations will be related to urban and regional planning.

*Choice B* is incorrect because the data in the graph do not support the claim that job growth in urban and regional planning will slow to 14 percent by 2020.

*Choice D* is incorrect because the data in the graph do not support the claim that 14 to 18 percent of urban and regional planning positions will remain unfilled.

# Math

The Math Test assesses your ability to problem-solve and use appropriate approaches and tools strategically. The questions measure math skills across four areas:

- Heart of Algebra
- Problem Solving and Data Analysis
- Passport to Advanced Math
- Additional Topics in Math (covering relevant concepts learned in high school math, such as the Pythagorean theorem)

## Math Test Overview

The Math Test includes a portion that allows the use of a calculator and a portion that does not.

- **Total questions:** 48
- 40 multiple-choice questions
- 8 student-produced response questions
- **Time allotted for Math Test – No Calculator:** 25 minutes
- **Time allotted for Math Test – Calculator:** 45 minutes

Some questions are like those you may have seen in your math courses. The ability to reason logically in a variety of situations, including ones related to career, science, and social studies, is tested throughout. You will also encounter at least three sets of questions that include more than one question about a given scenario.

All figures are drawn to scale unless otherwise indicated.

## Tips for the Math Test

- Familiarize yourself with the directions ahead of time.
- You do not have to memorize formulas. Commonly used formulas are provided with the test directions at the beginning of each Math Test section. Other formulas that are needed are provided with the questions themselves. It is up to you to decide which formula is appropriate to a question.
- Read the problem carefully. Look for key words that tell you what the problem is asking. Before you solve each problem, ask yourself these questions: What is the question asking? What do I know?
- With some problems, it may be useful to draw a sketch or diagram of the given information.
- Use the test booklet for scratch work. You are not expected to do all the reasoning and figuring in your head. You will not receive credit for anything written in the booklet, but you will be able to check your work easily later.
- In the portion of the test that allows calculator use, be strategic when choosing to use your calculator. (See "Calculator Tips.")
- If you don't know the correct answer to a question, eliminate some choices. It's sometimes easier to find the wrong answers than the correct one. On some questions, you may even be able to eliminate all the incorrect choices. Remember that you won't lose points for incorrect answers, so plan to make your best guess if you don't know the answer.
- Check your answer to make sure it is a reasonable answer to the question asked. This is especially true for student-produced response questions, where no answer choices are given.

## Tips for Student-Produced Response Questions

- Review the directions on page 31 for gridding the student-produced response questions.
- Know the rules for gridding mixed numbers and repeating decimals before taking the test.
- Check your work if your answer does not fit on the grid. If you obtain a negative value or a value greater than 9999, you have made an error.
- A zero cannot be gridded in the left-most column of the answer grid. For example, if your answer is 0.25, you must grid .25 or convert it to the fraction $\frac{1}{4}$.
- A fraction does not have to be reduced unless it will not fit on the grid. For example, if $\frac{3}{5}$ is the correct answer to a question, both $\frac{6}{10}$ and $\frac{9}{15}$ are considered correct and do not need to be reduced before you enter them in the grid.

# Calculator Use and Policies

- The no-calculator portion has 17 questions.
- The calculator portion has 31 questions.
- You will not be allowed to share calculators. You will be dismissed and your scores will be canceled if you use your calculator to share information during the test or to store and remove test questions or answers from the testing room.

## Calculator Tips

- Remember to bring your calculator on test day. You should be familiar with how to use the calculator you bring to the test.
- Make sure your calculator is in good working order and that its batteries are new. If your calculator fails during testing and you have no backup, you will have to complete the test without it (or cancel your scores for the entire test).
- Don't buy an expensive, sophisticated calculator just to take the test. Although you can use them for the test, more sophisticated calculators are not required for any problem.
- Don't try to use a calculator on every question in the calculator portion. First, decide how you will solve the problem, and then decide whether to use the calculator. The calculator is meant to aid you in solving problems, not to get in the way.
- All questions in the calculator portion can be answered without a calculator, but for some questions a calculator may be helpful. Look first for algebra structures to solve problems before reaching for your calculator.
- Take the practice test with a calculator at hand for the calculator portion of the test. This will help you practice determining which types of questions you should use your calculator to answer.

## Unacceptable Calculators

Do NOT bring these types of calculators to the test (unless approved to use as an accommodation):

- Laptops or other computers, tablets, cell phones, or smartphones
- Models that can access the internet or have wireless, Bluetooth, cellular, audio/video recording and playing, camera, or any other smartphone-type features
- Models that have a typewriter-like keypad, pen-input, or stylus
- Models that use electrical outlets, make noise, or have a paper tape

  In addition, the use of hardware peripherals such as a stylus with an acceptable calculator is not permitted. Some models with touch-screen capability are not permitted (e.g., Casio ClassPad). Check the list of acceptable calculators on the next page for models that are permitted.

## Acceptable Calculators

All questions on the Math Test – Calculator portion can be solved without a calculator, but you may find using a calculator helpful on some questions. A scientific or graphing calculator is recommended for the Math Test – Calculator portion of the PSAT/NMSQT.

Calculators permitted during testing are:

- Most graphing calculators (see the list that follows)
- All scientific calculators
- Four-function calculators (not recommended)

If you bring a calculator with large characters (one-inch high or more) or a raised display that might be visible to other students, the proctor may seat you where other students cannot view the large or raised display.

You should be familiar with the operation of your calculator and know when the calculator can be used effectively.

### Acceptable Graphing Calculators

| **Casio** | | **Hewlett-Packard** | **Sharp** | **Texas Instruments** |
|---|---|---|---|---|
| FX-6000 series | CFX-9800 series | HP-9G | EL-5200 | TI-73 |
| FX-6200 series | CFX-9850 series | HP-28 series | EL-9200 series | TI-80 |
| FX-6300 series | CFX-9950 series | HP-38G | EL-9300 series | TI-81 |
| FX-6500 series | CFX-9970 series | HP-39 series | EL-9600 series* | TI-82 |
| FX-7000 series | FX 1.0 series | HP-40 series | EL-9900 series | TI-83 |
| FX-7300 series | Algebra FX 2.0 series | HP-48 series | | TI-83 Plus |
| FX-7400 series | FX-CG-10 | HP-49 series | **Other** | TI-83 Plus Silver |
| FX-7500 series | FX-CG-20 series | HP-50 series | Datexx DS-883 | TI-84 Plus |
| FX-7700 series | FX-CG-50 | HP Prime | Micronta | TI-84 Plus CE |
| FX-7800 series | FX-CG-500* | | NumWorks | TI-84 Plus Silver |
| FX-8000 series | Graph25 series | **Radio Shack** | Smart[2] | TI-84 Plus C Silver |
| FX-8500 series | Graph35 series | EC-4033 | | TI-84 Plus T |
| FX-8700 series | Graph75 series | EC-4034 | | TI-84 Plus CE-T |
| FX-8800 series | Graph95 series | EC-4037 | | TI-85 |
| FX-9700 series | Graph100 series | | | TI-86 |
| FX-9750 series | | | | TI-89 |
| FX-9860 series | | | | TI-89 Titanium |
| | | | | TI-Nspire |
| | | | | TI-Nspire CX |
| | | | | TI-Nspire CM-C |
| | | | | TI-Nspire CAS |
| | | | | TI-Nspire CX CAS |
| | | | | TI-Nspire CM-C CAS |
| | | | | TI-Nspire CX-C CAS |

* The use of the stylus is not permitted.

## Sample Math Test Materials

On the following pages are samples of the kinds of Math Test – No Calculator and Math Test – Calculator questions that may appear on your test. For these sample materials:

- Review the notes and reference materials.
- Decide on the best answer to each multiple-choice question.
- Read the explanation for the best answer to each question.

The notes and reference materials will appear at the beginning of both portions on the actual test. The explanation of the student-produced responses will appear in both portions of the actual test, but only once in these sample materials (page 31). The directions provided here match what you will see on the actual text.

# Math Test – No Calculator

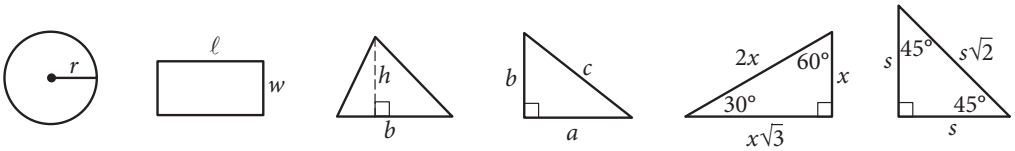
**DIRECTIONS**

**For questions 1-4**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding bubble on your answer sheet. **For questions 5-6**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 5 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

**NOTES**

1. The use of a calculator **is not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function $f$ is the set of all real numbers $x$ for which $f(x)$ is a real number.

**REFERENCE**



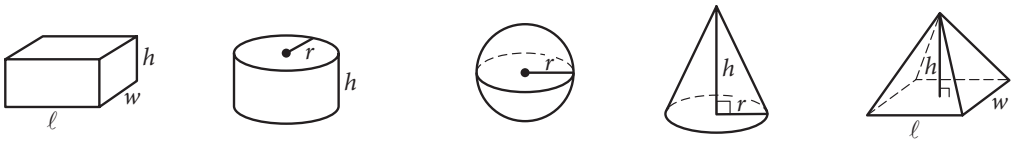

$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$

$A = \frac{1}{2}bh$

$c^2 = a^2 + b^2$

Special Right Triangles




$V = \ell wh$

$V = \pi r^2 h$

$V = \frac{4}{3}\pi r^3$

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\ell wh$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is $2\pi$.

The sum of the measures in degrees of the angles of a triangle is 180.

**1**

$$\frac{5(k+2)-7}{6} = \frac{13-(4-k)}{9}$$

In the equation above, what is the value of $k$?

A) $\frac{9}{17}$

B) $\frac{9}{13}$

C) $\frac{33}{17}$

D) $\frac{33}{13}$

| **Estimated Difficulty:** Medium | **Key:** B |
|---|---|

**Choice B** is correct. Simplifying the numerators yields $\frac{5k+3}{6} = \frac{9+k}{9}$, and cross-multiplication gives $45k + 27 = 54 + 6k$. Solving for $k$ yields $k = \frac{9}{13}$.

*Choice A* is incorrect. This value may result from not correctly applying the distributive property on the right-hand side, resulting in the expression $13 - 4 - k$ in the numerator. Correctly applying the distributive property yields $13 - (4 - k) = 13 - 4 + k$ in the numerator.

*Choice C* is incorrect. This value may result from not correctly applying the distributive property on the left-hand side, resulting in the expression $5k + 2 - 7$. Correctly applying the distributive property yields $5(k + 2) - 7 = 5k + 3$ in the numerator.

*Choice D* is incorrect. This value may result from not using the appropriate order of operations when simplifying either numerator.

**2**

$$4x - y = 3y + 7$$
$$x + 8y = 4$$

Based on the system of equations above, what is the value of the product $xy$?

A) $-\frac{3}{2}$

B) $\frac{1}{4}$

C) $\frac{1}{2}$

D) $\frac{11}{9}$

| **Estimated Difficulty:** Medium | **Key:** C |
|---|---|

**Choice C** is correct. There are several solution methods possible, but all involve persevering in solving for the two variables and calculating the product. For example, combining like terms in the first equation yields $4x - 4y = 7$ and then multiplying that by 2 gives $8x - 8y = 14$. When this transformed equation is added to the second given equation, the $y$-terms are eliminated, leaving an equation in just one variable: $9x = 18$, or $x = 2$. Substituting 2 for $x$ in the second equation (one could use either to solve) yields $2 + 8y = 4$, which gives $y = \frac{1}{4}$. Finally, the product $xy$ is $2 \times \frac{1}{4} = \frac{1}{2}$.

*Choice A* is incorrect. Students who select this option have most likely made a calculation error in transforming the second equation (using $-4x - 8y = -16$ instead of $-4x - 32y = -16$) and used it to eliminate the $x$-terms.

*Choice B* is incorrect. This is the value of $y$ for the solution of the system, but it has not been put back into the system to solve for $x$ to determine the product $xy$.

*Choice D* is incorrect. Not understanding how to eliminate a variable when solving a system, a student may have added the equations $4x - 4y = 7$ and $x + 8y = 4$ to yield $5x + 4y = 11$. From here, a student may mistakenly simplify the left-hand side of this resulting equation to yield $9xy = 11$ and then proceed to use division by 9 on both sides in order to solve for $xy$.

**3**

$$\frac{1}{x}+\frac{2}{x}=\frac{1}{5}$$

Anise needs to complete a printing job using both of the printers in her office. One of the printers is twice as fast as the other, and together the printers can complete the job in 5 hours. The equation above represents the situation described. Which of the following describes what the expression $\frac{1}{x}$ represents in this equation?

A) The time, in hours, that it takes the slower printer to complete the printing job alone
B) The portion of the job that the slower printer would complete in one hour
C) The portion of the job that the faster printer would complete in two hours
D) The time, in hours, that it takes the slower printer to complete $\frac{1}{5}$ of the printing job

| **Estimated Difficulty:** Hard | **Key:** B |
|---|---|

**Choice B** is correct. From the description given, $\frac{1}{5}$ is the portion of the job that the two printers, working together, can complete in one hour, and each term in the sum on the left side is the part of this $\frac{1}{5}$ of the job that one of the printers contributes. Since one of the printers is twice as fast as the other, $\frac{2}{x}$ describes the portion of the job that the faster printer is able to complete in one hour and $\frac{1}{x}$ describes the portion of the job that the slower printer is able to complete in one hour.

*Choice A* is incorrect. The student may have not seen that in this context, the rates (that is, the work completed in a fixed time) of the printers can be added to get the combined rate, but the times it takes each printer to complete the job cannot be added to get the time for both printers working together, since the time for printers working together is less than, not greater than, the times for each printer alone. Hence the terms in the sum cannot refer to hours worked. In fact, the time it would take the slower printer to complete the whole job is $x$ hours.

*Choice C* is incorrect. The student may have seen that $\frac{1}{x}$ is the smaller term in the sum, wrongly concluded that the smaller term must apply to the faster printer, and then assumed the 2 in the numerator of the second term implies the equation describes work completed in 2 hours. In fact, the portion of the job that the faster printer could complete in 2 hours is $(2)\left(\frac{2}{x}\right)=\frac{4}{x}$.

*Choice D* is incorrect. The student may have correctly seen that the value $\frac{1}{5}$ on the right side refers to the portion of the job completed, but not seen that in this context, the rates (that is, the work completed in a fixed time) of the printers can be added to get the combined rate, but the times it takes each printer to complete the job cannot be added to get the time for both printers working together. Hence the terms in the sum cannot refer to hours worked. In fact, the time it takes the slower printer to complete $\frac{1}{5}$ of the job is $\frac{x}{5}$ hours.

**4**

The graph of $y = (2x – 4)(x – 4)$ is a parabola in the $xy$-plane. In which of the following equivalent expressions do the $x$- and $y$-coordinates of the vertex of the parabola appear as constants or coefficients?

A) $y = 2x^2 – 12x + 16$
B) $y = 2x(x – 6) + 16$
C) $y = 2(x – 3)^2 + (–2)$
D) $y = (x – 2)(2x – 8)$

| **Estimated Difficulty:** Medium | **Key:** C |
|---|---|

**Choice C** is correct. The equation $y = (2x – 4)(x – 4)$ can be written in vertex form, $y = a(x – h)^2 + k$, to display the vertex, $(h, k)$, of the parabola. To put the equation in vertex form, first multiply: $(2x – 4)(x – 4) = 2x^2 – 8x – 4x + 16$. Then add like terms: $2x^2 – 8x – 4x + 16 = 2x^2 – 12x + 16$. The next step is completing the square.

| | |
|---|---|
| $y = 2x^2 – 12x + 16$ | |
| $y = 2(x^2 – 6x) + 16$ | Isolate the $x^2$ term by factoring. |
| $y = 2(x^2 – 6x + 9 – 9) + 16$ | Make a perfect square in the parentheses. |
| $y = 2(x^2 – 6x + 9) – 18 + 16$ | Move the extra term out of the parentheses. |
| $y = 2(x – 3)^2 – 18 + 16$ | Factor inside the parentheses. |
| $y = 2(x – 3)^2 – 2$ | Simplify the remaining terms. |

Therefore, the coordinates of the vertex, $(3, –2)$, are both revealed only in choice C. Since you are told that all of the equations are equivalent, simply knowing the form that displays the coordinates of the vertex

will save all of these steps—this is known as "seeing structure in the expression or equation."

*Choice A* is incorrect; it is in polynomial form, displaying the $y$-value of the $y$-intercept of the graph $(0, 16)$ as a constant.

*Choice B* is incorrect; it displays the $y$-value of the $y$-intercept of the graph $(0, 16)$ as a constant.

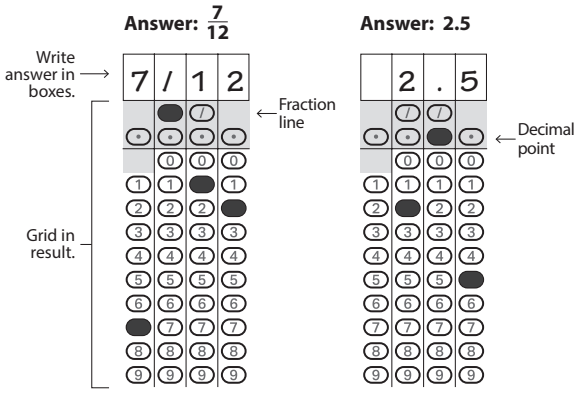
*Choice D* is incorrect; it displays the $x$-value of one of the $x$-intercepts of the graph $(2, 0)$ as a constant.

## Student-Produced Response Math Questions

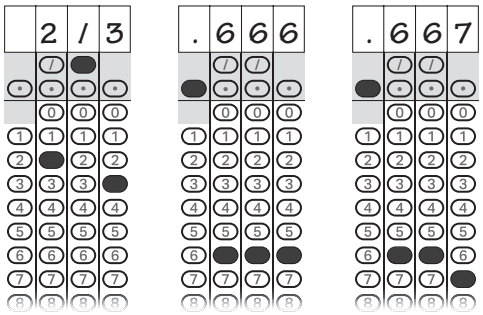
For some questions in the Math Test, you will be asked to solve the problem and enter your answer in the grid, as described below, on the answer sheet.

1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
2. Mark no more than one bubble in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If

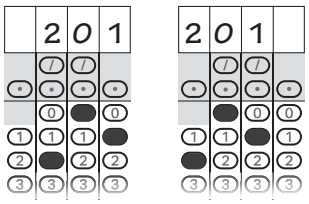
is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
6. **Decimal answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid.




**Acceptable ways to grid $\frac{2}{3}$ are:**




**Answer: 201 – either position is correct**




**NOTE:**
You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

**5**

If $\frac{1}{2}x + \frac{1}{3}y = 4$, what is the value of $3x + 2y$?

| **Estimated Difficulty:** Medium | **Key:** 24 |
|---|---|

Using the structure of the equation allows you to quickly solve the problem if you see that multiplying both sides of the equation by 6 clears the fractions and yields $3x + 2y = 24$.

**6**

$$x^2 + y^2 - 6x + 8y = 144$$

The equation of a circle in the $xy$-plane is shown above. What is the *diameter* of the circle?

| **Estimated Difficulty:** Hard | **Key:** 26 |
|---|---|

Completing the square yields the equation $(x - 3)^2 + (y + 4)^2 = 169$, the standard form of an equation of the circle. Understanding this form results in the equation $r^2 = 169$, which when solved for $r$ gives the value of the radius as 13. The diameter is twice the value of the radius; therefore, the diameter is 26.

# Math Test – Calculator

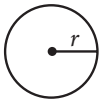
**DIRECTIONS**

**For questions 1-5**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding bubble on your answer sheet. **For question 6**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 6 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

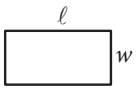
**NOTES**

1. The use of a calculator **is permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function $f$ is the set of all real numbers $x$ for which $f(x)$ is a real number.

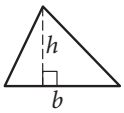
**REFERENCE**



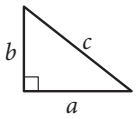

$A = \pi r^2$
$C = 2\pi r$



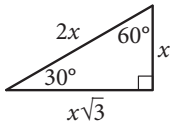

$A = \ell w$

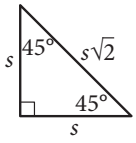



$A = \frac{1}{2}bh$

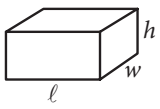



$c^2 = a^2 + b^2$

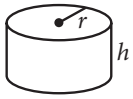



Special Right Triangles

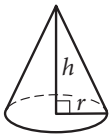



$V = \ell wh$

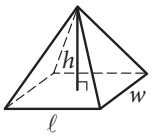



$V = \pi r^2 h$

$V = \frac{4}{3}\pi r^3$




$V = \frac{1}{3}\pi r^2 h$




$V = \frac{1}{3}\ell wh$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is $2\pi$.

The sum of the measures in degrees of the angles of a triangle is 180.

**1**

Aaron is staying at a hotel that charges $99.95 per night plus tax for a room. A tax of 8% is applied to the room rate, and an additional onetime untaxed fee of $5.00 is charged by the hotel. Which of the following represents Aaron's total charge, in dollars, for staying $x$ nights?

A) $(99.95 + 0.08x) + 5$

B) $1.08(99.95x) + 5$

C) $1.08(99.95x + 5)$

D) $1.08(99.95 + 5)x$

| **Estimated Difficulty:** Easy | **Key:** B |
|---|---|

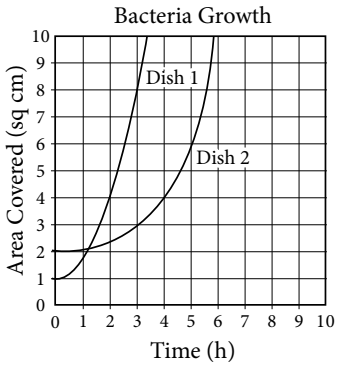
**Choice B** is correct. The total charge that Aaron will pay is the room rate, the 8% tax on the room rate, and a fixed fee. If Aaron stayed $x$ nights, then the total charge is $(99.95x + 0.08 \times 99.95x) + 5$, which can be rewritten as $1.08(99.95x) + 5$.

*Choice A* is incorrect. The expression includes only one night's stay in the room and does not accurately account for tax on the room.

*Choice C* is incorrect. The expression includes tax on the fee, and the hotel does not charge tax on the $5.00 fee.

*Choice D* is incorrect. The expression includes tax on the fee and a fee charge for each night.

**2**




A researcher places two colonies of bacteria into two petri dishes that each have an area of 10 square centimeters. After the initial placement of the bacteria ($t = 0$), the researcher measures and records the area covered by the bacteria in each dish every ten minutes. The data for each dish were fit by a smooth curve, as shown in the graph, where each curve represents the area of a dish covered by bacteria as a function of time, in hours. Which of the following is a correct statement about the data above?

A) At time $t = 0$, both dishes are 100% covered by bacteria.

B) At time $t = 0$, bacteria covers 10% of Dish 1 and 20% of Dish 2.

C) At time $t = 0$, Dish 2 is covered with 50% more bacteria than Dish 1.

D) For the first hour, the area covered in Dish 2 is increasing at a higher average rate than the area covered in Dish 1.

| **Estimated Difficulty:** Medium | **Key:** B |
|---|---|

**Choice B** is the correct answer. Each petri dish has area 10 square centimeters, and so at time $t = 0$, Dish 1 is 10% covered $\left(\frac{1}{10}\right)$ and Dish 2 is 20% covered $\left(\frac{2}{10}\right)$. Thus the statement in B is true.

*Choice A* is incorrect. At the end of the observations, both dishes are 100% covered with bacteria, but at time $t = 0$, neither dish is 100% covered.

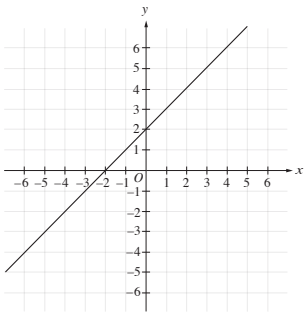
*Choice C* is incorrect. At time $t = 0$, Dish 1 is covered with 50% less bacteria than is Dish 2, but Dish 2 is covered with 100% more, not 50% more, bacteria than is Dish 1.

*Choice D* is incorrect. After the first hour, it is still true that more of Dish 2 is covered by bacteria than is Dish 1, but for the first hour the area of Dish 1 that is covered has been increasing at a higher average rate (about 0.8 sq cm/hour) than the area of Dish 2 (about 0.1 sq cm/hour).

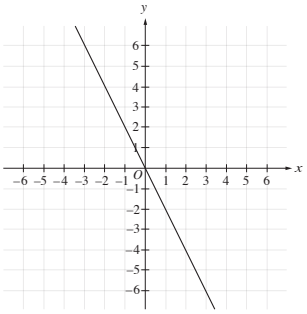
**3**

If $k$ is a positive constant different from 1, which of the following could be the graph of $y - x = k(x + y)$ in the $xy$-plane?

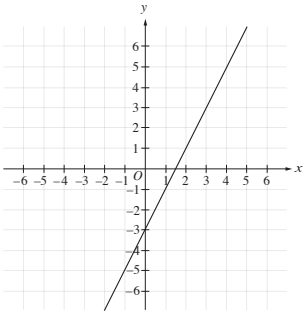
A)



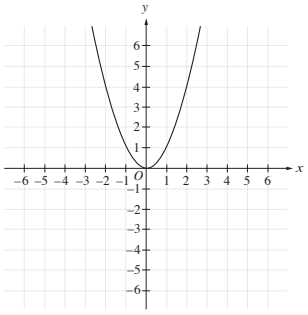
B)



C)



D)



| **Estimated Difficulty:** Hard | **Key:** B |
|---|---|

**Choice B** is correct. Manipulating the equation to solve for $y$ gives $y = \left(\frac{1+k}{1-k}\right)x$, revealing that the graph of the equation must be a line that passes through the origin. Of the choices given, only the graph shown in choice B satisfies these conditions.

*Choice A* is incorrect. If you selected this answer, you may have seen that the term $k(x + y)$ is a multiple of $x + y$ and wrongly concluded that this is the equation of a line with slope 1.

*Choice C* is incorrect. If you selected this answer, you may have made incorrect steps when simplifying the equation or may have not seen the advantage that putting the equation in slope-intercept form would give in determining the graph, and thus wrongly concluded the graph has a nonzero $y$-intercept.

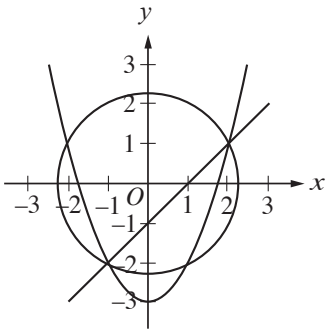
*Choice D* is incorrect. If you selected this answer, you may not have seen that term $k(x + y)$ can be multiplied out and the variables $x$ and $y$ isolated, and wrongly concluded that the graph of the equation cannot be a line.

**4**

$x^2 + y^2 = 5$

$y = x^2 - 3$

$x - y = 1$



A system of three equations and their graphs in the $xy$-plane are shown above. How many solutions does the system have?

A) One
B) Two
C) Three
D) Four

| **Estimated Difficulty:** Easy | **Key:** B |
|---|---|

**Choice B** is correct. The solutions to the system of equations are the points where the circle, parabola, and line all intersect. These points are (–1, –2) and (2, 1), and these are the only solutions to the system.

*Choice A* is incorrect. This answer may reflect the misconception that a system of equations can have only one solution.

*Choice C* is incorrect. This answer may reflect the misconception that a system of equations has as many solutions as the number of equations in the system.

*Choice D* is incorrect. This answer may reflect the misconception that the solutions of the system are represented by the points where any two of the curves intersect, rather than the correct concept that the solutions are represented only by the points where all three curves intersect.

**5**

If the expression $\frac{4x^2}{2x-1}$ is written in the equivalent form $\frac{1}{2x-1} + A$, what is $A$ in terms of $x$?

A) $2x + 1$

B) $2x - 1$

C) $4x^2$

D) $4x^2 - 1$

| **Estimated Difficulty:** Hard | **Key:** A |
|---|---|

**Choice A** is correct. The form of the equation suggests performing long division on $\frac{4x^2}{2x-1}$:

$$\begin{array}{r} 2x+1 \\ 2x-1\overline{)\,4x^2} \\ \underline{4x^2-2x} \\ 2x \\ \underline{2x-1} \\ 1 \end{array}$$

Since the remainder 1 matches the numerator in $\frac{1}{2x-1}$, it is clear that $A = 2x + 1$.

A short way to find the answer is to use the structure to rewrite the numerator of the expression as $(4x^2 - 1) + 1$, recognizing the term in parentheses as a difference of squares, making the expression equal to $\frac{(2x-1)(2x+1)+1}{2x-1} = 2x+1+\frac{1}{2x-1}$. From this, the answer $2x + 1$ is apparent. Another way to find the answer is to isolate $A$ in the form $A=\frac{4x^2}{2x-1}-\frac{1}{2x-1}$ and simplify. As with the first approach, this approach also requires you to recognize $4x^2 - 1$ as a difference of squares that factors.

*Choice B* is incorrect. If you selected this answer, you may have made a sign error while subtracting partial quotients in the long division.

*Choice C* is incorrect. If you selected this answer, you may have misunderstood how to work with fractions and may have tried the incorrect calculation

$$\frac{4x^2}{2x-1}=\frac{(1)\left(4x^2\right)}{2x-1}=\frac{1}{2x-1}+4x^2.$$

*Choice D* is incorrect. If you selected this answer, you may have misunderstood how to work with fractions and may have tried the incorrect calculation

$$\frac{4x^2}{2x-1}=\frac{1+4x^2-1}{2x-1}=\frac{1}{2x-1}+4x^2-1.$$

## Student-Produced Response Math Questions

For question 6, solve the problem and enter your answer in the grid, as described on page 31 of this guide.

**6**

The table below classifies 103 elements as metal, metalloid, or nonmetal and as solid, liquid, or gas at standard temperature and pressure.

| | Solids | Liquids | Gases | Total |
|---|---|---|---|---|
| Metals | 77 | 1 | 0 | 78 |
| Metalloids | 7 | 0 | 0 | 7 |
| Nonmetals | 6 | 1 | 11 | 18 |
| Total | 90 | 2 | 11 | 103 |

What fraction of all solids and liquids in the table are metalloids?

| **Estimated Difficulty:** Easy | **Key:** .076, $\frac{7}{92}$ |
|---|---|

There are 7 metalloids that are solid or liquid, and there are 92 total solids and liquids. Therefore, the fraction of solids and liquids that are metalloids is $\frac{7}{92}$, or .076.

**End of the Test-Taking Help Section. Turn book over for information about the National Merit Scholarship Program.**

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PSAT/NMSQT® | CollegeBoard / NATIONAL MERIT SCHOLARSHIP CORPORATION

**Fall 2018**

National Merit® Scholarship Program
conducted by National Merit Scholarship Corporation

# Student Guide

**TO ENTER THE 2020 NATIONAL MERIT SCHOLARSHIP PROGRAM:**

- ✓ Take the Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT®) in fall 2018
- ✓ Meet other entry requirements (see inside)

www.nationalmerit.org

**FLIP THIS BOOK OVER** FOR TEST-TAKING HELP ON THE **PSAT/NMSQT®**

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# National Merit® Scholarship Program

conducted by National Merit Scholarship Corporation (NMSC)

The **National Merit Scholarship Program** is an academic competition for recognition and college scholarships that began in 1955. High school students enter the National Merit Scholarship Program by taking the Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT®), which serves as an initial screen of approximately 1.6 million entrants each year, and by meeting published program entry and participation requirements.

**To enter the National Merit Scholarship Program and compete for recognition and 8,600 scholarships to be offered in 2020:**

- Take the PSAT/NMSQT in October 2018.
- Meet other entry requirements.

Program entrants must take the test in the specified year of the high school program *(see page 6)*. The 2018 PSAT/NMSQT is the qualifying test for entry to the 2020 program. Most entrants will complete high school and enroll in college in 2020.

**Important information about the 2020 National Merit Scholarship Program:**


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Scholarship Sponsors

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**Have questions?**

Website: www.nationalmerit.org
Phone: (847) 866-5100
Address: National Merit Scholarship Corporation
1560 Sherman Avenue, Suite 200
Evanston, IL 60201-4897

# Steps in the 2020 National Merit® Scholarship Competition

**1,600,000 Entrants.** In October 2018, U.S. high school students who take the Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT®) and meet other program requirements will enter the 2020 competition for National Merit Scholarship Program recognition and scholarships. Nearly all program participants (entrants) will be juniors planning to enter college in 2020. NMSC uses PSAT/NMSQT Selection Index scores (calculated by doubling the sum of the Reading, Writing and Language, and Math Test scores) to determine 50,000 high-scoring participants who qualify for program recognition.

In April 2019, NMSC will ask high school principals to identify any errors or changes in the reported eligibility of their high scorers (students whose scores qualify them for recognition).

## PARTICIPANTS WHO QUALIFY FOR NATIONAL MERIT PROGRAM RECOGNITION

**34,000 Commended Students.** In late September 2019, more than two-thirds of the 50,000 high scorers will receive Letters of Commendation in recognition of their outstanding academic promise, but they will not continue in the competition for National Merit Scholarships. However, some of these students may be candidates for Special Scholarships provided by corporate and business sponsors.

**16,000 Semifinalists.** In early September 2019, nearly a third of the 50,000 high scorers will be notified that they have qualified as Semifinalists. Semifinalists are the highest-scoring entrants in each state. NMSC will notify them through their schools and provide scholarship application materials explaining requirements to advance in the competition for National Merit Scholarships to be offered in 2020.

**15,000 Finalists.** In February 2020, Semifinalists who meet academic and other requirements will be notified that they have advanced to Finalist standing. All National Merit Scholarship winners (Merit Scholar® awardees) will be chosen from this group of Finalists based on their abilities, skills, and accomplishments.

## SCHOLARSHIP WINNERS

**1,100 Special Scholarship recipients.** Beginning in March 2020, NMSC will notify winners of Special Scholarships provided by corporate sponsors. Recipients are chosen from candidates sent scholarship application materials through their high schools in November 2019. Although not Finalists, scholarship recipients will be outstanding students who meet their sponsors' eligibility criteria. Sponsors will handle public announcement of their Special Scholarship winners.

**7,500 Merit Scholarship® winners.** Beginning in March 2020, NMSC will notify winners of the three types of National Merit Scholarships:

- National Merit® $2500 Scholarships
- Corporate-sponsored scholarships
- College-sponsored scholarships

In April, May, June, and July, NMSC will release names of Merit Scholar designees to news media for public announcement.

# The 2020 Competition Begins in 2018

The National Merit® Scholarship Program is an annual academic competition among high school students for recognition and college scholarships. The program is conducted by National Merit Scholarship Corporation (NMSC), a not-for-profit organization that operates without government assistance.

The 2018 Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT®) is the qualifying test for entry to the 2020 National Merit Program. (The PSAT™ 10 and PSAT™ 8/9 will NOT be considered for entry to the National Merit Scholarship Program.) The competition will span about 18 months from entry in the fall of 2018 until the spring of 2020 when scholarships for college undergraduate study will be awarded. It is expected that about 4 million students will take the PSAT/NMSQT in 2018, and approximately 1.6 million of them will meet requirements to enter this program.

# Entry Requirements

To enter the 2020 National Merit Program, a student must meet **all** of the following requirements. He or she must:

1. be enrolled as a high school student (traditional or homeschooled), progressing normally toward graduation or completion of high school by 2020, and planning to accept admission to college no later than the fall of 2020; and
2. take the 2018 PSAT/NMSQT in the specified year of the high school program and no later than the third year in grades 9 through 12, regardless of grade classification or educational pattern (explained in the next section).

On test day, students will be asked the following three questions to determine entry to the National Merit Scholarship Program:

A. Are you enrolled as a high school student (traditional or homeschooled)?
   A. Yes  B. No
B. When will you complete or leave high school and enroll full time in college?
   A. 2019  B. 2020
   C. 2021  D. After 2021
   E. Not planning to attend college
C. How many total years will you spend in grades 9–12?
   A. 1 year  B. 2 years
   C. 3 years  D. 4 years
   E. 5 or more years

The NMSC section of the PSAT/NMSQT Score Report shows the student's responses to these questions and whether the student's Selection Index score will be considered for the National Merit Scholarship Program.

# When to Take the Test

To participate in the National Merit Program, students must take the PSAT/NMSQT in the specified year of their high school program. Because a student can participate (and be considered for a scholarship) in only one specific competition year, the year in which the student takes the PSAT/NMSQT to enter the competition is very important.

1. **Students who plan to spend the usual four years in high school (grades 9 through 12) before entering college full time** must take the qualifying test in their third year of high school (grade 11, junior year).

   **Sophomores** who take the 2018 PSAT/NMSQT but plan to spend four years in grades 9 through 12 will **not** meet entry requirements for the 2020 National Merit Program. They must take the PSAT/NMSQT again in 2019 (when they are juniors) to enter the competition that will end when scholarships are awarded in 2021, the year they will complete high school and enter college.

2. **Students who plan to leave high school early to enroll in college full time after spending three years or less in grades 9 through 12** usually can participate in the National Merit Program if they take the PSAT/NMSQT before they enroll in college. To enter the 2020 competition, these students must be in either the *next-to-last* or the *last year* of high school when they take the 2018 PSAT/NMSQT:

   a. if they are in the *next-to-last year* of high school when they take the 2018 PSAT/NMSQT, they will be finishing their last high school year when awards are offered in 2020; or

   b. if they are in their *last year* of high school when they take the 2018 PSAT/NMSQT, they will be completing their first year of college when scholarships are awarded in 2020.

3. **Students who plan to participate in a post-secondary enrollment options program** (through which they enroll simultaneously in *both* high school and college) must take the qualifying test in their third year of high school (grade 11, junior year). To enter the competition that ends when scholarships are offered in 2020, these students must be in their third year of high school when they take the 2018 PSAT/NMSQT, the same as all other students who plan to spend four years in grades 9 through 12. The high school determines whether a student is participating in a post-secondary enrollment options program and certifies the student's status.

4. **Students who plan to take five years to complete grades 9 through 12** can participate in the National Merit Program if they take the PSAT/NMSQT in the third year of high school and again in the fourth year. These students' Selection Index scores will not be eligible for the program until a written request for entry to the competition is approved by NMSC. The request should include the student's name, high school name and location, year the student began high school, year the student will complete high school, and a brief explanation of the student's educational pattern.

   NMSC will use the student's Selection Index score from the PSAT/NMSQT taken in the student's third year of grades 9 through 12 to determine the expected level of recognition. In order to be recognized in the fifth (final) year of high school, the student must take the PSAT/NMSQT again in the fourth year, and earn a qualifying Selection Index score at or above the level achieved on the third year test. The level of recognition a student receives cannot exceed the level earned on the qualifying test taken during the student's third year in grades 9 through 12, the year in which all other competitors are considered.

**NOTE:** *If your high school standing and enrollment do not fit one of the preceding descriptions (1, 2, 3, or 4) or if you have any questions about when to take the PSAT/NMSQT for National Merit Program entry, contact NMSC immediately.*

### Unable to Take the PSAT/NMSQT?

If you do not take the 2018 PSAT/NMSQT because of illness, an emergency, or other extenuating circumstance, you may still be able to enter the 2020 National Merit Scholarship Program. To request information about another route of entry after the Fall 2018 PSAT/NMSQT administration, **write** to NMSC as soon as possible but no later than April 1, 2019. The alternate entry request should include your name and home address, the contact information of the person making the request, the name and address of your high school, and a brief explanation of why you missed the test. **Do not delay**; the earlier you write, the more options you will have for scheduling test dates.

**Mail your request to:**

National Merit Scholarship Corporation
Attn: Scholarship Administration
1560 Sherman Avenue, Suite 200
Evanston, IL 60201-4897

**Your letter must be postmarked on or before April 1, 2019, for your request to be considered.**

If you do not want your 2018 PSAT/NMSQT Selection Index score used for participation in the 2020 National Merit Program due to an irregularity that occurred when you took the test, you must contact NMSC immediately but no later than November 15, 2018, to submit a formal request. Requests received after November 15, 2018, will not be considered.

## Program Recognition

NMSC uses PSAT/NMSQT Selection Index scores (calculated by doubling the sum of the Reading, Writing and Language, and Math Test scores) as an initial screen of some 1.6 million program entrants. The 2018 Selection Index scores of all students who meet entry requirements for the 2020 program will be considered. In the spring of 2019, NMSC will ask high school principals to identify any errors or changes in the reported eligibility of their high scorers (students whose Selection Index scores will qualify them for recognition in the fall of 2019).

**Commended Students.** In September 2019, more than two-thirds (about 34,000) of the high scorers will be designated Commended Students. They will be named on the basis of a nationally applied Selection Index qualifying score that may vary from year to year.

In recognition of their outstanding ability and potential for academic success in college, these students will be honored with Letters of Commendation sent to them through their high schools. Although Commended Students will not continue in the competition for National Merit Scholarships, some may be candidates for Special Scholarships offered by corporate sponsors (see page 9). NMSC will notify those candidates in November 2019.

**Semifinalists.** Some 16,000 of the high scorers, representing less than 1 percent of the nation's high school graduating seniors, will qualify as Semifinalists. Only Semifinalists will have an opportunity to advance in the competition for Merit Scholarship® awards. NMSC will notify Semifinalists of their standing and send scholarship application materials to them through their high schools in September 2019. Their names will be sent to regionally accredited four-year U.S. colleges and universities and released to local news media for public announcement in mid-September.

NMSC designates Semifinalists in the program on a state-representational basis to ensure that academically able young people from all parts of the United States are included in this talent pool. Using the latest data available, an allocation of Semifinalists is determined for each state, based on the state's percentage of the national total of high school graduating seniors. For example, the number of Semifinalists in a state that enrolls approximately two percent of the nation's graduating seniors would be about 320 (2 percent of the 16,000 Semifinalists).

NMSC then arranges the Selection Index scores of all National Merit Program participants within a state in descending order. The score at which a state's allocation is most closely filled becomes the Semifinalist qualifying score. Entrants with a Selection Index score at or above the qualifying score are named Semifinalists. As a result of this process, Semifinalist qualifying scores vary from state to state and from year to year, but the scores of all Semifinalists are extremely high.

In addition to Semifinalists designated in each of the 50 states and without affecting the allocation to any state, Semifinalists are named in several other selection units that NMSC establishes for the competition. These units are for students attending schools in the District of Columbia, schools in U.S. commonwealths and territories, schools in other countries that enroll U.S. citizens, and

U.S. boarding schools that enroll a sizable proportion of their students from outside the state in which the school is located. A participant can be considered for Semifinalist standing in only one state or selection unit, based on the high school in which the student is regularly enrolled when taking the PSAT/NMSQT.

**Finalists.** A Semifinalist must fulfill several additional requirements and advance to the Finalist level of the competition before being considered for a National Merit Scholarship. Over 90 percent (about 15,000) of the Semifinalists are expected to become Finalists and receive a Certificate of Merit attesting to their distinguished performance in the competition.

**To qualify as a Finalist, a Semifinalist must:**

1. continue to meet all program entry requirements (explained on page 5);
2. be enrolled in the last year of high school and planning to enroll full time in college the following fall, or be enrolled in the first year of college if grades 9 through 12 were completed in three years or less;
3. complete the National Merit Scholarship Application with all information requested, which includes writing an essay;
4. have a record of very high academic performance in all of grades 9 through 12 and in any college course work taken (the high school must provide a complete record of courses taken and grades earned by the student, as well as information about the school's curriculum and grading system);
5. be fully endorsed for Finalist standing and recommended for a National Merit Scholarship by the high school principal;
6. take the SAT® or ACT® and earn scores that confirm the PSAT/NMSQT performance that resulted in Semifinalist standing; and
7. provide any other documentation and information that NMSC requests.

## Choosing Scholarship Winners

Only Finalists will be considered for the 7,500 National Merit Scholarships. Approximately half of the Finalists will be Merit Scholarship winners (Merit Scholar® awardees). Winners are chosen on the basis of their abilities, skills, and accomplishments—without regard to gender, race, ethnic origin, or religious preference. Scholarship recipients are the candidates judged to have the greatest potential for success in rigorous college studies and beyond.

To receive a scholarship payment, a Merit Scholarship winner must notify NMSC of plans to (a) enroll in a college or university in the United States that holds accredited status with a regional accrediting commission on higher education, and (b) enroll full time in an undergraduate course of study leading to a traditional baccalaureate degree. NMSC scholarship stipends are not payable for attendance at service academies or certain institutions that are limited in their purposes or training.

The selection process involves evaluating substantial amounts of information about Finalists obtained from both students and their high schools. Included are the Finalist's academic record (course load and difficulty level, depth and breadth of subjects studied, and grades earned); standardized test scores; the student's essay; demonstrated leadership and contributions to school and community activities; and the school official's written recommendation and characterization of the Finalist.

The same process is used to select Special Scholarship winners for a corporate sponsor's awards.

## Types of Scholarships

Some 7,500 National Merit Scholarships of three types and approximately 1,100 Special Scholarships will be awarded in 2020; these 8,600 awards will have a combined value of more than $41 million. Different types of scholarships will be offered, but no student can receive more than one monetary award from NMSC.

**National Merit® $2500 Scholarships.** These awards are unique because every Finalist is considered for one and winners are named in *every* state and other selection unit. The number awarded in each state is determined by the same representational procedure used to designate Semifinalists. Finalists compete with all other Finalists in their state or selection unit for one of the 2,500 National Merit $2500 Scholarships. Winners are selected by a committee of college admission officers and high school counselors.

National Merit $2500 Scholarships provide a single payment of $2,500. NMSC's own funds support the majority of these scholarships, but corporate sponsors help underwrite these awards with grants they provide to NMSC in lieu of paying administrative fees.

## A Total of 8,600 Scholarships Offered

| | National Merit® $2500 Scholarships | Corporate-sponsored Merit Scholarships | Corporate-sponsored Special Scholarships | College-sponsored Merit Scholarships |
|---|---|---|---|---|
| **Who is considered?** | All Finalists compete with all other Finalists in their state or other selection unit. | Finalists who meet criteria specified by a corporate sponsor, usually:<br>• children of employees;<br>• residents of specific communities; or<br>• Finalists with certain college major or career plans | High-performing program participants (although not Finalists) who meet a sponsor's criteria; most are for:<br>• children of employees;<br>• residents of specific communities; or<br>• participants with certain college major or career plans | Finalists who plan to attend a sponsor college and have informed NMSC that the sponsor college is their first choice |
| **Who selects winners?** | A committee of college admission officers and high school counselors | NMSC's professional staff | NMSC's professional staff | Officials of each sponsor college |
| **What is the monetary value?** | Awards provide a one-time payment of $2,500. | Varies by sponsor—awards can be one-time or renewable. (See chart on page 10.) | Varies by sponsor—awards can be one-time or renewable. (See chart on page 10.) | Awards are renewable for 4 years of study at the sponsor institution. Stipends range from $500 to $2,000 per year. |
| **When does NMSC begin sending scholarship offers?** | Late March | Early March | Early March | Early May |

**Corporate-sponsored scholarships.** In 2018, about 230 corporations, company foundations, and businesses sponsored scholarships through the National Merit Program as part of their educational philanthropy. These sponsors committed about $16 million to support more than 1,000 corporate-sponsored Merit Scholarship awards and 1,100 Special Scholarships for students with qualifications that particularly interest them.

The number of **National Merit** Scholarships a company or business offers annually may range from one to more than 100. Finalists who meet a sponsor's criteria are identified from information Semifinalists supply on their scholarship applications. Winners are selected from this pool based on their abilities, skills, and accomplishments. The scholarship name usually identifies the grantor—for example, National Merit XYZ Company Scholarship.

Over two-thirds of the program's corporate sponsors also provide **Special** Scholarships. Organizations that sponsor Special Scholarships make Entry Forms available to children of employees or members, or to students with other qualifications that interest them. Entry Forms are completed by students (and their parents, if applicable). If the number of Finalists eligible

for a sponsor's awards is smaller than the number of awards the corporate organization wishes to offer, NMSC establishes a pool of high-scoring candidates who filed Entry Forms. NMSC then sends Special Scholarship application materials to these candidates through their high schools and invites them to compete for the sponsor's Special Scholarships.

Each corporate sponsor specifies the monetary limits of scholarships it finances and decides whether the awards provide one-time payments or fixed stipends that can be renewed for up to four years of college undergraduate study.

| Type of Award | Type of Stipend | Stipend Ranges |
|---|---|---|
| Renewable | Fixed | $1,000–$10,000 per year |
| One-time | Single-payment | $2,500–$5,000 |

**College-sponsored Merit Scholarships.** In the 2020 competition, it is expected that about 4,000 National Merit Scholarships will be offered to Finalists who plan to attend a sponsor college or university. (See the list of about 180 colleges that currently are Merit Scholarship sponsors beginning on page 21.) A college-sponsored scholarship is renewable for up to four years of undergraduate study at the sponsor institution. It cannot be transferred; therefore, it is canceled if a winner does not attend the college financing the award.

Officials of each sponsor institution choose award recipients from among Finalists who have been accepted for admission and have informed NMSC that the sponsor college or university is their first choice. Each college sponsor chooses the annual stipend their institution offers to award recipients, within a range of $500 to $2,000 per year. All college-sponsored scholarship recipients at the institution will receive the same stipend amount as determined by the college.

# Scholarship Sponsors

Approximately 410 independent organizations and institutions sponsor more than two-thirds of the National Merit Scholarships offered each year. All Special Scholarships are sponsored by business organizations that also support Merit Scholarship awards.

**Corporate scholarship sponsors.** Following is a list of corporate organizations that currently sponsor scholarships in the National Merit Program with any eligibility criteria that apply to candidates for their awards. An asterisk (*) indicates the sponsor offers Special Scholarships in addition to National Merit Scholarships and requires that Entry Forms be filed.

The number of awards shown is an estimate of the yearly total, and neither the sponsor nor NMSC is obligated to offer these scholarships in 2019, 2020, or beyond.

## A

**AbbVie Inc.**–Every Finalist who is the child of an employee of the corporation or a U.S. subsidiary will be offered an award.

**ACI Worldwide, Inc.**–2 awards for Finalists who are children of employees of the corporation and its subsidiaries.

* **Acushnet Company**–3 awards for children of employees of the company and its subsidiaries.

* **ADP Foundation**–40 awards for children of employees of ADP.

* **Aerojet Rocketdyne Foundation**–10 awards for the children of employees of Aerojet Rocketdyne Holdings, Inc. and its subsidiaries.

**Air Products Foundation**–Every Finalist who is the child of an employee of Air Products and Chemicals, Inc. or a subsidiary will be offered an award.

* **Akzo Nobel Inc.**–6 awards for children of employees of the corporation and its subsidiaries.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

* **Albany International**–2 awards for children of employees of the corporation and its subsidiaries.

* **The Allergan Foundation**–10 awards for children of employees of Allergan, Inc. and its eligible subsidiaries.

**Alliance Data Systems Corporation**–Every Finalist who is the child of an employee of the corporation or an eligible subsidiary will be offered an award.

* **Ameren Corporation Charitable Trust**–6 awards for children of employees of Ameren Corporation.

**American Air Liquide Holdings, Inc**–5 awards for Finalists who are children of employees of the corporation and its subsidiaries.

* **American City Business Journals, Inc.**–2 awards for children of employees of the corporation.

**American Electric Power Company, Inc.**–5 awards for Finalists who are children of employees of the corporation and its subsidiaries.

* **American Financial Group**–2 awards for children of employees of the corporation and its subsidiaries.

* **AmerisourceBergen Corporation**–8 awards for children of employees of the corporation and its subsidiaries.

* **The AMETEK Foundation**–7 awards for children of employees of AMETEK, Inc. and its subsidiaries.

* **Anadarko Petroleum Corporation**–4 awards for children of employees of the corporation and its subsidiaries.

* **Aon Foundation**–15 awards for children of employees of Aon and its subsidiaries.

* **Apache Corporation**–2 awards for children of employees of the corporation and its subsidiaries.

**The Aptiv Foundation**–4 awards for Finalists who are children of employees of Aptiv Plc and its subsidiaries.

* **Archer Daniels Midland Company**–10 awards for children of employees of ADM and its subsidiaries.

* **Arkema Inc. Foundation**–4 awards for children of employees of Arkema Inc. and its subsidiaries.

**ARRIS International, plc**–Every Finalist who is the child of an employee of the corporation will be offered an award.

**ASC Partners, LLC**–2 awards for Finalists in the National Merit Scholarship Program.

* **Astellas US LLC**–2 awards for children of employees of the corporation and its eligible affiliates.

* **AstraZeneca Pharmaceuticals LP**–30 awards—20 awards for children of employees of AstraZeneca Pharmaceuticals LP and 10 awards for children of employees of MedImmune, LLC or MedImmune Biologics, Inc.

## B

**BASF Corporation**–Up to 20 awards for Finalists who are children of employees of the corporation and its subsidiaries.

**Battelle**–Every Finalist who is the child of an employee of the company will be offered an award.

* **BB&T Corporation**–20 awards for children of employees of the corporation.

**Bentley Systems, Incorporated**–Every Finalist who is the child of an employee of the corporation will be offered an award.

**Mary E. Beyerle Trust**–7 awards for Finalists from Maryland, New Jersey, and Pennsylvania.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

**Bio-Rad Laboratories**–2 awards for Finalists who are children of employees of the company and its eligible subsidiaries.

**BNSF Railway Foundation**–Up to 10 awards for Finalists who are children of employees of BNSF Corporation and its subsidiaries.

**The Boeing Company**–Every Finalist who is the child of an employee of the company or a subsidiary will be offered an award.

* **BorgWarner Inc.**–6 awards for children of employees of the corporation and its subsidiaries and divisions.

* **Brady Corporation Foundation, Inc.**–3 awards for children of employees of Brady Corporation and its eligible subsidiaries.

* **Bridgestone Americas Trust Fund**–Up to 50 awards for children of employees of Bridgestone Americas, Inc. and its participating subsidiaries.

* **Bristol-Myers Squibb Foundation, Inc.**–50 awards for children of employees of the Bristol-Myers Squibb Company's U.S. divisions and subsidiaries.

* **Broadridge Financial Solutions, Inc.**–6 awards for children of employees of the corporation and its qualifying subsidiaries.

* **Brooks Brothers Group, Inc.**–2 awards for children and grandchildren of employees of the corporation and its subsidiaries.

* **Bunge North America, Inc.**–4 awards for children of employees of the corporation and its subsidiaries; the awards are distributed among employment groups.

* **Bunzl USA, LLC**–5 awards for children of employees of the corporation and its subsidiaries.

## C

* **CACI International Inc**–5 awards—3 awards for children of employees of the company and its subsidiaries; 2 awards for Finalists who are planning to major in certain technological and mathematical fields.

* **California Resources Corporation**–2 awards for children of employees of the corporation.

**Cardinal Health Foundation**–Every Finalist who is the child of an employee of Cardinal Health, Inc. or a participating affiliate will be offered an award.

* **Carlisle LLC**–2 awards for children of employees of the corporation and its subsidiaries; the awards are distributed among employment groups.

* **Carpenter Technology Corporation**–4 awards for children of employees of the corporation and its subsidiaries.

**CBS Corporation**–5 awards for Finalists who are children of employees of the corporation and its eligible subsidiaries.

* **CDK Global, LLC**–6 awards for children of employees of the corporation.

**Chevron U.S.A. Inc.**–10 awards for Finalists who are children of employees of the corporation and its affiliated companies.

* **Colgate-Palmolive Company**–20 awards for children of employees of the company and its subsidiaries.

* **Commvault Systems, Inc.**–2 awards for children of employees of the corporation.

* **Computer Aid, Inc.**–2 awards for children of employees of the corporation and its subsidiaries.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

**Conagra Brands Foundation**–Up to 10 awards for Finalists who are children of employees of Conagra Brands and its subsidiaries.

* **Corning Incorporated**–5 awards for children of employees of the corporation and its subsidiaries.

* **(COUNTRY Financial) CC Services, Inc.**–5 awards for children of COUNTRY employees.

* **Crum & Forster**–10 awards for children of employees of the company.

**CSX Corporation**–5 awards for Finalists who are children of employees of the corporation.

## D

* **Denstply Sirona Inc.**–2 awards for children of U.S. associates of the corporation and its subsidiaries.

**Gaylord and Dorothy Donnelley Foundation**–1 award for a Finalist from a designated county in South Carolina.

## E

* **E*TRADE Financial Corporation**–2 awards for children of employees of the corporation.

**Eastman Foundation**–7 awards for Finalists who are children of employees of Eastman and its subsidiaries.

* **Eaton Charitable Fund**–15 awards for children of employees of Eaton Corporation.

* **Electrolux North America**–4 awards—2 awards for children of salaried employees of the corporation and its subsidiaries; 2 awards for children of hourly employees.

**Emerson Charitable Trust**–10 awards for Finalists who are children of employees of Emerson Electric Co. and its subsidiaries.

* **The Estée Lauder Companies Inc.**–3 awards for children of employees of the corporation and its U.S. affiliates and subsidiaries.

* **Eversource Energy Foundation, Inc.**–5 awards for children of employees of the company or its subsidiaries.

## F

* **FedEx Custom Critical, Inc.**–4 awards—2 awards for children of employees; 2 awards for children and grandchildren of contractors.

* **FedEx Freight Corporation**–20 awards for children of employees of the corporation.

* **FedEx Ground Package System, Inc.**–12 awards—6 awards for the children of package handlers; 6 awards for the children of non-package handlers.

* **Ferro Corporation**–3 awards for children of employees of the corporation.

* **Fifth Third Foundation**–25 awards for children of employees of Fifth Third Bank.

**Fluor Foundation**–4 awards for Finalists who are children of employees of Fluor and its eligible subsidiaries.

* **FMC Corporation**–4 awards for children of employees of the corporation and its subsidiaries.

**Formosa Plastics Corporation, U.S.A.**–Every Finalist who is the child of an employee of the corporation or an affiliated organization will be offered an award.

**FTS International, LLC**–1 award for a Finalist from either Washington, DC, or Denver, Colorado, metropolitan areas planning to pursue certain college majors.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

## G

* **GAF**–2 awards for children of employees of the corporation and its subsidiaries; the awards are distributed among divisions.

* **Gannett Foundation, Inc.**–6 awards for children of employees of Gannett Co. Inc.

* **Gates Industrial Corporation Foundation**–Up to 10 awards for children of employees of Gates Industrial Corporation; the awards are distributed among the employment base.

**GEICO Philanthropic Foundation**–3 awards for Finalists who are children of associates of GEICO Corporation and its subsidiaries.

**General Dynamics Corporation**–Every Finalist who is the child of an employee of the corporation or a subsidiary will be offered an award.

* **General Dynamics Ordnance and Tactical Systems**–2 awards for children of employees of the corporation and its subsidiaries.

* **Georgia-Pacific Foundation, Inc.**–50 awards for children of employees of Georgia-Pacific LLC and its subsidiaries within the United States; the awards are distributed among employment groups.

* **Gleason Family Foundation**–Up to 8 awards for children of employees of Gleason Corporation and its U.S. subsidiaries and divisions.

* **Global Tungsten & Powders Corp.**–2 awards for children of employees of Global Tungsten & Powders Corp. and GTP Group Services.

* **W.W. Grainger, Inc.**–10 awards for children of employees of the corporation and its U.S. subsidiaries.

* **Greyhound Lines, Inc.**–Up to 6 awards for children of employees of the corporation and its subsidiaries.

**The Guardian Life Insurance Company of America**–2 awards for Finalists who are children of employees of the company and its eligible subsidiaries.

* **(Gulfstream Aerospace Corporation) Rolls-Royce North America Inc.**–2 awards for children of employees of Gulfstream Aerospace Corporation.

## H

**Harris Corporation**–2 awards for Finalists who are children of employees of the corporation and its subsidiaries.

* **Hill-Rom Holdings, Inc.**–3 awards for U.S.-based student employees and children of U.S.-based employees of Hill-Rom and its subsidiaries.

* **(Hoffmann-La Roche Inc.) Genentech, Inc.**–20 awards for children of employees of Hoffmann-La Roche Inc. and its designated subsidiaries.

* **Hormel Foods Corporation Charitable Trust**–18 awards for children of employees of Hormel Foods Corporation and its subsidiaries.

* **The Harvey Hubbell Foundation**–4 awards for children of employees of Hubbell Incorporated and its subsidiaries.

## I

* **Illinois Tool Works Foundation**–Up to 30 awards for children of employees of Illinois Tool Works Inc. and its subsidiaries.

* **Ingalls Shipbuilding Division of Huntington Ingalls Industries**–4 awards for children of employees of Ingalls Shipbuilding.

* **Ingersoll-Rand Charitable Foundation**–17 awards for children of employees of Ingersoll Rand Company and its subsidiaries.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

* **Insperity Services, L.P.**–4 awards—2 awards for children of corporate employees; 2 awards for children of worksite employees.

* **International Union of Bricklayers and Allied Craftworkers**–3 awards for children of members of the union in good standing.

## J

* **J. Walter Thompson Company Fund, Inc.**–3 awards for children of employees of the company and its subsidiaries.

**Jack Henry & Associates, Inc.**–2 awards for Finalists who are children of employees of the corporation.

**Jacobs Engineering Foundation**–Every Finalist who is the dependent of an employee of Jacobs Engineering Group, Inc. or a subsidiary will be offered an award.

* **John Bean Technologies Corporation**–2 awards for children of employees of JBT Corporation and its subsidiaries.

* **Johnson & Johnson Services Inc.**–20 awards for children of employees of the corporation and its business units.

## K

* **Kaman Corporation**–3 awards for children of employees of the corporation and its subsidiaries.

* **The Kennametal Foundation**–5 awards for children of employees of Kennametal Inc. and its subsidiaries.

**Knovel**–2 awards for Finalists from specified geographical areas who plan to pursue a major in mechanical, plastics, design, or civil engineering.

## L

* **LANXESS Corporation**–6 awards—5 awards for children of employees of LANXESS Corporation and Great Lakes Chemical Corporation; 1 award for the child of an employee of ARLANXEO USA LLC.

**Leidos, Inc.**–10 awards for Finalists who are children of employees of the corporation or its subsidiaries.

* **Liberty Mutual Scholarship Foundation**–30 awards for children of employees of Liberty Mutual Insurance Company and its subsidiaries.

* **Loews Foundation**–4 awards for children of employees of Loews Corporation and its divisions and wholly owned subsidiaries.

* **LPL Financial LLC**–9 awards—6 awards for children of associates of the corporation; 3 awards for students served through non-profit organizations designated by the corporation.

**The Lubrizol Foundation**–Every Finalist who is the child of an employee of The Lubrizol Corporation, Lubrizol Specialty Products, Inc., and their eligible subsidiaries will be offered an award.

## M

* **Macy's, Inc.**–54 awards for student employees and children of employees of Macy's, Inc. and its direct and indirect subsidiaries; the awards are distributed among divisions.

* **Mannington Mills, Inc.**–2 awards for children of employees of the corporation and its eligible subsidiaries.

* **Maritz Holdings Inc.**–3 awards for children of employees of the corporation and its subsidiaries.

* **Marsh & McLennan Companies, Inc.**–25 awards for children of employees of the corporation and its subsidiaries.

* **McGraw-Hill Global Education Holdings, LLC**–4 awards for children of employees of the corporation and its affiliates.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

* **Mead Johnson & Company, LLC**–2 awards for children of employees of the company.

**Mead Witter Foundation, Inc.**–10 awards for Finalists from specified geographic areas of Wisconsin.

**The MITRE Corporation**–4 awards for Finalists who are children of employees of the corporation.

**Molex LLC**–2 awards for Finalists who are children of employees of the corporation and its subsidiaries.

* **The Moody's Foundation**–2 awards for children of employees of Moody's Corporation and its subsidiaries.

**Motorola Solutions Foundation**–Every Finalist who is the child of an employee of Motorola Solutions, Inc. or a subsidiary will be offered an award.

## N

**National Distillers Distributors Foundation**–7 awards for Finalists in the National Merit Scholarship Program.

* **(National Gypsum Company) C. D. Spangler Foundation, Inc.**–2 awards for children of employees of National Gypsum Company and its subsidiaries.

**National Oilwell Varco, LP**–Every Finalist who is the child of an employee of the corporation and its eligible subsidiaries will be offered an award.

* **Nationwide Foundation**–14 awards—10 awards for children of employees of Nationwide Insurance Companies and certain affiliates and associates; 4 awards for children of career agents.

* **New Jersey Manufacturers Insurance Company**–At least 3 awards for children of employees of New Jersey Manufacturers Insurance Group.

**New York Life Foundation**–Every Finalist who is the child of an employee or agent of New York Life or certain subsidiaries will be offered an award.

* **The NewMarket Foundation**–2 awards for children of employees of NewMarket Corporation and its subsidiaries.

* **NextEra Energy Foundation, Inc.**–10 awards for children of employees of NextEra Energy, Inc. and its subsidiaries.

* **NiSource Charitable Foundation**–15 awards for children of employees of NiSource and its subsidiaries.

* **Norfolk Southern Foundation**–10 awards for children of employees of Norfolk Southern Corporation and its affiliated companies.

* **Northrop Grumman Corporation**–50 awards for children of employees of the corporation and its subsidiaries.

* **Novartis US Foundation**–20 awards for children of employees of Novartis Corporation and its subsidiaries and divisions.

* **Novo Nordisk Inc.**–2 awards for children of employees of the corporation.

**NVIDIA Corporation**–Every Finalist who is the child of an employee of the corporation or an eligible subsidiary will be offered an award.

## O

**Occidental Petroleum Corporation**–Every Finalist who is the child of an employee of the corporation or a division or subsidiary will be offered an award.

* **Old National Bancorp**–3 awards for children of associates of the corporation and its entities.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

**Olin Corporation Charitable Trust**–Every Finalist who is the child of an employee of Olin Corporation or a subsidiary will be offered an award.

* **OMNOVA Solutions Foundation, Inc.**–3 awards for children of employees of OMNOVA Solutions, Inc. and its subsidiaries.

* **Omron Foundation, Inc.**–Up to 5 awards for children of employees of Omron.

**ON Semiconductor**–Every Finalist who is the child of an employee of the corporation will be offered an award.

**Owens Corning Foundation**–Every Finalist who is the child of an employee of Owens Corning will be offered an award.

## P

**Parker Hannifin Foundation**–Every Finalist who is the child of an employee of Parker Hannifin Corporation or a subsidiary will be offered an award.

**Sagar G. Patel Memorial Fund**–2 awards for Finalists who are children of U.S. employees of Accenture LLP.

* **Frank E. Payne and Seba B. Payne Foundation**–3 awards for children or grandchildren of employees of John Crane Inc. and its domestic subsidiaries.

* **The Penn Mutual Life Insurance Company**–2 awards for children of company employees, agents, and office employees.

**The PepsiCo Foundation, Inc.**–Every Finalist who is the child of an employee of PepsiCo, Inc. or a division, subsidiary, or affiliate will be offered an award.

* **Pfizer Inc**–50 awards for children of employees of the corporation and its subsidiaries.

* **Pilkington North America, Inc.**–2 awards for children of employees of the corporation and its subsidiaries.

* **PPG Foundation**–49 awards—35 awards for children of employees of PPG and its subsidiaries; 14 awards for residents of communities where PPG has operations.

* **PPL**–4 awards for children of employees of the corporation and its subsidiaries.

**PricewaterhouseCoopers Charitable Foundation, Inc.**–15 awards for Finalists who are children of partners, principals and staff of PricewaterhouseCoopers LLP.

**Principal Life Insurance Company**–Every Finalist who is the child of an employee of the company or a subsidiary will be offered an award.

**Public Service Enterprise Group**–Every Finalist who is the child of an employee of Public Service Enterprise Group or its subsidiaries will be offered an award.

* **Putnam Investments, LLC**–2 awards for children of employees of Putnam Investments and its subsidiaries.

## Q

* **Quanex Foundation**–3 awards for children of employees of Quanex Building Products and its divisions and subsidiaries.

## R

* **Raytheon Company**–75 awards for children of employees of the company and its eligible subsidiaries.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

* **Research Triangle Institute**–2 awards for children of employees of the institute.

* **Reynolds American Foundation**–Up to 20 awards for children of employees of Reynolds American Inc. and its eligible subsidiaries.

* **Rheem Manufacturing Company**–5 awards for children of employees of the company and its subsidiaries.

**Rockwell Automation**–5 awards for Finalists who are children of employees of the corporation and its subsidiaries.

**Rockwell Collins**–8 awards for Finalists who are children of employees of the corporation and its subsidiaries.

**Rolls-Royce North America Inc.**–3 awards for Finalists who are children of employees of Rolls-Royce plc and its eligible subsidiaries.

**RSM US LLP**–2 awards for Finalists who are children of employees of the corporation and its eligible subsidiaries.

## S

* **S&P Global**–6 awards for children of employees of the corporation and its subsidiaries.

* **Schindler Elevator Corporation**–5 awards for children of employees of the corporation.

* **Schneider Electric North America Foundation**–25 awards for children of employees of Schneider Electric North America.

* **Sensient Technologies Foundation**–3 awards for children of employees of Sensient Technologies Corporation and its divisions and subsidiaries.

* **Sentry Insurance Foundation, Inc.**–5 awards for children of employees of Sentry Insurance Group and its eligible subsidiaries.

* **Siemens Foundation**–75 awards for children of employees of Siemens Corporation and its designated affiliates.

* **Snap-on Incorporated**–6 awards for children of employees and dealers of the corporation.

**Sogeti USA**–Every Finalist who is the child of an employee of the corporation will be offered an award.

**Solvay America**–4 awards for Finalists from specified geographical areas who plan to pursue certain college majors.

* **Sony Electronics Inc.**–3 awards for children of employees of Sony Electronics Inc. and Sony Corporation of America.

**South Carolina Sports Medicine & Orthopaedic Center**–4 awards—first preference for Finalists who are children of employees of the practice; second preference for Finalists from the Greater Charleston Area of South Carolina.

**Southern Company Services, Inc.**–Every Finalist who is the child of an employee of Southern Company or a subsidiary will be offered an award.

**Southwest Airlines Co.**–5 awards for Finalists who are children of employees of the company.

**Spirit AeroSystems, Inc.**–7 awards for Finalists who are children of employees of the corporation and its eligible subsidiaries.

* **SRI International**–2 awards for children of employees of the corporation and its eligible subsidiaries.

* ***This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

** **State Farm Companies Foundation**–100 awards for children of employees and insurance agents of State Farm Companies.*

** **Suburban Propane, L.P.**–3 awards for children of employees of the company.*

## T

** **Tate & Lyle Americas LLC**–2 awards for children of employees of the corporation and its affiliates.*

** **TD Ameritrade Services Company, Inc.**–5 awards for children of employees of the company.*

**Teachers Insurance and Annuity Association of America**–5 awards for Finalists who are children of employees of TIAA and its eligible subsidiaries.

** **TEGNA Foundation, Inc.**–6 awards for children of employees of TEGNA Inc.*

** **Teradata Corporation**–4 awards for children of employees of the corporation.*

**Texas Instruments Foundation**–Every Finalist who is the child of an employee of Texas Instruments Incorporated will be offered an award.

** **Textron Charitable Trust**–10 awards for children of employees of Textron Inc. and its subsidiaries.*

** **3M Company**–40 awards for children of employees of the company and its affiliates and subsidiaries.*

** **The Travelers Employees' Club**–7 awards for children and specified relatives of members of The Travelers Employees' Club.*

** **Tredegar Corporation**–3 awards for children of employees of the corporation and its subsidiaries.*

## U

**United Services Automobile Association**–Every Finalist who is the child of an employee of the company will be offered an award.

** **The UPS Foundation**–180 awards—150 awards for children of full-time employees and 30 awards for children of part-time employees of UPS and its subsidiaries.*

** **USG Foundation, Inc.**–8 awards for children of employees of USG Corporation and its subsidiaries.*

** **Utility Workers Union of America, AFL-CIO**–2 awards for children of members of the union.*

## V

**Varian Medical Systems**–2 awards for Finalists who are children of employees of the corporation.

**Verus Claims Services, LLC**–1 award for a Finalist from Mercer County, NJ.

**ViaSat, Inc.**–Every Finalist who is the child of an employee of the corporation will be offered an award.

** **Vulcan Materials Company Foundation**–3 awards for children of employees of Vulcan Materials Company and its subsidiaries.*

## W

**Walgreen Co.**–Every Finalist who is the child of an employee of the company will be offered an award.

**Waste Management National Services Inc.**–Every Finalist who is the child of an employee of Waste Management National Services Inc.'s family of companies will be offered an award.

** **This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

**Westlake Chemical Corporation**–2 awards for Finalists who are children of employees of the corporation and its subsidiaries.

## X–Z

∗**Zoetis Inc.**–5 awards for children of colleagues of the corporation.

***∗This corporate sponsor offers Special Scholarships in addition to Merit Scholarship® awards, and Entry Forms that the sponsor makes available must be filed.***

**College Merit Scholarship® sponsors.** The higher education institutions listed below currently are sponsors of National Merit Scholarships. The number in parentheses reflects the minimum number of Merit Scholarship awards NMSC expects the college to offer annually. However, neither the institution nor NMSC is obligated to offer these scholarships in 2019, 2020, or beyond.

## A–B

Abilene Christian University (3)
American University (10)
Arizona State University (85)
Auburn University (55)
Ball State University (3)
Baylor University (35)
Belmont University (3)
Bethel University (3)
Boston College (7)
Boston University (15)
Bowdoin College (3)
Bradley University (3)
Brandeis University (10)
Brigham Young University (10)
Bucknell University (3)
Butler University (3)

## C–E

Calvin College (16)
Carleton College (60)
Case Western Reserve University (25)
Centre College (3)
Claremont McKenna College (8)
Clemson University (25)
Colby College (Maine) (3)
College of Charleston (3)
College of Wooster (3)
Colorado College (6)
Colorado State University (3)
Concordia College (Minnesota) (3)
Creighton University (3)
Davidson College (3)
DePauw University (3)
Dickinson College (3)
Drake University (3)
Embry-Riddle Aeronautical University, and identified campuses (3)
Emory University, and identified campuses (20)

## F–H

Florida State University (15)
Fordham University (3)
Franklin and Marshall College (3)
Furman University (15)
Gordon College (Massachusetts) (3)
Goshen College (3)
Grinnell College (15)
Gustavus Adolphus College (3)
Harding University (10)
Harvey Mudd College (30)
Hendrix College (7)
Hillsdale College (10)
Hope College (3)

## I–N

Illinois Wesleyan University (3)
Indiana University Bloomington (6)
Iowa State University (35)
Ithaca College (3)
Kalamazoo College (3)
Kansas State University (5)
Kenyon College (5)
Knox College (3)
Lawrence University (Wisconsin) (3)
Lehigh University (3)
Lewis & Clark College (Oregon) (3)
Liberty University (3)
Louisiana State University (25)
Louisiana Tech University (3)
Loyola University Chicago (3)
Luther College (3)
Macalester College (25)
Marquette University (3)
Miami University-Oxford (15)
Michigan State University (35)
Michigan Technological University (3)
Mississippi State University (10)
Missouri University of Science and Technology (9)
Montana State University-Bozeman (3)
New College of Florida (3)

North Dakota State University (5)
Northeastern University (Massachusetts) (3)
Northwestern University (50)

## O–R

Oberlin College (30)
Occidental College (3)
Ohio University-Athens (3)
Oklahoma Christian University (3)
Oklahoma City University (3)
Oklahoma State University (10)
Franklin W. Olin College of Engineering (3)
Oregon State University (5)
Ouachita Baptist University (3)
Pennsylvania State University,
and identified campuses (5)
Pepperdine University (3)
Pomona College (6)
Purdue University (30)
Rensselaer Polytechnic Institute (15)
Rhodes College (11)
Rochester Institute of Technology (10)
Rose-Hulman Institute of Technology (15)
Rutgers, The State University of New Jersey,
and identified campuses (15)

## S–T

Saint Louis University (3)
St. Olaf College (20)
Samford University (5)
Santa Clara University (4)
Scripps College (3)
South Dakota School of Mines and Technology (3)
South Dakota State University (3)
Southern Methodist University (15)
Southwestern University (Texas) (3)
Stony Brook University (3)
Tennessee Technological University (3)
Texas A&M University, and identified campuses (110)
Texas Christian University (3)
Texas Tech University (3)
Trinity University (Texas) (3)
Truman State University (3)
Tufts University (10)
Tulane University (20)

## U

University of Alabama at Birmingham (5)
University of Alabama at Tuscaloosa (115)
University of Arizona (55)
University of Arkansas, Fayetteville (30)
University of Central Florida (10)
University of Chicago (60)
University of Cincinnati (10)
University of Dallas (15)
University of Dayton (3)
University of Evansville (3)
University of Florida (20)
University of Georgia Foundation (20)
University of Houston-Main Campus (10)
University of Idaho (15)
University of Iowa (20)
University of Kansas (28)
University of Kentucky (75)
University of Louisville (12)
University of Maine (3)
University of Maryland,
and identified campuses (15)
University of Miami (15)
University of Minnesota,
and identified campuses (36)
University of Mississippi (10)
University of Missouri-Columbia (20)
University of Montana-Missoula (3)
University of Nebraska-Lincoln (20)
University of Nevada, Las Vegas (3)
University of Nevada, Reno (3)
University of New Mexico (3)
University of North Dakota (3)
University of North Texas (3)
University of Oklahoma,
and identified campuses (75)
University of Oregon (6)
University of Pittsburgh (3)
University of Puget Sound (3)
University of Richmond (5)
University of Rochester, and identified campuses (20)
University of St. Thomas (Minnesota) (3)
University of the South (3)
University of South Carolina (8)
University of South Florida (12)
University of Southern California (35)

University of Southern Mississippi (3)
University of Tennessee, Knoxville (15)
University of Texas at Dallas (100)
University of Tulsa (40)
University of Utah (20)
University of Wisconsin-Eau Claire (3)
University of Wisconsin-Madison (5)
University of Wyoming (3)

## V–X

Valparaiso University (3)
Vanderbilt University (18)
Villanova University (5)
Virginia Commonwealth University (3)
Washington and Lee University (15)
Washington State University (3)
Wayne State University (Michigan) (10)
West Virginia University Foundation, Inc. (12)
Western Washington University (3)
Wheaton College (Illinois) (20)
Whitman College (5)
Wichita State University (3)
Willamette University (3)
Wofford College (3)

**End of the National Merit Scholarship Program Section. Turn book over for test-taking help on the PSAT/NMSQT.**