

SECTION C. WORK PLAN

Note: Section headings that are underlined and highlighted in yellow indicate sections where changes were made from the original submittal to reflect the new GCA timeframes established with PDE during the negotiation discussion process.

I. Objectives

DRC recognizes that PDE embraces its responsibility to ensure quality education, maintain high standards, provide a comprehensive curriculum, and develop valid and reliable assessments for all students. DRC is also keenly aware of the necessity of designing assessments that are aligned to the *Pennsylvania's Assessment Anchor Content Standards* for Reading, Mathematics, Science, and Social Studies and the *Pennsylvania's Academic Content Standards* for Writing. We will assist PDE in developing assessments that are focused and set clear expectations for Pennsylvania students, and will help PDE to inform classroom instruction by tightly defining the rigor level expected for graduation. We will work with PDE to design a reporting suite that accurately measures achievement of the standards.

DRC has proposed an experienced Test Development and Psychometrics Team that will ensure assessments meet the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 1999) and can be used to accurately measure student achievement from one year to the next. The proposed design of the assessment program also will allow the maximum number of students to take the Graduation Competency Assessments and Diagnostic Assessments without threats to validity or reliability.

We understand that PDE desires a comprehensive approach to the development and administration of the three program components:

- The **Graduation Competency Assessments** will be composed of three modules containing specific course-related content topics. Students who fail to achieve proficiency on a given module(s) will be permitted to retake only those modules. The assessments will be available for administration at least three times per year, in the fall, spring, and summer. Tested content will be aligned to the Pennsylvania Academic Standards and Assessment Anchors.
- The **Diagnostic Assessment Tool** is an online test system used to provide instructional feedback to students and teachers. It includes the assessment of prerequisite skills of students entering grade 6 through grade 12 based on the academic content covered by the Graduation Competency Assessments. The tool will be available for use in schools and classrooms throughout the school year to assess students' skill attainment.
- The **Model Curriculum** component includes the development of curricular resources and materials aligned to the Pennsylvania Academic Standards, Assessment Anchors, and competencies assessed by the

Graduation Competency Assessments and the Diagnostic Assessments. Regular and systematic feedback of Pennsylvania's teachers, administrators, and higher education faculty will be incorporated into the development process.

In preparing our response, DRC has meticulously reviewed the Request for Proposal (RFP), and we believe that we have superior, in-depth knowledge, technical expertise, and experience to provide support to PDE in the development and administration of the Graduation Competency Assessments, the Diagnostic Assessment Tool, and the Model Curriculum. We will meet and exceed PDE's goals in providing all of the services and deliverables of this contract.

II. Nature and Scope of the Project

No other testing vendor understands the nature and scope of Pennsylvania assessments as well as DRC. We have 16 years of demonstrated success with the PSSA. This experience forms the basis of our proposed approach to the GCA Program.

DRC understands that the GCAs will measure student achievement of Pennsylvania academic standards in reading, writing, mathematics, science, and social studies. We also understand that the Diagnostic Assessment Tool and the Model Curriculum will be designed to support classroom instruction to help teachers meet students' needs. We are excited about the possibility of working with PDE to accomplish all tasks necessary for successful implementation of the new GCA Program and its ongoing management.

WORK PLAN FORMAT

This section of our proposal provides DRC's response to *Part IV. Work Statement*, as required and detailed in the Request for Proposals (RFP). Unless otherwise noted, references to the GCA Program include the GCAs, the Diagnostic Assessment Tool, and the Model Curriculum, collectively. Likewise, processes will apply to all three of the GCA Program components, unless specifically noted. We are pleased to present our plan for continuing as PDE's partner in this new GCA Program endeavor.

III. Term of the Project

III.A. TERM OF THE CONTRACT

DRC acknowledges that the term of this contract will begin from the effective date of the contract and will continue until June 30, 2015.

IV. Requirements

IV.A. REQUIREMENTS FOR PROJECT

IV.A.1. Project Management Plan

DRC will ensure that all work performed by us and our subcontractors is completed according to the timelines and schedules required by the RFP and/or PDE.

DRC's many years of experience as a leading provider of program management, planning, and other customized services in the assessment industry enable us to deliver accurate, high quality services and deliverables on time. We have the skills to anticipate challenges that have the potential to delay deliverables and recommend solutions to avoid costly errors and missed deadlines.

DRC's Project Management teams are set apart by:

- Extensive large-scale assessment experience.
- Longevity and continuity of service.
- Commitment to strong client relationships.

For more than 16 years, DRC has collaborated with PDE to successfully implement work plans that encompass the full range of required assessment tasks, including item development, assessment logistics, and psychometric support. Our experience and knowledge of Pennsylvania's educational and assessment systems will be instrumental in developing and implementing the GCA Program.

DRC is proposing a strong team of managers for the GCA Program, many of whom currently work as part of DRC's Pennsylvania Project Team. We acknowledge that PDE will review the résumé of our proposed project manager and must approve the candidate, as well as any future candidates.

Our team will be led by **Dr. Adisack Nhouyvanisvong, Director of Psychometric Quality**. Dr. Nhouyvanisvong brings over eight years of experience as an assessment researcher and professional. In the role of **GCA Program Manager**, he will provide overall direction to the program and will be the primary liaison between DRC's GCA Program Team and PDE. He will help address and mitigate areas of risk, ensure that the project management and quality control processes are being followed, and assist with escalating issues to DRC's Senior Management Team as needed.

As Program Manager, Dr. Nhouyvanisvong will provide overall project management for the GCA Program. He will ensure that all deadlines are met and that the program is running smoothly and within budget. He will have a frequent and consistent line of communication with PDE, the senior management of DRC, and the staff of our subcontractors. He will have the authority to make decisions and commitments on behalf of DRC.

Dr. Nhouyvanisvong's other responsibilities will include creating and maintaining project planning and summary documents and MS Project schedules; developing and utilizing communication plans, risk management plans, and change management plans; and ensuring that all DRC project team members and

subcontractors understand and adhere to the project scope and that all deliverables are met on time, with the highest possible quality. He will also have the full support of DRC's Executive Team and all of our corporate resources at his disposal to deliver a successful assessment program.

Dr. Nhoyvanisvong brings to this program direct experience with Pennsylvania assessments, through his psychometric work on the current PSSA program. This familiarity with Pennsylvania assessments will help to ensure the success of the GCA Program throughout the duration of the contract.

During his career, Dr. Nhoyvanisvong has managed high-stakes educational assessments for the Minnesota Department of Education. He has also directed quality initiatives and provided psychometric services related to educational and professional licensure and certification examinations for other testing companies, including Pearson VUE and Educational Testing Service (ETS).

Dr. Nhoyvanisvong has significant expertise in computer-based testing (CBT) and computer-adaptive testing (CAT). He holds a Ph.D. and an M.S. in Psychology from Carnegie Mellon University in Pittsburgh, Pennsylvania, along with a B.S. in Psychology from the University of California, Davis. He is currently pursuing an M.B.A. from the Carlson School of Management at the University of Minnesota.

PDE can be assured that Dr. Nhoyvanisvong will have immediate access to a high level of authority and issue resolution whenever necessary. He will help to ensure the continuing success of Pennsylvania assessment programs, including the GCA Program, by building a lasting relationship with PDE.

Ms. Shaundra Sand, Senior Director of Large-Scale Assessment, will serve in an advisory capacity for the new contract, providing high-level oversight to the GCA Program and assistance as needed to Dr. Nhoyvanisvong. Currently serving as the Project Director for the PSSA, she will continue the tradition of superior service to PDE in this advisory role. Ms. Sand has served in a project management capacity for Pennsylvania programs since 1996 and is a certified Project Management Professional (PMP[®]) through the Project Management Institute.

Dr. Nhoyvanisvong will be assisted by **Ms. Karen Olsen, Senior Director of Software Quality Assurance**. Ms. Olsen, as the **GCA Component Lead** for the contract, will provide overall management and support of the day-to-day operations of the GCAs, working to expedite communications, resolve issues, and provide exceptional support to PDE and Pennsylvania LEAs. She will oversee materials development, project schedules, and project documentation and will provide other general project management duties. Ms. Olsen will be in frequent and consistent communication with Dr. Nhoyvanisvong.

Ms. Olsen currently oversees software quality assurance efforts for numerous statewide assessments, including seven years of work on Pennsylvania assessments, along with testing programs for Louisiana, South Carolina, and

Washington. For each of these programs, she ensures that solid SQA practices and standards are established and implemented.

Before joining DRC in 2001, Ms. Olsen worked as an SQA manager and analyst for several corporations in the Twin Cities and Chicago, including Amoco Oil Company. She earned a B.A. degree in Business from Iowa State University.

Dr. Melvin W. Webb II, Director, Assessment Products and Research, will serve as the **Diagnostic Assessment Tool Component Lead** for the GCA Program and will also provide leadership for standard setting for the GCAs. In this role, he will provide oversight and coordination for the development and implementation of the Diagnostic Assessment Tool, ensuring continuity between it and the GCAs and the Model Curriculum.

Dr. Webb offers many years of experience in the management and development of large-scale educational assessments, having worked on a number of projects for K–12 and post-secondary testing programs. Since 1996, Dr. Webb has served as Scoring Services Manager and Senior Product Manager at CTB/McGraw-Hill. Dr. Webb also recently served as Assessment, Research, and Evaluation Administrator for Sacramento City Unified School District for two years. Prior to his tenure with CTB/McGraw-Hill, Dr. Webb served three years as Director, Office of Assessment, for the School District of Philadelphia, and two years as Director, NAEP Project, for the American College Testing Program National Office.

Dr. Webb holds an Ed.D. in Education Administration and an M.Ed. in Student Personnel Work in Higher Education from North Carolina State University, Raleigh. He received his B.A. degree in English from the University of North Carolina-Chapel Hill.

Ms. Patricia Porter, Vice President of Large-Scale Assessment, will provide additional support to Dr. Nhouyvanisvong. Ms. Porter will serve as the **Model Curriculum Component Lead** for this contract. In this role, she will provide oversight and coordination of the model curriculum work, ensuring both the timely development of the Model Curriculum and its alignment with the GCAs and the Diagnostic Assessment Tool.

Ms. Porter has more than 39 years of experience in the field of education. Her impressive credentials include serving as Director of Accountability for the Texas State Board of Education Certification, where she managed the development and implementation of more than 60 certification tests for Texas educators. For 20 years, Ms. Porter served as the Director of Programs II for the Texas Education Agency, where she oversaw the development and implementation of statewide assessments that tested approximately 2.5 million students annually. Ms. Porter is an expert in the *No Child Left Behind* legislation.

In addition to this exceptional experience, Ms. Porter holds a Master's degree in Curriculum and Instruction and a Bachelor's degree in History and Social Sciences, both from the University of Delaware in Newark.

Mr. Russ Spencer, DRC's Vice President of Program Management and Strategic Alliances, will provide senior management-level support to Dr. Nhouyvanisvong, the GCA Project Management Team, and other DRC staff. Mr. Spencer has more than 24 years of experience in large-scale, document-based testing and survey projects. He is currently the senior manager responsible for project management within DRC's Education Services. In this role, he supports the delivery of statewide educational testing programs. In addition, he oversees DRC's partnerships and third-party relationships. He has been with the company since 1996.

Mr. Spencer has been closely involved with the PSSA since he joined DRC's Education Services in 2000. His long-term expertise and experience will help to ensure the success of Pennsylvania's new testing program.

Mr. Spencer holds an M.B.A. from the University of Pittsburgh and a B.S. in Mechanical Engineering from Carnegie Mellon University. He has also completed postgraduate work in Numerical Analysis.

Ms. Lisa Peterson-Nelson, Vice President of Quality, is DRC's executive in charge of company-wide quality enhancements. For the GCA Program, she will provide senior-level support for quality assurance activities associated with the contract. She will carefully audit the project management and planning processes and work with the Program Manager, Dr. Nhouyvanisvong, to resolve any risk management issues that arise. Ms. Peterson-Nelson is currently directing the enhancement of DRC's key work processes for delivery of products and services to clients. She serves as the internal auditor of all quality processes and risk management plans for current clients. She has recently led the company's efforts to achieve ISO 9001:2000 certification in three areas. Ms. Peterson-Nelson has an engineering and operations management background spanning 18 years.

Planning and Management Meetings

Effective collaboration requires productive meetings. Whether in person or through teleconferencing, DRC's project management professionals are highly skilled in facilitating such meetings.

DRC understands that a start-up planning meeting, as well as regular planning meetings, will occur throughout the life of the contract and will include DRC project management team members, PDE staff, and, as appropriate, other DRC subcontractor staff. Please see *Appendix 12* for detailed information regarding meetings required for the GCA Program.

DRC will be responsible for planning, coordinating, and covering the costs associated with all planning and management meetings. We will work closely

with PDE to ensure the focus of each meeting is appropriate given where the project is in its yearly cycle and that the proper GCA Program team members are prepared to participate. Early meetings will focus on ensuring all activities associated with this contract are clearly understood by all parties and that PDE preferences for conducting and documenting meetings are established. Subsequent meetings will focus on the progress of tasks and activities relevant to the assessment cycle at those points in time.

Prior to each meeting, we will collaborate with PDE to identify topics and draft a meeting agenda for PDE review and approval. The DRC GCA Program Management Team will ensure that detailed notes and lists of participants for all meetings are recorded. Meeting notes and records of participants will be submitted to PDE for review and approval.

This regular meeting schedule will **promote success** for the GCA Program and ensure **continuous program improvement**.

Ongoing Communication

DRC's hallmark in the testing industry is our collaborative, cooperative, and responsive service to our clients. DRC considers itself a partner with our clients in our efforts to enhance and contribute to the quality of education available to all students.

Our GCA Program Manager, Dr. Nhouyvanisvong, will be in frequent communication with PDE and will be authorized and prepared to respond quickly to inquiries. He has extensive experience working closely with staff from state agencies and is qualified, experienced, and capable of providing timely assistance to PDE. Dr. Nhouyvanisvong will carry a Blackberry (or similar) electronic device that will enable him to respond to PDE staff in a timely manner through either telephone or email.

Dr. Nhouyvanisvong will provide immediate notification to PDE of critical issues or risks that arise in the project. His proactive project management approach will ensure that the development and administration of the GCA Program will not be hindered or delayed by unforeseen issues or complications. Please see *Subheading X, Archive, Business Continuity, and Disaster Recovery Requirements*, for further information on our plans and solutions for handling and responding to unexpected situations and issues.

In addition to Dr. Nhouyvanisvong's availability, DRC will provide reliable and timely customer service support to respond to district assessment coordinators' questions or concerns. Customer service support will be available throughout the duration of the contract and will include **a toll-free customer service telephone number, email address, and fax number**. Further details regarding our customer service processes are available under *Subheading VII.G.1, Customer Service Support*.

We know PDE will have many constituencies to please and inform when fielding an assessment program like the GCA Program. **DRC's commitment is to be nothing less than a trusted advisor that PDE can rely on for support and counsel regarding all aspects of this program.**

IV.A.2. Core Team of Key Personnel

In addition to the Project Management professionals presented above, DRC has proposed a team of assessment professionals who will be of great value to PDE and the GCA Program. These individuals possess expertise gained from working on the PSSA and other statewide testing programs involving tasks similar to those required for the GCA Program. The management, professional, and technical staff of our company is experienced and fully capable of applying and managing the resources necessary to carry out the statement of work for this contract. *Section E. Personnel* contains information regarding each of our proposed team members, including subcontractor personnel, as well as a DRC's Corporate Leadership Chart and an Organization Chart for the Pennsylvania GCA Program. Complete résumés are presented in *Volume III, Appendix 1*.

DRC understands the necessity of providing adequate staffing for the GCA Program to ensure that all program requirements are met. DRC and our partners have the flexibility and the resources to meet the anticipated staffing needs of this program, and to add staff should the future needs of the contract require it. We acknowledge that no changes to key personnel shall be made without PDE's written approval.

In addition to the staff identified in this proposal, DRC and our partners employ numerous other individuals who meet the staffing requirements of the GCA Programs. We maintain sufficient reserve capacity in all areas of our businesses, so that we have the ability to draw from existing staff and add staff as needed to our projects.

DRC employs over 475 permanent, full-time personnel. The majority of these individuals are involved in our Education business unit. We have the staff required to develop and administer assessment programs for ten client states, with room for expansion. This gives us an extensive pool of staff members—project managers, test developers, psychometricians and statistical analysts, software developers and quality assurance analysts, handscoring personnel, and operations personnel—who could easily transition to the GCA Program, should the needs of the program require it.

Ability to Recruit Replacement Staff

We believe that the staffing plan described in this proposal fully meets the requirements of the GCA Program. However, we understand that it is often necessary over the course of a long project to find replacement personnel. Depending upon the specific situation, DRC and our partners will either provide replacement staff from among our existing employees or recruit new employees.

Because DRC is a growing organization, we continuously recruit new employees to meet current staffing needs, as well as anticipated staffing needs. Our headquarters location allows us to draw from the highly educated population of the Twin Cities metropolitan area, giving us a large pool of candidates. DRC offers competitive salaries and excellent fringe benefits, which also helps to attract and retain employees. Many of our new recruits in test development, psychometrics, and software development already have direct experience in the testing industry, bringing skills which immediately transfer to their new positions at DRC.

DRC uses a number of methods to recruit employees, including newspaper and trade press advertisement, recruitment at professional meetings, traditional networking in professional associations, employee referral, and professional recruitment firms. We are confident that should the need arise to acquire replacement personnel, we would have no trouble finding the appropriately qualified staff.

IV.B. KEY DELIVERABLE DATES

DRC agrees to meet all project deadlines and deliverable dates for the GCA Program. The chart below outlines the key deliverable dates for the Diagnostic Assessment Tool, the Model Curriculum, and the GCA per discussions with PDE.

Please see *Subheading XI.A, Task Plan*, for more information regarding our work plan. *Appendix 11* contains our preliminary project schedule, showing all tasks, task work elements, resources assigned to each task, and the timeframe allowed for each task and deliverable. Please see *Subheading IV.A.1, Project Management Plan*, above, for more information regarding DRC's approach to managing the GCA Program. *Subheading VII.M* presents our proposed testing window and reporting schedule for PDE's review.

Key Deliverable Dates

Content Area	Operational Date		
	Diagnostic Assessment Tool	Model Curriculum	GCA
Algebra 1 Algebra 2 Geometry	September 2010	September 2010	December 2010
Biology Chemistry English Composition Literature U.S. History World History Civics/Government	September 2011	September 2011	December 2011

IV.C. REQUIREMENTS FOR THE GRADUATION COMPETENCY ASSESSMENT

IV.C.1. Deadlines by Subject

DRC agrees to meet all project deadlines and deliverable dates, including field testing, for the GCAs. DRC will ensure that the GCAs are available to school districts according to the content-area implementation schedule (please see *Subheading IV.B, Key Deliverable Dates*, above, for a chart that outlines this schedule).

DRC's GCA Program work plan is discussed in more detail in *Subheading XI.A, Task Plan*. Our preliminary project schedule, showing all tasks, task work elements, resources assigned to each task, and the timeframe allowed for each task and deliverable is provided in *Appendix 11*. Please see *Subheading IV.A.1, Project Management Plan*, above, for more information regarding DRC's approach to managing the GCA Program.

The table that follows summarizes DRC's proposed approach to meeting the requirements for implementation based on negotiation discussions with PDE. The table depicts a high-level overview of the activities occurring for the various GCA courses over the life of the contract. This information is provided in the context of PDE fiscal year as well as school year.

*Pennsylvania Graduation Competency Assessments
Section C. Work Plan
Revised February 3, 2009*

DRC's Proposed Activities for the GCA during Each Year of the Contract

PDF Created with deskPDF - PDF Writer - Trial :: http://www.docudesk.com

GCA		Year 1 (PDE FY 08-09)			Year 2 (PDE FY 09-10)			Year 3 (PDE FY 10-11)			Year 4 (PDE FY 11-12)			Years 5 and 6 (PDE FY 12-13 and FY 13-14)			Year 7 (PDE FY 14-15)		
Wave	Subject	School Year 2008-2009			School Year 2009-2010			School Year 2010-2011			School Year 2011-2012			School Years 2012-2013 and 2013-2014			School Year 2014-2015		
		Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer
		1	Algebra 1																
Algebra 2			Item Development Work			FT	FT Analysis & Create Forms	Dec OP	OP and Standard Setting	OP	OP	OP	OP	OP	OP	OP	OP	OP	
Geometry			Item Development Work																
2	Biology		Item Development Work																
	Chemistry		Item Development Work																
	English Composition		Item Development Work			FT	Item Development Work	FT	FT Analysis and Create Forms	Dec OP	OP and Standard Setting	OP	OP	OP	OP	OP	OP		
	Literature		Item Development Work																
	US History		Item Development Work																
	World History		Item Development Work																
	Civics & Government		Item Development Work																

IV.C.2. Assessment Materials

DRC takes great pride in the quality of state testing publications produced on behalf of our department of education clients. We have extensive experience providing high-quality, customized PSSA assessment materials to Pennsylvania LEAs, including public school districts, charter schools, approved private schools, non-public schools, and Career and Technology Centers. DRC's proven procedures and systems will ensure that sufficient quantities of GCA materials, including overages to accommodate enrollment changes, are produced and distributed in a timely and accurate manner. The following sections of our proposal provide more information detailing our functions and procedures as they relate to materials production, enrollment, materials ordering, packaging and distribution, and customer service:

- *Subheadings IV.C.7, IV.C.8, and VII.D*—Materials Production
- *Subheadings VII.F.1*—Enrollment and Materials Ordering
- *Subheading VII.F.4, VII.F.5, and VII.F.6*—Packaging and Distribution
- *Subheading VII.F.7 and VIIG.1*—Customer Service
- *Appendix 10*—Materials List

IV.C.3. Item Development

DRC's test design and item development plan ensures that three parallel core operational forms plus breach forms are provided per year. Our plan further takes into account the release of approximately 10% of items per year for the Item and Scoring Sampler. Please refer to *Subheading VII.B* for details about DRC's proposed item development plans. Detailed test designs can be found in *Subheading VII.B.2*.

IV.C.4. Plan for Initial Field Testing

DRC has developed a detailed plan for the initial field testing of each GCA course. DRC proposes to do all initial field testing in the spring prior to the first operational assessment, as follows:

GCA Course	Initial Field Test
Wave 1: Algebra 1, Algebra 2, Geometry English Composition*	Spring 2010
Wave 2: Biology, Chemistry English Composition*, Literature US History, World History, Civics/Government	Spring 2011

* English Composition will be field tested over 2 years and operational with the Wave 2 courses in 2011-2012.

Note that field testing for English Composition will take place over two separate events (in both Spring 2010 and Spring 2011). DRC proposes to field test both paper/pencil and online versions for the initial standalone field tests. Please refer to *Subheading VII.C.2* for detailed information about the plan for initially field testing each GCA course.

IV.C.5. Content Area Item Writers

DRC has extensive experience recruiting, training and maintaining item writers for all GCA courses. DRC's cadre of test development content leaders are among the most experienced in the industry. DRC understands that PDE will review and approve the resumes for each content area leader, including any future replacements. Furthermore, PDE will review the resumes of all content specialists who will participate in face-to-face item review meetings with Pennsylvania educators. Please refer to *Subheading VII.B* for details about DRC's item development process, including our processes for training item writers. Please refer to *Section E. Personnel* for information about our staffing plan. *Appendix 1* contains résumés for DRC's proposed test development team.

IV.C.6. PDE Approval of all Work

Incorporating state client review requirements is critical to DRC's internal project schedules. DRC's Project Management, Test Development, and Document Services teams have extensive experience working with numerous state departments of education in the refinement and final presentation of test materials. DRC follows a meticulous set of internal quality standards to ensure high-quality printed products for our clients.

DRC will obtain the approval of PDE on all work as required by PDE, including, but not limited to, mock-ups; and assessment packets, paper stock, ink color, cover designs, report formats, labels, sites, and mailings. For all materials, PDE will review the content and format and will have final approval. Any changes to these materials that result in a deviation from PDE-approved versions will require PDE approval. Printing, publishing, and distribution of materials will not begin until final approval has been provided by PDE.

DRC will incorporate PDE reviews into our standard materials development procedures. This will ensure that all materials meet or exceed PDE requirements. The GCA Program Manager will include PDE review stages in the GCA Program Schedule (please see *Subheading XI.A, Task Plan*). This will provide adequate time for PDE review and incorporation of PDE revisions at each stage of the development and production processes, while ensuring that all GCA production, printing, and distribution deadlines are met. We will provide proofs (in either paper or electronic format) of forms, handbooks, manuals, reports, and all other testing-related materials to PDE for approval.

Please see *Subheadings IV.A.1, IV.B, and IV.C.1* for more information regarding DRC's commitment to meeting project timelines. *Subheadings IV.C.7, IV.C.8, and VII.D* provide more information regarding our materials production

procedures, while *Subheading VII.K* discusses our approach to developing and producing reports.

IV.C.7. and IV.C.8. Proofreading of Printed Documents and Production of Materials

DRC understands that PDE requires error-free materials; DRC will assume the ultimate responsibility for the quality and accuracy of GCA Program materials. We take great pride in the excellence of the state testing publications we produce on behalf of our department of education clients, and are proud of our delivery of accurate test materials for PDE for the past 16 years.

Our proposed **GCA Component Lead, Ms. Karen Olsen**, will oversee the design, printing, and distribution of all testing-related materials and, in collaboration with other resource groups, will **ensure that PDE receives error-free products**.

All GCA Program testing-related materials will be produced through DRC's ISO 9001-certified Document Services business unit that incorporates our Document/Graphic Design Group, which designs, edits, and typesets testing-related materials.

DRC and PDE will collaborate on updating and maintaining a program style guide to ensure consistent application of preferences and expectations across all program materials. The use of a style guide will ensure that detailed specifications for materials development, including format, font, and color, are available to PDE and all DRC GCA Program Team staff involved in materials development. It will also serve as the principal resource document to facilitate testing materials discussion between PDE and DRC, including our subcontractors as appropriate.

Before any material is submitted to PDE, DRC's editing professionals will conduct a minimum of **three rounds** of independent quality checks (**word-for-word editing/proofreading**) for each document. **At least two DRC Editors** will perform independent word-for-word reviews of materials. This team will also check for consistency across documents, as well as content and accuracy of assessment items. They will ensure that all GCA Program materials are customized to the Commonwealth's specifications, while maintaining rigorous standards for accuracy. DRC's editing staff will conduct proofreading of all materials to confirm that all directions work in concert and are accurate and easy to follow. They will also conduct a final word-for-word proofreading of the printer's proof after it has been printed.

Final draft materials will be provided to PDE for review and approval. Printing, publishing, and distribution will not begin until final approval has been provided by PDE. Any changes after sign-off will require PDE approval.

All typesetting, desktop publishing, and printing activities associated with the production of GCA Program testing-related materials will be under our direct

control. DRC's in-house Printing Department will print all scannable materials based on predetermined specifications and will adhere to **exacting specifications to guarantee the highest possible data integrity for scanning and scoring.**

Please see *Appendix 3* for samples of test booklets, answer documents, manuals, and other materials we have produced for Pennsylvania assessments, as well as other state testing programs. *Subheadings IV.C.7, IV.C.8, and VII.D* provide additional information regarding DRC's materials production procedures.

All document development, production, and printing tasks and activities, including editing, proofreading, and other quality-control processes, will be incorporated into the GCA Program master schedule (see *Subheading XI.A, Task Plan and Appendix 11*). This schedule specifies all the activities that lead up to quality products or services delivered to either PDE or Pennsylvania LEAs. A company-wide Microsoft Project schedule will be utilized to ensure that all GCA deliverables, including internal handoffs, are of highest quality, within budget, on time, and meet specifications and requirements. The GCA Program Manager, Dr. Adisack Nhouyvanisvong, and his staff will use the GCA Project Schedule to track key milestones and deliverables, as well as to identify schedule risks early so that adjustments can be made before delivery dates are in jeopardy.

IV.C.9. Accuracy of Computer Programs and Scoring Operations

DRC is committed to embedding quality throughout every aspect of our software design, development, and quality assurance processes, ensuring 100% accuracy in our scoring and reporting systems.

DRC will thoroughly document all computer programs for the GCAs. The DRC quality plans will be developed and will be available for PDE's review, if desired. Software Quality Assurance staff will follow our project delivery quality-control process and adhere to the quality-control checkpoints for processing, scanning, and editing, described by the State Collaborative on Assessment (SCASS) on Technical Issues in Large-Scale Assessments (TILSA). Our proven Software Quality Assurance standards and procedures are directly aligned with the Capability Maturity Model (CMM) from the Software Engineering Institute (SEI).

DRC's disciplined approach is requirements-driven and iterative in nature. A significant contributor to our success is quality activities that are integrated into each step of every process. Please see *Subheading VII.I* for a discussion of DRC's corporate quality management plan and initiatives.

Our Software Quality Assurance staff will apply industry-standard software quality assurance methodologies throughout the program. **Prior to any GCA Program test materials returning to DRC, the Software Quality Assurance staff will perform extensive tests** to ensure all scanned data (including demographic and multiple-choice responses) will be captured and accurately

stored in a secure database environment. Each record in the database will be independently verified against the test decks for validation.

The analysts will follow a software testing methodology that thoroughly evaluates and verifies the scanning and scoring system and verifies that each scanner is configured and set up for the GCAs. This process includes validating test decks, which will be comprised of answer documents with and without student and school pre-ID/precode information for each form/version of the test. The test decks will be specifically gridded to include a variety of possible student response permutations and combinations.

We will prepare and refine the requirement documents for the scoring of student answer documents well in advance of the receipt of test materials. These specifications will contain detailed scoring procedures, along with the procedures for determining whether a student has attempted a test and whether they should be included in statistics and calculations for computing summary data. The requirement documents will be completed and reviewed with PDE. After all changes and edits have been made, the final requirement documents will be sent to PDE for final approval.

DRC understands the activities and coordination required for data processing and scoring of the GCAs and has the proven experience and capabilities to score the tests accurately. DRC brings many years of valuable and accurate scoring experience for the PSSA and spanning across programs such as Alabama, Alaska, Louisiana, Ohio, Oklahoma, South Carolina, and Washington.

DRC's strict quality procedures will ensure accurate scoring for the GCAs. **We have handled the multiple forms and grade/subject combinations for the PSSA for many years** and have built in solid checkpoints and reviews throughout the entire scoring process.

Please see *Subheading VII.I* for a detailed discussion of our scoring processes and DRC's Quality Management Plan.

IV.C.10. Cost Estimates—Paper and Online Delivery

DRC's cost estimates for the delivery of the paper and pencil and online formats of the GCAs are presented in our *Cost Submittal*, provided under separate cover. For the online delivery of the GCAs, the cost estimates are based on 20,000 students per course.

Online Delivery of the GCA

DRC is excited to present the following proposal to PDE for online versions of Pennsylvania's GCA Program. Along with our partner, Computerized Assessments and Learning (CAL), we look forward to sharing our experience with assisting states in the transition to computer-based testing, and working with both state-level and local stakeholders in Pennsylvania to move into this exciting arena of testing. The sections that follow detail CAL's computerized assessment

system and address relevant factors required to support the implementation of the GCA online testing program under the direction of PDE.

Introduction to CAL

As pioneers in developing, implementing, and delivering online assessment solutions to K-12 education systems, CAL is the industry leader in online testing in terms of quality, security, reliability, capacity, and innovation. CAL is in the forefront on testing, assessment, and psychometric applications to create computer-based assessment systems that support the teaching and learning process. Over the past six years, CAL has created the most up-to-date computerized assessment platform available in the country today. Our system has been developed and refined to perform efficiently and effectively through collaborative work and millions of successful implementations in online assessment programs in states such as Kansas, Alaska, Idaho, Oklahoma, and South Carolina. Our uncompromising commitment to quality and service has positioned CAL as the industry leader in providing dependable and trustworthy online assessment solutions.

To market its online test delivery system and services, CAL has entered into an exclusive partnership with DRC, whereby CAL serves as the subcontractor for the delivery of the computerized testing component of large-scale assessment programs.

CAL provides not only the testing interface for students, but also online training tools, tutorials, and practice and formative tests for each subject area to educate and prepare school faculty and students for online testing. Teacher tutorials provide an overview of the CAL system and its components. Student tutorials are also made available and are intended for review by educators and direct, hands-on use by students (and parents, if desired). Each tutorial, covering the assessed grades within a content area, provides essential instruction for taking or administering the state assessments via the CAL system.

Tutorials can be seen by test administrators and students in advance of their first test day, and students are allowed to repeat the CAL tutorials as often as desired and needed. In most states, there are no restrictions on downloading these tools and they may be used outside of school for review by parents and the local community. CAL's tools support all assessment types and formats, from informal appraisals to high-stakes tests. The CAL system supports item bank storage and usage appropriate to needs ranging from those of local teachers to those of customized state assessment applications.

CAL's Experience

The online assessment system being offered by CAL for the GCA Program is an outgrowth of professional experiences gained by a team of educational researchers over a 30 year period of involvement in developing and delivering educational assessment solutions for a variety of purposes and audiences.

Development of the CAL system began in 2002 at the Center for Educational Testing and Evaluation at the University of Kansas. Capitalizing on the pioneering development work at the University, CAL was formed to provide assessment systems and products developed by CETE to a broader audience.

Since its inception, CAL has demonstrated its capacity to independently deliver online testing solutions and that capacity continues to grow. Through the millions of tests administered to students in a variety of states, CAL has demonstrated extensive expertise in implementing online assessment solutions to both experienced clients and those transitioning to online testing. In Idaho, for example, DRC and CAL provide a comprehensive system in an assessment environment that is nearly 100% computer based. CAL has also assisted several states, including Kansas, Alaska, and Oklahoma, in introducing, transitioning to, and supporting online assessment. Listening and responding to the needs of these states, CAL has successfully implemented customized, high-stakes computerized testing solutions alongside traditional paper-based tests. In 2008 alone, the CAL online assessment system reliably delivered almost 5 million computer-based tests without delays, interruptions, or failed service.

Given its university roots, the CAL online assessment system is the most studied and researched computerized, real-time test delivery application in K-12 education. The CAL team has conducted and authored a variety of rigorous studies to ensure online assessments that lead to valid and reliable results. The online assessment system's proven delivery capability, our record of uncompromising quality, and experience in transitioning state education agencies to online assessment has firmly placed CAL among the industry leaders in online testing systems and services.

Understanding of the GCA Program

CAL is uniquely positioned to fulfill the requirements of PDE necessary for the successful implementation of the online administration of the GCA Program. We are the most successful assessment company focusing solely on online testing, having delivered more secure online assessments to students in large-scale assessment programs than any other vendor.

CAL has a distinct understanding of the unique goals and needs of Pennsylvania's GCA Program. Our powerful online assessment system is designed with the quality, flexibility, usability, security, and reliability required by PDE. CAL's solution for Pennsylvania is based on decades of research, refinement, and millions of successful online, large-scale assessment implementations across many states served. CAL is pleased to offer a proposal to PDE for the computerized delivery of the GCAs that is built on CAL's strong foundation of experience and expertise, and our uncompromising dedication to quality online assessment systems that support student learning and classroom instruction.

CAL's staff has many years of experience working collaboratively with a variety of education agencies to implement online assessment solutions. What

distinguishes CAL on this proposal is our deep understanding of the challenges and complexities of computerized assessment in education, and our knowledge and appreciation of Pennsylvania's desire to implement an instructionally supportive assessment system. CAL fully understands PDE's focus on student achievement in relation to Pennsylvania curriculum content standards. CAL's solution offers PDE a valid and reliable comprehensive web-based assessment system by which to measure and report student achievement. No other vendor can offer this degree of understanding from the perspective of PDE to ensure that the needs of the Department, Pennsylvania schools, and Pennsylvania students come first.

DRC and CAL: The Best Solution for Pennsylvania

DRC and CAL have a proven track record of success in providing inclusive assessment solutions to support large-scale, standards-based testing programs and look forward to engaging in a successful relationship with PDE as Pennsylvania moves toward implementing an online student assessment program. Our experienced staff is committed to completely providing the comprehensive services to support the state's goals and objectives in implementing the highest quality statewide assessment program delivered online. CAL is unmatched in our ability to host, deliver, administer, and score Pennsylvania's GCA Program via computerized delivery.

As the industry leader in online assessment, CAL's unique solution for Pennsylvania guarantees the following:

- **Security**— CAL offers Pennsylvania the most secure large-scale testing environment available. In over six years of online testing, neither student data nor actual test materials have ever been compromised.
- **System validity and reliability**—The CAL engine is the most reliable, robust, and rigorously tested system on the market with regard to meeting performance expectations and requirements as well as the transfer of information regardless of school network capacity.
- **Capacity**—The CAL system has the power to host the highest number of concurrent test-takers of any online assessment engine and has never experienced a system failure or related testing delays.
- **Assessment that supports instruction**—CAL's available management tools, visual interface, and feature-rich support environment empower Pennsylvania educators to become data-driven decision makers.

Functionality of CAL's Online Assessment System

Over the past six years, CAL has created **the most up-to-date computerized assessment platform available in the country today**, honing the system to perform efficiently and effectively for educator and student audiences in a variety of content areas. CAL's computerized assessments support benchmark assessments and a variety of high-stakes tests, as well as informal appraisals. Not only does CAL provide an exceptional platform for a variety of school testing

computer systems and networks, but its application seamlessly supports instruction and student learning through the testing process. Translating theory into best practices, CAL's computerized testing engine assists educators in blending assessment information with teaching and instructional processes.

CAL focuses on the K-12 educational environment and understands the different levels of infrastructure available throughout different school districts. CAL provides a reliable solution that **reduces demands on the local user's site, ensuring greater technological stability and a standardized user experience** for all students across all schools. In addition, CAL supports local technology personnel and provides estimation tools for schools to gauge local capacity and readiness. The CAL technology estimation tools allow schools to readily evaluate their system and network capacity for online testing (School Capacity Calculator).

CAL's Superior Software Features

As the industry leader in creating computerized assessment solutions, CAL readily equips educators and students with informative, easy-to-understand training tools, teacher and student tutorials, and practice tests in preparation for online testing. CAL's computerized assessment application offers several beneficial features, listed below. CAL has the capacity to customize all features of the system to meet the needs of PDE.

- A robust, reliable, and trusted online system that has been used for six years to deliver millions of tests flawlessly every year across subject areas as diverse as reading, English language arts, mathematics, science, and social studies in grades 3–12.
- A feature-rich assessment application with a complete set of assistive tools available to all students, such as a graphic calculator, regular calculator, at-your-rate text-to-speech translator, periodic table, mark for review designator, eraser, ruler, highlighter, striker, protractor, guideline, and interactive formula sheet. These and all other tools are all designed as drop-in modules, allowing for the easy addition or removal of features as needed.
- Capacity to deliver a wide variety of innovative, rich content item types including multiple-choice, multiple correct, short-answer, limited and extended constructed-response, true-false, and gridded-response items.
- CAL's online assessment system has the capacity to store and deliver a wide variety of innovative, rich content item types such as constructed-response and short-answer items that require students to type their written response directly into the delivery system. A series of standard text editing tools such as bolding, underlining, and aligning text are included in the CAL application. Student responses to constructed-response items are constantly saved to CAL central servers to guarantee that students do not lose their responses in case of computer interruptions.

- Support for rich content item display such as multiple complex graphics, sound and video items, and animated flash items.
- A testing application with strong support for Universal Design principles, providing multiple means of representation, expression, and engagement to students with a wide range of abilities, disabilities, language skills, learning styles, and ethnic and cultural backgrounds. The CAL system is compliant with Section 508 of the Rehabilitation Act of 1973.
- Accommodations for students with special learning needs including large print, audio support, enlarged graphics and adaptable font size, zoom features, and a guideline tool to assist with the reading of passages. CAL's system provides for the needs of particular students while maintaining test security and standardization without compromise.
- State-of-the-art text-to-speech synthesizing capabilities for all students, as required by the specific assessment program. CAL's text-to-speech reader allows students to listen to all text as it is displayed on a computer screen. CAL has carefully researched the text-to-speech voices available on the market and has selected and integrated the most natural-sounding, world-class voices into the CAL online delivery system.
- Along with the text-to-speech synthesizers, CAL has also the capacity to deliver items that require audio and video files.
- Cross-platform system support for Windows, Linux, Solaris, and MAC computer environments. The CAL application provides identical presentation, functionality, and performance in all environments. The system requirements to run the CAL system are also supported by the most common hardware configurations currently available in schools.
- Supplements to assist users in the implementation of the CAL system. Unique tutorials and training tests are available at all grade levels and subjects to help familiarize both students and administrators with the CAL testing system. Manuals, user guides, FAQs, and system notifications are made available to assist teachers, test administrators, and technology staff with the implementation of the system. Extensive support through training sessions and manuals are also available to aid students, teachers, schools, and districts in evaluating computer and network capacity for online testing.
- Use of industry-standard installation tools and an automatic update feature that automatically updates new versions of the CAL system to each school computer. Every year, hundreds of thousands of computers **automatically receive CAL software updates without any manual intervention from school technology staff**, considerably reducing maintenance needs from school personnel.
- Capability for dynamic test delivery solutions such as computerized adaptive testing (CAT). CAT has the attractive benefit of increased efficiency in assessment. CAL has considerable experience in the

operational implementation and delivery of CAT for the Idaho Standards Achievement Tests (ISAT), as well as in various research settings.

Option—Artificial Intelligence Scoring

Additionally, CAL has made a strong investment in the future of online assessment with the development of Artificial Intelligence (AI) to offer **automated (machine) scoring of short-answer and constructed-responses.**

If desired by PDE, costs associated for the development of a transition plan to AI scoring, including pilot and feasibility studies, can be discussed with PDE upon contract award.

CAL's Software Toolsets

CAL's computerized testing engine provides a standardized display of test content including text and graphics to students regardless of the computer architecture, operating system (Macintosh or Windows), monitor type, or resolution settings. The CAL system **uses the HTML item display format**, a format **with the flexibility to support innovative and rich content items** including multiple complex graphics, sound and video items, and animated flash items.

CAL's system allows Pennsylvania to tailor administration of the online GCAs to fit their unique needs. To facilitate proctor test management, the student name appears on the screen upon a successful log-in to a test. As the student responds to items, the responses are stored in a central location. The student can stop the test at any time. With proper authority, the student can then resume the computerized test using the same computer or using a different computer at any location assigned by the test session administrator. All student responses recorded in the central server are restored regardless of the computer where the student previously took the computerized test. The student can view and change his/her previous responses upon reactivation (as allowed by each state's test administration rules). Items are presented one at a time, except for those associated with a scenario. Passages and scenarios are presented with stimulus text on the left side of the screen and one or more items on the right. **In reading the passage/scenario, the text scrolls separately so that the items remain fixed on the screen while the student scrolls to view the passage/scenario text.**

The CAL engine has the ability to display multiple-choice and open-ended (gridded-, restricted-, and extended-response) items. Using a mouse or keyboard, a student can respond to an item and perform the tasks required by that item. When selecting a response option, the CAL system facilitates ease of use by students by marking respective student answer choices relative to a mouse click that is anywhere near the boundaries of a particular answer choice. Furthermore, the application provides a flexible interface for test navigation, with controls to view the previous or the next item, and to skip items in order to move on to another item. **The interface has color-based status indicators that help a student identify whether an item has been answered. Students can also flag an item for further review.**

The CAL system allows students to review the status of all items before they exit, and it warns students if they have not answered all of the questions. From this exit review page, students have the option of going back to respond to or modify a previous response to any item. A final warning screen is presented to students when they try to exit the computerized test. This warning screen gives two options to the students: to exit or to continue taking the computerized test. If assigned by the assessment coordinator, **the student can receive a performance report at the end of the assessment** and may be allowed the opportunity to review missed test questions, again, as determined by the local educator. Of course, PDE may overrule these types of diagnostic testing/reporting options.

The CAL client application **comes bundled with a rich set of tools and features that both enhances the student's experience and emulates paper-and-pencil test taking skills**. Tool sets are customizable and can be configured for each computerized test. States are at liberty to select those tools they wish to make available for any content area or grade. Particular tools and features, to be incorporated at the discretion of PDE, include the following:

- *Highlighter* to mark key words, sentences, etc., in the displayed text.
- *Striker* to eliminate answer choices.
- *Eraser* and *clear screen option* to remove partial or all markings on the screen.
- Subject assistive tools such as *graphic* or regular *calculator, periodic table, protractor, ruler, and interactive formula sheet*.
- *Guideline* to help students track their progress through a reading passage.
- *Tag* tool to mark key ideas within reading passages.
- *Text-to-speech* tool that reads any selected text in the computerized test with options for volume, and speaking rate under the control of the student.
- *Note pad* for students to make notes on an individual items.
- *Click-to-enlarge* feature to expand some figures, tables, charts, illustrations, etc., that might otherwise be difficult for certain students to see.
- *Timer* to show remaining time for timed tests.
- *Navigation bar* to record student progress by item number.
- Unique indicators for items *answered*, items *not answered* and items *marked for review*.
- *Help screen* to explain the operation of all tools.
- *Pause* feature to cover item content when students step away from workstations and an *inactivity* warning before logging a student out of a test.
- *Graphic* tool that allows students to respond to constructed response items that require the drawing of tables, diagrams, graphs, charts, etc.
- *Open-ended/Constructed-Response* tools that allow students to format their response text with standard text editing tools: bolding, underline, text alignment, etc.

- *Tab/Enter navigation* of the testing interface (allowing keyboard access to all dialogues, menus, and tools).
- *Presentation of signed text* in American Sign Language or Signed Exact English.
- *Magnification* of text and images for students with visual impairments.
- *Color overlays* that allow the testing interface to invert the contrast to light text on a black background, with individual choice of text color.
- *Alternate language text and vocabulary definitions* in the form of links or cursor rollovers.

Customizability

The **client application** is designed and built using a flexible modular structure; this will allow it to be **highly customizable based on the testing needs of PDE**. Some of the major customizations CAL has added in the past, based on client request, include:

- Displaying surveys at the end of an online test.
- Supporting different types of assessments, such as formative, early warning, and teacher-created assessments.
- Supporting students with special accommodations, through features such as large-print, audio support, enlarged graphics, and many more.
- Collecting certain demographic information from a student at the start of a test.
- Add/remove tools based on specific test and/or items requirements.
- Add/remove test timers according to testing needs.
- Add capability to support computer adaptive testing and fixed form testing through the same test delivery engine.

DRC and CAL look forward to working with PDE and Pennsylvania educators to customize the wide variety of online tools as desired.

CAL's Commitment to Special Needs & Accommodations

One of the primary goals of the CAL test delivery system is to provide an application that is universally accessible by all students, without the need for adaptation or specialized design for various populations. CAL's testing engine has been designed from the beginning to be accessible and valid with respect to the widest possible range of students, including students with disabilities and students with limited English proficiency. Therefore, the CAL assessment system fully supports the principles of Universal Design, namely equitable use by people with diverse abilities, wide ranging individual preferences and abilities, and tolerance to accidental or unintended actions.

In every state in which CAL has provided online testing solutions we have delivered assessments to special populations and students with diverse abilities, without compromising test security and standardization. Section 508 of the Rehabilitation Act of 1973 details the standards to follow to guarantee a universally accessible application, and the National Center on Educational Outcomes (NCEO) has further articulated the principles of Universal Design to be followed to ensure that assessments are accessible to all students. The CAL online assessment system complies with these standards, has been evaluated in terms of Section 508 compliance, and is a system familiar to NCEO staff as the Director of NCEO (Dr. Martha Thurlow) is a member of the Kansas Technical Advisory Committee (TAC).

CAL's universally designed online assessment system significantly reduces the need for accommodations, but does not eliminate the need for all of them. CAL's unique test delivery engine increases the variety of accommodations that can be used without threat to the validity and comparability of GCA scores. This will result in inclusive accountability measurement for Pennsylvania, and provides instructionally supportive information across the full range of students.

CAL will work closely with PDE to implement accommodations and modifications to further support students with special needs. Standard CAL tools and features capable of delivering accommodations to support students with various needs include:

- A testing application with strong support for Universal Design principles.
- State-of-the-art text-to-speech synthesizing capabilities for all students, as required by the specific assessment program. CAL's text-to-speech reader allows students to listen to all text as it is displayed on a computer screen. Students can choose to listen to any part of the text multiple times, and while listening they may visually follow the text on the computer screen through the visual tracking support offered by a text highlighting feature.
- Items with audio files are also supported; however, CAL's text-to-speech synthesizers offer a substantial advantage over audio files since they do not require the downloading of the enormous amount of data required for audio files.
- Accommodations for students with special learning needs including large-print, audio support, enlarged graphics, zoom features, and a guideline tool to assist with the reading of passages.

Further, standard CAL features such as the Guideline tool, the "Click to Enlarge" tool, various navigation options such as the "BACK" and "NEXT" and the status bar, differing layouts for item display, the "tool help" menu, the summary page, the "Mark for Review" tool, the color-based item status coding, and the warning messages when trying to exit an incomplete test all contribute significantly toward a universally accessible test delivery engine.

Additionally, DRC and CAL will collaborate with PDE to review all items to be entered into the online assessment system to ensure that the items are all compliant with Section 508 of the Rehabilitation Act and NCEO Universal Design principles.

Minimum System Requirements

The minimum system requirements required to install, access, and experience the full functionality of the CAL online testing system are listed below.

- Operating systems: Windows 98, NT, ME, 2000, XP, Vista, Mac OS X and above
- Minimum CPU standard supported: CPU running a 200 MHz and higher
- Minimum Memory: 64 MB of RAM
- Minimum bandwidth requirements: 56K and higher
- Display: Monitors should have a resolution of at least 800X600 pixels
- No additional plug-ins will be required for the testing interfaces.

The CAL engine is a cross-platform system with support for Windows and Mac computer environments. The CAL application provides identical presentation, functionality, and performance in all environments. The system requirements to run the CAL system are also supported by the most common hardware configurations available in schools.

LAN Servers and Bandwidth Solutions

CAL supports two major types of computer lab configurations. In the first approach workstations directly connect to the CAL central servers, eliminating the need for a local LAN server. The second approach requires a local caching server to be installed in the local school network whereby each workstation directly connects to the LCS. Both configurations use the industry-standard communication protocols HTTP and HTTPS and any local network configuration (i.e. wireless, wired) will be supported.

If the second approach is selected, CAL will work with schools and districts to determine if a LAN server is required in their particular situation. Below are the system requirements for a LAN LCS server.

- Operating System: Windows 2000/NT/XP/2003, Mac OSX 10.3, Linux
- Processor: 800 MHz
- Memory: Minimum of 512 MB
- Disk Space: Minimum 512 MB of free space
- Connectivity: Able to connect to the Internet via http/https
- A dedicated server is not required

CAL System's Best-in-Business Features

Speed

The CAL system offers the guarantee of an uninterrupted and speedy testing experience, regardless of school network capacity. CAL incorporates a fine-tuned, two-level caching system that reduces bandwidth demands on local schools. The first level of caching preloads all the test items in memory of each workstation, greatly reducing delays by eliminating the need to download item by item. Since test data is only stored in the system memory, and never to the local file system, test data is never compromised. As soon as a student completes a test, test data is completely removed from the local system.

The second level of caching is accomplished by the use of a Local Caching Server (LCS). The LCS preloads all the test data into a local school server. Each workstation downloads the test from the local LCS, eliminating the need for repetitive downloads of the same test from the CAL central servers.

Through six years of service to K–12 education high stakes assessment, we have never experienced slow downs or testing delays waiting on the transfer of information. The LCS also allows students to continue testing even in cases when **Internet connectivity at the local school level is interrupted**. In the State of Idaho alone, CAL is delivering online testing for 100% of the student population eligible for the NCLB testing program. The LCS solution has been critical in CAL's success delivering online testing to all students in Idaho, even in the more remote and isolated areas of the state with very limited Internet connectivity.

Security

The CAL testing engine is a secure system appropriate for use in high-stakes assessment programs. The CAL system maintains a very tight and secure testing environment at the workstation-level. CAL is proud to report that there has never been a security breach in six years of its system use and service for approximately ten million student test administrations in states such as Kansas, Idaho, South Carolina, Alaska, and Oklahoma.

The CAL application retains total control of the desktop computer during the entire testing process, both in Macintosh and Windows environments. While students take a test, the desktop is locked down forcing the application to run always on top, preventing students from accessing other applications. All special key combinations such as Print Screen, copying/pasting, Alt-Tab, Ctrl-Alt-Del, and right mouse are all deactivated during the test session. A pause and inactivity feature to cover item content when students step away from the testing station and a color code testing interface used to differentiate different test forms are also included to reinforce test security.

Transmission of test and student data between CAL data centers and the CAL testing application at each school workstation will be secure and encrypted using the industry-standard Secure Socket Layer (SSL) protocol. The use of standard

communication protocols like HTTP and HTTPS, which are already supported by all the school networks, ensures a secure and reliable mechanism for schools to exchange data without potential issues with firewalls, filters, or proxy servers. Only upon valid student authentication (using test session tickets) is the specific test and student data transmitted to the student's computer. Once data is received and decrypted in the local computer, it is loaded into the computer's memory only; no test or student data is ever written to the hard disk for permanent storage. As soon as a student completes a test, or if the test is interrupted (e.g., power failure, lost Internet signal), all test and student data is automatically and completely deleted from the local computer's memory; therefore, no footprint of sensitive data is left behind at the local computers.

Reliability

The server system architecture designed by CAL engineers is a robust, reliable, and scalable cluster of redundant enterprise-level application, report, and database servers. Each state testing program served by CAL is hosted in its own independent cluster of servers. This approach guarantees that testing demands from one state testing program do not affect others. CAL currently deploys clusters of servers capable of supporting up to **40,000 concurrent users** in each state we serve. Given this capacity, more than 250,000 tests can be delivered in Pennsylvania per day.

As a CAL best practice, we routinely perform load testing analysis to evaluate and ensure system capacity. As new testing demands arise, more infrastructure is added to the server farm. Each state testing program's needs are carefully analyzed and adequate resources are exclusively assigned to that testing program to guarantee 100% availability to all users with no slowdowns **during testing windows**.

In the spring 2008 testing window (approximately six weeks), over 2 million test parts were completed without interruption, delays, or failures in the State of Kansas. At the same time, 600,000 tests were delivered for the Idaho testing program in a four-week testing window.

In addition, CAL supports local technology personnel and provides estimation tools for schools to gauge local capacity and readiness. The CAL technology estimation tools (e.g., School Capacity Calculator) allow schools to readily evaluate their system and network capacity for online testing.

Ensuring System Reliability and Data Security

CAL's computerized testing platform is a secure system appropriate for use in high-stakes assessment programs, as proven through its successful use over the past six years in the Kansas, Idaho, South Carolina, Alaska, and Oklahoma NCLB testing programs. Key features of CAL's security plan are described below.

Administrative Access Control

One of the major components of the CAL online delivery system is a web-based interface known as CAL Management Tools. This management interface provides school and district administrators all the tools required to manage the CAL online testing process. Some of the functions available through the management tools are: downloading and printing test session tickets, monitoring of students' testing status, and ticket reactivation.

Access to the Management Tools interface is strictly controlled by password-protected administrative accounts. There are different levels of administrative accounts (e.g., district, school, teacher), each with different levels of access to functionality and information. Super user accounts are capable of creating accounts within/for lower levels of access. Higher-permission managers can restrict (e.g., reports only) or deny access to lower-level account users.

All communication between users and the Management Tools system is through secure industry-standard communication protocols: Secure Socket Layer (SSL).

Test Access Control

At the core of CAL test access control system are the Test Session Tickets (described later in this section in more detail). Tickets are the students' "passport" to access a test; they contain the login information that students need to take the test. Tickets must be given to students by test proctors right before the start of a test session, and as soon as the student logs into the test, the ticket is invalidated for future use.

Since the login information included in a test session ticket is unique for each student and each test, there is a minimal risk of students taking an incorrect test. If students are given correct test session tickets, they are automatically directed to the correct test they need to take.

In cases of special circumstances in which students need to re-take a test, test proctors will have the option to "reactivate" the test session ticket so that the student can log to the test again.

The simplicity and efficacy of the Test Session Ticket model for student test access control has been very positively embraced by school administrators and test proctors of all the state programs delivered by CAL.

Security of Test Content and Student Data

Transmission of test and student data between CAL data centers and the CAL testing application at each school workstation will be secure and encrypted using the industry-standard Secure Socket Layer (SSL) protocol. Only upon valid student authentication (using test session tickets) is the specific test and student data transmitted to the student's computer. Once data is received and decrypted in the local computer, it is loaded into the computer's memory only; no test or student data is ever written to the hard disk for permanent storage. As soon as a

student completes and ends a test, or if the test is interrupted (e.g., power failure, lost Internet signal), all test and student data is automatically and completely deleted from the local computer's memory; therefore no footprint of sensitive data is left behind at the local computers.

CAL has developed a proprietary Local Caching Server (LCS) solution that can be installed on a local school or district level server to increase the testing capacity of schools with limited internet bandwidth access. The LCS optimizes bandwidth utilization by caching test data at the local level. Any test data cached in the LCS is temporarily stored in memory and disk, and data stored in disk will be cached in an encrypted format and automatically deleted after schools finish administering the tests.

Desktop Security during Testing

The CAL computerized assessment system maintains a very tight and secure testing environment at the workstations. The CAL application retains total control of the desktop computer during the entire testing process, both in Macintosh and Windows environments. That is, while students take a test, the desktop is locked down forcing the application to run always on top so that students cannot access other applications; all special key combinations such as Print Screen, copying/pasting, Alt-Tab, Ctrl-Alt-Del, and right mouse are deactivated. A pause and inactivity feature to block item content when students step away from the testing station and a color code testing interface used to differentiate different test forms are also included to reinforce test security.

CAL is proud to report that there **has never been a security breach** in six years of its system use and service for approximately eight million student test administrations.

Recovery from Technical Interruptions

To eliminate the risk of losing student responses in the event of unexpected technical disruptions in school labs or classrooms while students are taking a computerized test (i.e. power failures, interruptions of Internet connectivity, etc), the CAL system constantly saves student responses to a secure location. For multiple-choice items, student responses are automatically saved to a local school server or to central data-hosting facility *each time* a student navigates away from the item. For open-ended items, all typed student response text is automatically saved every minute or whenever students click a "Save" button.

After local systems recover from a technical interruption, students will be able to login again to continue their test at the last item they were working on prior to the interruption, and their previous responses will be loaded from the central server. Note that in order for students to be able to re-login to the test, their session ticket will need to be "reactivated" by an administrator to preserve security.

CAL's computerized system will be available to schools at all times during the testing windows except for PDE-approved scheduled downtime, as necessary.

Quality Assurance Procedures

CAL's online assessment system is a robust, reliable, and trusted system that has been used for more than six years by numerous large-scale assessment programs to deliver millions of standards-based tests, from formative and diagnostic appraisals to summative, high-stakes assessments. Tests are flawlessly administered every year across subject areas as diverse as reading, English language arts, mathematics, science, and social studies in grades 3–12. The millions of tests successfully delivered annually and the continued relationships CAL enjoys with its clients speak to trustworthiness and validity of the CAL system in operational, high-stakes settings.

As a standard procedure dictated by our quality assurance system, CAL performs full system-level tests in an independent environment that emulates real-world usage conditions on behalf of the client prior to each release of the CAL online assessment system. During validation testing, the system is evaluated on all supported computer platforms and browsers as well as various computer system specifications. The system-level tests routinely include comprehensive assessments on functionality, usability, reliability, security, and overall performance. Each online page, tool, link, test item, and accompanying image (where applicable) is verified to ensure it is displaying properly and functioning as designed. System content is also validated for accuracy during this process. External, independent system tests are also performed by DRC. Functionality, usability, and reliability of the system are further confirmed through user-group field testing with diverse, volunteer school populations.

For each new client contract CAL has been awarded, rigorous system validation and acceptance tests are performed to confirm that the CAL online assessment solution meets or exceeds the functional requirements and the performance and reliability specifications as required under the agreement between the CAL and the client. Where issues or problems are identified, these are corrected and subsequently incorporated back into the internal CAL testing and validation process. Once approved, the CAL system is released to the client for final verification. Upon final approval, the system is moved to the production environment where it will again be verified to assure it is ready for use by schools, teachers, administrators, and students. CAL's comprehensive quality assurance tests provide us the opportunity to test our solution and verify its validity while assuring clients that the CAL solution is acceptable for operational deployment.

Automatic Updates for System Upgrades

CAL understands the need for periodic updates of the system to improve its quality and adapt to new demands of specific users. To meet this need and to optimize the upgrading process, CAL has developed an **automatic update feature that allows us to deploy software updates at any time without any**

manual intervention from school technology or administrative staff. This approach minimizes software maintenance efforts at the local level as updates are applied. This automatic update feature has been successfully used for several years by thousands of schools in multiple states.

Pre-ID and Test Registration Process

We understand that all student identification, demographic, and score attribution information required for reporting will be provided via PIMS. DRC will incorporate the PIMS information into our systems and process the data so that a master precode database is established. All student pre-ID information (e.g., student numbers, demographic, and program information) provided to DRC through PIMS will be loaded into CAL's online assessment system. The CAL online assessment system can accommodate student identification numbers (i.e., PASecureID) to link demographic data with assessment results. This information will be used to ensure appropriate student access and tracking of student results.

School and/or building test coordinators or other authorized staff will be responsible for ensuring the pre-ID student data is accurate in the online system and will also be responsible for entering student information for those students without pre-ID information.

Based on the PIMS file, along with information collected from DRC's Online Enrollment System and transferred to CAL, students from volunteer schools will be automatically enrolled to participate in the online version of the test. During this enrollment process, the CAL computerized assessment application creates a Test Session Ticket for each test session a student will take. Each ticket is unique and consists of a log-in ID, password, and test session ID. Prior to test administration, school administrators will be provided with a secure web interface where they will be able to download and print student tickets. Students will need the tickets at testing time to access the test.

The test session ticket information is randomly and uniquely assigned; once a student accesses a test, the ticket is invalidated and no log-in will be allowed with that same ticket. If the student needs to log in again to continue the test at a later time or date, school personnel will need to revalidate the ticket through the secure web interface. Access to tests can also be controlled by date and time without the use of student tickets. However, based on previous experience, CAL believes that the use of student tickets is more advantageous and less burdensome on teachers and test administrators than controlling test access by date and time: teachers print tickets prior to testing, deliver them to students at testing time, and once students use them (i.e., at the time of log-in), tickets are automatically invalidated. An image of a sample test session ticket is provided below.

Test Session Ticket	
Pennsylvania GCA	
Algebra I	
Student Name:	Mary O'Brian
PA Secure ID:	1000455454
Username:	mobrian
Password:	none779
Session ID:	62779

Sample Test Session Ticket

Six years of experience and the administration of millions of tests have demonstrated that **the simplicity of the ticketing system is a convenient, secure, and efficient mechanism** to manage test administration.

CAL's User/Presentation Interface

CAL's computerized testing engine provides a standardized display of test content including text and graphics to students regardless of the computer architecture, operating system (Macintosh or Windows), monitor type, or resolution settings. The CAL system **uses the HTML item display format, a format with the flexibility to support innovative and rich content items** including multiple complex graphics, sound and video items, and animated flash items.

The student testing interface has been designed based on years of research with student and teacher focus groups to provide the student test takers with an environment that is both easy to learn and enjoyable to use. Navigation through a test and the response process is easy and intuitive, allowing students to focus on test content rather than a burdensome delivery mechanism. Simple color metaphors provide students with immediate feedback on questions responded to, marked for review, and awaiting a response. Multiple item display formats and a rich set of manipulative tools are also available to assist students during the testing process. **CAL's system allows Pennsylvania to tailor administration of online assessments** to fit their unique needs.

A series of images is presented below that demonstrate the CAL testing interface. The figure below shows the student log-in page to take the GCAs. To log into the test, each student receives a unique log-in ID, password, and test session number via a test session ticket immediately before the test is administered. The log-in information on the ticket is specific to the respective student and to the test the student is scheduled to take, making it nearly impossible for students to sit for an incorrect test.

Version 4.4.1

pennsylvania
DEPARTMENT OF EDUCATION

TAKE THE GCA ASSESSMENTS

Please enter the following login information to start.

Your Username:

Your Password:

Your Session ID:

[Clear All](#) [Continue](#)

If you are not taking the GCA Assessments, use the "Back to Menu" button to return, and make another choice.

[BACK TO MENU](#) [EXIT](#)

Sample Student Log-in Page

Upon successful authentication, students are automatically directed to the test directions page. Students then continue to the item display area as shown in the following image. In this case, an example of a mathematics multiple-choice item is provided. Students can navigate through the test using the handy item selection buttons on the status bar at the top of the interface, or through the "NEXT" and "BACK" buttons at the bottom. Below the status bar is the tool bar, which groups the set of assistive tools available for a given test. These tools are easily added or removed according to the test specifications or blueprint.

Below the status and tool bars is the item display area. Multiple item layout formats are supported in the display area. Each layout is carefully selected based on the option that best utilizes the area; that is, the layout that requires no or minimal student scrolling and that provides for the cleanest utilization of space.

In the sample item displayed below, the student uses the graphing calculator tool to plot equations and solve the given problem. This image also illustrates how

students can use the highlighter tool to emphasize important information and the striker tool to eliminate some of the distractors.

mary

1 2 3

Chooser Highlighter Striker Eraser Calculator Audio Formulas Help

1. The graph of which equation has a **steeper** slope than the graph of $y = 2x - 3$?

~~$y = -2x + 3$~~
 ~~$y = \frac{1}{3}x + 3$~~
 ~~$y = x + 3$~~
 $y = 3x + 3$



Graph Calculator

X: 7 Y: 24

f(x) = 2x-3
g(x) = 3x+3

X-Axis-Min -10 X-Axis-Max 10
X-Axis Unit Scale value 1

Switch to Normal Mode

Back Plot Clear All

() x Clear

SIN COS TAN LN LOG

7 8 9 ÷ MOD

4 5 6 X x^y

1 2 3 - √

0 . = + π

BACK Clear Mark for Review Review/ End NEXT

Mathematics Multiple-Choice Item
Illustrating the Use of the Graphic Calculator, Highlighter, and Striker

The next two figures offer one example of an open-ended (constructed-response) item being supported by the CAL system. In the item below, the student is presented with a prompt and a “Click here to Answer” button that he/she needs to click in order to attempt an item response.

Practice 1

1 2 3 4 5 6

Chooser Highlighter Striker Eraser Calculator Pause Help

Question [Click here to Answer](#)

1. A student records these findings of an experiment in which the same type of bean plant was grown under different colors of light.

Effects of Light Color on Bean Plants

Bean Plant	Light Color	Starch Present in Leaf
1	White	91 mg
2	Yellow	10 mg
3	Green	13 mg
4	Blue	68 mg
5	Red	72 mg
6	No Light	4 mg

- Draw a scientific conclusion based on the data above.
- Explain how the data from the experiment supports your conclusion.
- Describe a way to gather more evidence to support your conclusion.

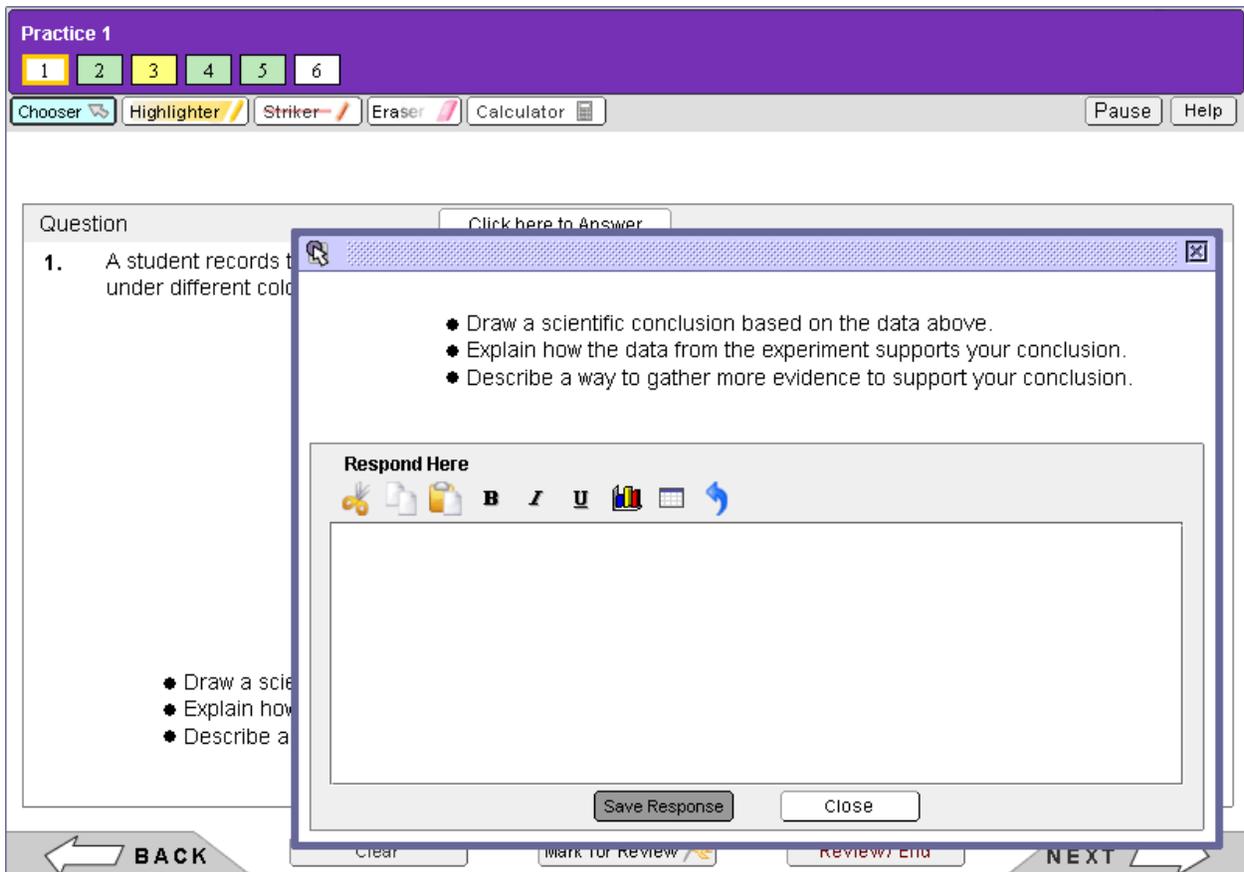
BACK Clear Mark for Review Review/ End NEXT

Prompt of an Open-Ended Item

Selecting the “Click here to Answer” button opens the student response window shown in the following figure. This response window can easily be dragged around using the mouse such that the student can review the prompt at any time.

As a student enters the response, the text is frequently and automatically saved (the desired interval can be determined by PDE) to a central location to minimize the amount of data potentially lost in case of an unplanned interruption.

At the top left corner of this figure, the color-based item status indicators used by the CAL system are readily seen: green for items already answered, yellow for items marked for further review, and white for items not yet answered. Students can also use this status bar to move directly to any item in the test by clicking on the corresponding item button.



Open-Ended Item with Student Response Window

Another sample open-ended item is depicted in the figure below. In this example, the student employs the CAL Graphic tool to draw a bar chart diagram in response to a mathematics question. This sample item illustrates the capacity of CAL's online system to support different item types.

The Graphic tool allows students to draw lines, curves, and quadrants; draw and manipulate shapes (arcs, circles, ellipses, polygons, triangles, etc.); draw graphs (bar, circle, line); configure diagrams, including Venn diagrams; insert text; rotate figures; zoom in and out; as well as perform other similar operations.

The screenshot shows the CAL Graphic tool interface. At the top, there is a purple header with "Practice 1" and three numbered tabs (1, 2, 3). Below the header is a toolbar with icons for "Chooser", "Highlighter", "Striker", "Eraser", and "Ruler", along with "Pause" and "Help" buttons. The main area contains a math problem:

1. A seventh grade class collected data on the type of pet liked most. From a survey of 100 students, 35 said dogs, 10 said birds, 42 said cats, 8 said fish and 5 said some other kind of pet. Use the drawing tool to make a bar chart that shows these data.

Below the problem is a drawing area with a grid. A bar chart has been drawn with the following data:

Pet Type	Number of Pets
Dogs	35
Birds	10
Cats	42
Fish	8
Other	5

The drawing area includes a toolbar with various drawing tools (line, regular line, label line, curve, quadrant) and a menu. The bar chart is drawn on a grid with the x-axis labeled "Dogs", "Birds", "Cats", "Fish", and "Other", and the y-axis labeled "Number of Pets" with values 10, 20, and 30. The bars for "Dogs" and "Birds" are drawn, with their respective values (35 and 10) labeled above them. The drawing area also has a "Line" and "Fill" dropdown menu. At the bottom of the interface are navigation buttons: "BACK", "Clear", "Mark for Review", "Review/End", and "NEXT".

Use of Graphic tool to Solve an Open-Ended Mathematics Item

The “Click to Enlarge” feature is another important tool supported through the CAL testing system. With this feature, images that are difficult to fit on the screen are presented in two formats, a small and a large version as shown in the image below. The large version is displayed when students select the “Click to Enlarge” link.

The enlarged image window can easily be dragged around using the mouse, allowing the student to see the item prompt at any time.

Practice 2

1 2 3 4 5 6 7

Chooser Highlighter Striker Eraser Calculator Audio VOLUME Help

6. The table below shows the lengths, in number of minutes, of 4 movies.

Movie	Number of Minutes
African Safari	121
Lions of Africa	109
Raging Waters	132
Snakes of the Amazon	118

[Click to enlarge](#)

Which movie has the **greatest** length?

(Hint: You can click on the link and see a bigger picture, and use your Chooser to move the image around the screen.)

African Safari
 Lions of Africa
 Raging Waters
 Snakes of the Amazon

Movie Lengths

Movie	Number of Minutes
African Safari	121
Lions of Africa	109
Raging Waters	132
Snakes of the Amazon	118

Close

← BACK Clear Mark for Review Review/ End NEXT →

Mathematics Item with the “Click to Enlarge” Feature

For reading items that are associated with a passage or scenario, the CAL system presents items with stimulus text on the left-side of the screen and one or more items on the right. The text in the passage scrolls separately so that the items remain fixed on the screen while the student scrolls to view the passage text.

Examples of how reading items can be displayed with passages are shown below. In this example the test consists of two passages and one set of skill items. The student is currently working on “Passage 1” and he/she can move to the other passages by clicking on the passage buttons at the top of the screen.

The first image below displays the passage on the left side and only ONE item on the right side. Students can move to items by clicking the “NEXT” and “BACK” and/or the item numbers on the status bar above the tool bar.

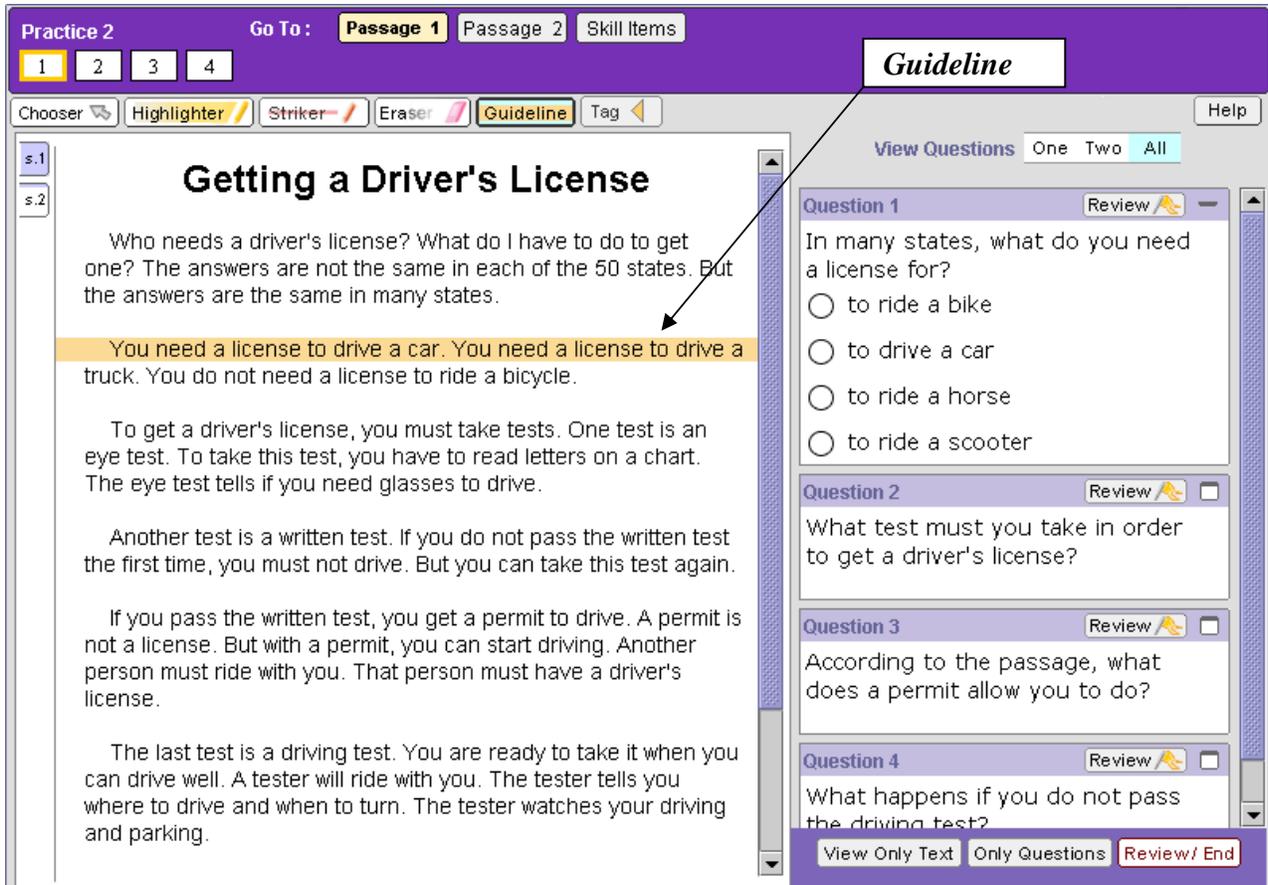
The second image shows a display format with the passage on the left side and **all** items in that passage on the right side of the screen.

The screenshot displays the CAL system interface. At the top, there is a navigation bar with "Practice 2" and "Go To:" followed by buttons for "Passage 1", "Passage 2", and "Skill Items". Below this is a status bar with item numbers 1, 2, 3, and 4, where item 1 is highlighted. A toolbar contains various tools: Chooser, Highlighter, Striker, Eraser, Guideline, Tag, Audio, and a volume control icon. The main content area is split into two panes. The left pane shows a passage titled "Getting a Driver's License" with several paragraphs of text. The right pane shows "Question 1" with the text "In many states, what do you need a license for?" and four radio button options: "to ride a bike", "to drive a car", "to ride a horse", and "to ride a scooter". At the bottom of the interface, there are buttons for "View Only Text", "Only Questions", and "Review/ End".

Reading Passage with One Item Displayed

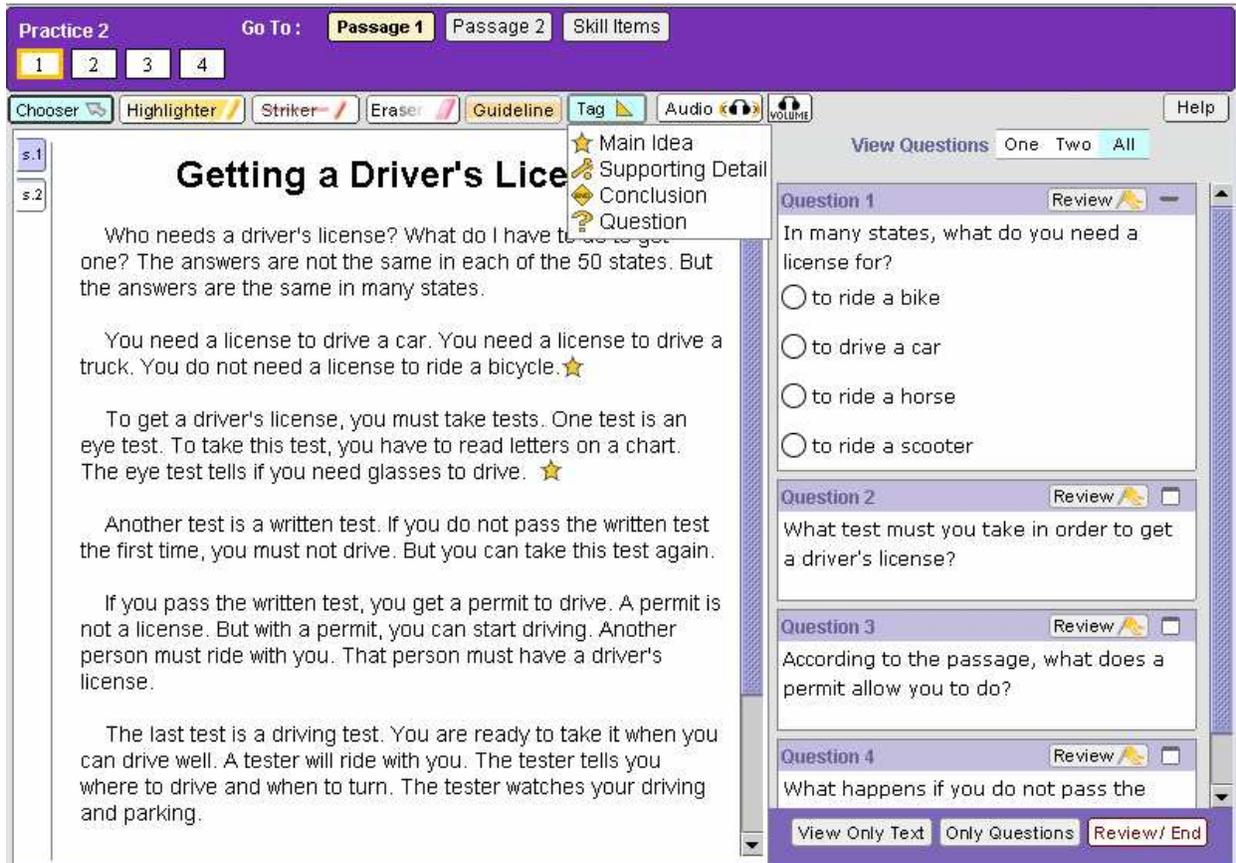
Other display options are also available to students. For instance, they can view the passage only (items removed) or view only the questions (passage removed) or students can alternate from one view to the other at any time.

One important tool available in the reading model and depicted in the image below is the Guideline tool. Using the Guideline tool, students can move the mouse over a line of text in a passage and highlight the row making the reading easier not only for students with reading disabilities, but also for the general population.



Reading Passage with All Items Displayed and the Guideline Tool

The Tag tool is another feature available for reading tests. With the tags, students can mark sections of a reading passage that correspond to certain reading elements such as main idea, supporting details, conclusions, and others. The tagging of these elements can assist students with the understanding of the passage and item responses. The image below shows the use of the Tag tool.



Example of Reading Passage with the Tag Tool for Marking Text

Once students answer all questions on an assessment, they can click on the “Review/End” button, which will direct them to the Summary page. On this page students can see a summary of the status of all the items in the test. In the example shown below, students can see items 5 and 8 marked as incomplete (red circle), while the rest of the items are marked as having been answered (green check mark). Items 3 and 5 have been marked for review. Students have the option to go back to any of the items in the test by simply clicking on the item button.

To exit the test, students click on the “End Assessment” button. If all items on the test have not been answered, students are warned, as illustrated, in the image below. Students will need to confirm that they indeed want to end the test before they can exit.

If assigned by the assessment coordinator, the student may be allowed the opportunity to review missed test questions, again, as determined by the local educator. Of course, PDE may overrule all options.

Practice 2
CAL

Before you click the END ASSESSMENT button:

1. If you need more time to finish this part of the test, talk to your teacher or the person giving the test now. DO NOT click the END ASSESSMENT button if you need more time.
2. Review the Summary. Check each question.
3. If the Summary has any or you are NOT ready to end the assessment. Questions with are NOT answered. Questions with might need more thought. To return to an unanswered question or a question marked for review, use the mouse to click the question's number in the Summary Table.
4. If you have more time available and would like to continue reviewing your work, click on the RETURN TO ASSESSMENT button.
5. Click the END ASSESSMENT button when you are ready to END the test. Remember you CANNOT return to this part of the assessment.

Summary

= Answered = Answered & Marked for Review
 = Not Answered = Not Answered & Marked for Review

Review your Answers

Q1	Q2	Q3	Q4	Q5
Q6	Q7	Q8	Q9	

End Assessment

You have not answered all the questions.
What would you like to do?

YES I want to end the Test now.

End
Return to Summary Page

Return to Assessment
End Assessment

Example of the Summary Page Displayed before the Student Ends/Exits the Test

System Documentation and Support

CAL is fully prepared to support all computerized aspects of the GCA Program. To assist administrators and educators in both assessment programs online, CAL will provide the following beneficial tools:

- **A Set of Web-Based Training Sessions** for district and school test administrators as well as district technology coordinators. Demonstrations of the CAL system would be available at these sessions, along with pertinent information for district and school personnel to assist in successfully preparing their sites for online test administration.
- **A System User's Guide** that fully details the functionality of the computerized testing system for an end user in a school.
- **A System Infrastructure Guide** that details the minimum and recommended technical specifications and configurations needed to successfully access the computerized testing system and deliver computerized tests.
- **A System Training Workbook** that provides step-by-step details for how to complete the most commonly needed tasks in the computerized testing system.
- **System Update Notifications** as needed that detail the specifics of newly deployed system changes.

DRC and CAL will develop all of these materials in conjunction with PDE, and all training and test preparation tools will be available to schools and districts at least 30 days prior to the online test administration window.

Concluding Remarks

CAL's computerized assessment solution is a robust, reliable, and trusted online system that has evolved into the most advanced computerized testing application available. The user-friendly CAL system is easy to learn, yet powerful enough to provide solutions for all of Pennsylvania's online assessment needs. CAL's strong investment in developing, refining, and customizing assessments, coupled with our experience working with other state education agencies, offers the most effective online testing solution for Pennsylvania. The CAL engine quite simply provides PDE the most complete online application that seamlessly supports instruction and student learning through the testing process.

CAL and DRC are excited to move into this new arena of testing with PDE. We would be happy to arrange a demonstration of the CAL system at any point during the evaluation and award process.

IV.C.11. Accuracy of Data

DRC's expertise in understanding the data elements captured and reported for the PSSA will be invaluable to the successful implementation of the GCA Program. Our unparalleled experience in understanding Pennsylvania requirements will allow DRC to assist PDE with a variety of options for data delivery and reporting. We have well-defined processes and strict quality-control measures that ensure that data captured from student answer documents will be accurately included in data files. For a full discussion of our process and quality steps, please see *Subheading VII.I, Scanning/Imaging and Scoring*.

IV.C.12. Timely and Accurate Delivery of Materials and IV.C.13. Timely and Accurate Collection of Materials

Accurate packing, shipping, and delivery of test materials are critical for districts and schools to successfully administer the GCAs. DRC is proud of our 16 years of accurate and on-time deliveries for the PSSA. We are committed to bringing that level of service to the GCA Program. Please see *Subheading VII.F, Materials Delivery*, for additional information regarding DRC's **ISO 9001:2000-certified** materials packaging, shipping, and delivery processes, and *Subheading VII.H, Assessment Materials Collections and Shipping*, for a full description of DRC's approach to materials collection.

IV.C.14. Scoring and Reporting Results

DRC understands the activities and coordination required for data processing and scoring of the GCAs and has the proven experience and capabilities to score the tests accurately. DRC brings many years of valuable and accurate scoring experience for the PSSA and spanning across programs such as Alabama, Alaska, Louisiana, Ohio, Oklahoma, South Carolina, and Washington.

DRC's strict quality procedures will ensure accurate scoring for the GCAs.

We have handled the multiple forms and grade/subject combinations for the high-stakes testing programs for many years and have built in solid checkpoints and reviews throughout the entire scoring process.

Please see *Subheading VII.I* for a detailed discussion of our scoring processes and DRC's Quality Management Plan.

DRC has 30 years of experience reporting large-scale assessment results. Our extensive reporting experience for the PSSA and other assessment programs such as those for Alabama, Alaska, Louisiana, South Carolina, and Washington, can assure PDE that DRC has the ability to report accurate results in critically prescribed time limits. We are pleased to include eMetric as our reporting partner for the GCAs Program. Our comprehensive reporting package is a collaboratively crafted system that offers **flexibility**. The GCA report design and content will be **useful and easy to understand**, and all data files and reports will be **produced and delivered on time**. For a full discussion of our proposed report offering, please see *Subheading VII.K*.

IV.C.15. Security of Test Materials and Results

DRC is an industry leader in successfully delivering high stakes, large-scale assessments, including the PSSA and other programs in Alaska, Idaho, Louisiana, Ohio, Oklahoma, South Carolina, and Washington. We have proven quality-control and security procedures integrated throughout all of our operational processes. PDE can be assured that all GCA assessment materials and student responses and data will be handled and stored in a secure manner, as DRC has done over the past 16 years in managing the PSSA.

DRC understands that ensuring security is critical to maintaining the technical quality, perceived fairness, and integrity of any testing program. We recognize that assessment security is of the utmost importance to PDE. To ensure the highest level of security throughout all phases of the GCA Program, DRC will implement the security features and procedures discussed below. We will also implement other necessary security measures as requested and approved by PDE to enhance security.

In the following graphic, we have highlighted our security procedures and policies.

Highlights of DRC's Security Policies and Procedures

Facility and Personnel Security Measures

- ✓ Employees use key-card identification badges to enter the buildings. All employees, permanent and temporary, must wear a badge. Visitors to all DRC sites must sign in and are issued badges that must be worn at all times.
- ✓ The secure access system keeps a log of all persons entering the building, including all after-hours and weekend activity.
- ✓ Unauthorized personnel are not allowed in the receiving, check-in, document processing, or materials assembly areas unless accompanied by a Project Manager.
- ✓ All electronic files are maintained at password-protected workstations and are accessible only to key personnel on the project team.

Information Technology Security Controls

- ✓ DRC employs a full-time IT Security Administrator, who oversees implementation and operational aspects of technology security.
- ✓ DRC is certified under the Federal Information Security Management Act (FISMA) law.
- ✓ All servers are located in secure, locked rooms with limited access. Server rooms are constructed of concrete floors, walls, and ceilings and are designed to be fireproof and crushproof. The server rooms have fire suppression systems to minimize the effect of any fire started within the server room.
- ✓ Passwords—which must be changed regularly—are required for all employees to access any data.
- ✓ DRC utilizes software that tracks all documentation and data files and prohibits the distribution of any files without appropriate approval.
- ✓ DRC maintains redundant backup copies and off-site storage of all data files.
- ✓ The DRC network has a full array of security technologies, including firewalls, intrusion protection, vulnerability scanning, patch management, and monitoring.
- ✓ DRC has in place a complete disaster recovery plan for all of our systems and data.

Test Materials Security Features

- ✓ DRC's in-house Document/Graphic Design Group produces scannable documents and other test materials under DRC's direct control.
- ✓ DRC's in-house Printing Department prints scannable test documents in our fully secure printing facility at the Maple Grove headquarters building.
- ✓ Outside printing vendors are required to understand and certify adherence to the security requirements of DRC and our clients before documents are submitted to them for production.
- ✓ DRC's use of barcoding technology maintains an accurate account of all test booklets. We generate a unique security code that is pre-printed on each secure document, ensuring that each document can be unequivocally associated with only one record in a master database.

Operations Security Features

- ✓ All incoming and outgoing shipments are "logged in" and "logged out."
- ✓ DRC utilizes only shipping vendors that provide online tracing and tracking services.
- ✓ DRC's innovative and proprietary Operations Materials Management System (Ops MMS) uses barcode technology to provide an accurate and efficient method to track materials from packaging and distribution through final data conversion for reporting.
- ✓ Secure materials check-in and processing occurs immediately upon receipt of testing materials. Ops MMS provides data on actual versus expected receipts, along with missing materials reports early in the process.

Scanning, Scoring, and Reporting Security Features

- ✓ DRC carries out all processing, scoring, and reporting of test results in a manner that does not permit the personal identification of students or their parents by individuals other than representatives of DRC.
- ✓ Our handscoring system, utilizing image scanning, permits the handscoring of student responses without the inclusion of student names, birth dates, or other personal identification information.
- ✓ All scanning and scoring, including handscoring, takes place at fully secure facilities.
- ✓ All readers (scorers) are required to sign confidentiality agreements.

Facility and Personnel Security Measures

All of DRC's secure facilities are designed to meet the stringent security requirements of large-scale testing programs. DRC enforces strict security measures to prohibit unauthorized personnel from access to client materials through either deliberate or unintentional action. All materials are processed and stored in an environment secure from access by the general public or any unauthorized employee. Documents with students' names are stored in a secure environment accessible only to authorized DRC personnel. All DRC personnel are trained in and informed of all security requirements.

The following corporate security measures are in place at DRC:

- Employees use key-card identification badges to enter the buildings. All employees, permanent and temporary, must wear a badge. Visitors to all DRC sites must sign in and are issued badges that must be worn at all times.
- The secure access system keeps a log of all persons entering the building, including all after-hours and weekend activity.
- Unauthorized personnel are not allowed in the receiving, check-in, document processing, or materials assembly areas unless accompanied by a Project Manager.
- All incoming and outgoing shipments are "logged in" and "logged out."
- Confidentiality of individual data is maintained at all times.
- Client confidentiality and privacy are maintained.
- All electronic files are maintained at password-protected workstations and are accessible only to key personnel on the project team.
- Security requirements are discussed with selected printers and other subcontractors. Vendors must certify adherence to these standards before documents are submitted to them for production.

Information Technology Security Controls

In our computing environment, DRC utilizes security controls that relate to our hardware, data, and network. DRC manages multiple terabytes of client data; therefore, security is an inherent, inextricable, and indispensable component of our system.

DRC has a full-time IT Security Administrator who oversees the implementation and ongoing operational aspects of our technology security. The IT Security Administrator is currently leading the process for DRC to become certified under the Federal Information Security Management Act (FISMA), as defined by National Institute of Standards and Technology (NIST) Special Publication 800-53, SP800-53A and Department of Defense Instruction (DoDi) 8500-2. The focus of this security accreditation is the full range of computing environment and

network security processes and tools, including intrusion detection, firewalls, patch management, vulnerability scans, and monitoring.

Hardware—All servers are in secure, locked rooms with access limited to technology support staff only. DRC has two primary server rooms, each in separate buildings. These server rooms are constructed of concrete floors, walls, and ceilings designed to be fire- and crush-proof. Key card access is required to access both DRC's buildings and the server rooms. In addition, a log is maintained, documenting each time a server room is entered, by whom, and for what purpose.

Data—Protection of data starts with a process that denies everyone access to files, and then specifically grants access to those authorized (following the principal of least privilege). There is an end-user password policy in place, requiring passwords to be changed periodically. DRC utilizes state-of-the-art software to track sensitive client data. This software “fingerprints” all documentation and data files important to each client contract. This software prohibits the distribution of any of the documents or files without approval from appropriate DRC personnel. This tool is also able to identify parts of each of these documents, so that no portion of the files may be electronically removed from DRC. Our data backup process includes redundant backup copies and off-site vault storage, as well as a highly secure on-site vault.

Network—DRC employs a “defense in depth” approach that incorporates a full array of security technologies and processes pertaining to firewalls, intrusion protection, vulnerability scanning, patch management, and monitoring. We have extensive experience with secure web applications and secure file transmission. For some network connections, such as secure web applications, encryption is required. DRC uses Secure Sockets Layer (SSL), which provides 128 bit encryption. Network connections are audited regularly, and the network accounts of employees who leave DRC are disabled immediately.

In addition to the system security features listed above, DRC also has routine backup procedures in place to keep all systems, files, and data secure from loss due to system breakdown or disruption in the system environment (e.g., fire, tornado). A full description of our back-up and disaster recovery practices can be found under *Subheading X. Archive, Business Continuity, and Disaster Recovery Requirements*.

Test Development and Operations Security Features

Security Procedures for Item and Form Development

At DRC, the integrity and security of items and forms continuously punctuate every phase of the test development process. Because we fully understand the fundamental issues regarding test security, we unfailingly adhere to the security measures described below.

Physical Document Storage—During the item and form development processes, all hard copy materials related to item and form development will be stored in secure locations when not in use. Upon completion of review meetings and delivery of items or camera-ready forms, all item and form development materials are boxed for security purposes and final storage. Document retention is based on the client’s security policy requirements, which includes storage in an environment that is secure from access by the general public or unauthorized personnel. Authorized Test Development and Project Management staff can retrieve documents quickly and efficiently as the need arises. Materials will remain secure until written authorization has been received from the appropriate PDE contact to securely destroy hard-copy materials.

Electronic Item Bank Security—Noteworthy security features related to our electronic item banking system, Item Development and Educational Assessment System (IDEAS), patent pending, are:

- Security for the bank will be provided through a Secure Socket Layer (SSL) protocol for information transfer over the Internet and Windows authentication for user access to the bank.
- The system will be protected by a password assignment and sign-in process that authenticates users based on each person’s role on the project.
- The item bank will have an audit trail feature that displays user changes to items and documents these changes.

DRC has in place high-level security structures for our hardware, data, and network. Authorized users will be provided access only to portions of IDEAS pertinent to their roles. For example, mathematics test development specialists are not allowed to view science items, while others may be restricted to read-only access. Electronic item and form information stored in IDEAS will remain secure until written authorization has been received from the appropriate PDE contact to securely delete all such information. Please see *Subheading VII.B* for more detailed information on IDEAS.

Committee Review Security Processes—DRC appreciates the importance of maintaining security of all items, prompts, and student responses. No secure material will ever be released to content/bias review, standard setting, and rangefinding committee members before meetings.

DRC requires signed security agreements from all review meeting participants and retains the agreements for the duration of the contract. At the beginning of all review meetings, each participant will be asked to sign a Confidentiality Agreement letter, which will specify the confidentiality agreement, security regulations, and ownership regulations. DRC will ensure that no confidential materials related to the project will be released without PDE's explicit approval.

During the review meetings, secure materials (e.g., items, passages, rubrics) will never be left unattended. In other words, DRC staff (facilitators and recorders) will monitor the security of all items, passages, and testing-related materials throughout the entire process. All materials sent to meetings are sent through a secured mailing process with tracking documentation. DRC will number each set of materials used during the meetings so that any missing material will be immediately noted when materials are checked in and out each meeting day. DRC staff is vigilant about maintaining security at these meetings. Depending on PDE's preferences, DRC will either arrange for on-site shredding bins and secure disposal or securely ship the materials in tamper-proof boxes back to our headquarters facility in Maple Grove, Minnesota, where they will be securely shredded and disposed.

In-House Printing

DRC's Document Services area incorporates our complete in-house Printing Department, which produces and prints scannable forms and other testing materials from typesetting to editing and printing. Because Document Services is under our direct control, a majority of the printing for our clients is completed at our fully secure printing facility by our staff, adhering to DRC's stringent security requirements. If outside printing vendors are used, security requirements are discussed with them and they must certify adherence to these standards before documents are submitted to them for production.

Secure Materials/Test Booklet Security Barcodes

DRC is confident that our methods to track student materials through the use of our barcoding technology will maintain an accurate account of all test booklets and answer documents. DRC generates a unique security code that is pre-printed on each secure document. The barcode will ensure that each document (e.g., test booklets and answer documents) can be unequivocally associated with only one record in a master database. Requirements for barcoding and printed documents are subjected to strict quality assurance inspections to ensure accuracy. The format and precision of the printed information are closely examined by DRC's Software Quality Assurance analysts to make certain the information is correct.

Operations Materials Management System (Ops MMS)

DRC will use Ops MMS, which is a proprietary and innovative system that uses barcode technology. Ops MMS provides an accurate and efficient method for tracking secure materials throughout packaging, distribution, collection, receipt, check-in, processing, scanning, editing, data validation, and data conversion for

reporting. For packaging and distribution, Ops MMS identifies all secure test materials by site code and provides an automated quality check between items designated for a site based on the following: Name of Testing Program, Site (School/District), Grade, Content Area, Material Type, Quantity, etc. For materials receipt and processing, Ops MMS provides data on actual versus expected receipts, along with used versus unused answer documents. Ops MMS also generates real-time Missing Materials Reports from the start of check-in, so that any missing materials can be quickly discovered and resolved.

Distribution and Collection Security

To maintain test security during distribution and collection, DRC uses only shipping vendors that provide online tracing and tracking services, such as United Parcel Service (UPS). **DRC's Logistics Manager, Mr. Shaun Fahey**, will coordinate and monitor the distribution activities of all shipments. These carrier methods allow cost-effective, timely, traceable, and secure distribution. DRC will be responsible for the secure and timely distribution and collection of materials through our approved and selected shipping vendors.

Secure Materials Processing

Secure materials check-in and processing will occur immediately upon receipt of GCA testing materials. DRC Operations staff is able to provide real-time feedback on actual receipts versus expected receipts for schools and districts. This allows for immediate communication with districts and schools regarding any materials receipt "shortfall." This processing system offers a tremendous advantage to PDE by providing quality-control measures that are specifically related to potential test security issues. Problems can be detected early and swiftly resolved. Secure materials issues are identified and resolved before any reporting takes place.

Scanning and Scoring Security

All processing and scanning occurs at fully secure facilities. DRC maintains stringent security and quality-control procedures during scannable answer document processing. Approved processing and scanning procedures will provide our Document Processing staff with step-by-step instructions to follow during scannable answer document processing. DRC's Software Quality Assurance staff will perform extensive tests to ensure all scanned data are captured, and securely and accurately stored in a secure database environment. Student responses and data are kept confidential and secure at all times. Our use of barcoding technology allows us to score and accurately link student response data and images without the inclusion of student names, birthdates, or other personal identification information.

Our hand-scoring facilities have secure database servers and multiple applications that support the hand-scoring processes. The database backups and archived images are also housed on the secure servers. Access to all DRC scoring facilities is limited to staff and to visitors accompanied by authorized personnel. DRC staff

discusses security guidelines and obtains signed security agreements from all scorers. DRC retains these agreements for the duration of the contract. To prevent the unauthorized duplication of secured materials, scorers are not able to print from their imaging stations without authorization by management. Additionally, scoring terminals do not have access to the Internet. DRC's scorers fully understand that no testing materials may leave a scoring site.

Student Confidentiality

DRC ensures that all student data remains confidential and secure. Individual student reports, data records, and any transmittal media are distributed only to the appropriate entity upon approval of each state department. DRC is highly aware of the confidentiality of student information. DRC will carry out all processing, scoring, and reporting of test results in a manner which does not permit the personal identification of students or their parents by individuals other than representatives of DRC. Additionally, our use of barcoding technology allows us to score and accurately link student response data and images without the inclusion of student names, birthdates, or other personal identification information. All sample reports, student data diskettes, and summary data files provided to PDE will be carefully developed to exclude student names. Mockups and samples will be provided with a nonspecific identifier (e.g., Student 01). This has been the practice at DRC over the years and is documented as part of the requirements and Quality Assurance testability for each deliverable. Each DRC staff member is keenly aware of our student confidentiality requirement.

Security of Reports, Data Files, and Transmittal Media

Student data, reports, data files, test items, answer keys, and other program data are managed within DRC's secured network environment. Throughout the process of producing final student data files and reports, DRC takes steps to safeguard our customer's data.

Data posted to a website, or made available via web access, is managed through industry-standard firewall, log-in/password, and access controls. For encryption and secure transmission needs, DRC has proven approaches that have been used with our assessment and surveys customers. Care is taken to design solutions that permit users to view only the data that is appropriate for them. Reports, diskettes, CDs, DVDs, and other media are produced in DRC's secured facility and then readied for distribution. Quality control procedures are followed to ensure that these media are distributed correctly and that the right information is sent to the right party.

As part of the security of data and in accordance with Pennsylvania regulations, DRC is highly-aware of the need to ensure that student names are not included in any delivery to the Commonwealth or any other government or non-government agency. Our data layouts specifically exclude this information, our staff is sensitive to this requirement, and our quality processes double-check compliance.

Audit Trails

DRC has extensive experience in designing systems for our clients that have built-in audit trails. All systems developed for the GCA Program will include audit trails. The information from these audit trails will be available to PDE if desired and will be maintained throughout the life of the contract. The audit reports on user information can be run on a regular basis or as requested by PDE. This information may include, but is not limited to, the following for each user of the system:

- User name
- Account number or account identification
- Time and date stamping for entering and leaving the system
- Information accessed, composed, edited, or deleted

Mitigating Security Breaches

During DRC's years of experience in educational testing, we have found that there are specific methods for mitigating the potential for security breaches. One of the most critical of these is providing test security information to assessment coordinators and any individuals assisting in the testing process. These informational needs are directly related to:

- Identifying all secure materials as "secure" (e.g., test security regulations highlighted or summarized on all documents, test security protocols specified within the documents, a "secure materials" notation on each footer of each page within a document).
- Communicating that all student work is confidential and secure.
- Providing detailed test security information in all manuals, handbooks, and other informational materials.
- Providing specific test security training or training overviews in manuals to encourage the formal training of all local staff.
- Clearly specifying all activities that constitute breaches of security.
- Clearly delineating the repercussions associated with a test security breach.

Once appropriate and sufficient "opportunities to learn" have been provided to teachers and administrators relative to PDE's test security requirements and practices, there are specific areas on which DRC can focus to identify possible needs for additional investigation. One of these areas is related to communications from districts. These can be telephone conversations, emails, and faxes subsequent to the administration. DRC's customer service database system, Education Project Information Center (EPIC) allows DRC to collect information related to specific communications and correlate these communications. This tool provides DRC with an excellent database from which to track potentially

problematic situations such as multiple requests for additional materials beyond the scope of what was projected or verbal references to inappropriate activities regarding test security (e.g., references to specifics in test booklets). Our EPIC system has proven to be highly beneficial in documenting test security issues encountered during communications with district staff. It also provides evidence related to any suspect activities (e.g., ordering large quantities of additional materials or many discrete instances of ordering additional materials). Please see *Subheading VII.G.1, Customer Service Support*, for more information on DRC's Customer Service function and our customer service database system, EPIC.

In any instance of a suspected breach of test security, DRC Operations staff will document the communication or circumstance and will immediately notify DRC Project Management. DRC Project Managers will review the documentation and swiftly notify PDE, providing as much documentation as possible. DRC will not address potential test security breaches with district staff; DRC considers the sharing of inappropriate information with any districts, schools, parents, media, etc., to be a breach of our commitment to client confidentiality. DRC staff will support PDE as it addresses any potential test security breaches within districts. Support will include documentation and/or data analysis.

IV.C.16. Storage and Retrieval of Materials

All electronic assessment data, including online assessment data and scanned data, will be stored in DRC's highly secure database management system. The electronic storage system will allow efficient and easy retrieval of individual student tests within a short timeframe.

Processed and stored test booklets and answer documents can be retrieved quickly and efficiently as the need arises, either during or upon completion of processing. All documents are stored in a secure environment that can only be accessed by authorized project personnel.

We have highlighted our security features in *Subheading IV.C.15*, above. For a full discussion of our plan for storage and retrieval of the GCAs, please see *Subheading VII.I.16, Storage, Retrieval, and Destruction of Materials*.

IV.C.17. Destruction of Materials

All hard-copy secure materials, including test booklets and answer documents, and electronic data and image files will remain secure until written authorization has been received from the appropriate PDE contact to release or securely destroy the documents and files. Please see *Subheading VII.I.16, Storage, Retrieval, and Destruction of Materials*, for more information regarding DRC's storage and retrieval procedures.

IV.C.18. Reporting Requirements

DRC has 30 years of experience in reporting large-scale assessment results. Our extensive reporting experience for the PSSA and other assessment programs such as those for Alabama, Alaska, Louisiana, South Carolina, and Washington, can assure PDE that DRC has the ability to report accurate results in critically prescribed time limits. We are pleased to include eMetric as our reporting partner for the GCA Program. Our comprehensive reporting package is a collaboratively crafted system that offers **flexibility**. The GCA report design and content will be **useful and easy to understand**, and all data files and reports will be **produced and delivered on time**. For a full discussion of our proposed report offering, please see *Subheading VII.K, Reports and Data Files*.

IV.C.19. Interconnection with Other Vendors

At DRC, we have a successful history of cooperation with other vendors who work in large-scale assessment. We achieve this success by placing a testing program's success as a top corporate priority. Through hard work, attention to detail, and a forward-thinking management team, DRC has maintained an excellent reputation in the testing community. The dedication of DRC staff to the ultimate goal of all assessment programs—the improvement of the educational experience of students—ensures that we will find ways to **build relationships and solve issues when working with other contractors**.

As the prime contractor for the PSSA, Grades 3–8, 11, and 12, DRC has had extensive experience interfacing with other PSSA past and current contractors, such as the PSSA reporting contractor, The Grow Network, and the prior vendor for the Grade 3 Reading and Mathematics Assessment, CTB/McGraw Hill. DRC routinely assists PDE to fulfill requests for data from other contractors, consultants, and government agencies, including the University of Pittsburgh. DRC interacts with these vendors and agencies through annual planning meetings, biweekly conference calls, and regular phone and email contact. With direction from PDE, DRC executes and manages the:

- Communication plan.
- Contact list for all parties.
- Established data transfer protocol.

Our experience with these vendors has successfully met the objectives of PDE for reporting and data analysis.

For the GCA Program, DRC will continue to connect with previous/other contractors as requested by PDE. As appropriate, this communication will include information transfer, dissemination of information, and conversion of data, files, and other records. DRC will ensure that such requests for information will be handled in a prompt, professional, and cooperative manner.

We recognize that the exchange of data between entities is a critical and essential component in the success of assessment programs and have embedded quality checks throughout. To support this process, DRC proposes using our secure, high quality data exchange procedures to ensure that all document and data files are successfully and accurately transferred between DRC and other parties as directed by PDE. Please see *Subheading VII.K, Reports and Data Files*, for a more comprehensive discussion of DRC's data management and exchange procedures.

IV.C.20. Ensuring Test and Data Security

Student Confidentiality

DRC ensures that all student data remains confidential and secure at all times. All data files provided to PDE will be carefully developed to exclude student names. Mockups and samples will be provided with a nonspecific identifier (e.g., Student 01). This has been the practice at DRC over the years and is documented as part of the requirements and Quality Assurance testability for each deliverable. Each GCA Program team member will be keenly aware of this requirement when managing data requests.

We incorporate rigorous quality assurance activities throughout the process to ensure the highest level of data quality, integrity, and security. All precode data will be accurately stored in a secure database environment. In our computing environment, DRC utilizes security controls that relate to our hardware, data, and network. DRC manages multiple terabytes of client data; therefore, security is an inherent, inextricable, and indispensable component of our system. DRC has extensive experience in designing systems for our clients that have built-in audit trails. All GCA Program systems will include audit trails. Please refer to *Subheading IV.C.15, Security of Test Materials and Results*, above, for more information on DRC's security features and procedures.

Independent Security Audit

DRC is pleased to be partnering with Caveon Test Security to perform the independent security audit for the GCA Program. Caveon will conduct periodic, independent security audits of the entire assessment system, including PDE, DRC, and DRC subcontractors, at a time agreed upon by PDE and DRC. (Note that the final submitted cost sheets indicate that the audit will be performed during the fourth year of the program [PDE FY 2011]). The company will also perform subsequent audits on an annual or biannual basis, based upon the results of the most recent audit. Please note that since the needs of subsequent audits could not be firmly established at this time, DRC has not included costs for any audits past year four in our cost proposal.

As a company devoted to test security, Caveon is in a unique position to provide additional recommendations for secure test administration practices that may not be currently required by PDE or the GCA Program. Caveon will make recommendations to strengthen test security efforts as part of this audit process.

Overview of Caveon Test Security and the Audit Process

Effective test security is more crucial than ever for maintaining valid and reliable testing. National standards requirements and new technologies, including the Internet, place new pressures on the integrity of tests and test results.

Caveon Test Security is a high-growth technology company dedicated to helping test organizations protect against test theft and security breaches. Caveon employs 14 individuals, many of whom are testing-industry experts. In combination, these professionals possess over 300 years of testing experience.

Caveon is the first test security firm to offer proprietary detection services. Caveon provides security services to help fortify testing programs from compromise and identify security breaches to exam content. Caveon also offers remediation services to halt and prosecute abuses of sensitive test information.

Caveon Test Security strongly supports the position that every high-stakes testing organization that is committed to delivering fair and valid tests should undergo an independent review of its existing test security measures. Since the company's inception, Caveon has conducted more than 50 Caveon Security Audits for high stakes testing programs in a number of industries, including health care, information technology, engineering, and of course, state education. During the audit process, Caveon systematically measures existing policies and procedures (formal and informal) against more than 250 best practice standards.

In all cases, Caveon's clients have realized significant benefits from the recommendations made by Caveon's test security experts. At the conclusion of an audit, Caveon generally makes 40 to 65 recommendations to each of our clients. By prioritizing and implementing these recommendations, our clients see measurable improvements in test security and program integrity. Importantly, many of these recommendations do not require significant human effort or financial resources to implement.

The following proposal describes Caveon's Test Security Audit process for PDE. This service will help PDE understand the effectiveness of test security policies, materials, and procedures associated with the GCA Program at state, district, and school levels. The scope of the audit will include subsequent annual audits to verify improvement and to make further recommendations. Costs for subsequent audits will be provided upon request.

As part of the audit process, Caveon will conduct an onsite audit at DRC to validate that proper processes, procedures, and practices are followed in maintaining the security and confidentiality of Pennsylvania's confidential testing materials.

Security Audit Scope of Work

1. Caveon Test Security will provide a Test Security Audit of the GCA Program as specified in the RFP. Caveon staff will meet all terms and requirements of the RFP.
2. The Test Security Audit will include face-to-face or telephone interviews with PDE staff, school districts, and contractors. Caveon will also review appropriate written material (e.g., security plan, communications with school districts related to test security issues, test administration manuals). Caveon Test Security personnel who conduct the audit will ask detailed questions in specific topic areas to collect data about security measures. They will compare the security measures that are in place against best practices in order to identify potential vulnerabilities. In every instance where a vulnerability is identified, specific remedial actions will be recommended.
3. Highlights of the Test Security Audit:
 - a) An initial audit question is “Does the testing program have a security plan in place?” If so, follow up questions will determine whether the plan is comprehensive and detailed in key areas.
 - b) Although the APA/AERA/NCME standards for test security described in the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 1999) are used as a foundation, Caveon Test Security will apply its own Test Security Audit Standards, which cover 14 areas and 250 standards, after review by PDE for appropriateness to the goal of this program. The following areas identified in the RFP will be given special emphasis:
 - Item writing, field testing, and item banking
 - Test design
 - Test administration
 - Data transfers, reporting and statewide adherence to FERPA requirements
 - Communications to regional, district, and school staff
 - Legal precautions and recommendations for policy consideration
 - Security agreements, which may be required (internal and external) to reduce potential liabilities
 - c) In addition to these topics, other areas that will be examined, subject to PDE approval, include training of staff and test administrator/proctors, validation of scores, transmission of test information, web monitoring for unauthorized disclosure of test items, and the security breach action plans of PDE and individual districts.
 - d) A key component of the Test Security Audit is a review of the policies and procedures related to the handling of suspected instances of misconduct, including instructions to test administrators, decision rules for clearing or confirming cases, and follow-up policies and actions.

4. Caveon Test Security proposes to develop a Test Security Audit report covering the following areas:
 - a) Security Plan
 - b) Roles and Responsibilities
 - c) Budget and Funding
 - d) Legal Precautions and Agreements
 - e) Test and Item Design
 - f) Test and Item Development and Maintenance
 - g) Test Publication
 - h) Test Administration
 - i) Test Scores and Results
 - j) Information Security
 - k) Web and Media Monitoring
 - l) Security Awareness and Training
 - m) Security Breach Action Plan
 - n) Physical Security
5. It is anticipated that the audit will be conducted by Caveon's President, Dr. John Fremer, and another senior Caveon staff member, Dr. Jim Impara, a former assessment director for two states. Account management functions will be fulfilled by Dr. Jamie Mulkey. However, other Caveon staff may participate as needed. Résumés for Dr. Fremer, Dr. Impara, and Dr. Mulkey are included in *Appendix 1*.
6. It is anticipated that the Test Security Audit of both the Commonwealth and its contractors will be conducted in a mutually agreed-upon time frame.

Security Audit Process: Prior Review of Materials

Prior to conducting the Security Audit, Caveon will seek a planning conference call with PDE staff to go over the plans, standards, and procedures. Caveon Test Security will also request a set of materials to review before the audit interviews. The following is a generic list of the kinds of materials that will be requested. Caveon will consult with PDE as to which materials would be most useful for conducting the Security Audit in a manner that minimizes demands on PDE, district, and school staff. In some cases it may be easier to interview an appropriate person rather than to have PDE, district, and school staff prepare written materials.

- Security Plan
 - If no formal plan, then provide individual policies

- Policies should include PDE general security policies, as well as those specific to the assessment area
- Roles and Responsibilities
 - Job description for individual carrying out the majority of test security functions
- Budgeting and Finance
 - Planned security expenses
 - Ad hoc security expenses
- Legal
 - Non-disclosure agreements and contracts with subject matter experts
 - Include all communication of procedures with item writers and item reviewers
 - Allocation of security functions—who is responsible for mitigating the various types of breaches that could occur
- Item Development and Maintenance; Test Development and Maintenance
 - Item writing manual
 - Test design strategies, exposure controls, etc.
 - Transmission and storage of items
- Test Publication and Distribution
 - Documentation of the methods and procedures for storing files in a secure location during the publication and dissemination process.
- Test Administration
 - Tests need to remain secure immediately before, during, and after test administration. Test administration refers to the process of scheduling, providing physical security measures, presenting the test content, gathering the test results, and communicating results and other information to the organization. This would include, but is not limited to, the test administration manual and policies.
- Test Scores and Results
 - Test score policies including distribution, access, etc.
- Information Security
 - Digital and physical information related to the organization’s testing program must be stored and transmitted securely at all times. This would include policies and procedures in this area.
- Web Monitoring
 - Planned vs. ad hoc
 - Method of and procedures for publicizing results, etc.
- Security Awareness and Training

- Security Breach Action Plan
 - Policies and escalation path
- Physical Security
 - Policies based on physical access
 - Key card access
 - Logs

Security Audit Interviews

Security Audit interviews are typically scheduled over a two-day period and may be completed by the middle of the second day. It is useful to start the first day with a group session, wherein the procedures, schedule, and goals of the Security Audit are reviewed with those who will be interviewed, as well as other interested parties. Often final schedule adjustments are made to take into account unanticipated absences or major developments that restrict the availability of client staff.

The Security Audit interviewers work separately or as a team of two, depending on the number of people to be interviewed and schedule restrictions. Whenever two interviews can be held at the same time by the two interviewers, this is done. If only one interview is set, both interviewers participate.

The interviews go through the standards in each area of the Security Audit with those individuals identified as appropriate to the content covered. Different staff members are often interviewed for the program management, training, test development, test administration, information security, file maintenance, score analysis, and security breach action plan functions.

For some purposes, group interviews are used, as is the case where there are several staff performing similar but related functions (e.g., content specialists for different test development domains). A working lunch is one way that such group interviews can be conducted.

At the end of the interview process, often at the midpoint of the second day, the auditors give an oral report with the recommendations that have emerged from the prior review of materials and the interviews. This will give PDE or district staff immediate feedback on the process, providing an opportunity to clarify recommendations and correct any misimpressions that the auditors may have formed on the basis of the interviews. PDE staff can also indicate the areas that should be emphasized in the written reports. The oral report can be given to a small or large group, as desired and feasible.

Review of Draft Report

The auditors will provide a draft report for review at each stage of the interview process. After receiving comments from PDE, a final version will be prepared. In addition, Caveon Test Security will deliver with the final report an accompanying

set of PowerPoint slides. The slides will be prepared for possible use by PDE in sharing with others the results of the Security Audit.

Management Plan

Overall management of the Test Security Audit and interactions with both the Commonwealth and DRC will be the responsibility of Dr. Jamie Mulkey, Vice President, Client Services, and Founder. Dr. Mulkey will serve as the PDE principal point-of-contact.

Dr. Mulkey will provide scheduling information, report content feedback, and other relevant communications from PDE to Caveon about the project. She will also review all reports for completeness and accuracy and provide explanatory details to PDE after report delivery. All reports will be delivered on a timely basis in electronic format, unless otherwise specified, to PDE. Dr. Mulkey will also be assisted by other Caveon management staff, if needed.

Reports

An oral report will be provided to appropriate staff at PDE at the close of interviews at the state and contractor facilities.

A formal written report complete with prioritized recommendations will be provided in two phases. A draft report will be provided to PDE for review. Any necessary edits/additions will be made to the report before it is made final. DRC will also receive a copy of the report.

Option—Data Forensics

In addition to the security audit performed by Caveon, we would like to propose the option of data forensic analyses to be conducted by DRC. Data forensics can be used for detecting instances of potential testing irregularities such as:

- Evidence of collusion among test takers
- Results that indicate prior exposure to test questions
- Inconsistent student response across the test materials
- Erasures to answer choices
- Changes in performance from test event to test event (a new feature that was discussed with PDE, note that this feature is not listed in *Appendix 8*)

DRC has crafted a unique solution to be offered to PDE for data forensic analysis, utilizing specific expertise and experience of staff members from both organizations. Costs associated with the data forensic analysis plan are provided as a line item in the cost spreadsheets. A full description of our proposed plan for optional data forensics can be found in *Appendix 8*.

IV.D. PERFORMANCE MEASURES

IV.D.1. Assessment Development and Administration Schedule

DRC acknowledges and will meet all performance requirements, project deliverables, and specified timelines outlined in the RFP and/or by PDE. We understand that beginning in the 2011-2012 school year, all GCA assessments will be administered three times each school year—fall, spring, and summer. DRC further understands that the specific administration schedule will be determined jointly by DRC and PDE. Please see *Subheading VII.M, Assessment Schedule* for our proposed, preliminary testing schedules.

IV.D.2. Timeframe for Delivery of Scores

DRC appreciates the need to report GCA results on an accelerated schedule, particularly results for graduating students. DRC acknowledges and will meet all performance requirements, project deliverables, and specified timelines outlined in the RFP and/or by PDE, including delivery of student scores/reports. *Subheading VII.K, Reports and Data Files*, discusses our reporting processes, procedures, and timelines. Please see *Subheading XI.A, Task Plan* and *Appendix 11* for our proposed project schedules.

IV.D.3. Delivery of Electronic Data Files to PDE

DRC will provide all electronic student data files and summary data files to PDE at the same time that GCA scores are provided to schools and school districts. DRC will work with PDE to determine appropriate file layouts for each administration. Our expertise in understanding assessment data requirements enables us to provide logical, well-organized, and consistent file layouts. *Subheading VII.K, Reports and Data Files*, discusses our data file management procedures.

IV.D.4. Quality Assurance Tests

DRC agrees to perform quality assurance tests to ensure the accuracy of all data and analyses. We understand that discrepancies identified by PDE must be corrected to PDE's satisfaction at no additional cost. Within 48 hours of identification of any discrepancy(ies), DRC and PDE will agree on an appropriate timeline for solution implementation. Please see *Subheading VII.I* for more information regarding DRC's Quality Management Plan, including ensuring accuracy of data and results.

IV.D.5. Technical Report

The GCA Program Technical Report will serve as the primary vehicle for documenting reliability and validity evidence for the program. From the earliest stages of programs, DRC psychometricians are mindful of technical reporting and consider documentation needs continually. The same staff members who plan and conduct project analyses also prepare the associated technical documentation.

Subheading XI.J.10, Technical Report, provides information regarding our proposed Technical Report procedures.

IV.D.6. Secure Website

DRC and our partner, eMetric, will provide secure websites for online enrollment, online reporting (district and school summary reports), and data interaction. All DRC/eMetric websites will be compatible with Ed Hub, so that PDE and district staff can easily access them in a secure environment. We have extensive experience with secure web applications and secured file transmission. For any web applications requiring encryption, DRC uses Secure Sockets Layer (SSL), which provides 128 bit encryption. PDE can be assured of our dedication to data security in our online systems for the GCA Program.

IV.D.7. Student Identifiers

DRC will continue to use PAMSecureID as the unique student identifier for all Pennsylvania assessments, including the new GCA Program. As the PSSA testing contractor during the development and implementation of PIMS, DRC has worked with PDE to ensure that our systems and processes work effectively with Pennsylvania's new information management system. We are confident that we can continue our successful use of PAMSecureID under this contract, and look forward to working with PDE as the use of PIMS data continues to evolve. For a full discussion of our proposed approach to unique student identifiers and precode information, please see *Subheading VII.F.2, Collection of Student Demographic and Program Information*, and *Subheading VII.F.3, Precode Labels and Precode Student Information*.

IV.D.8. Status Report Updates and Project Schedules

Our proposed team knows the importance of communication to accomplish the goals of a program like the GCA Program. Regular communication processes will promote program success and further support the program's continuous improvement. DRC will work with PDE to schedule, coordinate, and participate in weekly status meetings with PDE staff. Please see *Subheading XI.B, Status Report*, for more information.

IV.E. REPORT OF ERRORS

The report of errors required by the RFP is provided in *Appendix 15*.

V. Requirements for the Diagnostic Assessment Tool

V.A. TASKS

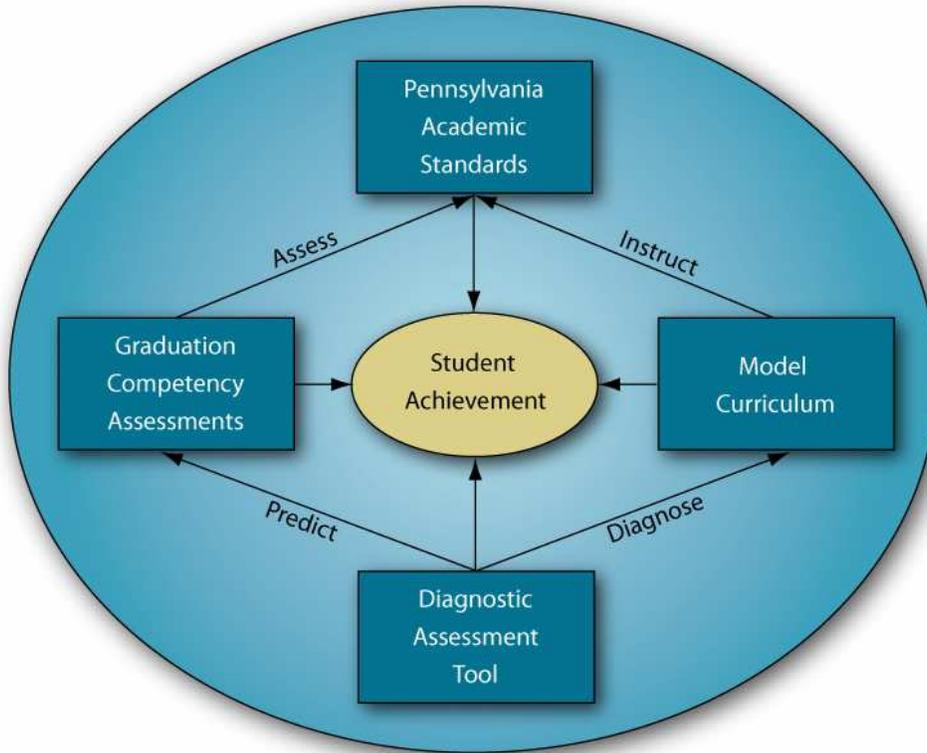
V.A.1. Diagnostic Assessment Tool Usage

DRC understands that the Diagnostic Assessment Tool will be used for students in grades 6–12 to:

- Diagnose prerequisite skills for each GCA content area.
- Serve as an achievement monitoring tool for students currently enrolled in a GCA content course.

V.A.2. Differentiate Instruction and Provide Interventions

DRC will develop a Diagnostic Assessment Tool that can be used by educators to help them determine students' strengths and instructional needs. Educators can then provide instructional interventions appropriate for each individual student or the entire classroom. The figure below illustrates DRC's design for the Diagnostic Assessment Tool. It begins with the Pennsylvania Academic Standards. These standards will be **assessed** by the Graduation Competency Assessments (GCAs) and **receive instruction** through the Model Curriculum. When students have been taught and have learned the academic standards through the Model Curriculum, they should be well prepared to demonstrate the acquired knowledge of the standards through the Graduation Competency Assessments. That is, learning the curriculum should translate into success on the assessments. Likewise, successful performance on the Diagnostic Assessment should translate into successful performance on the GCAs. At the core of the system is **student achievement**. All of the components (i.e., the GCAs, the Diagnostic Assessment Tool, and the Model Curriculum) and the Pennsylvania Academic Standards should have a positive influence on student achievement.



Framework Showing How the Diagnostic Assessment Tool Relates to the Graduation Competency Assessments, the Model Curriculum, the Pennsylvania Academic Standards, and Student Achievement

To determine if students have learned the curriculum, DRC will design the Diagnostic Assessment Tool to match the Model Curriculum so that the tool can **diagnose** how well the students have learned the material. Diagnostic feedback on how well the students have learned the material will be provided in the form of a diagnostic profile that specifies each student’s specific strengths and instructional needs. For example, instructionally diagnostic feedback may include the use of an “item map” report that will specify a student’s scaled score by each of the key skills measured by the Diagnostic Assessment Tool, a link to sample items that represent that level of achievement on those skills, and a link to units of the Model Curriculum that instructs those skills.

The Diagnostic Assessment Tool will also be designed to **predict** how well the student is likely to do on the GCAs. To do that, the Diagnostic Assessment will be given in modules similar to the GCAs. However, to gather the necessary information for diagnostic and predictive purposes, the design of the Diagnostic Assessment Tool includes more points per module than does the GCA. For the Diagnostic Assessment Tool, we propose having approximately **30 points** (or items) per module. This will allow for better diagnostic and predictive

capabilities. Please refer to *Subheading VIII.B.3*, for details on the plans to gather and develop predictive capabilities for the Diagnostic Assessment Tool.

Integration with the Model Curriculum

To integrate with curricular resources, DRC will design the Diagnostic Assessment Tool to be closely linked to the Model Curriculum. The items making up the Diagnostic Assessment Tool will be written to align with the Assessment Anchors, as defined by the Eligible Content. Since the foundation of the Model Curriculum will also be based on the Pennsylvania Academic Standards and Assessment Anchors, the Diagnostic Assessment Tool items and Model Curriculum will thus be closely linked. Upon contract award, DRC will work with PDE to specify the exact relationship that the Diagnostic Assessment Tool should have with the Model Curriculum.

V.A.3. Alignment with Pennsylvania Standards

The Diagnostic Assessment Tool items will be aligned to the Pennsylvania Academic Standards, concepts, competencies, and assessment anchors for Reading, Writing, Mathematics, Science, and Social Studies. The content of the diagnostic assessment will mirror the content of the GCAs. In addition, DRC and WestEd understand that the diagnostic tool will cover the prerequisite skills needed for success in each GCA content area. Diagnostic Assessment Tool items will meet PDE-approved style guidelines and item specifications. Based on our acquired knowledge and experience in Pennsylvania, the DRC and WestEd team is grounded in a solid understanding of the standards that form the foundation of Pennsylvania's assessments. We have worked closely with PDE as decisions about PSSA assessable anchors, eligible content, and cognitive complexity have been made over the life of the PSSA. In so doing, we have supported PDE as the Commonwealth has added rigor to their assessments through increased demands for cognitive complexity.

DRC has successfully worked with PDE to produce items and assessments that align to the identified assessable anchors for reading, mathematics, and science and the standards for writing that assess student knowledge and skill at the desired level of cognitive complexity. In recent years, Pennsylvania has classified items using Norman Webb's depth-of-knowledge framework (Webb, N.L. 1997, 2007), and DRC and WestEd staff have extensive knowledge and experience using Webb's Depth of Knowledge to classify cognitive complexity.¹ In determining the depth of knowledge level for each item, the content specialists at DRC and WestEd have worked closely with PDE staff in order to internalize and implement PDE's definition for the overall cognitive complexity by clarifying objectives and developing strategies to expand the depth of knowledge of the item pool. Our team of item developers is well positioned to continue to meet the Commonwealth's goals for complexity for the Diagnostic Assessment Tool.

¹ We are also familiar with the other methodologies for classifying cognitive complexity that are widely in use, including those developed by Bloom et al. and Porter.

DRC's and WestEd's thorough understanding of the Pennsylvania assessment, the assessment anchors, the content standards, and the desired cognitive complexity of the Diagnostic Assessment Tool required by the RFP places us in a unique position to respond to any future changes in the assessment anchors or other parameters of the development. Going forward, we face no "learning curve" in developing such an understanding because our item development team is conversant in all aspects of the content that is at the heart of the Diagnostic Assessment Tool for all content areas.

V.A.3.a. Meeting the Development, Training, and Implementation Schedule

Please see *Subheading VIII.K, Assessment Schedule*, for a discussion of DRC's plan for meeting the development, training, and implementation schedule for the Diagnostic Assessment Tool component.

The table that follows summarizes DRC's proposed approach to meeting the requirements for implementation. The table depicts a high-level overview of the activities occurring in each year of the contract. This information is provided in the context of PDE fiscal year as well as school year.

*Pennsylvania Graduation Competency Assessments
Section C. Work Plan
Revised February 3, 2009*

DRC's Proposed Activities for the Diagnostic Assessment Tool during Each Year of the Contract

Diagnostic Assessment Tool		Year 1 (PDE FY 08-09)			Year 2 (PDE FY 09-10)			Year 3 (PDE FY 10-11)			Year 4 (PDE FY 11-12)			Years 5 and 6 (PDE FY 12-13 and FY 13-14)			Year 7 (PDE FY 14-15)				
		School Year 2008-2009			School Year 2009-2010			School Year 2010-2011			School Year 2011-2012			School Years 2012-2013 and 2013-2014			School Year 2014-2015				
Wave	Subject	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer		
1	Mathematics: G6-Geometry		System and Item Development		FT	FT Analysis and Development		OP1	OP1	Link/OP2	OP2	OP2	OP2	OP2	OP2	OP2	OP2	OP2			
2	Science: G6-Chemistry	System and Item Development					FT	FT Analysis and Development		OP1	OP1	Link/OP2	OP2	OP2	OP2	OP2	OP2	OP2	OP2	OP2	
	Language Arts: G6-Literature																				
	Social Studies: G6-Civics & Government																				

V.A.3.b. Providing Materials for LEAs

DRC takes great pride in the quality of state testing publications produced on behalf of our department of education clients. We have extensive experience providing high-quality, customized assessment materials to Pennsylvania LEAs, including public school districts, charter schools, approved private schools, non-public schools, and Career and Technology Centers. DRC's proven procedures and systems will ensure that sufficient quantities of materials, including overages to accommodate enrollment changes, are produced and distributed in a timely and accurate manner. The following sections provide more information detailing our functions and procedures as they relate to materials production, enrollment, materials ordering, packaging and distribution, and customer service:

- *Subheadings IV.C.7, IV.C.8, and VII.D*—Materials Production
- *Subheadings VII.F.1*—Enrollment and Materials Ordering
- *Subheading VII.F.4, VII.F.5, and VII.F.6*—Packaging and Distribution
- *Subheading VII.F.7 and VIIG.1*—Customer Service
- *Appendix 10*—Materials List

V.A.3.c. Perpetual License or Ownership

DRC will provide PDE with perpetual license/ownership of all items created under the scope of the contract. Please see *Subheading VII.B, Item Development*, for a discussion of our permissions process.

V.A.3.d. Ensuring Predictive Validity

An essential feature of the Diagnostic Assessment Tool is its ability to predict future performance on the GCAs. DRC's solution for Pennsylvania will assist educators in anticipating whether students are on track and have the knowledge and skills needed to achieve at proficient levels on the GCAs.

DRC is proposing a comprehensive, ongoing, predictive validity research agenda for the Diagnostic Assessment Tool. Specific elements of this research agenda are discussed in more detail in *Subheading VIII.B, Assessment Construction*.

V.A.3.e. Documenting and Testing Computer Programs

CAL is uniquely positioned to fulfill the requirements of PDE for the successful implementation of the Diagnostic Assessment Tool that will provide educators with on-demand means to determine students' strengths and needs as a tool to differentiate instruction and to provide the appropriate interventions.

The CAL solution for PDE is fully-integrated and has been thoroughly tested and deployed in many state assessment environments. Additionally, the proposed online system for the administration of the Diagnostic Assessment program is the same platform proposed for the online delivery of the GCA program, placing us in

a unique position to offer the state a common online testing platform for all of the assessment components under the current RFP.

V.A.3.f. Online Format for Diagnostic Assessments

DRC and CAL are in the unique position to administer and deliver Pennsylvania's Diagnostic Assessment Tool via CAL's online assessment system platform, using the Computerized Adaptive Testing (CAT) format. Computerized adaptive testing (CAT) is a measurement model that has the attractive benefit of increased efficiency in assessment. CAL has considerable experience in the operational implementation and delivery of CAT for the Idaho Standards Achievement Test (ISAT), as well as in various research settings. CAL's fully functional CAT algorithm is customizable to limit item exposure and balance content to a client's specified test blueprint. The item pool to be developed for Pennsylvania's Diagnostic Assessment system to support the GCA program will be of sufficient size to support the adaptive delivery of these diagnostic exams, and we would be happy to explore options for the delivery of various GCA assessments, in either an applied or research setting, if PDE expressed a future interest in CAT. Please see *Subheading VIII.B* for details of DRC's and CAL's proposed CAT plan.

V.A.3.g. Pennsylvania's WAN/Network System

CAL's solution for Pennsylvania's Diagnostic Assessment Tool will be fully operational within the parameters of Pennsylvania's regional WAN/network system. Please see *Subheading IV.C.10* for more information regarding compatibility of the online assessment system with Pennsylvania's WAN/network system.

V.A.3.h. Ensuring System Reliability and Data Security

CAL's computerized testing platform is a secure system appropriate for use in high-stakes assessment programs, as proven through its successful use over the past six years in the Kansas, Idaho, South Carolina, Alaska, and Oklahoma NCLB testing programs. Key features of CAL's security plan are described in *Subheading IV.C.10*.

V.B. PERFORMANCE MEASURES

V.B.1. Development, Training, and Implementation Schedule

DRC and CAL agree to meet all project deadlines and deliverable dates, including field testing and training. DRC's plan for implementation of the Diagnostic Assessment Tool is discussed in more detail in *Subheading VIII.K. Appendix 11* contains our preliminary project schedule, showing all tasks, task work elements, resources assigned to each task, and the timeframe allowed for each task and deliverable. Please see *Subheading V.A.1, Project Management Plan*, above, for more information regarding DRC's approach to managing the GCA Program, including the Diagnostic Assessment Tool.

V.B.2. Diagnostic Student Profile and Class Reports

V.B.3. Building and District Reports

Please refer to *Subheading VIII*.

V.B.4. Quality Assurance Tests

Please refer to *Subheading IV.C.10*.

V.B.5. Technical Report

DRC will produce an annual technical report documenting the Diagnostic Assessment Tool test administrations. Statistical analyses of the students tested and of the items used will be provided for all content areas. The Diagnostic Assessment Tool technical report will be very similar to the GCA technical report, with the former having a more detailed section on predictive validity. See *Subheading XI.C, Technical Report*, for details of DRC's plan for providing a technical report for the GCAs.

VI. Requirements for the Model Curriculum

VI.A. DEVELOPMENT SCHEDULE

It is readily apparent that the development and the field testing of the model curricula will need to occur under a very accelerated timeline. DRC will ensure that the Model Curriculum is available to school districts according to the content-area implementation schedule discussed with PDE. The table that follows summarizes DRC's proposed approach to meeting the requirements for implementation. The table depicts a high-level overview of the activities occurring in each year of the contract. This information is provided in the context of PDE fiscal year as well as school year.

Our field testing plan is discussed in *Subheading IX.B.8, Curriculum Field Testing*. During the field testing (labeled *Initial Tryout* in the following table), curriculum materials and resources (i.e., the unit and lesson plans) will be used and reviewed by teachers who served on the committees. Their feedback will be incorporated to revise the units and lesson plans as appropriate. We strongly believe that no materials should be considered final and be posted to the Ed Hub (labeled *Final Rollout* in the following table) until they have been tested in the field. Our resulting approach is reflective of this belief.

Please see *Subheading IX.B.4, Ed Hub Posting with Committee Approval*, for an explanation of the Ed Hub posting procedures.

*Pennsylvania Graduation Competency Assessments
Section C. Work Plan
Revised February 3, 2009*

DRC's Proposed Activities for the Model Curriculum during Each Year of the Contract

Model Curriculum		Year 1 (PDE FY 08-09)			Year 2 (PDE FY 09-10)			Year 3 (PDE FY 10-11)			Year 4 (PDE FY 11-12)			Years 5 and 6 (PDE FY 12-13 and FY 13-14)			Year 7 (PDE FY 14-15)		
Wave	Subject	School Year 2008-2009			School Year 2009-2010			School Year 2010-2011			School Year 2011-2012			School Years 2012-2013 and 2013-2014			School Year 2014-2015		
		Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer
		1	Mathematics: K-Geometry		Unit Development and Review		Initial Tryout		Revise and Finalize	Final Rollout	In Use	In Use	In Use	In Use	In Use	In Use	In Use	In Use	In Use
2	Science: K-Physics		Unit Development and Review						Initial Tryout			Revise and Finalize	Final Rollout	In Use	In Use	In Use	In Use	In Use	In Use
	Reading, Writing, Speaking, & Listening: K-English Composition																		
	Social Studies: K-Civics & Government																		

PDF Created with deskPDF PDF Writer - Trial :: http://www.docudesk.com

VI.B. ALIGNMENT WITH CURRICULAR FRAMEWORK

All newly developed curriculum materials and resources must be developed in a manner consistent with a number of foundational resources, one of the most critical of which is the attendant curriculum framework (academic standards, big ideas, concepts, competencies, and anchors). It is for this reason that DRC has chosen to partner with the Association for Supervision and Curriculum Development (ASCD) to help guide the development of the Model Curriculum. ASCD staff members are highly experienced in the backwards design model and know that this is a fundamental requirement of backward design. ASCD trainers will provide a capacity building professional development workshop to DRC's unit and lesson plan developers. Additionally, ASCD will provide training to give Pennsylvania's committee members an overview of the Understanding by Design (UbD) framework. These activities will help ensure that the units and lesson plans developed for the Model Curriculum are aligned with Pennsylvania's curriculum framework.

Our Model Curriculum development initiatives underscore this requirement and it will be a fundamental feature of the work of our developers and the model curriculum committees, both in the initial training sessions and with the subsequent substantive work with the curriculum materials themselves. In other words, alignment will be woven into the fabric of the committees' ongoing review activities and will be an integral part of our deliberations and decision-making. As with all other alignment-related requirements, there will be a recording sheet, which will provide evidentiary documentation relative to the alignment of the curricular materials with the supporting curriculum framework. This document will bear the signatures of the committee members attesting to their agreement that the necessary alignment has been met and will be forwarded on to PDE for review and documentation purposes. Please refer to *Subheading IX.B* for more information about alignment.

VI.C. WORKING WITH TEACHERS, ADMINISTRATORS, AND FACULTY

DRC understands that the task of reviewing the curriculum materials and resources will be central to the work of the Model Curriculum committee and that these committees will consist of members from a number of different groups (i.e., teachers, administrators, and higher education faculty). DRC has a rich history in working with all of these groups. More information about working collaboratively with teacher committees can be found in *Subheading IX.B.1, Working with Teachers, Administrators, and Faculty*.

VI.D. ENSURING ALIGNMENT WITH PENNSYLVANIA STANDARDS

The Pennsylvania standards and its standards-aligned systems, such as the curriculum frameworks, are one of the foundational resources that will undergird

and drive the development of the Model Curriculum materials and resources. DRC staff are highly experienced in ensuring alignment between standards and curricula and this will be a fundamental feature of the committees' work. The GCAs and Diagnostic Assessment Tool will be aligned with the curricular resources and materials developed as part of the Model Curricula. Please refer to *Subheading IX.B, Utilizing "Understanding by Design" Format*, for more information about alignment.

VI.E. BACKWARD INSTRUCTIONAL DESIGN MODEL

Please see *Subheading IX.B, Utilizing "Understanding by Design" Format*, for a description of how DRC will use the Backward Design Instructional Model to support the development of appropriately crafted curriculum materials and resources.

VI.F. OWNERSHIP OF CURRICULAR MATERIALS

DRC acknowledges that all of the curricular resources and materials developed for the model curriculum will become the property of the PDE. This ownership includes all units, lesson plans, templates, intervention and support materials, rubrics, exemplars, etc.

VI.G. INDEPENDENT CURRICULAR AUDIT

An independent curricular audit will be performed during the third year (2010–2011) of the contract. DRC is recommending that Phi Delta Kappa International conduct the audit and we have engaged them to do so, pending the approval of the PDE. Phi Delta Kappa International has a national reputation for its curriculum auditing work, which is based on the pioneering efforts of Dr. Fenwick English.

VI.H. PERFORMANCE MEASURES

DRC acknowledges and will meet all performance requirements, project deliverables, and specified timelines outlined in the RFP and/or by PDE. DRC agrees to perform quality assurance reviews to ensure the accuracy of the curricular materials and resources available on the Ed Hub website. We understand that discrepancies identified by PDE must be corrected to PDE's satisfaction at no additional cost. DRC understands that monthly status updates will be produced that will include all dates, time, locations, and participants of curricular team meetings. Other elements to be included in the monthly status updates will be determined by PDE and DRC upon award. Please see *Subheading VI.A, Development Schedule*, and *Subheading IX, Tasks for Model Curriculum*, for more information about the proposed timelines and our detailed approach for the Model Curriculum component.

