



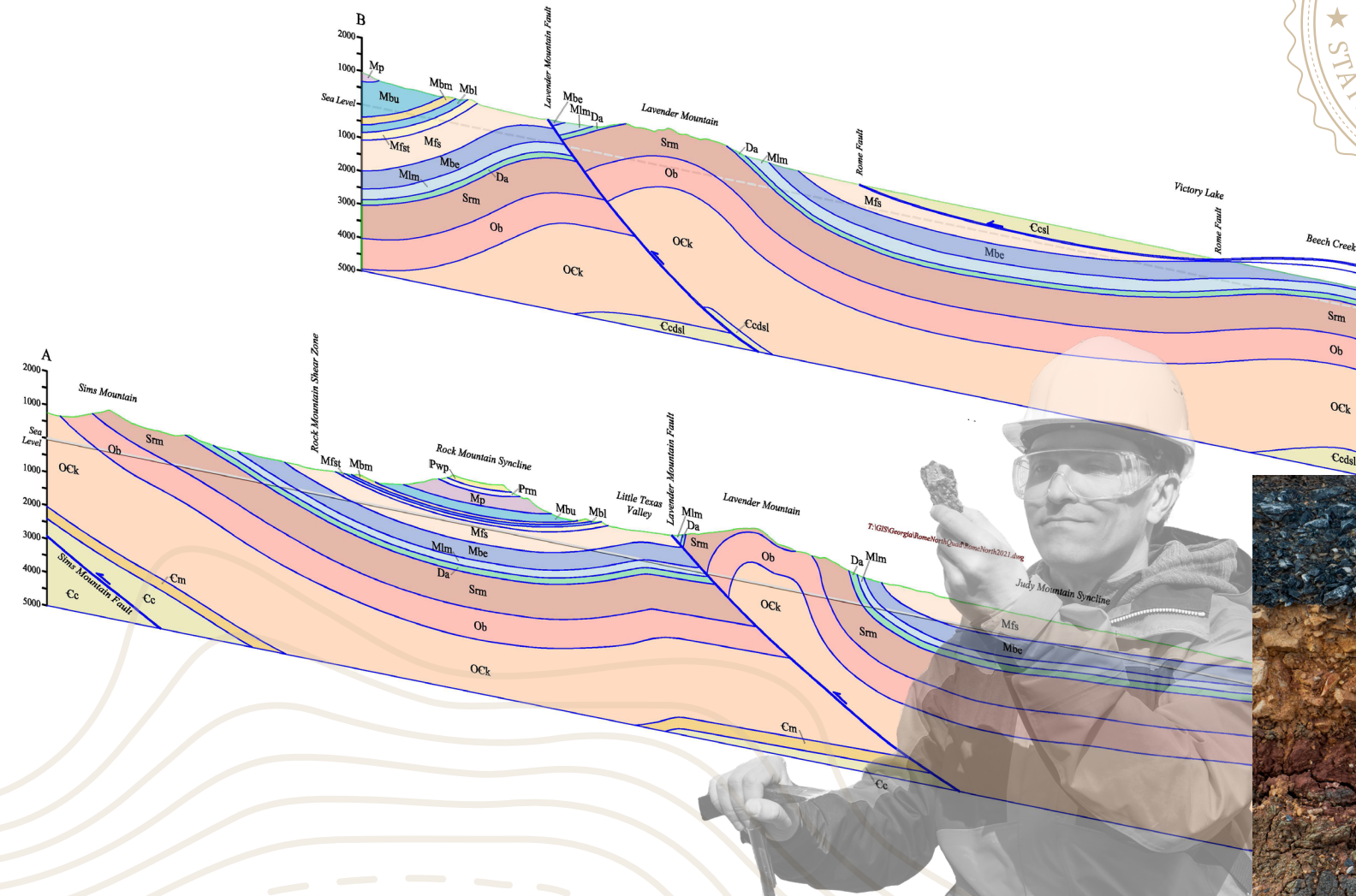
Association of State
Boards of Geology

A Cross Sectional View



**NATIONAL ASSOCIATION OF STATE
BOARDS OF GEOLOGY**

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FROM THE PRESIDENT

ASBOG® continues to work diligently on the organizations’ four major goals: 1) increase attendance and diversity of participants at the Council of Examiners (COE) Workshops; 2) better align ASBOG® with other organizations within the geosciences community; 3) increase participation in FG and PG examinations; and 4) continue to improve communications with, and between, our Member Boards. To this end, we are pleased to introduce the 4th edition of A Cross Sectional View, an ASBOG® publication that captures statistical data related to exam development, administration and performance. This publication presents an annual snapshot of accomplishments of the ASBOG® organization illustrating its basis, mission, member boards, and related demographics. It is our goal for A Cross Sectional View to provide our Member Boards a better understanding of the trends in licensure and health of the organization.

2023 was a busy year for ASBOG®. It saw the completion of the most recent Task Analysis Survey and its incorporation into the Knowledge Base and Test Blueprints for our examinations. It also saw our first implementation of Computer Based Testing and the introduction of our first Fundamentals of Geology online review course. The 2023 ASBOG® spring COE workshop was held in Greenville, South Carolina and the fall Annual Meeting and COE workshop was held Spokane, WA. The success of this organization is founded in the many volunteers who pledge their time and talents to it. If you’re a Member at Large (MAL) or State Board Member (MBR) who hasn’t participated in the COE workshop for a while, consider joining us. If you’re a licensed/registered Geologist who’s been thinking about participating, please contact ASBOG® for more information about how you can get involved. And to all of the individuals and Member Boards that have contributed to the success of ASBOG® over the years, your efforts and support are very much appreciated.

Thank you!

Douglas E. Rambo

Douglas E. Rambo, P.G.
2023 ASBOG® President

STATEMENT

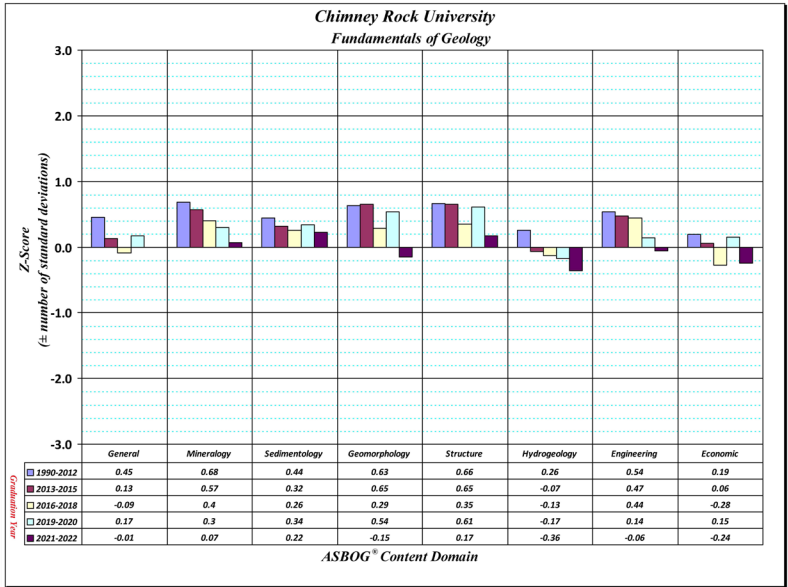
The Mission of the National Association of State Boards of Geology (ASBOG®) is to serve as a connective link for the individual state geologic registration licensing boards for the planning and preparation of uniform procedures and the coordination of geologic protective measures for the general public. One of ASBOG®’s principal services is to develop standardized written examinations for determining qualifications of applicants seeking licensure as professional geologists. Examination candidates are provided with a copy of the Professional Geologists Candidate Handbook which delineates the format and outline for the examination.

ASBOG® administers the Fundamentals of Geology (FG) and Practice of Geology (PG) Examinations twice each year. The FG and PG examinations were developed to evaluate common knowledge and skills related to the practice of geology. The FG examination emphasizes knowledge and skills that are typically emphasized in undergraduate academic programs, and the PG examination emphasizes skills and knowledge acquired and expanded in a practice or job setting. Participating states administer each “closed-book” examination during a four-hour period. Both examinations are constructed using a four-option multiple choice form, and the FG and PG examinations contain 140 and 110 items, respectively.

Both examinations are based on the results of periodic task analysis surveys (TAS) that are designed to evaluate the current geologic practice. Task analysis surveys have been performed every five years since 1995 by collecting data from a random sampling of licensed geologists from each of the ASBOG® member states. The results of all five task analysis studies indicate a high degree of consistency in the practice of Geology throughout the United States and Canada, thereby establishing a sound basis for the development of examinations that are fair to candidates from all regions of the country.

Geologic tasks were rated by both practicing geologists and academicians in terms of the importance of the specific tasks to protection of the public, and the results of the survey were utilized to create test blueprints for both examinations that temporally and geographically reflect the practice of the profession. The eight (8) established Content Domains for the FG and PG Test Blueprints are listed in the Candidate Handbook.

CURRICULUM PERFORMANCE ASSESSMENT TOOL (CPAT)



Z-Scores can be used to show the statistical performance of candidates that are grouped by graduation year. Scores above zero indicate the number of standard deviations above the national mean, whereas scores below zero indicate the number of standard deviations below the national mean.

The Fundamentals of Geology examination is broken into eight content domains. CPAT allows for a detailed evaluation of domains. CPAT allows for a detailed evaluation of domain-specific performance for a department by using different statistical evaluation plots based on user selected variables.

Select Area of Assessment **Field and General Geology**

Select Test Attempts-

☐ First
☐ First and Second
☐ First, Second, and Third
☒ All Attempts

Highest Degree-

☐ No Degree
☐ BA/BS
☐ MA/MS
☐ Ph.D
☒ No Degree/BA/BS

Normalized Ratio Score of Selected Domain

Normalized Ratio Score of Selected Domain w/ n

Percent Above/Below National Average

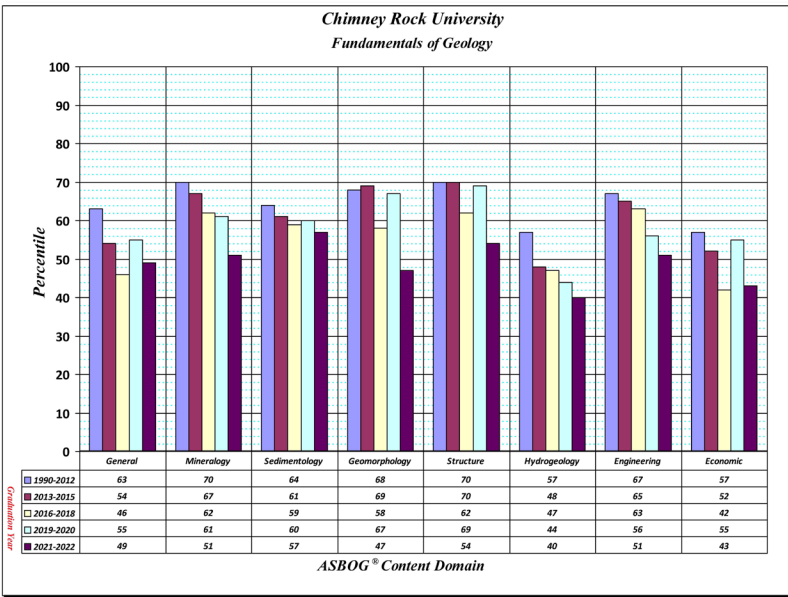
Percent Above/Below National Average w/ n

Ratio Score Scatter Plot of Selected Domain

Ratio Score Scatter Plot of Selected Domain w/ n

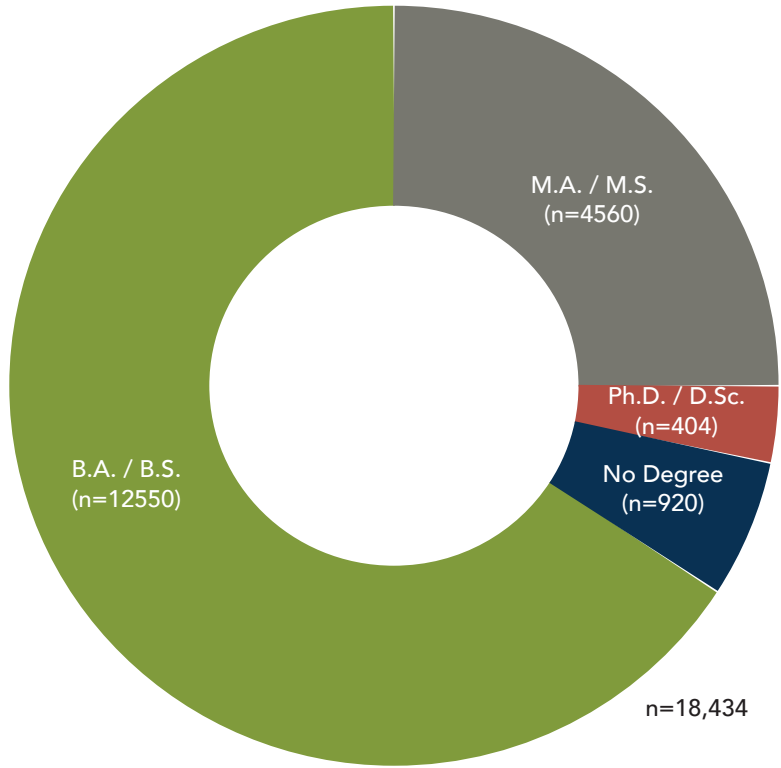
Ratio Score Bar Graph of Selected Domain

Hi-Lo-Mean Graph of Selected Domain



Normalized ratio plots allow comparison of a school’s aggregate domain-specific scores relative to the national domain score per test administration. These are grouped by graduation year as shown.

More than 79% of all candidates taking the Fundamentals of Geology examination are graduating seniors (no degree) and/or B.A./B.S. graduates; allowing for the use of this national examination for undergraduate program review, program modification and curriculum assessment.

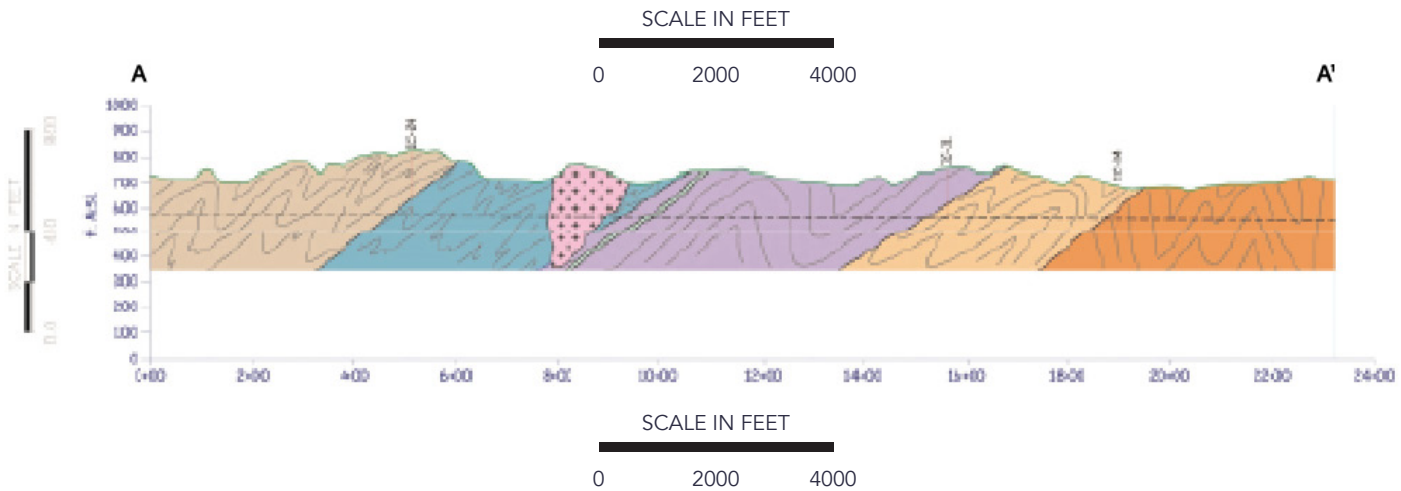
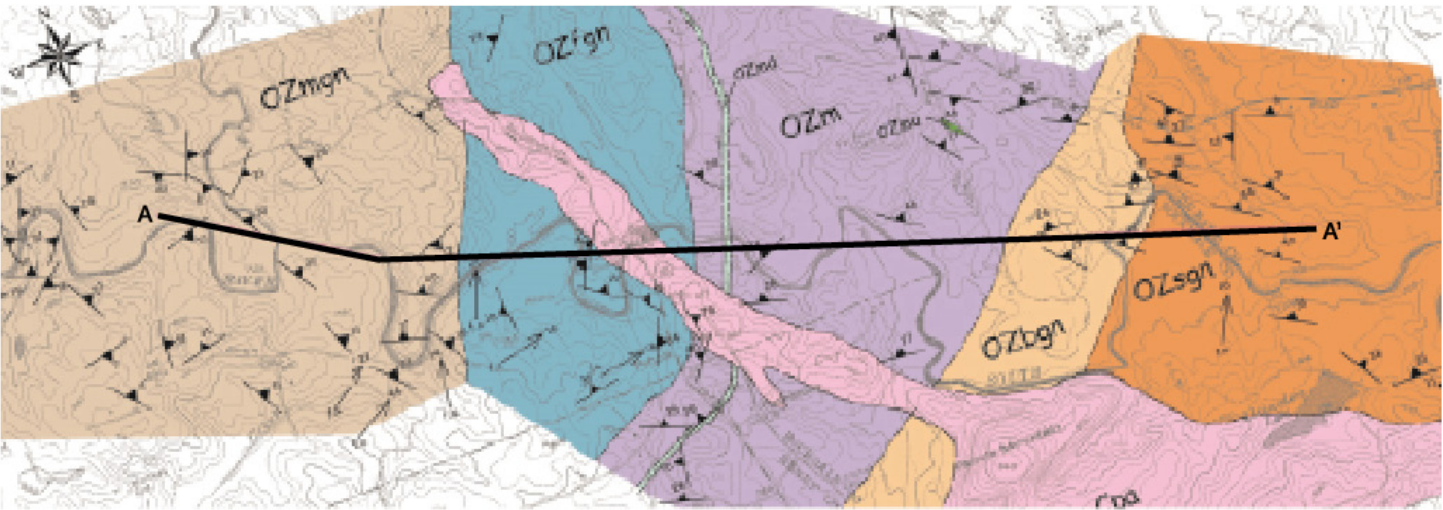


A geological cross section is a graphical representation of a vertical slice through the earth used to clarify or interpret geological relationships with or without accompanying maps.

There are two major classes of cross sections:

- Structural cross section, which shows the present day geometry of an area;
- Stratigraphic cross section, which shows the prior geometric relationships by adjusting the elevation of geological units to some chosen geological horizon.

There are other variations of cross sections, the most common being a balanced cross section (a combination of structural and stratigraphic cross sections), that attempts to portray the form of geological units prior to some episode of structural deformation.



EXAMPLE

Chimney Rock University (fictitious) contains more than 10 examinations in the CPAT database; therefore, it is statistically valid for CPAT to compare the candidates performance on the Fundamentals of Geology examination to the national examination performance.

The main CPAT menu provides summary statistics for the school's performance relative to the national average. Z-Scores, Percentiles, Percent Passing by Degree Year and other data are available.

Chimney Rock University

The following graphics provide summary statistics for your schools performance on the Fundamentals of Geology (FG) Examination. These dataset include multiple test attempts by test takers from your school. To view your department's overall summary statistics and performance on the FG exam, select the appropriate graph below:

Z-Scores for all Data

Candidate's Primary Practice vs. ASBOG® Domains

Percentiles for all Data

Percent Passing FG by Degree Year

Scaled Score vs. Number of Attempts

Percent Correct for all Students

Scaled Score vs Percent Correct

Average % Correct by year all Content Domains

Go to Domain-Specific Assessment Analysis

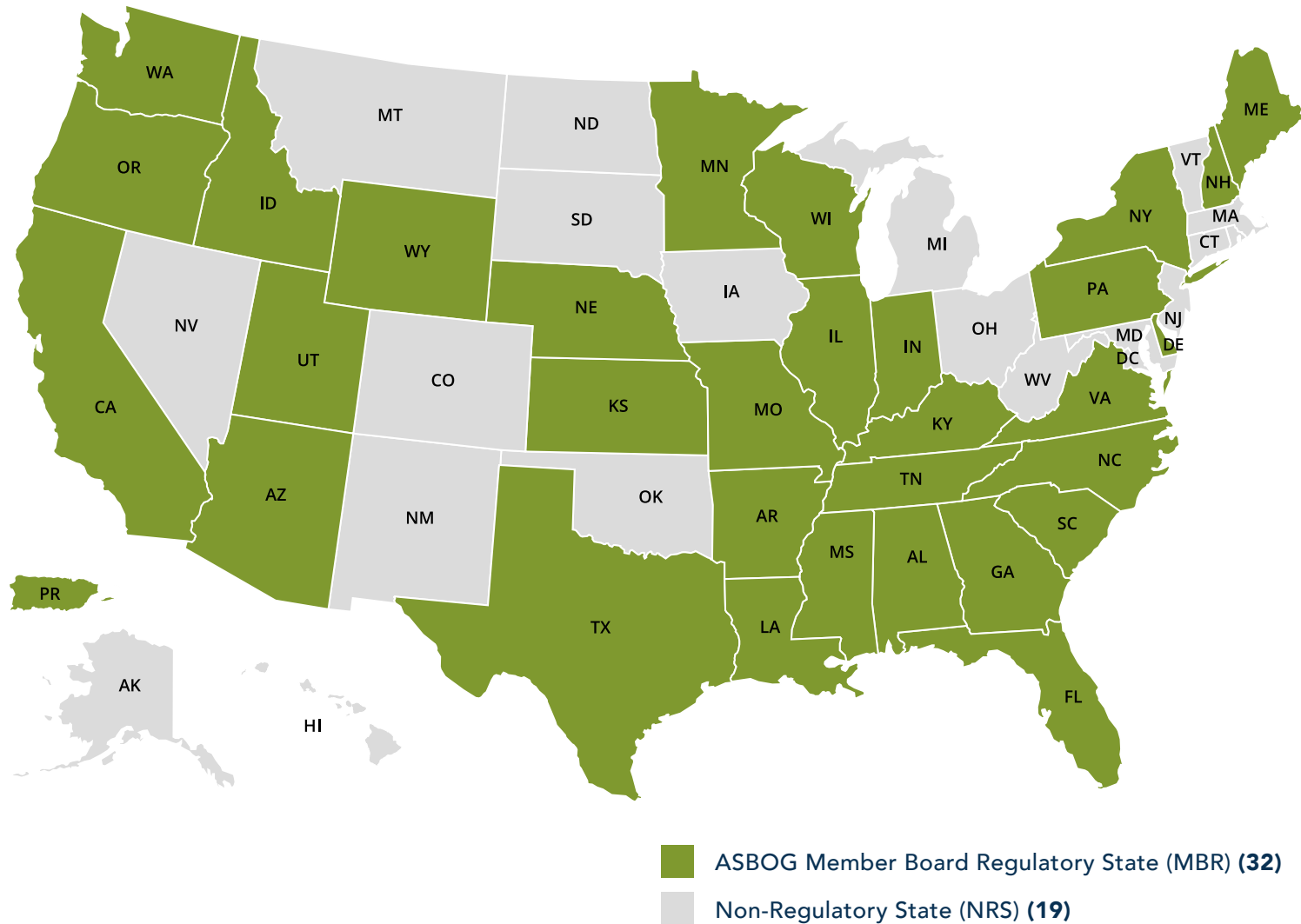
ASBOG National Association of State Boards of Geology

WHO WE ARE

The National Association of State Boards of Geology (ASBOG®) is a national nonprofit organization committed to advancing professional licensure for geoscientists.

Professionally licensed geoscientists have met specific qualifications in education, examination, and work experience and are professionally charged to work in a manner that safeguards and protects the public's health, safety, and welfare.

UNITED STATES & PUERTO RICO



USING THE FG FOR ACADEMIC ASSESSMENT (CPAT)

As with other professional licensure testing organizations, the Fundamentals of Geology examination has been utilized as an assessment tool for universities/colleges. Over the past 29 exam administrations, there have been 545 institutions of higher learning whose students have taken the FG examination (2008–2022) with the total number of examinees totaling nearly 12,615 over that period. In addition, there now exists a software analysis program (Curriculum Performance Assessment Tool or CPAT) developed by Past President Dr. Randy Kath available to those institutions that want to assess their department and student performance on the FG examination.

There are currently 270 institutions with 10 or more examinations in the CPAT database. This is an increase from 262 institutions with 10 or more examinations from last year. This accounts for the 11,177 records (tests) stored in CPAT. There are many institutions that have 8 or 9 tests and we anticipate that these will be added to the CPAT database when the results from the next administration of the FG examination become available.

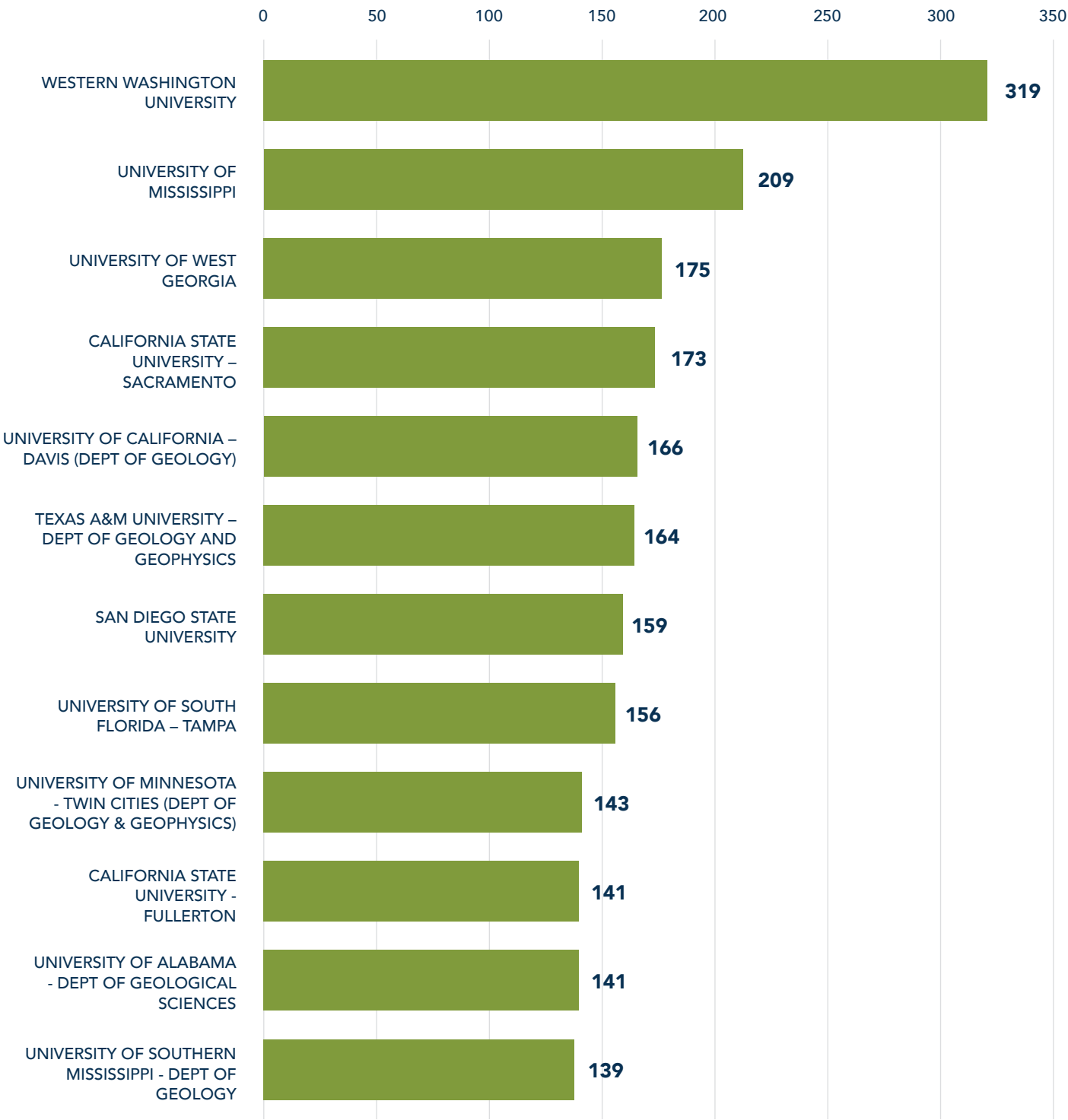
Academic Assessment is an integral part of ASBOG®'s outreach to academic institutions. The primary objective of Academic Assessment is to support academia through promotion of CPAT for use of the ASBOG® FG Examination as an assessment tool, exit examination, and/or graduate school entrance examination. CPAT support has been provided to the following institutions:

Appalachian State University	Eastern Kentucky University	University of Arkansas- Little Rock
Arkansas Tech University	Eastern Washington University	University of California- Davis
Auburn University	East Carolina University	University of California- Santa Cruz
Baylor University	Fort Hayes State University	University of Delaware
Bloomsburg University	Georgia State University	University of Kansas
California State University- Bakersfield	Hamilton College	University of Georgia
California State University- Chico	Iowa State University	University of Minnesota- Duluth
California State University- Fresno	James Madison University	University of Pittsburgh
California State University- Fullerton	Kansas State University	University of Pittsburgh- Johnstown
California State University- Northridge	Millersville University (Pennsylvania)	University of South Alabama
California State University- Sacramento	Mississippi State University	University of South Florida- Tampa
California State University- San Bernardino	Northern Arizona University	University of West Georgia
California State University- Stanislaus	Northwest Missouri State	University of Wyoming
California University of Pennsylvania	Portland State University	Utah State University
Central Michigan University	San Francisco State University	Virginia Tech University
Central Washington University	San Diego State University	Weber State University
East Carolina University	Sonoma State University	West Chester University
	Texas A & M	Western Oregon University
	Texas Tech University	Western Washington University

TOP UNIVERSITIES

TOP 12 UNIVERSITIES by FG examination volume

Many universities recognize the value of licensure and encourage their students to take the FG during the final semester of their senior year or as soon after graduation as possible.



WHAT WE DO

ASBOG® facilitates the mobility for professional geoscientists in the United States by providing services to its member licensing boards including examination development, examination maintenance, and the overall mobility of professional geoscientists. These services include promoting the uniformity of licensure laws across the U.S. in the attempt to facilitate geoscientists to become licensed.



SMEs on field trip near Greenville, SC 2023



Field trip near Minneapolis, MN 2019



SMEs on field trip near Wilmington, NC 2022



SMEs on field trip near Hot Springs, AR 2021

EXAMINATION DEVELOPMENT

Through its Council of Examiners (COE) and psychometricians ASBOG® has independently created two national geoscience examinations: the Fundamentals of Geology Exam (FG) and the Practice of Geology Exam (PG).

Licensed geoscientists volunteer their time and experience to examination development and maintenance by coming to ASBOG® Council of Examiners Workshops to write and evaluate examination questions and answers. In 2022, there were 86 Subject Matter Experts (SMEs) hailing from 24 Member States, 1 non-member State, and the District of Columbia that participated in two semi-annual ASBOG® Workshops. This represents over 3,500 hours spent on developing and evaluating examinations for both of ASBOG®’s examinations. In addition to having strong geographic representation, the SMEs bring a diverse set of technical skills that cover each of the eight (8) content domains:

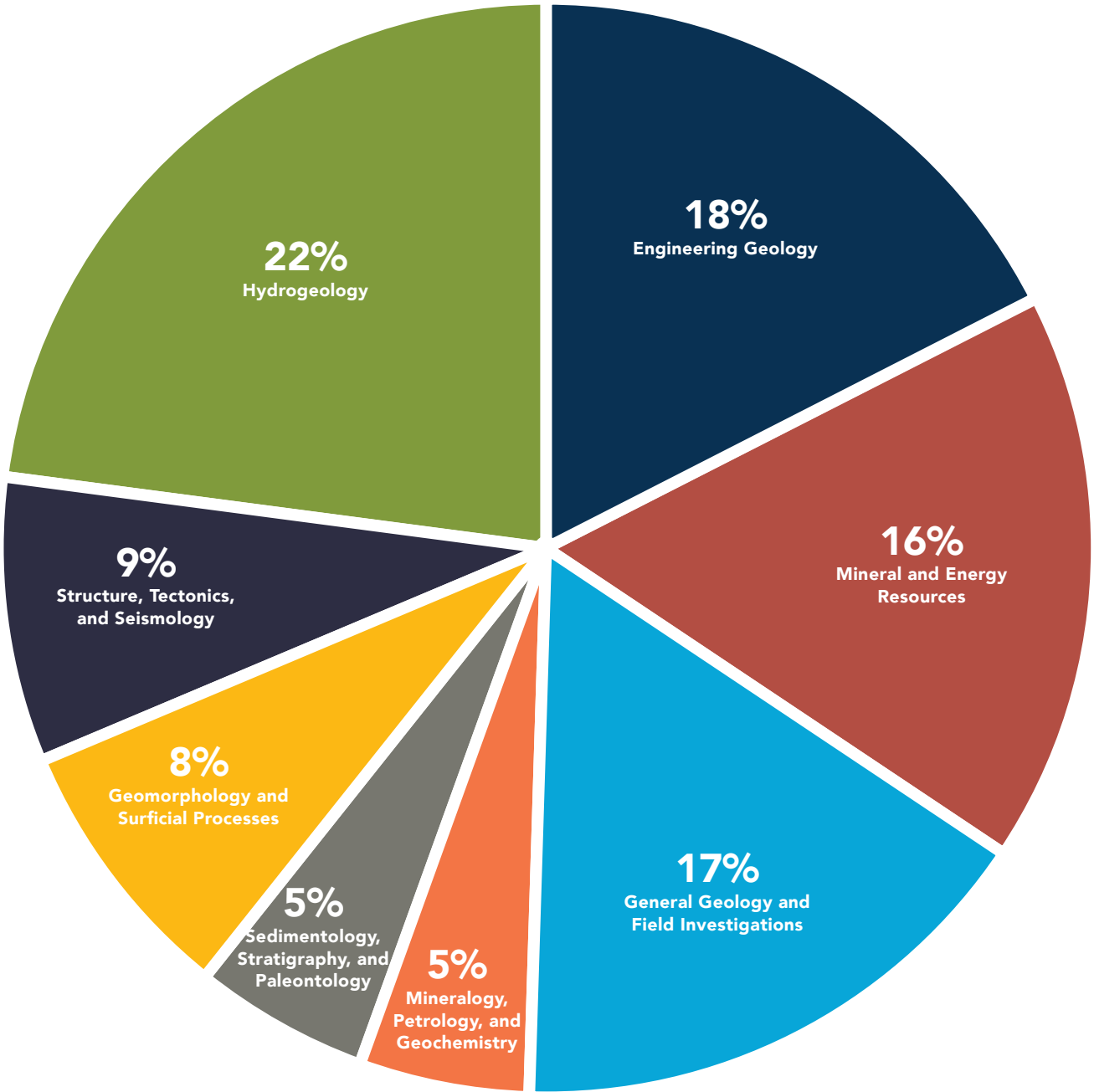
- A) General Geology and Field Investigations;
- B) Mineralogy, Petrology, and Geochemistry;
- C) Sedimentology, Stratigraphy, and Paleontology;
- D) Geomorphology, Surficial Processes, and Quaternary Geology;
- E) Structure, Tectonics, and Seismology;
- F) Hydrogeology;
- G) Engineering Geology; and
- H) Mineral and Energy Resources.

Subject Matter Experts work with a psychometrician to re-evaluate examination and examination question statistics and to select and edit examination questions. Based on results of the COE Workshop, the psychometrician determines final scores for the recently administered national examinations, and adds new questions to the item bank for use in future examinations.

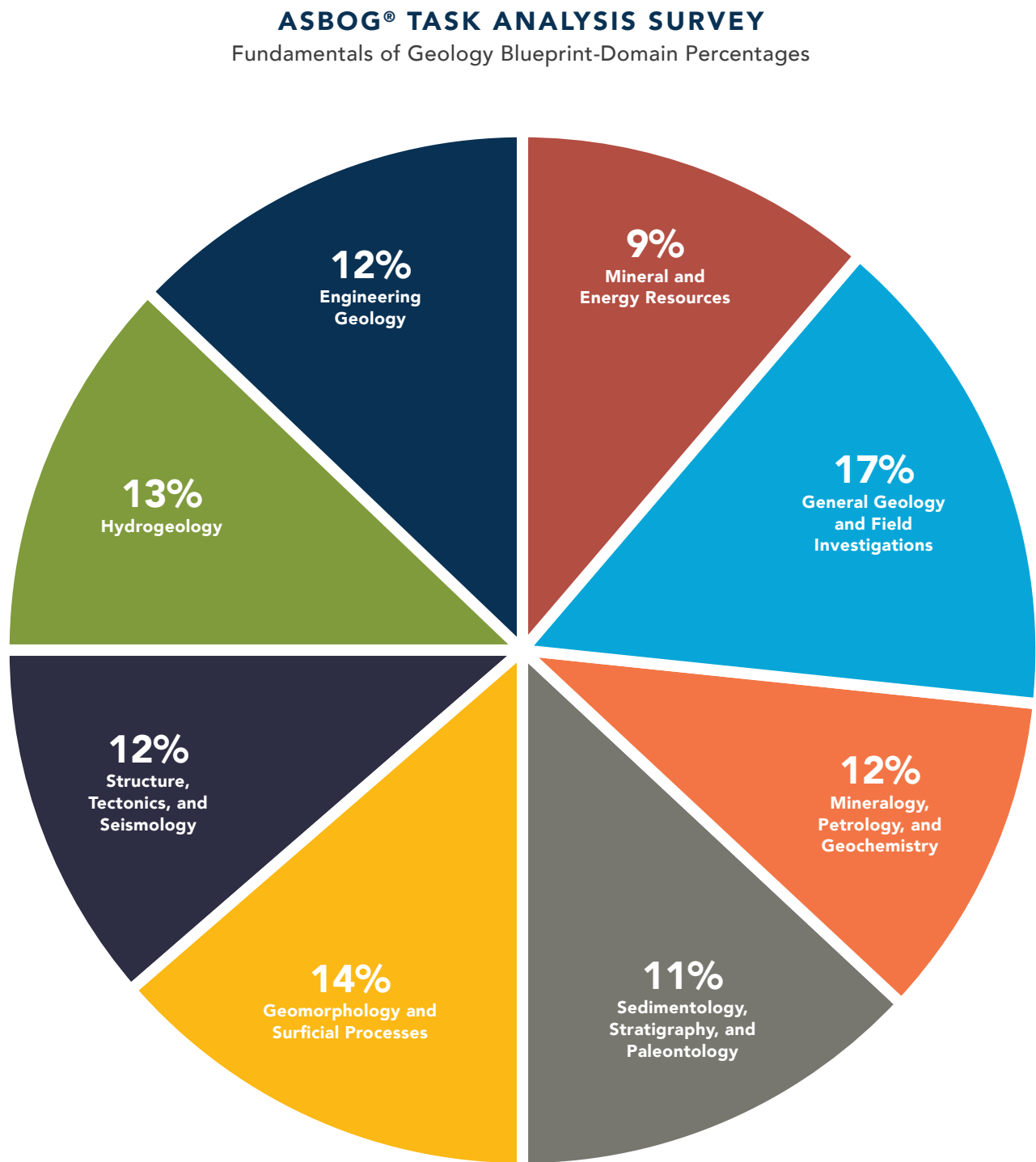
The examinations are administered twice a year, the Spring examination is the 3rd Friday of March; the Fall administration is the 1st Friday of October.

THE PRACTICE OF GEOLOGY (PG) EXAMINATION

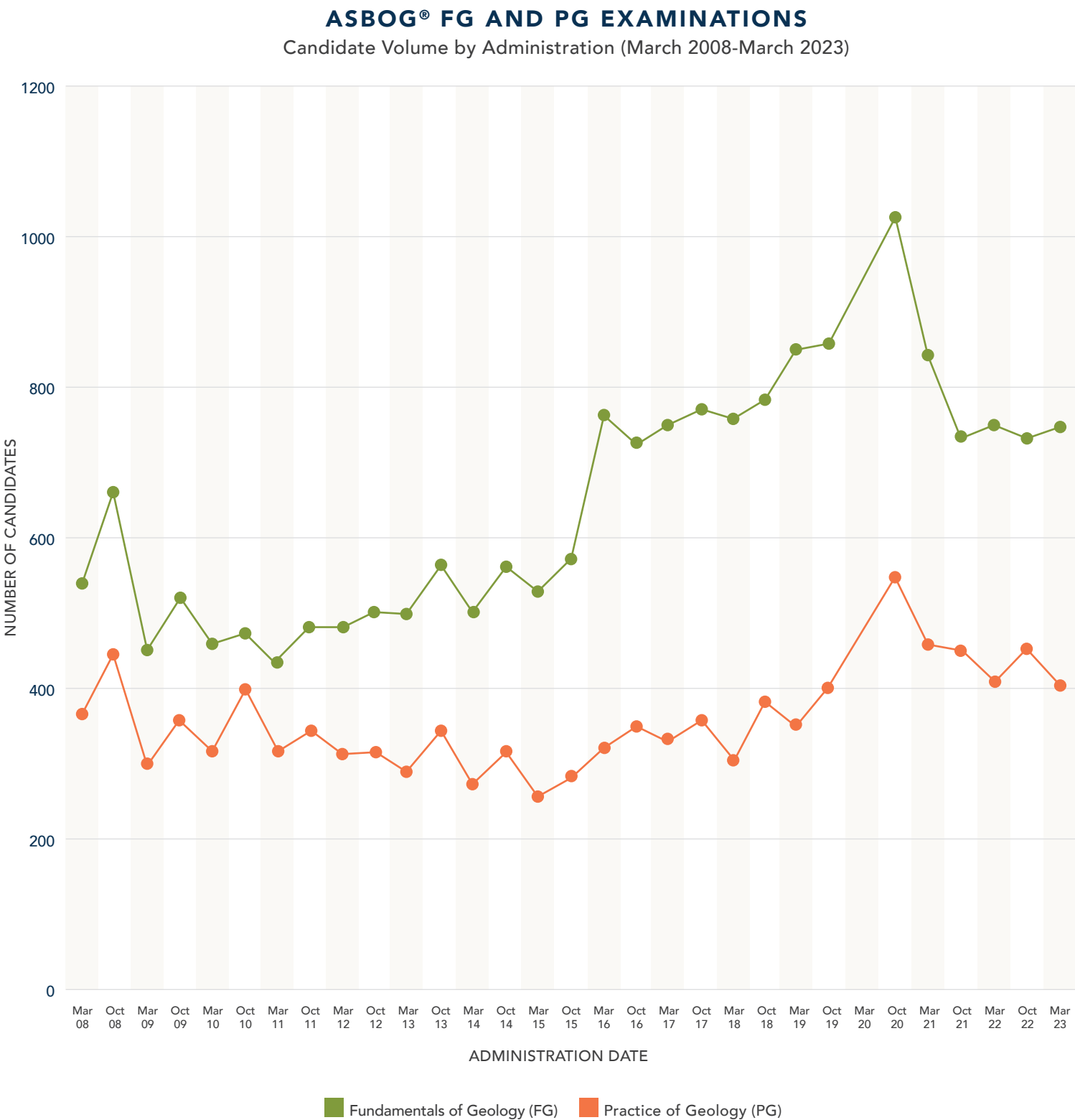
ASBOG® TASK ANALYSIS SURVEY
Practice of Geology Blueprint-Domain Percentages



Percentages based on the 2023 Task Analysis Survey (TAS)



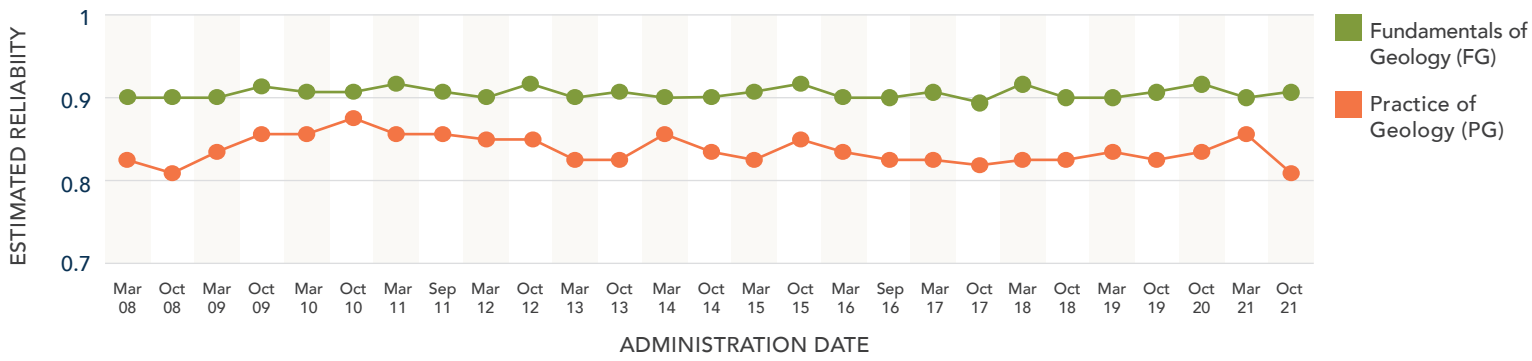
Percentages based on the 2023 Task Analysis Survey (TAS)



EXAMINATION PERFORMANCE AND PASSING RATES

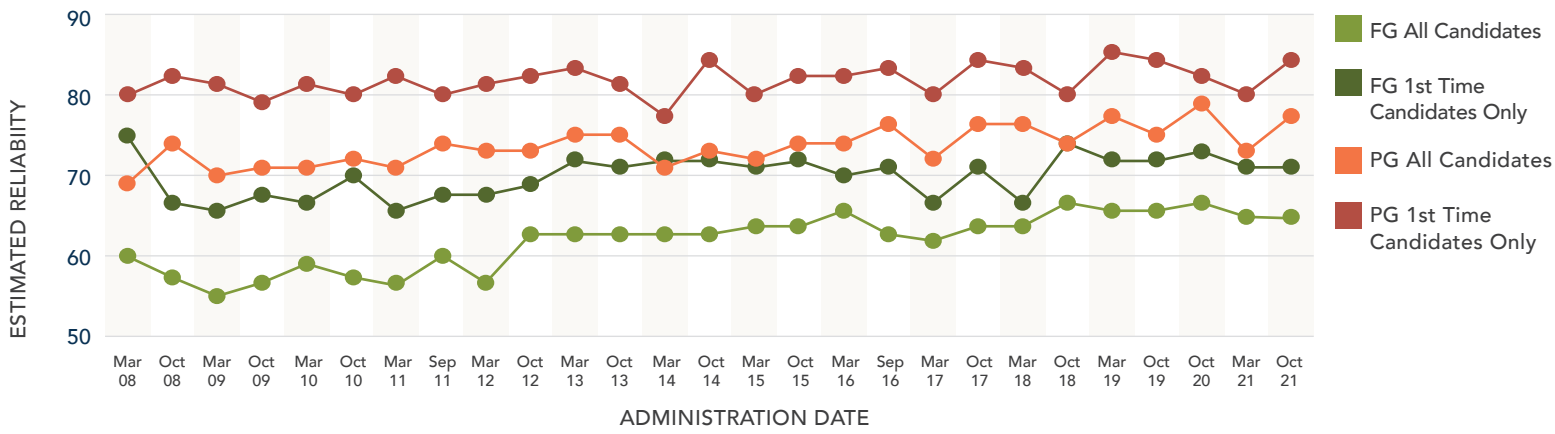
ASBOG® PRACTICE OF GEOLOGY EXAMINATION

Passing Rate of Number of Attempts
(March 2008 – October 2021) | Total Number of Candidates = 9,521



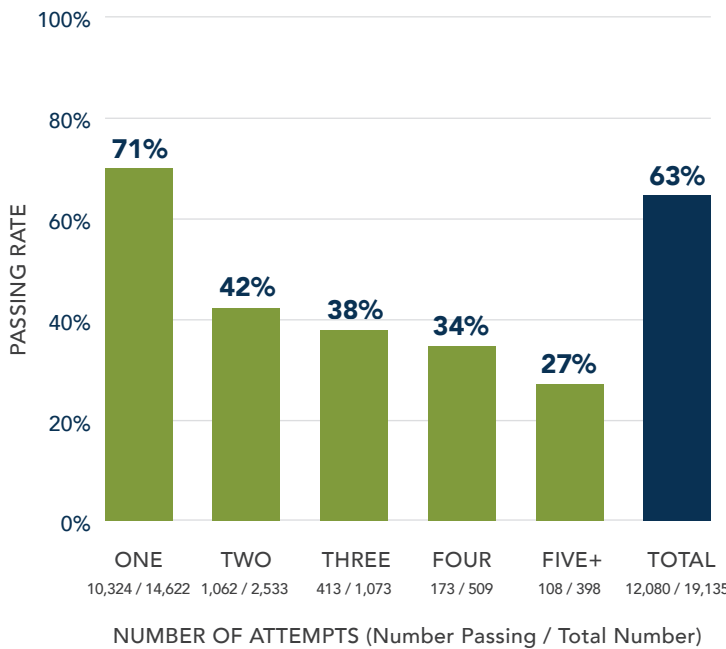
ASBOG® FG AND PG EXAMINATION

Passing Rates by Administration
(March 2008 – October 2021) | First Time Candidates VS All Candidates



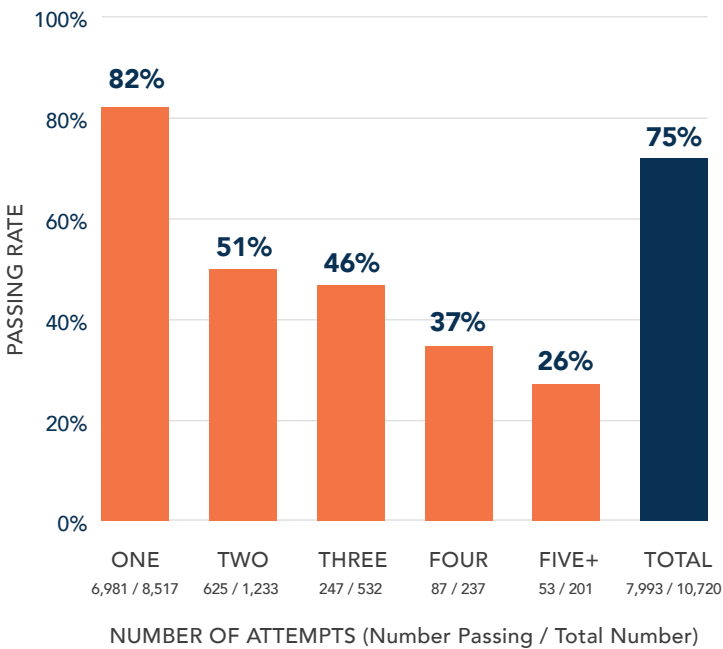
ASBOG® FUNDAMENTALS OF GEOLOGY EXAMINATION

Passing Rate of Number of Attempts
(March 2008 – October 2021) | Total Number of Candidates = 9,521



ASBOG® PRACTICE OF GEOLOGY EXAMINATION

Passing Rate of Number of Attempts
(March 2008 – October 2021) | Total Number of Candidates = 9,521



2023 CANDIDATE HANDBOOK

Appendix 1:
Glossary

Raw Score:

Unadjusted score on an examination based on the total number of correct responses. If the COE Subject Matter Experts (SMEs) deem a particular question to have no correct answer (based on candidate comments, statistical information, evaluation of the accuracy of the question, etc.), then that item is not scored (i.e., the FG examination would be graded on the basis of 139 instead of 140 questions. Similarly, the PG examination would be scored on the basis of 109, not 110 questions.) Candidates are given credit for an item which has been deemed to have no correct answer. If the SMEs deem a particular question has two correct answers (e.g., a double-keyed question), then candidate select either answer will be given credit. This enhances the fairness of the examination by eliminating substandard items (that have no correct answer) before calculating candidates' scores.

Scaled Score:

Adjusted score, based on the average difficulty of each examination (FG and PG). A scaled score of 70 has been established as a standard of competency. On all forms of the ASBOG Examinations, a scaled score of 70 is the score required to pass and 100 is the highest possible. Failing scaled scores range between 60 (lowest failing) and 69 (highest failing).

SME:

See Subject Matter Expert.

Stem:

The introductory portion of an examination item that states a question, states a problem, or presents an incomplete statement.

Subject Matter Expert (SME):

A geologist who serves on the ASBOG Council of Examiners; SMEs represent the profession in terms of geography, ethnicity, gender, age, and area of practice.

Registering for the
Computer-Based Exam

